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COMPUTERWORLD

Top-dollar CIO to retire

BY ROSEMARY HAMILTON
CW STAFF

NEW YORK — DuWayne Peterson, the high-profile chief information officer at Merrill Lynch & Co. who commanded a $1 million compensation package, will retire later this year, the company announced last week.

Edward Goldberg, a 30-year veteran at Merrill Lynch who is currently a senior vice president and director at the Professional Securities Services Group, will take over for Peterson.

Peterson plans to step down in June 1991 and will continue as a consultant for the firm. He insisted the move has nothing to do with either the recent corporate reorganization at Merrill Lynch — which dissolved two business sectors into one corporate entity — or the ongoing realignment of information systems.

Since late 1989, the company's IS group has shifted from centralized to decentralized management and then back to a centralized operation just a few months ago, according to Peterson.

Peterson said his 1991 retirement was planned when he joined Merrill Lynch in 1986.

"This is a personal timetable driven since the day I walked in the door," said Peterson, who will be 59 at the time of his retirement. "I wanted to get this done in five years and get back" to California, where he worked for Security Pacific Corp. before joining Merrill Lynch.

Peterson said he will begin working immediately on the transition with Goldberg, who was not available for comment. In an unrelated move last week, Security Pacific Automation Corp. named John Singleton president, replacing Michael Heschel, who resigned in November (see story page 8).



Andy Freeberg

Merrill Lynch IS chief Peterson *says the easiest job for his successor, Edward Goldberg, will be working with the business units. 'What will be difficult for him is knowing what is essential information technology. That's probably where my [consulting] role will come in.'*

Excel to renew Lotus assault

BY JAMES DALY
CW STAFF

The first rumblings of a potentially major tremor in the spreadsheet market may be felt Wednesday when Microsoft Corp. is expected to unveil a more visually arresting version of Excel that observers said could ride on the coattails of Microsoft's successful Windows 3.0 operating environment. The move could dramatically reshape vendor market share, analysts said.

The enhanced visual features of Windows 3.0 are expected to unlock the latent potential of Excel, which was critically well received but has lagged behind the market leader, Lotus Development Corp.'s 1-2-3 spreadsheet.

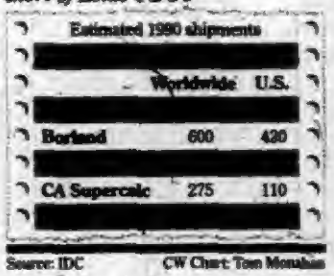
"Excel has always been hampered by its association with Windows," said Peter Rogers, an analyst at Robertson, Colman & Stephens, a research firm in San Francisco. "But now, Windows is an advantage and a significant one at that. The conclusion is clear: Lotus has a lot to worry about in the spreadsheet market."

Excel 3.0 plays off the graphic strengths of Windows 3.0, early assessors said, and it addresses the complaints of users who have clamored for more graphics-intensive spreadsheet functions.

"We don't just need better ways to manipulate the data, but better ways to get people to understand the data," explained John Winterhalter, MIS manager at 3M Corp.'s Commercial

Continued on page 6

Running the numbers
While Excel has carved out a respectable share of the spreadsheet market, its sales fall far short of Lotus 1-2-3's



Source: IDC — CW Chart: Tom Monahan

LANs satisfy Blue Shield MIPS craving

BY JOANIE M. WEXLER
CW STAFF

CAMP HILL, Pa. — The nation's largest Blue Shield plan and Medicare contractor has turned to Token-Ring local-area networks to deal with a processing crunch that was threatening to drive its mainframe costs sky high.

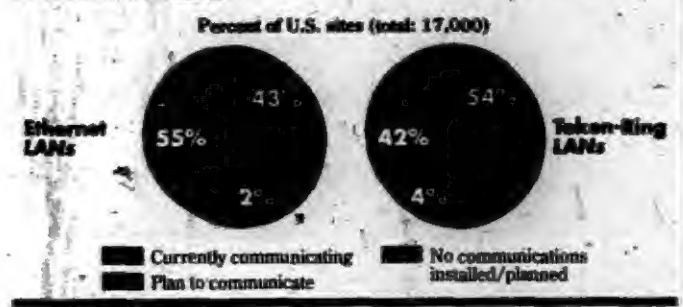
Blue Shield of Pennsylvania decided to rethink its entire computing strategy when it realized that claims growth of 15% per year was munching four additional MIPS of CPU power each month.

The insurance carrier is not thinking "smaller is better" so much as it is trying to run centralized and decentralized computing strategies in harmony.

The LANs will complement rather than replace the company's four mainframes — two IBM 3090s and two Hitachi Data Systems Corp. machines. In fact, the insurance carrier said it is entertaining the idea of adding a fifth mainframe to run IBM's

Continued on page 96

Tied in
LAN-to-host communications links are more common with Token-Ring LANs than with Ethernet



Source: Computer Intelligence — CW Chart: Doreen St. John

DEC slams door on upgrade fees loophole

BY MARYFRAN JOHNSON
CW STAFF

Digital Equipment Corp. customers who upgrade their machines through third-party resellers will be facing hefty new charges for the VAX/VMS operating system license after an abrupt shift in DEC's licensing policy, industry analysts and resellers confirmed last week.

At issue is DEC's decision to begin reinforcing a previously ignored policy to charge customers the full value of a VAX/VMS operating system license when they buy upgrade boards from sources other than DEC. In the past, these "in-cabinet, in-tier" CPU upgrades took the software license along at no extra charge.

What DEC is calling a "policy clarification" could slap a licensing fee of more than $60,000 on an in-cabinet upgrade from a VAX 6210 to a 6310, for example, while the CPU itself would cost less then $3,500 from a reseller.

"This is creating a fair amount of contention out there," acknowledged Pat Spratt, DEC's software business manager. "We are talking to dealers and customers, and our intention is to continue working with them."

DEC officials are re-examining the policy and will announce any revisions to it by Feb. 1, Spratt added.

The DEC review was prompted by a flood of phone calls unleashed recently by an open letter from the 138-member Digital Dealers Association in Chelsea, Mich. In the letter, the association detailed DEC's new software stance to its members, urging them to pass the word along to customers.

"DEC is changing an upgrade practice they have condoned for

Continued on page 4

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Executive Report — Good planning integrates new architecture with existing structures. Page 65.

Oracle back in the black, but questions remain about whether the company's quick fixes will be sustained. Page 6.

Technology Analysis: 486 systems. Compaq's entry is the fastest but most costly. AST's 486/25 packs less power, low price. Page 42.

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Quotable

"My ultimate motivation was to be a bum in the park, and that doesn't go far."

KEITH WILLIAMS
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On his unusual route into information systems. See profile page 59.

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The 5th Wave



"GUESS WHAT, DAD - THOSE CHOCOLATE DISKETTES FIT RIGHT INTO YOUR COMPUTER, NO PROBLEM."

EXECUTIVE BRIEFING

■ **Merrill Lynch Chief Information Officer DuWayne Peterson will retire** in June, the company announced. Senior Vice President Edward Goldberg will take over the high-profile position at one of the world's largest financial services firms. Peterson said his departure is not related to recent executive shakeups at Merrill Lynch but is part of the plan he set for himself when he joined the firm in 1986. **Page 1.**

■ **IBM's push into outsourcing** is back in the news after a year-long lull. Southeast Bank in Miami and Riggs National Bank in Washington, D.C., will turn data center operations and employees over to IBM for up to 10 years. Analysts say these deals may be the first of many for IBM in 1991. **Page 12.**

■ **DEC is getting tough with customers** who choose third-party upgrades. DEC has revised its VMS licensing policy to charge customers for a second operating system license fee if they upgrade VAXs with third-party equipment. The Digital Dealers Association is up in arms, and DEC is re-examining the policy. **Page 1.**

■ **IS executive turnover continues** as CSX's Jack Cooper becomes the first CIO at Seagram. Separately, John Singleton returned to the helm at Security Pacific Automation about a month after Michael Heschel resigned. **Stories, page 8.**

■ **Despite economic gloom and doom,** the computer and semiconductor industries will enjoy healthy growth this year, the U.S. Commerce Department says. Fueled by corporate demand for automation to lower costs, the industry is projected to see double-digit growth in services and 6% growth in hardware sales. **Page 4.**

■ **Blue Shield of Pennsylvania** will make a major move to token-ring LAN-based processing for its transactions. The nation's largest Blue Shield/Medicare contractor says the strategy will complement rather than replace mainframes. **Page 1.**

■ **IBM's long-awaited laptop** will be introduced late this month or next, sources say. Users appear to be hungry for the Intel 80386SX-based unit, which will weigh 7.5 pounds and run at 20 MHz. **Page 7.**

■ **Concurrent filed for Chapter 11 protection** from its creditors, but customers are hopeful the vendor will survive by restructuring its debt. **Page 10.**

■ **Changing IS architecture is a large step** and not one to be approached lightly. The best approach starts with an inventory of current technology and proceeds with a blueprint of what the firm wants to achieve. **Page 65.**

■ **Retrofitting old PCs** instead of buying new ones may appear to be an attractive option to PC managers in recession-strapped times. But user experiences indicate that performance trade-offs are not always worth the savings. **Page 35.**

■ **Should IS professionals switch jobs?** Why is it so hard to find a position in the right field? A new feature, Fast Track, passes these and other questions on to a leading IS recruiter. **Page 78.**

■ **College grads heading into IS** are often taught outdated technology on less than state-of-the-art equipment. However, one college and several companies have joined forces to improve the situation, resulting in lowered training costs and sharper grads. **Page 91.**

■ **A potentially serious threat** to employee privacy lurks in employers' increasing need for health records and other data, a Conference Board report says. **Page 59.**

■ **On-site this week:** Unix is the healthy choice of Wellmark, a Westlake Village, Calif., provider of a health care information networks. Wellmark will forsake its IBM 3083 to process transactions on AT&T's RISC-based Unix processor. The conversion is a 5-year, $30 million project. **Page 29.**

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Feds say industry to fare well

Commerce Department sees high-tech silver lining to the economic cloud

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Despite a weakening economy — and partly because of it — most segments of the U.S. computer industry will enjoy strong growth this year, the U.S. Department of Commerce predicted last week. Overall, the agency's annual analysis of 350 industries projected continued real growth for the nation's economy, but at a rate barely above 1%.

The Commerce Department's industrial outlook projected that sales of U.S. computer hardware will rise 5.9%, semiconductor shipments will climb 8.9%, computer software revenues will jump 20% and electronic information services will bring their providers 16% to 20% more revenue than in 1990. Sales by U.S. firms overseas will be especially strong, the report said.

"What is most striking is the continued strength of the high-technology industries," said J. Michael Farren, undersecretary for international trade. That strength stems from the international stature of U.S. firms and the trend to use computers and other high-tech gear to lower costs, he said.

"In general, the Commerce Department forecasts are very good, but unforeseen things can obviously happen to the economy," said Helga Sayadian, an official at the Computer and Business Equipment Manufacturers Association. She said the Commerce figures agreed closely with the Computer and Business Equipment Manufacturing Association's own forecasts, although the trade association predicted slightly worse performance for the economy overall.

Technology industries will grow faster this year than in 1990, the agency's report said. "Their more rapid growth is a strong indication of two important trends: increased use of automation to improve productivity and the expanded demand for information services," said Jonathan C. Menes, director of the department's Office of Finance, Industry and Trade Information.

"The demand by both U.S. and foreign firms for U.S. information services appears to be insatiable," the report said. Commerce predicted the following trends for information services:

- Data processing and networking services will grow 16% to $36.1 billion. That growth will be fueled by outsourcing and the increased use of electronic data interchange.
- Electronic information services will grow 20% to $10.8 billion and will continue at that rate at least until 1995. Uncertainties include efforts by the regional Bell telephone companies to ease restrictions on providing these services, concerns about privacy and security and possible amendments to the Freedom of Information Act.
- Revenue from computer professional services will rise to $52.2 billion, up 17.3%. The move to packaged solutions will curb the growth of custom programming but spur spending on training, documentation and software maintenance and enhancements.

"The numbers are great; we're very excited about them," said Luanne James, president of Adapso. "They are consistent with what we believe is happening in the industry. These trends will continue because businesses need information technology to be competitive."

Sales of packaged software by U.S. firms will continue to grow at a 20% clip, reaching $35 billion this year, the report said. The global market will reach $50 billion in 1991 and should break $100 billion by 1995, according to the Commerce Department.

Facing slack domestic demand and intense price competition, the value of computers and peripherals shipped rose just 4% overall in 1990, to $71 billion. Meanwhile, exports grew 15% to $24.7 billion. The industrial outlook said U.S. firms will continue to enjoy faster growth overseas but not enough to offset the skyrocketing imports of parts and peripherals.

The Commerce Department did not break out its hardware forecasts by system type but did offer these projections, in current dollars, from various sources:

- The global market for supercomputers will grow 13% to $1.7 billion.
- Mainframe shipments by U.S. manufacturers will edge up 3% to $13.4 billion.
- Global sales of U.S.-made mid-range systems will grow by as much as 4% from $20 billion in 1990.
- Workstation shipments by U.S. firms will increase 30% to $11 billion.
- Sales of personal computers, including portables, to the U.S. market by all manufacturers will grow 6% to 9% from $31.8 billion, while sales of portables will jump 48% to $8 billion.
- The global market for all local-area network hardware will increase 27% to $8.1 billion.

What recession?

Computer industry growth projections for 1991 are healthy despite the general economic slowdown

1991 growth projections for selected technology (Dollars are in billions, and adjusted for inflation)

	1990	1991	Percent increase
Electronic information services	$9	$10.8	20%
Data processing and network services	$31.1	$36.1	16%
Computer professional services	$44.5	$52.2	17.3%
Computer hardware and peripherals	$71	$75.3	5.9%
Computer software	$29	$35	20%

Source: U.S. Department of Commerce

CW Chart: Doreen St. John

Loophole

FROM PAGE 1

at least a decade," said Elliot Klugman, secretary of the dealers' association and vice president of operations at Brookvale (Computer) Associates, Inc.

Even if DEC refuses to rescind the policy, Klugman said, the firm should at least "grandfather in" all of the CPU upgrades already done so users cannot be retroactively charged additional licensing fees.

Policy not adequate

The policy, written years ago when the only upgrade available was from a VAX 11/780 to an 11/785, is now "inadequate" to cover the variety of in-cabinet upgrade options existing since the VAX 6000s started rolling out, DEC officials said.

Mary Welch, a DEC software business marketing manager, said she had no way to tell if any customers had actually paid for a new VMS license after upgrading through a reseller. But she noted that a customer dealing directly with DEC would have to pay $79,000 for an upgrade from a VAX 6210 to a 6310 — with more than $77,000 of that cost earmarked for the VMS and Decnet licenses.

"Obviously, DEC has a right to enforce its ownership and rights in software," said Tom Donovan, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "But from a practical point of view, it is not a very bright thing to do."

A more reasonable and industry-accepted approach, analysts and dealers said, would be for DEC to charge an upgrade fee that takes the more powerful configuration into account without attempting to crush the secondary market.

> "CRACKING DOWN LIKE this is bad business."
>
> PETER SCHAY
> GARTNER GROUP

"Cracking down like this is bad business," said Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn. "What DEC might make in additional software revenues would end up being carved out of the residual value [of the older systems]. It makes DEC less competitive with IBM and other vendors," he added.

Resellers are already shunning low-end VAX 6000s, Klugman said, so the residual value of older systems is plummeting.

"DEC is reacting to a situation they didn't like or didn't understand, and they took this knee-jerk reaction without looking at what it meant," Klugman said. "They really stepped in it."

CORRECTIONS

Jim Wegmann is senior vice president of corporate electronic data processing at Talman Home Federal Savings and Loan, not vice president, as was reported in *Computerworld*'s Dec. 10 issue.

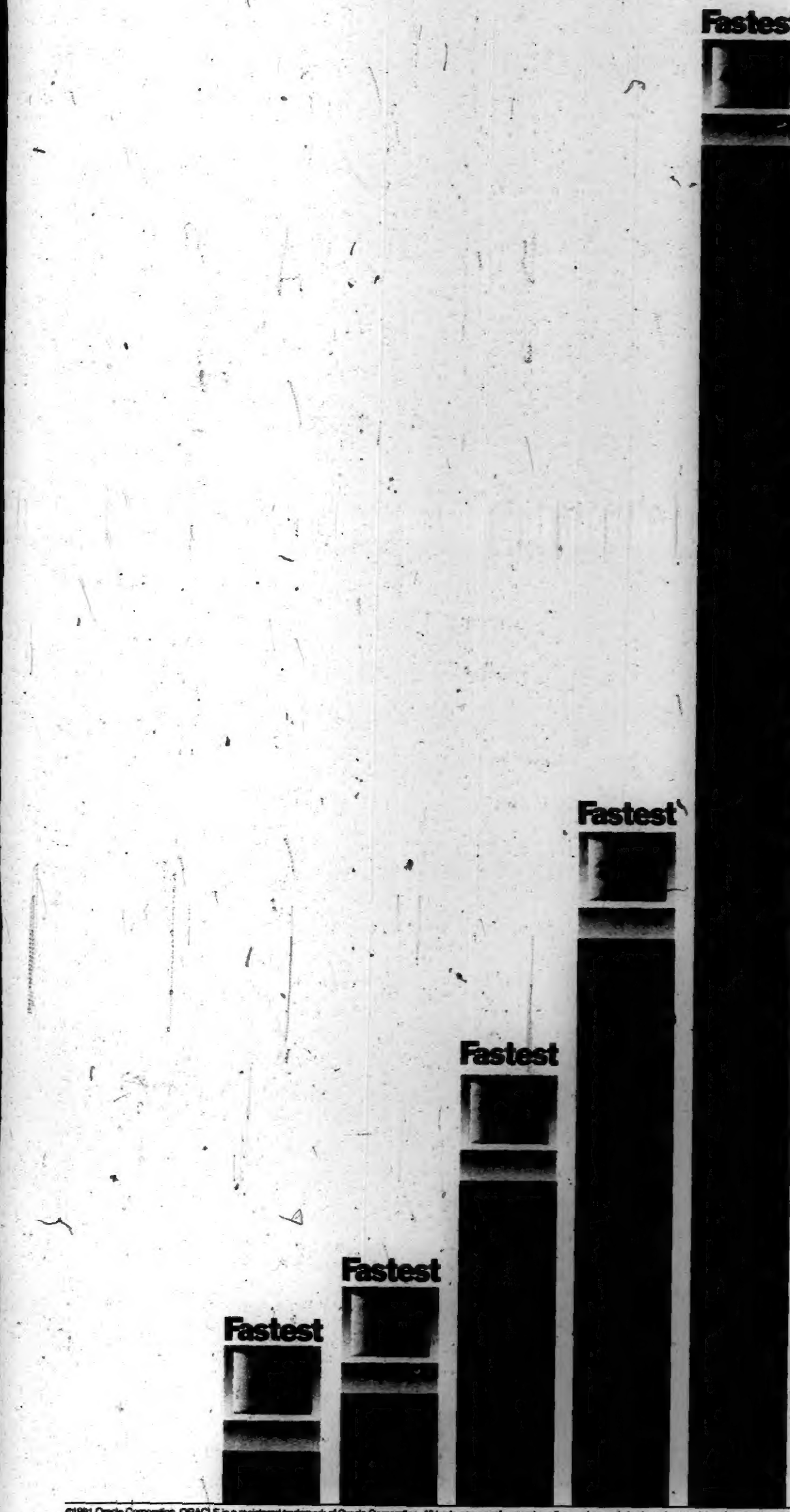
Prime Computer, Inc. will deliver a multinational version of its PI Plus Unix-based database product this month, not in June 1991, as was previously reported in *Computerworld*'s Dec. 10 issue.

In the listing of Comdex products in the Nov. 19 issue of *Computerworld*, the address for Aview Technology, Inc. was incorrect. The correct address is:

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Oracle offsets earlier losses

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Systems Corp. eked out a small profit for its second fiscal quarter ended Nov. 30, marking a turnabout from Oracle's first-ever loss of $36 million in the firm's first fiscal quarter [CW, Oct. 1].

Oracle generated $268.7 million in quarterly sales, but the net income from this record-setting sales activity was just $6.7 million. In contrast, Oracle earned $19 million on $209 million in sales for the same period last year. Including the first-quarter loss, Oracle's bottom line for the first six months was a $29 million loss, compared with profits of $31 million for the six-month period one year ago.

In a written statement, Oracle Chief Executive Officer and founder Larry Ellison put the best face on his firm's faltering finances. "As we hoped, we returned to profitability in a difficult economic climate during our second quarter," Ellison said. "We held expenses essentially flat with the first quarter, tightened our financial controls and restructured the Oracle USA [sales division]. We expect continued progress in the third quarter."

Profit a must

Profitability is critical to Oracle's continued financing by a syndicate of more than a dozen banks worldwide for up to $250 million. Analysts said that Oracle had recently renegotiated its loan covenants with the syndicate, winning in relaxed conditions but accepting higher interest rates. The terms of the loan covenants will be filed with the Securities and Exchange Commission on Jan. 14, Michael Musson, Oracle's director of investor relations said.

Financial analysts said they saw Oracle's report as positive but not convincing. "It's not a resounding rebound," said Rob Anderson , a senior vice president at Stratagem, a San Francisco market research firm. "You'll need a few more quarters to see whether top management has realized a new way of running their business." Anderson gave Oracle high marks for putting cost controls into place quickly and for greatly improving user support services.

Staying cool

Users did not seem overly troubled by Oracle's financial problems, Tony Ziemba, president of the New York Oracle Users Group said. "In the short term, these financial reports won't make any difference to the user, unless they begin to impact research and development or product support," he said. "The one thing that worries me is that they're still operating in a relatively rough economic climate and having to pull rabbits out of their hat at the end of the quarter to make it profitable."

Several analysts said Oracle's second quarter was highlighted by the closing of several multimillion-dollar transactions. Oracle declined to confirm the identity of these large customers.

Had it not been for such large-scale transactions, Oracle might have faced a second money-losing quarter, some analysts said. "Under Oracle's current set of accounting rules, they can recognize any revenue they believe will be shipped within the next 12 months," said Bruce Lupatkin, a senior technology analyst at Hambrecht & Quist, Inc. in San Francisco. Many other software firms have moved to booking only the revenue that has been shipped, analysts said.

Oracle senior management said that the firm is planning on "flat" revenue growth in the U.S. because of long sales cycles and an economic downturn. However, plans for 25% growth in worldwide sales are still in place for the $971 million company. Oracle will not make any major cutbacks in R&D, even though cost controls are in place, top managers said. Selective hiring has continued, even after an October reorganization terminated more than 400 Oracle staff positions and 100 temporary workers.

Reading the signs

Despite increased revenue compared with the second quarter a year earlier, increased expenses dampened Oracle profits

Second quarter ended Nov. 30
(in thousands)



Source: Oracle Systems Corp. CW Chart: Paul Mock

LAN Manager '91 plans include Mac, Novell links

BY PATRICIA KEEFE
CW STAFF

3Com Corp. and Microsoft Corp. will hold a joint press conference this afternoon, during which the two companies are expected to confirm that 3Com will turn over LAN Manager development and Version 2.0 sales to Microsoft [CW, Dec. 17].

Once 3Com hands over its interest in LAN Manager to co-developer Microsoft, what then? In an interview last week, Mike Murray, general manager of Microsoft's network business unit, declined to comment on today's announcement, but he did outline 1991 LAN Manager enhancement plans.

He said users can expect delivery of the following in 1991: interoperability with Novell, Inc.'s Netware, Apple Computer, Inc. Macintosh connectivity and Transmission Control Protocol/Internet Protocol.

He scoffed at reports that LAN Manager does not operate well in a Microsoft Windows environment. "LAN Manager has excellent Windows support, which we'll be enhancing. I'd like to think that if an organization standardized on Windows, they would see an absolute advantage to standardizing on LAN Manager as well," Murray said.

A new Forrester Research, Inc. report predicted a rebound for LAN Manager in 1991 but cautioned that both it and rival Netware lack needed wide-area telecommunications.

Murray said users can also expect to see some progress here this year in terms of connecting remote local-area networks to each other. The next step, he said, lies in enabling personal computer users on the road to gain full access to all services in the home-office system.

Internal documents said 3Com will provide Microsoft with directory service technology currently under development. Murray noted that Microsoft has repeatedly stated that directory technology is very important. He also said work continues on messaging server technology to include X.400.

> "LAN MANAGER has excellent Windows support, which we'll be enhancing."
>
> MIKE MURRAY
> MICROSOFT CORP.

In 1990, Microsoft added the Domain directory management tools to LAN Manager 2.0. An extension of that technology to the user level will show up in a later release of LAN Manager, Murray said. Most observers expect Version 3.0 to be delivered this year.

Excel

FROM PAGE 1

Office Supplies Division in St. Paul, Minn. "Graphics have become the most central part of spreadsheets today."

Beta-test users of Excel 3.0 said the new program features many presentation tools that allow documents to be cosmetically enhanced. New components include three-dimensional chart capabilities, new drawing tools and a feature that can be employed to place a text box anywhere in the spreadsheet. The program also features word-wrap within cells.

Better tools

The new package will also offer beefed-up functional tools, early users said. Excel 3.0 includes enhanced solver functions, an easier method to program macros that appear to the user to be built-in functions and font support — users now have up to 255 fonts per sheet, compared with four in the previous version. An optional tool bar also simplifies font or drawing tool selection.

The update also supports embedded objects, thus allowing users to place an Excel chart in Powerpoint, a presentation graphics program, and then double-click between the two programs. Additionally, early users said they like the spreadsheet outlining and live-linked consolidation functions, which can collapse spreadsheets to produce summary reports and bring similar information from different worksheets into a summary spreadsheet.

Excel 3.0, however, still faces a strenuous uphill climb in gaining market share. According to research firm Computer Intelligence in La Jolla, Calif., Lotus controlled 65% of the PC spreadsheet market in 1990, while Microsoft came in with only 12%.

Excel choice

However, Excel has also caught a cresting wave of Windows popularity. Analysts said that while Lotus' 1-2-3 was standard in DOS environments, many users switching to Windows typically look for software that takes advantage of the environment. Their most frequent spreadsheet of choice is Excel. Additionally, Microsoft remains less of a one-trick pony than Lotus because of its strengths in the presentation graphics and word processing markets.

"There's been a key change in the spreadsheet world," Rogers added. "With the rush to Windows, Lotus must face the fact that it is no longer the incumbent but is now the challenger."

For some, the enhanced capabilities of Excel 3.0 mean a better ability to create in-house applications. "With the new graphics tools of Excel 3.0, we can now produce EIS applications in-house," said John Stingl, vice president of office automation at Pacific First Bank in Seattle. Stingl said he was impressed with many of the ways Excel 3.0 was able to manipulate and integrate text and graphics.

Firm relocation brings woes

SAN ANTONIO — Datapoint Corp.'s decision to get out of town and head for Paris has cost the struggling originator of Arcnet networking products its fourth president in the last six years.

Michael Michigami, who took the reins in August 1989, resigned because family obligations prevented his relocation to Paris, where the firm recently said it will set up headquarters in the spring.

In accepting the resignation, Chairman Asher B. Edelman credited Michigami with stabilizing the firm's revenue and reducing its debt during his tenure. Nevertheless, Datapoint has continued to lose money, with an $82.8 million fiscal 1990 loss following a $29.2 million dive in fiscal 1989.

Michigami's replacement will be John Harrison, a British citizen who had spent 20 years with the European operations of the former Sperry Corp. Harrison has been working closely with Datapoint since August.

The relocation to Europe, where 80% of Datapoint's revenue reportedly originates, will not affect its status as a U.S. firm. Manufacturing facilities will remain in San Antonio.

Since taking over the firm in 1985, Edelman has been beset with troubles. The firm has suffered heavy restructuring charges and fended off a hostile shareholder takeover attempt.

RICHARD PASTORE

IBM prepares to hit market with 386SX-based laptop

BY MICHAEL FITZGERALD
and RICHARD PASTORE
CW STAFF

Sources briefed by IBM have confirmed that the company's long-expected foray into the laptop computer market will happen by the end of next month.

The sources said the new notebook system will be based on Intel Corp.'s 80386SX chip and will be announced on Feb. 26. Other sources indicated the release date will be earlier — Jan. 29.

The Micro Channel Architecture (MCA)-based machine will weigh 7½ pounds and run at 20 MHz. It will be available in configurations with 30M-, 40M- or 60M-byte hard drives and will offer 2M bytes of random-access memory, expandable to 18M bytes. With a Video Graphics Array-compatible screen and a built-in 2,400 bit/ sec. modem, it will cost under $5,000 in the 60M-byte configuration.

"I THINK IBM has been incredibly lax in its pursuit of the portable market. What they're doing is coming in two years late with 'me-too' technology."

TIM BAJARIN
CREATIVE STRATEGIES

The SX is also expected to have a "¾" version of the MCA bus architecture that will simply be shorter than the desktop version.

Three strikes, you're out

This is IBM's third swing at the portable market, after three luggables — the discontinued PC Convertible, the PS/70 and PS/75 — failed to sell well. Users and analysts are tentatively saying that this time IBM will get a hit, based on the product specifications. But some questioned IBM's strategy in the portable field.

"I think IBM has been incredibly lax in its pursuit of the portable market. What they're doing is coming in two years late with 'me-too' technology," said Tim Bajarin, executive vice president at Creative Strategies Research International, Inc. "If the task was to establish a foothold in the market, then they'll do it. If it's establishing a leadership position, they have a very long way to go."

Another skeptic is Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass. However, Stephen said if the product is solid, IBM will get space in retail stores.

"There's not going to be shelf space for everyone, and IBM is extremely well positioned from a distribution standpoint, so they'll get an automatic place in the market, provided it's a good product," Stephen said. He added that buyers will be more forgiving of IBM's history in portables.

Jacqueline Bynsdorp, personal computer coordinator at Jockey International, Inc. in Kenosha, Wis., is one who is inclined to be forgiving, provided the machine meets the expected configuration.

"It would be of interest because we are looking at a new venture for our sales force," Bynsdorp said.

Other users are excited about it, period.

"Needless to say, we're salivating for it. The lighter weight with the high-capacity disk drives has a great deal of appeal to us," said Claude Rankin, manager of MIS at Deloitte & Touche's New York office.

The machine's specifications essentially match those of Compaq Computer Corp.'s LTE 386/20s, but both RAM expandibility and hard-drive capacity appear to meet or exceed the specifications on every other sub-10-pound portable announced to date. Its price is also expected to undercut Compaq's by $1,000 to $1,500, and this may attract some potential Compaq buyers.

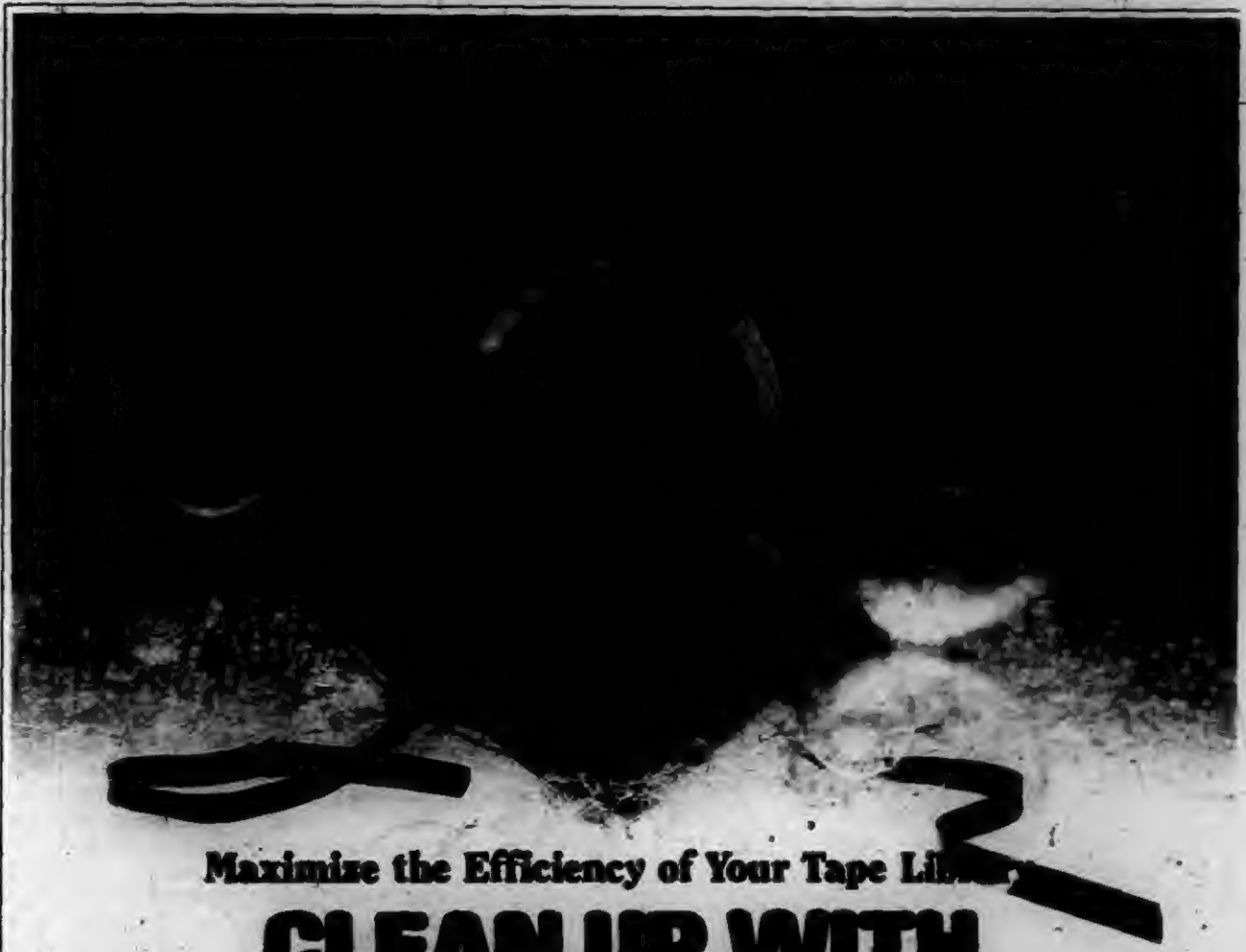
"That's a very good price — it certainly piques my interest," said Paul Nelis, microcomputer specialist at Caisse Nationale de Credit Agricole USA, a Compaq LTE 286 user. "I've looked at the Compaq 386; it's really expensive."

A slow start

While SX notebooks began to hit the market at the end of October when Compaq introduced its LTE 386s, Compaq is among only a handful of vendors to actually ship the product. Some analysts said a February ship date, while not early, would probably still put IBM in a solid position in the SX notebook market.

"The race is for the mind share: Who will be there first, who will people think about with these machines?" said Dan Ness Jr., an industry analyst at Computer Intelligence in La Jolla, Calif.

"People complain that IBM delivers products later than it should, but I think in this case it has more to do with IBM's desire, stated to its dealers, that it must have critical levels of inventory before it releases a product into the market," said Dave Korus, hardware analyst at Kidder, Peabody & Co. in New York.



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NEWS SHORTS

Phone outage hits New York

Damage to an AT&T fiber optic cable in Newark, N.J., caused major problems in New York last Friday. AT&T, which detected the problem at 9:30 a.m., was able to handle just 40% of its normal call volume into and out of the city. While long distance traffic in the rest of the country was unaffected, the loss of the 100,000-plus circuits in the cable also affected international calls. The outage interrupted Federal Aviation Administration voice and radar data communications, prompting Newark International Airport to close. It also caused traffic problems at LaGuardia and Kennedy airports and at Boston's Logan Airport. Trading was suspended on New York's commodities and mercantile exchanges. The American Stock Exchange reported minor problems. An AT&T spokesman said the company's operators had been instructed to provide the access code numbers to competing long distance companies to customers who request them.

Western Union closes deals

Western Union Corp. completed two related transactions last week by selling most of its Business Services unit to AT&T for $180 million in cash and using the net proceeds to buy $335 million of the principal amount of its outstanding high-yield notes in a cash-tender offer of 50 cents on the dollar. In the AT&T transaction, Western Union sold the assets used to provide its Easylink electronic mail service and its packet and telex services. The sale also included the transfer of Business Services' employees and customer base to AT&T, the company said. It did not include Western Union's Priority Services, which includes Mailgram, Priority Letter and Custom Letter service offerings.

Pyramid plans high availability

Software to allow Pyramid Technology Corp.'s Unix-based computers to perform on a "high-availability," but not fault-tolerant, basis will be introduced by the company this week. Mountain View, Calif.-based Pyramid makes high-end, reduced instruction set computing machines aimed at the commercial market.

Aid for Eastern Bloc schools

Boston-based International Data Group (IDG) has announced the creation of the East-West Education Development Foundation, an organization designed to aid Eastern Bloc schools in gaining access to computer technology. The foundation is looking for corporate donations of older machines that are being replaced or personal computers now in excess inventory. Manufacturers can also use the donation program to introduce Eastern European students to their products. IDG is the parent company of *Computerworld*, more than 100 other publications that circulate throughout the world and the International Data Corp. market research firm.

IBM wins IRS pact

IBM last week won a systems integration project contract that could be worth $340 million over seven years. Under the contract IBM, GC Services of Houston and Andersen Consulting will work with the Internal Revenue Service to link all areas of the IRS tax collection function. If the IRS exercises all of its options, as many as 21 host systems, 5,000 desktop systems and 10,000 portable computers may be installed.

DEC plans Ultrix moves

Digital Equipment Corp. will unveil new capabilities this week for Ultrix, its own flavor of the Unix operating system. The new features, according to industry analysts, should give both DEC and IBM users additional tools for computer aided software engineering. Industry analysts said that DEC may be ready to fill in a few blanks on its Portable Common Tools Environment, a system software environment similar to Hewlett-Packard Co.'s Softbench, which would enable message passing between different tools and applications across multivendor platforms.

Cooper fills Seagram's CIO post

BY CLINTON WILDER
CW STAFF

NEW YORK — The information systems profession had barely rung in 1991 when the year's first high-level IS executive to change jobs settled into his new chair. Jack M. Cooper, former president of CSX Technology, became vice president and chief information officer at beverage giant The Seagram Company Ltd. on Jan. 1.



Ron Bell/Picture Group

Cooper settles into Seagram's after leaving CSX position

Cooper, who relocated to the New York office of Montreal-based Seagram, had been a high-profile fixture at CSX for 10 years. But the lure of a new challenge in a new industry was too great to pass up, he said last week.

"I did a lot of productive and exciting things in IS [at CSX], but the potential for introducing and developing information technology is greater here," he said.

Cooper resigned from CSX Technology, the IS unit of Richmond, Va.-based transportation firm CSX Corp., on Dec. 21. Ronald W. Drucker, senior vice president and CIO of CSX Corp., will take over Cooper's day-to-day duties running CSX Technology until a replacement is found. Drucker is also chairman of CSX Technology, which is based in Jacksonville, Fla.

The CIO position is a new one at Seagram, and Cooper will also be one of seven members of the firm's executive committee. He reports to Seagram President and Chief Operating Officer Edgar Bronfman Jr. The elevation of IS in the Seagram executive hierarchy was a big draw, Cooper said.

"I will play an integral part in developing company strategy, which I think is essential for the development of a successful information technology strategy today," he said.

Cooper is one of many IS executives who have recently changed industries as well as companies. However, he noted that he also switched industries to join CSX 10 years ago from The Williams Cos., an oil industry concern. Before that, Cooper worked in the academic IS world as vice president of computer services at the University of South Carolina.

Cooper said his first two goals at Seagram are developing an interlocked IS and business strategy and developing the technology infrastructure to support it.

Singleton returns to old job as permanent head of SPAC

BY CLINTON WILDER
CW STAFF

LOS ANGELES — A major corporate shakeup at its parent bank has resulted in the leadership of Security Pacific Automation Corp. echoing the old maxim: The more things change, the more they stay the same.

Security Pacific Vice Chairman John Singleton has returned as permanent head of the bank's IS unit, the position for which he hired former Baxter International, Inc. information systems chief Michael Heschel last spring. Heschel resigned in a surprise move in November, after which the bank announced that Singleton would run the firm on an interim basis until Heschel's replacement could be found.

Last month, however, Security Pacific announced new duties for virtually all of its senior executives, including Singleton. He no longer has responsibility for some non-IS staff support groups that formerly reported to him, including human resources and legal and public affairs. He retains responsibility for corporate central services and the title of vice chairman.



Mark Harmel

SPAC's Singleton takes on new duties

A Security Pacific spokeswoman said the changes were not related to job performance but were part of a larger realignment of executive responsibilities stemming from major strategic changes, notably disbanding the merchant bank unit. The moves will reduce the work force by 4,000 and result in a fourth-quarter charge of $200 million, contributing to a fourth-quarter loss of approximately $350 million. But the fifth largest bank in the U.S. expects to be profitable for the year.

"Integration of our technology systems is a critically important element in our continued success," Security Pacific President and Chief Executive Officer Robert H. Smith wrote in an internal memo. Singleton "will focus his attention entirely on his role as head of Security Pacific's automation company to coordinate these activities."

Singleton could not be reached for comment.

AT&T stirs revolt against NCR's board

BY MICHAEL FITZGERALD
CW STAFF

DAYTON, Ohio — AT&T opened the new year by making sure its acquaintance was not forgotten by NCR Corp., setting in motion a two-pronged assault designed to provoke a shareholder rebellion against NCR's board of directors and management..

While AT&T's $90-per-share, all-cash tender offer does not expire until Jan. 15, the company has made other tactical moves:

- On Dec. 31, it mailed a second proxy to shareholders seeking a special meeting of NCR's stockholders to remove a majority of NCR's current board and replace it with a slate proposed by AT&T. NCR would have to call a special meeting if AT&T receives votes representing 25% of NCR's stock, although NCR would have discretion to set the time within a "reasonable" period.
- On Jan. 3, AT&T filed a lawsuit in Federal District Court in Dayton asking the court to invalidate NCR's takeover defenses and charging NCR with violating securities laws for failing to disclose how it arrived at $125 per share as a fair price for the company.

Barry Bosak, who follows NCR for Smith, Barney, Harris Upham & Co. in New York, said NCR would be trading in the mid-50s without AT&T's bid, and other analysts priced the stock lower.

None of AT&T's tactics were unexpected, and only the lawsuit drew response from NCR, which issued a one-paragraph statement calling the suit "frivolous and baseless."

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Concurrent down, but up

Firm hopeful about turning debts around, regaining profits

BY NELL MARGOLIS
CW STAFF

TINTON FALLS, N.J. — Concurrent Computer Corp. was abruptly derailed from its comeback trail late last week when major bondholders threw the struggling computer vendor into involuntary Chapter 11 bankruptcy proceedings.

Nevertheless, officials at Concurrent, which has been in technical default on some $177 million of debt since September 1990, remained upbeat.

In view of a recent surge of orders, a slew of new software partners and a recapitalization blueprint that has proven to be persuasive at the bank [CW, Dec. 10], Chief Executive Officer Denis Brown said, "We are confident that Concurrent can return to profitability following a successful debt restructuring." The firm has 20 days from the petition's filing in which to convince the bankruptcy court that its services will not be needed.

Meanwhile, users who have stuck by the embattled firm this far have taken a wait-and-see stance.

"Concurrent has a fine product line and has been a very good supplier to us," said Robert Breakstone, executive vice president at international lottery software player Gtech Corp. in West Greenwich, R.I. "If things work out for them — and we hope they do — we will continue to contract with them."

"I'm taking this philosophically," said Jim Wieter, information systems director at Concurrent user site Loral Defense Systems, Inc. in Akron, Ohio.

Concern for users

His firm's main concern at this point, Wieter said, is whether the Chapter 11 proceedings will affect Loral's maintenance agreement with Concurrent.

NASDAQ could prove less tolerant, a Concurrent spokesman conceded. The Chapter 11 proceedings could jeopardize the exhange's recent decision to continue trading the firm's stock despite Concurrent's technical failure to fulfill its financial requirements.

Ironically, last week's setback may have been triggered by Concurrent's successful renegotiation of its bank debt. Three institutions holding some $53 million of aggregate bond debt sought the bankruptcy court's protection within days of an accord that reduced and redrew the firm's even heftier IOU to its bankers.

According to Concurrent, the bondholders acted to hedge against being nosed out of their position in the creditors' line by the banks.

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Benchmark executable file size	104,713 bytes (2.6 times smaller)	282,288 bytes	282,288 bytes
Benchmark source available for review***	YES	NO	NO
DOS memory extender included	YES	NO	YES
No-charge run-time for DOS memory extender	YES	NO	NO
No-charge support for both EBCDIC and ASCII under CICS and IMS	YES	NO	NO
Dynamic Link Library (.DLL format) support under DOS as well as OS/2	YES	NO	NO
Dialect support for IBM VS COBOL, VS COBOL II, ANSI-74, ANSI-85, etc.	YES	YES	YES

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Intergraph absorbs Dazix

BY J. A. SAVAGE
CW STAFF

Intergraph Corp. completed its purchase of Dazix, formerly Daisy Systems Corp. and Cadnetix Corp., promising to port its computer-aided engineering software to the Sun Microsystems, Inc. Scalable Processor Architecture (Sparc) platform that Dazix had been using for its software. Intergraph will also continue to support Dazix's proprietary hardware.

The deal was finalized by a San Jose, Calif., federal bankruptcy court on Dec. 24 for $10 million in cash and $4 million in Intergraph stock. Dazix had been in Chapter 11 proceedings since May after a string of deficit years, which culminated in a 1989 loss of $140 million.

Keeping the home base

Intergraph did not acquire all of Dazix's distribution offices in Europe and the Pacific Rim but kept the firm's headquarters in Boulder, Colo., and its development office in Sunnyvale, Calif.

"It will be run as a separate company," said Rob Glasier, vice president of marketing at Intergraph in Huntsville, Ala. He said that while the company will first port Intergraph software to the Sparc platform, long-term plans are to offer both the Intergraph reduced instruction set computing (RISC) platform and the Sparc platform to software customers.

Although the emphasis on future products will be on RISC-based workstations, Glasier promised that the Dazix installed base of proprietary workstations using Intel Corp. CPUs will be supported. "To maintain loyalty and customer base, you have to support the systems," he said.

The odds of Dazix's survival as a separate entity are questionable, according to analysts such as Bob Herwick at Hambrecht & Quist, Inc. in San Francisco. "Once an organization has been as devastated as Dazix, I honestly have to wonder about rebuilding," he said.

Herwick added that Intergraph has to make a large investment in the sales force and then keep users narrowly focused on Dazix software offerings. He noted that there are similar and more integrated (with Sparc hardware) electronic design packages from companies such as Mentor Graphics Corp. in Beaverton, Ore., that present serious competition.

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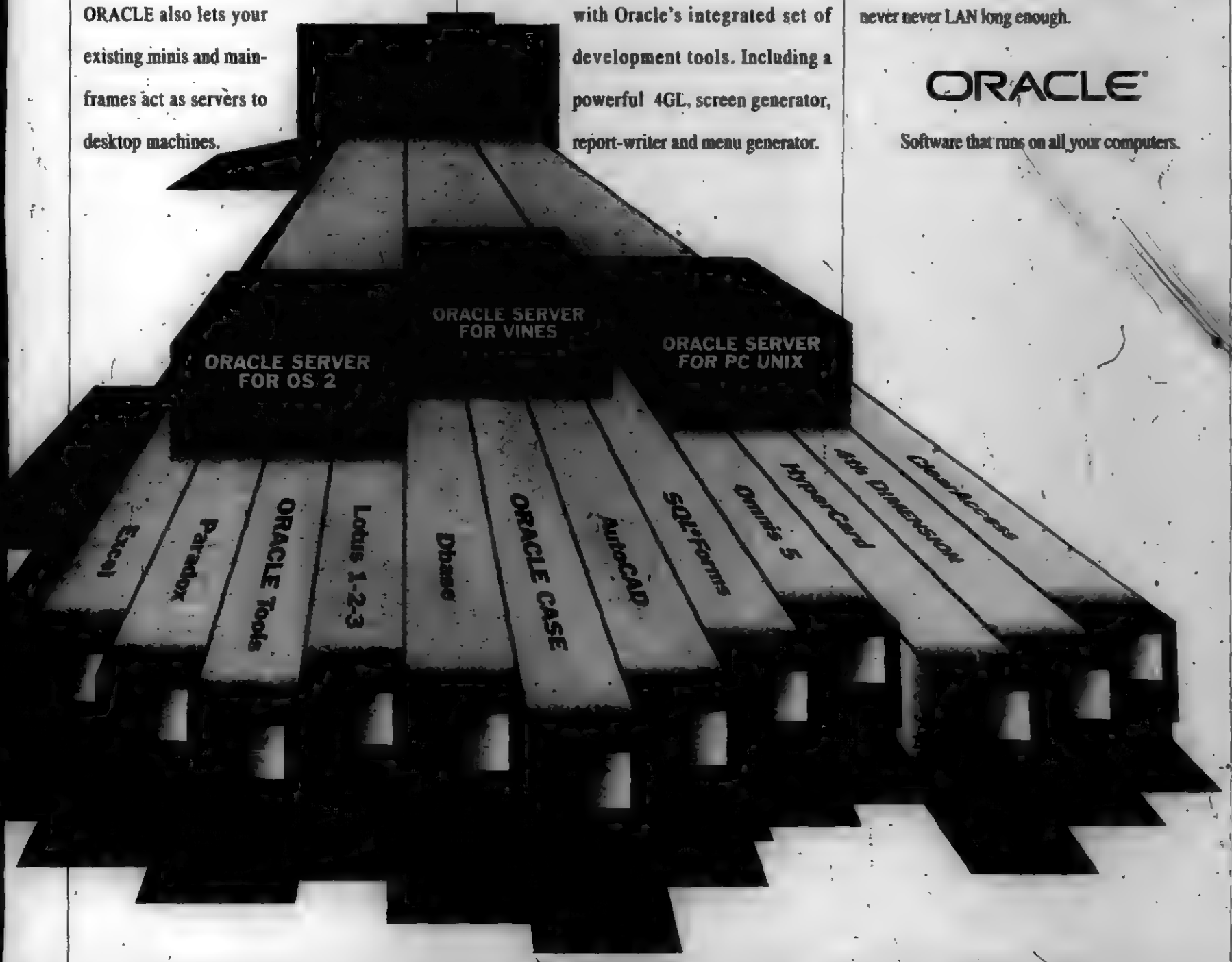
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New outsourcing deals for IBM

BY CLINTON WILDER
CW STAFF

IBM's outsourcing business was quiet through most of last year after a rousing 1989, but the sleeping giant has awakened for 1991.

IBM has forged separate agreements in principle to take over data center operations of two major banks for up to 10 years. One of them, Southeast Banking Corp. in Miami, is among the nation's 50 largest banks, with $13.4 billion in assets. It will be IBM's largest outsourcing customer in banking.

The other, The Riggs National Bank in Washington, D.C., is the largest bank in the capital, with assets of $7.25 billion.

Both contracts will be long-term agreements in which IBM will hire a majority of the bank's data center employees and run day-to-day systems operations. They are IBM's first major outsourcing deals since 1989, when it announced service pacts with three southern banks — Hibernia Corp., First Tennessee National Corp. and Bank South Corp. — and its blockbuster deal with Eastman Kodak Co.

IBM formed the Systems Services Division late last year to focus more specifically on outsourcing. Banking industry observers said they expect many banks to sign up with IBM this year in a hotly competitive market that includes Electronic Data Systems Corp. (EDS) and Systematics, Inc.

IBM "has done its on-the-job training," said M. Arthur Gillis, president of Computer-based Solutions, Inc., a New Orleans banking information systems consultancy. "When they first started, the real salesmen were the bankers coming to them, and they were novices. Now, they're acting more like the vendor, and they will be giving EDS and Systematics a rough time," Gillis said. Southeast and Riggs said they considered other vendors.

BANKING INDUSTRY observers said they expect many banks to sign up with IBM this year in a hotly competitive outsourcing market.

At Southeast, IBM will develop and implement an automation system for the bank's 230 branches within one year. In-house development would take three years and cost more, said Kenneth Sheridan, executive vice president for systems and operations at Southeast.

Southeast expects to save 20% in IS costs over the 10 years of the contract, including $6 million in the first year, Sheridan said. He did not disclose Southeast's current IS budget. IBM will hire most of the 90 employees in the bank's IBM mainframe data center in Miami. The vendor will also take over some telecommunications functions, but Southeast will retain new software development.

Southeast lost $165 million during the first nine months of 1990, but, "even without that, the rationale for outsourcing would still exist," Sheridan said.

The agreement is expected to be finalized later this month.

At Riggs, most of the 75 data center, telecommunications and technical support employees will be hired by IBM. Riggs will outsource the operations of its Washington, D.C., data center, which includes an IBM 3090 Model 400J and a System/88 transaction processor. The firms did not announce the specific length of the contract but said it was for more than five years.

A Riggs IS executive called the outsourcing "a beneficial way for us to stay on the top end of the technology curve. We can focus on business needs and not worry about when to buy the next processor."

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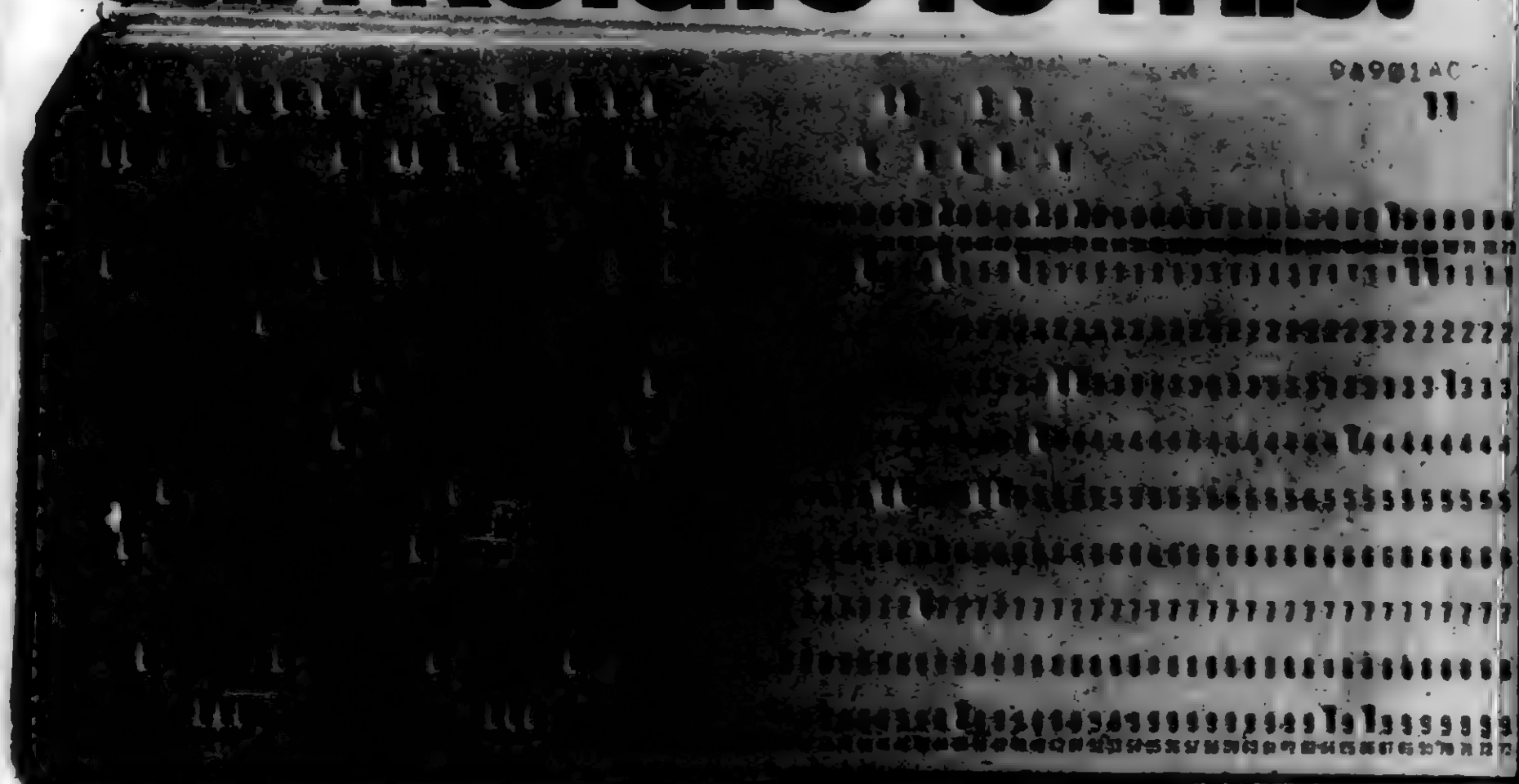
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R.I. bank closings could cost IS employees jobs

BY JOHANNA AMBROSIO
CW STAFF

PROVIDENCE, R.I. — Last week's closing of 45 credit unions and banks has left the fate of scores of information systems professionals throughout the state uncertain. Some IS staff members may need to find new jobs.

Rhode Island's new governor, Bruce G. Sundlun, ordered the institutions to close a few hours after taking his oath of office on Jan. 1. He made the move, a statement by his office claimed, because a private insurance firm closed, leaving the institutions and depositors uninsured.

The 35 credit unions and 10 banks are to remain closed until they can arrange for other insurance, such as that provided by the Federal Deposit Insurance Corp. As of Friday, seven of the 45 had done so and were scheduled to reopen today. Another 15 are likely to complete their arrangements and reopen this week.

What will happen to the other 23 institutions is anyone's guess. For now, many of their IS operations are still functioning, although they are not handling normal transaction loads because no business is being conducted. Customers cannot withdraw from or deposit into their accounts until the institutions reopen.

"Our computers are still running. We can get into the system and check on balances and other customer information," said Doreen Danko, a systems coordinator at Marquette Credit Union in Woonsocket, R.I., one of the largest institutions affected. "Everything in our computer room is the same as it was, except all the information is frozen."

It is possible, however, that the shutdowns might not be calamitous from an IS perspective. Typically, only the largest institutions — those with assets of $50 million or more — have in-house IS staff personnel, said Loren Meeder, senior vice president at the Credit Union National Association, Inc. in Madison, Wis. If that holds true in this case, only about a dozen of the institutions have IS departments, and the rest use service bureaus to meet their data processing needs.

Also, the credit union business as a whole is growing nationally, Meeder said. So those IS staff members who do find themselves out of work could probably find jobs in other states.

Nor will the IS departments have to deal with too much confusion once business resumes, Meeder predicted. "They might have a backlog of checks and credit-card postings, but if all the books were balanced before this happened, it won't be too bad a start-up. It may require some overtime, but it's better than with other types of disasters."



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CDC's chip plant sold to Cypress

BY MAURA J. HARRINGTON
CW STAFF

BLOOMINGTON, Minn. — One man's trash is another man's treasure, as the old saying goes, and Control Data Corp.'s sale to Cypress Semiconductor Corp. of the VTC Class-1 semiconductor wafer fabrication facility here is no exception.

The sale of the 170,000 sq-ft VTC facility brings CDC's ownership of semiconductor manufacturing plants to a close — a positive move for the computer and information services company that sold the plant as part of a restructuring plan started in 1989.

For Cypress, a $225 million company located in San Jose, Calif., the purchase could mean a significant increase in its production of static random-access memory (SRAM) chips.

Cypress has struggled to keep up production of its chips during the past year, and another facility could help it meet the demand for its SRAM and various MOS chips, according to Erik Jansen, a semiconductor analyst at Robertson Stephens & Co., an investment research firm in San Francisco.

Cheaper than building

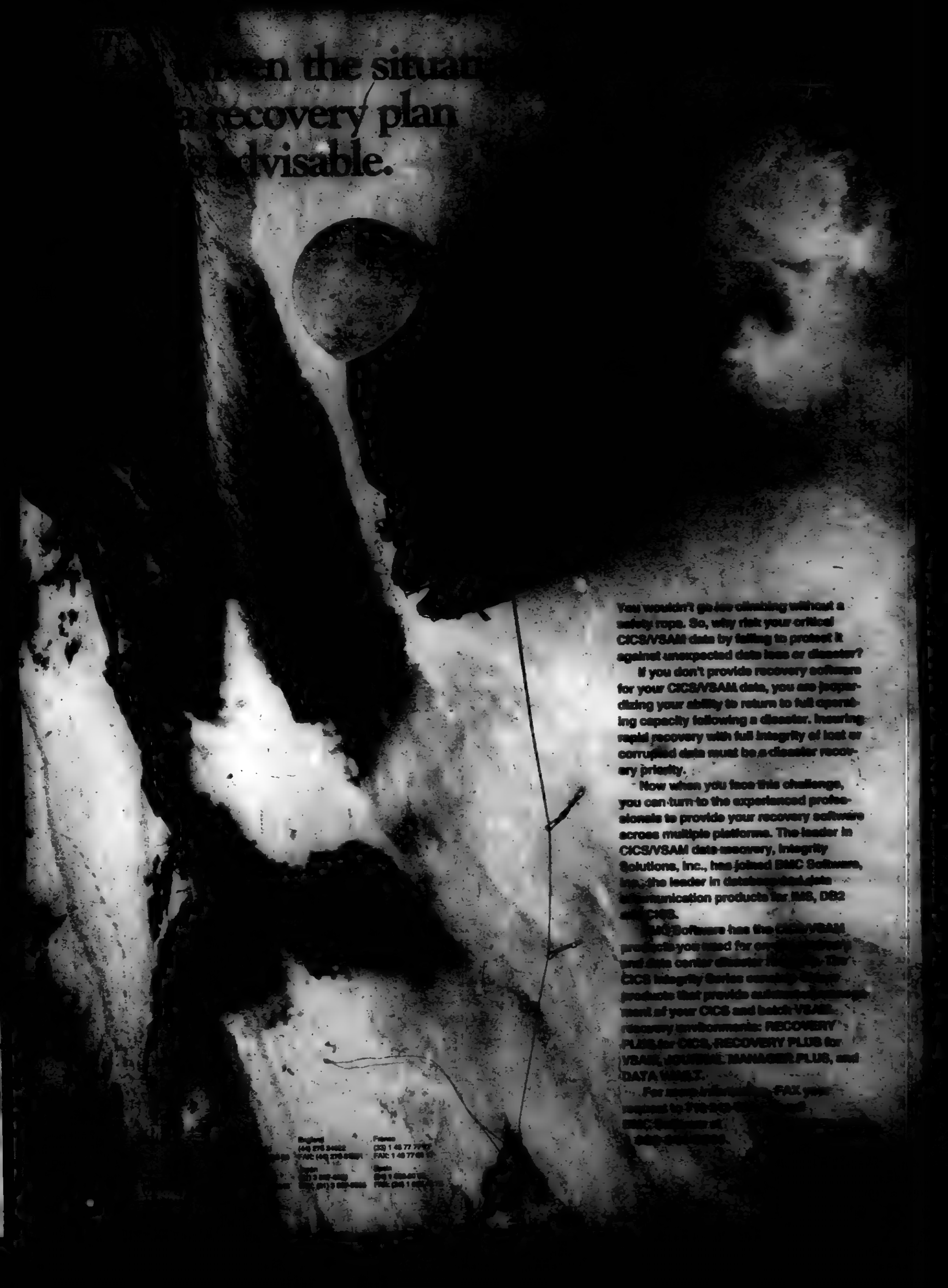
Cypress purchased the plant — as well as an estimated $32 million worth of factory equipment — for a price of $14.7 million, which is to be paid in stages over the course of the next two years, according to a Cypress spokesman.

The facility itself, he added, has an estimated value of $26.5 million. To build such a plant from the ground up would cost as much as $60 million, according to Cypress.

Jansen said the purchase was a "wise" move, even though it was slightly premature — about 1½ years ahead of the company's expansion plans.

With a 1.2% share of the MOS memory market, Cypress is not considered to be a large semiconductor manufacturer compared with its competitors, which include NEC Corp., Intel Corp. and Motorola, Inc., according to Jerry Banks, director of the Semiconductor Group at Dataquest, Inc., a San Jose market research firm.

However, Cypress is cash stable and growing in the MOS market, an area in which other companies are having trouble making profits.



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TECH TALK

Superlearning

■ The University of Illinois Center for Supercomputing Research and Development has installed an Alliant Computer Systems Corp. FX/2800 supercomputer as part of a new academic program aimed at making supercomputers easier to use and more effective for scientists and engineers. The program will begin this fall at the University of Illinois and five other universities nationwide. The goal of the program will be to bring students from several disciplines together to learn how to apply supercomputers to their sciences. The supercomputing center will get a better understanding of the needs of each science and can be used to build better software and architectures, officials said.

Eye on the sky

■ Scientists at the University of Chicago, Princeton University and the Institute for Advanced Study are working on a "Digital Survey of the Sky." The project will map an area 100 times as large as previous surveys. The scientists plan to build a wide-angle telescope in the Sacramento Mountains in New Mexico to take in large expanses of sky at once. The telescope will be connected to digital cameras and computers and will log data about celestial objects. Digital data will make it possible to process the information rapidly, the scientists said.

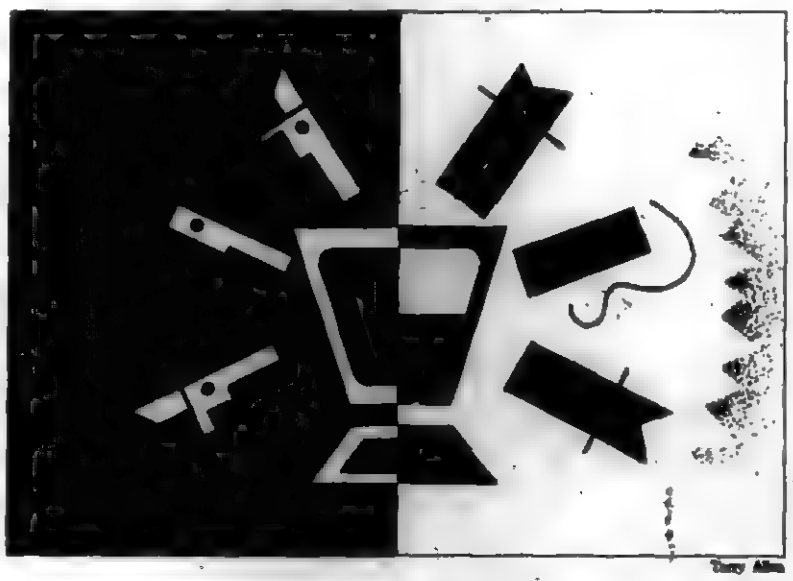
Canned computer cells

■ Sintar Software in Seattle, Wash., has introduced a "cellular automata" program called Cellmaster. Cellular automata, the firm said, are artificial universes where paramecium-like creatures, jellyfish and other eerie species are born, reproduce and die. The user sets the rules that govern how cells compete, cooperate or even prey on each other. A spokesman for Sintar said the program is a "construction set for building cellular automata models" that can be educational and entertaining. Cellmaster costs $45.

The changing faces of PCs

Personal computers of the year 2000 will be multifaceted information appliances

BY MICHAEL ALEXANDER
CW STAFF



Tony Allen

What is in store for the personal computer in the year 2000? According to some visionaries, the PC will by then have become an "information appliance," a multifaceted machine that will be portable, pervasive and more personal than any of today's PCs could ever hope to be.

At the current rate of advancement in microprocessors, memory chips and other electronic devices, tomorrow's information appliance will have the power of a minicomputer, yet it will be as simple as a toaster to operate, according to Samuel Bleecker, a Boca Raton, Fla., technology consultant who advises corporations on emerging technologies.

Tomorrow's microprocessor chips will have up to 100 million transistors, compared with about 1 million today. The fastest of these chips will run at nearly eight times the speed of today's Intel Corp. 1486, Bleecker said. Sixty-four megabit dynamic random-access chips, able to store the complete works of Shakespeare (1.6 million words), will be readily available, and 256M-byte chips will be around the corner.

With that much horsepower, the information appliance will be a ubiquitous device that will be so useful, you will want to carry it all of the time, Bleecker said. "It will be essentially a utility fielder that will be good for everything, including serving as a gateway to a host of information services," Bleecker said.

The traditional QWERTY keyboard will be replaced by a stylus for handwritten input and speech recognition technology for voice command.

The device will also double as a telephone, allowing users to communicate with anyone, no matter where they are. "People's addresses will no longer be street addresses but portable addresses like telephone numbers," Bleecker predicted.

Users will also use their appliances to access a wide range of information and entertainment services that will be delivered via fiber-optic cables, telephones and eventually satellites, Bleecker said. "As the cost of networking and transmission goes down, the PC will never be a stand-alone item again," he added.

Empruve, Inc., a small Knoxville, Tenn., start-up, is preparing to formally introduce in March a "multimedia appliance" that offers a glimpse of the portable PC that will be in use by the end of the decade.

The device, which has been named Cornucopia, was designed especially for multimedia applications. Cornucopia has a 10-in. LCD for text and graphics that is taller than it is wide, a 4-in. color LCD for video and still images and a narrow strip of illuminated icons that operate like function keys.

Cornucopia's designers opted for what they call a Tadpole — a hybrid of a joystick and a mouse — instead of a conventional keyboard. Cornucopia also has built-in stereo speakers, a compact disc/read-only memory drive, a 20M-byte hard disk drive, an Intel 80386-based microprocessor and 2M bytes of RAM.

The entire setup, which is packed into a "cabinet" and "console," weighs about 15 pounds. "I would like to see the console and cabinet together so you could pick it up and use it like a book and not be burdened by weight," said Sean Kitzmiller, a designer at Empruve.

Kitzmiller said he thinks an electronic book weighing only five or six pounds and having capabilities equal to the Cornucopia could be on the market before the end of the decade.

The company intends to sell the unit as an OEM for between $3,900 and $4,900.

Coming soon to a video store near you . . .

BY MICHAEL ALEXANDER
CW STAFF

You have to wonder what people did for entertainment before there were videotape rental stores. Now if they would just make it easier to find a worthwhile video instead of having to search the shelves.

Auteur, Inc., a start-up company in Philadelphia, said it has found the answer in a personal computer built around Intel Corp.'s Digital Video Interactive (DVI) technology.

The firm is putting the finishing touches on a "video for video" system for videotape rental stores that it said will be in operation in some of the nation's largest franchises this year.

Clips of films are stored on compact disc/read-only memory (CD-ROM) discs and retrieved using DVI compression and expansion algorithms. The technology makes it possible to store up to four hours of full-motion video on a single CD-ROM in a quarter-screen mode.

"Instead of going in the store for 10 minutes to half an hour and looking at boxes of tapes, you will be able to preview in half a minute any movie ever made," said Dom DiJoseph, vice president at Auteur.

Videotape renters will be able to sort films in the database in a variety of ways, including Academy Award winners, directors, genre and so forth.

The next step could be a completely self-service video rental operation that would permit customers to view clips and select videos without ever leaving their cars. The store would operate like a drive-in bank, DiJoseph said.

The company envisions that the kiosks will be installed in clothing stores and automobile showrooms, among other types of retail outlets, as well as in "remote malls" set up in airports, college dormitories and other high-traffic venues. Once in place, the kiosks could be networked so that consumers could shop for goods and place orders electronically. Eventually, the kiosks could be linked in what DiJoseph called a "flexmedia" nationwide network. "Flexmedia is anything you see or hear that you can access and control to learn, to be entertained or to find out information," DiJoseph said.

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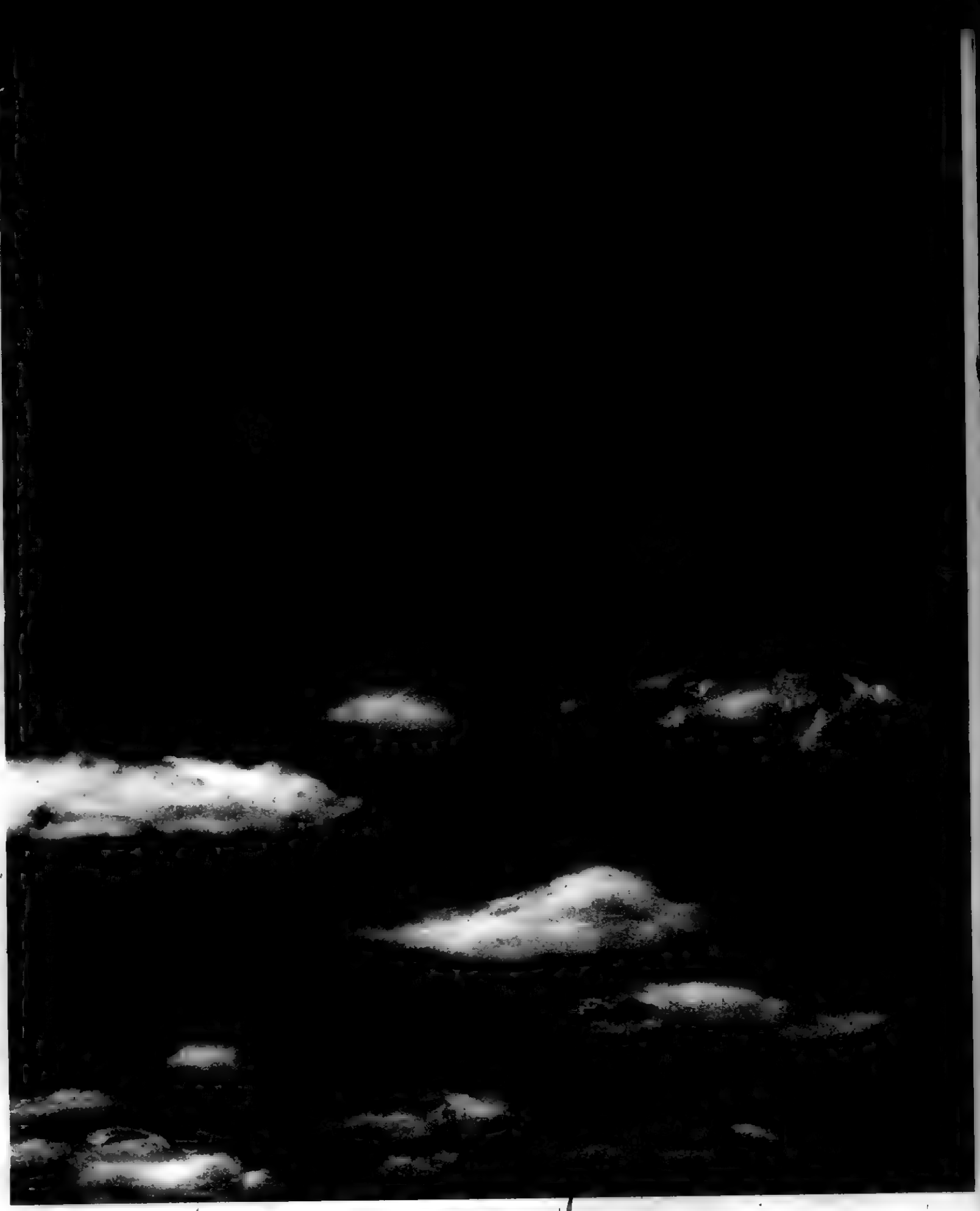
The System State Manager gets its information from AutoMate's Relational Data Framework which contains a data picture of what your system should look like—its desired state. The System State Manager compares this picture with the current state of system resources to be sure they match. If they don't, the System State Manager automatically corrects any discrepancies and notifies appropriate personnel.

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EDITORIAL

License to earn

EVER WONDER HOW a software package or license gets its price?

Clearly, the price is not based on the tangible value of the disks, tapes or package itself, no matter how thick the accompanying documentation. Nor does the price reflect the true costs of the vendor's software development and maintenance. It is nearly impossible to gauge those costs as they apply to the life of a product whose life span is unknown.

So more often than not, the price is based on the WTMWB rule, or "what the market will bear," unlike a piece of hardware, whose price equals the cost of production plus a markup based on the uniqueness of the product.

These days, the WTMWB rule for software is being put to some new tests. Over the last few months, vendors of software for small and big platforms have begun positioning themselves vis-a-vis the conditions of their software license agreements. While this doesn't necessarily affect the price per package, it certainly can impact the costs of ownership to the customer, and that's all that really matters to the user anyway.

In one case, some outsourcing vendors raised a stink at what they claimed was an aggressive posture of Computer Associates in its efforts to exact fees from outsourcing vendors when software licenses are transferred to them [CW, Sept. 24, 1990].

More recently, Lotus began talking with other personal computer software vendors about ways of stopping the proliferation of "shadow copies" of software — multiple copies made by a license holder for different machines [CW, Dec. 17].

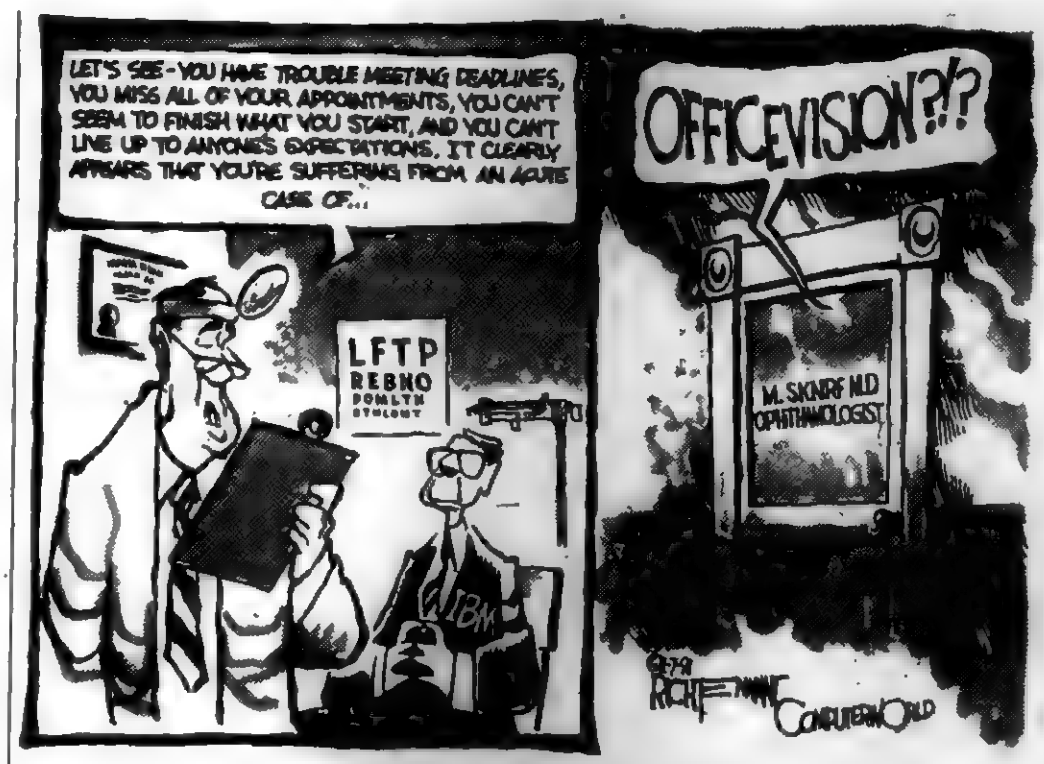
As our article on the subject showed, the license agreements from the different major PC vendors are an obfuscating morass that, when applied to a large site with thousands of users, becomes almost unenforceable for practical purposes.

There's nothing nefarious or underhanded in these efforts to define pricing. It's just good old-fashioned business in a recessionary climate of slowing sales in which vendor competition is getting nastier.

Rest assured that this competition almost always works in favor of the customer. The hardball tactics of some vendors will be seen (and are being seen) by others as a chance to woo customers with liberal licensing rules or aggressive unit price competition.

The vendors own the license. They can do whatever they choose with that license within the very broad confines of copyright and antitrust law. And the management of those companies has a fiduciary responsibility to make as much money as possible for the shareholders.

You, the customer, own the ultimate rights — the decision of whether to buy a package and the choice to buy whatever package you want. If you object to a vendor's licensing agreement, call the office of the chairman and let your thoughts be known. Buyers vote with their dollars, and those votes will be more scarce in the next 12 months than they have been in years.



LETTERS TO THE EDITOR

C++: The debate

I had imagined that the days must be gone when you would publish an ill-informed debate on matters such as Cobol PERFORM. Jim Murray's letter [CW, Nov. 12] on C++ shows that I was wrong. If he thinks that overloaded functions are a bad idea, does he also think the overloaded operators that exist in almost all high-level languages, as well as in at least one machine code, are a bad idea? For that matter, what about the effective overloading provided by languages that automatically convert arguments to the data types given in the function definition?

Call-by-reference is a bad idea? Apparently he wants to see copying of large arguments and more global data, or conversely, maybe he wants functions to be unable to affect the caller's environment at all.

The usual criticism of C++ is that object-oriented programming is hype. Murray wisely avoids this line of argument because, as he admits, he does not know much about the subject.

Bill Magaletta
Los Angeles

Infinite AD/Cycle

I eagerly grabbed the Nov. 26 edition of *Computerworld* and turned to Mr. Holcman's In Depth article, "Preparing for AD/Cycle." At last, I thought, all would be revealed to me so that I could sit down and calmly prepare myself for the coming of AD/Cycle.

However, the article turned out to be an "off the peg" discussion of change in an organization. Indeed, when I globally substituted "any new thing" for "AD/Cycle," the article read just as coherently.

I rather like the words of Mr. Holcman's own "software guru and visionary," Ed Yourdon, on the subject of AD/Cycle: "It was as if we had all suddenly blundered upon Stonehenge, left behind by some exotic race of aliens who pledged to return one day and tell us what it really meant."

When will one of the peddlers of AD/Cycle tell us what it's all about? Or will we have to wait for another book by Eric von Dannicken before we all become "enabled?"

Meilir Page-Jones
President
Wayland Systems, Inc.
Seattle

Mail storm

Congratulations to Marty Gruhn for taking a stand on the further erosion of our privacy [CW, Dec. 17].

It has gone far enough.

My solution to increased mail caused by "market blending" will be to write:

"Addressee moved.
Forward to:
Lotus Development Corp.
Cambridge Pkwy.
Cambridge, Mass. 02142"

Kenneth A. Kleinman
CDP Associate
K'Allan Associates
Stamford, Conn.

Open challenge

In the article "Not-so-open open systems" [CW, Dec. 3], Ms. Ambrosio implies that the meaning of an "open system" is one in which each type of application behaves in a similar manner to any other application of the same class.

Unfortunately, this has nothing whatever to do with what most of us are talking about when we speak of open systems. The question is not whether a large Fortran program can be transparently converted to work in a Cobol environment, but whether it can quickly be moved among highly dissimilar hardware — for example, from a Sun to a Cray.

It is precisely the ability to quickly migrate systems from one platform to another that characterizes Unix's open systems promise. And while this openness has plenty of room to be improved yet, already it is so much easier to port programs among highly dissimilar hardware (despite differing versions of the Unix operating system) that some companies are betting their corporate strategies on it.

So the issue of openness is not whether you can convert from a network database management system to a relational model but whether you can expect to move your application as it exists from one machine to another and have a decent chance of finding the same vendors represented on your new machine.

Remon Lapid
President
The Software Foundry, Inc.
New York

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Speak your mind — but clearly

RANDALL K. FIELDS



Communications is governed by two very critical rules: Do not speak in a way that makes the person listening feel stupid or uninformed, and do not make the listener feel like an outsider.

It's important to remember that the listener is already strategically disadvantaged because his role in the interaction is passive. Engaging his interest will lead to an endorsement of the ideas presented and a mandate for action.

On the other hand, allowing the listener to become alienated from the material under discussion — and nothing does it more quickly than making him feel stupid — could be a fatal blow to the project.

This is pretty basic material; we all covered it in Communications 101. And, just as obviously, the last person you would want to make feel stupid or like an outsider is your boss. Unfortunately, this is exactly what occurs all too frequently in the IS world.

Note the jargon in the previous sentence. It slipped out naturally, and I trust I can leave it where it is, given the assumed audience for this publication.



But what's acceptable among peer groups will not pass in other situations. Every profession now has its own jargon: Finance has IRRs, DCFs and hurdle rates. Operators have turnover, churn, QSC and others. Generally, however, professional buzzwords are sprinkled throughout business conversation, generally in some context that allows the uninitiated to follow the speaker's train of thought.

What's different in the information systems world is that we are almost devoid of vocabulary that is not jargon. Even the jargon has subsets, specific to areas within the field, so that managers in the industry are beginning to have trouble understanding the language of their subordinates. As a result, language is failing in its essential function — to communicate.

Where will this end? Will our fluid use of everyday language atrophy? By using techspeak, are we closing ranks against other professions and associations that could be our allies?

When we meet with chief executive officers or other senior managers, we are dealing with a group that is used to constantly being told how smart, effective and visionary they are. Such encounters can be intimidating, and the typical IS method is to deal with intimidation in the presence of authority and business expertise by shrouding the conversation in jargon.

Seeking to impress top managers with our own knowledge and expertise, we use technobabble, which they most likely will not understand. Subconsciously, we mean to imbue our presentation with a similar level of authority and expertise. However, it fails abysmally.

All we do is make the decision maker feel stupid and get ourselves relegated to performing for other, less well-placed audiences. Is it any wonder that company chairmen often prefer to have us report to some intermediary division, such as administration or finance, rather than directly to them?

Turning off

Once we have lost the decision maker's ears, we have dug ourselves into a second-class citizen hole. We have not used our language in a genuine information exchange, so we have been turned off.

Given the current economic climate and the difficult times predicted ahead, budgets will be diminishing while expectations are rising. Technology will be called on to deliver on its promise of increased productivity and efficiency.

There may never be a more opportune moment to cost-justify our products. The stage is being set for our industry to move into the spotlight. With senior management in the audience, we would be well-served by leaving our techspeak in the wings. Let them be impressed with our performance, results and solutions rather than the complexity of our speech.

Fields is chairman of Fields Software Group in Park City, Utah.

Czechs are speeding technology's bloom

JEFF ANGUS



Even in icy winter, when the earth crunches underfoot, people in Prague talk about flowers. During a recent trip to Czechoslovakia, a native of that city took a friend and me for a walk in a frozen park and pointed out where the various flowers bloom when they're in season. To me, the attention she gave to these still-hidden flowers was symbolic of how the country is approaching technology and its future.

The Czechs are trying to remake their society in double-time, and after scanning the world and researching the options, they are buying into computing technology with energy and determination.

Entrepreneurial drive

Some small shoots are already breaking through the cold earth. As early as the beginning of 1990, entrepreneurs had started setting up small dealerships in their homes. (Storefronts are hard to come by.)

Walter, a very young businessman, assembles and sells a range of Taiwanese personal computers using Intel 80286 and 80386 chips. His showroom is your office. He brings the systems in, assembles them and lets you play with them until you're satisfied. This process is time-consuming, yet the prices are very competitive with Taiwanese clones. Walter offers high service at low margins because he has an entrepreneurial bug, a fire in his belly for doing business.

The customers I saw Walter interact with were two staff members of Brontosaurus, an environmental education group that was allowed to have members only after the revolution. Both of these staff members were surprisingly advanced in their understanding of computer equipment and networks and what kinds of practical work you can get out of them.

I believe they are more clever about computers than their counterparts in the U.S. activist community because they have a "comparative advantage" that I think will have a telling effect on technology development in Eastern Europe.

A comparative advantage is when a group, through being held back or defeated, gains an advantage of time or experience. German industry, which was levelled during World War II, provides one good example of how comparative advantage can work.

By 1950, a significant piece of German industry was less than four years old, while much British production technology, which had been successfully protected by that country's air defense, dated from 1930. Although forced to start from the ground up, the Germans actually gained a running start because they had the opportunity to research the problems other nations had with newer technology and avoid many of them.

Czech technology implementers now have the same kind of advantage. Because it has been proven elsewhere that microcomputers have been effective in the workplace, they have fewer fights with centralized processing-focused managers than in the free market world.

In addition, because they are entering the market late, their baseline technology is more advanced 286-based systems, which now cost less than 8088s did in 1985. Much of the program design that makes applications more productive for users, from multitasking environments to graphics, are more practical to run on the high-end systems, so users are more productive, more quickly, than their First World peers were.

The Czechs also enjoy two cultural advantages. The first is what I call the "sex factor." There is no "sizzle" involved with office technology there. Brand name means little; the appropriate use for specific products is the crux. I can't imagine a breathless conversation between two propeller-heads in a Czech company cafeteria over the brand names on their computers or software. People there don't seem to attach any eroticism to their office appliances — a chronic, productivity-crippling malady here.

NO ONE VIEWED the computer as an enemy; no one seemed unwilling to learn and use the technology.

And, maybe as a result of the lack of eroticism attached to office equipment, I didn't meet any technophobes in Czechoslovakia. No one viewed the computer as an enemy; no one seemed unwilling to learn and use the technology. Everyone I spoke with viewed the technology as a useful tool.

It's possible that the country's recent industrial history has also played a part in the widespread acceptance of technology. Many U.S. employees' phobias about computing result from job replacement fear. But in Czechoslovakia, the old system was oriented to a full employment program, at least in principle. And really high unemployment, the kind free-market societies can have, hasn't hit yet.

The other cultural factor is the "humanist factor." Vaclav Havel, the president of Czechoslovakia, strongly believes the revolution's work has to do with people's individuality and souls at least as much as it does with economics. People don't seem to believe their individuality is meant to be subsumed to either state-owned or profit-making schemes.

So people implementing technology are viewing it for what it can do practically. The Czechs are applying the 80/20 rule as well as anyone I've seen. They don't try to do everything at once, but implement, in most cases, the highest payback technologies first, adding new applications only when needed. No one is trying to network systems that don't really need it. They may not be resource-rich, but from the installations I saw, they were getting their full 80% and on a low budget.

Angus is a manager at Farallon Computing, Inc., a maker of Apple Computer, Inc. Macintosh networking hardware and software in Berkeley, Calif.

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COMMENTARY

Rosemary Hamilton

IBM's bigger problem



IBM ended 1990 on a real sour note with Officevision as it found itself in the very uncomfortable position of announcing a second delay on this strategic office platform.

The company attempted to handle the bad news with style. It trotted out not only Tony Mondello, who as vice president of office systems development is directly responsible for Officevision, but also Joseph Guglielmi, Mondello's boss and head of the Applications Solutions Division, to explain what happened.

The two talked tough, readily admitting that IBM messed up and would do whatever it takes to make sure no customer suffers from the delay.

But here's the thing I still do not understand: IBM executives listed a few reasons for the delay, including that they made a mistake in estimating just how big a project Officevision was. Well, *how come?* They said this happened because it was new territory. Nothing quite like the Officevision project had been done at IBM before.

Maybe I'm holding IBM to a higher standard here, because that answer would be accept-

Continued on page 31

AS/400s are not going alone

Purchases of multiple systems increase as user interest grows

BY MARYFRAN JOHNSON
CW STAFF

One of IBM's most welcome surprises in 1990 was the boom in multiunit sales of the smallest Application System/400s, which are finding homes as the main processors for remote company branches or as nodes in large distributed networks.

At places such as KOA Kampgrounds of America in Billings, Mont., and ABC Home Health Services, Inc. in Brunswick, Ga., the entry-level AS/400s have moved in where computers were neither welcome nor affordable in the past.

Much of the publicity surrounding the AS/400 Models C4 and C6 at their debut last August centered on whether the machines could lure thousands of System/36 users onto the new platform. While IBM officials remain cautiously optimistic about that eventual migration, what they really enjoy talking about these days is the sheer volume of sales of the small AS/400s.



"Multiples are contributing more and more to our business," said Robert LaBant, IBM vice president and general manager of Application Business Systems. He estimated that at least 30% of his largest accounts are buying in multiples — anywhere from a few dozen machines to hundreds, and in some cases, thousands.

Networking improvements in OS/400 Release 3 are also encouraging more customers to attach greater numbers of personal computers to the AS/400 and to use the machine as a server, LaBant said.

Great Western Consumer Finance Group in Memphis, plans to put AS/400 Model C4s in 300 of its 440 offices during the next few years, rather than the larger Model B10s that were originally chosen.

"What we really liked about the C4s was not just that they were smaller, cheaper and faster," said Peter Colin, vice president of application systems at Great Western. "We also liked the new release of the operating system, which is particularly helpful to us in the way we use our distributed network."

One of the networking improvements in Release 3 — a facility called direct node support — gives Great Western a faster turnaround time on nightly dial-up communications between the AS/400s and the IBM 3090 mainframe at corporate headquarters. "When you're dialing up 300 offices, and you cut that time from eight minutes to six minutes, you're saving a lot of money," Colin noted.

A healthy change

At ABC Home Health, the largest privately held provider of home health care and nursing services, the new AS/400 models are displacing a network of System/36s in a $2.7 million to $3.5 million conversion project. Users are still working in the System/36 emulation mode but are being retrained at headquarters in Brunswick, Ga.

"We had been using the 36s

Continued on page 30

Low-emission VDTs begin to hit U.S. market

BY J. A. SAVAGE
CW STAFF

In January of last year, the only low-emission VDTs on the market could be found in Northern Europe. By December, however, nearly a dozen companies had, or had promised, VDTs with lower levels of electromagnetic radiation available in the U.S.

With concern rising over the potential health dangers from VDT emissions, vendors have seized the marketing opportunity. Most use an electromagnetic field to cancel out the one from the monitor, but others use shielding, screening or, in one case, glowing balls set at diagonal corners of the screen to achieve the same goal.

The most often used method of lowering emissions is through "cancellation coils." The original electromagnetic fields are produced from a coil at the yoke of the CRT inside a VDT. Another coil is added to generate a near-equal magnetic field to cancel out the first. This method is used by IBM, Idea Courier, Inc. in Phoenix; Megagraphics, Inc. in Camarillo, Calif.; Sigma Designs, Inc. in Fremont, Calif.; Sun Microsystems, Inc.; and Qume Corp. in Milpitas, Calif., among others.

Low in two fields

All of the low-emission monitors claim to be low in one of two types of electromagnetic fields that emanate from VDTs: Very low frequency fields range from 15,000 Hz to 16,000 Hz. A second type of field, called extra low frequency, is emitted between 3 Hz and 3,000 Hz. Some companies, such as Sigma, are attempting to cancel out extra low frequency fields with cross-canceling coils.

"Then there are issues of distortion," said Gulab Sharma, manager of CRT displays at Sun. Sharma said the canceling fields have to be aligned just right, or the pictures will wave or deform.

In addition to cancellation coils, most vendors incorporate other technology in low-emission terminals, but they are quiet about it because there are patents pending on the technologies.

Dave Corbin, an engineering manager at Qume, said that in

Continued on page 31

the totally automated office

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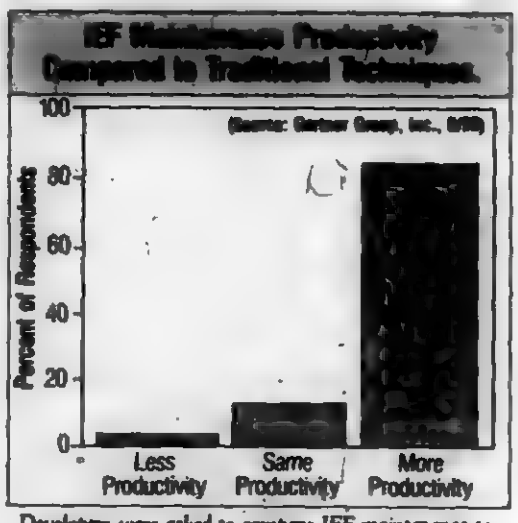
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Unix: The lifeblood of health network

ON SITE

BY ELLIS BOOKER
CW STAFF

WEST LAKE VILLAGE, Calif. — A Unix processor now beats at the heart of Well-Net, an information network for the health care industry that links insurance companies, doctors and medical institutions nationwide.

Two weeks ago, Wellmark, Inc. announced it would spend $30 million over five years with AT&T Computer Systems to revamp its Healthcare Information Network, including the replacement of its IBM 3083 mainframe with a System 7000 Model 7080, AT&T's top-of-the-line reduced instruction set computing Unix server.

Wellmark joins a growing number of firms moving transaction-intensive applications off traditional mainframes and onto large-scale Unix servers. Last year, Hyatt Corp. in Chicago made a comparable choice for its nationwide reservation system, exchanging an IBM 4381 mainframe for a group of AT&T System 7000s.

"My next step would have been a 3090 series," Wellmark's Chief Executive Officer Steve Muzzo said, adding that he bought the AT&T system for under $1 million — less than the annual operating system maintenance charge for an IBM 3090. "Actually, we do more with AT&T than the 7000," Muzzo added. "We've joined with them to provide a telecomputing solution to the health care industry."

In fact, practically every Well-Net component now has AT&T's handprint on it. In addition to the System 7000, Wellmark exchanged its dedicated-line, IBM Systems Network Architecture network with AT&T's Accunet X.25 packet network.

Muzzo also replaced the IBM 3270-type dumb terminals with which users had previously accessed the service with nearly 200 AT&T 6386 Workgroup System computers and AT&T Paradyne modems. "We reduced our networking costs by 80% by going to packet switching," Muzzo said, adding that the Intel Corp. 80386-class workstations are capable of much more local processing than the 3270 terminals "and so communications between the users and the network are few and far between." Unlike dedicated lines, Accunet is billed based on time on-line and number of packets transmitted.



CEO Muzzo sees Unix cut costs

As if changing a processor and a network were not enough, Wellmark also changed states, relocating its data center from Reno, Nev., to its current home in West Lake Village, midway between Los Angeles and Santa Barbara, Calif.

AT&T was contracted to port the IBM mainframe applications to the System 7000 Unix environment.

Electronic services such as Well-Net and others are needed to handle the paper glut in the health care business, Muzzo said. "Twenty billion to 25 billion pieces of paper are sent around the health care industry each year," he said, adding that few health care providers (hospitals, health maintenance organizations and doctors' offices) and insurance companies or third-party insurance administrators currently have electronic links.

The service gets around the predominantly proprietary world of hospital information systems by creating an interface that translates data into a common format. The service also includes a scanning device for capturing and transmitting images. When hospitals adopt the emerging Health-Level 7 (HL-7) open systems protocol for exchanging documents and files between incumbent with dissimilar data formats, Well-Net will be there, too: Its system is already HL-7-compliant.

What may make Well-Net unique, however, is its ability to transmit various types of documents — electronic claims, clinical information and electronic mail. Muzzo also said he believes his network is the first of its category to send optical images between subscribers.

Begun in April 1989, Wellmark is a wholly owned subsidiary of Primark Corp. in McLean, Va. The packet data version of the network went on-line last September, and Muzzo expects to have between 80 and 100 customers on Well-Net by the end of this month.

Escon an aid to remote disks

BY JEAN S. BOZMAN
CW STAFF

SAN JOSE, Calif. — Managers at IBM's Storage Systems Products Division said they believe the company's Escon fiber-optic channel technology will end up making remote disk drives the equals of those still tethered to central-site mainframes.

The result could be that users will be able to automatically "mirror" their on-line databases at sites as much as 5.6 miles away rather than creating database duplicates at a central site and having to haul backup tape cartridges off-site each night.

They also could opt to keep their primary disk drives at those remote sites.

"Managing data not only in the 'glass house,' but across the enterprise requires a total systems solution," said Ray Cosyn, manager of the division's marketing center. "Customers' requirements are changing," he said. "They tell us they cannot afford to have systems down for any time at all." At a recent technology briefing, Cosyn said that such customers include banks and airlines, which have strategic on-line systems that must run 24 hours a day, seven days a week.

But preventive maintenance, installation of new software releases and power outages continue to cause downtime at data centers. Software problems cause an estimated 85% of such central-site outages, IBM said. One solution, Cosyn said, would be to use the Enterprise System/9000 mainframe's Escon cables to "distribute" the corporate database to alternate data centers. That way, downtime at the central site would not destroy data or even interrupt other processing.

"One of the promises of this new fiber technology is that it will allow customers to place their [disk drives] in a remote site," Cosyn said. The remote disk drives could be hooked and unhooked from central processors without interrupting the central mainframe operations. That would prevent "planned" central-site interruptions caused by reconfiguring disk-drive strings under the IBM 3090 systems architecture.

Once Escon "directors," or switching centers, are in place, users can also carry out nonsynchronized updates to remote databases, Cosyn said. That way, they can refresh the remote copy of the central database within a specified interval of minutes or hours. "People are tired of trucking tape cartridges away from the central site each day," he said.

New flexibility

Database management will also be affected by new Escon hardware, said Bob McIvor, senior planner for marketing strategy at IBM's Santa Teresa Lab, just a few miles from the Storage Systems Division. "Now the user will have some flexibility in the physical placement of the data," McIvor said. "Some people would like to update their database twice, making a mirror image of the database. Escon is giving you greater flexibility in deciding where those two copies of the database will be located."

Until now, high costs have prevented the installation of duplicate data centers for all but a few user sites. However, a handful of firms, including Citicorp in New York, have begun such on-line "electronic vaulting" of valuable corporate data, analysts said. Vaulting is costly because high-speed T3 transmission lines are often used to link data sites.

In recent months, users at several large IBM mainframe sites have said they are planning to use the Escon cable and Escon director switches, announced Sept. 5, 1990, to duplicate and protect some portions of central-site processing. Many have begun installing Escon technology, but users at some large sites say they must also build an infrastructure of fiber-optic networks before moving disk-drive strings off-site.

"The new brand of wide-band networking is offering us an alternative in terms of disaster-recovery backup," said Steve Howard, manager of business continuance planning at Covia Corp., United Airlines' information systems subsidiary. "Putting different functional processors and different databases in multiple locations, with high-speed channels in between, would reduce the risk of an interruption in our business." However, Howard gave no target date for the installation of off-site databases at Covia. Right now, Covia's primary processors are located in two adjoining buildings in Denver.

American Airlines is also evaluating the dual data center option — while stopping short of committing to such a plan. "It may be possible to mirror part of your database with the new fiber-optics [technology]," said Roy Smythe, managing director of Sabre engineering in Tulsa, Okla. "That would give you some automatic protection, and I think that's something you could look forward to." American Airlines is installing a 45M bit/sec. fiber-optic backbone network, scheduled for completion by 1993.

Some technical barriers still remain to "mirroring" of the central-site database. IBM's IMS database already allows automatic updates of remote sites, McIvor said. But while IBM plans to extend that ability to DB2 in the near future, it has set no date for the feature's availability. Until then, DB2 users must intervene manually in the update process if they wish to make a duplicate copy, McIvor said.

DEC to discount VMS upgrade

BY MARTHEAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. Microvax users can kick off 1991 with savings of as much as 77% on the cost of standard VAX/VMS unlimited user licenses under an upgrade policy DEC announced recently.

Those eligible for the upgrade are the approximately 60,000 Microvax II and Microvax 3000 series customers with time-sharing licenses of VMS 4.0 and later versions. The deadline for the upgrade discount is June 28, 1991.

Companies expecting to increase their number of users per Microvax will be the major beneficiaries of the upgrade, DEC officials said.

"Those companies can get unlimited user access to VMS at a fraction of the usual cost," said Rick Spitz, group manager of VMS engineering at DEC. "Depending upon the customers' model and current license, the total savings could surpass $17,000."

Microvax grows up

Since the introduction of the Microvax II in 1985, DEC has installed more than 127,000 Microvax systems in the U.S., according to market researchers at Computer Intelligence in La Jolla, Calif.

"The VAX's little brother has grown up," observed Dave Eulitt, an analyst at Computer Intelligence. "The Microvax series has now surpassed the VAX series in total U.S. system processing power, as measured in MIPS." CI research shows that 60% of new Microvax sales end up running new applications or adding computing capacity to existing systems.

The most recent introduction to the line was the VAX 4000, which Eulitt noted is effectively a Microvax with the "micro" dropped from its name. The VAX 4000 uses the same Q-bus backplane as previous models, but DEC has singled it out as the first system designed with client/server computing in mind.

AS/400s

CONTINUED FROM PAGE 25

very happily, but we realized that in order for my professional staff to be truly productive, we had to take advantage of current technology," MIS Director Don O'Connor said.

Eventually, 100 of ABC Home Health's branch offices will have Model C4s installed, giving each site more efficient access to scheduling of nurses and therapists. Automating paperwork between each branch office and headquarters is another benefit, O'Connor said.

Market research firms have no installed base numbers yet for the new entry-level models, and IBM is not releasing sales figures. However, among other low-end models of the AS/400 — the B10 and 20, and the C10, 20 and 25 — growth in the installed base has been brisk. Computer Intelligence in La Jolla, Calif., reported that sales of the low-end AS/400s grew 57% between January and July 1990, while sales of the high-end AS/400s grew by 12% and the midrange models by only 5%.

A practical application

For KOA Kampgrounds, the appeal of the smallest AS/400s was their ability to smooth out the registration and reservations process at some of KOA's 630 campsites in the U.S. and Canada.

"On the larger campgrounds, managing the site inventory is a real problem," said Bryan Meyers, director of information services at KOA, which already owned a dozen AS/400s when the new entry-level models were introduced. "You can end up with double-booking problems, like 50 people showing up for 40 sites."

During the next few years, KOA will put in 60 to 70 of the AS/400 Model C4s, he added. "Our idea is to have one at every campground," Meyers said, "but we only own 15 of the campgrounds, and the rest are franchised, so a lot of our plan is a salesmanship job to our franchisees."

Because many of the campsite managers are leery of computers, the new ease-of-use features in OS/400 Release 3 — such as the Operational Assistant facility — were also welcome.

NEW DEALS

DEC, Inland join forces

Digital Equipment Corp. and Chicago-based **Inland Steel Co.** have announced a multimillion-dollar project to begin processing the steel company's business applications on DEC VAX 6000 minicomputers. DEC will act as a systems integrator in developing the database, integrating software and managing subcontractors. The project is scheduled for completion in September 1991.

The resulting "I/N Kote Business Level 3" system will provide operations management, planning automation and order processing functions. The system will also exchange information between Inland's corporate systems at the Indiana Harbor Works and I/N Kote in New Carlisle, Ind., a joint venture between Inland Steel Co. and Nippon Steel Corp. in Japan.

Damark International, a Minneapolis-based catalog mail-order company for consumer electronics, recently replaced a fault-tolerant system from **Stratus Computer, Inc.** with a Unix-based Series 300 computer from **Sequoia Systems, Inc.** in Marlboro, Mass.

With 370 users at Damark's national headquarters in Minneapolis, a Sequoia system running the Pick System, Inc. operating system will handle on-line order entry, billing and other business functions and be connected to IBM mainframes at a service bureau for credit-card verifications. Sequoia won the sale in a competitive series of benchmarks, Damark officials said.

Digital Analysis Corp., an open systems integrator, has been awarded a $10 million contract from **Unicor Federal Prison Industries, Inc.** to supply AT&T Unix System V computer systems based on the **Data General Corp.** Aviion workstation architecture.

The contract calls for the installation, maintenance and support of the DG Aviion systems in as many as 54 factory sites located at federal prisons across the U.S.

Federal Prisons Industries is a wholly owned government corporation that provides employment and training for inmates in federal correctional institutions.

Wang Laboratories, Inc. recently signed an agreement making it the official computer supplier for Great America and Festival Island, a major sports and entertainment complex currently under construction in Memphis.

The contract includes orders for midrange systems, cabling, point-of-sale devices, voice-mail systems and security and time-card processors.



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AT&T Network Systems

FDA screening effects of VDTs, TVs

BY MITCH BETTS
CW STAFF

Because of growing public concern, the U.S. Food and Drug Administration (FDA) is planning to embark on the first comprehensive study of electromagnetic radiation from VDTs since 1981.

The study, to be conducted at the FDA's field laboratory in Winchester, Mass., will measure both very low frequency (VLF) and extremely low frequency (ELF) emissions from more than 100 models of VDTs and television sets.

William Boivin, a physicist at the FDA lab, said his proposal for renewed VDT testing was prompted by "the general level of interest in the technical and popular press." He said the 18-month study will get under way in a month or two, after a robust methodology is approved by FDA officials. The FDA lab already tests VDTs for compliance with the federal standard on X-rays, so Boivin's plan is to measure these same units for VLF, ELF and ultrasound emissions.

Maureen Butler, an engineer at the FDA's Office of Compliance in Rockville, Md., said she hopes the study will include low-radiation VDTs and retrofit screens, to see if vendors' advertising claims for them are justified.

Low-emission

CONTINUED FROM PAGE 25

some monitors, there is the option of a low electrostatic tube. "Every tube builds up a small electrostatic charge," he said. "This drains it off continuously so you don't get shocked."

Getting in on the act

Other companies are attacking the problem with screens.

Santa Monica, Calif.-based Norad Corp., for instance, uses a wire mesh screen with a separate grounded wire to drain static.

The company claimed the screen "attenuates" electromagnetic fields coming from the front of the VDT. Those fields, however, also radiate from the back and sides of the monitor.

A more unusual method that is used to reduce the fields is offered by Wellware Corp. in Park City, Utah. Its product, which is called A/NOX, consists of two small bulbs that are placed in the upper left and lower right corners of a VDT frame.

The bulbs, which are filled with undisclosed elements, resonate and vibrate when the VDT is turned on.

According to the company, the fields resulting from the bulbs match those of the VDT but are half a cycle out of phase, thus canceling each other out.

According to Wellware, the company is still testing the product.

Hamilton

CONTINUED FROM PAGE 25

able if it were coming from a small start-up software firm. But IBM? Surely the company is savvy enough to know when it doesn't fully understand something. And surely that would mean that announcing aggressive delivery dates, as it did in 1989, would not be the smartest of moves. The executives more or less agreed with that point and said that in the future, they will not make such blue sky announcements.

Looking to this year doesn't exactly brighten the Officevision picture, either. We expect an update sometime in the second quarter, and at that point, IBM may have a new delivery schedule.

But unless the general mood in the market changes between now and then, that event should be a letdown. Based on interviews with customers and industry analysts, one has to wonder if many users will be jumping for joy by the time the full-blown Officevision rolls out.

It seems that since the initial hoopla when Officevision was announced in 1989, user enthusiasm has been on the decline. By some future date, when all the features of Release 2 do arrive, how can we expect much interest at all?

Oh, don't get me wrong. There are some very satisfied Officevision users. *Computerworld* has talked to some. Typically, they are running it on a host as a step up from earlier IBM office products. But there are also many would-be Officevision customers who see no burning reason to move to that platform.

Really, the bad news for IBM was not the delay or the fact that executives had to publicly acknowledge they goofed. The bad news was that few people were really ticked off. If there had been more anger, sure, that would have been difficult for IBM, but at least it would have shown that people really want the product. But it's that indifference that is going to plague IBM in the future.

NEW PRODUCTS — HARDWARE

Processors

Harris Corp.'s Computer Systems Division has introduced a multiprocessing real-time system designed to perform time-critical applications such as flight simulations, seismic data and signal processing.

The Night Hawk 4800 is based on 25-MHz Motorola, Inc. 88100 reduced instruction set computing technology. It supports three of Harris' compatible operating systems for use in software development and interrupt-driven production applications, the vendor said.

The system has been available since October. Pricing starts at $58,500.

Harris
Computer Systems Division
2101 W. Cypress Creek Road
Fort Lauderdale, Fla. 33309
(305) 977-5502

I/O devices

Intecolor Corp. has introduced a 20-in., color X Windows-based terminal designed for industrial environments.

The IX3000 includes a 20-in. display that features 1,024- by 768-pixel resolution, two microprocessors, an Intel Corp. 80386SX processor and a Texas Instruments, Inc. TI34010 graphics processor. Up to 8M bytes of random-access memory and a logic platform equipped with two IBM Personal Computer AT-compatible bus slots are also featured.

Pricing starts at $5,500.

Intecolor
2150 Boggs Road
Duluth, Ga. 30136
(404) 623-9145

Data storage

EMC Corp. has announced its Orion series of solid-state disk subsystems for Unisys Corp. 1100 and 2200 mainframes.

The series consists of two models: Orion and Orion/VL. The Orion subsystem contains two control units with a maximum capacity ranging from 16M to 1.8G bytes of memory. The Orion/VL contains two to eight control units and features a subsystem capacity of up to 4.8G bytes.

A 16M-byte Orion configuration costs $34,000, and a 32M-byte Orion sells for $51,400. A 256M-byte Orion/VL version is priced at $224,000, and a 1G-byte Orion/VL costs $552,000.

EMC
171 South St.
Hopkinton, Mass. 01748
(508) 435-1000

American International Devices, Inc. has announced the AI/3109, a plug-compatible 32M-byte board that uses 4M-byte chips designed for IBM's Application System/400 Model B70.

Features include an off-line switch for disconnecting without having to remove the board, LED indicators to monitor activity on a system and a transferrable lifetime warranty.

The product's list price is $25,000.

American International Devices
12540 Beatrice St.
Los Angeles, Calif. 90066
(213) 305-8161

General Business Technology, Inc. has announced two digital audio tape (DAT) drives designed for IBM Application System/400 environments.

The GBT 4604 can be used with AS/400 Models B10 through B20 and C10 through C25. The GBT 4606 DAT drive runs on the IBM AS/400 9406 models. Both helical scan drives store 2.5G bytes of data on a single 4mm DAT cartridge and transfer data at 1G byte/hour.

The GBT 4604 is priced at $9,995 and $13,450 with a data compression feature. The GBT 4606 costs $10,950 and $13,950 with data compression.

General Business Technology
1891 McGaw Ave.
Irvine, Calif. 92714
(714) 261-1891

Power supplies

The Superior Electric Co. has announced the Stabiline series of uninterruptible power supplies, featuring full-load operating times ranging from 10 to 30 minutes and half-load times of 25 to 60 minutes.

The series consists of cord, plug and hardware models with the following ratings: 400, 800 and 1,250 VA; 120 V; and 60Hz. Pricing ranges from $1,250 to $2,795, depending on type of model.

Superior Electric
383 Middle St.
Bristol, Conn. 06010
(203) 582-9561

Emergency Power Engineering Technologies, Inc. has announced the EPS 2000 11-kVA, the latest model in its EPS 2000 family of uninterruptible power supplies.

The EPS 2000 11-kVA is a three-phase device designed to be used with midrange computer systems, the vendor said.

The product costs $24,000.

EPE Technologies
1660 Scenic Ave.
Costa Mesa, Calif. 92626
(714) 557-1636

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SYSTIMAX PDS

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AT&T AR Series Riser Cable
Ideal for high-rise or multi-story building networks, AR Riser Cable offers fast, trouble-free cable installation and high pair density in a small diameter cable. These UL-listed Type CMR cables can be placed in vertical shafts without using conduit, per NEC standards, for more effective use of space.

AT&T SYSTIMAX™ PDS LAN Cable
AT&T 100 ohm high-performance data cable allows high bit-rate signaling up to 500 feet. It supports simultaneous transmission of multiple systems' high-speed data signals and is compatible with AT&T's 110 Connector Systems.

AT&T 110 Connector Systems
As quick-connect terminating systems for cross connections and termination of cable conductors, AT&T's 110 Connector Systems may be configured to any building terminal layout. One-piece design reduces space and hardware needs, yet is rugged enough to stand up in a high-activity terminal environment.

AT&T
Network Systems

AT&T Network Systems
505 North 51st Avenue
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Attn.: National Telemarketing Center

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NEW PRODUCTS — SOFTWARE

System software

Ingres Corp. has announced the release of *Ingres Tools for Ultrix/SQL*, a suite of tools designed for Digital Equipment Corp.'s Ultrix/SQL relational database management system.

The product enables Ultrix users to query data, create tables and perform third- and fourth-generation language applications. The family of tools includes five optional decision support and application development modules.

Pricing ranges from $2,000 to $210,000 for VAX and reduced instruction set computing-based DEC machines. All prices are based on host CPU size.

Ingres
1080 Marina Village Pkwy.
Alameda, Calif. 94501
(415) 769-1400

Development tools

Silvon Software, Inc. has announced that Version 2.3 of its Implementer change control program is available for users developing applications on IBM Application System/400 or System/38 computers.

The product's distributed data management feature ensures that development information for all systems is stored on a single machine, thereby enabling users to develop and maintain one software application concurrently on multiple machines, the vendor said.

Licenses cost between $2,500 and $7,000 for AS/400 Models B10 through B70 and $5,000 for System/38s.

Silvon Software
935 Oaklawn Ave.
Elmhurst, Ill. 60126
(708) 668-9380

Utilities

Sysdata International, Inc. has announced that it has released a product designed to restart batch jobs from their last database management system checkpoint by repositioning all database files, sequential disk files and tapes.

Quickstart is said to enable users to recover from batch abends without having to perform restores or job returns. It also allows a program to be altered and recompiled after a job has been abended.

Jobs can also be viewed, and the frequency of a checkpoint can be altered while a job is still running, according to the vendor.

The product runs in an MVS environment and is priced at $5,600 per CPU.

Sysdata International
175 Fifth Ave.
New York, N.Y. 10010
(212) 447-1581

Apertus Technologies, Inc. has introduced Soap/Premis, a software system designed to enhance the Premis database or a similar database of an independent telephone company. (Premis is a database used by the regional Bell operating companies.)

The Unix-resident software package automatically validates critical elements in a Premis database by comparing Premis data with corresponding information from other related databases, the vendor said.

Initial pricing for Soap/Premis is $138,000.

Apertus Technologies
7275 Flying Cloud Drive
Eden Prairie, Minn. 55344
(612) 828-0300

Chicago-Soft Ltd. has announced MVS/Quick-Ref, a pop-up quick-reference resource that documents operating system software, development tools and applications for IBM ISPF users.

The software runs on IBM mainframes using MVS.

Pricing ranges from $7,500 to $13,500, depending on CPU size.

Chicago-Soft
738 N. LaSalle St.
Chicago, Ill. 60610
(312) 282-4777

Version 5 of Fulcrum Technologies, Inc.'s Fulcrum Ful/Text is available for Sun Microsystems, Inc.'s Sun 3 and 4 platforms.

The product's client/server architecture allows users to access local and remote collections and permits indexing and retrieval functions to be centralized on server systems. Pricing for servers ranges from $5,000 to $70,000; pricing for clients ranges from $100 to $1,500.

Fulcrum Technologies
560 Rochester St.
Ottawa, Ontario K1S 5K2
(613) 238-1761

Computer-aided software engineering

Language Technology, Inc. has announced Advance II, an OS/VS Cobol-to-VS Cobol II translation tool.

It is said to provide planning and analysis capabilities and a range of conversion reports.

The product runs on IBM System 34, 36 or 38, as well as on all IBM 370-based machines and compatibles running under MVS/ESA, MVS/XA or MVS/SP. It is priced at $27,000 per copy.

Language Technology
27 Congress St.
Salem, Mass. 01970
(508) 741-1507



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- *The Technology Track* explores topics like needs assessment; evaluating languages, environments, and databases; and standards and user groups.
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- 22. Dir./Mgr. Tech. Planning, Adm. Svcs. Data Comm. Network Sys. Mgt. Dir./Mgr. PC Resources
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Mgrs., Supvr. of Programming, Software Dev.
- 32. Programmers, Software Developers
- 99. Sys. Integrators/VARs/Consulting Mgt.

OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice-President, Asst. VP
- 13. Treasurer, Controller, Financial Officer
- 41. Engineering, Scientific, R&D, Tech. Mgt.
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- 70. Medical, Legal, Accounting Mgt.
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Types of equipment with which you are personally involved either as a user, vendor, or consultant.
- A. Mainframes/Supermins
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- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/ Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Distr./Retailer
- 75. User: Other _____
- 95. Vendor: Other _____ (Please specify)

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- 22. Dir./Mgr. Tech. Planning, Adm. Svcs. Data Comm. Network Sys. Mgt. Dir./Mgr. PC Resources
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Mgrs., Supvr. of Programming, Software Dev.
- 32. Programmers, Software Developers
- 99. Sys. Integrators/VARs/Consulting Mgt.

OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 51. Sales & Mktg. Management

OTHER PROFESSIONALS
- 70. Medical, Legal, Accounting Mgt.
- 99. Educator, Journalists, Librarians, Students
- 99. Others _____ (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
- A. Mainframes/Supermins
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Weighing upgrade options

BY RICHARD PASTORE
CW STAFF

As the stifling shadows of recession creep across the nation, personal computer managers are more seriously weighing the merits of buying new machines vs. retrofitting old inventory with memory and controller upgrades. Many said upgrades are not cost-effective, but others are taking a hard look at these add-in options.

Retrofitting is "throwing good money after bad," said Marc Kustoff, director of microcomputing at Rhone Poulenc Rorer, Inc., a pharmaceuticals firm in Fort Washington, Pa.

Kustoff's predecessor had been installing Intel Corp. 80386 accelerator cards in IBM PC XTs, but Kustoff put a stop to that practice.

"You're putting a 32-bit processor on an 8-bit bus and still only getting 8-bit performance," Kustoff said.

Higher support costs

Upgrade cards also add complexity and introduce potential reliability weaknesses to an installed base, Kustoff said. With 1,000 PCs in a multisite environment, this could only lead to higher support costs, he said.

Other users with large installed bases see only limited use for retrofitting.

"It's cost effective in some cases," said Sid Diamond, vice president of worldwide information services at Black & Decker Corp. But in most cases, the company prefers to invest in new technology, he said. "We're not cutting back."

PC Edge, a San Jose-based dealer, actually saw a decline in retrofitting this year. Because prices have dropped on Intel 80386SX-based systems, "It's hard to justify spending money upgrading a system rather than buying an SX machine," PC Edge President Sam Adicoff said.

However, Adicoff admitted that current sales are based on budgets set last year. He said he is concerned that current budgets will allow for fewer new system purchases in 1991.

Some users, already hit hard by the weakening economy, add credence to such industry fears. "We're trying to get the most out of our current inventory," said Jerry Weinstein, director of corporate MIS at General Instruments Corp. in Lyndhurst, N.J. A recent restructuring at the company has placed greater emphasis on "careful husbanding of fixed assets inventory," Weinstein said.

Incompatibility a factor

Despite this mandate, Weinstein said, retrofitting will not work in many cases. When the need calls for higher disk speed, the speedier component may be incompatible with the PC's CPU. "Where those mismatches are obvious, we'll pay the extra money and buy new equipment," he said.

At the Haskell Co. in Jacksonville, Fla., "We have needs for additional resources, but the realities of the marketplace right now may dictate otherwise," said William Etheridge, who is the director of computing and communications.

If the yet-to-be-set capital expense budget precludes new systems, Etheridge said, he will dip into the more flexible operating budget for retrofitting funds. "We've got a lot of old 286-class machines we need to do something with," he said.

Some industry analysts who are pessimistic about the 1991 economy said managers will be forced to come to terms with retrofitting.

"The money is not going to be there for wholesale purchases of 386s with 4M bytes of RAM," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Upgrade sales expected

Some dealers are expecting a surge in upgrade board sales, particularly in the first six months of this year.

"Until the economy improves, there's going to be interest in trying to upgrade equipment rather than replace it," said Matt Fitzsimmons, owner of a Computerland Corp. franchise in White Plains, N.Y.

Again, the economy is the driving factor, according to Fitzsimmons. "If you work for a company that's cutting back on employees, it's almost sacrilegious to be considering replacing your hardware," he said.

Tough choice: To retrofit or not to retrofit?

Pros

- Easier to justify in poor economic times.
- Less expensive in the short term.
- Funded by operating budget rather than capital budget.
- Quickest way to boost performance.

Cons

- Only a temporary fix.
- Performance increase may be negligible.
- Possible incompatibility problems.
- Adds complexity, potential support burden.
- Board cost vs. cheap 386SX systems hard to justify.

Intel releases cache controller for 386

BY MAURA J. HARRINGTON
CW STAFF

FOLSOM, Calif. — Intel Corp. recently introduced two versions of its line of Smart Cache memory controllers designed for use with its 20 MHz 80386SX microprocessor.



As the second-generation product family to its cache controller for the 386SX chip, the 8K-byte 82395SX and the 16K-byte 82396SX cache controllers reportedly incorporate several chips needed for cache memory into one chip, including the static random-access memory and the cache control logic.

"Basically, this cache controller is the same cache a user would find in the 80486 CPU, only it works with the 386SX chip," said Mike Casey, Intel's product marketing manager for the 386 cache controller product family.

A cache controller acts to improve CPU efficiency by taking information out of the main memory and holding it for the processor until it can use it. With the controller, Intel claimed, users can see improvements of as much as 35% in performance.

The 82395SX is scheduled for volume production by March, and the 82396SX is due out in volume by the second half of 1991. Pricing for the 82396SX cache controller will be $44 in 1,000-unit quantities, the company said. Pricing for the 82395SX is still unavailable.

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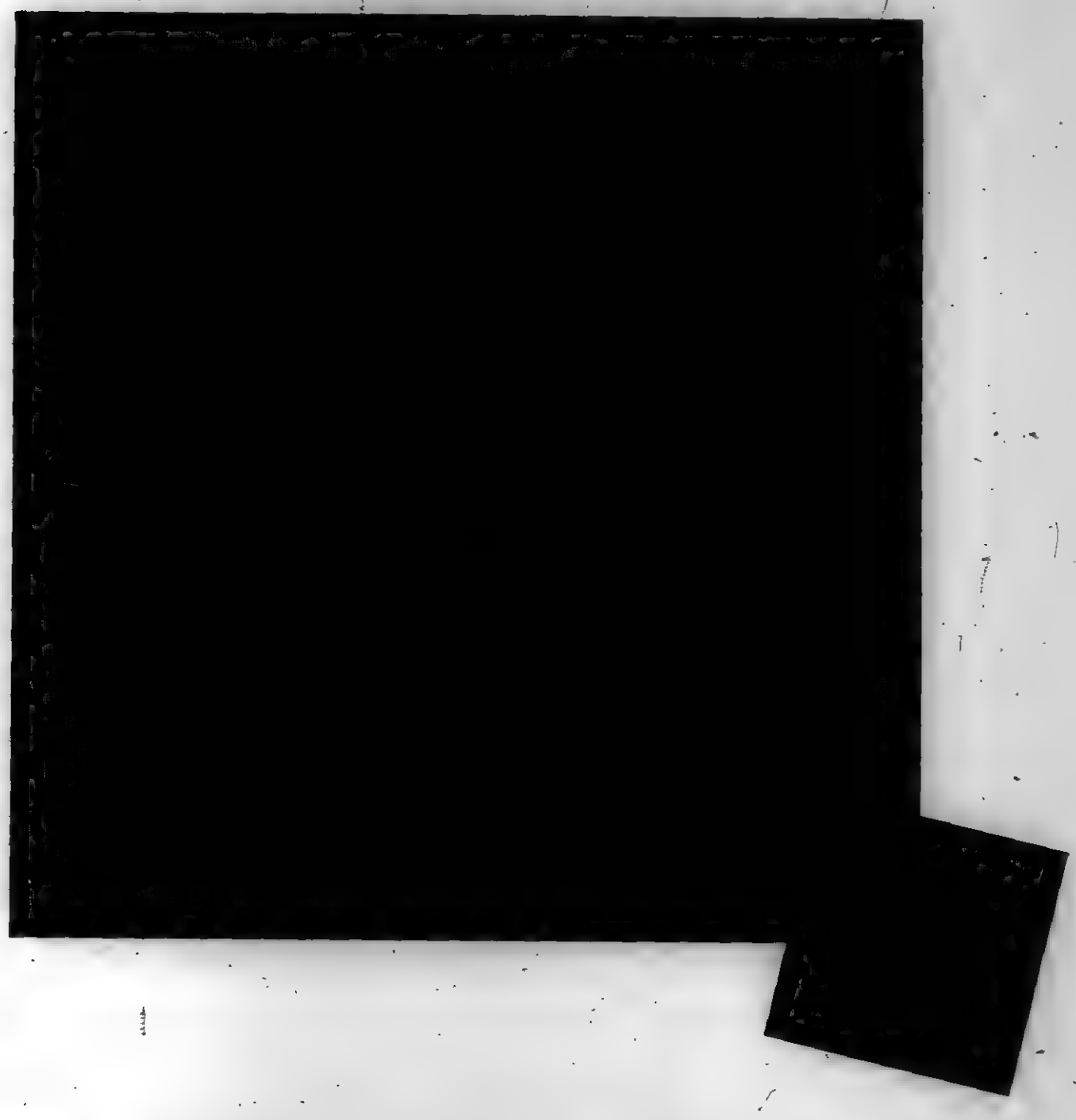


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Can home computers predict earthquakes?

BY MEL MANDELL
SPECIAL TO CW

If seismologist Edward Cranswick has his druthers, a network of home computers will provide valuable information on earthquakes in the San Francisco Bay area and perhaps even warn of the next big one.

Cranswick and his collaborator, Robert Banfill, have proposed that inexpensive seismic data acquisition units (SDAU) be attached to only a fraction of the many home computers in and around San Francisco. Having as few as 1% of the estimated 100,000 home computers in the area equipped with the SDAUs could provide important data on how different terrain responds to even the slightest of earthquakes, Cranswick said.

Cranswick, 39, a 10-year veteran of the U.S. Geological Survey in Golden, Colo., has been programming in Fortran since he was in high school in Nyack, N.Y. Banfill, 29, has been working with personal computers for 10 years. He operates a one-person business called Small Systems Support in Big Water, Utah. It was Banfill who convinced Cranswick that PCs could be substituted for large computers in the analysis of seismic data.



The owners of the home computers would be asked to buy the SDAUs, which, the proponents hope, could be made in volume for only $500 each. Each SDAU would consist of an accelerometer connected by cables to a box containing a small microprocessor, at least 1M byte of memory and an internal clock. The accelerometer, which would measure motion in three directions, would be buried in the backyard. Any motion picked up by the accelerometer would be transmitted to the box, which would be loaded with "trigger" algorithms to eliminate unwanted information, such as earth movements caused by passing vehicles. Movements caused by quakes would be stored in random-access memory.

Once a day, the central computers at the Geological Survey offices in Menlo Park, Calif., would poll each SDAU via modem. Only the starting times and amplitude of each movement would be forwarded, Cranswick said, so each transmission should "last no longer than 30 seconds and not interfere with other users." A light on the SDAU would inform the homeowner that seismic data has been collected. The homeowner could then call the data up on the screen of the home computer, study it and compare it with data from prior quakes stored in the computer. Cranswick said he believes the amateur seismologists in his proposed network could eventually make contributions to seismic research.

The idea for a vast network of SDAUs first came to Cranswick more than 10 years ago after a great earthquake centered in Haicheng, China. Local peasants reported odd behavior by animals and changing water levels in wells just before the earthquake. At the time, some seismologists proposed the creation of low-cost, electronic "seismic animals" to warn of impending earthquakes.

Cranswick and Banfill proposed their concept at a meeting of the American Geophysical Union held in San Francisco on Dec. 6.

Reaction to the proposal was mostly positive. For instance, the head of the Geological Survey in Menlo Park said his office has long operated a network of sophisticated SDAUs, but they number only 84. They are tied to Digital Equipment Corp. PDP-1170, VAX 750 and VAX 780 computers.

Cranswick's network of home SDAUs is still at least a year away. First, he must locate manufacturers who will supply the accelerometer — the most costly component — at a reasonable price. Next, he and Banfill must create more sophisticated trigger algorithms to eliminate irrelevant data generated, for example, by the homeowner's dog unearthing a bone next to the buried accelerometer. Seismic analysis software for each kind of home computer must then be written "most likely in a mixture of languages including C and Fortran," Cranswick said.

The collaborators must then recruit and train amateur seismologists to install and test the SDAUs in the homes of volunteers who join the network.

Mandell is a New York-based free-lance writer.

Cheap laptops raise reliability concern

BY MICHAEL FITZGERALD and RICHARD PASTORE
CW STAFF

While desktop personal computer clones have earned a grudging acceptance from economically strapped users, the coming influx of portable clones from the Far East and elsewhere has observers worried. Though cheaper than name-brand products, these laptops may spend more time traveling to the repair shop than traveling on business.

"I think there could be a big difference in the quality of these machines," said Peter Teige, an analyst at Gartner Group/Infocorp. "With desktops, a certain level of clone machine is a good buy. But with laptops, you're talking about abuse."

Venerable portable vendors have had experience in ruggedization. "They've spent lots of money in researching and developing high-impact plastics," said Andrew Seybold, an analyst at Dataquest, Inc. in San Jose, Calif. That is not the case with the new clone vendors, he said.

Most of the Pacific Rim cloners exhibiting prototypes at Comdex/Fall '90 in November said price was their only distinction, according to Peter O'Connor at New York-based Laptop Expositions, Inc. The pricing pressures on these vendors may lead to corner-cutting and reliability problems, he said.

With a chance of frequent downtime, support will also be key to deciding between new clones and old-line manufacturers. Customers will be more attracted to vendors with established support than to low-cost clone makers, said John Dunkle, an analyst at Workgroup Technologies, Inc. in Hampton, N.H.

Computer repair shops are already seeing new clones.

Because parts are hard to locate, and sometimes the vendors themselves cannot be found, "I would not recommend purchasing any of those unless you don't plan on having it serviced," said Dan Mazurek, service manager at Advanced Computer Repair Centers in Woburn, Mass.

Wang's latest software complies with Windows 3.0

LOWELL, Mass. — Wang Laboratories, Inc. put another piece of its Open/Architecture strategy into place recently with the announcement of a Microsoft Corp. Windows 3.0-compliant software package.

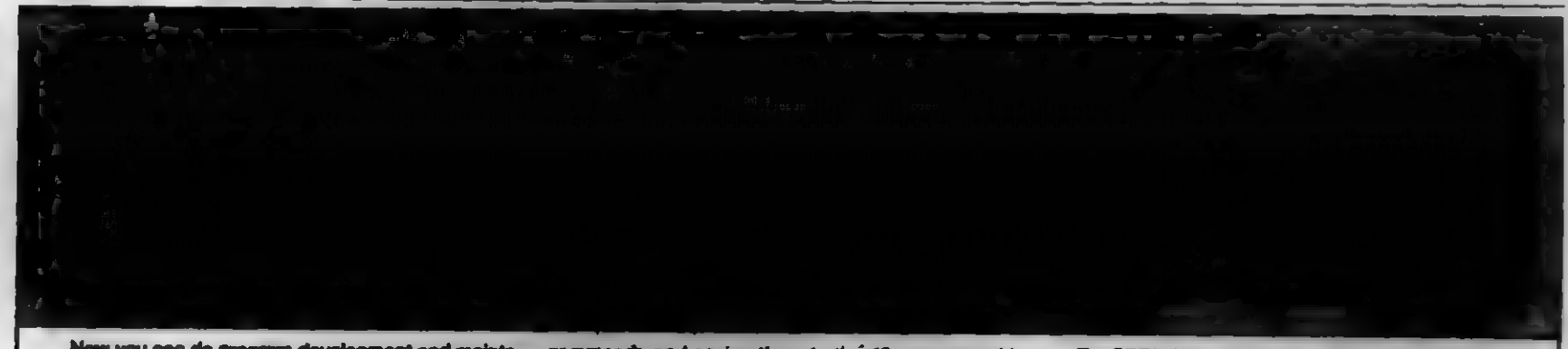
Called Winloc 3.0, the software package will be used in conjunction with the Wang Local Office Connection or Micro Channel Local Office Connection option boards, which allow industry standard architecture and IBM Micro Channel Architecture personal computers to function as workstations on Wang's VS midrange systems.

According to Wang, the product will give users access to VS applications, such as data processing and text editing, by running VS terminal emulation in a RC Window while having PC applications active in other windows on the PC screen.

Winloc 3.0 can be run in Microsoft Windows Real mode, Standard mode or 386 Enhanced mode.

Release 3.0 is priced at $200. Those who already own Winloc 2.0 can upgrade to the latest release for $50, according to the company.

SALLY CUSACK



Now you can do program development and maintenance on the PC the same way as you do on the mainframe with SPF/2, a new OS/2 alternative to working with ISPF/PDF.

Written specifically for OS/2, SPF/2 offers the same familiar environment, command structure and editing capabilities. SPF/2 utilizes virtual memory to handle very large files, multi-process technology for split screens, and an interface to OS/2's REXX as a macro language.

SPF/2 includes 75 ISREDIT commands that interface with REXX. Therefore, you may write your own commands and assign them to the 48 programmable function keys. Your existing mainframe REXX edit macros will also run with SPF/2.

SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 also displays 3270-style status indicators.

While you will enjoy working in the PC environment with an editor you already know, you will also enjoy an SPF/2 feature not available on the mainframe — high-speed PC-processing.

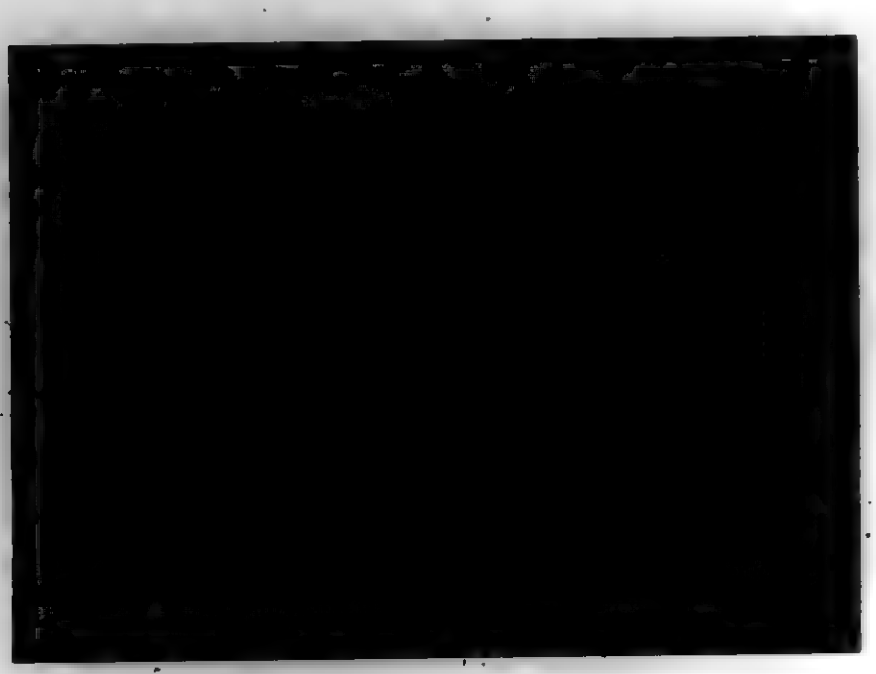
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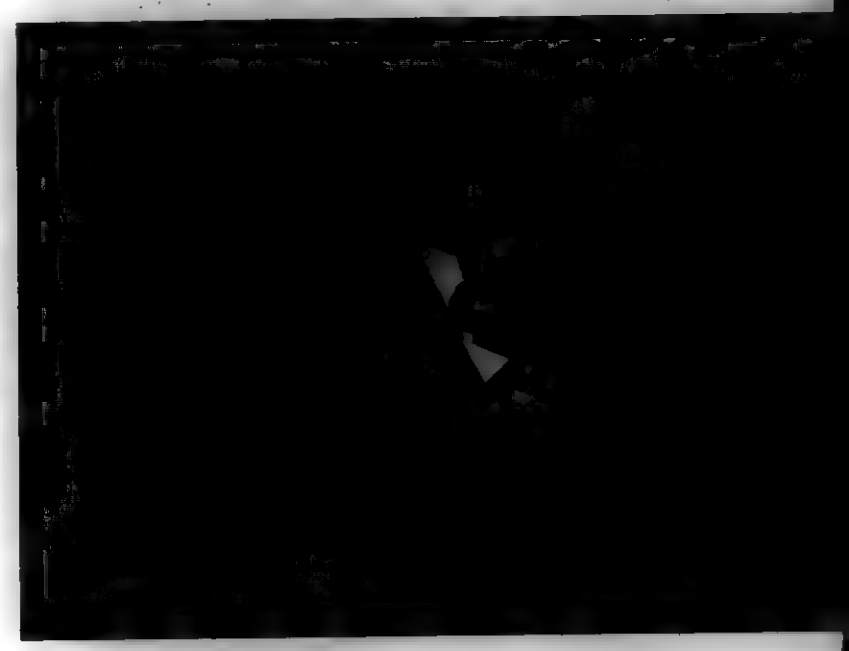
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Model designed and analyzed using PDA Engineering's PATRAN® MCAE system. © 1990 Hewlett-Packard Company CPWG006

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HEWLETT PACKARD

Compaq Deskpro 486/25: High speed, high price

Technology Analysis — a roundup of expert opinion about new products. Summaries written by free-lancer Suzanne Weixel.

Compaq Computer Corp.'s Deskpro 486/25, built around the Extended Industry Standard Architecture (EISA) bus, pushes the definition of "personal computer" to its limit. But the system also reaches new heights in price. Loaded, the Deskpro costs nearly $30,000 — extreme even if you use it as a file server, PC reviewers say.

Performance: As far as desktop workstations go, you are not going to find too many systems faster than the Deskpro 486/25. Its storage and memory capacity is impressive — as much as 100M bytes of random-access memory with the motherboard and use of six expansion "pockets." In theory, the EISA bus should boost performance even more, but reviewers say that without a hardware caching EISA controller, you can't get that extra power.

Compatibility: The only software compatibility problem encountered by testers was the inability to switch between applications when running under Quarterdeck Office System's Desqview.

Documentation: As usual, Compaq delivers good documentation. The installation utility that comes with the system also eases setup.

Support: Compaq's one-year limited warranty is fairly standard, but the firm's insistence on dealer-only support is a major drawback, reviewers say.

Value: The Deskpro 486/25 delivers a lot of power, but the base price for a system with a 120M-byte hard drive is high: $13,999.

Server capabilities: The Deskpro's capacity suits it for small to medium-size networks.

Reviews Summary

Criteria			
Performance	A screamer	Excellent	8
Compatibility			
Documentation	NC	Very good	8
Support			
Value	Most expensive	Satisfactory	3
Reviewer's score			

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. PC Week and Infoworld ratings are included in the score chart (right). NC: No comment. These are excerpts from the reviews. Refer to actual articles for details.

RATINGS

- Users: Ken Sandlin, Brand and Allen Architects, Inc. (performance: 10, cost: 3); Ken Sandlin, Brand and Allen Architects, Inc. (10,5); Charline Avey, Indianapolis Water Co. (8,5)
- Analysts: George Thompson, Datapro (8,5); Egil Juliussen, Workstation Labs (8.5,5)
- Financial: Jerry Fleming, Fahnestock & Co. (*overall rating:* 9); Eric Zinnis, Rauscher Pierce Refsnes (8); Jim Poyner, William Woodruff & Co (8).

Compaq Computer Corp. had sales of $2.6 billion for the first nine months of 1990, up from $2.1 billion in 1989. Net income was $320 million over the same period, up from $254 million in 1989.

Deskpro 486/25

Points (maximum)	Category
22 (30)	Published reviews
16 (20)	Analysts' ratings
14 (15)	Users' ratings
10 (20)	Cost evaluation
12 (15)	Vendor financials

(Maximum score: 100)

What Compaq users say

"Compaq could provide the software compatibility we needed. I've heard compatibility horror stories from people using other machines."

Charline Avey, Indianapolis Water Co.

"We've had absolutely no problems with the product, but it is rather expensive."

Ken Sandlin, Brand and Allen Architects, Inc., Houston.

(Note: Compaq declined to respond to this review.)

AST Premium 486/25: Speed at a reasonable rate

Premium 486/25

Points (maximum)	Category
23 (30)	Published reviews
15 (20)	Analysts' ratings
13 (15)	Users' ratings
13 (20)	Cost evaluation
11 (15)	Vendor financials

(Maximum score: 100)

Reviews Summary

Criteria			
Performance	Very good	7	Good
Compatibility			
Documentation	Very good	NC	NC
Support			
Value	Very good	5	Good
Reviewer's score	7.0		

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. PC Week and Infoworld ratings are included in the score chart (left). NC: No comment. These are excerpts from the reviews. Refer to actual articles for details.

AST responds

Larry Fortmuller, director, high-performance systems:

Performance: For $1,500 over a 386/33, the Premium 486/25 gives a minimum 30% performance increase. The AST CUPID architecture supports more memory than last year.

Server Capabilities: The system's speed is dependent on hard drives selected, disk arrays, peripherals and Extended Industry Standard Architecture vs. XT/AT bus controllers.

RATINGS

- Users: Ken Sandlin, Brand and Allen Architects, Inc. (*performance:* 10, *cost:* 8); Bruce Greif, County Natwest, Inc. (8,6); user at Illinois aerospace equipment manufacturer (8,5)
- Analysts: George Thompson, Datapro (7,5); Egil Juliussen, Workstation Labs (7.5, 8)
- Financial: Jerry Fleming, Fahnestock & Co. (*overall rating:* 6); Eric Zinnis, Rauscher Pierce Refsnes (7); Jim Poyner, William Woodruff & Co (8).

AST Research's net sales were $533.8 million in fiscal year 1990 vs. $456.5 million in fiscal year 1989. The company's gross profit was $173.4 million for 1990 vs. $112 million in 1989.

With the Premium 486/25, AST Research, Inc. has made its Completely Universal Processor I/O Design (CUPID) available in a system that provides both improved performance over Intel Corp. 80286- and 80386-based systems and compatibility with existing hardware and software, according to reviewers.

Performance: The Premium 486/25 is neither too fast nor too slow, scoring somewhere in the middle on most benchmarks. However, the maximum system memory is 48M bytes, and the machine has too few expansion slots, reviewers say.

Compatibility: Its 16-bit AT bus, makes the system compatible with most products. But *Infoworld* had to disable the secondary random-access memory cache to operate a Token-Ring adapter.

Documentation: The Premium 486/25 comes with a short, clearly written manual.

Support: AST's strong technical suppport includes a toll-free help line and an electronic bulletin board.

Value: The standard configuration, which includes 4M bytes of RAM and a 110M-byte hard disk, costs $10,944 — one of the best workstation values around, reviewers agree. In fact, *PC World* claims that the Premium 486/25 delivers better DOS performance than IBM's I486-based system for about $4,000 less.

Server Capabilities: AST was not thinking about networks when it designed the Premium 486/25, reviewers say. Its performance is good enough to support small networks without a lot of traffic, but the AT bus and the lack of expandability limit its usefulness as a server.

Methodology: *Published reviews: average of numeric scores from product reviews published by PC publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of analysts ratings of vendor financials and product sales from financial analysts multiplied by 1.5.*

Technology is beacon of light

Computers are used as teaching tools for children in Boston community

BY CAROL HILDEBRAND
CW STAFF

Instead of a mustard seed, David L. Evans placed his faith in computers.

His belief resulted in the expansion of a church tutorial program that uses high technology to help teach young people. It also led the way for Evans to be named as President Bush's 311th Daily Point of Light.

Evans, who left an engineering career at IBM to work in the admissions department at Harvard University, said he started to see possibilities when he bought a personal computer five or six years ago.

"I said to myself, 'Well, OK now, what can I do here to help my kids with their homework?' So I taught myself Borland International's Turbo Pascal and started to write software," said Evans, now the senior admissions officer in the undergraduate office at Harvard.

When the programs showed positive results with his children, Evans said, he began to wonder whether these applications might be useful in a larger setting. So he began talking with area churches and found a niche at the Charles Street African Methodist Episcopal Church in Boston, which has had a tutorial program in place since 1984. "Charles Street was very fascinated by high tech," Evans recalled.

> "WE NEED TO put educational enterprise back into the hands of the community."
>
> DAVID L. EVANS
> PRESIDENTIAL HONOREE

With a grant from the Larsen Fund in Southport, Conn., the church bought four Intel Corp. 80386-based PCs from Standard Computer Co., along with four printers.

Evans and a group of 10 volunteers teach children ranging from preschool to sixth grade twice weekly. The programs cover such subjects as multiplication tables, division, spelling, French and Latin. Evans also stays after services on Sunday to encourage people to try out the machines. He said it is important to have this kind of neighborhood service. "We need to put educational enterprise back into the hands of the community," Evans said.

Evans wrote his programs with both the parent and child in mind. When users get a correct answer, they are rewarded with a snippet of song — for instance, the opening bars of "Swing Low, Sweet Chariot." Parents who are not familiar with computers can then tell when the children are doing well and praise them accordingly. "I was seeking to give Mom's dignity back," Evans said.

The church is currently seeking funding to buy more software. "We've bought some and need more," Evans explained, adding that as the program becomes less maintenance-intensive, he hopes to expand it to other churches in the area.

Undaunted by holidays, Lotus adds enhancements

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — The merriment associated with the month of December failed to distract Lotus Development Corp. from the grindstone, as the vendor managed to enhance customer service and update several packages.

Late last month, Lotus announced several extensions to its customer service. First, the spreadsheet maker unwrapped an on-line support database available through Compuserve's Information Service.

The Lotus Technical Library reportedly contains several thousand answers to questions about Lotus' product line. The data contained therein goes back as far as the introduction of 1-2-3 in 1983.

The library allows users to find solutions by searching for a product name, feature, key word or phrase.

Second, Lotus said that it now offers 900-number telephone support for all of its personal computer-based products. The first minute is free; each additional minute costs $2.

Third, this month Lotus begins offering product support for hearing-impaired customers.

Lotus also shipped the Bonus Viewer Disk for Magellan Version 2.0, utility software for IBM Personal Computers and compatibles.

The new disk adds mouse support, a program information file, an icon file for use with Microsoft Corp.'s Windows 3.0 and seven new viewers. It also updates and improves Magellan 2.0's existing viewers.

The Bonus Viewer Disk is offered free of charge to registered users of Magellan 2.0; these users will receive a mailing this month enabling them to order the disk, the vendor said.

Agenda entered the legal market with the release of two Agenda Version 2.0 legal applications: Practice Management and Trial Notebook. Both will be offered free of charge to owners of Agenda 2.0. A card with instructions on how to obtain the legal applications is included with Agenda 2.0.

What would it take
to outperform DASDMON?

Tool helps distribute applications

BY JOHANNA AMBROSIO
CW STAFF

Distributed applications may be the "wave of the future," but for that to happen, someone will need to start writing them today. A tool scheduled to be available in a few weeks aims to help users do just that.

Called XIPC, the package helps standardize the interprocess communications required for distributed computing. These are the tasks that need to be synchronized for applications such as database access across heterogeneous machines.

Expected to be released this month, XIPC will support OS/2 and several versions of Unix, including Xenix, SunOS and AIX, as well as Ethernet. Future versions planned for mid-1991 include Digital Equipment Corp.'s VMS and Ultrix, DOS Windows, token-ring, Decnet and other versions of Unix.

Actually, XIPC is not new. The tool's developer, Momentum Software Corp. in Englewood, N.J., has sold standalone versions for Unix, OS/2 and VMS since January 1990. This has helped users write applications that are portable across all three platforms, said Daniel I. Schwartz, Momentum's vice president of software development. With the new version, he said, developers can write software that takes advantage of client/server and cooperative processing models.

The traditional problem with writing distributed and portable applications, Schwartz said, is that the interprocess communications library is different for each operating system.

Also, some of the libraries — especially for Unix and VMS — "are old, and they show it," Schwartz said. They do not have the functionality needed for today's applications, such as multiplexing. "You can't even kluge this in VMS," he said.

Another constraint is that queues for interprocess communications messages in the older systems have a predetermined size. After that limit has been exceeded, messages can be lost. With Momentum's XIPC, Schwartz said, messages are automatically spooled onto a disk until they can take their place in the message queue.

Schwartz said interprocess communications has been "like an orphan child with no real tools. Programmers have tricks they use to get around these problems, but each solution is specific to each operating system. There's a lot of praying and drudge work."

And that is where XIPC comes in. It is a "superset" of existing interprocess communications libraries, Schwartz said, and as such, already includes elements familiar to developers. Also, because it sits outside the kernel, no changes to the operating systems are necessary. "You just put the XIPC information in one file and update your applications," he said.

Momentum has no current plans to port XIPC to the mainframe world, but that could change. "It's not a technical problem," Schwartz said. "We'd just need someone to lend us a mainframe."

The five-person company was founded in 1986 by Schwartz and Ely Eshel, president of the company. The two met during stints as consultants to Wall Street firms.

Wall Street companies, in fact, remain among the client base. Current users of XIPC include Dean Witter Reynolds, Inc. and Quotron Systems, Inc.

MICRO BITS

Tektronix, Supermac to develop color products

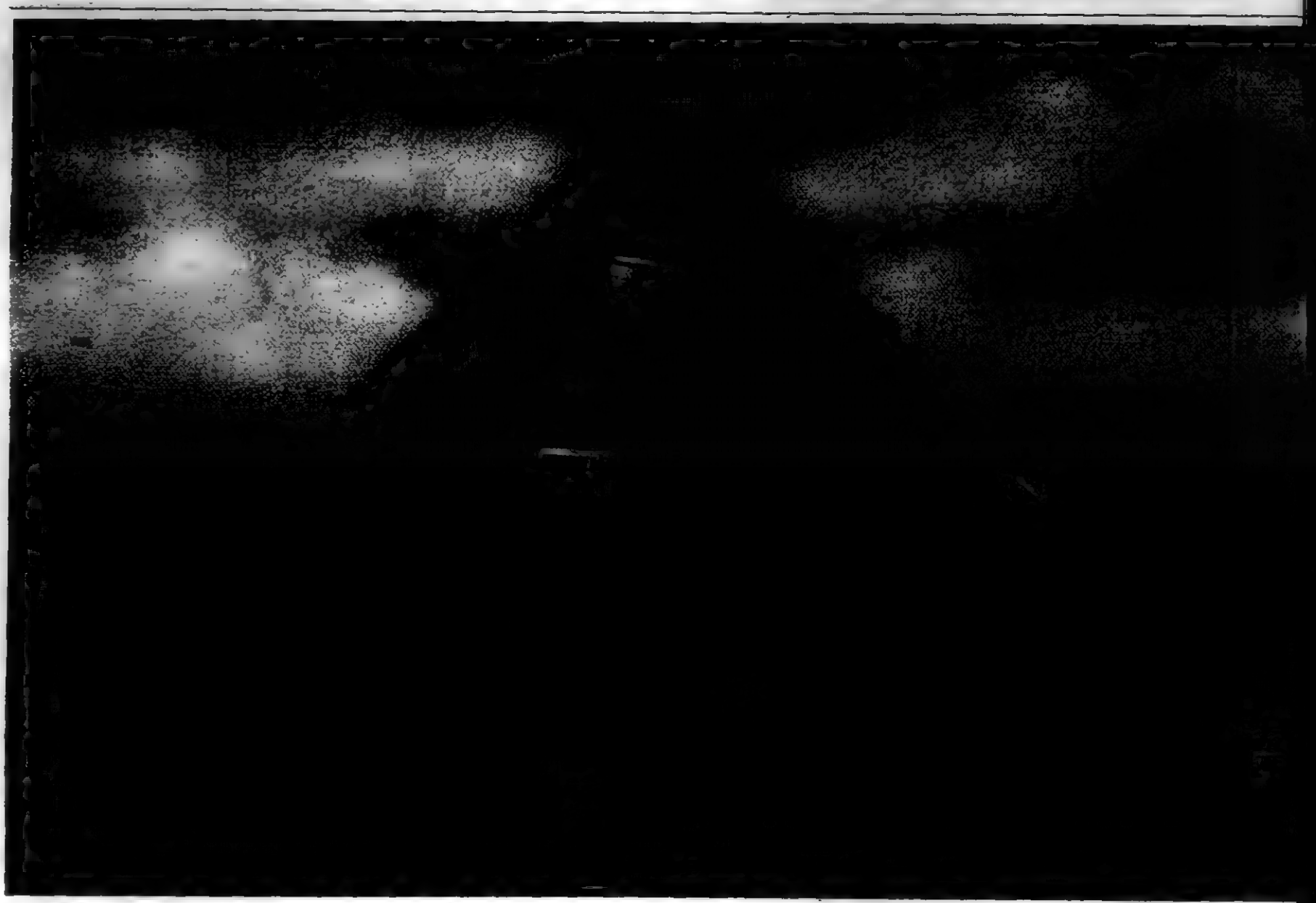
Tektronix, Inc. and Supermac Technology Co. have formed a partnership to develop color fidelity products for the Apple Computer, Inc. Macintosh electronic publishing industry. The development and marketing pact will incorporate a combination of Tektronix's Tekcolor color fidelity system and Supermac's SuperMatch Professional Color Matching system.

NCR Corp. and Micah Systems, Inc. said they will jointly market a health information system that uses Micah's client/server software and NCR's System 3000.

Gammalink announced recently that three computer manufacturers have chosen the Gammafax CP as the core facsimile technology platform for integrating fax into their systems applications. The vendors include Hewlett-Packard Co., Digital Equipment Corp. and Unisys Corp. Separately, IBM has selected Gammalink products for use in its Office Facsimile Application.

Sybase, Inc. has launched the Sybase Open Tools Program, under which the company will act as coordinating agent for the sales and support of various third-party tools to customers worldwide. The goal of the program is to provide customers with a single point of contact for software purchases and support in a multivendor environment, Sybase said.

Interleaf, Inc. and IBM have signed a cooperative software agreement that authorizes IBM to market Interleaf publishing software for the IBM RISC System/6000. Interleaf will set prices, terms and conditions for its software.



Versacad gets versatile

Computervision CAD products aimed at PCs

BY SALLY CUSACK
CW STAFF

BEDFORD, Mass. — Computervision, a Prime Computer, Inc. company specializing in computer-aided design software, recently announced several additions to its Versacad software family that targets MS-DOS, Apple Computer, Inc. Macintosh and AT&T Unix System V platform users.

There are currently 80,000 Versacad users.

The company has released Version 6.0 of Versacad/386 and Versacad Design. The software, which runs on Intel Corp. 80386- and I486-based MS-DOS personal computers, now provides an attribute function for attaching nongraphical information to any graphic object, the company said.

Using this function, users can extract attribute information, such as price and material type, and pass it on to a database for generating bills of materials, estimates and other reports.

Other features in Version 6.0 include associative linear dimensions, two-dimensional construction planes for creating complex three-dimensional models, a *drawing import function* and direct file exchange capabilities between Versacad/386 or Versacad Design software and Versacad/Macintosh Edition software on the Apple Macintosh platform.

Version 6.0 of Versacad/386 is available immediately and is priced at $3,495. Versacad Design Version 6.0 lists at $2,995. According to the company, there are 45,000 licensed users on Versacad DOS platforms.

More versatile Mac

Computervision also announced an add-on package for its Versacad Macintosh products. Priced at $295, the Versacad Drawing Manager program reportedly allows users to manage large numbers of drawings by creating and maintaining project folders.

Versacad Design Version 5.4, Revision 7 for the Sparcstation is also available for shipment.

Priced at $3,495, the software runs on Sun Microsystems, Inc. and Hewlett-Packard Co. workstations, as well as HP Apollo Division workstations.

Mips operating system learning many tongues

By taking commands that are unique to the English language out of the core of its version of the Unix operating system, Mips Computer Systems, Inc. is attempting to make its software easier to use internationally. The international operating system, called RISC/OS 4.51, will run on all of Mips' computers, from low-end workstations to minicomputers.

The first language being offered is Japanese. "You type something in English, and it will reinterpret it into Kanji," a Mips [illegible] said.

By externalizing English idiosyncrasies such as punctuation and date displays, Mips can more easily develop the operating system to work with other languages, according to Chodi McReynolds, director of international field operations. "The operating system isn't English; it's just a set of code, so, for instance, you don't have to completely redo the operating system to use Greek."

NEW DEALS

Credit union to image with Metafile

The IBM Mid America Employees Federal Credit Union has chosen Metafile Information System's Metaview software as its document imaging system. The credit union will replace a microfiche system used for storing new loan documents. The application will be developed in-house using Metafile's Developer's Workbench. The new system will provide optical storage for the 700,000 loan documents generated annually.

Data General Corp. has selected Mind's Eye, Inc.'s computer-aided manufacturing software to help forecast, optimize and manage critical resource assignments for DG's factory operations. Mind's Eye will be used as a high-level tool for manufacturing process load and capability planning.

Arthur Andersen & Co.'s Audit Division, which has more than 4,000 workstations, has signed a worldwide site license for use of Ray[illegible] Inc.'s ASC Fieldsystem.

Next Computer, Inc. recently began volume shipments of its Motorola, Inc. 68040-based computer. Two new color computers, the Nextstation Color and the Nextdimension, are supposed to ship on schedule this quarter. The company also said that it has succeeded in luring Ernie Arneson away from Cupertino, Calif.-based Apple Computer, Inc. in order to set up a value-added reseller (VAR) channel. Arneson created the VAR program at Apple.

NEW PRODUCTS

Peripherals

Moniterm Corp. has announced its Viking Gold series of personal computer and Apple Computer, Inc. Macintosh monochrome grayscale and color monitors.

The series includes the Viking 3/91 M window screen model, a 20-in. PC display optimized for Microsoft Corp.'s Windows 3.0 and the Viking 3/72 M, a 20-in. monochrome monitor designed for Macintosh systems.

The Viking 3/91 M is priced at $1,490, and the Viking 3/72 M is priced at $1,295.

Moniterm
5470 Green Circle Drive
Minnetonka, Minn. 55343
(612) 935-4151

Wyse Technology, Inc. and Lapis Technologies, Inc. have announced Amdek Powerpage, a 14-in. monochrome video display subsystem designed for Apple Computer, Inc.'s Macintosh SE, SE/30 and the II series of computers.

The device couples a 14-in. monochrome monitor with a Lapis video board that enables users to adapt their monitors to personal computer and Macintosh platforms, the vendor said.

Amdek Powerpage is priced at $599.

Wyse Technology
3471 N. First St.
San Jose, Calif. 95134
(408) 473-1200

Relisys, Inc. has announced a 15-in. analog color monitor that uses a single video integrated circuit and yields a dot pitch of 0.28mm.

The Model RE1528 features 30- to 48-KHz multiscanning horizontal frequency tracking and 50- to 90-Hz vertical scanning. It is based on Motorola, Inc.'s MC1381 multimode monitor processor, which supports IBM's Video Graphics Array (VGA) standards.

The product is suitable for IBM Personal System/2 VGA graphic adapters and Apple Computer, Inc. Macintosh II systems and is priced at $1,095.

Relisys
320 S. Milpitas Blvd.
Milpitas, Calif. 95035
(408) 945-0000

Systems

Sun Moon Star's North American Personal Computing Division has announced the introduction of a Microsoft Corp. Windows-based Intel Corp. 80386SX, 16-MHz compact disc/read-only memory (CD-ROM) computer.

The product is bundled with CD-ROM- and MS-DOS-based software. It includes a proprietary CD-Setgo installation disk, which can automatically install the CD-ROM drive and bundled software, the vendor said.

A unit equipped with a multisynchronous monitor is priced at $3,295. A version with an IBM Video Graphics Array monitor costs $2,995.

Sun Moon Star
1941 Ringwood Ave.
San Jose, Calif. 95131
(408) 452-7811

Tatung Science and Technology, Inc. has introduced an entry-level expandable S-bus Sun Microsystems, Inc. Scalable Processor Architecture (Sparc)-compatible color desktop system that features a 19-in. color monitor and three S-bus slots for I/O expansion.

The Tatung Sparc Workstation includes a 20-MHz diskless CPU that yields 12.5 million instructions per second and 1.4 million floating point operations per second, the vendor said. Its 8M-byte main memory can be expanded to 64M bytes.

The product is priced at $6,995.

Tatung Science and Technology
2060 Ringwood Ave.
San Jose, Calif. 95131
(408) 435-0140

DTK Computer, Inc. has announced the DLP/1, an Intel Corp. 80386SX-based laptop that features a removable keyboard, a built-in touch mouse and an IBM Video Graphics Array page-white LCD.

The product includes 1M byte of random-access memory and an optional 2,400K bit/sec. modem card that fits into an internal RS-232 port.

It costs $4,000 for a 1M-byte RAM configuration that includes a 3½-in., 1.44M-byte floppy disk drive, an 80M-byte hard disk and an internal battery.

Volume shipments are scheduled for this spring.

DTK Computer
15711 E. Valley Blvd.
City of Industry, Calif. 91744
(818) 333-7533

Data storage

Ardat, Inc. has added a data compression feature to Qicstream, the software package it includes with its Hornet line of personal computer tape backup drives.

The data compression feature enables the drives to provide between 80M and 240M bytes of storage capacity. The drives include 40M- and 80M-byte versions that support standard and long-length tape.

Pricing for a 40M-byte internal drive begins at $399, and initial pricing for an 80M-byte internal version is $599.

Ardat
1650 Sunflower Ave.
Costa Mesa, Calif. 92626
(714) 641-1230

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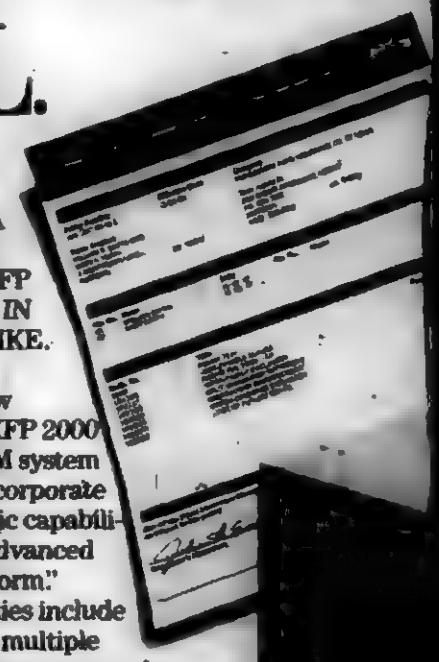
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- Invoices and statements which have the "branded" and "corporate-look" of the issuer can be output with raw alphanumeric data of sales transactions.
- Visualizations of insurance claim forms, bank statements, utility bills, and other industry-specific representations can be easily created.



Tandberg Data, Inc. has introduced a ¼-in. streaming tape drive that reportedly can store up to 1G byte of data in less than 88 minutes without requiring data compression.

Model TDC 4100 was designed for use in backing up hard disks, providing archival data storage and downloading application software programs. It transfers data at 200K bit/sec., moves tape at 53.3 in./sec. while recording, and it features a fast-search capability that allows single files to be accessed in 40 seconds, the vendor said.

The product is priced at $1,395.

Tandberg Data
2649 Towngate Road
Westlake Village, Calif. 91361
(805) 495-8384

Board-level devices

Definicon International Corp. has introduced Cad Race, an IBM Video Graphics Array adapter designed for users of Autodesk, Inc.'s Autocad and other computer-aided design systems.

The board is driven by a Taeng Laboratories, Inc. ET4000 graphics controller equipped with a built-in cache. Near-photographic color representations can be achieved by using Edsun Laboratories, Inc.'s Continuous Edge Graphics technology.

The board is priced at $495.

Definicon International
181-B W. Orangethorpe
Placentia, Calif. 92670
(714) 961-0438

Training

Fliptrack Learning Systems, a division of Mosaic Media, Inc., has announced a self-paced audiocassette course on Version 3 of Apple Computer, Inc.'s Quark Xpress.

How to Use Quark-Xpress, Versions 2.1, 2.12 and 3 guides users through a series of text manipulation, graphic cropping and sizing tasks. A quick reference guide and a data disk with realistic practice files are also included with the product.

The cost of the audiocassette course is $195.

Fliptrack Learning Systems
999 Main St.
Glen Ellyn, Ill. 60137
(708) 790-1117

Software applications packages

Computer Support Corp. has announced Version 3.1 of its Arts and Letters Graphics Editor, a graphics tool equipped with more than 5,000 clip art images and 50 typefaces.

Its features include a warp/perspective function, a special effects tool for modifying text, clip art or free-form graphics and a graduated fill function that allows users to create interiors in one step.

The product is priced at $695 and is being offered free to users who purchased a previous version after Nov. 12, 1990.

Computer Support
15926 Midway Road
Dallas, Texas 75244
(214) 661-8960

Design Science, Inc. has begun shipping an IBM Personal Computer version of Mathtype, its mathematical equation editor designed for Microsoft Corp.'s Windows environments.

The product enables users to build complex mathematical equations by first pointing and clicking and then pasting them into documents.

The new version features pull-down menus from which more than 270 symbols and mathematical components can be picked to build various equations, the vendor said.

Mathtype for Windows is priced at $249.

Design Science
4028 Broadway
Long Beach, Calif. 90803
(213) 433-0685

Letraset USA has announced Shapes, an add-on product for Colorstudio ($995), its color image creation and manipulation software package designed for Apple Computer, Inc. Macintosh systems.

The product is an Adobe Systems, Inc. Postscript-based raster image processor that enables users to render objects or fonts as anti-aliased, the vendor said. Anti-aliasing is a process used to smooth out jagged edges in digitally produced objects and fonts.

The add-on product costs $295 and is being included free of charge for a limited time with purchases of Colorstudio.

Letraset
40 Eisenhower Drive
Paramus, N.J. 07653
(201) 845-6100

Development tools

Borland International, Inc. has announced Version 6.0 of Turbo Pascal and Turbo Pascal Professional, its object-oriented programming language-based software packages designed for IBM Personal Computer XTs, ATs, Personal System/2s and compatibles.

Turbo Pascal 6.0 ($149.95) includes turbo vision, which enables users to write applications that include built-in support for overlapping windows, an integrated development environment and a built-in assembler.

Turbo Pascal Professional 6.0 ($299.95) includes the same features as Turbo Pascal 6.0, plus a Turbo Drive Compiler, a debugger, a profiler and an assembler.

Borland International
1800 Green Hills Road
Scotts Valley, Calif. 95066
(408) 439-1619

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MacMainFrame distributes terminal emulation, file transfer, printer emulation and mainframe graphics across a wide variety of networking schemes.

Since it's fully AppleTalk compatible, EtherTalk, TokenTalk and LocalTalk networks are part of the solution, too.

For customization, there's Avatar's Programmer's Toolkit, a full range of Applications Programming Interface (API) tools. For example, Avatar's Hypercard API has been used to develop a front end system to PROFS, IBM's electronic mail system.

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DCW9

FDDI vendors meet for test

BY JOANIE M. WEXLER
CW STAFF

In rural Durham, N.H., away from the scrutiny of eagle-eyed customers and the trade press, a 20-vendor Fiber Distributed Data Interface (FDDI) local-area network interoperability test will be running quietly this week.

The event, planned since June by the University of New Hampshire's Interoperability Lab, aims to iron out implementation differences among different vendors' products "to speed up fixing interoperability glitches so FDDI products can be made more cheaply," said Barry Reinhold, director of the lab.

FDDI is a 100M bit/sec. token-ring LAN with built-in redundancy via two counterrotating rings. Bandwidth-hungry data applications are emerging that demand FDDI's rapid-fire speeds and the high reliability of its glass fiber medium — particularly in backbone scenarios. Cost and interoperability issues for the gelling FDDI LAN, however, are still keeping many users at an arm's length.

"Interoperability is a tricky business in FDDI," explained Reinhold, who is also the Durham school's network manager and runs an FDDI backbone for the university. "Because FDDI is the most complex LAN, the probability that something will go wrong in a multivendor environment is naturally higher."

Complex problems

One aspect of FDDI that makes it complex is that it is the only LAN with network management capabilities inherent in its standard (see story below).

Reinhold explained that different interpretations of a standard's many components can result in varying implementations and that "one guy screwing up a little bit can affect the whole network." Smooth multivendor interoperability, he said, will drive FDDI devices toward becoming commodity products and get prices down.

Fostering products that can run data at 100M bit/sec. over copper media — led by the American National Standards Institute FDDI committee — will compete with the FDDI and cut costs, Reinhold said.

He described this week's test as the first opportunity for vendors to "sit down with a big ring and really work on the problems." Public demonstrations, such as the FDDI interoperability demonstration at the Interop '90 show in October, Reinhold said, do not afford vendors the opportunity to "get technical" with each other, because of demands to "look good" to the outside world.

A similar multivendor FDDI test will reportedly take place at the end of the month at Advanced Micro Devices, Inc.'s Advanced Networking Test Center in Sunnyvale, Calif.

Mandatory management?

Though a near-final version of the FDDI standard's Station Management (SMT) component was distributed for letter ballot by the American National Standards Institute FDDI committee in April, tweaks to SMT are still under discussion.

The major debate remaining among standards committee members — aside from proposals to run FDDI's 100M bit/sec. speeds over copper media and create lower cost fiber components with relaxed specifications — is how much network management should be mandated in SMT.

FDDI specifies only the physical and data link layers of the Open Systems Interconnect protocol stack, and thus SMT addresses network management at just those two layers.

The issue of Parameter Management Frames (PMF) was not resolved at the group's December meeting in San Jose, Calif., according to Floyd Ross, chairman of the SMT working group. He explained that PMF, which is currently an option in the standard, allows users to remotely set attributes and parameters in an FDDI station. Committee members are debating whether to leave PMF an optional SMT component or make it mandatory.

"Advocates of not using PMF anticipate using Simple Network Management Protocol or some other higher layer management tool in conjunction with SMT," explained Barry Reinhold, director of the University of New Hampshire Interoperability Lab and network manager for the university. "But in some applications running over just the first two layers, you don't always need intelligent management."

JOANIE M. WEXLER

Report finds image transmission rising

BY ELIZABETH HORWITT
CW STAFF

PARSIPPANY, N.J. — A rising tide of documents is threatening to swamp businesses, thereby generating a healthy computer-based image transmission equipment and services market, according to a recent report by The Eastern Research Corp.

The transfer of images, including freeze-frame video, will mesh with the growing demand for videoconferencing to bring on a new generation of broadband networking services, the research firm further predicted.

Paper flood

Eastern Research cited government statistics that U.S. businesses today add a total of more than 250 million new documents to their files and generate more than 3.2 billion copies and computer printouts each day. An IBM study cited by Eastern Research found that 75% to 80% of all paper output from computers is then input into another computer.

Users are thus demanding new ways to increase the speed and lower the cost of transferring information that resides on paper documents, the report said. Vendors are responding with network equipment and services that move images directly from one location and system to another, without the need for manual input, Eastern Research said.

Sales to private network users of imaging equipment such as scanners and facsimile boards will see a compound annual growth rate of 40.3%, from $10.4 million in 1990 to $94.3 million in 1999, the report predicted.

Imaging telecommunications service revenue will grow from $509.8 million in 1990 to $3.3 billion in 1999 — a compound annual growth rate of 22.9%, according to the firm.

Another related high-growth sector is freeze-frame video, which allows a personal computer equipped with a special camera to transmit frozen video im-

Continued on page 55

Applications driving imaging services

Horizontal breakdown of imaging telecommunications service market

Transaction processing	$219.20	$433.60	$807.90	$1,471.10	23.60%
Archiving & Storage	$168.20	$333.90	$624.20	$1,140.50	23.80%
Electronic publishing	$56.10	$114.60	[illegible]	$413.20	25.80%
Tech drawing central	$66.30	$114.60	[illegible]	$281.00	15.30%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Source: The Eastern Research Corp. CW Chart: Doreen St. John



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"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work… and still connect with all the networks I've already installed."



"We've got plenty of data… the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."



"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

Hidden camera reveals the se

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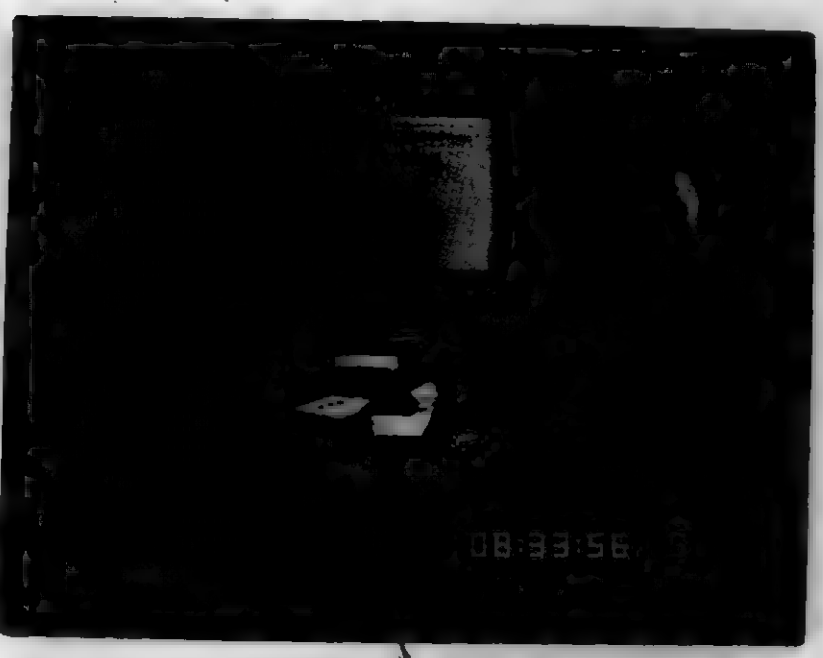
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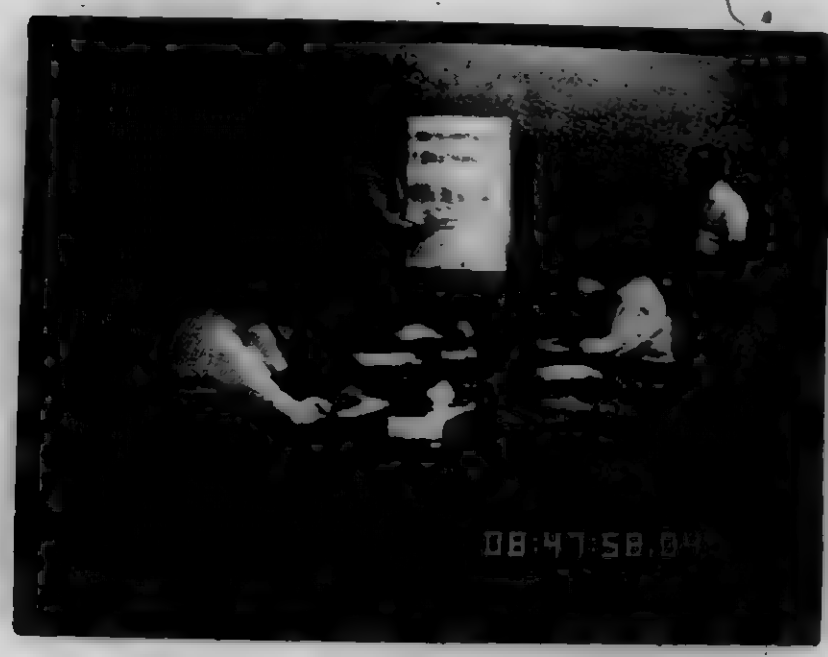
"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."



"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate the cost of constantly retraining."



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UK may open local networking to competition

BY ELISABETH HORWITT
CW STAFF

Pending deregulation of the UK's local networking services market could bring lower prices, a greater choice of providers and possibly administrative and billing confusion to companies that do business there. A multiplicity of vendors — including U.S. regional holding companies and their CATV partners — are preparing to offer their versions of local services in various UK districts, pending the outcome of the Duopoly Review, now before the British government.

Great Britain's administration has already granted various UK CATV companies permission to offer telecom services in one or more of the districts where they own CATV franchises. Several U.S. local carriers have established a toehold in the UK's local networking market by partnering with such franchisees. Indeed, US West Communications, Inc. began officially offering telecom services in the UK's Croydon district late last year, in partnership with a United Artists Communications, Inc. subsidiary.

The British government is considering whether to allow the CATV companies to provide telecom services not only within, but also among their own franchise areas, according to a spokeswoman for a UK regulatory agency, the Office of Telecommunications (Oftel). The review "is asking for more freedom with switching arrangements: at the moment, you have to go through either [Cable & Wireless PLC subsidiary] Mercury or British Telecom to go to another franchise area," as well as to make an overseas call, she added.

A favorable outcome for the Duopoly Review would, in effect, open up the local telecom market by "really encouraging people sitting on the fence that they can make a go of the telecom business," said Tom Morrow, vice president of US West's cable communications subsidiary.

While not all local providers would choose to do their own interregional switching, "having the option to do so would increase our leverage" in determining what prices the interexchange carriers will charge for such services, Morrow said.

A growing throng of viable alternative local providers would challenge British Telecom's long-standing dominance of the local loop and help the UK's other major provider, Mercury Communications, give its customers local connections more on a par with British Telecom's. Indeed, firms such as US West have already arranged for Mercury to provide interexchange service to their customers.

"We welcome competition, as long as it's fair," said British Telecom spokesman Derek Wilson. While conceding the fairness of more open competition on the local loop, he added, British Telecom feels that "it is unfair for our license to prohibit us from offering cable TV." The company plans to formally submit its views to the government prior to the end of the review period. "Many of the cable TV companies now in the UK are owned by powerful and rich North American companies that don't need this type of protection," Wilson said.

Mixed feelings

The regional holding companies' venture into the British local market is a mixed blessing to Fortune 500 users, according to Kenneth Phillips, chairman of the Committee of Corporate Telecommunications Users and vice president of telecom policy at Citicorp. "In theory, competition in the international arena bodes well [for major users] because it should drive prices closer to cost," Phillips said.

On the other hand, large users in the U.S. want assurances that, as the Bell operating companies' domestic customers, they do not become "the ultimate guarantors of success in those overseas ventures," he added.

Business users in the UK may suffer if too many providers offer too many conflicting options in various parts of that region, according to Jeremy Frank, director of international communications at Gartner Group, Inc. "Most users are not sophisticated enough to choose between providers for the local loop, the interexchange carrier and the exiting local loop."

Another source of confusion will be how to keep track of billing and costs across so many different carriers. Each carrier may tender a different bill for each site — as sometimes happens in UK-to-U.S. communications now, Morrow said. US West now acts as a one-source supplier and biller in the UK for its own local services and interexchange services from Mercury, he added, but "if you have multiple sites on different franchisees, cost analysis could be tough."

While U.S. West is starting small, offering plain old telephone services to only a few of United Artists' UK franchises, the company wants to extend services across the UK and eventually offer a full range of data and voice services as well as leased-line links, Morrow said. "Our total investment in the UK by the time we get all services up will be $300 million — and not just in United Artists," he added.

One way that the CATV telecom providers may attract business initially is by "enabling customers to buy all their services from one package: cable TV, shopping services, plus telephony," the Oftel spokeswoman said.

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COMMENTARY

Jeffrey N. Fritz

Knowing no boundaries



Transparency of access is an ideal that is slowly approaching reality. Simply put, transparency of access allows a user to invoke local-area network-based data services in exactly the same manner, every time, independent of whether the user is across the room or across the country from the system on which said services reside.

Obviously, we are a long way from having this kind of accessibility today. For example, a user on the office Ethernet LAN can invoke a variety of Transmission Control Protocol/Internet Protocol (TCP/IP)-based services, such as Telnet for terminal-to-host access and File Transfer Protocol (FTP) for file transfer.

From home at night or from on the road, however, the user's access is very different. The user has only host-supported Telnet capability and therefore cannot use FTP at all.

EMERGING telecommunications protocols, such as Integrated Services Digital Network (ISDN) and frame relay, are beginning to provide the kind of transmission speeds LAN users require.

There are two reasons why remote access to LAN services is so much less satisfactory than local access, even when you equip your home personal computer or portable with TCP/IP software.

The first is the fact that LAN protocols such as TCP/IP simply were not designed to run over ordinary telephone modem-type connections. Special software is needed to permit LAN protocols to run, in their full functionality, over a switched connection.

The second reason is that your typical PC modem connection — 9.6K bit/sec. or less — is extremely slow to LAN habitue. A copy of Wordperfect resident on the server takes much too long to load, and a large file transfer is simply out of the question. As for graphics-intensive applications, many are rendered completely useless.

Fortunately, both problems are close to being resolved. Emerging telecommunications protocols, such as Integrated Services Digital Network (ISDN) and frame relay, are beginning to provide the kind of transmission speeds LAN users require, over switched links that — when such services become more widespread — will enable users to access full-scale LAN services from virtually anywhere.

Meanwhile, software has emerged that is capable of extending LAN connections over such switched, high-speed synchronous links so the user literally cannot tell the difference in service quality between the office LAN and remote access. One such program is Synchronous Link Interconnect Protocol, which was originally developed by the National Center for Supercomputer Applications. Another example is Sun Microsystem's PC-NFS.

Even more promising is the fact that certain vendors are now testing new software that will provide even more efficient and powerful ways to extend TCP/IP protocols over remote LAN connections.

West Virginia University has been testing ISDN in combination with some of the programs described above as a method to extend LAN services to remote offices as well as faculty and staff homes. Such configurations enable the user to access a LAN, not as a dumb terminal with restricted speeds, but as a regular TCP/IP terminal with full LAN services.

Furthermore, there is no reason to restrict this type of end-to-end connectivity to TCP/IP alone. With terminal server hardware and the proper software drivers, other protocols, such as Local-Area Transport and Xerox Network Systems and even the newer ones that follow the Open Systems Interconnect model, can be adapted to LAN extension as well.

The university's early test results are very encouraging. In fact, one test application running over a single ISDN line is producing TCP/IP connectivity at speeds exceeding 64K bit/sec. There is no perceptible difference between connectivity on the local LAN or the remote LAN in this test application.

One final thought: The ISDN user community, many ISDN vendors and the regional Bell operating companies in particular are regularly moaning about the lack of good ISDN applications. It is easy to see how ISDN's on-the-fly dial-up data capabilities uniquely address the need for transparency of access.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

EIS

If You're Thinking About It...

Unisys plans open CTOS

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Making good a year-old promise to open its networked workstations to other operating systems and networking schemes, Unisys Corp. last month beefed up several aspects of its CTOS workstation line, adding support for Unix servers and Microsoft Corp.'s Windows 3.0 and introducing a sophisticated network management system.

Key among the enhancements is support for Network File System (NFS), a de facto industry standard for file transfers among networked computers. With NFS services such as remote procedure call and external data representation, CTOS workstations will be able to interoperate with either CTOS or Unix servers on a network. Non-Unisys systems will also be able access CTOS files.

NFS support also brings the CTOS line into sync with the Unisys Architecture, the open systems initiative Unisys outlined earlier this year.

"Essentially, what they're doing is incorporating industry-standard application programming interfaces," said John Dunkle, vice president at Workgroup Technologies, Inc. in Hampton, N.H. Giving CTOS users access to other operating systems will help avert a hemorrhaging to other operating systems, he added.

Unisys, which acquired CTOS developer Convergent Technologies, Inc. in 1988, claims there are 800,000 workstations from all vendors using the multitasking, network-enabled CTOS operating system worldwide, making it the third most popular operating system behind the DOS and the Apple Computer, Inc. Macintosh operating systems.

Hoping to keep those customers on board, Unisys also announced a Windows 3.0 software emulator. The emulator provides for multiple virtual DOS sessions on an Intel Corp. 80386-class CTOS workstation. The PC Emulator Release 4.1 is priced at $435 per server plus $529 per workstation.

Unisys also announced Incontrol, a management and software distribution tool for CTOS networks. Incontrol features automatic routing of alerts to local or remote management centers, from which a systems administrator can access a SQL-based Oracle Systems Corp. event database.

Unisys said a version of Incontrol that is compatible with IBM's Netview network management system will be ready in the second quarter of 1991 and that the new version will "converge" with international standards such as the International Standards Organization's Open Systems Interconnect Common Management Information Protocol.



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Railways seek to expand EDI

BY JIM NASH
CW STAFF

When a railroad company transfers a cargo container to a ship, the move is often only the halfway mark for U.S. goods. Domestic railroads see an opportunity in that situation to provide wider services for customers. Some railroad executives said they expect their industry will someday transport bills of lading, invoices, sales contracts and even payments for goods shipped anywhere on Earth.

In a sense, they will become as much carriers of information as carriers of freight, said Kathleen Davila, a spokeswoman for CSX Transportation, Inc., a rail company in Jacksonville, Fla.

Last month, a subsidiary of the Association of American Railroads took a step in that direction when it joined with Infonet Services Corp. to build a global electronic data interchange (EDI) network.

Railinc Corp. in Washington, D.C., became one of Infonet's first North American partners to establish an EDI mailbox, said Laura Andrus, program director at El Segundo, Calif.-based Infonet.

Most major U.S. railroad companies already offer EDI services such as freight tracking for their domestic clients.

Rail companies watching U.S. firms beef up their exports are finding that the traditional paper-based communications still in place for overseas shipment are inadequate, said Henry Meetze, Railinc president.

Data must be transferred along with the cargo, a process that invites errors in paper-based systems.

Ron Byrd, assistant vice president of management services at Southern Pacific Transportation Co. in San Francisco, said, "I think [Railinc] is going to evolve. Within the next five years, [rail companies] could bypass the [ocean-going] shipper and transmit administrative messages and invoices directly to receiving firms."

Today, Southern Pacific relies heavily on ocean lines to transmit much of the paper and electronic data between sender and receiver, he said.

Railinc, Andrus said, is better than most EDI setups in use today, which she described as "dial, dump and pray," in that it confirms accurate transmission.

Meetze said Railinc is piggybacking its existing EDI software on Infonet's backbone into Europe, Australia and Asia.

LAN card eases some PS/2 server processing load

BY JOANIE M. WEXLER
CW STAFF

WHITE PLAINS, N.Y. — IBM last month started shipping a $1,030 IBM Token-Ring local-area network adapter that reportedly beefs up the processing performance of a Personal System/2 server by an order of six.

According to IBM, data transfers between the system memory of Micro Channel Architecture-based PS/2s and the 16/4 Busmaster Server Adapter/A card completely bypass the server's main processor. This allows the server to use the excess CPU power for other functions, such as accessing other network adapter cards and processing applications.

In previous Token-Ring configurations, the same $957 adapter ran on both client workstations and servers.

"We anticipate that customers will continually expect more work out of their LANs," commented Jane Celly-Sharp, IBM's manager of LAN marketing in Atlanta. "With the price so close to that of the client card, anyone in acquisition mode for a server is a target customer."

Busmaster Server Adapter/A is currently supported by Novell, Inc. and Banyan Systems, Inc. network operating systems. An OS/2 LAN Server version is in the works, IBM said.

BIT BLAST

Cabletron gear OK'd

The software drivers for Cabletron Systems, Inc.'s E1000, E2000 and E3000 Desktop Network Interface cards have been certified by Digital Equipment Corp. and Banyan Systems, Inc. as interoperable with DEC's Lanworks for DOS and Banyan's Virtual Networking Software, or Vines, Version 4.0 network operating system.

Uniplex Integration Systems, Inc. has reportedly signed a one-year marketing agreement with GTE Supply in Dallas, a distributor and value-added reseller (VAR). GTE and Uniplex plan to conduct a series of VAR recruitment seminars throughout the U.S., and GTE will market Uniplex Business Software, an integrated office system.

The Unix Products Division of Rabbit Software Corp. has announced a distribution agreement with Dickens Data Systems. Dickens will distribute Rabbit's Unix-to-IBM connectivity products for the IBM RISC System/6000, AIX for the Personal System/2 and The Santa Cruz Operation's Xenix and Unix operating environments.

Imaging

CONTINUED FROM PAGE 49

ages to a remote PC for display purposes. One common use is to enable engineers at a central site to diagnose and troubleshoot problems at remote assembly lines and plants.

For example, McDonnell Douglas Computer Systems Co. has been experimenting for the last few months with technology that, "in some cases, goes right onto the factory floor with a freeze-frame camera, transmitting those images back to sites for evaluation, diagnostics" and other purposes, according to Wayne Hannah, director of telecommunications at the aerospace firm.

Other companies that have implemented similar freeze-frame transmission applications include the three largest U.S. auto makers, chemical distributors such as Du Pont Co. and electrical power equipment manufacturers such as General Electric Co. and Westinghouse Electric Corp., Eastern Research reported.

A third related technology for sharing ideas over distance is videoconferencing. Indeed, McDonnell Douglas uses high-quality, full-motion videoconferencing systems, which it now has at 11 special sites, to transfer high-resolution graphics drawings for perusal at remote sites, Hannah said.

Some companies hope to see switched high-speed services such as broadband Integrated Services Digital Network (ISDN) drive down the cost of setting up full videoconferencing and image transfer, Hannah said. The advantage of such services is that instead of paying monthly charges for dedicated T1 links that only get used occasionally for videoconferencing, users can set up high-resolution videoconferencing links on the fly and only pay for the time they use them.

Eastern Research predicted that the ISDN services for imaging applications would see a 50.1% compound annual growth rate through 1999. While broadband ISDN will not emerge as a viable option until the mid-1990s, the market will then explode, with broadband ISDN adapter revenue rocketing from $5.5 million in 1995 to $76.5 million in 1999, the report said.

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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."

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NEW PRODUCTS

Local-area networking software

Hughes LAN Systems, a subsidiary of Hughes Aircraft Co., has announced an integrated connectivity software product that provides access to Banyan Systems, Inc.'s Virtual Networking Software, Microsoft Corp.'s LAN Manager and AT&T's Star Group network operating systems.

Prolinc Version 1.0 allows users of DOS and Microsoft's Windows 3.0 personal computer-based workstations to concurrently access multiple hosts, file servers and network operating systems, the vendor said.

The product is priced at $595 per workstation.

Hughes LAN Systems
1225 Charleston Road
Mountain View, Calif. 94043
(415) 966-7300

Lanshark Systems has announced a network utility designed for Banyan Systems, Inc.'s Virtual Networking Software (Vines) networks.

Diskalarm is a Vines server-based product designed to monitor free disk space on each of the server's drives. If free space on a drive dips below a user-specified level, the product alerts a specified list of network administrators.

License fees are priced at $295 per server.

Lanshark Systems
3000 Stone Mountain Drive
Pickerington, Ohio 43147
(614) 866-5553

Network services

BT Tymnet, Inc. has announced an IBM midrange connectivity package that provides users with access to multiple IBM environments such as the Application System/400.

The package includes Multipoint SDLC, a bundled, port-based synchronous data link control (SDLC) service that reportedly operates at 9.6K bit/sec. on the terminal connection side. The service allows SDLC devices to be linked with SDLC hosts via the Tymnet Global Network, the vendor said.

Flat-rate bundled pricing for monthly rates and installation charges for host and terminal interfaces range from $400 to $4,200, depending on the type of service selected.

BT Tymnet
2560 N. First St.
San Jose, Calif. 95161
(408) 922-0250

Infonet has announced a portable personal communications tool that enables users from more than 115 countries to access Infonet Services Corp.'s Notebook Network, a global communications and information service for users of laptop and notebook computers.

The Personal Communicator includes Poquet Computer Corp.'s pocket-size personal computer, The Poquet PC, Infonet's Notice Notebook software package and a Touchbase Systems, Inc. Worldport 2,400 bit/sec. portable modem.

The product is priced at $1,995, including a corporate network contract.

Infonet
2100 E. Grand Ave.
El Segundo, Calif. 90245
(213) 335-2875

Customer premises equipment

Teleprocessing Products, Inc.'s Model 1/SM Speed Matching channel service unit/data service unit was designed for matching the speed of synchronous customer terminal equipment with a 56K-bit/sec. digital service line.

The product supports terminal speeds of 2.4K, 4.8K, 9.6K, 19.2K and 56K bit/sec., according to the vendor. V.35 and RS-232C terminal interfaces and a proprietary unattended remote loop-back feature are included.

Model 1/SM comes with a one-year parts and labor warranty and is priced at $675.

Teleprocessing Products
4565 E. Industrial St.
Simi Valley, Calif. 93063
(805) 522-8147

Host-to-host

Network Systems Corp. has announced four cross-point network switches designed to comply with the ANSI High-Performance Parallel Interface (HIPPI) standard.

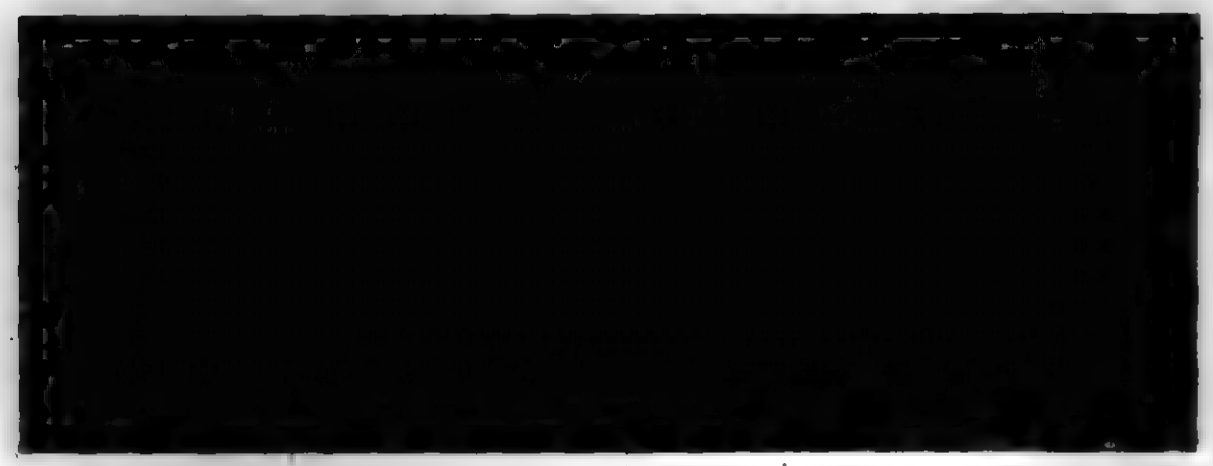
The PS8-8 includes four full-duplex channels and reserves a destination port for the next access.

The PS32 line includes three models: PS32-108, PS32-116 and PS32-132. The PS32-132 is equipped with up to 32 HIPPI source ports and 32 HIPPI destination ports, which can be paired to support up to 32 simultaneous data streams with an aggregate capacity of 25.6G bit/sec., the vendor said.

The PS8-8 has a list price of $56,000. The PS32 models are priced from $50,000 to $200,000, depending on configuration.

Network Systems
7600 Boone Ave. North
Minneapolis, Minn. 55428
(612) 424-4888

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CW

EXECUTIVE TRACK



John B. Young has been named to the new position of vice president of corporate technology and information systems at Boston educational publisher **Houghton Mifflin Co.**

Young was most recently vice president of Houghton Mifflin's software division, a job he has held since 1989. In his new position, he is responsible for developing and implementing the company's IS and publishing technology strategies.

Young joined Houghton Mifflin in 1973 as a manager of systems and programming. He became director of software products in 1983 and was promoted to corporate services vice president and director of Houghton Mifflin Software Laboratories in 1984. He became corporate services vice president and director of corporate editorial systems development in 1986. He was named director of technology in 1988.

Replacing Young as head of the software division is **Steven R. Vana-Paxhia**, who was given the title of director. He comes to Houghton Mifflin from Macmillan, Inc.



Jeffrey C. Rehm has been named manager of the MIS department at **Rea Wire Industries, Inc.**, a manufacturing firm in Fort Wayne, Ind.

Rehm joined Rea from Whirlpool Corp. He holds an MBA from Bradley University in Peoria, Ill.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and Computerworld wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, Computerworld, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Not the usual vanilla IS chief

Ben & Jerry's Williams offers staff independence and all the ice cream they want

BY CHRISTOPHER LINDQUIST
CW STAFF

Ben & Jerry's Homemade, Inc. is not your typical company. It would only seem fitting that the company's information systems chief was not typical either — and he isn't.

Keith Williams, the company's 36-year-old director of data processing, fits in well with the relaxed atmosphere of Ben & Jerry's, the $70 million gourmet ice cream maker based in scenic Waterbury, Vt. A flannel shirt, jeans and work boots take the place of a suit and tie. Williams' curly hair and beard bring to mind images of the Grateful Dead's Jerry Garcia, the namesake of "Cherry Garcia," one of the company's most popular flavors. A poster on his office wall asks, "If it's not fun, why do it?"

Williams' route into information systems was not the norm, either. "I'm uneducated. I scraped through high school — just barely," Williams says with the honesty that permeates his conversation. "My ultimate motivation was to be a bum in the park, and that doesn't go far."

So he joined the U.S. Air Force in 1972, and it was there that his computer career began. He worked on IBM mainframe hardware and software during an eight-year Air Force stint.

After leaving the service, Williams worked for nine months at Becton, Dickinson & Co., a medical equipment manufacturer in Westwood, Mass., and then went to Ocean Spray Cranberries, Inc. in Plymouth, Mass. After one year as a systems programmer at Ocean Spray, Williams decided to go back to his home state of Vermont.

PROFILE: Keith Williams



Stella Johnson

Position: *Director of data processing, Ben & Jerry's Homemade, Inc.*
Mission: *To make all of the company's critical data easily accessible to the users who need it, no matter what their platforms and levels of IS knowledge.*

"I had had my fill of company politics," he says. "There was a lot of back stabbing, scrambling and scratching for positions. I couldn't handle that stuff."

He took a position as data processing manager at the Cooperative Health Information Center of Vermont in Burlington. When that company went out of business, Williams started his own consulting, contract programming and value-added reselling firm targeting the market for medical, law and dental practices.

"That went on for about six years, working long hours, long weeks — 30 hours a day, eight days a week. My blood pressure was at the point where one of the doctors I worked for

Continued on page 60

Balancing need for information and privacy

BY MITCH BETTS
CW STAFF

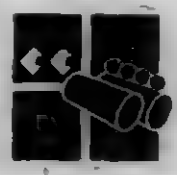
Americans worried about government surveillance have a new "Big Brother" to worry about: their employers.

There is a growing conflict between companies' need for more detailed information about workers and employees' privacy rights, according to a study by the New York-based Conference Board.

The study, "Employee Privacy," found that U.S. corporations have a growing appetite for information about the health and criminal records of their employees and job applicants.

Sixty-five percent of the 301 U.S. companies surveyed said their needs for health information — such as physical or psychiatric conditions and evidence of alcohol or drug abuse — have increased in the last five years.

Likewise, U.S. firms are eager to get more information about criminal histories, a trend not seen in Canada or Europe. The regional differences are most likely because of U.S. companies' greater concern about employee theft, sabotage, security of proprietary information and real or potential conflicts of interest, according to Ron Berenbeim, author of the study.



He said there is some ambivalence among U.S. corporations regarding the use of various surveillance techniques, such as searching lockers and handbags, videotaping employees and monitoring telephone and computer use. Despite fairly widespread use of these methods, many personnel executives called them ineffective and damaging to morale, Berenbeim said.

The Conference Board did not specifically address monitoring of electronic mail, but the Electronic Mail Association is urging companies to spell out how much privacy an employee can expect regarding E-mail. For example, will there be routine monitoring of E-mail messages? Are personal messages allowed on the company's E-mail system?

"Most employers should establish privacy policies that deal with all media of communication used by employees, rather than singling out electronic mail as if it posed some unique threat to employee privacy," said a white paper commissioned by the Arlington, Va.-based association.

Vanilla

CONTINUED FROM PAGE 59

looked at me and checked it and gave me 10 minutes to live."

His chance to work at Ben & Jerry's came in early 1988 in the form of a help-wanted ad. "Someone dropped off the ad at my office," Williams says, and he decided that "if there is any place I can work . . . Ben & Jerry's is it."

Williams was given the job of data processing manager and found himself faced with a rapidly growing company based almost entirely on manual systems. A handful of personal computers and a Digital Equipment Corp. PDP-11 running a single-user accounting and payroll system was the extent of computerization. A DEC Microvax had been brought in, but the manufacturing resource planning package the company had purchased had not been installed on it.

"At that point, the MIS department was 5-foot-8 and 200 pounds, and I was all of it," Williams says. Nine months later, with computerization beginning to take hold, it became obvious that the department needed to be expanded. Williams wanted to stay focused on installing the technology, so he considered hiring an outside manager to run the department. After some indecision, Williams decided to manage the department himself.

Williams currently manages seven full-time employees and one contract programmer in Ben & Jerry's DEC VAX 6210-based IS department. The company is world famous for its innovative corporate policies, and one of them poses a unique challenge for Williams.

> "I SPEND A LOT of time basically being a buffer between upper management and the people who work for me so they can continue to enjoy what they do."
>
> KEITH WILLIAMS
> BEN & JERRY'S

Ben & Jerry's maintains a five-to-one salary cap for all employees — the highest salary cannot be more than five times the lowest. Finding people to fill available positions is never easy, but the salary cap could exacerbate the problem by making it difficult to pay technical people their full market value.

"I get nervous about losing good people because they can get paid more elsewhere," he says. In response to this, Williams strives to make the department an enjoyable place to work.

"I spend a lot of time basically being a buffer between upper management and the people who work for me so they can continue to enjoy what they do," Williams says. The strategy appears to be working.

Tom Phillips, the company's VAX sys-

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tems specialist, says the somewhat lower pay scale is not really an issue because "the benefits of working in Vermont and working at Ben & Jerry's far outweigh any benefits that I might get by working somewhere else," he says. "Plus, we can always run up to the freezer and get a pint [of ice cream]. Very often you can tell the level of stress by the number of pints open in the office."

Ben & Jerry's currently runs VAX-based Oracle Systems Corp. financial software and an in-house inventory control package developed with the Oracle database management system (see story on page 60). Approximately 60 terminals, 50 Apple Computer, Inc. Macintoshes and 50 IBM Personal Computer-compatible systems are in use, with more coming.

Keeping tabs on the activities of users is one way Williams helps to ease implementation of new systems. "I try to gather information about what's going on in the company so I can feed it to my department before it becomes a problem with what they're doing," Williams says.

Fran Rafke, the firm's chief financial officer, says that Williams does so in a way that doesn't put users on the defensive. "He knows he has to ask people a lot of questions because sometimes they don't realize it has a systems connotation," Rafke says. "He's aware of people's shortcomings in that area, and I don't think he ridicules people."

Keeping things pleasant is only part of Williams' style. It is important to him to give employees the freedom to do their jobs and push them to do a little more than they think they can, and the people he supervises seem to appreciate it.

"Working with Keith I have a lot of autonomy; in fact, the project that I'm working on is pretty much my baby," says Chris McClary, manager of systems development. "I came in, and he set the general direction for me and let me go."

Williams' future challenges include the development of a sales-order entry system and connecting a third plant and a distribution center, whose locations have yet to be determined, via leased lines — all moving toward Williams' goal for IS at the 13-year-old company. "I want everyone in this company to be able to sit down and get what they need to get done on their system," he says.

Lincoln S&L is outsourced

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Resolution Trust Corp. (RTC), the federal agency charged with resolving the savings & loan asset crisis, has outsourced the computer operations at Irvine, Calif.-based Lincoln Savings & Loan Association to Citicorp Information Resources, Inc.

Lincoln is the S&L for which five U.S. senators are alleged to have acted improperly on behalf of its previous owner, Charles Keating.

Citicorp will manage the thrift's two data centers, an IBM mainframe-based center in Irvine and a Unisys Corp. mainframe-based center in Santa Ana, Calif. The deal is worth $4 million over two years.

Approximately 20 people will be employed in computer operations, hardware maintenance and software development at the two sites, said Michael Harden, a regional sales manager at Stamford, Conn.-based Citicorp Information Resources. Some are Lincoln employees hired by Citicorp; others were provided by the computer services firm, he said.

All the right moves

Harden said Citicorp moved into Lincoln before a contract was signed. "It's important to move quickly because when [RTC takes over], key data processing people may start leaving right away, and data processing is the heart of the S&L's operation," he said.

Lincoln is the second S&L outsourcing deal won by Citicorp. Two months ago, Citicorp took over the data processing at Gibraltar Savings in Simi Valley, Calif. Gibraltar's deposits had been sold earlier by RTC to Security Pacific Corp., but that still left RTC with $4.5 billion in assets, including the data processing facilities that are needed to service the bank's loans.

Picking up the pieces

Failed S&Ls create a market with considerable, if short-lived, potential. Over the next six years, RTC must dispose of an estimated 600 failed thrifts with assets of $300 billion, more than the combined assets of General Motors Corp., IBM and AT&T.

Harden said Citicorp's chief competitors for the S&L work include Electronic Data Systems Corp., Fiserv, Inc. and Systematics, Inc.

"This [outsourcing] is in the formulation stage, but it's becoming more common," an RTC spokesman said. He added that outsourcing is more likely to be done for large thrifts but will be done for small ones when it is felt to be the most cost-effective way to operate the S&L while RTC seeks to unload it, he said.

John Sayre, a conservatorship specialist at RTC said, "Computer services companies are beginning to realize there's a market there. And as they market their services, our managing agents are increasingly likely to consider the outsourcing option. As they sell, we buy."

Lincoln is for sale, and a new owner could retain Citicorp or revert to in-house management, Harden said.

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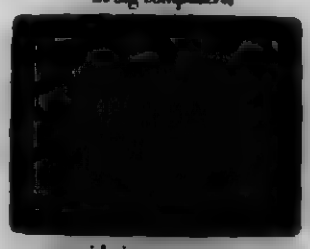
The IBM Data Interpretation System (DIS) is graphical, mouse-driven software that actually lets you access, manipulate, analyze, share and store information—right from your own desk.

And, speaking of information, a recent customer survey shows that on a typical workday customers spend a full 50% of their time gathering information—and only 10% using it to their competitive advantage.

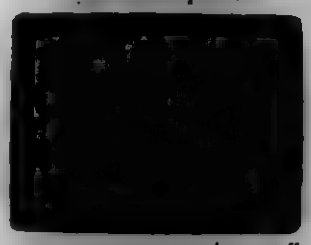
The good news? When customers used the right system, the exact opposite was true:

Time spent gathering data plummeted to 15% while time spent outsmarting sharks jumped to 55%.

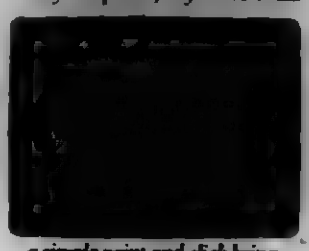
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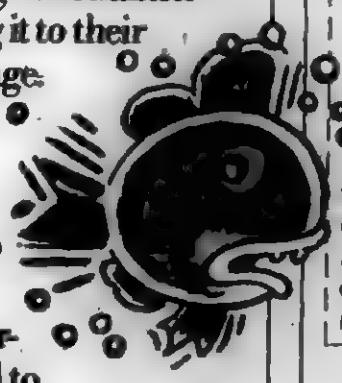
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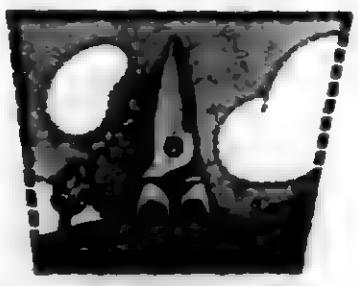
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1991 Editorial Calendar
(January-June)

Executive Reports			
Maximizing the I/S Investment: Laying the Groundwork for New Architectures	Jan. 7	Dec. 20	Dec. 28
Taming the Unmanageable Network	Jan. 21	Jan. 4	Jan. 11
How I/S and Individual Business Units are Negotiating Project Priorities	Feb. 18	Feb. 1	Feb. 8
How Large Companies are Creating Data Standardization	Mar. 4	Feb. 15	Feb. 22
Maximizing the I/S Investment: Evaluating Advanced Technologies	Mar. 18	Mar. 1	Mar. 8
The I/S Role in Workforce Education	Apr. 15	Mar. 29	Apr. 5
View from the Top: How CEOs and CFOs Evaluate I/S	Apr. 29	Apr. 12	Apr. 19
Maximizing the I/S Investment: Data Center Efficiency	May 13	Apr. 26	May 3
Striking the Right Balance Between Centralization and Decentralization	June 17	May 31	June 7
Product Spotlights/Buyers' Scorecards			
High-end Modems	Jan. 14	Dec. 28	Jan. 4
Network Connectors - Gateways, Bridges and Routers *(Featuring Buyers' Scorecard)*	Jan. 28	Jan. 11	Jan. 18
Systems for Flexible Manufacturing	Feb. 11	Jan. 25	Feb. 1
Relational Databases *(Featuring Buyers' Scorecard)*	Feb. 25	Feb. 8	Feb. 15
Project Management Software	Mar. 11	Feb. 22	Mar. 1
Software Maintenance Tools *(Featuring Buyers' Scorecard)*	Mar. 25	Mar. 8	Mar. 15
Sales Force Automation	Apr. 8	Mar. 22	Mar. 29
CASE Tools *(Featuring Buyers' Scorecard)*	Apr. 22	Apr. 5	Apr. 12
LAN Servers	May 6	Apr. 19	Apr. 26
Network Management *(Featuring Buyers' Scorecard)*	May 27	May 10	May 17
Minicomputers	June 10	May 24	May 31
Portables and Laptops *(Featuring Buyers' Scorecard)*	June 24	June 7	June 14
Integration Strategies			
Using Commercial Systems Integrators	Feb. 4	Jan. 18	Jan. 25
How Companies are Effectively Incorporating LANs into the Integration Strategy	Apr. 1	Mar. 15	Mar. 22
Strategic Integration of Databases	June 3	May 17	May 24
Industry Closeups			
Industry Closeup: Information Systems in Medical Care	Feb. 4	Jan. 18	Jan. 25
Industry Closeup: Information Systems in Transportation	Apr. 1	Mar. 15	Mar. 22
Industry Closeup: Information Systems in Energy Production	June 3	May 17	May 24
Special Reports			
Special Report: Advances on the PC Front	May 20	May 3	May 10

COMPUTERWORLD

CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"The new IS manager for the 1990s"

By Stewart Stokes Jr.

The Journal of Information Systems Management
Winter 1991

■ IS managers will face great challenges in the 1990s from several different areas. Within the corporation, there will be new pressure from downsizing, decentralization of IS functions and the ever-stronger emphasis on the bottom line. Externally, pressure will come from increased international competition, corporate takeovers and changing markets.

IS chiefs need new skills and attitudes for successful IS management in this decade. The requirements can be grouped into four categories: managing self; directing workers inside the IS unit; managing the relationship of IS to other units within the company; and understanding the goals and strategies of the business.

Managing self involves setting personal priorities and letting go of familiar roles to assume new responsibilities.

Managing inside and outside of the IS unit requires strong human relations skills; the IS manager must be able to motivate and develop the abilities of the IS staff as well as communicate clearly with managers of business units.

Understanding the "power points" within the company and networking with key personnel are necessary if IS is going to support the business effectively. IS managers must understand that business thrust so they can leverage technology for competitive advantage.

In addition to cultivating management skills, IS execs will need to maintain their technical knowledge. Effectively performing the day-to-day duties of the department while learning new skills will make the IS manager's job more difficult and time-consuming than ever before. Not every IS professional will be willing to make the necessary sacrifice to manage in the 1990s. — Derek Slater

"IS quality — What is it?"

By Pat Ragazzino

Journal of Systems Management
November 1990

■ Professionals of all kinds have turned their attention to quality, and information systems is no exception. IS quality, or lack thereof, has a direct effect on customers' perceptions of a company. In many cases, customers interact with the operational side of IS through such system-dependent functions as on-line tellers, patient scheduling, income tax refunding and the like.

IS must actively involve itself in organizing, managing and implementing a quality assurance function. IS-related quality means having systems in place that meet IS objectives and standards and that support the company's goals. The most effective quality technique, IS managers agree, is a structured training and education program for the IS staff.

The IS quality assurance function is still in its developmental stage. But a few things are certain:

- The quality assurance function can improve the quality of information systems.
- IS needs to market quality assurance to senior management and explain its objectives and benefits.
- Quality assurance professionals must market, define and create career guidelines for the quality assurance function within IS. — Lory Zottola

"Ways women lead"

By Judy Rosener

Harvard Business Review
November-December 1990

■ The first wave of women executives had to employ the same command-and-control leadership style that spelled success for men. But the second wave is succeeding by drawing on a set of nurturing or "interactive" skills that are generally considered to be feminine.

Women executives are more likely than men to have a leadership style that transforms subordinates' self-interest into a concern for the whole organization. They do this by encouraging participation, sharing power and information and getting others excited about their work.

Believing that people perform best when they feel good about themselves and their work, women executives work hard to contribute to those feelings.

Actually, some men use the same style of interactive leadership, and some women prefer the traditional style. Organizations should expand their definition of effective leadership to include a variety of personal styles, which would create a wider path for all sorts of managers — men and women — to attain positions of executive leadership. — Mitch Betts

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Pricing and maintenance	7.5	5.7	6.7

*Based on results of *Computerworld* Survey published July 16, 1990

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The best laid plans blend old and new

BY ALAN RADDING

Switching horses in midstream is a breeze compared with changing information or communications architectures without disturbing the normal flow of business.

As architectural changes go, Union Camp Corp. in Wayne, N.J., is not attempting a particularly tricky switch. The company is simply moving from a proprietary Hewlett-Packard Co. environment to open, Unix-based systems from the same vendor. Even so, John Ineson, director of information technology, is holding fast to one stabilizer: the companywide network.

"I don't care what we get or how it works, as long as it ties into the network. We have to maintain file sharing and interoperability," he declares, adding: "These are mission-critical areas. We can't lose functionality."

Between two worlds

Losing mission-critical functionality is the nightmare of every systems manager who contemplates a change of architecture. Downtime is not the only concern. There's also the fear that the organization may find itself mired between architectures, unable to move completely into the new world yet incapable of returning to where it was.

Successful architectural change requires more than just good timing. It also entails balancing current and future business requirements, the unknowns of technological change and budget realities. And, as most who have been through the process emphasize, it can only really work if there is a management-level consensus on what the company wants to achieve and how it wants to achieve it.

Sometimes, getting business managers to concentrate on the implications of major change can be difficult, however. Mitch Chaney knows this from experience. He has watched as his business managers allowed critical architecture decisions to happen by default.

Chaney, director of information systems at SKF Bearings Industries in King of Prussia, Pa., says he's been stymied by managerial indifference toward his efforts to fashion a truly useful systems architecture.

SKF's manufacturing and business systems evolved over the last 10 years with no clear direction, he says. Now, the company is faced with adopting the architecture of SKF's European-based parent company or developing one itself. The parent company "wants us to opt for their system, but if we go that route, we lose all flexibility and the ability to influence the system," Chaney explains.

SKF's business managers appeared ready to go along by default, seemingly uninterested in the implications of the decision — absolutely the wrong way to lay a groundwork for a new architecture.

Frustrated by this indifference to what he sees as a major change that could have a profound impact on business practices, Chaney has brought in a consulting firm, Nolan, Norton & Co. in Lexington, Mass., to explain the options and their implications to business managers.

Find a backer

Gaining support isn't always quite that hard. Gerry Long, vice president of systems development at Roadway Express, Inc. in Akron, Ohio, found he was able to turn his plans for a distributed architecture into action with the help of a single strong champion — the head of a major business unit.

It helped, Long says, that "information systems are a differentiator in the transportation business." In that situation, it wasn't very difficult to make the case that Roadway, a decentralized nationwide trucking company, needed something better than an old store-and-forward network with only limited message-switching and tracking capabilities.

As with any major move, one of the hardest parts of planning architectural change is figuring out what to discard and what to save. It is rare that a company can afford to make a clean and total break with the past.

Paul Ricker had that luxury at G. Heileman Brewing Co. When Ricker, vice president of IS, arrived at the LaCrosse, Wis., company, he says he found virtually nothing worth salvaging.

"All the applications needed to be upgraded or replaced. The hardware had all the costs associated with big systems, and we were stuck with proprietary communications systems," he says.

Most IS executives can't just push all existing systems out

Continued on page 66



Reinhold Spengler

Union Camp's Ineson *has only one rule when it comes to renovations: Anything new must coordinate with the network*

INSIDE

Taking out use insurance
Page 66

Staff readiness
Page 69

Radding is a free-lance writer based in Newton, Mass.

Continued from page 65

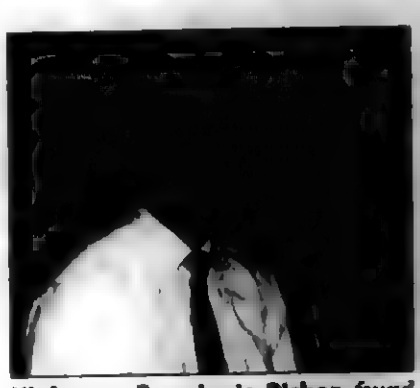
the door, however. More typically, they have to figure out how to reconcile future plans with current systems and operating requirements. Of course, that presupposes detailed knowledge not only of current equipment but also of current data paths.

A comprehensive survey of its computing landscape helped Seattle-based Boeing Computer Services, a division of The Boeing Co., identify both the totality of what was in use and the subset that was critical to preserve. Laurie Bride, manager of network architecture and standards, refers to the core applications that the company has determined must be kept functioning as "legacy systems."

Although Boeing has begun to prune the unruly collection of networks it uncovered in its survey — 17 proprietary network operating systems as well as a Transmission Control Protocol/Internet Protocol network — the policy is to leave the crucial legacy systems undisturbed until their replacement becomes a realistic possibility.

Federated keepsake

The must-keep element at Federated Mutual Insurance Co. in Owatonna, Minn., was the corporate mainframe database. The company was trying to move to cooperative processing, but "we'd been a Cincom Systems database user since 1973," says Gary Tobiason, director of information services. That precluded the use of new technologies such as



Holeman Brewing's Ricker *found no old architecture worth salvaging*

SQL, because Cincom couldn't handle SQL at that time.

"If we were to convert to something like SQL, we'd need a new database, and that would put all development on hold for five years. That wasn't an option for us," Tobiason says.

Fortunately, Tobiason found an application development tool, a programming language called Metaview from Metafile Information Systems, Inc. in Rochester, Minn. The product allowed the company to preserve its corporate database while rolling out a personal computer-based cooperative processing architecture. It also, by virtue of its support for image processing, gave Federated a head start in a direction that, even in 1985, the company was fairly certain it would want to pursue.

While preservation of certain parts of the present is often critical, care must also be taken to safeguard the future. And that means both establishing and enforcing standards.

Basically, says Randy Olson, a systems associate for telecommunications development at Kingsport, Tenn.-based Eastman Chemical Co., users can have any technology they want, as long as it

Continued on page 68

Testing the elements

Once an architecture has been established in concept, there is still the task of filling it in with specific products and technologies. The architecture itself "is a high-level blueprint that indicates only goals," says David Sluyter, research analyst at Liberty Mutual Insurance Co. in Boston.

Sluyter's advanced technology research group investigates specific technologies using a newly introduced four-step model composed of initial investigation, focused research, prototyping and implementation and product rollout. This model replaces "a shotgun approach" by which Sluyter's group looked at virtually every technology that came down the pipe, he explains.



After Liberty Mutual abandoned its IBM architecture for open systems last year, Sluyter's group found it needed a more logical and targeted approach to keep up with the work of locating the right enabling technologies.

The initial investigation assesses a technology in terms of its applicability to the company's stated directions. Only if a technology seems like a match does the group proceed into focused research — running benchmarks and identifying benefits and problems.

According to Sluyter, the goal of the prototyping stage is to "educate ourselves in the potential of the new technology and to understand the infrastructure needed to support it."

No technology has yet reached the final step — development of a business product. Sluyter estimates that journey will take six months.

ALAN RADDING



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10. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs. Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
99. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
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80. Educator, Journalists, Librarians, Students
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Types of equipment with which you are personally involved either as a user, vendor, or consultant.
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EXECUTIVE REPORT

Avoiding organizational rejection

Make change more acceptable: Reality-test those plans

Implanting new architectures within organizations is delicate work. If you forget there are real humans on the receiving end, you will likely trigger what James Hatch, manager of financial investment strategy at Aetna Life and Casualty Co. in Hartford, Conn., calls "the organizational immune system."

The key to avoiding rejection, Hatch says, is figuring out how people really use the systems and then devising ways to minimize traumatic changes. That may sound simple, but Hatch can testify to the fact that it is not.

What makes it hard, he says, is that much of what systems architects are told about the way users work is just plain wrong. "People don't use the systems the formal way, the way the managers and supervisors say they do," Hatch says. They improvise, he adds.

The only real way to map these improvisational patterns is through close-up contact and careful observation. Hatch manages this by selecting sites from which he can elicit direct user input and watch how users employ systems.

In one instance, when he was trying to plan implementation of a distributed system for field offices, Hatch actually recreated a working field office at headquarters through which he regularly walked users from the pilot sites to get continuous feedback on system design. "You'd better keep the users informed on a steady basis rather than spring the system on them fully formed," he says.

Once Hatch knows which procedures are most critical to users, he devises a plan for insulating these tasks from direct contact with the underlying mechanics of the system.

By creating a buffer between the users and the technology, Hatch, in effect, divorces the applications from those elements that are subject to technological change.

When switching to a relational database structure for mutual fund operations, Hatch's group created a buffer that eliminated the need to alter applications every time fund products were added or changed. "You want your architectural model to minimize the impact of change," he says. "It adds a layer of overhead, but it saves you from having to revise all the programs."

ALAN RADDING

Continued from page 66

complies with the standards that are specified in the architecture.

At Eastman Chemical, the proposed new standard for the communications architecture is Open Systems Interconnect, but declaring a standard architecture is easier said than done. Like Boeing, the 11,000 Eastman Chemical employees use a variety of systems involving a host of proprietary standards. And getting business managers to recognize the need for



Boeing's Bride *says some systems are legacies that must be preserved*

change and to change their purchasing habits is a slow process. "One thing they want to know is, who's going to pay," Olson says.

How far? How fast? How much? Who is going to pay? These are questions frequently thrown at IS managers when architectural change is in the air.

Little by little

Slow and easy is the best answer to all those questions, according to many IS executives. "We're phasing in the new systems one at a time, says Gary Hayes, manager of corporate IS at Haarman & Reimer, a manufacturer based in Springfield, N.J. Haarman & Reimer is converting to a new business software environment as a result of a corporate restructuring. The new system is a comprehensive, integrated, off-the-shelf business package that replaces an obsolete existing package and an aging home-grown system.

Rather than trying for wholesale change, Hayes will build interfaces for the existing applications to the new financial system. "Down the road, we'll add other modules, but we decided to take it step by step," he explains. Trying for a complete changeover "would take a lot more resources than we have," he says, "and because we had two systems as our base, there would be more organizational problems than we could handle." ●



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Maintaining staff readiness

BY MARY LOU ROBERTS

The difficulty of acclimating systems staffs to new technologies is often underestimated. Madeline Weiss, president of Weiss Associates, Inc., a Bethesda, Md., consulting firm that specializes in organizational and management issues, says, "People often think that learning to use a new technology is like learning to use a toaster. But in fact, it's a lot more like learning to play a musical instrument."

Wayne Garner, manager of technology development at Dow Chemical Co. in Midland, Mich., reaches for a different analogy. To him, he says, the process "is something like black magic."

Although there are no formulas that will work across the board in all situations, companies such as Dow Chemical that are in a constant state of technology advancement are working hard to make the learning curve an easier climb.

Getting the staff involved in the change process as early as possible is extremely important, according to most information systems managers and consultants. Dave Shinkfield, vice president at PA Consulting Group in Heightstown, N.J., cautions that there is a very real difference between information sharing and accommodation, however. Involving staff in this kind of situation, he says, "doesn't mean as much asking for advice as it does communicating well."

Building the staff

On the whole, Weiss says, practicality will make the majority willing, if not eager, to learn new skills. "Most systems professionals realize that the name of the game today isn't employment security — it's employability," she says.

Still, because it is a given that individuals will react differently to change, it's important that IS management pay more attention than ever to the makeup and philosophy of its organization.

Howard Ludwig, manager of technical development and services at Inland Steel Co. in East Chicago, Ind., notes that when his company hires, "we look specifically for people who are excited by new technology." In addition, he makes a point of rotating IS professionals into new areas roughly every two years.

Other firms promote learning through example. Ludwig describes his company's strategy as "ramping up people through technology transfer." What this means, he explains, is that "we bring in new technology knowledge through the use of outside consultants, and we let them help us bring people up to speed."

Polaroid Corp. also believes in learning through example, but its translation of that concept is a little different. According to Al Hyland, director of worldwide systems at the Waltham, Mass.-based firm, the systems department frequently



Polaroid's Hyland *takes his systems department on educational field trips*

takes field trips to other firms using technologies it plans to adopt.

Try it — you'll like it

Another technique that can ease the transition to a new technology platform is the use of pilot programs to gradually introduce systems staff members and users to the new technology. Dow's Garner says his company uses pilots as a way of building acceptance for new technologies.

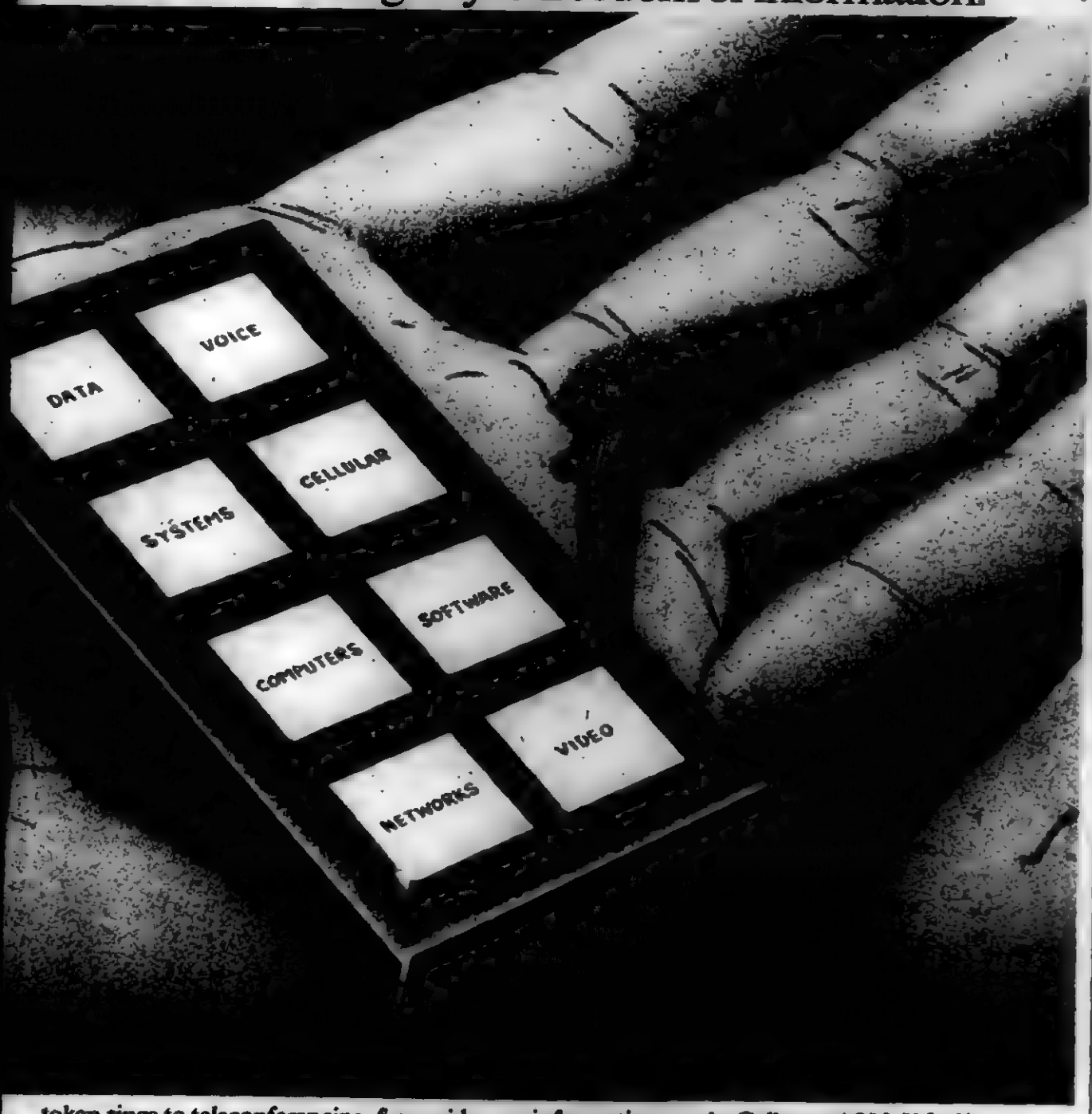
Naturally, formal training and education is an important component of the staff synchronization and technology transfer process. This process can require significant investments from both company and staff.

Weiss offers the example of one of her clients, S. C. Johnson and Son, Inc. in Racine, Wis., which has a firm policy of retaining existing personnel. When the company moved from a Bull HN Information Systems, Inc. platform to an IBM mainframe environment, systems personnel were told they would be expected to spend 150 hours per year on company-sponsored education — with only half of that occurring on company time. The company created an automated skills inventory program that matched skills of the employees with skills needed for the new environment.

IS staff members aren't the only ones in need of re-education when large-scale changes are made to the technical environment. "It's important to educate at both the systems staff and the systems management level," Hyland says. •

Roberts is a free-lance writer and consultant in Glenside, Pa.

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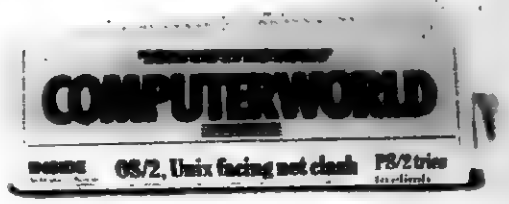
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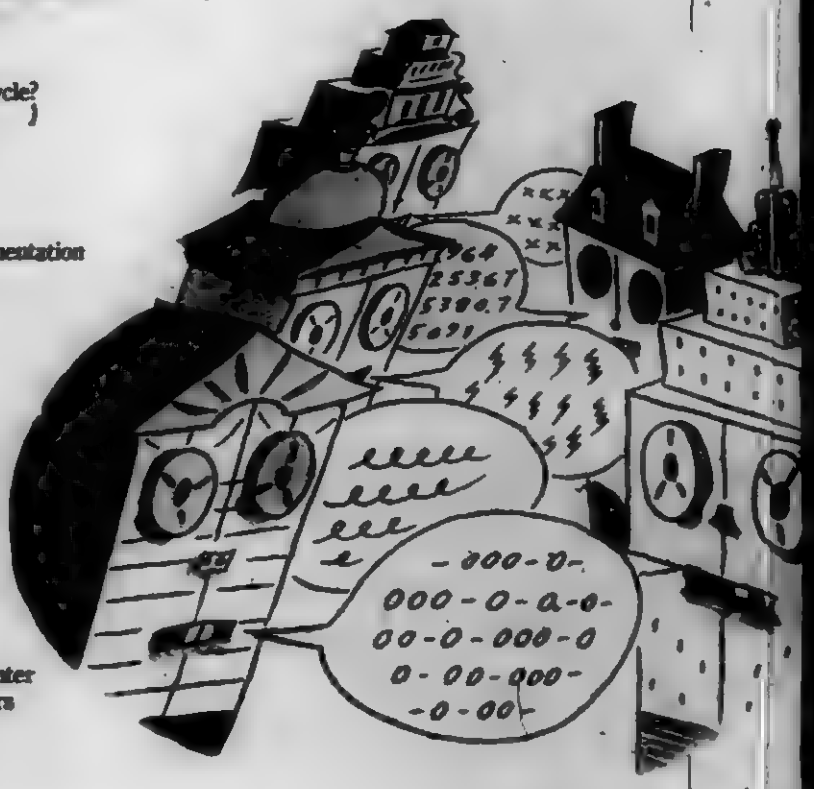


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A directory of 1990 In Depth articles

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2/5	*Janet Mason*	Crackdown on software pirates
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Dispatching months' worth of rumors to the contrary, **Datapoint Corp.** Chairman **Asher B. Edelman** definitively told shareholders that the firm is not for sale at the present time. In fact, Edelman said, Datapoint is on the move — to France, where headquarters, now in San Antonio, will be reestablished as part of a plan to reinvigorate the computer manufacturer by placing resources closer to customers. Datapoint, which will retain its U.S. corporate citizenship and its New York Stock Exchange listing, currently draws some 80% of its revenue from Europe.

Holiday shopping

It didn't all happen at the mall: Sarasota, Fla.-based time-control software vendor Techtime, for instance, spent the holiday season announcing planned expansions. The firm signed a letter of intent to acquire Atlanta-based Tridata Systems, Inc., a privately owned company specializing in time-control systems tailored to the hospitality industry. Techtime is also poised to buy research and development firm Uniquest, Inc. in an acquisition that contemplates Uniquest's current owner making a cash investment in Techtime and becoming a part of the combined firm's management team.

Fuller disclosure

In an attempt to tighten the focus on its core businesses — engineering and consulting — **Bechtel Corp.** last month agreed to sell off its information systems subsidiary. Gaithersburg, Md.-based **Bechtel Information Services, Inc.**, a subcontractor on the Securities and Exchange Commission's Electronic Data Gathering Analysis and Retrieval, or Edgar, project, will be acquired by Bethesda, Md.-based corporate information and research firm **Disclosure, Inc.**

Imagen's Olson dies

Robert Olson, president of document printing systems vendor Imagen Corp., died last month after a lengthy illness. Olson, 56, was a retired board member of QMS, Inc., the parent company of Santa Clara, Calif.-based Imagen. He had previously served as chief executive officer of the Allied Linotype Group.

BBN makes comeback in 1990

After some improvement in 1990, BBN looks to re-establish itself in 1991

BY JOANIE M. WEXLER
CW STAFF

CAMBRIDGE, Mass. — Long typecast as a government contractor, BBN Communications — a division of research and engineering company Bolt Beranek and Newman, Inc. — is endeavoring to polish its image as a commercial management networking player.

The publicly held, 42-year-old Bolt Beranek and Newman is back in the black after a couple of years of financial blows dealt by curtailed government spending, an underbid contract between BBN Communications and Japan Airlines, an $18 million purchase-gone-awry of Network Switching Systems, Inc. in 1987 and other factors.

The company's financial situation resulted in a personnel reduction last year — from 3,000 to 2,500 employees worldwide — through layoffs and attrition.

For its fourth fiscal quarter ended June 30, however, the parent company wiped the red ink from its balance sheet (see box page 74). Goldman Sachs & Co. securities analyst Mary Henry estimated that while the BBN Communications division lost money in its most recent fiscal quarter, it should break even or make money in its quarter ended in December.

To continue its upward financial trend, BBN Communications plans to leverage what has historically been acknowledged as top-notch data communications technology into commercial products that will address looming user demand for more efficient use of bandwidth.

The demand is being driven by burgeoning data-intensive applications, the trend toward local-area interconnection across wide geographical areas and emerging imaging and video applications.

The firm described its strategy as "linking yesterday's, today's and tomorrow's devices," said Jeffrey H. Palmer, BBN Communications' vice president of marketing and planning.

Toward that end, the firm's X.25 packet switches have been designed to accept and convert traffic speaking a broad array of protocols. BBN Communications has also announced intentions to support a trunk-side frame-relay interface on its T/300 packet-switching node during first-quarter 1991. It has also said it will have cell-relay products available in the first half of 1992.

BBN Communications is also addressing the local-area network interconnect market by reselling a router manufactured by Wellfleet Communications Co.

Analysts said the strategies are sound but could also leave BBN little room for technological or logistical errors as the market heats up. Frame-relay and cell-relay transport mechanisms fall under the umbrella of fast-packet technology, one of the myriad technologies surfacing to address users' burgeoning bandwidth requirements.

BBN Communications has pledged to jump on the fast-packet bandwagon and develop new marketing and distribution schemes that will shift the company's "think tank" reputation to that of a viable commercial vendor.

In this particular case, perception could be everything for the company's success.

"We feel the company has not fully matured on the commerical side in recognizing the difference between servicing commercial and government accounts," said Mark Raisch, manager of international telecommunications and network technology at Bank of New York, a user of BBN Communications' packet-switching products since 1987.

"BBN's equipment is rock solid once it is installed. However, the company approaches each project as though it's the very first time, which drags out implementation."

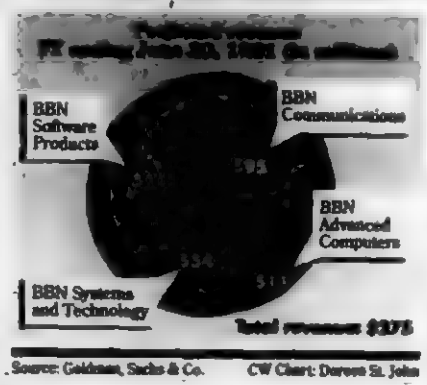
Palmer noted that his firm's commercial customers — which also include Barclays Bank PLC, Mastercard International and Wang Network Services — actually outnumber those in the government sector. However, he acknowledged, the government contracts are substantially larger and thus account for more of the firm's revenue.

Frame and cell relay represent the "next wave" of packet switching, a type of store-and-forward switching in which data is broken up into small packets that are dispersed throughout a circuit where there are chunks of

Continued on page 74

Adding to the success

As a hefty contributor to parent Bolt Beranek and Newman's revenue base, BBN Communications' ability to turn the corner on profitability would benefit the whole business



Source: Goldman, Sachs & Co. CW Chart: Doreen St. John

Leasing game changing, survey says

BY NELL MARGOLIS
CW STAFF

If the 1990 edition of the Gartner Group, Inc.'s annual survey of the U.S computer leasing industry is any indication, dealers and lessors are entering 1991 with characteristic optimism and a rallying cry: The less Blue we are, the less blue we are going to be.

"We've been focusing on diversification as one of the most important issues for computer leasing companies, and the results of this survey tell us we've been right," said Kenneth A. Bouldin, chief executive officer of the 370-member Computer Dealers and Lessors Association (CDLA), which commissions and responds to the Gartner Group survey each year. IBM equipment accounted for 71% of overall computer leasing volume in 1989, down sharply from 82% in 1987 and a continued drop-off from 74% in 1989, according to the survey.

Both Gartner Group and the CDLA expect that number to continue decreasing as third-party leasing companies — faced with a domestic economy on the wane and IBM captive leasing firm IBM Credit Corp. on the rise — scramble to deal in other vendors' hardware. Gartner Group projects IBM's share of equipment leased by survey respondents at 67% for 1990 and falling. The list of gainers from lessor diversification, the report said, will likely include Amdahl Corp., Hitachi Data Systems Corp., Digital Equipment Corp. and AT&T.

Computer leasing and remarketing volume rose 7.5% in 1989, according to the survey. Data compiled by Gartner Group showed the industry growing from $20 billion in 1988 to $21.5 billion in 1989, with $25 billion projected for 1990.

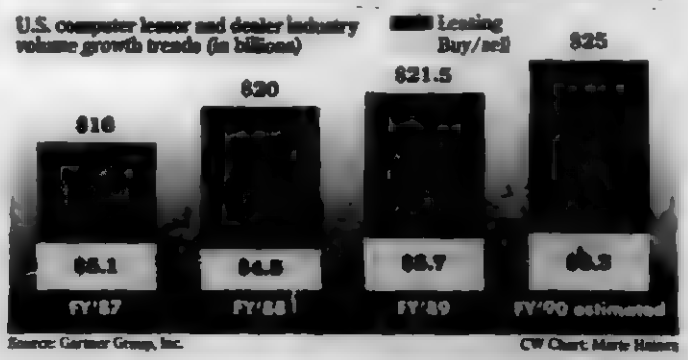
"The CDLA was certainly disappointed with the growth figure, which was only about half of what we predicted," Bouldin said. Nevertheless, he noted that leasing firms showed marked optimism, predicting 19% growth for 1990. Gartner Group analysts came in at a more conservative 10% to 15%. The 1990 figure projected by the firm reflects an average of the two.

Portfolios as well as vendor diversification showed up in the survey. Large systems accounted for 34% of equipment volume in 1988; the figure was down to 33% in 1989, with a continued decline to 32% predicted for 1990. Midrange systems leasing and trading jumped from 12% in 1988 to 17% in 1989; workstation deals climbed from 9% in 1988 to 10% in 1989.

IBM's policies and practices topped the list of leasing industry concerns for the third year running, followed by overall competition.

High stepping into new year

A $3.5 billion boost in revenues over the past year has most lessors smiling



Source: Gartner Group, Inc. CW Chart: Marie Haines

Fast-packet players

Despite its new persona, BBN Communications is not the only fast-packet act in town. Firms are continually tossing their hats into the fast-packet ring with announcements and occasional product rollouts.

Fast-packet pioneer Stratacom, for example, offers a frame-relay interface and cell-relay transport mechanism on its IPX T1 multiplexer line. Codex Corp., which owns a 20% equity investment in Stratacom, is slated to start shipping the IPX as the Codex 6290 fast-packet backbone during the first quarter of this year.

The specifications for the companies' frame-relay interfaces match those of router vendor Cisco Systems, Inc., whose products work in tandem with the Stratacom offering on the customer premises side of a network.

Stratacom's and Cisco's products conform to a set of specifications that the two companies, along with Digital Equipment Corp. and Northern Telecom, Inc. set in September. In addition, Timeplex, Inc. recently started marketing its Fastpath cell-relay line, which it acquired this past fall when it purchased Dosk, Inc.

The products from the "group of four" will not necessarily adhere to standards currently under construction by the CCITT. "All the current offerings are narrowband, proprietary devices," said Nick Lippis, principal consultant at Northeast Consulting Resources, Inc. in Boston. "BBN [Communications] is developing a next-generation backbone that could displace the T1 multiplexer."

BBN Communicitions cited as its competitors the triumvirate of Stratacom, Cisco and U.S. Sprint Communications Co. Sprint has committed to public-cell switching by the end of 1991.

JOANIE M. WEXLER

BBN

FROM PAGE 73

available bandwidth. The data packets are then reassembled at the receiving end.

Like traditional X.25 packet-switching — a standard that was actually developed by BBN Communications in the late 1960s — fast-packet technologies make more efficient use of bandwidth than circuit switching, a technique that nails up dedicated channels within a circuit to await traffic for transmission. Packet switching is more efficient because dedicated circuits often sit idle during nonpeak communications periods.

Frame and cell relays are faster than today's standard X.25 packet switching because they capitalize on today's highly reliable digital communications lines by eliminating error checking and recovery at every node throughout the network.

Frame relay breaks data into packets of variable length. Cell relay uses a fixed length, making it more suitable than frame relay for sending traffic that cannot tolerate unpredictable delays such as voice.

The company's target rollout time frames will hit fertile market conditions, analysts said.

"The T1 market is starting to break up, with data traffic increasing 35% annually," noted Nick Lippis, a principal consultant at Northeast Consulting Resources, Inc. in Boston. "It will take about 18 months for companies to realize they should start dismantling their T1 backbones, so their time frame is right on the mark."

However, Rosemary Cochran, principal at Vertical Systems Group in Dedham, Mass., cautioned that "the company will have to stick to that time frame. The window will close if they slip a year or two. Like the T1 market, once you secure an account, it's yours; the first vendors to market will do best."

Palmer said that, ultimately, the company's cell-relay line will "support a mix of services," but that it has not yet committed to anything but data support in the

Indelible black ink?

Slashing operating expenses has helped put BBN back on its financial track, but analysts said new marketing and distribution tactics will be key for continued success.

First quarter ended Sept. 30, 1990 Net income of $5.19 million on sales of $62.59 million	**First quarter ended Sept. 30, 1989** Net loss of $3.14 million on sales of $64.15 million
Fourth quarter ended June 30, 1990 Net income of $3.82 million on sales of $69.28 million	**Fourth quarter ended June 30, 1989** Net loss of $22.74 million on sales of $71.92 million
Year ended June 30, 1990 Net loss of $34.8 million on sales of $261.93 million	**Year ended June 30, 1989** Net loss of $25.13 million on sales of $291.57 million
Third quarter ended March 31, 1990 Net loss of $32.37 million on sales of $64.89 million	**Third quarter ended March 31, 1989** Net loss of $5.18 million on sales of $74.46 million

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To simplify matters even more, NETBuilder's bridge, router and brouter have the same menu-driven user interface. So there's a common look and feel. Yet, you can still create custom menus to suit a particular network environment.

As a result, NETBuilder cuts three big expense items in internetworking—new hardware purchases, and the training and servicing to support it.

Yet, you sacrifice nothing for this simplicity.

first release of its cell-relay product line.

Richard Malone, another Vertical principal, said he is worried about BBN Communications' noncommittal attitude toward supporting voice in the first release and its refusal to include circuit-switching products in its equipment array.

"BBN must address all forms of traffic in the first release — not just the traffic they're comfortable with [data]," he asserted. "Their job is going to be to convince companies that they can serve as an enterprise vendor. Many companies are moving back to the public carriers for voice and video services; if BBN doesn't support those services, it can't seriously be considered an enterprise player."

Palmer said his company is leveraging its strength in mission-critical installations and is banking on the philosophy that "all companies' networks will be mission-critical" in the near future.

He said that BBN Communications considers its historical data communications emphasis a strength because emerging imaging, video and LAN internetworking applications mean that data communications is where the projected growth spikes are.

Firm selects DEC's management base

It almost goes without saying these days that companies in the networking business cannot ignore the issue of network management in their product lines.

BBN Communications' strategy to target mission-critical, wide-area networks includes support of Digital Equipment Corp.'s Enterprise Management Architecture (EMA), a framework for managing heterogeneous distributed computing environments. BBN Communications intends to "add value" to the platform, rather than just supply hooks into it from lower level network management systems, according to Jeffrey H. Palmer, vice president of marketing and planning at BBN Communications in Cambridge, Mass.

Palmer said his company will provide EMA-compatible tools to enhance DEC's Open Systems Interconnect-based core. For example, BBN Communications will bring performance monitoring to identify bottlenecks in sessions to the EMA table, he said.

Palmer added that he believes BBN Communications is DEC's first partner "to build on top of EMA instead of just linking into it." He said BBN chose DEC's EMA "because DEC is out in front with its core database and application programming interface."

He acknowledged that DEC lags behind its enterprise network management competitors — including IBM with its Netview and AT&T with its Accumaster Integrator — in providing an impressive graphical user interface.

"DEC has sweated on the most important details — it just doesn't look as good at trade shows," Palmer remarked.

JOANIE M. WEXLER

IBM, British Telecom venture may be planned

BY RALPH BANCROFT
IDG NEWS SERVICE

LONDON — IBM's unprecedented decision to move the headquarters of its communications business to London may be a signal for an even more audacious move in the global telecommunications market.

According to reports in the British financial press, IBM and British Telecom PLC are close to announcing a joint venture that will offer a global value-added data network service offering functions ranging from electronic mail to electronic data interchange.

Familiar path

This is not the first time the two companies have discussed a joint data network. British Telecom and IBM announced such a network for the UK in 1984, only to have the plans nixed by the British government on antitrust grounds following protests and complaints from competitors.

However, a global data network may escape such scrutiny because of its worldwide scope and the fact that the venture would increase competition by pitting the two companies against the data networks provided by monopolistic national telecommunications organizations.

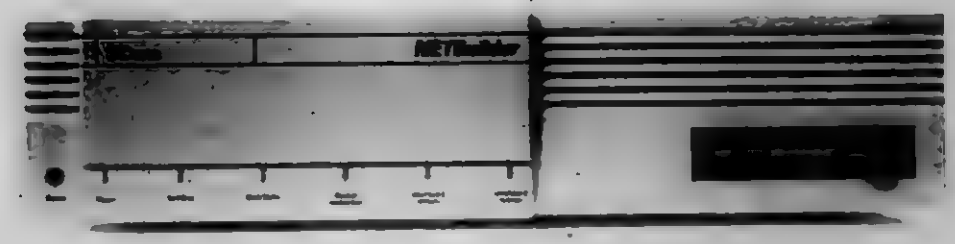
The planned alliance, which has reportedly been under discussion for two years, would see British Telecom take over the management of IBM's internal communications network and link it with BT Tymnet, Inc., the international data network that British Telecom acquired from McDonnell Douglas Computer Systems Co. last year. BT Tymnet is well established in the U.S. and Europe.

IBM would take responsibility for supplying the information services and the software for the network. When the regulatory climate allows, cooperation between the two companies will be expanded to provide international voice communications.

Bancroft is an IDG News Service correspondent based in London.

Ch Changes.





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INTERNATIONAL

BRIEFS

Everybody's in tech business, too

Osaka, Japan-based Matsushita Electric Industrial Co., which recently riveted the attention of U.S. stargazers by pulling off the largest purchase of a Hollywood studio to date, returned to its more traditional turf late last month with an announcement of plans to establish a computer software and graphics development laboratory in Princeton, N.J. The nascent Matsushita Information Technology Laboratory, to be headed by former Princetonian Richard Lipton, will be the Japanese firm's eighth such endeavor. Maybe its birth isn't unrelated to the Matsushita/MCA deal after all: The lab, according to the firm, will focus on technological advances that are likely to be applied in new film production.

No-confidence vote

The Swedish public sector has little faith in most of its computer suppliers, according to a study of 219 information systems directors released late last month by Stockholm-based market research firm IMU-Testologen. Least confidence-inspiring among the major vendors, the study said, are Wang Laboratories, Inc., Commodore International and Norway's Norsk Data. Only 30% of the users surveyed reported having any faith in Wang; none said they were confident. Commodore pulled a 33% faith rating but also inspired no confidence. Forty percent of the users said they had faith in Norsk Data, but again, none were willing to go as far as being "confident."

And now, Far Southwestern Bell

An international consortium of subsidiaries of St. Louis-based Southwestern Bell and France Telecom, as well as Mexican multi-industrial entrepreneur Carlos Slim, bid roughly $2-billion late last month for a control stake in Telefonos de Mexico. The privitization of Mexico's telephone company, said Southwestern Bell Chief Executive Officer Ed Whitacre, "puts us one step closer to increased economic and cultural exchange between our nations." Oui. Si. Right.

REPORTER'S NOTEBOOK

A conference of partners

BURLINGAME, Calif. — The Technologic Partners' quadrennial gathering of the tribes last month drew a number of witty and frank comments.

Some of the choicer comments included the following:

■ Apple Computer, Inc. Chief Executive Officer John Sculley predicted that the firm's mix of new low-cost Macintoshes will help Apple continue to grow at a 10% annual rate. Sculley said Apple will more aggressively pursue new technological frontiers. "We clearly missed the boat in the laptop market, but we won't miss the notebook market and the handheld market," he said.

■ While attendees munched broccoli and carved chicken, Sun Microsystems, Inc. President Scott McNealy let singers go at the rest of the industry. McNealy seemed distressed about AT&T's potential takeover of NCR Corp. He compared it with the merger of Sperry Corp. and Burroughs Corp. to create Unisys Corp., which used "The Power of Two" as its motto. "They proved the power of two, all right," he said. "That's their stock price right now."

■ One panel discussed ways to attract new users to the industry and essentially agreed on the KISS (keep it simple, stupid) theory. "How many people in this room even know how to use their VCR?" asked Adobe Systems, Inc. President John Warnock. "We can't add more features [to personal computers] because people can't even use the darn things now." Until the problem of complicated machines is solved, Warnock added, huge markets probably will not develop.

■ AT&T's Bob Kavner said the company is working on a stripped-down version of Unix that will require as little as 4M bytes of random-access memory and a 40M-byte disk. "Unix Lite" will take out all the extraneous enhancements to Unix and make them available as add-on packages, he said.

■ Debates raged over whether the emerging pen-based computer market will need to forge its own operating system or whether it can adopt an established one such as DOS. Microsoft Vice President Mike Maples declared the market would need to rely on "standards" to get things done. Said Jerry Kaplan, president of Go Corp., which is pushing its own operating system for pen-based computers: "What standards? There are no standards with pen-based computers. It's an open playing field."

JAMES DALY

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Eric Butlein
Principal
Computer People Unlimited, Inc

Richard Weiss
Principal
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The largest software services consulting firm in Wisconsin, Computer People Unlimited, Inc. (CPU) is also listed in *Inc.* magazine as one of the fastest growing privately held companies in America. Together, its Milwaukee headquarters and branch offices in Appleton and Madison employ more than 250 professionals. During 1989 alone, Principals Eric Butlein and Richard Weiss saw the firm hire 98 new consultants. To keep pace with its rapid expansion and maintain its low employee turnover, CPU implements a rigorous recruitment program to hire the right professionals for every position.

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Richard Weiss

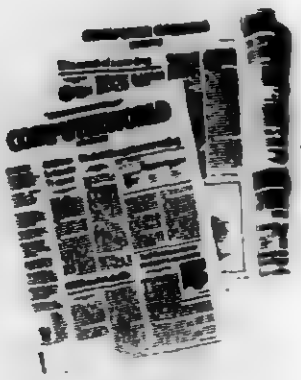
"The talent we need to service all our clients — in banking/finance, insurance, manufacturing, medical technology, utilities, retail, high-tech, and state/local government — isn't always available locally. Also, CPU's policy is not to hire from customers. So it's essential that we look for professionals from outside of Wisconsin. In fact, roughly 80% of the consultants we hire in the scientific/engineering area, as well as up to 30% of our business consultants, come from out of state. Here, the nationwide exposure we get with Computerworld *is crucial to our recruitment efforts.*

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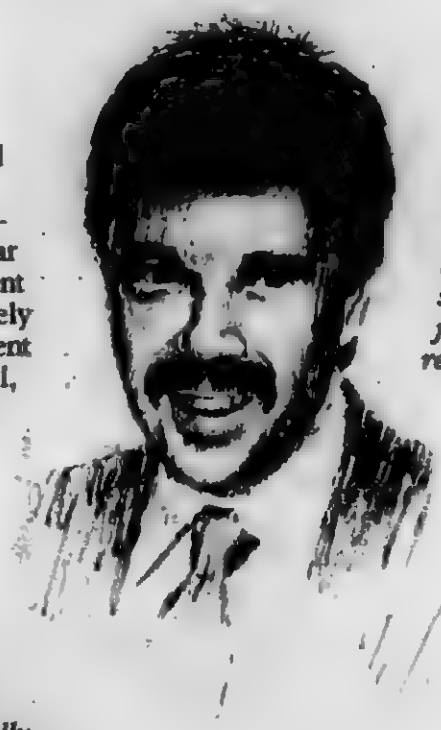
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— Richard W. O'Donnell
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Job hoppers lose their bounce

'Fast track' is a monthly column dedicated to answering questions on career directions.

BY MAX MESSMER
SPECIAL TO CW

I've been trying to find a position as a project leader for nearly a year. I have a master's degree in computer science, five years of project management experience at a well-known West Coast bank, and I've been developing applications using the C language and relational database software for several years. Based on my experience, I expected to find a new job (and a healthy raise) within a couple of months. Instead, the offers I've received so far have not even matched what I'm earning today. I know the economy is slowing down, but am I just having a spell of bad luck, or are things going to continue like this?

During the last 10 years, information systems people have usually changed jobs for significant, rather than ordinary, increases in pay. Recently, in some parts of the country and in some specialties, the earnings increases haven't been nearly as dramatic.

In all likelihood, this situation will continue until the economy starts growing again.

During an economic downturn, the publicity about layoffs and cutbacks often means people are more inclined to stay in their current jobs than to look for new positions and higher pay. For some people, that's the right thing to do. An employee is often less likely to get caught in a cutback if he has some seniority and is performing well than if he is the new person in a department.

Your skills in relational database software and C language are still in demand, particularly if you're familiar with Microsoft Corp.'s Windows and the hotter database management system products from Oracle Systems Corp. and Sybase, Inc. A new position and increased earnings are not out of the question, but you'll need to be selective, and you may have to spend more time on your search.

I am a systems analyst with a background in distributed processing systems. I was recently contacted about a position with a group that is using the RPG III programming language on IBM Application System/400s. I've always considered RPG environments out of the mainstream of IS, and I'm wondering why I am now reading about the demand for people in this area. If I were to make this move, would I be less marketable than I am today?

For a long time, RPG shops were somewhat outside of the IS mainstream. Most RPG programming was done for smaller organizations, while the larger ones stuck with Cobol and Fortran. That has begun to change radically since the introduction of IBM's AS/400, which uses RPG III as its principal applications development language.

FAST TRACK
CAREER ADVICE FOR THE '90s

A large portion of the AS/400s are going into big companies that are adding to and/or replacing centralized systems with distributed processors. Most of the applications for these new systems have to be written in RPG III, and that means RPG III experts are some of the most sought after technical people in IS right now and should continue to be in demand for several years to come.

Naturally, you should consider more than just the technical area you'd be in if you join this group. Before you make a decision, you should think about the chemistry with your prospective boss, the stability of the organization, the compensation package, whether the project is technically interesting and whether there is career development.

The sum of all these considerations may or may not mean this is the right position for you, but AS/400 experience would definitely be a career asset to you in the future.

I am a programmer/analyst with five years of mainframe financial applications experience, and I plan to remain on the technical side of the business. I was recently offered a position in a group that is developing real-time manufacturing applications. The salary the company is offering me is a major increase. However, I work for a money-center bank in a major metropolitan area right now, and I don't know much about manufacturing. How might this job affect my marketability in the future?

Real-time manufacturing applications will be one of the potential high-growth areas in IS during the next 10 years, largely because of the productivity benefits. Consequently, people who understand the area can expect above-average earnings for the foreseeable future.

Accepting this position doesn't need to be a permanent commitment to manufacturing, but if you think you may stay in the field, you should consider whether you'd be willing to live where the sophisticated manufacturers conduct their software development. Relocation may become necessary if you're going to take advantage of the best career opportunities, and you could find yourself living in upstate New York, the Midwest, Texas or the Southeast.

The likelihood of leveraging your expertise will be much greater in a region with a high concentration of manufacturing companies. Whether or not you decide to move into manufacturing, after five years in a single technical area, you should consider learning some new skills.

Messmer is chairman of Robert Half International, Inc., which places permanent and temporary IS professionals in the U.S. and abroad.

We welcome your questions on career directions. Send them to Cathy Duffy, Careers Fast Track, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701.

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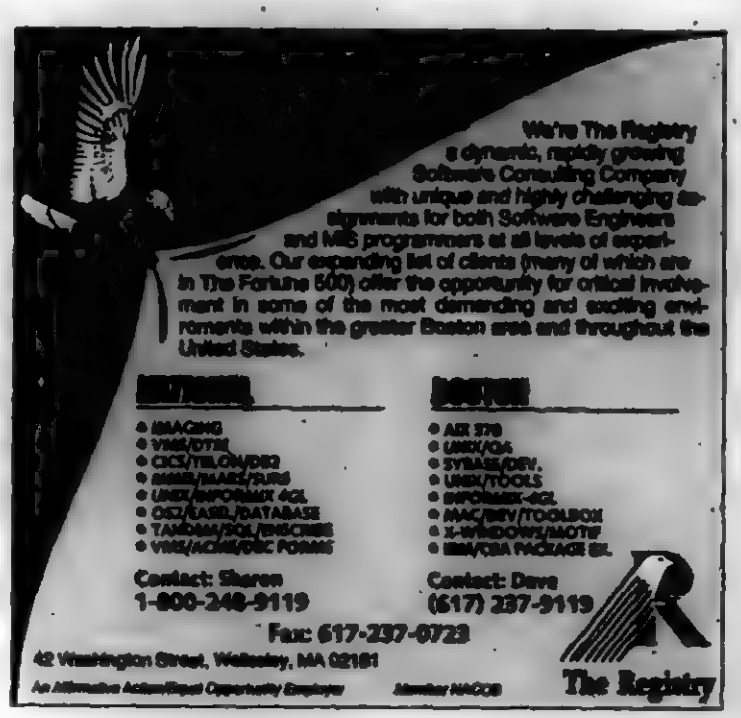
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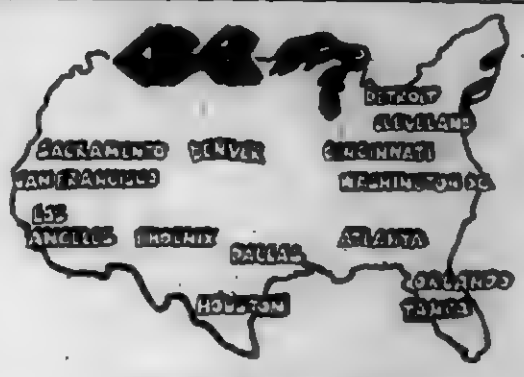
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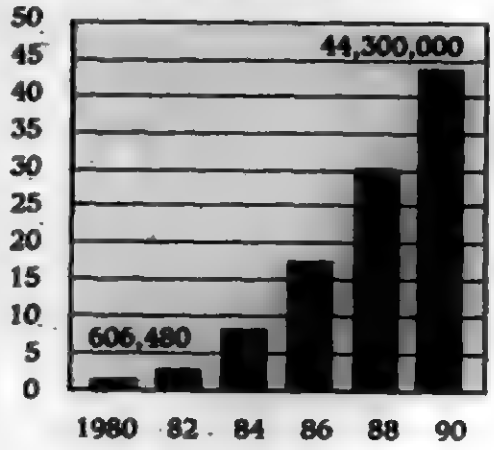
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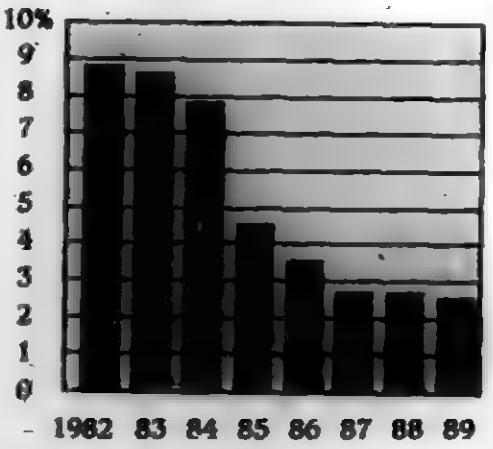
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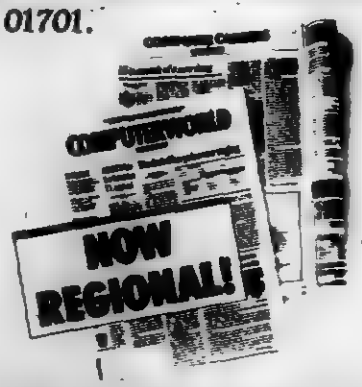
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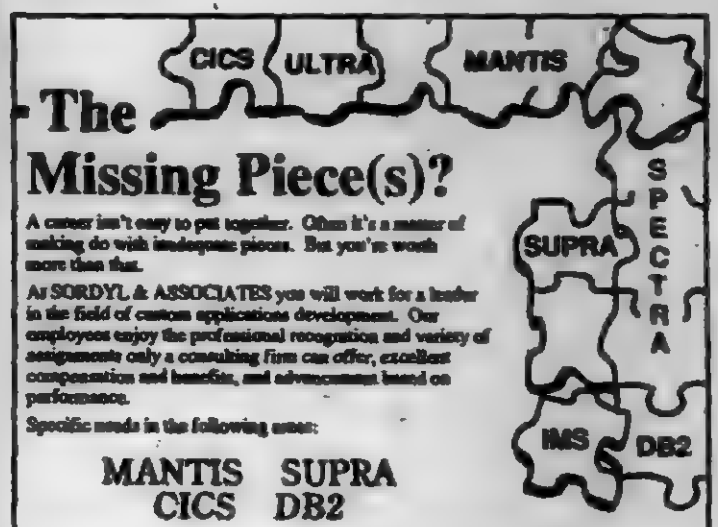
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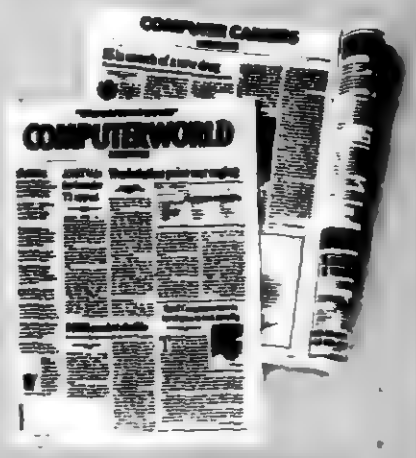
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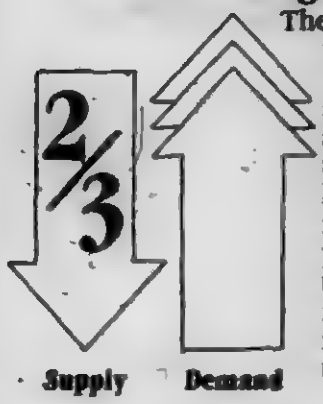
A few important tips on recruiting computer professionals

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The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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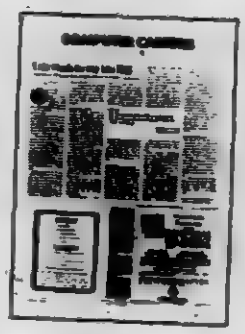
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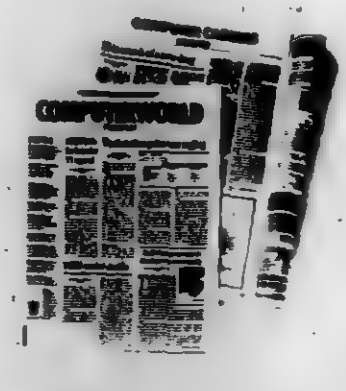
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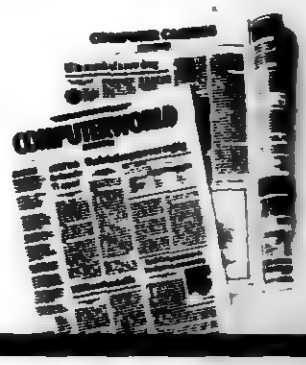
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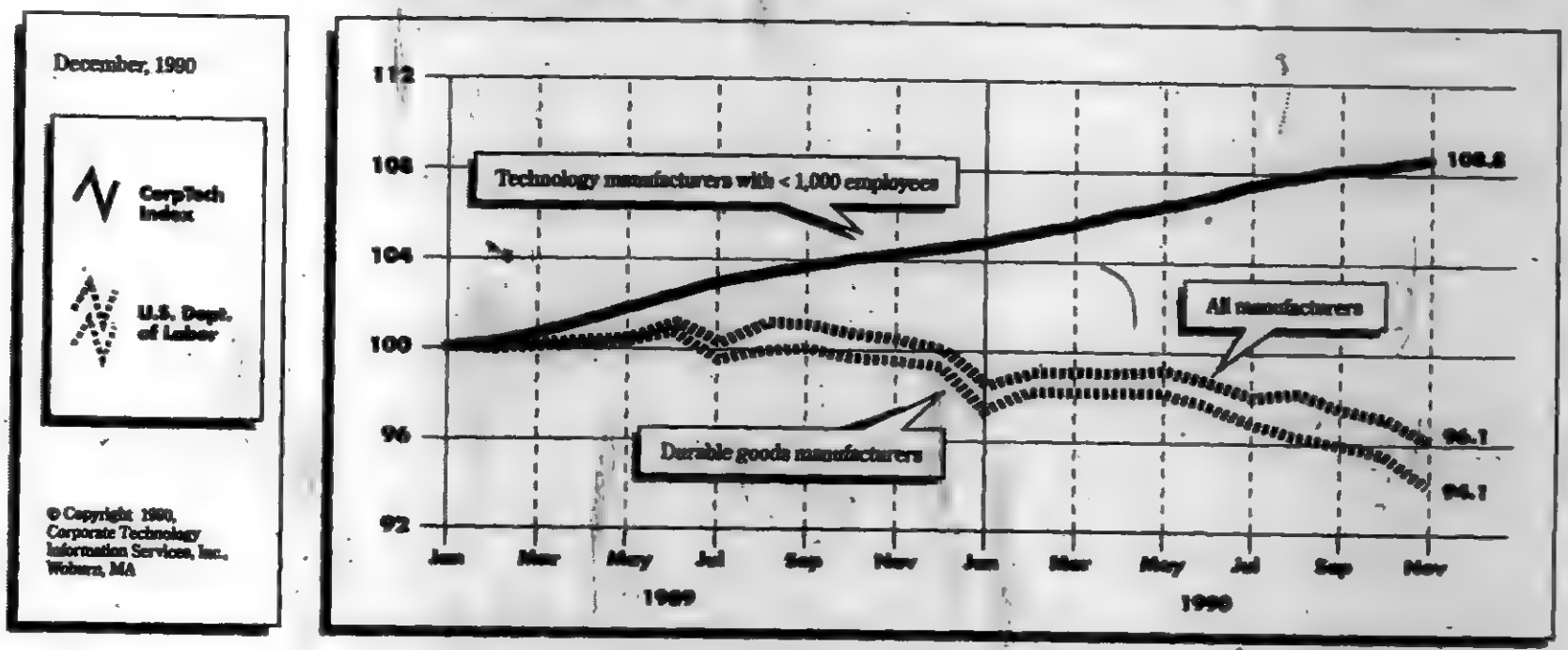


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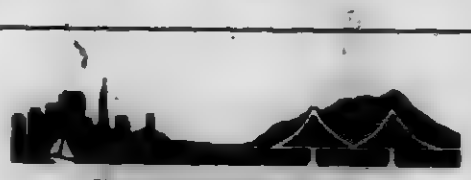
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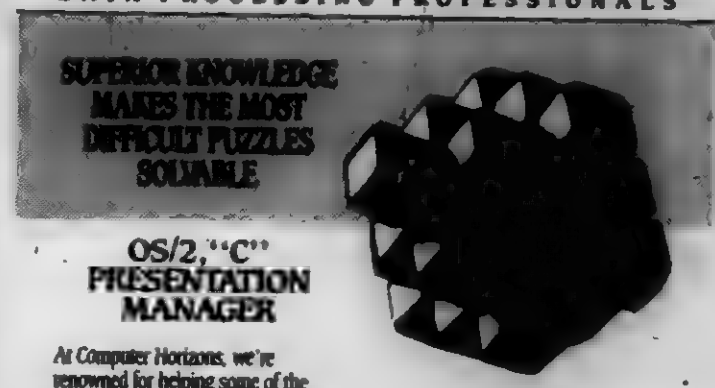
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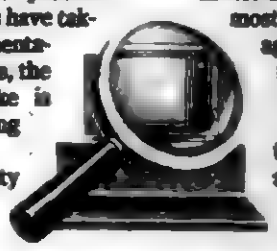
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MARKETPLACE

Drawing tools add panache and pizzazz

BY JESSICA KEYES
SPECIAL TO CW

The job of a technology manager has moved far beyond the role of directing the development and implementation of software. It has moved into an era of fierce competition for every corporate budget dollar. And managers find they can't effectively justify their needs by just scribbling presentations on a blackboard. While presentation graphics tools have taken the art of presentation to new heights, the icing on the cake is freehand drawing software.



There are plenty of presentation graphics packages in the marketplace today, running mainly on Apple Computer, Inc. and IBM platforms: Lotus Development Corp.'s Freelance Plus, Software Publishing Corp.'s Harvard Graphics and Wordperfect Corp.'s Drawperfect are taking the lead. And at an average price of $495, presentation graphics tools are easy to justify in most IS budgets [CW, July 30, 1990].

But one software package can't be all things to all people. In the case of presentation graphics, more serious graphics users find that there is a rather large gap in these packages' ability to do, well, graphics.

Specifically, a drawing package picks up where a presentation package ends. Graphics, in the literal meaning of the term, are more than just the squares, circles and straight lines that most presentation packages limit themselves to. A true graphics package, or drawing software tool, lets the user create one- and two-dimensional art images that are the basis for professional-looking presentations. Even if users aren't artists, these packages are powerful enough and forgiving enough to let them create some heavy-duty graphics.

There are several leaders in the drawing software field (see list at right), and the prices hover competitively around the $595 mark. However, starter drawing packages, such as Zsoft Corp.'s PC Paintbrush, cost as little as $149 but for less robust capabilities.

The following is a checklist of important features to look for when purchasing a drawing software package:

• **Design accuracy.** Depending on the kind of job a user has, he may need to produce true-to-life scaled graphics. If his information systems department supports a group of graphics designers, then the accuracy in drawing had better be there for them. If an IS manager is making a major presentation to justify why he wants 1,000 more personal computers for the company, his slides had better be good.

Drawing software enables the presenters to go beyond what presentation software would enable them to draw. In fact, some of these draw packages come with features that let users smooth those squiggly lines, perfect those circles and ensure that their squares are indeed squares.

• **Speed.** Speed is an important consideration because users will constantly have to move images around their screens. The drawing software repositions images and then redraws the screen. It can be quite frustrating to have to wait long periods of time for each redraw.

• **WYSIWYG.** If the what-you-see-is-what-you-get feature is important for desktop publishing and word processing, it's doubly important for drawing software. This may seem like an obvious feature, but many drawing packages don't offer it. If a user labors for hours over a graphical representation of a horse, then he wants to see it reproduced exactly in its final output form.

Top freehand drawing graphics packages

- Corel Systems' Corel Draw Version 1.11
- Computer Support Corp.'s Arts & Letters Graphics Editor Version 2.1
- Micrografx, Inc.'s Micrografx Designer Version 3.0
- Adobe Systems, Inc.'s Adobe *Illustrator*
- Digital Research, Inc.'s Artline Version 1.0
- Computer Associates International, Inc.'s CA-Superimage Version 1.5
- Kinetic Presentations, Inc.'s Graphs & Art Version 2.0

• **Quality of printed output.** Chances are, the final form of a manager's artistic endeavor will need to be printed. But how? Does his draw package support a plotter such as the six-pen Hewlett-Packard Co. 7475A? If it supports a laser printer, can it print at more than 300 dot/in.? (Most only support 300 dot/in.) The Travelers Corp. uses Corel Systems Corp.'s Corel Draw to achieve print resolution anywhere from the standard 300 dot/in. to a very professional rate of 2,400 dot/in.

• **Clip art library.** Even if a user is a virtual Picasso, why reinvent the wheel? Users must find out if the package they are interested in includes a clip art library in the purchase price (many of them come with coupons that give users discounts on clip art).

• **Ability to import and export clip art.** Most graphics users buy or scan every available piece of clip art they can to save time. Thus, it's a bonus to have the ability to import images from purchased clip art libraries or from other packages that create image files such as simple paint programs or scanners.

Drawing software is a fine complement to presentation graphics software. It provides the capability to create and tailor the basic building block of any good business presentation — the image.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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The BoCoEx index on used computers

Closing prices report for the week ending December 21, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$300	$450	$200
XT Model 086	$500	$550	$450
XT Model 089	$550	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,100	$1,300	$1,025
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,425	$3,450	$3,175
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,180	$1,450	$1,000
SLT 286	$2,500	$2,625	$1,500
Portable 386	$2,300	$2,800	$2,200
LTE 286	$2,000	$2,100	$1,850
Deskpro 286	$1,900	$1,200	$975
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh Plus	$750	$975	$700
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*Source: Audit Bureau of Circulations Supplemental Data Report, May 25, 1987.

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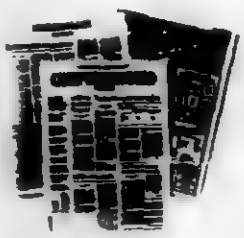
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When IS America and colleges share notes

Editor's note: "Head of the Class" is a monthly column that explores innovative training approaches throughout corporate America.

BY THOMAS R. METZLER
SPECIAL TO CW

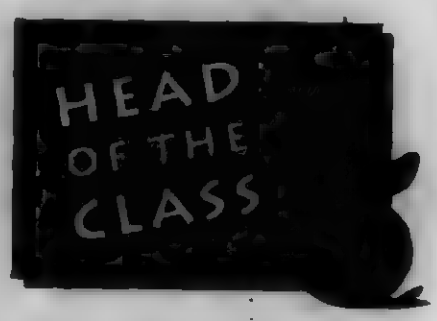
The difference between what computer science graduates need to know and what they actually do know can be like ordering dinner at a nouvelle cuisine restaurant: The menu is pleasing, but there isn't always enough substance to justify the price.

From an information systems manager's perspective, this gap translates into expensive and time-consuming training. For example, last year at Cincinnati Bell Information Systems, Inc., computer science graduates received anywhere from three to seven weeks of training to make up for a lack of technical depth.

From a university's perspective, this hole is even more difficult to fill. The faculty members know that there is a problem, but they are hard-pressed to address it because they are overburdened with course development and are trying to keep up with a technical field that changes very quickly.

Fortunately, some colleges and corporations are working together to correct these inadequacies. For example the DeVry Institute of Technology, a four-year college in Columbus, Ohio, addresses this problem by enlisting the help of an advisory board.

The advisory board consists of volunteer IS directors and managers, computer research scientists and training professionals from corporate IS. Some of the companies that currently participate in the program include Cincinnati Bell, Battelle Memorial Institute, J. C. Penney Co., IBM, The Limited, Inc., Bank Ohio and Nationwide Mutual Insurance Co.



DeVry professors formed the advisory board because they weren't sure whether their school's computer science curriculum was appropriately meeting the needs of the industry. In fact, professors and staff were getting feedback not only from the advisers, but also from students, who told them how to gear their courses toward a particular technology or industry.

The board members meet with DeVry faculty several times per year to discuss issues related to the following questions: What should be taught that isn't being taught now? And, where will the IS path lead in three to five years?

The advisory board's input has prompted course changes. In addition, it has given the faculty leverage in negotiating with the administration to obtain state-of-the-art equipment.

For example, at one board meeting, advisers discussed the impact of computer-aided software engineering (CASE) on corporate software development.

Fitting CASE into curriculum

Through these discussions, DeVry staff members became more aware of the increase in the number of IS departments using CASE technology and investigated how CASE could be fit into DeVry's IS curriculum.

First, the staff presented a CASE seminar for the faculty featuring one of the board members. The seminar prompted the faculty to reshape course offerings, ultimately rolling CASE into the second part of a systems analysis course.

A board member experienced with CASE participated in re-writing the course material. In addition, he taught the first two classes as a part-time paid instructor and then proceeded to obtain CASE tools for the student computer laboratory. Eventually, DeVry's computer laboratory was expanded to include 20 Hewlett-Packard Co. personal computers to support the CASE tools.

CASE awareness has grown ever since. This spring, two educational service instructors from Cincinnati Bell will host a seminar to provide a technological overview of information engineering and CASE for the DeVry faculty.

In addition to CASE, other technologies that have been introduced by the board include the following: replacing Pascal with C; adding MS-DOS, PC-DOS and Unix operating system training; enhancing Cobol training, especially the application and maintenance courses; teaching techniques in Cobol code-generating and workstation debugging; and information engineering methodologies.

The benefits from this information exchange program are obvious: DeVry receives professional consulting free from the board members. The school maintains a strong presence in providing companies with graduates who have practical training at a current technological level, and corporations save money in training. The graduates also gain a more marketable education.

Metzler is a senior training instructor at Cincinnati Bell Information System's Technical Center and has been a member of the DeVry computer information systems local advisory board for more than two years.

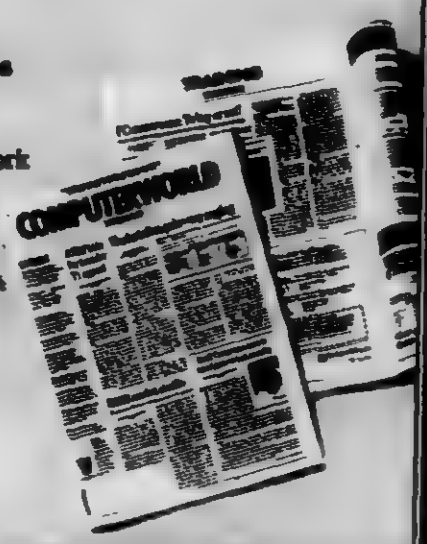
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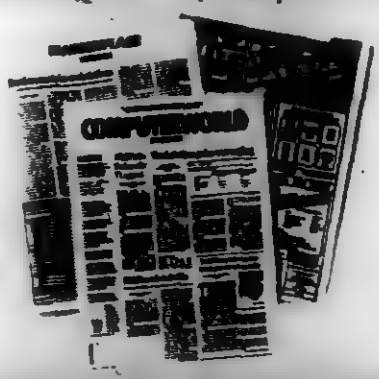
Headquartered in the Boston area, Compurex Systems is a distributor of new and reconditioned IBM and Digital equipment. With a product line that includes everything from systems and disk drives to printers and other peripherals, it has a lot to offer large end users. President Mark, "Rocky" Ostroff, along with his two partners, Christopher Pernock and Jack Malamut, face the challenge of finding everyone who has something to sell or is looking to buy. When it comes to advertising, they're on the right track.

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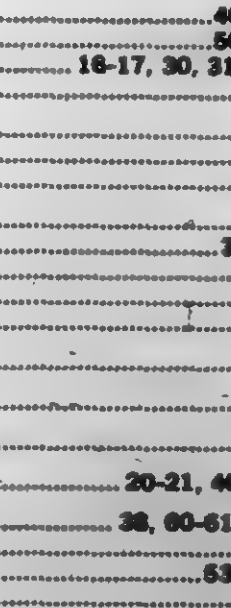
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

FROM HOLD TO BUY: AST Research, Inc. (by Prudential-Bache Securities, Inc.). Reason: Current-quarter earnings will outpace predictions . . . **Intergraph Corp.** (by Prudential-Bache). Reason: Expected to diversify product line by adding software for workstations from Sun Microsystems, Inc.

FROM SELL TO HOLD: Digital Equipment Corp. (by Bear Stearns & Co.). Reason: Reorganization of sales and distribution divisions is a step toward streamlining the firm and becoming more responsive to customers.

FROM MARKET PERFORMER TO UNDERPERFORMER: Adobe Systems, Inc. (by Montgomery Securities) Reason: Uncertainty about revenue growth and the decision to increase operating expenses this year.

INSIDER ACTION

Two vice presidents at Comdisco, Inc., James Duncan and Hugh Roberts, bought stock in the firm early last month. Duncan added more than 68,700 shares to his holdings, while Roberts bought 9,296 shares.

John Adler, chairman of Adaptec, Inc., bought 42,500 shares of company stock in November.

Microsoft Corp. President and Chief Operating Officer Jon Shirley and Director P. G. Allen sold chunks of their stakes in the company in mid-November. Shirley reduced his holdings by 13%, or 7,640 shares, while Allen sold 1% of his portfolio.

GUEST SPEAKER

LIZ BUYER, vice president and personal computer analyst, Needham & Co., New York:

"I do expect growth in the personal computer arena in 1991. Corporations are watching or cutting budgets, so MIS directors may not be able to cost-justify an expensive new Compaq Computer Corp. machine any longer. Companies will be forced to look at the cheaper products of second-tier PC makers, such as AST Research, Advanced Logic Research, Inc. (ALR) and Dell Computer Corp.

"AST will probably pick up the most customers, because it advertises so effectively. Its stock is a good buy now.

"Long-term investors should buy ALR and Tandy Corp. This quarter won't be great for Tandy, but it will come out ahead of most other retailers. The stock will reach the high twenties, maybe even poke into the thirties, within a year.

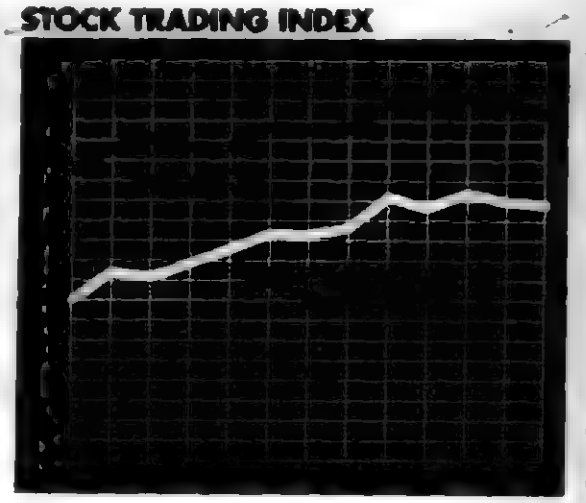
"Sell shares of Everex Corp. It doesn't have a strong product now and won't have one for at least six months, when it plans to make introductions. Its notebook computer is moving now, but it has heavy competition from ALR and Compaq."

ANALYSIS IN BRIEF

Demand for mainframes introduced by IBM, Hitachi Ltd. and Amdahl Corp. last fall continues to beat analyst expectations. Promises to add or improve Unix implementations on these machines will help boost sales. The short-term investment view is cautious but will brighten by later 1991. — Bear Stearns, Enterprisewide Computing, Dec. 21, 1990.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- After reporting that its profits dropped 65% in the fiscal second quarter, Oracle Systems Corp. dove 1 point last week to close Thursday at 7.
- Other software issues were mixed, as Prudential-Bache Securities, Inc. released recommendations for the sector. Microsoft Corp. and Automatic Data Processing, the only "buys" on the brokerage firm's list, both advanced last week. Microsoft added ¼ of a point to 75¼, and Automatic Data Processing inched up ⅛ of a notch to close at 53½.
- The excitement on Wall Street over the fight between AT&T and NCR Corp. may be wearing thin, as both stocks fell. NCR lost 1¼ points by Thursday to close at 88¼, while AT&T declined ⅛ of a point to 29⅜.
- While AT&T tangled with its takeover target, MCI Communications Corp. gained 1 point, closing at 19⅜.
- Semiconductor maker Texas Instruments, Inc. lost 2 points, closing at 37.

Computerworld Stock Trading Summary

TOP PERCENT GAINERS

Datapoint Corp.	44.44
Mitsubishi Electronics	38.94
Businessland Inc.	20.00
Ferret Corp.	19.30
Amplicon Inc.	18.09

TOP PERCENT LOSERS

Altey Computer	-19.67
Sungard Data Sys.	-16.19
Data General Corp.	-12.50
Tandon Corp.	-11.76
Fiberex Int'l Inc.	-11.67

TOP DOLLAR GAINERS

AST Research Inc.	2.75
Dell Computer Corp.	2.25
NCR Corp.	2.00
Dynatech Corp.	2.00
Sequent Computer S	1.75

TOP DOLLAR LOSERS

Digital Equipment Corp.	-3.63
Bell Atlantic Corp.	-2.00
Hynex Corp.	-2.50
Sungard Data Sys.	-2.50
ITT Corp.	-2.38

Exch.	52-Week Range			Jan. 2 Close	Wk. Net Change	Wk. Pct Change

Communications and Network Services — Up 3.16%

OTC	19.50	5.38	3 COM Corp.	8.38	0.88	3.13
NYS	98.75	52.50	American Info Techs Corp.	68.50	-1.75	-2.88
NYS	46.63	29.50	AT&T	29.75	-1.13	-3.64
OTC	3.63	1.13	Ariel Communication Corp.	1.50	-0.06	-4.00
NYS	57.13	38.38	Bell Atlantic Corp.	52.63	-2.75	-4.97
NYS	59.25	46.00	Bellsouth Corp.	54.38	-0.88	-1.59
OTC	16.38	9.25	Compression Labs Inc.	11.00	-0.13	-1.12
NYS	36.38	23.38	Comsat Corp.	35.00	-0.38	-1.06
OTC	4.38	1.75	Data Switch Corp.	3.00	-0.25	-8.00
NYS	88.75	8.88	Digital Comm. Assoc.	11.75	-0.50	-4.08
OTC	20.50	12.38	Dynatech Corp.	19.25	2.00	11.59
OTC	12.88	6.50	Fibronic Int'l Inc.	6.63	-0.88	-11.67
OTC	5.13	1.75	Gandalf Technologies Inc.	2.50	0.13	5.56
NYS	5.00	1.88	General Datacomm Inds.	2.38	0.13	5.56
NYS	36.00	23.50	GTE Corp.	28.75	-0.88	-2.95
OTC	6.50	0.88	Intecom Systems Corp.	1.06	0.06	3.10
NYS	60.88	40.25	ITT Corp.	48.88	-2.38	-4.65
OTC	44.88	16.38	MCI Communications Corp.	19.75	0.50	2.60
OTC	21.00	2.75	Microcom Inc.	4.19	-0.31	-6.89
NYS	34.38	5.00	Network Equipment Tech.	5.75	-0.13	-2.13
OTC	14.63	4.00	Network General	8.88	0.88	11.28
OTC	15.25	8.00	Network Systems Corp.	11.00	0.50	4.76
NYS	28.63	22.13	Northern Telecom Ltd.	27.38	0.50	0.09
OTC	24.00	13.75	Novell Inc.	20.75	0.75	2.27
NYS	91.38	67.13	Nynex Corp.	70.50	-2.50	-3.42
NYS	51.50	38.38	Pacific Telesis Group	44.63	-1.75	-3.77
ASE	9.13	4.75	Paradyne Corp.	8.50	1.38	19.30
NYS	38.13	8.88	Scientific Atlanta Inc.	12.75	0.25	2.00
NYS	84.75	47.25	Southwestern Bell Corp.	56.75	-0.63	-1.11
NYS	46.38	30.63	United Telecom	33.25	0.63	1.78
NYS	48.50	38.38	U S West Inc.	38.25	-1.25	-3.16

Computer Systems — Up 3.81%

OTC	8.75	0.88	Altent Computer Sys.	1.19	0.16	16.88
ASE	18.88	10.00	Amdahl Corp.	14.00	-0.88	-4.27
OTC	47.75	24.25	Apple Computer Inc.	43.88	-0.50	-1.14
OTC	13.88	4.25	Archive Corp.	6.38	0.38	6.25
NYS	7.63	3.88	Burr, Brown & Newman	4.63	0.38	8.82
NYS	11.38	4.88	Commodore Int'l	11.38	1.38	13.75
NYS	67.38	36.50	Compaq Computer Corp.	38.25	-0.25	-0.44
OTC	4.25	0.13	Computer Automation Inc.	0.75	0.06	9.01
NYS	21.63	7.88	Control Data Corp.	8.88	0.13	1.43
NYS	20.88	8.38	Convex Computer	10.88	-0.38	-3.33
NYS	51.25	30.00	Cray Research Inc.	30.50	0.50	1.67
NYS	13.25	3.50	Data General Corp.	4.38	-0.63	-12.50
NYS	4.38	0.75	Datapoint Corp.	1.63	0.50	44.44
OTC	18.25	4.63	Dell Computer Corp.	10.25	2.25	14.06
NYS	95.13	46.50	Digital Equipment Corp.	54.88	-2.63	-4.58
NYS	35.13	13.75	Harris Corp.	20.63	1.13	5.77
NYS	80.38	34.88	Hewlett Packard Co.	31.75	0.13	0.40
NYS	123.13	94.13	IBM	112.13	-1.88	-1.65
OTC	14.00	8.00	Information Int'l	8.75	0.50	6.06
OTC	23.50	10.50	Intergraph	14.00	0.25	1.82
NYS	3.88	0.88	MAI Basic Four Inc.	1.00	0.00	0.00
NYS	165.00	115.50	Mitsubishi Electronics	118.00	-2.00	-1.67
OTC	28.00	9.00	Morley Graphics Corp.	13.63	1.13	9.00
NYS	62.88	44.50	NCR Corp.	89.00	2.00	2.30
OTC	35.50	11.00	Pyramid Technology	12.63	0.63	5.21
OTC	34.00	12.50	Sequent Computer Sys.	19.50	1.75	10.45
NYS	40.88	16.00	Silicon Graphics	28.88	-0.75	-2.71
NYS	28.00	14.63	Stratus Computer Inc.	23.75	0.50	2.15
OTC	37.25	15.00	Sun Microsystems Inc.	21.38	-0.50	-2.29
NYS	39.13	8.88	Tandem Computers Inc.	11.75	0.25	2.17
NYS	41.13	23.50	Tandy Corp.	28.50	-0.38	-1.30
OTC	35.50	9.75	Teradata	12.25	-0.75	-5.77
NYS	9.00	1.38	Ultimate Corp.	2.00	0.00	0.00
NYS	17.13	1.75	Unisys Corp.	2.88	0.38	15.00
ASE	6.25	2.38	Wang Labs Inc. (a)	2.69	0.13	5.00

Software & DP Services — Off 0.89%

OTC	80.75	17.00	Adobe Systems Inc.	28.75	-0.75	-2.54
OTC	31.50	15.00	Aldus Corp.	28.50	0.00	0.00
OTC	19.75	10.50	American Mgmt. Systems	17.88	0.38	2.14
OTC	10.25	7.50	American Software Inc.	14.13	0.13	0.89
NYS	4.75	1.38	Anacomp Inc.	1.75	0.00	0.00
OTC	23.50	10.00	Analysts Int'l	14.25	0.25	1.79
OTC	15.13	4.88	Ashton Tate	5.38	0.00	0.00
OTC	10.25	4.50	ASK Computer Sys.	5.88	0.13	2.17

NYS	80.25	48.25	Auto Data Processing	54.50	0.75	1.40
OTC	60.25	32.00	Autodesk Inc.	39.75	-1.75	-4.20
OTC	35.50	12.00	BGS Systems Inc.	21.50	1.50	7.50
OTC	30.25	17.75	BMC Software Inc.	23.25	1.50	6.41
OTC	21.50	11.00	Boole & Babbage Inc.	14.50	-0.25	-1.69
OTC	32.00	9.50	Borland Int'l	20.38	-0.13	-0.61
NYS	11.25	1.13	Businessland Inc.	1.50	0.25	20.00
OTC	10.25	4.50	Cognos Inc.	5.38	-0.25	-2.50
NYS	16.88	4.38	Computer Associates	7.75	-0.25	-3.13
OTC	17.25	7.75	Computer Horizons	16.75	0.00	0.00
NYS	58.00	26.75	Computer Sciences	49.38	0.63	1.28
NYS	12.25	8.88	Computer Task Group	8.38	0.88	8.06
OTC	25.25	14.25	Comshare Inc.	16.13	-0.63	-3.73
OTC	18.00	3.75	Corporate Software	6.88	0.25	4.00
NYS	40.13	24.38	General Motors pf cl	37.75	-1.75	-4.43
OTC	18.25	7.25	Goal Systems Int'l	11.75	1.25	11.90
OTC	4.75	1.88	Hogan Systems Inc.	2.44	-0.06	-2.49
OTC	8.75	6.63	Indec Technology	6.69	0.13	1.47
OTC	10.63	7.75	Information Resources	8.88	-0.75	-7.80
OTC	17.50	3.88	Informix Corp.	4.25	-0.25	-5.56
OTC	7.88	1.38	IntelliCorp Inc.	1.88	0.13	7.14
OTC	27.50	10.00	Knowledgeware Inc.	21.25	0.13	0.59
OTC	31.00	16.75	Legent Corp.	28.38	0.38	1.44
OTC	28.25	12.50	Lotus Development	19.75	-0.13	-0.63
OTC	28.25	13.88	Microgate	23.50	-1.38	-5.55
OTC	80.75	42.00	Microsoft Corp.	74.75	-1.50	-1.32
NYS	11.38	4.88	On Line Software Int'l	6.13	-0.38	-5.77
OTC	38.88	4.88	Oracle Systems	8.00	-0.13	-1.54
NYS	18.50	7.50	Parasitic Systems	9.50	1.38	16.97
OTC	5.38	1.38	Phoenix Technologies	2.75	0.13	4.76
NYS	43.50	20.50	Policy Management Sys.	41.75	0.13	0.30
NYS	24.50	11.50	Reynolds & Reynolds	18.75	0.50	2.60
OTC	16.13	8.00	Sage Software Inc.	8.75	-0.75	-7.89
OTC	22.25	14.50	SAS Corp.	21.50	0.50	2.38
OTC	18.50	12.00	Shared Medical Systems	16.13	-0.25	-1.53
OTC	20.00	12.00	Software Publishing Corp.	22.75	1.25	5.81
NYS	11.00	5.38	Sterling Software	9.25	0.75	10.00
OTC	22.00	8.00	Sungard Data Sys.	11.25	-2.50	-18.18
OTC	29.50	15.00	Symantec Corp.	27.50	-2.50	-8.30
NYS	24.88	4.88	System Center Inc.	5.75	0.88	17.95
OTC	28.75	12.75	System Software Assoc.	26.75	1.50	5.94
OTC	27.38	4.75	Wang	7.75	-1.00	-11.43

Semiconductors — Off 1.77%

NYS	33.88	17.38	Advanced Micro Devices	22.38	-0.38	-1.65
NYS	9.88	5.50	Analog Devices Inc.	6.88	-0.50	-6.78
OTC	23.88	5.38	Chips & Technologies	7.75	-0.50	-6.06
OTC	52.00	28.00	Intel Corp.	39.50	-0.75	-1.91
NYS	13.00	5.13	LSI Logic Corp.	8.38	0.13	2.69
NYS	16.38	8.75	Micron Technology	9.88	-1.50	-6.30
NYS	68.38	46.13	Motorola Inc.	52.50	0.50	0.99
NYS	8.88	3.00	National Semiconductor	4.50	-0.50	-7.69
NYS	44.00	32.50	Texas Instruments	37.25	-0.50	-1.32
OTC	12.25	3.00	VLSI Technology	4.88	0.38	8.33
ASE	14.88	4.88	Western Digital Corp.	5.00	0.88	11.11

Peripherals & Subsystems — Up 0.31%

OTC	2.38	0.88	Alloy Computer Prod.	0.13	-0.69	-18.97
OTC	2.50	0.88	Apertus Technologies	1.38	0.00	0.00
OTC	38.50	10.38	AST Research Inc.	28.50	2.75	8.16
OTC	24.00	10.00	Bancec Inc.	10.88	-0.50	-4.88
ASE	7.88	3.13	Cognitronics Corp.	7.13	0.13	1.79
NYS	31.25	12.25	Conner Peripherals	23.13	0.50	2.21
ASE	22.00	7.88	Datarem Corp.	8.75	0.00	0.00
NYS	9.75	2.38	EMC Corp.	6.88	0.75	9.82
NYS	43.88	33.75	Eastman Kodak Co.	41.13	-0.75	-1.79
OTC	8.88	4.38	Emulex Corp.	5.38	0.25	4.88
OTC	34.50	14.00	Evans & Sutherland	17.88	-0.50	-2.78
OTC	8.00	2.50	Interlaser Inc.	3.88	-0.13	-3.33
OTC	6.25	3.00	Iomega Corp.	5.13	-0.06	-1.21
OTC	16.50	5.88	IPL Systems Inc.	14.50	1.00	7.41
OTC	2.38	0.13	Maxstor Systems	0.44	0.13	39.84
OTC	17.00	4.00	Mentor Corp.	5.13	0.25	5.13
OTC	10.25	2.38	Micropolis Corp.	6.38	-0.50	-6.77
NYS	91.38	73.88	3M Corp.	84.88	-1.50	-1.74
OTC	14.50	8.00	Peripheral Inc.	8.75	0.13	1.45
NYS	21.25	8.50	Qubi Inc.	14.25	-0.75	-5.00
OTC	28.75	9.88	Quantum Corp.	17.88	-0.88	-4.98
NYS	7.50	4.38	Reprographic Equipment	5.00	0.00	0.00
OTC	9.88	4.00	Rexon Inc.	6.50	-0.88	-4.77
OTC	18.75	8.88	Seagate Technology	11.88	-0.25	-2.11
NYS	35.25	11.00	Storage Technology	21.50	-0.50	-2.27
OTC	4.00	0.63	Tandon Corp.	1.88	-0.25	-11.76
NYS	10.25	11.88	Tektronix Inc.	16.13	-0.13	-0.69
OTC	0.69	0.19	Televideo Systems	0.22	0.00	0.00
NYS	58.88	38.00	Xerox Corp.	38.38	1.13	2.39

Leasing Companies — Up 4.79%

OTC	11.50	6.88	Amplicon Inc.	9.00	1.38	18.88
OTC	4.50	0.31	Capital Associates	0.69	0.06	10.00
NYS	38.50	14.50	Comdisco Inc.	16.88	1.38	7.91
OTC	16.50	9.38	LDI Corporation	12.00	-0.38	-3.07
OTC	6.75	2.38	Safeguard Inc.	2.50	-0.38	-10.00

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NEWS SHORTS

Ingari leaves Lotus

While Interleaf President Robert Weiler was going in one door at Lotus Development Corp. (see story page 97), Lotus Vice President Frank Ingari was going out another — and up the career ladder. Last week, Ingari was appointed president and chief executive officer at Ontologic, Inc. Ingari previously headed up the Emerging Markets Business Group at Lotus and was responsible for the recent launch of Lotus Marketplace. That group will now report to Lotus Vice President June Rokoff. Separately, Ontologic, which claims to have 200 commercial sites using object-oriented databases, announced Release 2.0 of its Ontos production database. In his new post, Ingari said he expects to be doing a lot of market creation and evangelism work. Relational is king among databases today, but object orientation is the next generation, he said.

Michigan dumps software tax

The Michigan state legislature has decided not to tax computer software as tangible personal property after all. In a move praised by Adapso, the legislators reversed a decision by the state tax commission that applied the tax to all software within the state — whether developed by a company for internal use, by a contractor or purchased off the shelf. The tax was strongly opposed by Comshare, Inc., a software vendor based in Ann Arbor, Mich., and the Michigan Chamber of Commerce.

Computer law pioneer dies

Edward Saltzberg, a computer industry attorney credited as a pioneer in the emerging area of intellectual property law, died suddenly of a cerebral hemorrhage last week. Saltzberg, 43, a partner in the Boston-based law firm Warner & Stackpole, started his career as a systems analyst. He spearheaded and edited the "Computer Law" newsletter, a publication distributed by his firm. Saltzberg described himself as an interpreter, able to translate "legal jargon and computerese back into a language that all can understand."

Northern chops pollutants

Northern Telecom, Inc. announced last week that its two largest manufacturing operations have completely eliminated the use of chlorofluorocarbons (CFC), adding that it plans to completely eliminate CFCs from its worldwide operations sometime this year. The network switch manufacturer said it has reduced its use of CFCs by 80% since July 1988. The current use of CFC solvents by a variety of industries is reported to be depleting the earth's protective ozone layer. Northern Telecom, along with other members of the electronics industry, uses CFC-113 solvents to clean soldering residue from printed circuit boards.

Los Alamos licenses testers

Los Alamos National Laboratory has granted an exclusive license to Input Output Systems Corp. for testers of the High Performance Parallel Interface (Hippi) channel. Mountain View, Calif.-based Input Output, which is a joint venture of FPS Computing and Systolic Technology, Inc., will develop, manufacture and distribute the testers. The Hippi channel, which is supported by such high-performance computer firms as Cray Research, Inc., IBM and FPS Computing, supports a data bandwidth of 100M byte/sec.

Summer trial for Lotus cases?

Following a pretrial conference last week with Lotus Development Corp., Borland International, Inc. and The Santa Cruz Operation (SCO), U.S. District Court Judge Robert Keeton had ordered Borland and SCO to combine their evidence-gathering activities and gave them six months to complete the process. Borland's request for a one-year discovery period was rejected by Keeton, who said he would rule later on whether he will combine the two trials into one. Lotus has filed separate suits in Boston federal court against Borland and SCO, alleging copyright infringements. A Lotus spokesman said a trial date will probably be set this summer.

Third-party tool gains manufacturing favor

BY ELISABETH HORWITT
CW STAFF

Approximately one year after hitting the market, a third-party tool for coordinating data flow between shop-floor process control and business systems is well on its way to being a computer-integrated manufacturing (CIM) linchpin for the process manufacturing industries. It has also become a keystone of IBM's efforts to become those industries' prime CIM supplier, according to one company spokesman.

Process Operations Management System (POMS), developed by Industrial Computing Designs Corp., or Incode, is an IBM OS/2 Extended-based system that combines a relational database management system "core" with application development tools.

The resulting architecture is said to allow nonprogramming users to develop their own applications to integrate various levels of plant scheduling, operations and control.

By backing the development of a "real, live CIM application that targets real, live business problems," IBM hoped to encourage process manufacturers to take the CIM plunge, said Jim Dixon, IBM's strategy manager for the process industries. Unlike discrete manufacturers, the process industries have been almost virgin territory when it comes to CIM implementations, according to Cambridge, Mass., research firm Advanced Manufacturing Research, Inc.

Worth the risk

IBM's gamble has clearly paid off: In the first year of commercial availability, POMS has been implemented at 50 to 80 companies, including a growing number of process industry sectors and at least one discrete manufacturer, Dixon said.

While the vast majority of the newer installations consist of one test site, several members of the POMS consortium are now preparing to move beyond testing to expanding installation. The consortium, which was formed to provide input, funding and pilot testing for POMS, consisted of IBM and five food and drug companies.

Nestle Foods Corp. is one such company. The food giant is now in the process of setting up a POMS database that will collect data from the factory floor and feed it into scheduling, analysis and eventually inventory and manufacturing resource planning systems, according to company spokesman Walter Carey. POMS saved Nestle from the expense of having to develop its own system, Carey said.

One of POMS' more recent implementors is Baxter Health Care Corp. At Baxter's intravenous solutions plant in North Cove, N.C., POMS applications now under development will not only manage collection of data for compliance with Food and Drug Administration requirements but will also ensure better compliance by sending instructions down to the personal computers of users on the plant floor, according to Steve Hunter, CIM development manager.

One of POMS' biggest pluses, Hunter said, is the fact that it is designed for use by people like him who are not programmers but "know operations, documentation and FDA requirements."

One of the reasons POMS has met such a wide range of user needs is that it was endowed with "snap-ons" — hooks on which existing third-party software packages can post data to and access data from POMS databases. IBM is now pushing for links between POMS and the systems and applications of its chief rivals on the factory floor. "We can't expect users to throw out all of their existing systems," Dixon said.

POMS' support of a broad range of IBM and non-IBM systems is key to Rohm & Haas Co., said Alan Kober, the Philadelphia-based firm's information technology manager. Rohm & Haas is installing POMS at one of its plants to collect data from process control systems and feed the relevant data to business systems and to a database that can be accessed by troubleshooting, process optimization and quality improvement applications, Kober said.

IBM IS NOW pushing for links between POMS and the systems and applications of its chief rivals on the factory floor.

Reading POMS

In one year, POMS has drawn between 50 and 80 converts to IBM's Computer Integrated Manufacturing Advantage Program — and, incidentally, sold a fair number of OS/2 Extended Edition-based workstations. However, recent and pending developments could make 1990's harvest of customers look paltry in comparison with this year's doings.

Perhaps the most crucial development to date is IBM's purchase last October of sole marketing rights to POMS from Incode. IBM charges $6,300 for one workstation license, compared with Incode's $4,900 price tag. However, IBM's price includes one year of maintenance and updates, an amenity many Fortune 500 companies will appreciate. Incode remains the system's primary developer.

The year 1990 also saw the disbanding of the original POMS consortium to make way for a second group, which will include IBM and end users. The group's mandate will be to define POMS' next batch of added capabilities.

Those capabilities will include the following:

- Advanced statistical analysis, modeling and experimental tools will be integrated into POMS so that such applications can make use of the large volume of data available in the system's relational database.
- Incorporation of technology recently developed jointly by IBM and Intel Corp., which makes it practical to transmit interactive video over local-area networks. As a result, supervisors will not only be able to track how their operators are doing on the floor but also instruct them to call up a given video that will demonstrate the next procedure via POMS, according to Incode President Kurt Grina.
- POMS' graphics capabilities will be extended to include more recent developments in IBM's Common User Access interface. This will provide users with the ability to view and zoom in on various factory processes in real time, Grina said.
- Support of networking protocols that will allow POMS workstations to interact with other major plant systems from firms such as Digital Equipment Corp. and Hewlett-Packard Co.
- Links between POMS on the OS/2 and IBM RISC System/6000 AIX workstations. This development addresses the growing support among engineers for databases running on such systems, Grina said.

ELISABETH HORWITT

Blue Shield

FROM PAGE 1

Imageplus image processing application.

"However, the cost per MIPS [millions of instructions per second] is phenomenally lower on the desktop than on the mainframe," explained Richard R. Buehler, director of information strategy.

Mainframes are still needed to house the corporate IBM DB2 database, according to Buehler. He said the relational database management system allows him to get reports one day after the end of the month and "look at all aspects of the company and customers — not just claims — instead of being 120 days behind the power curve."

> "PART OF THE payback on our investment will simply be staying in business."
>
> ROBERT E. THOMAS
> BLUE SHIELD OF PENNSYLVANIA

The company, which fortunately has no existing LAN investment to abandon, has standardized on the Banyan Systems, Inc. Virtual Networking System network operating system (see story below).

"We were given orders by executive management in February of 1989 to look at the whole computing ball of wax so that we could hold our place in the market," Buehler said. "We determined that the network was the key to the whole thing — the real pipeline," he said.

Buehler estimated that his company will have invested about $3.5 million in its revamped network between 1989 and year's end 1991.

"Part of the payback on our investment will simply be staying in business," commented Robert E. Thomas, manager of technical strategies.

He said the network is needed to support the addition of a new facility and 1,500 to 3,000 users this year. The configuration will involve the installation of 30 to 50 high-end IBM Personal System/2s and possibly Compaq Computer Corp. Systempros as servers.

Currently, the four-site Blue Shield campus supports about 6,000 users, and its information services staff numbers about 600.

Other factors inspiring the firm to a LAN solution were the influx of nearly 800 personal computers into the company and the hefty cost of directly attaching them to the mainframes — particularly because the company moves about 50% of its staff per year, according to Thomas.

He added the company will save $115,000 per year by terminating its lease for Hyperchannel Network Systems Corp.'s Hyperchannel extenders — high-speed PC-to-mainframe links.

Replacing IBM controllers

A $2.5 million chunk of the firm's $3.5 million investment will go toward replacing about 200 IBM 3274 cluster controllers, which do not attach to a Token-Ring network.

The new cluster controllers will protect the company's investment in about 4,500 3270 dumb terminals by bringing them onto the Token-Ring network. Claims applications will remain on the terminals, while PCs will be used for data manipulation and statistical and actuarial tasks.

Cluster controllers link terminals and PCs into an IBM front-end processor, which hooks into an IBM mainframe.

About $750,000 will be invested in IBM Token-Ring bridges, which were selected over equipment from Andrew Network Products and Crosscom Corp. after benchmark testing, according to the company.

Token-Ring LANs spanning five locations will interconnect via two 16M bit/sec. fiber backbones (one for redundancy), which will eventually be upgraded to 100M bit/sec. Fiber Distributed Data Interface LANs when the company deems it a stable technology, according to Michael S. Kinsey, leader of the network project.



Blue Shield of Pennsylvania's *Buehler, Thomas and Kinsey are leading the company's LAN brigade*

The fiber backbones tie into the company's four mainframes via an IBM 3745 front-end processor and bridge to the satellite locations over redundant dedicated T1 lines, which carry both voice and data.

Redundancy was a major network consideration, according to Buehler. Part of the reason, he said, is that the government mandates that any agency handling Medicare claims must provide nearly 100% network availability. Inherent in Token-Ring technology is a loop-back capability, which is not found in Ethernet LANs, that allows the network to wrap and heal if one node goes down.

Health care insurer picks Vines

Amid all of the purchasing decisions facing Pennsylvania Blue Shield after signing off on a Token-Ring local-area networking strategy was the selection of a network operating system. The firm chose Banyan Systems, Inc.'s Virtual Networking System (Vines), which industry analysts have long pegged as a technical prodigy because of its Streettalk global naming service.

The Streettalk feature, which allows users to use one log-on from anywhere in a wide-area network, better positions the network operating system for enterprisewide networking than products inherently designed for departmental-size networks.

Indeed, the insurance carrier said it chose Vines for "its ease of use and ability to have one log-on," said Linda DuRussell, a communications programmer in the company's network planning and design group who recommended Banyan.

While Pennsylvania Blue Shield acknowledged that commercial applications are more widely available for other network operating systems — such as market leader Novell, Inc.'s Netware — the insurance carrier is taking strides to minimize in-house software development. Blue Shield has joined with other large Banyan users to approach applications developers en masse and demand the applications they need [CW, Dec. 17, 1990].

Banyan said it fully supports the fledgling group. "It is precisely the type of consumer lobby the industry needs to validate future development for what promises to be one of the booming software markets of the new decade," said James D'Arezzo, vice president of marketing at Banyan.

While Banyan positions itself as an enterprise vendor, DuRussell acknowledged that "you get better response from Banyan without troubling them with petty problems." She added that Banyan has suggested the company work with a value-added reseller instead of directly with the vendor for support.

JOANIE M. WEXLER

IBM bids to build on Japan clone market

BY RICHARD PASTORE
CW STAFF

As the U.S. personal computer market continues gasping for growth and the Western European market becomes winded, PC vendors are turning to the Far East for resuscitation. As evidence, IBM announced its intention late last month to open up its Japanese PC architecture to clone vendors.

U.S. PC shipments will grow by only 3% in 1991, while Western European shipments will increase 6.5% enroute to a 1992 peak, according to International Data Corp. in Framingham, Mass. The Japanese market, however, will jump 25.5% this year.

To get a bigger piece of this fast action, IBM has formed an Open Architecture Developers Group in Japan that will provide future members with specifications, testing guidelines and technical support for building Japan-specific IBM-compatible systems.

When the group gets down to business sometime next year, the first architectures to be opened will be the Japanese version of IBM's Personal System/2 Model 55, its new Kanji/English DOS J4.0/V and the Video Graphics Array controller.

"We're opening this architecture as we did with DOS here to try to encourage it becoming a more widely accepted standard," IBM spokesman Mac Jeffrey said.

Increased Japanese sales

In Japan, the move is expected to increase development of IBM-compatible hardware and software, which in turn should spur sales.

"So far, users have tended to choose NEC because of the variety of software applications," a Japanese user told *Computerworld Japan*. "But from now on, IBM can be a big candidate for purchase because we can expect many more applications than before."

NEC Corp. dominated the market in fiscal 1989 with about 47% of PCs shipped and 46% of the installed base. IBM units comprised only 6% of shipments and 5% of the installed base.

Because the group is open to members from Japan and elsewhere, it could make rivals such as Compaq Computer Corp. overseas bedfellows with IBM.

"If Compaq went ahead with their own products in Japan, they would be fighting NEC. It seems they would be better off joining a common cause," said Sam Albert, an independent consultant and president of Sam Albert Associates in Scarsdale, N.Y.

In a recent interview, Compaq Chief Executive Officer Rod Canion stated his intent to launch a major thrust into the Japanese market over the next five years. However, he added, "It will be a tough market to enter."

IBM's open architecture strategy will be expanded to OS/2, the Micro Channel Architecture (MCA) bus and more advanced graphics controllers, IBM Japan Vice President and General Manager Nobuo Mii said. IBM will not charge license fees for these technologies, with the exception of MCA, he noted.

Mii also intimated that the program will span beyond Japan. "Other worldwide IBM offices, including Europe, Taiwan and Korea, will soon take the same approach," he said. IBM spokesmen in the U.S. could not confirm these expansion plans.

Lotus/DBMS killed in inaction

Officials say firm is switching to a family of database tools for nonpros

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — It looks like Lotus/DBMS, which Chairman Jim Manzi recently classified as "missing in action," is actually dead, Lotus Development Corp. officials acknowledged last week that it has killed the database engine, first announced in May 1987.

There is an element of truth in Manzi's joking remark. Eric Kim, general manager at Lotus' End User Database Tools Group, confirmed last week that the database engine has been scuttled. Kim and Manzi said that, instead, they plan to deliver a family of database tools for nondatabase professionals during the next 12 to 18 months. The first tool in this family to ship was Datalens.

Lotus plans to enable the average spreadsheet user to quickly and painlessly access, capture and structure data in a way that is meaningful to the user. For example, the user may need to manipulate and attach certain numbers to the same report every week, Manzi said. Lotus plans to provide tools that will enable the user to write an application to automate the process.

This latest database strategy has gone through many incarnations and unmet promises. The initial strategy was to ship an OS/2-based Lotus/DBMS for networks in 1988, after OS/2 Presentation Manager shipped. Lotus/DBMS was supposed to aid in linking local-area networks to IBM hosts, and it was described as a line of LAN and SQL database products whose engine would be compatible with IBM's DB2.

Victim of circumstance

Lotus/DBMS "lost its way," according to a source close to Lotus. The source claimed the project fell prey to various "screwups" as well as a revamping of priorities in 1989 as Lotus hustled to get 1-2-3 Version 3.0 out the door.

At one point, the product veered off course into a since-aborted Ashton-Tate Corp. Dbase clone effort. "It wasn't a well-managed product," the source said.

This track record does not deter Manzi's apparent determination to crack the database management system market, however. "If we do our job right, the end user will be able to get at the database without IS intervention," he predicted, saying that every white-collar job has the need to access "immense warehouses of data."

Neither Manzi nor Kim would explain how this would be done. Kim did say Lotus is looking at providing tools that do things spreadsheets and word processor are not made to do.

Kim ticked off a list of probabilities, including tools that would help users get to needed data in a relational DBMS, build applications quickly, keep track of information and provide a way to attach data to prespecified files on a regular basis. He did not elaborate further.

Kim said the key to cracking the market is "breaking the usability barrier." Existing tools require users to be database experts, he claimed. Lotus' strategy is to "provide a higher degree of usability through a combination of a graphical user interface — Microsoft Corp.'s Windows 3.0 first — object-oriented programming and a true client/server architecture," Kim said.

Weiler jumps Interleaf, takes Lotus sales helm

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Following two quarters of sluggish profitability and increasingly successful raids by competitors on its installed base, Lotus Development Corp. last week named Interleaf, Inc. President Robert Weiler senior vice president of sales and marketing.



Weiler: *brings IS experience from Cullinet, M&D*

Weiler will report to Lotus President Jim Manzi. The post was formerly managed by Frank King, senior vice president of the Software Business Group.

A onetime president of Cullinet Software, Inc. who gained his management training in various positions at McCormack and Dodge, Weiler gets high marks from industry observers.

"He's a brilliant marketer," said Mort Rosenthal, president of Corporate Software, Inc. Weiler sits on Corporate Software's board.

The appointment is seen by industry observers as a sign that Lotus will become more aggressive in the months ahead, when it is expected to introduce at least as many products as it did last year. These will include the release of 1-2-3 for Windows and a version for Apple Computer, Inc.'s Macintosh.

"One of my priorities will be competitive response," Weiler said in an interview. This is considered key by analysts such as Montgomery Securities' David Bayer, who said that this week's release of Microsoft Corp.'s Excel 3.0 (see *story page 1*) will make it that much harder for Lotus to post a profitable first quarter.

Following Weiler's departure, Interleaf named Mark K. Ruport president and chief operating officer. He was previously Interleaf's senior vice president of sales and marketing.

While acknowledging the need to aggressively confront rivals Microsoft and Borland International, Inc., Manzi said Weiler's primary role will be to use his information systems experience to transition Lotus as the industry moves away from stand-alone retail sales toward more corporate and network-oriented sales.

The 39-year-old Weiler is generally credited with turning around the financially troubled Interleaf, which produced a small profit at the end of his 14-month tenure.

A 17-year industry veteran, Weiler joined Interleaf after serving as president and COO at Cullinet. Before that, he was president and chief executive officer at Distributed Management Systems, which was acquired by Cullinet.

Macworld eyes will be focused on connectivity

BY JAMES DALY
CW STAFF

SAN FRANCISCO — Connectivity will be the buzzword at this week's kickoff of the semiannual Macworld Expo as Apple Computer, Inc. unveils a pair of add-on Ethernet connectivity cards: one designed for the Macintosh LC and another for its Macintosh II family. Several transceivers and an updated version of Apple's X Window System-based software for its A/UX Unix offering will also debut during the four-day show.

The networking card introductions highlight Apple's renewed commitment to go beyond the slow 230K bit/sec. Localtalk support built into the Macintosh motherboards and to commit to faster 10M bit/sec. Ethernet connectivity options. "Ethernet is the LAN medium of choice; it provides the higher speed platform we need for the large corporate network accounts," said Jim Groff, Apple's networking and communications product manager.

A Macintosh picture

The graphics abilities of the Macintosh have spurred a healthy market for presentation graphics software

	Packages shipped	Revenue	Installed base
1988	[illegible]	[illegible]	210.1
1989	[illegible]	[illegible]	351.1
1990*	185.3	$97.3	$34.4
1991*	240.2	$62.6	777.5

*Estimated

Source: International Data Corp. CW Chart: Paul Mock

The Ethernet NB Card features a built-in Motorola, Inc. 68000 microprocessor and is scheduled to arrive in the first quarter and sell for $424. The Ethernet LC card is due by the end of the month and will sell for $199. Both boards will include an attachment unit interface that requires Apple's new Ethernet Twisted-Pair Transceiver. Groff said the design simplifies network installation and configuration changes because it allows users to connect and disconnect at the interface level rather than at the cable level, leaving the transceiver in place.

Additionally, Apple will introduce X Window System 2.1 for its A/UX Unix derivative. The system will sell for $350 and is scheduled to ship by the end of the month.

Other products expected to debut at Macworld include the following:

- Apple third-party networking product manufacturer Asante Technologies, Inc. will announce a family of products that supports Apple's new Ethernet strategy.
- Sony Corp. will strengthen its multimedia offerings with the VBOX controller, a computer/video interface box that helps step up the integration of video cameras, recorders and display devices into the personal computer environment. VBOX is slated to be available later this year. No price had been determined at press time.
- Radius, Inc. will add a spin to color with a color version of its Pivot Monitor. The company will also unveil the Pivot for Built-In Video, which offers built-in video display capabilities for the Macintosh.
- Solutions, Inc. will unveil its Appletalk version of Backfax, which allows a single facsimile modem to be shared by Appletalk network users. The Williston, Vt.-based company said it will ship the product in the spring with a suggested retail price of $495 for a server and five users.
- Advanced Vision Research, Inc. will introduce both the AVR 3000/CL Plus color scanner and the AVR 3000/GS Plus gray-scale scanner. The products are expected to be available later this month for $2,590 and $2,090, respectively.
- Paracomp, Inc. will demonstrate a full revision of its Modelshop three-dimensional design and sketch tool. Modelshop II will be priced between $600 and $800; the product is scheduled to ship in March.

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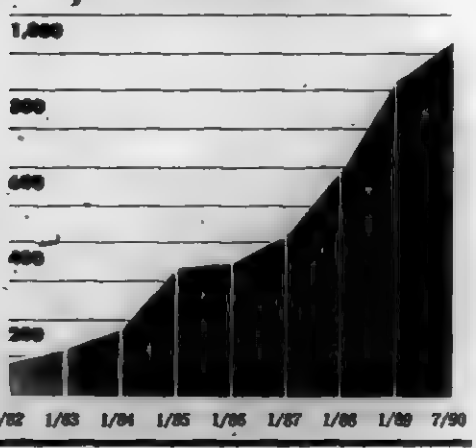
DASD

The pace of the direct-access storage device (DASD) market within the IBM/plug-compatible arena has slowed in the last two years after enjoying a period of prolonged growth

Estimated installed DASD capacity, U.S. sites

(in terabytes)

Although installed DASD capacity has reached over 900 terabytes, the anticipation of the 3390 lessened the demand for 3380 drives slightly, causing a slowdown in the rapid growth the market experienced a year before



3380, 3390 drive types, U.S. sites

(percent of installed capacity)

IBM's 3390 has not yet displaced 3380 installations, accounting for only 3% of installed disk capacity of 3390 and 3390 drives

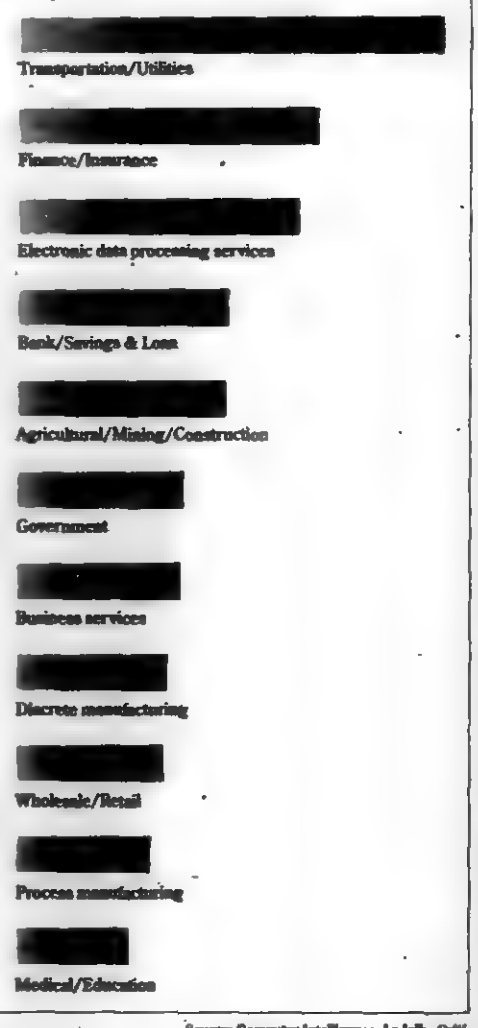


Respondent base: 7,350 U.S. IBM/plug-compatible mainframe sites

Average installed DASD capacity, U.S. sites

(average capacity per site in gigabytes)

The transportation and utilities industries average a greater DASD capacity per site than any other area with 97% provided by 3380-type drives



Source: Computer Intelligence, La Jolla, Calif.

NEXT WEEK

The centrally decentralized information systems model exists at Waste Management, Inc., the nation's largest trash hauler and landfill operator. IS chief Edward Bacom heads a central staff of 400 at the Oak Brook, Ill., headquarters but also leads a network of 10 "regional CIOs." Manager's Journal examines this hybrid IS structure.



Michael Abramson

The IS field has not been a very hospitable place for minorities. Whites far outnumber blacks, Hispanics and Asians in IS management and technical positions. But efforts are being made to reverse that trend through science and engineering training and mentoring. In Depth takes a look at what life in IS is like for minorities.

INSIDE LINES

Burning NET bridges?

Despite denials from both parties, those rumors of discord between IBM and its T1 switch partner Network Equipment Technologies are simply not going away. The latest fillip, reported by several reliable sources, is that IBM is now in the midst of a "heavy mating dance" with NET's rival, Newbridge. One good indicator of where IBM's affections now lie will be who becomes involved in a switch adjunct to the 3745, which IBM is supposed to announce by spring. Unlike the NET switches IBM now resells, this switch will be IBM-labeled and tightly coupled to both IBM's front end and Netview, our sources tell us.

What did Santa leave Lotus?

The elves tell us they left a June ship date for Lotus 1-2-3/W, the Microsoft Windows 3.0-compatible spreadsheet, and a possible October ship date for the Apple Macintosh version, which is appropriately code-named Houdini, as in "can Lotus pull a successful Macintosh rabbit out of a hat?" According to Forrester Research, Lotus is making Houdini compatible with Apple's System 7.0, which helps explain the tardiness.

Time does indeed tell

The persistent chorus of McCormack & Dodge loyalists who contend that their former firm has been/is being/will continue to be eradicated in the course of last year's avowed Merger of Equals with MSA got louder last week as Dun & Bradstreet Software said goodbye to yet another highly placed Dodger. Vice President Dean Redfern, one of only two members with McCormack & Dodge roots still sitting on the nine-man D&B Software executive committee, departed the firm "to pursue other opportunities." In his case, Redfern told a source close to *Computerworld*, the euphemism translates into an executive title that brings a real job along with it.

What was in their stockings?

About 25 hackers showed up for the Christmas Con hacker conference at a hotel just outside of Houston's airport during the December holidays. At least two of the hackers who attended the gathering were suspected of being security people from Baby Bell companies. After consuming too many beers and pulling fire alarms, the group was kicked out of the hotel.

DG listens for the cavalry charge

A sorely needed $1 billion contract with the U.S. Army Reserve may be in the offing for Data General by the end of 1991. Rumor has it that the bidding for the Army Reserve's Call Up system has dwindled down to two players: DG and Boeing Computer Services.

Now you see it, now you don't

Some users and analysts said that IBM's SX notebook is not the only laptop we'll see from IBM in 1991. According to sources, IBM is showing versions of a battery-powered SX-based laptop that will feature 80M-, 100M- and 120M-byte 2½-in. hard drives and weigh 7.8 to 8½ pounds. This box will also offer a radio frequency modem as an option, sources said, and will be available in June. However, an IBM spokesman expressed bewilderment at these reports.

Casting nets into Blue seas

Novell is expected to deliver Portable Netware for IBM's Application System/400 at the upcoming Networld show. With luck, Novell will have more success in the IBM arena than it has had with the Unix versions of Portable Netware.

Today's joint 3Com/Microsoft announcement seems to be something of a hot potato. 3Com first dropped word of the scheduled phone teleconference while a Microsoft official said he knew nothing about it, but if it was taking place, 3Com was arranging it. 3Com subsequently revealed that Microsoft's PR agency was setting things up. If you read Computerworld *on Dec. 17, you know they'll be announcing that 3Com is turning back its LAN Manager rights to Microsoft. The question is, whose idea was that? If you know, tip off News Editor Pete Bartolik at (800) 343-6474, or drop a message to* COMPUTERWORLD *on MCI Mail, MHTS78A on Prodigy or 76537,2413 on Compuserve.*

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COMPUTERWORLD

3Com cuts back net plans

Users no longer have 'one-stop shopping' option

BY PATRICIA KEEFE
and JIM NASH
CW STAFF

SANTA CLARA, Calif. — User reaction ranged from staunch support to angry condemnation last week as 3Com Corp. abruptly withdrew from the client/server market and refocused its efforts on internetworking.

A three-phase restructuring and downsizing plan announced by the company will result in both a $70 million pretax write-down and 3Com's first layoff ever, affecting 12% of the 1,953-person work force (CW, Dec. 17).

3Com confirmed that it will turn its LAN Manager 2.0 business over to Microsoft Corp., including LAN Manager-related technology 3Com currently has under development.

Don Barry, network administrator at Ochsner Medical Institutions in New Orleans, said the move harms users who enjoyed the simplicity of dealing with one networking vendor.

However, 3Com Chief Executive Officer and President Eric Benhamou said there just were not enough sites like Ochsner that were willing to rely on 3Com to supply virtually all the pieces of its network — hence his divestiture plans and pact with Microsoft.

3Com Vice President Alan Kessler stressed that 3Com will continue to offer and support all

Continued on page 4

DEC to bite the layoff bullet

BY NELL MARGOLIS
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. broke with a lifelong no-layoff tradition last week and announced that it will "involuntarily sever" approximately 3,500 U.S. employees by June 30.

The plan is unlikely to find fans in the ranks at DEC, where job security has been a watchword for 34 years. However, analysts — many of whom have long characterized DEC layoffs as inevitable — applauded the move, even questioning whether it goes far enough. Meanwhile, users largely took the occasion to repledge allegiance to the struggling vendor.

Gerald Siddons, director of the Scientific Computing Division at the Dana Farber Cancer Institute, a DEC user site in Boston, said the company deserves applause for making the right, albeit hard, decision. "You've got to live within your means," he said. "[Massachusetts] didn't do it, and look where we are. Chrysler did it, and look where they are," he added, referring to DEC's troubled home state and the automobile maker that came back from near bankruptcy.

"You've got to feel bad for Ken Olsen," Siddons added. "For years, he's said, 'Read my lips: no layoffs,' and now he's got to have layoffs."

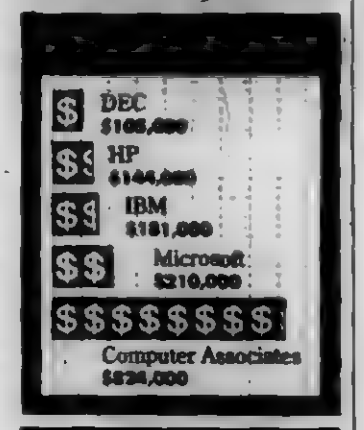
Among other DEC users in Massachusetts — where the layoff is predicted to hit heavily — Bill Stella, senior vice president of information systems at Waltham, Mass.-based Arkwright Mutual Insurance Co., said DEC "needed to become leaner." From a business standpoint, Stella termed the action a positive step, but, he said, "I'm not pleased to hear about this from the people point of view."

Arkwright, which has built a major customer information

Continued on page 8

Trailing indicator

One gauge of efficiency – revenue per employee – shows DEC lagging behind other industry leaders in '90



Source: Montgomery Securities
CW Chart: Paul Mach

Army's IS ready for the worst

BY MAURA J. HARRINGTON
CW STAFF

FORT HUACHUCA, Ariz. — Obtaining permission to put an antenna on a Saudi Arabian prince's mountain is just one of the frustrating problems currently on Maj. Noel Goyette's mind as he helps prepare the U.S. Army for a possible war in the Middle East.



With peace talks appearing to have fallen apart last week and tomorrow's United Nations' deadline for Iraq to withdraw from Kuwait, the prospect of war is imminent.

"Since we moved out of the batch computer processing age, which is what we were in Vietnam, we've never tried to do anything like this on this scale," said Goyette, chief of the Information Systems Operations branch of the headquarters of the U.S. Army Information Systems Command.

The Information Systems Command is responsible for the management and upkeep of the Army's IS operation. Goyette's branch, with about 1,500 personnel in the Middle East,

Continued on page 89

Sliced fiber-optic cables point up technology gaps

BY JOANIE M. WEXLER
and JOHANNA AMBROSIO
CW STAFF

Users of fiber-optic communications lines said two recent outages point to a need for more fiber routes and better planning with their carriers to offset the risk of concentrating thousands of calls into one vulnerable cable pair.

The first outage this month occurred Jan. 4, when an AT&T maintenance crew mistakenly cut through a fiber-optic cable in Newark, N.J. Approximately 40% of AT&T's long-distance service into and out of New York was disrupted.

Just over two years ago, a similar incident, also in New Jersey, disrupted 3½ million calls when contractors installing piping cut a cable. Coincidentally, one year ago this week, a software glitch affected AT&T service across the nation on Martin Luther King Jr.'s birthday — luckily, a federal holiday.

Last Monday, a U.S. Sprint Communications Co. fiber cable in Indiana broke, disrupting calls to and from Chicago and Indiana.

Affected customers took the mishaps in stride. However, one New York user affected by the

Continued on page 87

Who can open E-mail?

Nissan latest to be sued for privacy invasion

BY JIM NASH
and MAURA J. HARRINGTON
CW STAFF

LOS ANGELES — Blistering "Dear John" notes, embarrassing wisecracks and even sexual fantasies are showing up on corporate electronic-mail systems with greater frequency. And in some cases, they are finding their way into personnel folders and even to court.

Last week, two information systems employees filed a suit in California Superior Court against Nissan Motor Corp. in U.S.A. claiming the company violated their privacy by intercepting their electronic messages. The E-mail notes allegedly led to the firing of one and the forced resignation of the other, the employees said.

It is the second such E-mail privacy suit to be filed in California in the past year, although the first suit was thrown out of court last week in a ruling that rejected any right to privacy on employer-owned systems.

Continued on page 88

Confidential! Don't open, ever

The rapid rise in electronic-mail use may heighten concerns over privacy

U.S. E-mail users		
Year	Total	LAN-based E-mail
1988	6.9M	545,000
1989	8.6M	1.1M
1990	12.4M	3.0M

Source: International Resource Development, Inc.
CW Chart: Mario Hamen

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INSIDE

Product Spotlight — Dial-up modems: Are they safe at any speed? Page 57.

The final count on AT&T's $90-per-share tender offer for NCR should be in hand Wednesday, but it is unlikely to end the battle. Page 8.

FDIC takeover of Bank of New England has no immediate impact on IS, but the future is very much in question, as are vendor contracts. Page 89.

National Car Rental taps EDS for 10-year data and communications outsourcing pact. Page 10.

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8 While **AT&T**'s attempted takeover of **NCR** is looking very possible, the beleaguered NCR is by no means ready to give up the ghost.

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"A year or two ago, I was thinking how switched 56K bit/sec. digital could give me faster communications. Now, I'm thinking about my company taking my job to pay for it."

JOHN TEGELER
AMERICAN DOOR CO.

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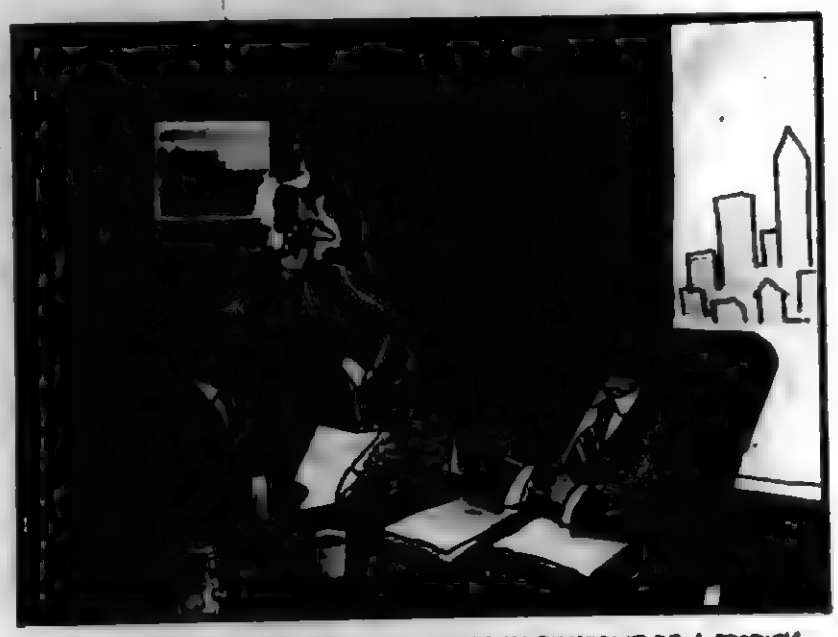
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The 5th Wave



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EXECUTIVE BRIEFING

■ **Using the latest and greatest networking technology can be nice,** but there can be dangers in terms of reliability. Managers have been learning that lesson from the nuisance of communication outages caused by fiber-optic cable cuts. Now, armed with the fresh memory of two outages during the first week of the year, managers in New York and the Midwest want to take the initiative and work with carriers such as AT&T to help avoid such emergencies. **Page 1.**

■ **There's more ouch in the financial news.** DEC's no-layoff tradition died last week when the vendor said it will "involuntarily sever" 3,500 U.S. employees. Unisys' fourth-quarter results are due next week, and observers agree there will be a loss. The question seems to be "how big?" In addition, the question mark may be removed from above NCR's head Wednesday, because AT&T's tender offer expires at midnight tomorrow night. On the user side, the federal takeover of Bank of New England did not have an immediate impact on the information systems group. It's business as usual in the computer room. **Pages 1, 8 and 89.**

■ **The discovery that your Unix isn't their Unix can** lead to challenges and problems that were unexpected when firms first moved to the open operating system. The most common complaints center around communications, as managers discover when they try to tie together Unix systems from different vendors in autonomous departments. **Page 29.**

■ **Life after layoffs:** Part 1 of this series focuses on the determination of a former programmer who is now making ends meet by consulting, writing and translating Spanish to English. **Page 72.**

■ **Yes, you can make clear to nontechnical managers** the effect that information technology has on a firm. IS Executives can take advantage of strategic planning techniques that show how information can impact an organization. **Page 63.**

■ **"Garbage in, garbage out"** takes on a fresh meaning at Waste Management of North America. Waste Management's successful IS group is an example of a new hybrid — which has been called a "centrally decentralized" operation that relies on a strong headquarters staff and regional CIOs out in the field. **Page 53.**

■ **National Car Rental System has joined the outsourcing crowd,** awarding EDS a 10-year contract to run its information technology operation. **Page 10.**

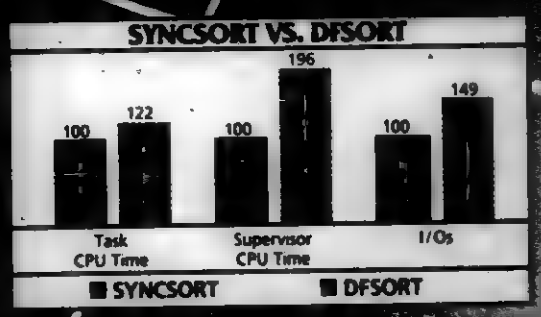
■ **Apple users may be getting antsy.** Macintosh users surveyed by *Computerworld* remain loyal to their machines but are leaning toward Microsoft Windows and MS-DOS machines, showing dissatisfaction with Apple's support. **Page 41.**

■ **Support is a concern for Data General users, too.** But in a survey by a DG user group, the leading question raised is whether users can count on continued software quality. **Page 29.**

■ **PC dealers are dealing in new ways,** including offering trade-in allowances on used equipment. The idea has been tried before with only limited success. **Page 37.**

■ **On-site this week:** When it was time to build a voice-mail system for its customers, Pacific Bell Telephone decided to break out of the telephony-specific hardware cycle. Pacific Bell is using a Unisys mainframe to do work that in the past would have required a proprietary, limited-function communications processor. **Page 33.** Marist College sees a chance to build the college network of the future and is taking advantage of an IBM grant to carry out its dream. **Page 49.**

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NCR takes new laptop road

BY MICHAEL FITZGERALD
CW STAFF

DAYTON, Ohio — NCR Corp. will take a different road when it enters the 80386 notebook computer market this spring, basing its first systems on Intel Corp.'s new portable-specific 80386SL chip. Observers said NCR's entry could mark the beginning of the end for the 80386SX chip that is now at the heart of many high-powered portables.

NCR showed portable products based on the 80386SX at Comdex/Fall '90, but product line manager Bruce Langos told *Computerworld* that its System 3000 portables under development will use the 386SL, which combines a 386SX chip with cache controller and memory.

It creates the potential for smaller, lighter portables with battery lives of between four and six hours, compared with three hours on most SX notebooks. The 20-MHz SL also runs slightly faster than a 20-MHz SX for about the same cost, according to David Ryan, Intel's marketing manager for the 386SL.

NCR expects to introduce a notebook system in the April to May time frame, followed by a handwriting interface-based device by midyear. The System 3100 will run at 20 MHz, weigh less than six pounds and fit into the 8½- by 11-in. form factor.

Lightweight in the ring

NCR is shooting to have the notepad system weigh in at less than four pounds and feature an IBM Video Graphics Array-compatible display and base configuration of 2M bytes of random-access memory, expandable to 16M bytes. It also expects to offer a built-in, 2,400 bit/sec. modem, facsimile capabilities, a four- to six-hour battery life, a port to support a standard keyboard and an external 3½-in. floppy drive. Langos said that the portables will have flash memory drives, which are credit-card-size memory cards that can store erasable or read-only memory (ROM). The notepad is expected to list for $3,500.

While NCR is the first company to publicly acknowledge that it is working on the SL, analysts said it is by no means alone.

"The 386SX notebook market is going to be the shortest lived product line you've ever seen," said Andy Seybold, portable computing analyst at Dataquest, Inc. in San Jose, Calif. "The next generation will be all SLs, and they'll all be here by Spring Comdex [in May]."

Dan Neas Jr., an industry analyst at Computer Intelligence in La Jolla, Calif., agreed that vendors will move quickly into the SL market, "because the technology is compelling."

Moreover, Intel does not expect to see such a quick shift in the market, although one source at the company said NCR would not be the first vendor to announce an SL-based product. Ryan said volume production of the SL chip is "a definite reality" for this quarter but noted that portables based on the SL will need time to establish a market presence.

The System 3100 that will use a handwriting interface will go into beta testing on April 1 at 10 sites, Langos said.

NCR will not bundle operating software but will let users choose between Go Corp.'s Penpoint, Microsoft Corp.'s Pen Windows or Microsoft's DOS, which will be installed in ROM on the system.

According to Langos, San Francisco-based Communications Intelligence Corp. is developing specialized handwriting algorithms for NCR's notepad. It will also accommodate a standard-size keyboard.

Microsoft pen-based system is unveiled

BY JAMES DALY
CW STAFF

Handheld systems using applications based on Microsoft Corp.'s Pen Windows handwriting-recognition technology could reach the commercial market by the end of the year, Microsoft officials said last week.

Pen Windows, which is based on Windows 3.0, will come preinstalled on an "integrated tablet," a device resembling a computer screen with an attached keyboard that will be sold by OEMs, Microsoft Vice President Jeff Raikes said. The Intel Corp. 80286- or 80386-based tablet will include about 2M bytes of random-access memory and will retail for about $4,000.

With a pen-based computer, users enter data by clearly writing printed commands rather than tapping keys. The potential for the developing technology is broad: Salespeople could enter orders from the road, police officers could write tickets, and nurses could update patient charts. As such, sales of pen-based computers could hit $3 billion by the year 2000, Prudential-Bache Securities, Inc. analyst E. Gray Glass said.

Grid Systems on the map

Tandy Corp.'s Grid Systems Corp. is the only firm selling pen-based notepad computers in the U.S., although Momenta Corp. and Superscript, Inc. are planning introductions.

Sony Corp. and Canon U.S.A., Inc. offer products in Japan but currently have no plans to sell them in the U.S. Additionally, Go Corp. in Foster City, Calif., will demonstrate its pen-based operating system at a developers conference in San Francisco on Jan. 22.

A beta-test version demonstration of Pen Windows last week relied on navigating the user through programs. Pen Windows also recognized uppercase and lowercase letters and was adept at recognizing imperfect printing. However, cursive writing recognition is still several years off, Raikes said.

Raikes said current versions of Microsoft applications such as Microsoft Word, Excel and Powerpoint can run on Pen Windows, but succeeding generations will more thoroughly exploit Pen Windows technology.

Although handwriting recognition is still primarily geared for handheld computing, its potential is much broader. "Ultimately, we see data input by pen across all platforms on up to minicomputers," product manager Pradeep Singh said.

3Com

FROM PAGE 1

versions of LAN Manager up to Version 2.0 and related value-added software on its servers. 3Com will help Microsoft port 3Com's LAN Manager-related software to LAN Manager 2.0.

In return, 3Com will not receive any cash compensation. Benhamou told financial analysts that Microsoft has excused about $25 million owed under a licensing contract between the two vendors.

Ironically, 3Com's effort to meet user demands by providing one-stop shopping may have been its undoing. Analysts said the firm was spread too thin over too many markets.

3Com will narrow its focus significantly. In addition to downsizing its network management investment, the company has put its file server, network station and Systems Network Architecture (SNA) gateway businesses on the block.

It will take the onetime charge estimated at $45 million against fiscal third-quarter income, resulting in a loss.

Opposite sides of 3Com

Some industry analysts were concerned that 3Com is too far behind in the bridge and router market, while others commended the company on finding a focus and getting back to basics.

Wall Street fell somewhere in between, as the stock quickly lost 25% of its value. 3Com is, however, considered in sound financial shape and has no debt.

Barry also criticized how the switch was presented to users, claiming that such a dramatic change with so little preparation leaves him wondering which division may be next.

An information systems manager at a Midwestern financial company was not as surprised. 3Com's decision to divest itself of its Maxess SNA gateway software division was logical, he said. "Their Maxess software was behind the market."

From a software perspective, 3Com's moves appeared to be more warmly embraced. Quotron Systems, Inc.'s senior software specialist Todd Booth said he was encouraged for the same reason hardware users were disappointed. "I hate it when we have to maintain multiple companies' software," Booth said.

If 3Com does concentrate more on the hardware connecting discrete systems, Quotron is likely to buy more of its products, he said.

Barry said Ochaner will spend most of its annual networking budget elsewhere. "We may buy their boards but little else," he said. "It's an issue of trust, and we really feel that that trust has been violated."

Analysts will be watching 3Com in the bridge and router market, which is dominated by Digital Equipment Corp., Cisco Systems, Inc. and Wellfleet Communications.

LAN clamp

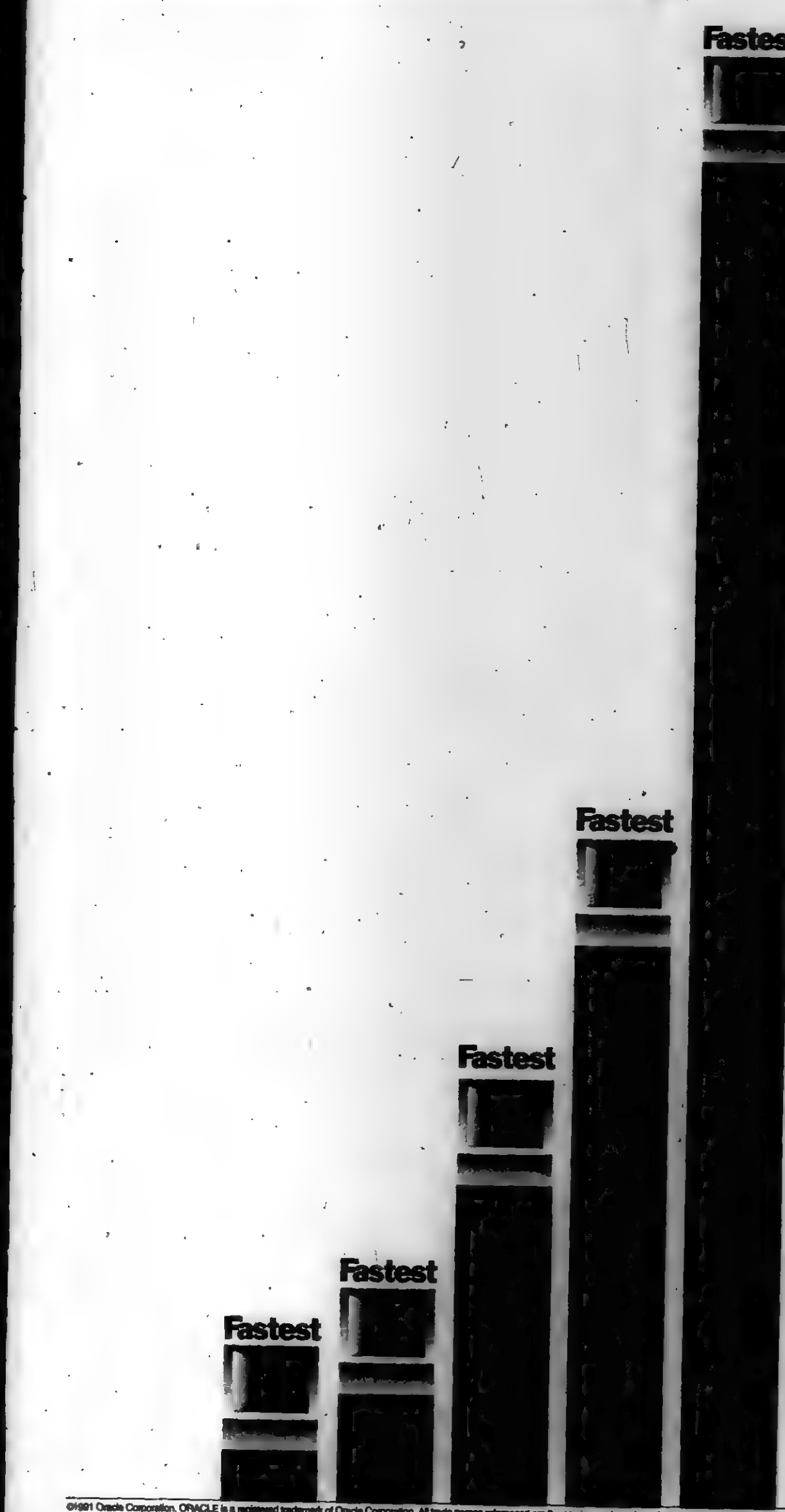
3Com has been unable to pry loose Novell's hold on the local-area network operating system market



Source: International Data Corp.
CW Chart: Paul Mock

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NEWS SHORTS

Revlon settles with Logisticon

Revlon, Inc. and Logisticon, Inc. are not fighting in court anymore, but the two companies, which came to blows over Revlon's alleged nonpayment of fees, are not telling why. Revlon sued Logisticon in Superior Court in Santa Clara, Calif., on Oct. 22, after the small Silicon Valley software firm used a modem to disable warehouse automation software. Logisticon's late-night telephone call to Revlon's systems idled one Revlon warehouse in Edison, N.J., and another one in Phoenix for three days. Revlon demanded payment of damages. The two companies recently disclosed that they had, indeed, reached an out-of-court settlement, but neither would talk about the terms.

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Vendors unite on sales reports

The world's largest personal computer manufacturers are planning to suppress their competitive natures and pool their sales statistics. The goal is to render a more accurate, reliable and useful portrait of the marketplace than is currently attainable from independent market research. Intel Corp. and Compaq Computer Corp. are among the industry giants committed to forming a market research collective, to be known as the Worldwide Microcomputer Statistics Association. The group will reportedly not make its sales figures public.

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Amelio heads National Semi

It was announced last week that Gilbert F. Amelio, who is currently president of Rockwell International Corp.'s Communications Systems Unit, will leave the company to become president and chief executive officer of National Semiconductor Corp. When Amelio takes up his new position on Feb. 1, he will be succeeded at Rockwell by Kent M. Black, the company's executive vice president and chief operating officer.

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NTT plans broadband ISDN

Nippon Telegraph and Telephone Corp. (NTT) last week announced an agreement with a multinational assortment of leading communications equipment providers to develop a network system for broadband Integrated Services Digital Network (ISDN) services, which the Japanese carrier plans to introduce in fiscal 1996. NTT plans a series of broadband ISDN offerings that will support voice, data and video transmissions at speeds of 156M or 620M bit/sec.

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DEC plans retail products

Digital Equipment Corp. is expected to announce a bevy of products and alliances at the National Retail Federation's conference in New York this week. Under contracts totaling $16 million, Toys 'R Us will purchase 1,300 DEC Microvax 3100 systems to upgrade its current Microvax 2000s at 700 stores, and CVS will purchase Decstation PCs for 1,300 stores. DEC also announced Decrashier, an integrated point-of-sale terminal, and an architecture to help retailers design and implement multivendor systems.

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Schementi takes over Columbia IS

Columbia Pictures Entertainment, Inc. announced the appointment of Peter Schementi to the position of vice president of MIS last week. Schementi will report to Ted Howells, Columbia vice president and controller. Schementi previously held the position of vice president of information technology at EMI-Capitol Music.

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D&B upgrades HR package

Dun & Bradstreet Software last week released an enhanced version of The Human Resource, the company's PC-based human resources software package. According to the vendor, Release 4.02 offers over 30 additional functions, such as screen painting, menu and database customization and field-level security.

More news shorts on page 88

Excel packs Windows punch

Microsoft claims Excel 3.0 features an edge over Lotus' 1-2-3 spreadsheet

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. pointed all of its guns at spreadsheet market leader Lotus Development Corp. last week when it introduced a new version of Excel that packs in more than 100 new graphical and analytical features.

Microsoft officials claimed Excel 3.0 will have a significant edge in the hotly contested market for spreadsheets that use the company's Windows 3.0 graphical user interface, which has sold more than 2 million copies since it was introduced in May 1990.

"This year will determine which spreadsheet will lead to the Windows environment," Microsoft Chief Executive Officer Bill Gates said. "The last six months have seen a radical change in the DOS world: Windows is now mainstream."

Excel 3.0 for Windows is available immediately, while editions for the OS/2 Presentation Manager and Apple Computer, Inc. Macintosh platforms are expected by midyear, Microsoft officials said.

Cambridge, Mass.-based Lotus, until midway through last year, had pointedly ignored Windows in favor of developing for OS/2. While the firm is now readying a Windows spreadsheet, early Excel 3.0 assessors said it may arrive too late. "In a Windows environment, there really is no reason to stick with Lotus," said Steve Birgfeld, a manager at Martin Marietta Corp.'s information systems group in Chantilly, Va. "Excel 3.0 is a real nice addition. Its enhanced graphics are terrific."

Stiff competition

Analysts said the Microsoft action puts stiff competitive pressure on Lotus, which is also struggling to deflect a price-cutting campaign by Borland International, Inc. designed to sell to existing Lotus users. "The spreadsheet advantage is now in Microsoft's court," said Peter Rogers, an analyst at research firm Robertson Stephens in San Francisco.

Excel 3.0 also makes an aggressive move to woo away Lotus' 1-2-3 users by offering a dialog box that allows users to enter 1-2-3 commands into Excel. The Help box then describes the Excel equivalents or simply performs the functions.

The Excel update incorporates several new elements that have been praised by early users:

- A tool bar that runs across the top of the screen and allows users to perform common operations such as adding up columns or formatting cell contents at the click of a button.
- A "solver" that aids in determining what mix of figures will best provide a desired result, such as what products to manufacture to maximize profits.
- The ability to collapse complex spreadsheets into an outline form.
- Support for linking and embedding objects between applications.

System requirements for Excel 3.0 include an Intel Corp. 80286-based or higher personal computer, 2M bytes of random-access memory, a hard disk with 3M bytes of free space and a graphics board and monitor compatible with IBM Enhanced Graphics Adapter, Video Graphics Array or Hercules Computer Technology. Excel 3.0 is priced at $495; current Excel users can upgrade for $129.

Microsoft also said that Excel 3.0 will be added to Microsoft Office for Windows by the end of the month. It includes Microsoft Word and Powerpoint and will retail for $995.

1-2-3 users say Lotus is secure for the moment

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Microsoft Corp.'s announcement of Excel 3.0 last week had Lotus Development Corp. officials scurrying to batten down the hatches. But despite counterstriking with aggressive advertising and product promotional packages, Lotus and its users insisted it is hardly curtains for 1-2-3 in a Windows world.

Jeffery Beir, director of product marketing at Lotus' Graphical User Interface Spreadsheet Group, claimed Excel 3.0 is playing catch-up by adding features that character-based 1-2-3 already offers in the DOS world.

Sheldon Laube, national technology director at Price Waterhouse, said it would be "hasty and premature" to make a decision on a Windows spreadsheet before seeing the "exciting products to come" from Borland International, Inc. and Lotus. "All the creativity there in the spreadsheet world has not been incorporated into Excel 3.0," Laube added.

By and large, Lotus users interviewed last week concurred with Laube's assessment. "Lotus users are an awfully dedicated group, not to Lotus, but out of habit and ease of use. To have to retool for another package would just be terribly difficult," said Claude Delphia, a spreadsheet consultant who works with the 1-2-3 special interest group of the Modesto, Calif., IBM PC Users Group.

Lest Lotus become too complacent, some users, including Bob Holmes, a computer technology research analyst at Southern California Gas Co., suggested it would be prudent for Lotus to get beta-test copies of 1-2-3/W into users' hands as quickly as possible.

"Excel is clearly the front runner at the moment; Lotus will be between a rock and a hard place if they don't show 1-2-3/W soon," Holmes said.

"In the DOS world, it's still Lotus you have to displace, but it's Excel in the Windows world," agreed Rodger Bender, president of the New York Micro Manager's Association.

Gartner Group, Inc. analyst David Cearley said his firm's Lotus clients have said they will stay the course as long as Lotus provides them with sufficiently functional copies of 1-2-3/W on which to compare with Excel 3.0.

"There is great pressure to get 1-2-3/W out," Beir acknowledged. But he estimated that only 30% of 1-2-3 Release 3.1 users are running under Windows, while 10% of the overall Lotus installed base is currently moving aggressively into Windows. "Microsoft does not have a solution for the 70% of the world that uses DOS," he said, pointing out that it took Microsoft six years to attain widespread acceptance of Windows.

Bill Machida, a microcomputer consultant at Infopro, Inc. in Fairfield, Conn., said he has not seen a mass movement among his corporate clients to Windows. Large Lotus users typically have built key applications around 1-2-3, and many are just not ready to retrain people, he said. So it is really difficult to justify moving to another product — no matter how good. "It's going to be a big stumbling block," Machida said.

The technology and training investment, coupled with the rapidly disintegrating state of the economy, were common themes stated by cautious Lotus users — even those committed to Windows.

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Unisys expects gloomy 1990 4-Q results

BY [redacted]
CW STAFF

BLUE BELL, Pa. — Unisys Corp. will likely round out a dismal 1990 next week with the issuance of its fourth-quarter results. Analysts said they expect the company to post a loss for that period.

The amount of the shortfall, however, may depend on how much Unisys writes down for the year, effectively lumping its bad financial news into 1990 in hopes of doing better in 1991. Unisys would not comment, citing federal securities regulations.

"I think they'll throw in the kitchen sink and try to get as much out of the way as the accounts will let them," said Rick Martin, a computer industry analyst at Prudential-Bache Securities, Inc. in New York.

Analysts have been paying particular attention to Unisys' nearly $4 billion debt load as well as the structure of its loan agreements.

A revolving credit agreement that could be crucial to the firm weathering continued financial problems includes a so-called net-covenant stating that Unisys' net worth (assets minus liabilities) must be at least $3½ billion.

"At the end of September, they were at $3.8 billion" in net worth, Martin said. Adding that the losses expected for the fourth quarter will push Unisys perilously close to the line, Martin said the company's executives "don't have much room for any mistakes."

Should Unisys fall below the net-worth threshold in the covenant, the banks could renegotiate it in a variety of ways, including demanding a different interest rate, offering a smaller loan or securing the loan to an asset. Lastly, the banks could walk away.

Martin said he expects Unisys to post about a $35 million loss for the quarter and pay out another $30 million in its preferred dividend, for a total loss of about 40 cents per share, or $65 million.

"My hunch is 50 cents per share, or $85 million," said David Schofield, a technology analyst at Duff & Phelps Investment Research Co. in Chicago. That would give Unisys a $520 million loss for the year.

Schofield will be watching for two other components in the fourth-quarter statement: how well Unisys revenue has held up and how much its business is off in Europe. In addition, Schofield will watch the company's gross margins, which he said have declined from 35% to 25% in the third quarter of 1990 and probably point to operating expenses increasing faster than revenue.

To get a handle on its operating expenses, Unisys announced last September that it would lay off about 5,000 people in 1991. Recently, the company has told analysts it may make still deeper staff cuts.

Martin said he believes that if Unisys makes progress on its asset sales — $500 million to $600 million total for the year — the underwriters for the revolving credit will likely waive the net-worth covenant.

For years, Unisys has operated with little cash on hand, preferring to take short-term loans, according to Martin.

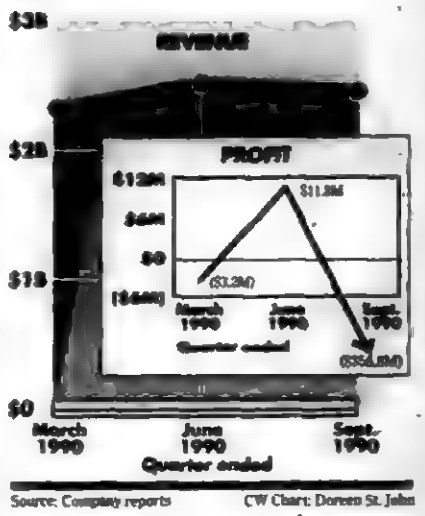
At any one time, Martin said, Unisys has $600 million to $800 million in these short-term loans, the majority coming from banks outside the U.S.

Should those banks balk, Unisys has a revolving credit line for $1.25 billion through January 1993. The revolving credit, negotiated by a consortium of 23 banks, will not be needed unless the local banks refuse to make the short-term loans, Martin stressed.

The apparent economic recession will undoubtedly harm Unisys and other mainframe vendors because mainframe purchases can be deferred — at least temporarily.

Gloomy prospect

There was little for Unisys to cheer about in the first nine months of last year, and analysts expect another substantial loss will be reported next week



Source: Company reports — CW Chart: Doreen St. John

AT&T, NCR await tender offer reply

BY MICHAEL FITZGERALD
CW STAFF

DAYTON, Ohio — The final count on AT&T's $90-per-share tender offer for NCR Corp. should be in hand Wednesday, just before NCR's board holds its regularly scheduled meeting.

The tender offer expires at midnight tomorrow. While analysts said they expect AT&T will receive more than the two-thirds majority it needs to capture control of NCR, that would not necessarily cinch the deal.

NCR's board can still resort to a "poison pill" and certain antitakeover provisions in Maryland, where it is incorporated.

The Wall Street Journal speculated last week that NCR may also adopt a contingent value rights plan, in which shareholders would be promised a large payout if NCR did not reach a target price by a specific date. However, NCR President Gilbert Williamson told reporters at a Massachusetts Software Council meeting last week that he was not familiar with that news article, and an NCR spokesman strongly denied it.

AT&T also hopes to announce the results of its request for a special meeting to oust a majority of NCR's board. AT&T needs a 25% positive response from shareholders to force NCR to call a special meeting, but removal of the board would require an 80% vote.

NCR, meanwhile, is expected to announce third-quarter results today, leading some analysts to believe the firm may have excellent results to report. This could drive up the price of its stock. "I think that [NCR's] board, rather than saying, 'OK, it looks like you're *going to* win,' [is] going to *make* them win," said David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago.

Strategies win praise

NCR's recently announced hardware and software strategies, entitled Open, Cooperative Computing and System 3000, seem to be on track. Next Monday, it plans to announce Top End, an on-line transaction processor (OLTP) for the Unix operating system that analysts have praised.

"Top End looks like it's going to be a very complete transaction processor with a lot of interoperability," said Jim Johnson, chairman of the Standish Group, an OLTP research firm in Hyannis, Mass. Ironically, the only major Unix OLTP existing today is AT&T's Tuxedo, and analysts said they expect that one of the two products would be cut in a merger.

NCR product managers uniformly said talk of the merger has not slowed their development efforts. "If anything, [since the AT&T acquisition effort began,] we're even more fired up than ever to get it done and get it out the door," said Randy Smerik, consulting analyst for the distributed transaction processing group at NCR's West Coast laboratory.

AT&T's Computer Systems Division, meanwhile, appears to be preparing itself for a merger, in line with comments made by division head Robert Kavner [CW, Dec. 24/Jan. 1].

On Jan. 1, AT&T brought its 1,500-strong warehousing, manufacturing and distribution staff into the Computer Systems Division, increasing its size to 8,500 and making it essentially an autonomous organization. The firm is also laying off employees in its sales organization.

Midwest bureau chief Ellis Booker and senior editor Nell Margolis contributed to this report.

Layoff

FROM PAGE 1

database and distributed network on the VAX platform, deals with DEC in two capacities, Stella said: as a strategic systems vendor and also as a large customer. "If they fell off the face of the earth, it would be a disaster for us," Stella said. "But I think they're going to emerge as one of the strong survivors in the industry. The layoff just makes me think that even more."

Several users noted that the one fear they might feel in the face of a supplier's layoffs — fear of diminished support — does not apply in DEC's case, if for an ironic reason.

"We've been unhappy with Ultrix support all along," said Mark Scherfling, supervisor of Unix and communications support at Waltham, Mass.-based GTE Laboratories, Inc. "DEC's people are always hard to find and not always helpful when you find them," he said.

Nevertheless, according to Scherfling, DEC technology has justified GTE's investment in a difficult corporate relationship and will continue to do so. "I see these layoffs as an unfortunate sign of the times, not a sign of something wrong at DEC," Scherfling said.

Layoffs may help

Some users viewed the layoff as leading to benefits instead. "I sense that while DEC is having to lay off staff, downsize and make changes in the organization, there is still a long-term view of where they want to go," said Paul Stieman, associate vice president of computing and information services at the University of Pittsburgh.

Some analysts, however, failed to share Stieman's optimism. The layoff — resorted to, according to a DEC spokeswoman, after a voluntary severance plan announced last spring drew only about 2,500 takers — is aimed at reducing DEC's domestic head count by a total of 6,000. "That isn't enough," said John Logan, president of Boston-based Aberdeen Group.

A 6,000-person reduction, said Robert Herwick, an analyst at Hambrecht & Quist, Inc., "hardly makes DEC lean and mean. This move was necessary, but it isn't sufficient. And it isn't the last one we'll see."

Bay State blues

DEC's layoffs will be nationwide. However, company representatives conceded last week that the Maynard, Mass., firm's disproportionate operational presence in Massachusetts can logically be expected to result in a heavy hit on the Bay State.

The company said the firm will lay off as many employees as necessary, over and above continuing attrition, to achieve the corporate slimming it targeted last fall.

During the past three months, 2,500 DEC employees have opted for voluntary severance. "Nothing has changed since our September announcement except that the program will now be involuntary," a DEC spokeswoman said.

Employees departing under the involuntary severance plan will receive "substantially the same severance benefits they would have gotten had they left under the voluntary plan," according to a DEC spokesman. Cash amounts will be identical; health and dental benefits will be slightly less generous.

No plant closings are anticipated, DEC said.

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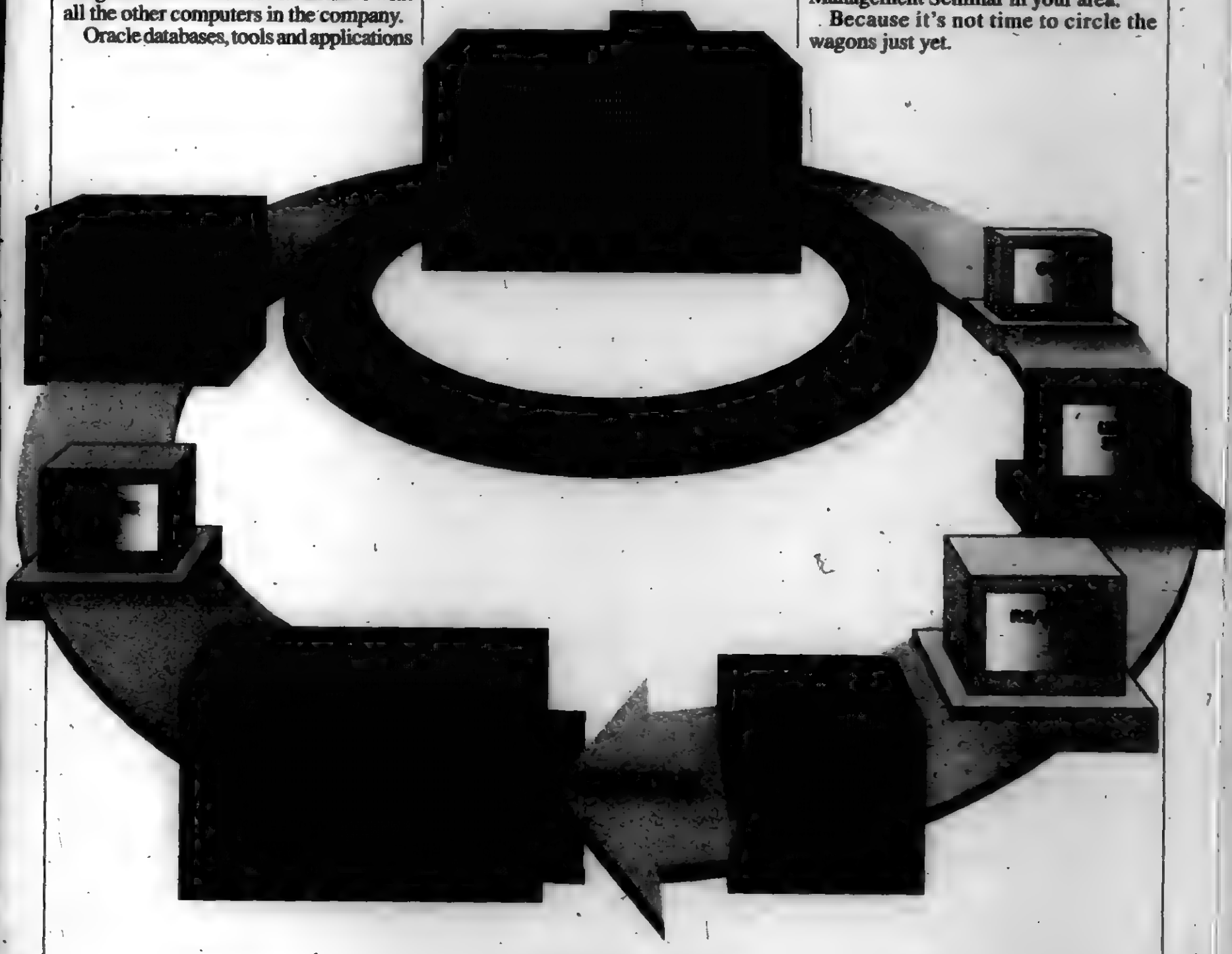
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EDS wins large transportation outsourcing deal

BY ELISABETH HORWITT
CW STAFF

MINNEAPOLIS — Electronic Data Systems Corp. (EDS) edged out IBM to win what is said to be the largest outsourcing contract to date in the transportation industry. Under a 10-year contract valued at $500 million, EDS has taken over responsibility for maintaining, running and updating National Car Rental System, Inc.'s data processing and networking operations.

The agreement was signed in late December but was not officially announced until last week. On Jan. 1, National turned its information systems and most of its 200-plus IS staff over to EDS.

Behind the company's decision to outsource is the hope of ensuring that it has the technological and human resources it needs to support its five- to seven-year IS strategy, according to John D. Livingston, National's chief information officer and executive vice president.

A widely acknowledged technological leader in the car rental business, National doubled its systems capacity in the past two years and expected to double or triple its capacity again to support that strategy, Livingston said.

While firms such as Merrill Lynch & Co. have lost key technological personnel as a result of outsourcing maneuvers, only a couple of people have left National so far. As part of EDS' data center here, National's former IS department will have a "much bigger pyramid" of jobs to move into, Livingston said.

National will also be able to draft additional EDS people to work on special projects without having to make those people "part of its permanent cost structure," said Ron Benigo, vice president of EDS' Transportation Business Unit. Conversely, EDS will be able to call on National's former IS staff members to work on other projects, he added.

National also wants its outsourcing partner to provide a marketing outlet for its growing base of strategic software for the car rental industry, Livingston said. EDS has purchased exclusive marketing rights to both existing and future National applications, Benigo said.

National and EDS plan to jointly develop applications and systems that will initially be installed at National and then marketed to other car rental companies, Livingston said. "I have a whole bunch of systems I am looking at, each of which will return multiple millions of dollars per year to National," he added.

National and EDS are already in the preliminary stages of developing a system that will allow cars to automatically transmit key information to a central computer via radio frequency link upon entering a National rental lot. The information will be collected and transmitted by a computer chip installed in the car and will include the mileage reading, gas level and maintenance status, Livingston said. The system will be used not only to speed up the car return process but also to better control how "these $15,000 assets" are assigned, processed and maintained by individual rental outlets, he added.

National, an IBM shop, chose EDS over the computer vendor primarily because "EDS seemed to want [the contract] more than IBM," in addition to "giving us everything we wanted both in systems support and in marketing," Livingston said.

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DEC announces Unix CASE tools

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. extended its Cohesion software development environment with graphical Unix-based tools for computer-aided software engineering (CASE) last week.

DEC Fuse is an integrated group of back-end CASE tools for programmers to use in debugging, coding and testing. The product runs on reduced instruction set computing (RISC) Decsystem platforms under Ultrix. It is expected to be available in March at $1,500 per workstation seat.

DEC Fuse supports the Motif user interface from the Open Software Foundation, "hiding" the Unix system commands. DEC Fuse is intended to increase programmer productivity by including popular Unix utilities in the one product.

"Many people have trouble working with a very confusing grab bag of utilities that don't interface well with each other," said Stuart Woodring, an analyst at Forrester Research, Inc. in Cambridge, Mass. "DEC is certainly addressing one problem in offering a variety of associated development tools under one overall umbrella structure."

DEC Fuse is the first product to be produced through joint research and development between DEC and the Brown University Industrial Partners Program.

DEC officials said they plan to move the Vaxset programming tools — renamed Decset — from the VMS platform to Ultrix in the second half of 1991.

The company also introduced a suite of Ultrix RISC language compilers for Fortran, Pascal and C.

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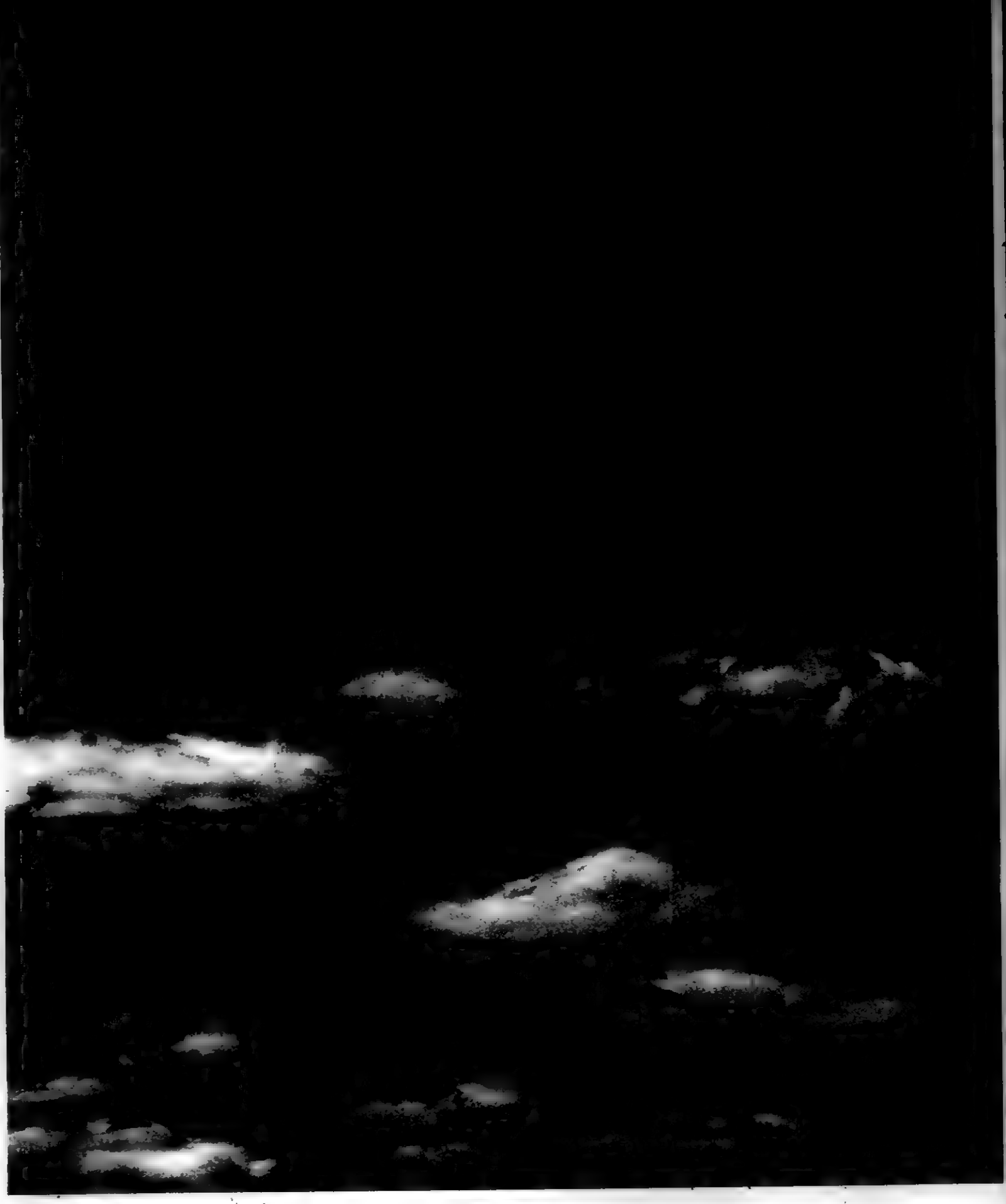
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IBM reassigns several top-level execs

Lautenbach, Puckett and Guglielmi all get new posts in recent staff reorganization

BY ROSEMARY HAMILTON
CW STAFF

IBM is starting the year off with a reshuffled executive deck that gives new jobs to several managers, including a key post for Ned Lautenbach, who will now be responsible for IBM's Asia Pacific operations.

Bernard Puckett, former president of IBM's Data Systems Division, will take over for Lautenbach as the general manager of the Application Solution line of business.

In addition, Joseph Guglielmi, who had been president of the Application Solutions Division, the piece of the Application Solutions line of business responsible for Officevision, has also been reassigned. He will take on a newly created position of general manager, marketing and business development for the Personal Systems line of business.

Rick Martin, an analyst at Prudential-Bache Securities, Inc., said the executive moves appear mainly to be steps up or lateral moves into staff positions. He said IBM routinely reassigns executives to either staff positions or line jobs. The staff jobs are often slots in which an executive can prove himself and then move on to a higher position in a line job, Martin said. A line job gives an executive responsibility for the overall operations of a business unit or division within a line of business.

Branching out

Martin said the Lautenbach move indicates that IBM wants him to gain international experience, which will boost his overall credentials. All of the Asian business units will report to him, which is "a major job," an IBM spokesman said.

Puckett's new assignment appears to be a reward as it is a step up to general manager level from the presidency of the Data Systems Division. He had responsibility for the rollout of the new mainframe generation last year.

Because Guglielmi's position is a new one, it is unclear if it is a lateral move or a step up, Martin added.

Nicholas Donofrio, who had been president of the Advanced Workstation Division, will take over for Puckett. Anne-Lee Verville, who has been on a special assignment for Terry Lautenbach, an IBM senior vice president, will assume Guglielmi's Application Solutions Division job.

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More than one OS/2 on the way

BY PATRICIA KEEFE
CW STAFF

Users pining for a 32-bit version of OS/2 can rest assured that the project is still on target. IBM said it began rolling out OS/2 Version 2.0 to small groups of customers late last month and will continue to release the product in stages until it is ready for a formal release.

Separately, IBM is expected to announce a minor upgrade designed to address some issues with the forthcoming unbundling of OS/2 Extended Edition. It will be called OS/2 Version 1.4, according to U.S. sources and a report in London-based *PC Business World* that quotes an unidentified IBM source. IBM shipped the 2M-byte OS/2 Version 1.3 last year.

A spokeswoman for IBM said that OS/2 2.0 is on schedule. IBM released a statement on Sept. 17 committing to general delivery of a 32-bit OS/2 in 1991.

Mum on version numbers

As for OS/2 1.4, the spokeswoman said IBM would not speculate on additional version numbers. But industry sources said there will be a Version 1.4.

"I wouldn't be surprised if on the Extended Edition side there wasn't another 1.X version," one user said. The user speculated that as IBM unbundles Extended Edition, it will have to make some kernel changes before it can offer the pieces to run with OEM versions of OS/2.

Another source said the last time he heard IBM contemplating some new versions of OS/2, it had to do with providing application programming interfaces in the Extended Edition kernel for supporting object-oriented structures. For example, this extention would enable Data Base Manager users to modify database applications through objects.

John Dunkle, vice president at Workgroup Technologies, Inc., said the inclusion of object technology within OS/2 1.4 is extremely important to IBM because competitive alternatives, such AT&T's Rhapsody and NCR Corp.'s Cooperation, already offer an object-oriented graphical user interface. Until IBM offers the same under OS/2, it will be considered a mediocre solution, he said.

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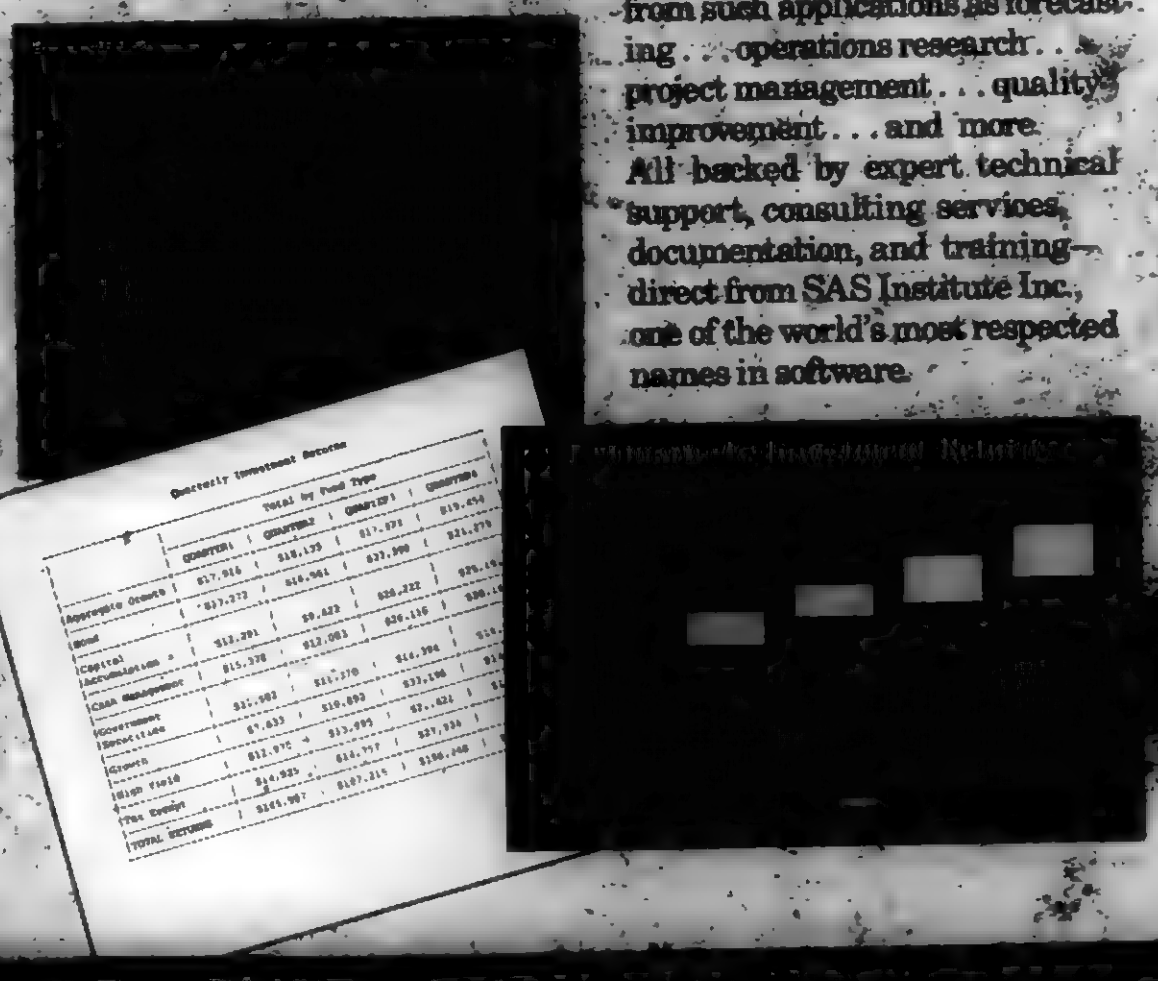
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about my son

above our house

I told him that

hand; however,

some unknown

and my little boy

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come up with

actually happen.

switch is devoted

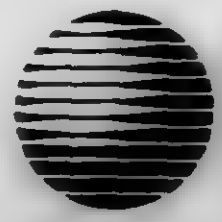
for the tip and he

fly right, Dad,

for me going to

corner office on a round planet and I'm thinking and how last night he looked at the crescent moon and said, "Daddy, broken moon, broken moon." And the moon would be fixed soon by a silent and unseen the PBX that I bought for the corporation from company might not be fixed any time soon at all, who is only five said, "Dad, AT&T has a REMOTE lab in Denver set up to detect any problems that might their DEFINITY® System and fix them before they You see, Dad, a full 1/3 of the memory of a DEFINITY entirely to self-maintenance." And I told him thanks looked up at me and said, "Straighten up and because no silent and unseen hand is going to pay college."

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Wang targets software at Windows environment

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. announced a version of its document image-processing software, Open/image Windows 3.0, targeted specifically for personal computer users in a Microsoft Corp. Windows 3.0 environment.

The product allows users and developers to integrate image functions into both new and existing applications in the Windows 3.0 operating environment. It runs on Intel Corp. 80286-, 80386- and I486-based platforms and in several local-area networks, including those from Banyan Systems, Inc., Novell, Inc., 3Com Corp. and IBM.

Martin Minjoe, information systems director at the San Jose Medical Center, a beta tester of the product, is now implementing the product in full production mode on a Banyan Virtual Networking Software network to relieve the paper backlog in the center's voluminous medical records department.

"Overall, Open/image fits in well for us," Minjoe said, citing the product's open architecture, customization capabilities and ease of use as beneficial to the medical records project. "It was not in our interest to move out of the open architecture environment; and Open/image fits the bill," he added.

Open/image Windows 3.0 includes support for the Windows 3.0 graphical user interface, query by keyboard functions and image caching to speed up image retrieval and display. It includes 200 application programming interfaces that integrate image functions into Windows 3.0 applications.

The company also released Open/image for Netware, which integrates with Open/image Windows 3.0 to bring image capabilities to applications that are running on Novell's Netware 386-based network operating system.

According to Ira Morrow, vice president of technical planning at Shearson Lehman Brothers, Inc. in New York, the firm has been piloting the product as part of an imaging program that allows internal forms to be routed back and forth over typical Netware 386.

Wang offers two Open/image Windows 3.0 software packages: the first is a document image application version, which is priced at $495, and the second is an image development kit, which offers a set of application programming interfaces and is priced at $995.

Both versions are scheduled for shipment next month. A development tool kit for Open/image for Netware, priced at $995, is also scheduled to be available next month.

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Sony RISC laptop to feature Unix

BY PATRICIA KEEFE
CW STAFF

SAN JOSE, Calif. — Sony Microsystems Co. introduced a RISC-based Unix portable last week, bundling in a variety of features such as AT&T's Unix System V, Release 4, and X Window System as well as the Open Software Foundation's Motif Version 1.1.

"Sony's use of the full Unix System V.4 allows us to satisfy both Unix System V and Unix BSD developers," company President James Mannos said.

Slated for delivery in March, the News 3250 Laptop Workstation starts at $9,900. Mannos said the unit will be among the first to ship with Motif 1.1 and Unix System V, Release 4. An $11,900, 406M-byte system is slated for May.

Sony just began selling a similar system in Japan and has been selling a complex instruction set computing chip-based luggable in Europe since last summer.

Just shy of 18 pounds, the latest system comes with a full-size LCD backlit monochrome, 11-in. diagonal screen with 1,120 by 780 pixels and "fake" gray scale. Clearly audible compact disc/read-only memory extended architecture-quality sound is also included.

The News 3250 uses a Motorola, Inc. R3000 reduced instruction set computing (RISC) chip, which can run at 17 million instructions per second; a 20-MHz R3010 coprocessor provides 1.8 million floating-point operations per second.

Other standard features include "endless windows"; the ability to "iconicize" a file for later retrieval; a 3½-in., 1.4M-byte floppy drive; and a built-in Ethernet card, small computer systems interface port and modem slot. Noting that Unix takes up a lot of disk space, Mannos said users would be guaranteed a minimum of 60M bytes with which to run programs.

Judith Hurwitz, editor of "Unix in the Office," which is published by Patricia Seybold's Office Computing Group, said Sony may be a little ahead of the market with its luggable. "The world isn't quite ready for a Unix portable," she said.

According to Hurwitz, the News 3250 "is a clear sign that Sony is starting to get aggressive about both Unix and the RISC market." She added that the box appears to be targeted at systems that are based on Sun Microsystems, Inc.'s Scalable Processor Architecture.

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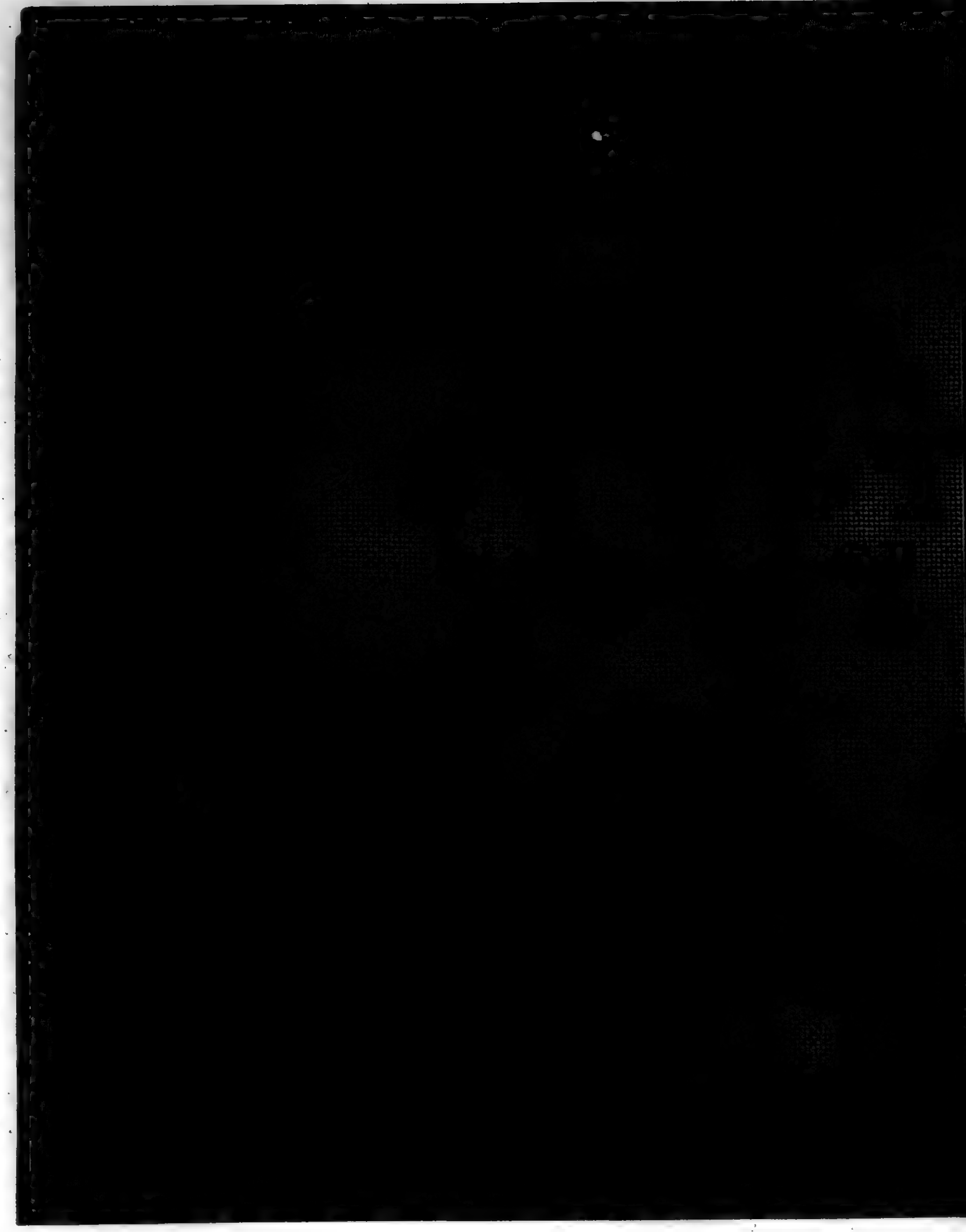
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ADVANCED TECHNOLOGY

TECH TALK

Smart-card challenges

■ A mass market for smart cards has been just around the corner for 20 years and is likely to stay there unless challenges of cost and standard-setting are overcome, according to a new study by Frost & Sullivan, Inc.
The notion that smart cards would eventually replace money and lead to the cashless society is not happening, the market research firm said. The cards and machines that read them are too expensive, and a lack of standards is an obstacle to widespread use of the cards.

Speedier SRAMs

■ Toshiba America Electronics Components, Inc. said recently that it has developed the world's fastest 1M-bit static random access memory chip (SRAM). The chip has an access time of 15 nsec, more than 25% faster than any other 1M-bit SRAM, the company said. Some 6.3 million elements, including transistors and resistors, are crammed on the 6.6mm by 13.3mm chip. That is the same level of integration found in 4M-bit dynamic random-access memory chips. Toshiba said the chip is also the first to store 16 bits of information at one time.

Mini meteorology terminal

■ Horizons Technology, Inc. said recently that it will begin work on a miniature meteorological observation terminal, a handheld device for entering and transmitting data to the National Weather Service. The company said it received a Small Business Independent Research award from the U.S. Department of Commerce to develop the terminal.

Japan on-line

■ Maxwell Online, Inc., an electronic information service vendor in McLean, Va., recently announced the Japan Technology database, which enables U.S. businesses to monitor Japanese technical literature. The journal abstracts, supplied by Scan C2C, Inc., are in English.

Is it real, or is it digitized?

Technical sleight of hand makes it possible to use computers for altering photos

BY MICHAEL ALEXANDER
CW STAFF

Desktop computers are magicians when it comes to altering photographs or even creating entire worlds using computer-generated images. It is a relatively simple trick, for example, to alter a photograph to put hair on a bald man's head or change a woman's eyes from brown to blue.

Virtual realities and a new offshoot that some call three-dimensional multimedia pose ethical challenges that go considerably beyond that of falsifying photographs, however.

With virtual reality and related technologies, people can be put into places where they have never been and objects can be made to take on lifelike qualities they never could have in actuality. Such technical sleight of hand is raising ethical issues that are now coming under close scrunity by a growing body of experts. Should users be told whether what they are seeing in applications based on virtual realties is contrived or real? What standards of behavior should be applied to two or more users interacting in an artificial space?

"It has become a major subject of discussion," said John Latta, president of 4th Wave, Inc., a multimedia production firm based in Alexandria, Va.

The consequences of this remain unclear but could be serious, Latta said.

"What is significant in virtual realities is that when two people interact, if the rules aren't clear to both, one could do psychological harm to the other."

In a computer-generated cyberspace, the rules of law and order are not clearly defined, partly because computer technology allows computer users to do things that are impossible in reality, Latta said. In an experiment involving two people, for example, one person was able to enter the computer body of another and take control of the other's actions. "Those kinds of things are verboten, but there is nothing to restrict that behavior," Latta said.



The lack of order in cyberspace is the "darker side of technology," and "we should not flinch when we examine computer-generated worlds," said Michael Heim, a philosophy professor at California State University at Long Beach.

The potential for deception using computers may be greater than with any other medium, said Brenda Laurel, managing director of Telepresence Research in Los Gatos, Calif.

Telepresence is a form of virtual reality technology that permits a user to control and interact with an environment from a distance.

Laurel envisioned that a code of behavior will evolve about "the sorts of warranties responsible users should be making about our identities" in cyberspace. She also said that a professional code of ethics would arise, much in the same way that ethics prevail in broadcasting, journalism and other areas.

Laurel said she believed that the ethical issues will become less important as users become more sophisticated and more accustomed to the technology.

The technology to create computer-generated images realistic enough to be deceiving is probably 10 to 15 years away, said Michael Spring, a computer science professor at the University of Pittsburgh.

Survey looks at critical issues in technology

BY MICHAEL ALEXANDER
CW STAFF

When it comes to advanced technology, senior information systems managers are preoccupied with technologies that are more valuable to the IS organization than to the business at large.

That is one of the primary conclusions of a survey of 392 top IS executives conducted by Cambridge, Mass.-based Index Group, Inc. Fortunately, this tinkering with self-serving technology appears to be lessening slightly, Index Group reported in its fourth annual survey of IS issues called "Critical Issues of Information Systems Management for 1991."

Computer-aided software engineering, image processing, expert systems, local-area networks and database tools were cited as the top five emerging technologies in which IS executives had the greatest level of interest.

It is encouraging to see image processing and expert systems among the top five technologies because they play a more direct role in changing business processes than in changing internal IS work, said Robert Morison, vice president and director of the Prism research program at Index Group.

The remaining three technologies are not really all that new, but they are technologies that the executives feel most comfortable with, according to Morison.

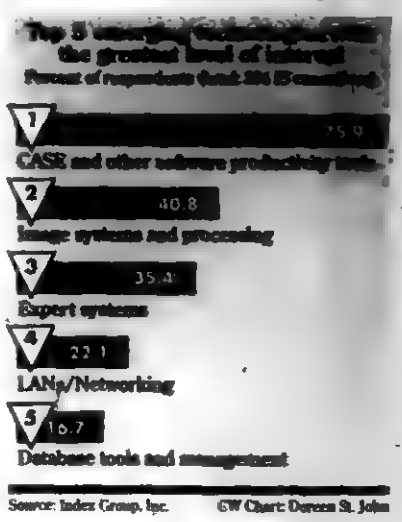
"The average IS organization is a large company is populated with technophobes who would rather not introduce new technologies that are going to disrupt the installed base."

The executives expressed only a passing interest in neural networks, voice recognition, supercomputing or handheld computers, all of which will probably have a profound impact on business processes in the next five years, Morison said.

Exactly half of the companies reported having a formal process for identifying and exploring new technologies. The IS executives said this process included advanced technology groups, task forces and steering committees, among other forms of technology-watching.

Of high interest

The pressure on IS to deliver higher quality applications faster is apparent as CASE and other productivity tools come out way ahead



Source: Index Group, Inc. CW Chart: Doreen St. John

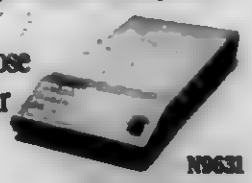
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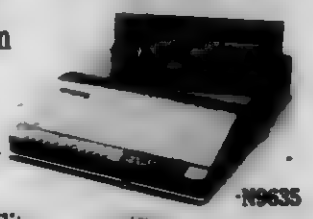
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EDITORIAL

Winds of change

IN AN ENVIRONMENT where layoffs are occurring in the tens of thousands every month, the news value of yet another round of reductions in force at any company is not high, as a rule.

However, when the nation's second largest computer company reverses a 34-year-old no-layoff policy and orders 3,500 "involuntary severances," now *that's* news, even though the number of people DEC said it would cut last week represents no increase to previously stated intentions to reduce its bloated work force.

To the thousands of DEC's very loyal customers, does this radical change in policy signify any new direction that will lead the company away from the downward spiral in which it has been inching down for the past several quarters? Or is the company destined to suffer a fate similar to its minicomputer brethren Wang and Data General, where layoff has followed layoff, and the companies have been essentially recast by the end of a painful process?

Clearly, no one knows the answer, but it is safe to say that DEC has a lot of different forces and weights stacked against it.

For one thing, the layoffs will immediately trigger a certain unease among DEC's 120,000 workers, an unease that comes from the realization that the next regular paycheck could be the last. Will any preoccupation with job security affect the performance of these workers? Would it affect yours?

Also, it would be surprising if the layoffs stopped at the levels stated last week. We're in a recession, DEC's revenue per employee isn't up to the levels of other big hardware makers, and most of its hardware competitors, including IBM, have already made comparably large cuts in their work forces.

As with DG and Wang, DEC's bread-and-butter minicomputers just aren't selling like they used to, nor will they ever again. The market's direction is toward smaller, cheaper and faster — a direction that has not been compatible with DEC's sales history.

However, many experts say they feel the biggest force against DEC is DEC itself, specifically its cumbersome internal management structure. As the story goes, ask a professional at DEC for the name of his boss, and you'll get three or more names back.

In an era when management structures across the board have been trimmed of midriff bulge with the intention of getting decision-making power closer to the seat of the business units themselves, observers say DEC's structure remains a matrix that greatly slows its ability to react to market changes.

Other company leaders before Ken Olsen — John Akers at IBM and Rick Miller at Wang, to name two — have found that the most important item on the change agenda is corporate cultural change. That is never easy, never painless and perhaps never so necessary as it is at DEC today. Rescinding a no-layoff policy does not a cultural change make, but it could be a starting point.



LETTERS TO THE EDITOR

Proving racism

The response by Mr. Ackerbauer, "Racial Tension" [CW, Dec. 10], to "IS: A tough road for minorities" [CW, Nov. 19] is an example of the racist attitudes prevalent in America, not just in information systems. The standard response is deliberate and, as in this case, elaborate obfuscation. Blacks are discriminated against in all aspects of life in this country. Nevertheless, whenever a black person complains about discrimination, the retort from the racist corner is "absurd," "where's the proof?" "reverse discrimination," "ludicrous" or "nonsense."

The *Harvard Business Review* article "Black managers: A dream deferred" [HBR, May-June 1986] points out clearly that white managers do go out of their way to sabotage the careers of black and female managers. Ms. Wilson's statements about the problem are clear, straightforward and obvious in light of such studies.

Kenneth N. Brown
Advanced Research Consultants, Inc.
Wilmington, Del.

EDI-TV

In "Turning the tide with technology" [CW, Dec. 24/Jan. 1], you captured the essence of the problem of slow electronic data interchange (EDI) implementation in the broadcast business, but it is incorrect to characterize myself, WGN-TV, any of the other Tribune Broadcasting Co. television stations or TBC Plus as opposing EDI.

TBC Plus and our six major-market television stations regularly exchange contract and billing information with many of our advertisers, our unwired network affiliates and sales organizations. We also encourage the use of such systems for the efficient handling of many routing transactions in our industry.

What would be correct to point out is that we oppose the potential for EDI to be used to foster the commodity sales of our air time. Such a use would rob our potential advertisers of the ability to learn of the many value-added enhancements that expand the worth of products when they are seen or heard on our outstanding group of radio and television stations.

Bill Murray
Director, Information Systems
Tribune Broadcasting Co.
Chicago

Babble-on

The letter from Thorne Perry regarding Glenn Rifkin's article "Abort, retry, ignore — truth about the PC age" [CW, Dec. 3], poses a rhetorical question to Rifkin about his whereabouts for the past five years in relation to the Information Age. I wonder where Thorne has been for the past 25 years.

IBM JCL doesn't compare with PC-DOS. JCL isn't an operating system; it's a mainframe bat file. The appropriate comparison would be DOS commands and TSO. "Abort, retry, ignore," even with its inconsistent results, would be good news in some software that gives no clues at all about how to extricate yourself from its clutches. And just when you think you've figured it out, it doesn't work the same on the next screen.

User-friendliness is definitely in the eye of the beholder. The reason for Rifkin's perplexity is that personal computers are friendly to hackers who never had to design and develop complex systems under harsh conditions. There is no "access barrier" to those with nothing better to do than run algorithms that endlessly compute passwords.

Frank McCormick
Port Hueneme, Calif.

Not the CASE

Your announcement of CGI Informatique's acquisition of Yourdon, Inc. [CW, Dec. 10] contained a few inaccuracies. First, the number of users, quoted as 250, is both ambiguous and incorrect. Yourdon has trained approximately 250,000 users in our method since the company was founded in 1974. The second inaccuracy is the common misconception that the Yourdon Structured Method (YSM) "approaches CASE from a process point of view." The latest version of YSM, called YSM 3.0, has a powerful integration of data, dynamics and function. YSM 3.0 supports a full range of information-based techniques such as enterprise modeling, the entity relationship attribute approach and entity life-cycle modeling.

John M. Baker
Director of Methodology
Yourdon
Raleigh, N.C.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. *Please include a phone number for verification.*

Battling the technology giants

T.J. RODGERS



The most dangerous threat to U.S. entrepreneurs today comes not from across the Pacific but from right here at home. In both insidious and overt ways, large companies that have lost their technological edge are using legal means to threaten some of the most vital and vibrant U.S. companies.

This trend not only is dangerous for the targeted companies, but it also weakens the fiber of U.S. competitiveness. The irony is that loss of competitiveness is the rationale used by the attacking firms that claim our technology leadership is at stake.

These legal wranglings pose a key question: Do we want big companies to dominate our supplier base at the expense of entrepreneurial companies?

To answer this, let's take a look at a bit of history. Two of the original players in the static random-access memory market, Intel and Advanced Micro Devices (AMD), lost their technology edge years ago and gave away the static RAM market share to the Japanese. During that time, both Integrated Device Technology and Cypress Semiconductor built successful $100 million U.S. static RAM businesses. In this key product area, smaller entrepreneurial companies have been the only ones that are keeping the U.S. in the game.

A similar situation exists in the programmable logic device (PLD) market. While AMD and Texas Instruments forced power-hungry bipolar PLDs on customers up until two years ago, Altera, Xilinx, Lattice and Cypress brought low-power CMOS erasable PLDs to market.

And in the microprocessor arena, the situation is even more black and white. As Intel and Motorola jammed outmoded 8086 and 68000 standards down computer makers' throats, the microprocessor landscape radically changed, and companies such as Sun Microsystems, Mips, Cypress, Integrated Device Technology (IDT) and Performance Semiconductor began offering designers higher performance, multisourced reduced instruction set computing (RISC) alternatives.

Had the big companies succeeded in snuffing out the entrepreneurial offerings, computer designers would have been forced to live with obsolescence as their only alternative.

The current cancer of useless litigation presents major hidden costs in the form of squandered time, dollars and creative energy. While, at first blush, each of the lawsuits may sound unique, on closer examination, these meritless suits fall into two basic categories.

One type is geared toward preventing small companies from hiring talented individuals from the large companies. Though they are never successful, these suits waste good management time and keep a raft of lawyers busy. The second category — far more insidious — is designed to eliminate competition. The good news is that both types rarely succeed.



Scott Matthews

Take a look at Cypress' record in these suits: 22 wins, no losses and three pending (with AMD, National Semiconductor and TI). Cypress has never paid a cent in these meritless cases.

While shrouded in a guise of intellectual property rhetoric, these lawsuits are a straight greed play. Look at TI, which is trying to manipulate the courts to gain a 5% surcharge on all Japanese semiconductors, based on the Kilby patent, plus a 10% surcharge on all dynamic RAMs. Through their legal department, which is, in effect, a profit center, TI is pulling in millions from competitors and customers alike.

In its latest legal foray, TI is trying to squeeze a 3% surcharge from Cypress, IDT, LSI Logic, VLSI Technology and Analog Devices through enforcement of a plastic packaging patent that dates back to 1963 and was filed in connection with a transistor package.

Should we pay to prop up TI or any of the other sagging giants of the electronics industry? The bottom line is we're fighting the suit, and we plan to win.

Another familiar type of legal irritation is monopolistic litigation. AMD has sued Cypress in an effort to shore up its sagging PLD business. This suit is clearly aimed at eliminating competition. If they win, this would raise prices and reduce the product types available to customers. Finally, let's look at that private club in Texas — Sematech — that was funded ostensibly to bolster U.S. competitiveness in semiconductor technology. Sematech's board of directors — all but two from billion-dollar companies — created an unfair dues structure, which effectively bars smaller companies. The result was that only 14 of about 300 U.S. semiconductor companies joined the consortium that was intended to help everybody.

Sematech was founded based on the scare tactic that the Japanese would control the semiconductor equipment industry. The irony is that Sematech is now trying to do just what it was founded to prevent: It is negotiating for exclusivity when it awards contracts to equipment companies. Furthermore, Sematech has begun to award contracts to its own members — a highly questionable practice.

Two-hundred million dollars is flowing into Sematech, but millions are flowing back to member companies in a closed loop that does little to benefit the U.S. semiconductor equipment industry and does real damage to some competitive entrepreneurial companies.

The unprecedented attack on entrepreneurs by large companies presents a clear danger to U.S. technological competitiveness. It's far past time to recognize that the only way to compete is through hard work and competence. And competence is one quality that can't be legislated. No "Ice Age Prevention Act" will save the dinosaurs.

Rodgers is president and chief executive officer of Cypress Semiconductor Corp. in San Jose, Calif.

Results speak louder than explanations

GLEN HUGHLETTE



Both Ron Brzezinski's article, titled "Plug the Understanding Gap," and a editorial on "Self-justification," which appeared in the same issue [CW, Dec. 3], suggest that a chief information officer should spend as much as 40% of his time validating his existence with key senior business managers.

The articles recommend that spending time in informational meetings with business managers will allow the CIO to create greater awareness of and generate support for the information systems department's mission and needs. According to the authors, "closing the understanding gap" will increase the likelihood of peers and business management supporting the CIO's requests for funding "the next technology wave."

It is simply nonproductive for a CIO to spend nearly half his time justifying his existence in face-to-face meetings with executive management. The measure of success for an IS department should be no different than for any other functional area within a corporation.

The department head who has implemented a program resulting in a productivity, profitability or market share increase is likely to receive favorable consideration for new departmental expenditures. Similarly, the CIO who implements systems that are instrumental in achieving corporate goals will be successful when attempting to increase expenditures and introduce new technology. Nothing succeeds like success.

Simply put, successful IS development does not require the business to understand more about the CIO or information technology. Rather, the IS department needs to deliver systems that respond to real business needs.

IS executives can never become true business experts. Nor can business users become expert in all facets of information technology. The key to success is to create a common language for business and IS so the two groups can effectively communicate their respective needs.

To bridge the communications gap, the CIO should adopt a structured methodology that provides the common language both groups can use. Replace the 40% time commitment for informal meetings with workshops designed to create business models that reflect the information needs of the enterprise.

Such workshops would be enlightening to both business managers and IS professionals by showing them how the organization works and how various departments share information.

Furthermore, business data models jointly developed by business managers and IS professionals would provide a blueprint for systems development. They would contain all of the data and metadata required by the organization's IS department.

The development of such models represents a unique opportunity for the organization to reflect its strategic business plan in IS. Adopting a participative IS planning and development methodology will allow the CIO to produce quality systems that meet the business users' needs the first time around and reduce the cost of maintaining redundant data.

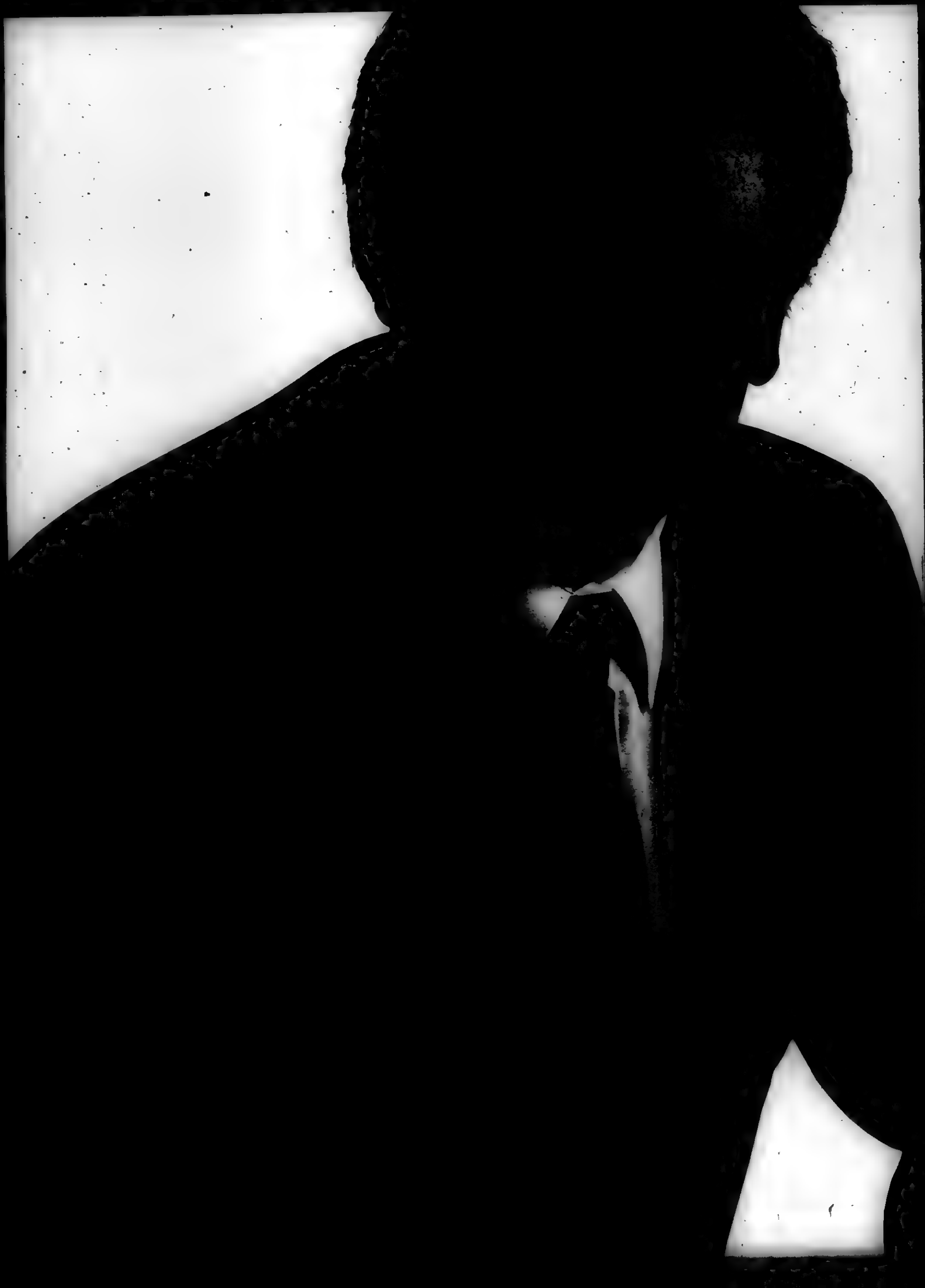
In addition, a methodology involving business managers and information users throughout the process will help build a consensus on prioritizing systems development projects to meet the most critical business needs.

Finally, the business models developed in this way will serve as the basis for systems development activities to improve the business and achieve the company's goals. It is those activities that will allow the CIO to garner support for the next budget.

Think about how the following statements would sound to a CEO: "I plan to spend 40% of my time in the coming year in informational meetings with business managers to justify the mission and purpose of the IS department and our need to implement new technology," or "I am committed to spending 40% of my time this year working with business managers and users in workshops to effectively determine their information needs. This way, we can build systems to help the organization achieve its objectives, leverage its investment in information technology and create a significant competitive advantage."

Don't you really think he'd prefer to hear the second one?

Hughlette is the president of Information Engineering Systems Corp., a CASE consulting firm in Alexandria, Va.



"We've got a complete SAA system up and running, and it's hard to say who's happiest: our programmers, our users, our customers, or me."

Keith Sievers, VP/Information Systems and Treasurer,
Federal Kemper Insurance Company

Federal Kemper Insurance Company is a home and auto insurer who's found some insurance for themselves, against system obsolescence.

It's a policy called SAA,™ or IBM Systems Application Architecture.™

Their SAA system is a client-server approach that ties IBM PS/2®s running OS/2® (in remote locations and the home office) with an ES/3090™ host. They chose SAA for both short- and long-term advantage.

"In our business," says Keith Sievers, "there's a tremendous need to cut costs, to make everybody as useful as possible. SAA is helping us do that. We also need a platform that's consistent, easy to manage, and built for growth. For us, going with SAA was just the obvious thing to do."

For programmers.

The first people to notice an improvement were FKI's programmers.

"We did everything in COBOL, but in the Presentation Manager™ environment," says Keith. "All of a sudden, people who'd been here for years were driving to work a little faster. They were doing better work, they were making a difference, and they saw results quickly, even without CASE tools."

FKI now has applications for data, image and customer service that are easy to use and easily portable. And they're delivering more function to users at less cost, thanks to SAA's cooperative processing.

Says Keith, "Under SAA, we're moving a lot of our processing from the mainframe to PCs, which offer flexibility and portability. And we see real benefits from a disaster recovery standpoint."

For users.

And do users like it?

"They ought to," says Mr. Sievers, "they helped us design it. SAA screens are sort of a personal thing, so it only made sense to include the people who'd be using them every day. Our old screens had acronyms tucked into every available space. The new ones are a lot easier to look at and understand, and everybody loves the mouse. It's less like work and more like fun."

And while multitasking doesn't mean much to the public, it's going to be a real plus for FKI's customers.

For customers.

"When policyholders call with questions, they want answers fast. And when our SAA system is fully implemented, they'll get them. Our representatives will be able to solve problems on the spot just by popping a new window onto the screen. Instead of 'I'll get back to you later,' they'll say 'Here's the answer right now.'"

Keith Sievers has other reasons for liking SAA, especially since MIS isn't his only job. He's also the company treasurer.

"We wanted a leading-edge system that would still be leading-edge five years from now, a base we could build on, something we could enhance with AI, voice or image technology, but without having to toss out what we already owned. People ask questions about SAA, but of all the options we explored it was easily the *least* questionable.

"We're very competitive, and the truth is, only two things separate insurance companies—cost and service. SAA gives us an edge both ways."

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COMMENTARY

Maryfran Johnson

DEC fees buy a headache



It sounds too silly to be real — like paying for a brand-new car when you've only changed the tires.

Yet after 10 years of allowing users to transfer their VAX/VMS operating system licenses at no charge when they upgraded their machines with used CPUs, DEC put on the piper's hat and demanded to be paid.

There was no public announcement, no notification to resellers, no warning to users.

DEC sales people just started telling certain customers — those who upgraded their machines with CPU boards purchased on the secondary market — that they owed DEC the *full value* of a new operating system license.

Surprise, surprise.

Once the Digital Dealers Association got wind of this last month, DEC got an earful from irate resellers and confused customers. So now the policy is being reconsidered, with a "clarification" expected by Feb. 1.

"The consistent message I've gotten from customers is they would like whatever policy we have to be clear and fair," said Pat Spratt, manager of software business practices for DEC in Nashua, N.H. "The clarity is what customers are asking for most of all, because we've had some very ambiguous policies in the past."

The ambiguous policy at work here is a dusty old thing.

Continued on page 34

Unmasking Unix's many faces

ANALYSIS

BY JOHANNA AMBROSIO
CW STAFF

Like brothers and sisters, different flavors of Unix can appear alike on the surface but have some striking dissimilarities on the inside. Information systems managers have adopted various strategies to deal with these differences, from programming tricks to using only one or two Unix variants.

The variations are most apparent when it comes to networking different kinds of Unix, users said. And it can be especially frustrating because IS managers may be unaware of potential inconsistencies. Many commercial enterprises have used Unix systems in applications that are only now being connected with each other and with the corporate mainframe.

"The flavors are sufficiently different, and it has been problematical," said Laurence Sikon, director of advanced technology at Worldwide Express in New York. "The guidelines are evolutionary, and there's an awful lot of on-the-job learning."

DHL uses AT&T Unix System V as its standard. But even with this, Sikon said, different System V-based versions implement communications protocols differently. So using Transmission Control Protocol/Internet Protocol or X.25 to tie together Unix variants is not all that simple. The differences come out in the types of network services available for one or the other Unix systems and in systems administration functions.

Other difficulties come with trying to move applications from one Unix variant to another.

While Unix has made its reputation as a portable operating system that allows applications to be moved easily from one system to another, the reality is that sometimes it is not all that painless to accomplish, users said.

The level of porting complexity depends on the specific types of Unix involved, how deeply into the operating system the application goes and which Unix calls the application uses. If these are the generic system calls that are common to all Unix variants, the application is indeed portable. But if the application uses a vendor-specific call, then it will take more work to move the application to another platform. So some IS shops use only the generic Unix systems calls when programming.

Cutting support

Others are taking an entirely different tack. Pearle Service Group in Dallas is reducing the number of Unix variants it uses. "We're getting out of the business of supporting different Unix systems," said Colby Springer, vice president of information services. The company currently has systems that run IBM's AIX and versions of Xenix and Unix from The Santa Cruz Operation. During the next 18 months, the company will switch entirely to SCO Unix for its point-of-sale system deployed in its retail stores nationwide.

"We felt long-term there would be problems in having different versions," Springer said. "There's a potential for significant upgrade problems."

General Motors Co. in Detroit is adopting a similar strategy by reducing the number of Unix vendors it uses in its "C-4" program, a five-year plan to tie various computer-aided engineering departments and manufacturing plants together.

GM will buy Unix workstations from only four vendors: IBM, Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc. "We're trying to restrict the set of things we have to deal with," said Patricia Amaranth, C-4 communications manager. She said GM chose those vendors because they comply with de facto standards such as Posix and the *X/Open Portability Guide*.

IS shops will likely increasingly rely on those standards as they seek to make sense of their Unix systems, according to Sikon.

DG users concerned about software quality

BY SALLY CUSACK
CW STAFF

The North American Data General Users Group (NADGUG) recently posted the results of its annual user survey, prioritizing user concerns regarding products, services and the company's long-term financial viability.

"This is by far the most comprehensive survey we have ever done, and this year there was a big shift in user concerns," said Greg Farman, executive director of NADGUG.

The survey was distributed to 4,000 Data General Corp. users and received 813 responses. The No. 1 concern among the users was the continuation of product software quality and availability. The No. 2 concern was unsatisfactory field service and support.

In past years, field service concerns would typically rank at the top of the list, Farman said. He added that this year was the first time the question of the vendor's financial viability was

Continued on page 34

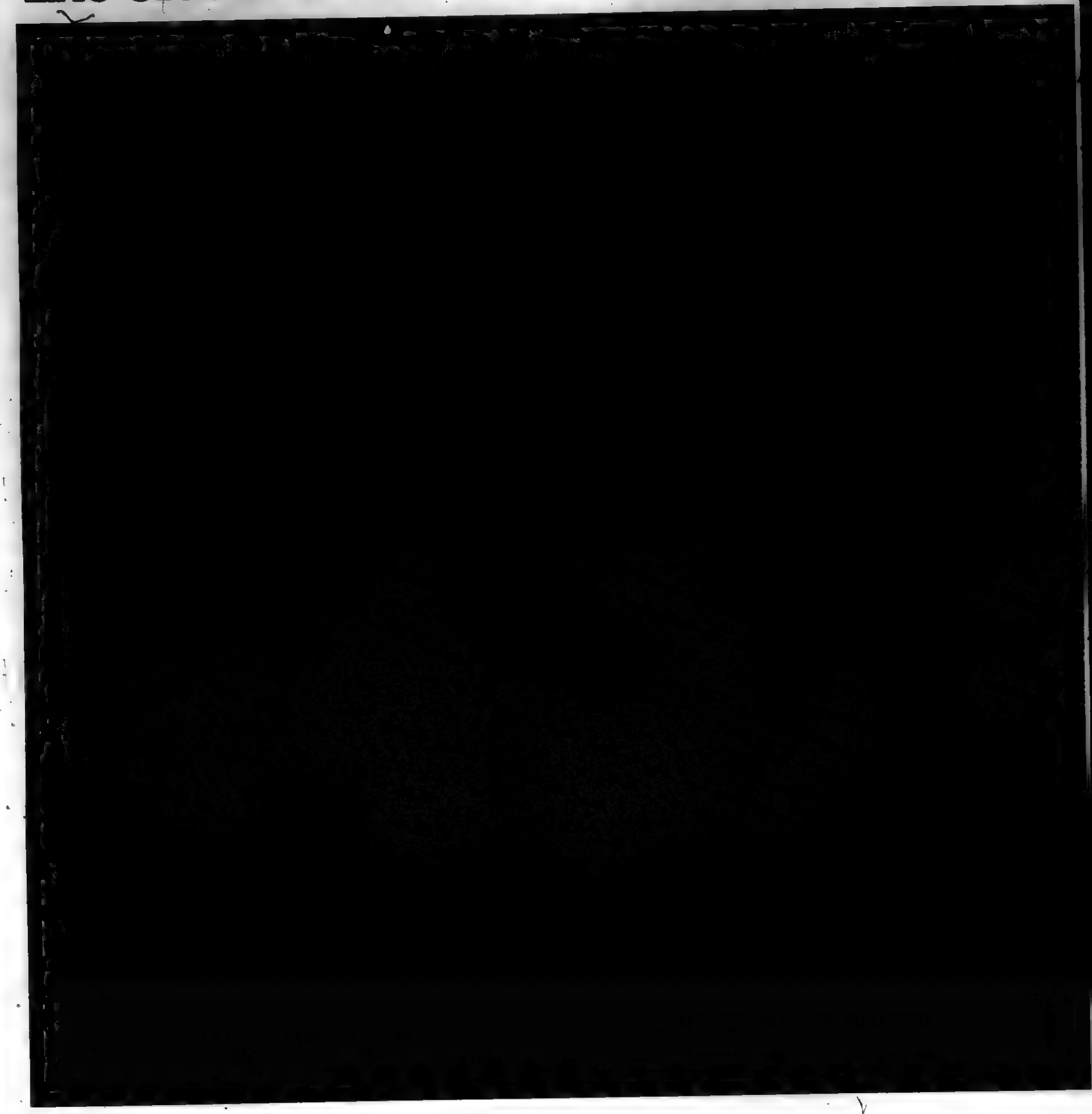
Issues of contention

A recent survey by the North American Data General Users Group ranked the following issues in order of user concern:

- Continuation of software quality and availability
- Service and support
- Continuity for proprietary line of MV computers
- Pricing
- Sales force (needs to increase response to user inquiries and become more involved in DG user communities)
- Connectivity
- DG's viability and survival
- Maintenance contracts (not price-competitive with third parties)
- Doing business (needs increased administrative efficiency)
- Marketing direction
- Industry marketing (needs more vertical industry market support in the field)



The Closer You Look At Software For The

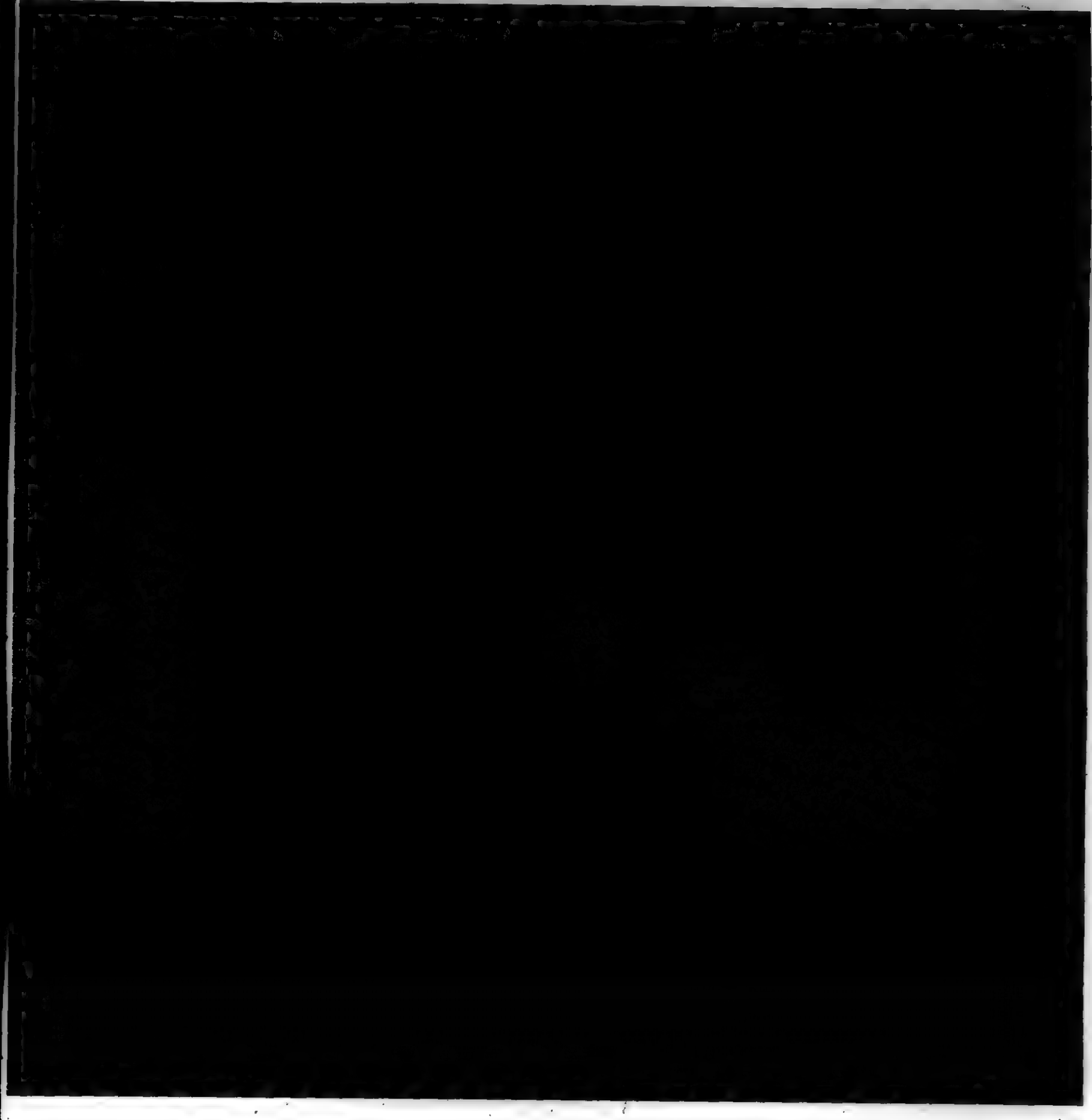


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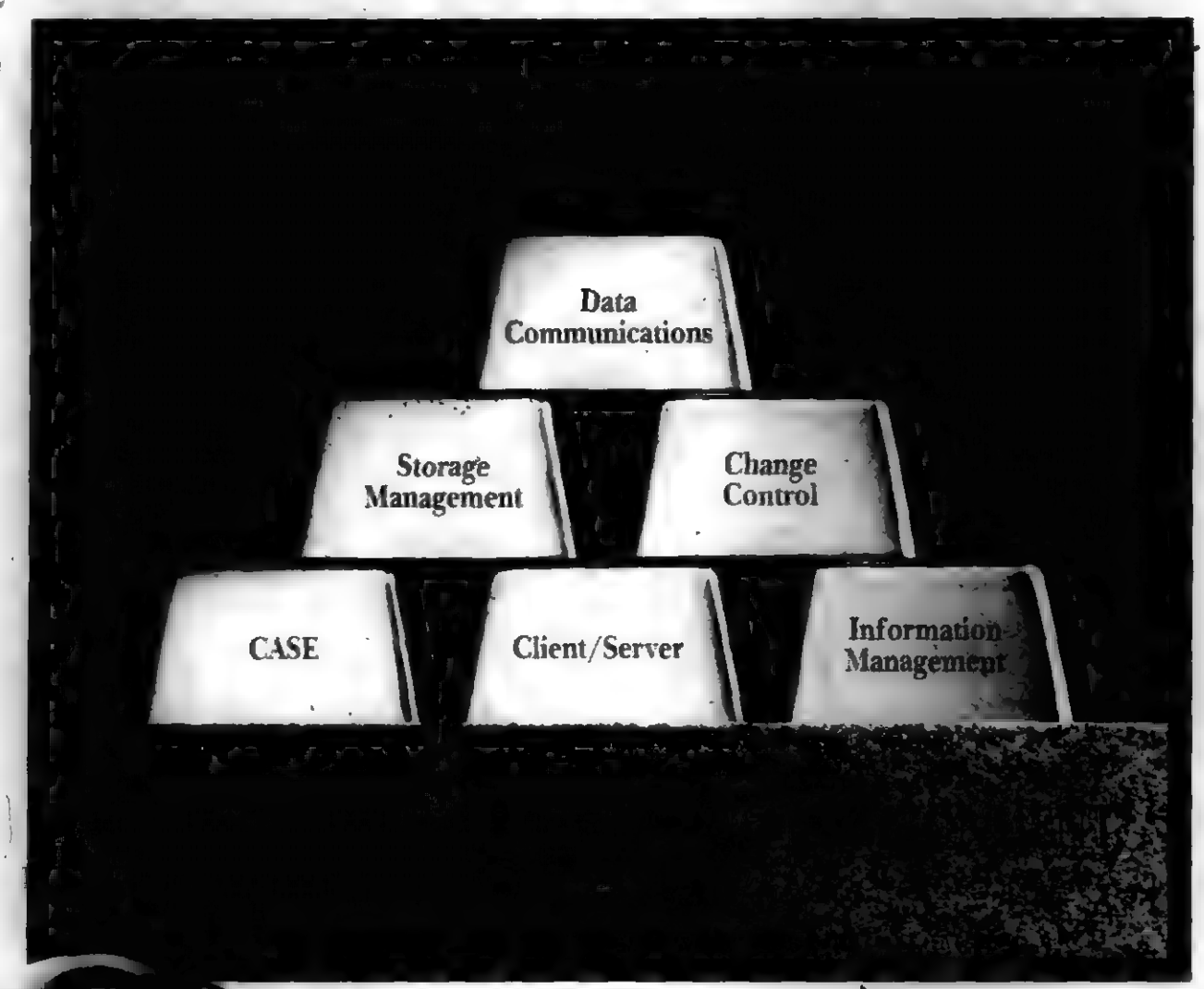


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Pac Bell mainframe takes specialist's role

ON SITE

BY JEAN S. BOZMAN
CW STAFF

PLEASANT HILL, Calif.— When Pacific Bell publicly launched a voice-mail service offering called the Message Center last month, the company tried something different behind the scenes.

Pacific Bell decided to leverage general-purpose computers rather than the dedicated telephony equipment traditionally programmed to support such services. In doing so, Pacific Bell sought the flexibility to modify the fledgling voice-mail service as it went along and greater speed in deploying future applications.

The messaging system is being marketed as an alternative for telephone answering machines at consumers' homes. Dedicated computer equipment will continue to be used for other applications and at some of the California phone company's largest customer sites.

"We're offering a new type of hybrid public/private service," explained Bill Stout, director of technology planning at Pacific Bell's Information Services Group here. "Our architecture says we'll have a mass-market platform [the A17 mainframe], using the general-purpose computer and a series of small-scale customer-premise equipment for special situations."

The voice-mail service uses a Unisys Corp. A17 computer to support thousands of "mailboxes" that hold phone messages. A Unisys database, DMS II, creates the logical "mailboxes" and tracks incoming phone calls. Pacific Bell expects to create hundreds of thousands of mailboxes but declined to say exactly how many customers have signed up for the new service.

Pacific Bell's packet-switched network will allow the new voice-mail system to communicate with existing voice-mail systems of different designs.

The Unisys system was designed to grow as demand for services increases. "We decided to go with a large-scale computer system because of its economy of scale — and the ability to share one access network among different types of customer service applications," Stout explained. If extra capacity is needed, the A17 could be reconfigured to hold more CPUs or, more likely, upgraded to a higher capacity A16. While Pacific Bell did not disclose the price of its system, Unisys said similar A17 systems would cost $8 million or more.

The phone company's move to a four-processor Unisys A17, which was installed here in October, is part of a larger trend toward using general-purpose computers as application platforms in the telephone industry, Stout said. For years, telephone companies have used a wide variety of computers, including those made by Tandem Computers, Inc., Amdahl Corp., Digital Equipment Corp. and IBM, to support special applications.

In the last year, Unisys began selling its A17 to telephone companies as part of a packaged system called the Network Applications Platform. One other early Network Application Platform site is a US West telephone switching center located in Bellingham, Wash.

Stout said Unisys had created special hardware modules, called Voice Interface Modules, that connect the Network Application Platform units to standard telephone switches and T1 multiplexers.

Software developers here programmed the voice-mail application in Linc, a fourth-generation language from Unisys. The software is a combination of custom and off-the-shelf Unisys programs. In the future, Stout said, he plans to add store-and-forward facsimile capabilities to the system. He said he is also considering the addition of a Unix hardware subsystem when Unisys provides it.

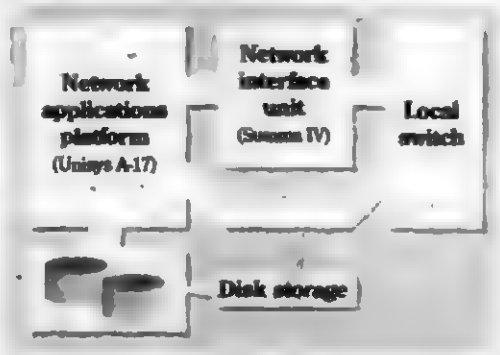
Despite two years of development and months of testing, Pacific Bell's Message Center launch was marred on Dec. 21 by a three-hour outage caused by the failure of several hardware components, a Pacific Bell spokesman said. The outage was corrected by a swap-out of the faulty components, and users will receive a $4.95 credit on their December bills — equal to the monthly charge for their voice-mail service.

> "WE'RE OFFERING A new type of hybrid public/private service."
>
> BILL STOUT
> PACIFIC BELL

At first, Pacific Bell's A17 will support the firm's new voice-mail service for residential customers. But eventually, the A17 will take on the task of running Pacific Bell's business voice-mail service.

A second voice-mail hub will be placed in suburban Los Angeles later this year. Pacific Bell did not disclose plans for any other voice-mail hubs. Future applications that could be launched on the Network Application Platform include voice-interactive database inquiry, on-line airline reservations and mail-order requests by phone, a Unisys spokesman said.

Out of character
Pacific Bell's Unisys A17 is working in a new role as a communications processor



CW Chart: Marie Hulser

General Automation unveils line of high-end processors

BY SALLY CUSACK
CW STAFF

ANAHEIM, Calif. — General Automation, Inc., an international supplier of database-oriented business information systems, software and services for the Pick and Pick/Unix community, recently released a series of business computers targeted at the midrange and high-end systems marketplace.

Dubbed the Advantage series, the initial rollout includes the midrange System A600, the upper end System A800 and the dual-processor System A800/2. According to the company, the basic System A600 is based on a 25-MHz Motorola, Inc. 68030 processor with 64K bytes of dynamic random-access memory.

The system also includes 16M bytes of memory, 376M bytes of disk capacity and 16 serial ports. It requires an uninterruptible power supply (UPS) and can be expanded to support as many as 256 users and 64M bytes of memory. It costs $93,950.

The A800 is configured with a 50-MHz version of the Motorola 68030 processor and offers 64K bytes of caching DRAM, 64M bytes of memory and 64 serial ports, which can be expanded to accommodate 512 users. It is priced at $164,950, and a UPS is required.

At $375,950, the top-of-the-line A800/2 dual-processor computer includes two 50-MHz, 68030 processors with a combined total of 128K bytes of caching DRAM. The system requires a dual UPS and can be expanded to accommodate up to 1,024 users.

The vendor is also offering a feature enhancement kit that facilitates the upgrade of selected prior-generation General Automation and CIE Systems, Inc. computers to provide Advantage series technology. CIE Systems was acquired by General Automation in January 1990. The enhancement kit is priced from $15,550 to $61,950.

System A600 and A800 deliveries are scheduled to begin this month, and the A800/2 is scheduled to ship in June. Deliveries on the enhancement kits will start in April, the firm said. A year's worth of on-site maintenance is included in the price of the A600 and A800 systems.

BMC ships beta version of CICS utility

BY ROSEMARY HAMILTON
CW STAFF

SUGAR LAND, Texas — BMC Software, Inc. said it began beta-test shipments of its CICS Integrity Series, a set of utilities that it picked up with the acquisition of Integrity Solutions, Inc. last year.

The software series, which is targeted at the IBM MVS and VSE operating environments, has been revamped and repackaged by BMC, according to Eric Brubaker, a director of product development.

He did not provide a general availability delivery date but said he expected the beta testing to have a short run.

The company added an electronic vaulting package and an on-line installation tutorial to this series of data and disaster recovery tools. In addition, it streamlined the series, which has been made up of 11 modules, to a set of seven packages by removing redundancies and shifting some functions, Brubaker said.

For example, the functions of one module that was used to coordinate jobs for a recovery were added to the core components of the series and will no longer be offered as a separate piece, Brubaker said.

Under the BMC label, the series will be made up of three modules, each of which has an MVS and a VSE version. These include Recovery for CICS, Recovery Plus for VSAM and Journal Manager Plus. The electronic vaulting package, called Data Vault, is available for MVS only.

Individual modules will be licensed separately and priced according to CPU size. VSE prices start at $1,500, and MVS prices begin at $2,000 per package, Brubaker said.

NEW DEALS

Unisys signs contract with Polish groups

In a recently announced venture, LOT Polish Airways and the Polish bank PBD SA have signed a $5.7 million contract for two Unisys Corp. mainframes, two airline applications and two DCP/40 distributed communications processors.

Unisys will supply its Airline Revenue Enhancement (ARE) system and USAS Departure Control System (DCS) to the joint venture, Unilot. Unilot will provide computer equipment and services to LOT and other Polish government agencies and will act as the Unisys sales and service agency throughout Poland.

The DCS was designed to modernize passenger check-in and load planning. The ARE will help airlines monitor departures and optimize bookings and revenue.

Arco Oil & Gas Co. in Plano, Texas, recently purchased two FX/2800 supercomputers from Alliant Computer Systems Corp. for seismic research and oil exploration. The contract involves a reduced instruction set computing-based parallel processor for Arco's corporate computer center and a rack-mounted version of the FX/2800.

Johnson

CONTINUED FROM PAGE 29

written back in the days when the only VAX upgrade around was an 11/780 to an 11/785. Nobody gave it a second look until DEC executives started talking tough about "making money in software." Nobody cared until used VAX 6000s began surfacing and competing against DEC's own sales force.

"DEC may be trying to regain control over what's theirs, but if they do it haphazardly, people could get skittish and not buy DEC," warned Tom Donovan, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Analysts who follow the used market were appalled by the policy shift, because charging for a whole new license would easily exceed the cost of an upgrade.

The accepted industry practice is to charge an upgrade fee when a user moves an operating system to a more powerful computer, supposedly for the additional value the operating system brings to the bigger box. No one is objecting to DEC charging *some* sort of upgrade fee. After all, faithful customers who upgraded directly with the company were often paying five to 10 times more than those dealing in used equipment.

But there is a distinctly punitive cast to DEC's claim that a CPU upgrade deserves an entirely new VMS license. These customers did pay in full for one VMS license already, and a second one will run them at least another $60,000 for VAX 6000-class machines.

What makes the policy even more onerous is it appears to encompass those customers who upgraded in the past. This means a DEC salesman could check out your shop's VAX configuration and inform you it is "invalid" because you upgraded the CPU through a reseller.

What's next, a squad of DEC "Upgrade Police?"

Analysts and resellers who have followed DEC's roller-coaster relations with the secondary market say consistency has never been the firm's strength. Ironically, the association's effort to clear up those murky areas of DEC policy on used equipment unearthed this poison pill.

"We agree DEC has a right to change its policy, but what about all the work already done?" asked C. D. Smith, president of C. D. Smith and Associates, a DEC reseller in Houston. The dealers' association is asking DEC to rescind the policy or at the very least "grandfather in" all those CPU upgrades out there.

"DEC has made this change without any consideration of its impact on the market," Smith said. "They don't understand us. They won't even talk to us."

DEC pulled a similar stunt a few years ago at a meeting of the DEC Users Society (DECUS) in San Francisco. A company official casually announced that VMS licenses would no longer be transferrable on used equipment.

Talk about your galvanizing forces. By the end of the week, the outraged DECUS members had organized a special meeting to protest the change. Thirty days later, DEC backed down.

History is likely to repeat itself in this latest brouhaha as well.

"Once they figure out that this makes them look really bad compared to IBM, they'll see they can't run this risk," said Peter Schay, an analyst at Gartner Group, Inc.

Johnson is a *Computerworld* senior editor, systems and software.

DG users

CONTINUED FROM PAGE 29

raised, which placed at No. 7 in the final tabulation.

"It's hard to feel sanguine about a company that has lost hundreds of millions of dollars over the past few years, but they're still in there, and they're still alive," Farman observed.

DG addressed the issue of software quality and availability by responding that its recently created Eclipse Business Unit will provide an additional focus on that area.

The company cited recently released revisions of CEO, CEO Object Office, DG/SQL and other releases as proof of its commitment to software development and support.

Even though it dropped to No. 2, field service — or lack thereof — is still a major issue for users.

Having trimmed field service back in recent years, DG is now facing more competition from third-party vendors.

DG has never been known for inexpensive maintenance contract offerings, and Farman speculated that the recent economic crisis may be luring users to less expensive third-party agreements.

"They have totally taken away local software engineering support," said Joe Antonio, data center manager at F. Schumacher & Co. in Newark, Del.

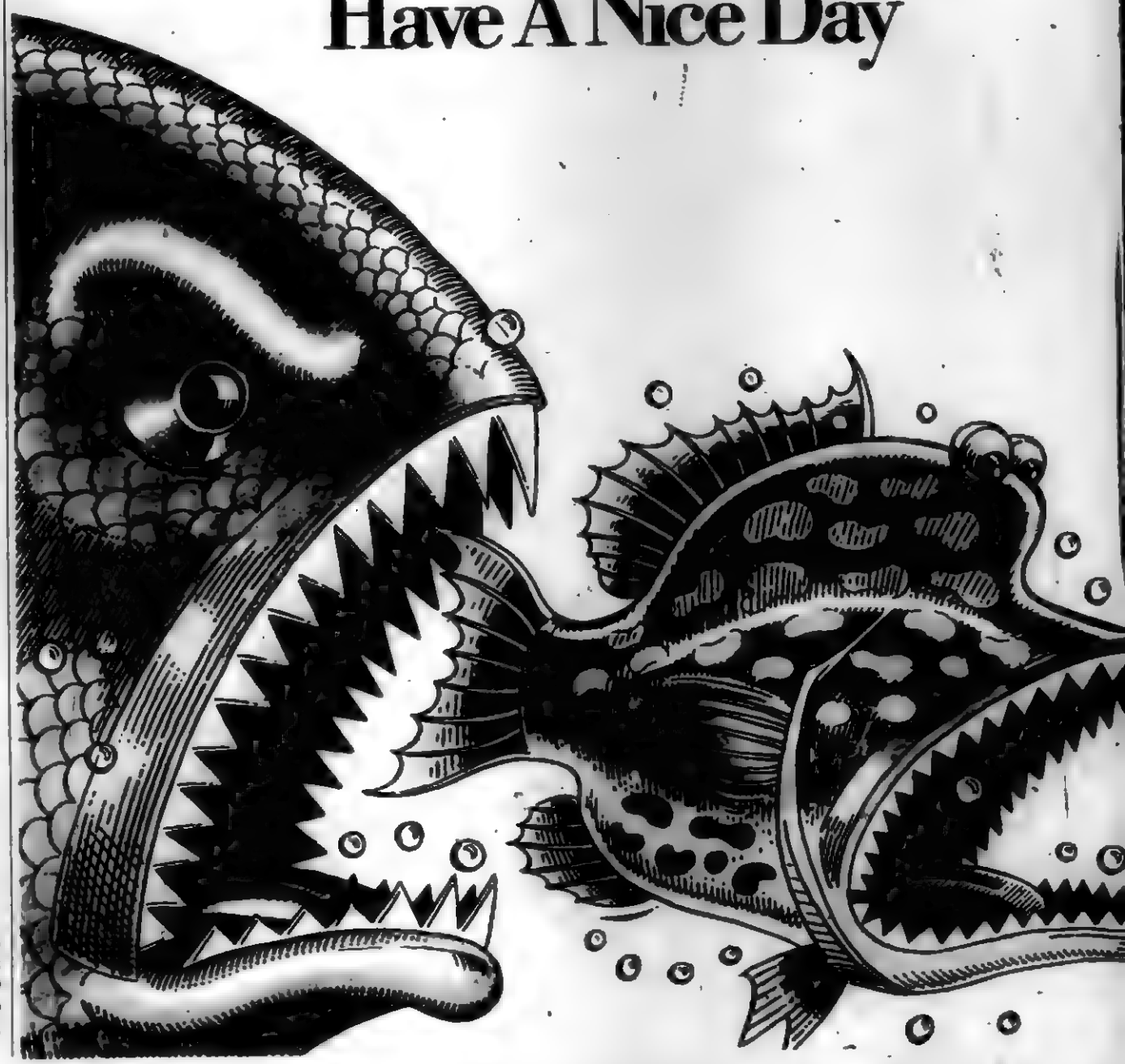
The wallcovering and fabric manufacturer has been a DG customer for almost 12 years, and according to Antonio, it no longer has any personal relationship with the vendor with regard to service and maintenance.

"The layoffs really killed customer service," Antonio said.

Another longtime DG user, Michael Kaiser, who works at Victim Services, a nonprofit agency in New York, said he is using a third party for maintenance and services on the organization's MV/15000 system. Kaiser said the decision to go with a contractor was driven by cost, not performance considerations.

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NEW PRODUCTS — SOFTWARE

Applications packages

Metier Management Systems, Inc. has announced several versions of its Artemis project management software package for various midrange and mainframe platforms.

Artemis 7000, priced at $20,000, has been released for Unix platforms, and Artemis Project, with a list price of $9,500, has been targeted at Hewlett-Packard Co. 9000/800 minicomputers.

The company has also announced Artemis 7000 Version 7.5 for Digital Equipment Corp. VAX systems and Artemis 9000 Release 9.4 for IBM mainframes. The products are priced at $20,000 and $40,000, respectively.

Metier Management Systems
12701 Fair Lake Circle
Fairfax, Va. 22033
(703) 222-1111

Lawson Associates, Inc. has announced an enhanced version of its purchase order system, a software application designed for IBM System/38 and Application System/400 environments.

Lawson Purchase Order, part of Lawson's Distribution Management System family, includes an overshipment/cost tolerance control feature that notifies users when prespecified parameters for overshipment quantities or invoice costs have been exceeded.

Pricing for the software package begins at $20,000.

Lawson Associates
1300 Godward St.
Minneapolis, Minn. 55413
(612) 379-0258

Languages

SQL Solutions, Inc. has announced that its SQR procedural fourth-generation language and report writer is available for users of Ask Computer Systems, Inc.'s Ingres Products Division's Ingres relational database.

The product features a straightforward command syntax and support for the full complement of SQL commands. A "select paragraph" facility enables programmers to combine queries with procedural commands, according to the vendor.

SQR runs on Digital Equipment Corp. VAX/VMS and Sun Microsystems, Inc. Unix platforms. Pricing ranges from $1,200 to $30,000 for VAX/VMS systems and from $750 to $12,000 for Sun Unix platforms.

SQL Solutions
8 New England Executive Park
Burlington, Mass. 01803
(617) 270-4150

NEW PRODUCTS — HARDWARE

Data storage

Clearpoint Research Corp. has announced a 64M-byte single-board memory upgrade for Digital Equipment Corp. VAX 8600 or 8650 machines.

The DCME-V86/64MB uses 4M-bit dynamic random-access memory technology to provide a single-slot upgrade alternative to DEC's MS86-DA, a two-slot motherboard equipped with multiple daughter cards, the vendor said.

The product has a list price of $20,000.

Clearpoint Research
35 Parkwood Drive
Hopkinton, Mass. 01748
(508) 435-2000

American Digital Systems, Inc. has announced a series of tape backup systems that features data compression and compatibility with all Digital Equipment Corp. Q-bus — Unibus — small computer systems interface- and Hierarchical Storage Controller-based systems.

The Mastertape 4 series of backup systems can provide as much as 6G bytes of formatted data storage on a 4mm digital audiotape cassette. Features include a sustained data transfer rate of 366K byte/sec. and a 20-sec. average search capability, according to the vendor.

Pricing for the product begins at $4,695.

American Digital Systems
490 Boston Post Road
Sudbury, Mass. 01776
(508) 443-7711

Cipher Data Products, Inc. has announced a ½-in. cartridge tape drive that features 18 tracks of read/write electronics and an integrated small computer systems interface.

The Cipher Tapexpress was designed to be compatible with IBM's 3480 tape drives. The drive uses standard 200M- and 220M-byte 3480-type cartridges, and when combined with a proprietary automatic cartridge loader, its capacity can be increased to 2.2G bytes without operator intervention, according to the vendor.

Pricing begins at approximately $13,000.

Cipher Data Products
10101 Old Grove Road
San Diego, Calif. 92131
(619) 693-7153

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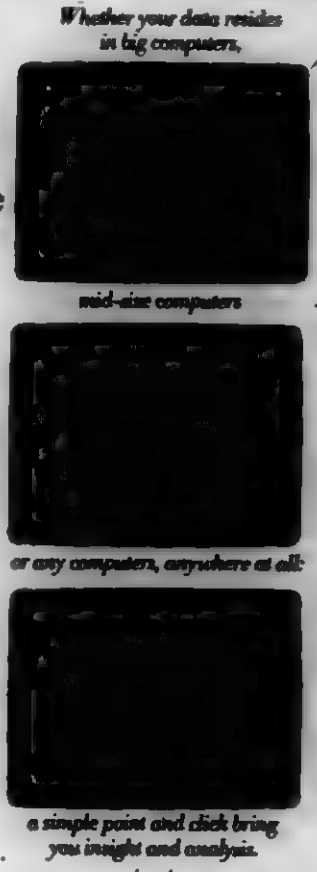
Instead of rough estimates.

The IBM Data Interpretation System (DIS) is graphical, mouse-driven software that actually lets you access, manipulate, analyze, share and store information—right from your own desk.

And, speaking of information, a recent customer survey shows that on a typical workday customers spend a full *50%* of their time gathering information—and only 10% using it to their competitive advantage.

The good news? When customers used the right system, the exact opposite was true:

Time spent gathering data plummeted to 15% while time spent outsmarting sharks jumped to 55%.



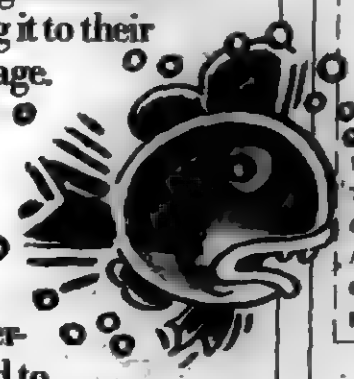
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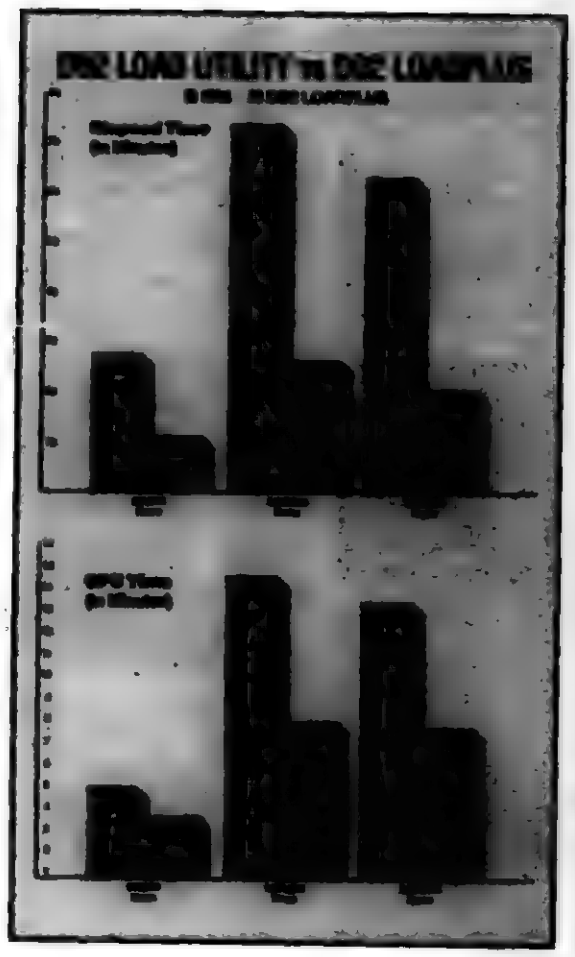
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COMMENTARY

Patricia Keefe

Playing the name game



What's in a name? According to a member of the Microcomputer Managers Association, OS/2 was originally supposed to be called DOS 5.0, but IBM changed the name to OS/2 to parallel the moniker of the Personal System/2s. This, added to reports that OS/2's design was hamstrung by IBM's hardware requirements, has convinced some that Microsoft's so-called Portable OS/2, or OS/2 3.X, as it is also known, will shed the OS/2 tag before it ever hits the streets. Further evidence may be gleaned from a recent report that references to OS/2 are scratched out of preliminary paperwork on LAN Manager 3.0.

Beat them with technology. As Lotus pushes forward with its third and fourth copyright lawsuits — a summer trial is expected — it's interesting to note who is not in Lotus' corner. Lee Reiswig, IBM assistant general manager of programming for the Entry Systems Division, revealed in a recent interview that he does not support the Lotus copyright frenzy. Reiswig suggested that the best way to deal with clones

Continued on page 45

Trade-ins can sweeten PC deal

Some outlets giving credit for used models as a way of luring customers

BY RICHARD PASTORE
CW STAFF

"If you buy this 1991 Hyundai 486, we'll knock off $300 for your 1985 Packard Bell."

It may sound like an auto dealer's pitch, but such banter is beginning to be heard on the showroom floors of personal computer dealerships. One major chain is now accepting trade-ins on PCs, and others say they are considering it. However, users and dealers indicate that it will be some time before trade-ins really get rolling and potentially become common.

Proponents of trade-ins say PC saturation, the popularity of Microsoft Corp.'s power-hungry Windows 3.0 and a tightening economy are all contributing factors to what will become an increasing customer demand for trade-ins.



Tom Payne

"There are a lot of potential replacement sales slipping away because there's not an incentive to do something with those old machines," said JoeAnn Stahel, president of Storeboard/Computer Intelligence in Dallas.

A trade-in policy reportedly helped loosen the purse strings of four network-equipped customers of Engle Business Equipment in Elizabethtown, Pa. "They would not have updated if it weren't for this program," claimed Engle's Steven Smith. "They would have kept their old equipment."

Analysts see trade-in policies as a lure for picky shoppers. "It's a merchandising ploy," said Seymour Merrin, president of Merrin Information Services in Palo Alto, Calif. "They're trying to entice them with classical retailing techniques."

The most visible dealership to take the plunge into trade-ins is Valcom, Inc. The 300-store chain has about 50 stores participating in the program, which was announced in November. The stores are offering near-market value for old boxes based on Boston Computer Exchange prices. The Exchange is responsible for reselling the trade-ins Valcom takes in.

Valcom expects the program to appeal more to large customers who have a great number of old machines on their hands.

Continued on page 45

Lotus fights to regain market share

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. went on the offensive last week, offering buyers of 1-2-3 Release 3.1 a "free" copy of its Ami Pro word processor and promising a $49 upgrade to its next spreadsheet release — presumably 1-2-3/W — this summer. In addition, Lotus unwrapped a massive advertising campaign.

The impetus for mounting the battlements was last week's expected release of Microsoft Corp.'s Excel 3.0 for Windows 3.0. Lotus rivals Borland International, Inc. and Microsoft had their most successful years in 1990, in terms of chipping away at 1-2-3's market share.

There is a $19.95 shipping and handling charge for Ami Pro, which ordinarily retails for $495. Users will need to provide a sales receipt for 3.1 and an Ami Pro coupon available through local and national advertising. The offer is valid in the U.S. and Canada for 1-2-3 Release 3.1 purchases and upgrades made between Jan. 8 and April 30, 1991.

Determined to grab a piece of the Microsoft Corp. Windows-based word processor market, Lotus last month purchased Atlanta-based Samna Corp., the developer of Ami and Ami Pro.

The Ami offer serves a dual purpose: It provides 3.1 buyers with an extra incentive while helping to seed the market for Ami. "We're eager to get [Ami Pro] into the hands of as many Lotus customers as possible," said Woody Benson, director of distribution management for Lotus' Software Business Group.

Although the Ami has received positive reviews — including a rating from *Software Digest* as both the best overall and Windows-specific word processor — Ami holds but a sliver of market share. Giants in terms of market share, Microsoft Word and Wordperfect Corp.'s namesake package dominate the market.

The $49 upgrade option is available to users who purchase 3.1 on or after Jan. 8. Customers must buy a personal computer version of 1-2-3 no later than six months following the original date of their 1-2-3 Release 3.1 purchase.

Users must submit system disks or the reference manual title page, along with the sales receipt. The free copy of Ami Pro comes with a coupon redeemable for the $49 upgrade.

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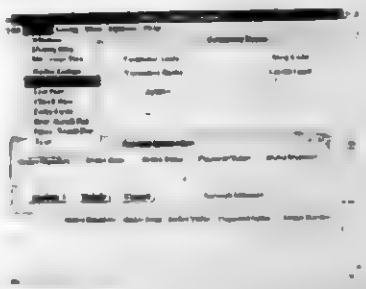
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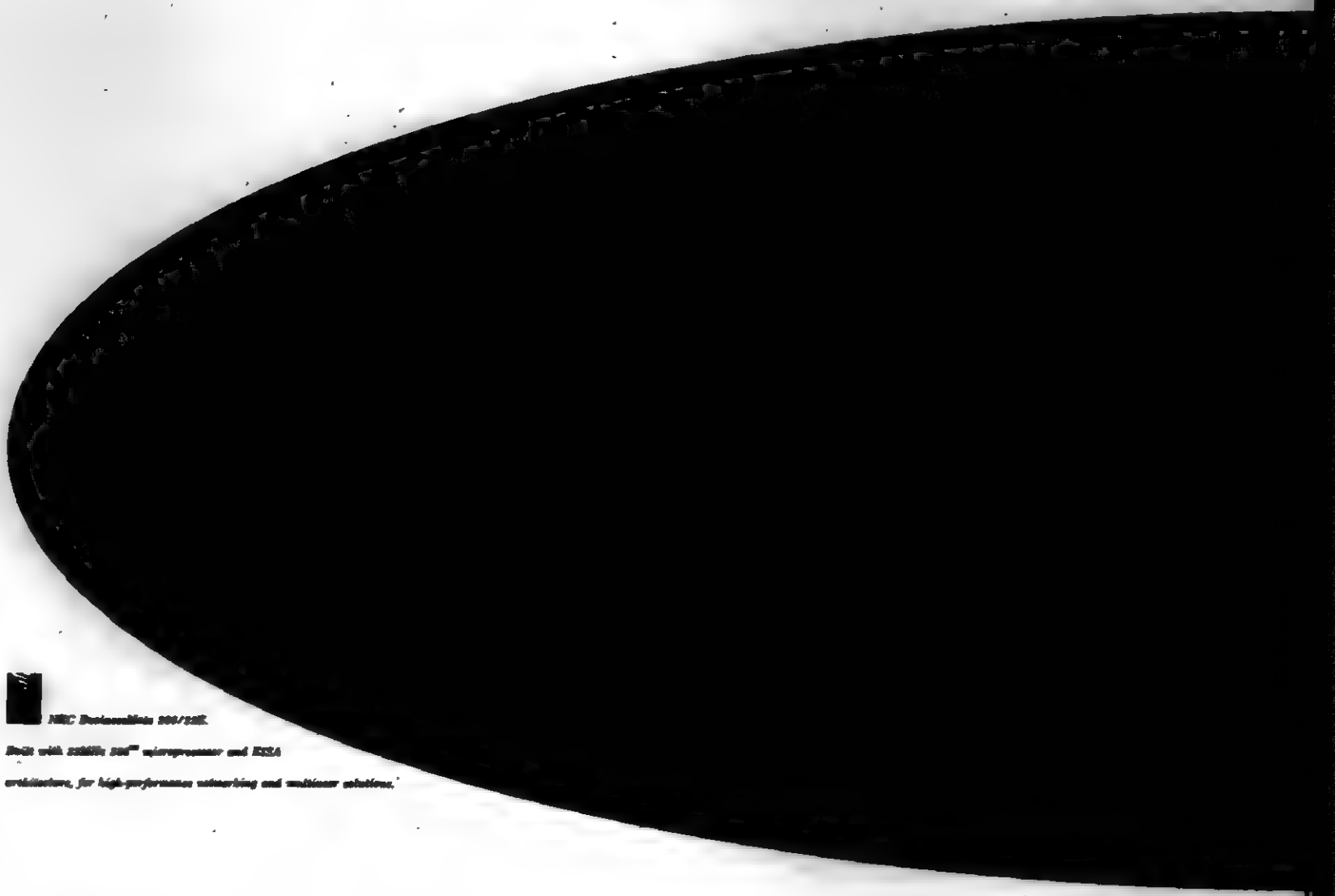
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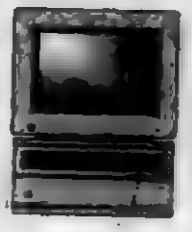
Users' trust in Mac slip sliding away

BY JAMES DALY
CW STAFF

Most users of Apple Computer, Inc.'s Macintosh remain basically happy with the machine. However, an emerging confluence of technological pressures from the DOS world, displeasure with Apple's product support and network offerings and the specter of tightening budgets are beginning to erode some of that enthusiasm, according to a recent *Computerworld* survey of 320 top information systems professionals.

Users say Apple lost a significant technological edge to IBM-compatible personal computers with the introduction of Microsoft Corp.'s Windows 3.0, an operating environment that replicates the point-and-click screen appearance that once made the Macintosh unique.

"You can do multitasking with Windows, and you can't with Apple; that's a sore point," said Patrick Lee, director of electronic data processing at Townecraft, Inc. in Glen Rock, N.J.



Respondents also said weak Macintosh networking product offerings and the company's poor support record after Apple products are installed have watered down their passion for the Cupertino, Calif.-based firm.

Users are troubled that these prominent weaknesses have quelled third-party software developer enthusiasm for the Apple line. "It seems that every software developer creates for IBM first and then Apple, and this delay is catching up with us," said Diane Coleman, director of MIS at Fleetguard, Inc. in Nashville.

Still, Apple users are generally willing to stick with their machines, warts and all. Nearly 84% said the availability of low-cost Intel Corp. 80386-based PCs and Windows 3.0 will not affect their Macintosh purchase plans. However, 14% said the introductions had caused them to lose interest in Apple, and they had begun standardizing on MS-DOS.

Apple's long-awaited response to its eroding user base came last fall, when the firm introduced three low-cost Macintoshes designed to counter complaints about the high prices. Even this move, however, may ultimately fall short. More than 85% of those surveyed said the new Macintoshes will not affect their purchase plans.

"The new introductions still do not address the central problem, which is that all the hot stuff that was once being developed for Apple is now being created for Windows," said Sheldon Laube, national director of information and technology at Price Waterhouse in New York.

Personal preferences aside, economic pressures may ultimately be Apple's greatest enemy. More than 60% of the respondents said they had no plans to buy Macintoshes within the next 12 months. The chief reason: budget freezes.

The survey also found that the majority of users still employ their Macintosh in its traditionally strong areas of desktop publishing and graphics. Sixty-percent and 46%, respectively, of the respondents ranked those as their two most important applications.

On Tech launches scheduler

Organizing groups will be easier for Mac users

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — On Technology, Inc. has introduced Meeting Maker, a network application said to enable a coordinator on an Apple Computer, Inc. Macintosh to plan, schedule and confirm meetings on-line.

Priced at $495 per five-user pack and $895 per 10-user pack, the program is slated to ship in March. Plans exist to port the server piece to DOS and to tie into an electronic-mail system.

The System 7.0-compatible client/server-based product was developed in concert with Natick, Mass.-based Callisto Corp., but On Technology owns the exclusive marketing rights.

Saving time

On Technology President Connall Ryan said large Apple accounts have consistently cited a need for group scheduling software. "They complained they spend too much time scheduling meetings."

Ryan said his only competitor in the Mac market is Wordperfect Corp.'s Office for the Macintosh. "It's a hairy technical problem" to build a scheduler, Ryan said.

Using Meeting Maker, the group coordinator can automatically compare multiple schedules to pinpoint the ideal time for a meeting. An "Auto-Pick" function can select the first available time for all required attendees.

Coordinators can then send meeting invitations to "required and nonessential" attendees, track responses, follow up on schedule changes or cancellations, distribute agendas and reserve rooms.

Workgroup members can make a personal calendar available publically. Members can block off time slots and indicate which slots can be changed and which appointments are public. Regular meetings can be put into the calendar, and users can print out their calendars.

A 32K-byte text memo capability allows users to compose notes. However, users cannot attach documents to communications, even though "a complete electronic-mail system" forms the underpinnings of Meeting Maker, Ryan said.

Sun holds leader role in workstation market

BY J. A. SAVAGE
CW STAFF

A good reputation and simple momentum kept Sun Microsystems, Inc. leading the workstation market in 1990, according to a report from Dataquest, Inc. Both IBM and Silicon Graphics, Inc. gained slight market share during the year, while Hewlett-Packard Co. and Digital Equipment Corp. lost some ground.

The San Jose, Calif.-based market research firm noted that the 1990 workstation market "was not one of the most robust in history," but it is still healthy and "has much growth ahead of it." The market grew 21.5% over 1989, compared with 40.3% from 1988 to 1989.

Dataquest attributed the slower growth to the general slowdown of the U.S. economy and to price competition.

This year, it will be a bit more difficult for Sun to hold onto its lead, said Laura Segervall, the author of the report. "They will have increased competition from Sparc [Scalable Processor Architecture] compatibles," she said. Sun's stubbornness in its insistence on holding onto the Open Look graphical interface in the face of user specification of Motif will cost some accounts, she said.

HP may find this year to be a turning point in maintaining its share of the market. The firm has been struggling in merging its own workstation products with those of its Apollo division. HP is redeemed somewhat by its ability to sell into commercial and technical markets, Segervall said.

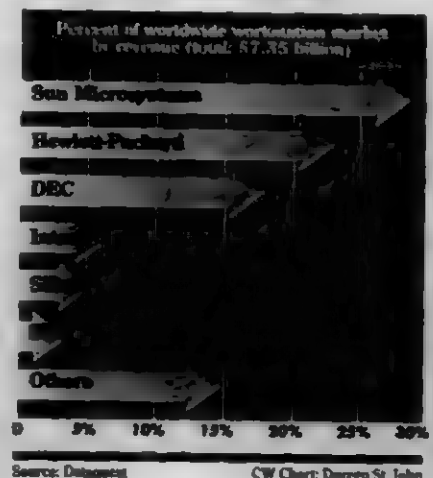
DEC's slow showing last year was blamed on the lack of available software. Dataquest predicts this will not be an issue in 1991. Instead, Dataquest forecasts that DEC's trouble will be selling its workstations against its own minicomputers.

Dataquest reported that IBM did surprisingly well in its first year of selling workstations, despite limited software. IBM is expected to do better this year, but it too is selling against its own proprietary product line.

Silicon Graphics and Intergraph Corp. remained nearly static in market share. The report noted that Silicon Graphics is likely to remain "a premier three-dimensional graphics company," but is unlikely to take much more of the market this year.

Extending its lead

Sun Microsystems strengthened its hold on the top position in the workstation market last year, but can its success continue?



Source: Dataquest — CW Chart: Doreen St. John

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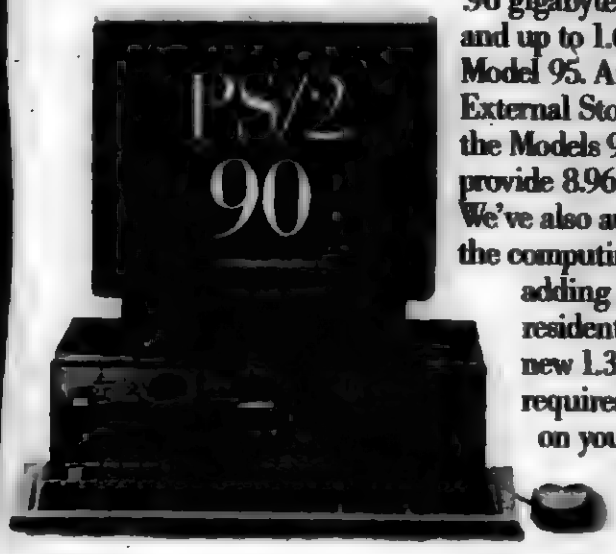
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Standard	80-320MB	160MB-320MB
Display Modes		
APA Modes	XGA (includes all VGA modes) 640 x 480 x 256 colors/64 gray shades; 1024 x 768 x 16 colors/gray shades; hardware support for 132 column text mode; 16-bit direct color mode at 640 x 480 x 64K colors	
Available Expansion Slots	three 32-bit	six 32-bit
Bus Architecture		
Data path	MCA 32-bit	MCA 32-bit

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HP's Vectra 486: Reliable but costly

Technology Analysis — a roundup of expert opinion about new products. Summaries written by Computerworld staff member Derek Slater.

Looking for a solid Intel Corp. 1486-based system at a high price? Consider Hewlett-Packard Co.'s 25-MHz Vectra 486, reviewers at personal computer publications say.

The Vectra earns high marks in benchmarking tests by these publications for its durable construction, good compatibility and performance and exceptional reliability. However, reviewers also point out that the price is relatively high at $13,099 for the basic configuration with a 330M-byte hard disk drive. The system, a tower case with 2M bytes of standard random-access memory and six expansion slots, is based on the Extended Industry Standard Architecture bus.

Performance: The Vectra rates at or above average on stand-alone performance and benchmark tests; reviewers note its quick hard-disk speed.
Compatibility: Test centers found no significant hardware or software compatibility problems.
Documentation: Hewlett-Packard's documentation is complete and thoughtfully organized.
Support: Technical support for the Vectra is excellent, although reviewers find fault with HP's dealer-only support policy.
Value: The product rates in the middle of the 1486-based pack in overall value. The Vectra is a high-quality machine, but the price is steep.
Server capabilities: The Vectra earns high marks in server functions, particularly transaction processing. It is able to handle larger networks than XT/AT bus machines can efficiently manage.

Reviews Summary

Criteria		
Performance	Very good	Excellent
Compatibility		
Design	Very good	Good
Documentation		
Support	Excellent	NC
Value		
Reviewer's score	8.3	7.8

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

- Users: Dean Evangelos, Jones & Cotton, [illegible] 10, cost: 10); Mike Gibbons, Wiley & Sons, [illegible]; Lauer Edwards, Graphicus, Inc. (10, 6).
- Analyst: Jerry Cason, Faulkner Microcomputer Reports (8, 7).
- Financials: Jerry Fleming, [illegible] 7); Jay Ritter, Bull & Phelps [illegible] Kessler (8).

"In the past, Hewlett was a real safety solution. Now it's very stable, very solid but underperforming from past expectations. Profitability has dropped," Fleming said.

Vectra 486

Points (maximum)	Category
23 (30)	Published reviews
18 (20)	Analysts' ratings
14 (15)	Users' ratings
14 (20)	Cost evaluation
11 (15)	Vendor financials

(Maximum score: 100)

Hewlett-Packard responds

Comments from Jeff Briggs, North American marketing manager for PCs:
Support: If a customer is already under a service contract with HP, the PCs fall under the same agreement. If the Vectra is purchased through a dealer, that dealer can provide support himself with HP's help, or he can refer the customer to HP.
Value: The Vectra is worth the extra money up front because of its reliability.

Northgate's Elegance: A lot of power for a low price

Northgate Computer Systems, Inc.'s Elegance 486/25I personal computer offers excellent power and speed in a system that takes full advantage of Intel Corp.'s I486 chip, according to reviews by leading PC publications.

Northgate's XT/AT bus-based machine is available by mail order only for $5,599, including a 200M-byte hard drive, two floppy drives, an IBM Video Graphics Array-compatible monitor and a mouse.

Performance: Northgate's system easily outscores better-known competitors in many benchmark tests. Though the Elegance lacks BIOS shadowing — the ability to copy information from read-only memory to random-access memory — its performance is described by *Infoworld* as "impressive."
Compatibility: Reviewers laud the system's hardware and software compatibility with standard products, noting no significant glitches.
Documentation: The documentation is very thorough, including photos, glossaries and indexes.
Support: Reviewers rate Northgate's support as excellent. The Elegance is backed by a 30-day return policy, on-site service and 24-hour toll-free telephone support.
Value: The system is an excellent value, offering superior system performance for a low price.
Server capabilities: Mass-storage capacity and fast network file-transfer speeds make the Elegance a good choice for small or medium-size networks. However, the XT/AT bus architecture results in large performance drop-offs in larger networks, according to the reviewers.

Elegance 486

Points (maximum)	Category
27 (30)	Published reviews
12 (20)	Analysts' ratings
14 (15)	Users' ratings
18 (20)	Cost evaluation
2 (15)	Vendor financials

(Maximum score: 100)

Reviews Summary

Criteria			
Performance	Very good	Excellent	[illegible]
Compatibility			
Design	Good	A winning combination	NC
Documentation			
Support	Excellent	NC	NC
Value			
Reviewer's score	9.1	Editor's Choice	[illegible]

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

- Users: Jerry Long, Science Applications, Inc. (performance: 9; cost: 10); John Wallman, Grant Thornton (9;10); David Hoffman, New York PC Users' Group (10,8).
- Analyst: Jerry Cason, Faulkner Microcomputer Reports (8,7). "It's priced tremendously, but it is a base-bones system without the high-end I/O capability," Cason said.
- Financials: Eric Zimits, Rauscher Pierce Refsnes (overall rating: 1); Joe McGlone, McGlone and Co. (1).

As of Sept. 1990, Northgate's sales for a nine-month period were $150 million, with a net income of $1.2 million.

"They've squandered all their cash," Zimits said.

Northgate responds

Comments from Art Lazere, chairman of Northgate:
Performance: There's no BIOS shadowing on the XT/AT bus machine because it is an unnecessary waste of resident random-access memory.
Server capabilities: We've been shipping the EISA version for a couple of weeks now.
Financials: We had a rocky third quarter. We expect a return to profitability in the near future.

Methodology: *Published reviews: average of numeric scores from product reviews published by PC publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of analysts' ratings of vendor financials and product sales from financial analysts multiplied by 1.5.*

Keefe

CONTINUED FROM PAGE 37

is to do a better job.

Of course, this doesn't account for IBM's attempt a few years back to shut out the rest of the industry with a proprietary line of hardware. The Micro Channel Architecture debuted after IBM began losing market share to clones taking advantage of the open AT bus architecture. But hey, that's hardware. IBM has since wised up, and Lee's thing is software.

Hang 'em high. Iffy news for impatient users waiting for IBM and Microsoft to converge their respective OS/2 LAN Server and LAN Manager servers. What's at issue is the differences between the directories and the two screen interfaces at the administrator level. A consultant close to Microsoft claimed IBM offered the company an olive branch last month regarding one of the more "outstanding technical issues" related to converging the servers. When it was rejected by Microsoft for some reason, IBM reportedly went "bonkers."

From the frying pan into the fire. Needless to say, reports like the previous one don't do much to enhance the relationship between the two micro giants. Hence a bind for IBM. MVS users are reportedly pressuring IBM to offer Named Pipes support under MVS.

Why? It's easier to deal with than IBM's Advanced Program-to-Program Communications. One customer has reportedly suggested cutting back on its mainframe commitment if IBM does not come through. However, adding Named Pipes support to MVS would undoubtedly benefit Microsoft, hence the bind.

Can you C this? IBM Vice President Jim Cannavino is reportedly funding IBM's Toronto lab's efforts to port the C compiler for the AS/400 to the PS/2. A source adds that Cannivino is telling folks inside IBM that he will "decommit" to Microsoft's C compiler, replacing it with an IBM alternative.

So much hot air? After spending the last several years anointing each "the year of Apple connectivity" and announcing, but not shipping, a bushel of networking products, Apple has found that most of its corporate users are not taking advantage of the networking capabilities built into their Macintoshes.

A developer who works with Apple says a company survey found most users were operating in stand-alone mode or linking up to a laser printer. This isn't sitting well in Cupertino, Calif., so Apple has launched a campaign to encourage its corporate accounts to take better advantage of its connectivity, the developer says. Maybe Apple should deliver all of its promised connectivity first and push users later.

Report from the trenches. Upword, Wang's Windows word processor or document processor, is much faster than Samna's Ami Pro for Windows, according to a hacker who has both. "It converted ASCII files almost as quickly as it would load its proprietary versions, spell checking was quick and convenient and it repaginated a 30-page document in about 30 seconds," he said approvingly. However, Upword sucks up 9M bytes of disk space in its full form. And the beta copy we had didn't have a lot of the online Help and tutorial features installed. "Granted, I'm not going to tie up 9M bytes of my disk for the thing, but it isn't bad," our source concluded.

Keefe is Computerworld's senior editor, PCs and workstations.

Trade-ins

CONTINUED FROM PAGE 37

However, because the trade-in concept is novel for PCs, "it's still a small part of our business and probably will remain so for quite a while," said Michael Steffan, vice president of corporate development.

Indeed, user attitudes bear out this stance. While some expressed interest in the program, they said they were not ready to participate. "Right now, we typically have a lot of areas where we can redeploy those machines. At a future date, [a trade-in program] might be attractive," said William Etheridge, director of computing and communications at Haskell Co. in Jacksonville, Fla.

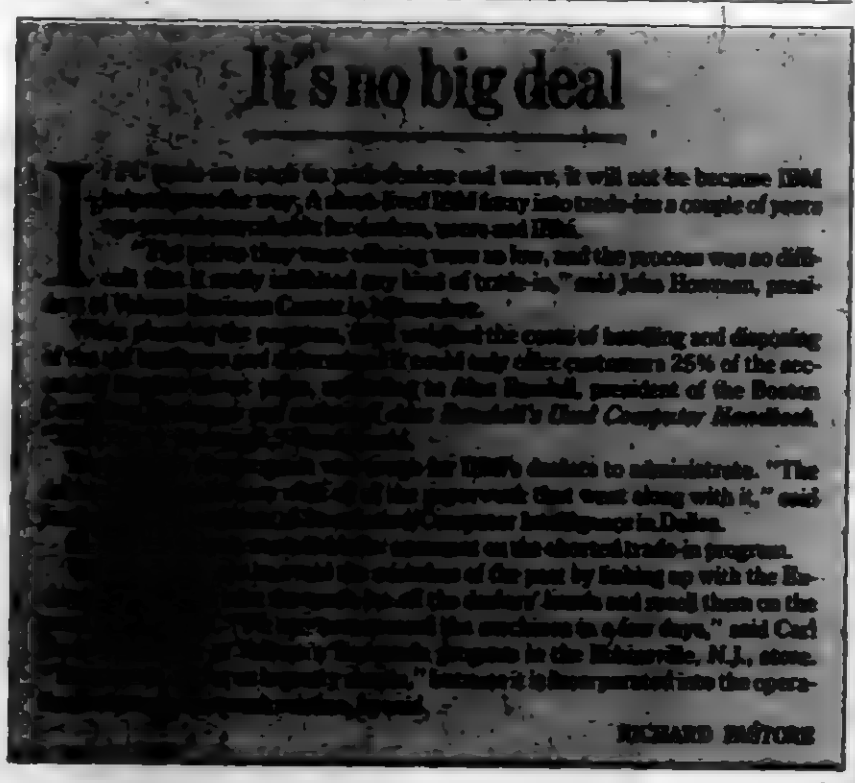
Other users said the trade-in value is not worth their while. Pharmaceutical firm Rhone-Poulenc, Inc. grudgingly accepted $20 for hardware that originally cost $1,200, microcomputing director Marc Kustoff said.

"For the amount of money these dealers are willing to pay, we're better off offering the PCs for sale to employees for home use," said Jerry Weinstein, director of corporate MIS at General Instrument Corp.

So far, dealers who have instituted trade-in programs have closed only a few deals. "Most people don't think about trading in PCs the way they think about trading in cars," said John Howman, president of Valcom Business Center in Milwaukee. "It will take another year or so for general acceptance."

Once the program catches on, however, 30% to 40% of customers will participate, estimated Ron Harris, president of an Oklahoma City Valcom dealership.

Despite this slow start, other dealers are reportedly considering similar trade-in programs. "We've resisted it in the past, but we're getting more pressure to handle trade-ins," said Sam Adicoff, president of PC Edge, a San Jose, Calif.-based dealer. "If a company's not growing but has a need for newer technology, there's more pressure to somehow dispose of those old machines."



NEW PRODUCTS

Systems

Everex Systems, Inc. has announced an Extended Industry Standard Architecture 12-slot, 33-MHz Intel Corp. 80386-based computer system that includes a thermal management system for cooling components.

Stepcube was designed to operate as either a file server or multiuser system. The computer system includes a 400-watt power supply.

Pricing for Stepcube ranges from $9,000 to $14,000, depending on configuration.

Everex Systems
48431 Milmont Drive
Fremont, Calif. 94538
(415) 498-1115

Cardinal Technologies, Inc. has announced a desktop system that includes a 12-in. IBM Video Graphics Array-compatible monitor and 1M byte of random-access memory.

The PC10-386SX, the latest member of Cardinal's PC10 series of desktop computers, features a 20-MHz maximum clock speed and is priced at $1,399.

Cardinal Technologies
1827 Freedom Road
Lancaster, Pa. 17601
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Access is a component of *The Network Center* family of VTAM extensions from North Ridge Software. To get the full story (the one that no one ever told you) contact the VTAM experts at North Ridge Software for complete information and a free ***Access*** demonstration diskette. Call (206) 882-2600 or FAX (206) 881-6904.

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What problems did you face?

"The worst problem was the conglomeration of hardware to be tied together. Everything from PC ATs to DEC VAXs and an IBM AS/400. That, and continuous moves as we remodel and expand the facilities."

Whose network operating software did you evaluate?

"Everyone's, it seems. IBM's, AT&T's, Novell's, Banyan's and 3Com's."

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COMMENTARY

Elisabeth Horwitt

New tools, new troubles



Any tool can be abused: The more powerful the tool, the stronger the potential for it to get out of hand. This tried-and-true formula is particularly applicable to computer-integrated manufacturing (CIM), the powerful set of tools that addresses the needs of such a broad range of users. The potential for abuse comes when the needs of two sets of users — such as management and operations — conflict.

When IBM unveiled its CIM Advantage program in the fall of 1989, user empowerment was one of its central themes. "This is IBM's third wave, or 'peace corps' approach to CIM, trying to understand users' needs," says Ted Rybeck at Advanced Manufacturing Research. The first wave was IBM's traditional Goliath approach of "running all manufacturing systems off a monster mainframe," while the second, or "Trojan horse" approach, involved entering the shop floor by way of PCs and ex-

Continued on page 51

Terminal servers cut LAN costs

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

Local-area networks are in vogue, and many companies with large investments in dumb terminals are scurrying to bring those desktop devices into the LAN environment. Terminal-intensive applications, such as inventory control, database access and order entry, justify maintaining the low-cost machines in many firms.

As a result, a not-so-hyped device called a terminal server — known in IBM parlance as a LAN-adaptable cluster controller — is quietly raking in more than $435 million per year with one half million devices and nearly six million ports installed.

Terminal servers connect terminals and other devices to a LAN and allow desktop users to link to more than one computer simultaneously. A main benefit of the devices, according to Dave Passmore, a partner at Ernst & Young's networking consulting practice in Fairfax, Va., is eliminating the cabling headaches involved in hard-wiring individual terminals or personal computers to a host.

An alternative piece of equipment, a data private-branch exchange, does not address the cabling issue and allows access to just one host at a time, he said.

The market for terminal servers is mature, particularly since Digital Equipment Corp. — the pioneer and leader in the terminal server market with about 50% overall market share, according to analysts — recently began licensing its proprietary Local Area Transport (LAT) protocol. DEC said terminal servers currently represent 50% of its networking business.

LAT, which can be bridged but not routed, has historically resided only in DEC terminal servers to let DEC VT series terminals communicate across an Ethernet LAN.

The DEC licensing move has allowed niche vendors to emerge and compete with new functionality and lower per-port costs than DEC.

Doubling up

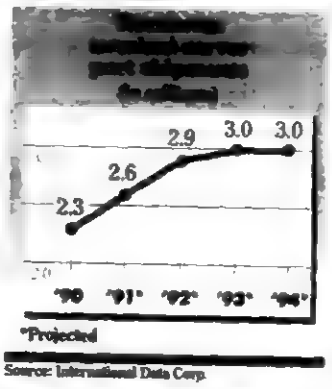
Another legacy of the licensing free-up has been single-product support of both LAT and Transmission Control Protocol/Internet Protocol (TCP/IP). Now that vendors such as Datability Software Systems, Inc., Emulex Corp., Xylogics, Inc. and Xyplex, Inc. are bundling both protocols into their products, desktops in companies running a mixture of DEC and Unix equipment can communicate with dissimilar hosts through one device.

Major terminal-server players Ungermann-Bass, Inc. and 3Com Corp., which hold 13%

Continued on page 50

Flatlands

Growth in the terminal-server market will flatten as desktop systems oust lingering investments in dumb terminals



Source: International Data Corp.

Looking for some elbow room

Terminal-server vendors are tripping over each other in a crowded market that is inevitably headed for shakeout.

Makers of stand-alone boxes are also feeling a squeeze from those in the sizzling smart hub market, as vendors such as Cabletron Systems, Inc. and Racal-Interlan are adding terminal-server support along with bridging, routing and network management to their intelligent wiring concentrators.

"While no one is going to install an intelligent wiring system specifically for the terminal-server capability, they'll go that way if they already have a smart hub and need terminal-server connectivity," said Brad Baldwin, an analyst at Gartner Group, Inc.

The reasons, he said, are that users gain "all functionality and network management with one system. Also, in terms of cost, you're now amortizing a more feature-rich box, so you realize a lower price per port."

Terminal-server market leader DEC has recognized its smart hub competitors and plans to act accordingly, said Lee Cooper, marketing manager for DEC's LAN Access Marketing Group.

"There's no question that we're going to be looking at smart hubs in addition to the terminal-server market," Cooper said.

JOANIE M. WEXLER

Marist creating a high-tech campus

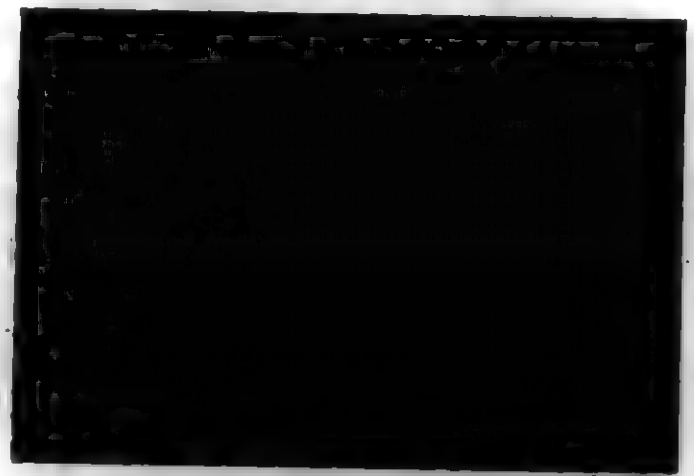
BY CAROL HILDEBRAND
CW STAFF

POUGHKEEPSIE, N.Y. — By the time Marist College is through, about the only things you will not be able to do there electronically will be either illegal, immoral or fattening.

As part of a $13 million partnership the tiny liberal arts school has formed with IBM, every room on campus will eventually be wired to take advantage of state-of-the-art voice and data systems.

Marist, which has a student population of about 3,200, has had a good relationship with IBM for years, according to Dennis Murray, president of the college. Marist is in the heart of IBM country, and about 10% of its graduates find jobs there when they graduate, he said.

The program originally emerged from a study aimed at gauging the impact of large mainframe capabilities on a small environment, for which Marist received an IBM 3090 Model 200E.



Marist College and IBM are working together to install state-of-the-art voice and data networks

After starting to network the campus together to take advantage of all this horsepower, "we started to realize that what we were doing for data also made sense for voice," Murray said. So the study was expanded to include voice capabilities as well.

IBM is providing Marist with a Rolm Systems 9751 CBX switch, as well as Rolm phone mail and IBM Token-Ring local-area networks. The college is paying for cabling and a fiber-optic backbone to connect campus buildings to each other as well as to the mainframe.

When the study is complete, Murray said, he expects every room on campus to be wired for voice and data transmission. "If a student has a personal computer, they can just walk into their room and plug into the network," he said, adding that they hope to get the wiring done by the fall.

Each student will also have a voice mailbox. "You can get to any phone on campus and punch in your code and get voice messages," Murray said. He added that he hopes it will smooth out a lot of organizational hassles. For instance, a faculty member can advise seminar attendees of a switch in location by leaving a phone-mail message.

Making connections

According to Carl Gerberich, vice president of information services at the college, each floor of a residence hall, for example, will have its own Token-Ring connected to a buildingwide ring, which in turn will hook into the campuswide fiber backbone.

Although Marist will not provide each student with a PC, each dormitory will boast several common terminal rooms, with even greater access available at the academic buildings. For example, the new Dyson Center for Management Studies, which was constructed to take advantage of the data and telephone network, has two laboratories with a total of approximately 45 IBM Personal System/2 55SXs.

Murray sees almost limitless opportunities for the new system. The card catalog at the library is already on-line. "It can tell you if a book is checked out and when it is due back, so you don't have to look through the stacks for books," he said. "Next year, you'll be able to reserve the book right over the lines." Murray said he wants the final phase of the study to examine methods to exploit optical storage technologies in the library.

Murray said general reaction has been positive: "Initially, there's a bit of grousing, but once they start to see how information technology can be useful to them, the students become very excited about it."

Terminal

CONTINUED FROM PAGE 49

and 10% of the respective markets, according to Stamford, Conn.-based Gartner Group, Inc., are also slated to ship dual-protocol products in first-quarter 1991. DEC announced a dual-protocol product last month, but the firm said it has not officially started shipping.

Another function differentiating products is the level of security they offer. Milo Medin, a network architect at the National Aeronautics and Space Administration's Ames Research Center in Moffett Field, Calif., said he installed about two dozen 35-port Xylogics Annex terminal servers because of their multilevel and flexible security features and the product's Unix command interface.

"The product allows you to alter the set of privileges users have, and all network activity is automatically logged," said Medin, who is consulting at the NASA arm for Sterling Software. "We can't have people dialing in from off-site and roaming around our network if they're not authorized."

Cautious consumers

Many firms eyeing their pocketbooks have decided to delay replacing their terminals with intelligent desktop systems for a few years.

Pennsylvania Blue Shield, for example, is now turning to a hybrid mainframe/token-ring LAN strategy [CW, Jan. 7]. The company is willing to shell out $2.5 million for new LAN-attachable cluster controllers to protect its investment in approximately 4,500 IBM 3270 terminals.

While the market for dumb terminals is flattening, a steady 2.5 million will continue to ship through 1994 as terminal server candidates, according to International Data Corp. research numbers.

In addition, DEC estimates that half of its installed 3 million terminal server ports are used for linking PCs — not terminals — into a network. The low-cost network connection makes the terminal server solution viable for PC installations in which PCs are going to run frequently in terminal emulation mode.

Brad Baldwin, a networking analyst at Gartner Group, tags DEC equipment at $450 per port and 3Com at about $300. Niche competitor Xylogics pegs its current per-port cost at about $200 and expects it to drop to about $100 in first-quarter 1991.

For PCs in a Unix network, terminal servers with TCP/IP also support Telnet, an application utility for terminal emulation.

Passmore remarked, however, that users "give their PCs a lobotomy" by linking the intelligent devices to a LAN via a terminal server in that the PCs "get the connectivity of a LAN but not the functionality."

Vendors, however, pointed out that communications software bundled into a terminal server will allow file transfers — a function not available with dumb terminals.

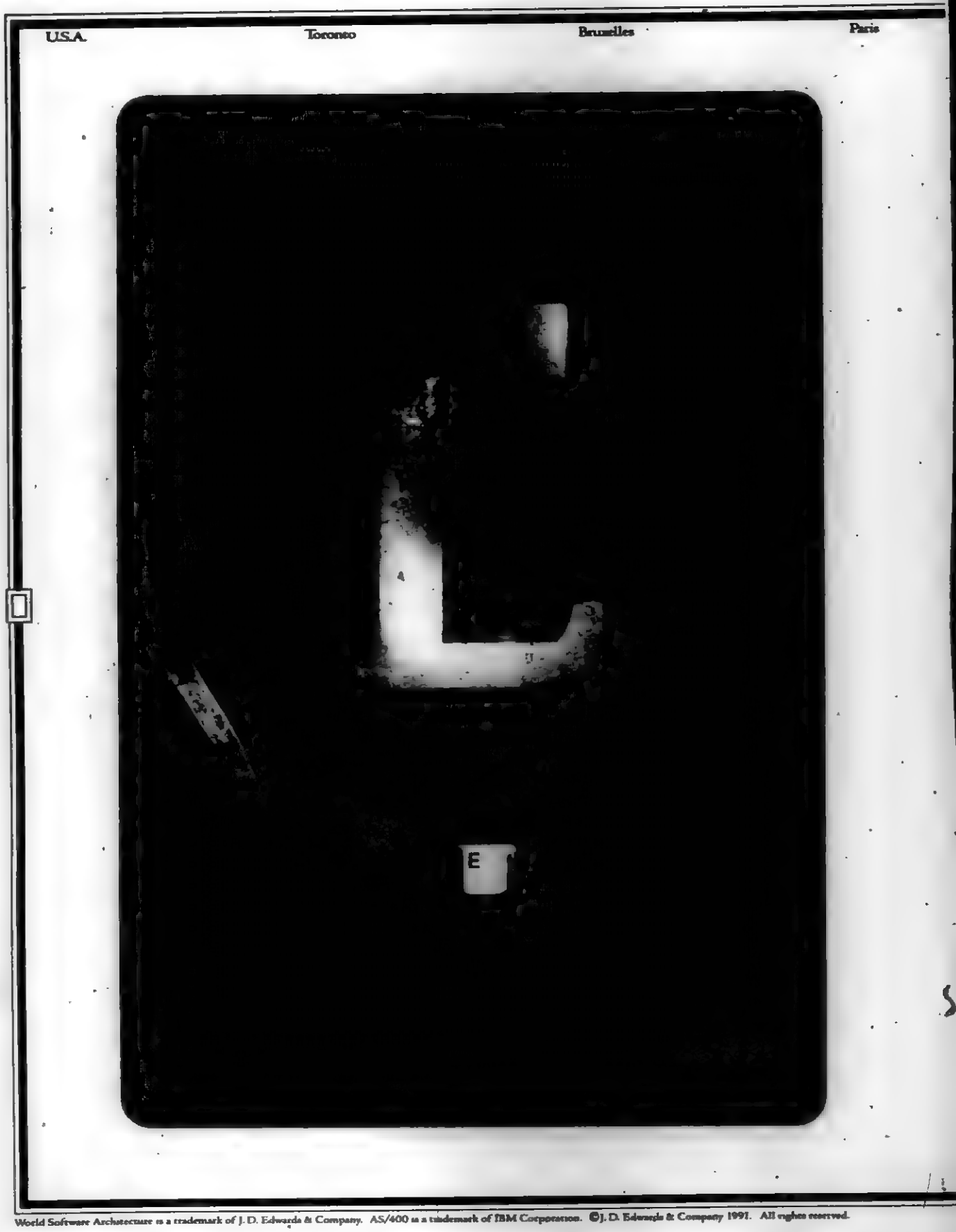
In addition, Serial Line IP, a protocol resident in some terminal servers, provides access to additional LAN features such as virtual disk drives, and PCs running a windowing program can run terminal emulation alongside local applications.

WORLD BRIEFS

Sprint lowers foreign rates

U.S. Sprint Communications Co. announced "significant" rate reductions for international calls to 36 foreign destinations. The plan, which targets small-business and residential customers, provides connections to more than 170 countries and territories, Sprint said.

Elektrim, the state-owned telecommunications company of Poland, has awarded **Siemens Corp.** a $33 million contract to install a digital telephone network in Kattowitz, Poland, by the end of this year. The installation will reportedly include four switching offices supporting approximately 56,000 subscriber lines, as well as an international long-lines office.



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Horwitt

CONTINUED FROM PAGE 49

panding from there, Rybeck says.

IBM sought to please end users by introducing a set of enablers, such as Plantworks, which uses screens, graphics and windows to help nontechnical users to write their own applications to track and control processes and create reports.

A related tool was Process Operations Management System (POMS), a third-party product aimed at the process industries.

At least one user who was interviewed recently was enthusiastic about the product's friendliness, which enables operations people with little or no programming expertise to generate reports and applications. Users may feel more ambivalent, however, about the fact that POMS can be used by supervisors to keep a tighter and tighter rein on their activities.

One of the original purposes of POMS was to automatically track and collect detailed information about plant processes and to help ensure food and drug companies' compliance with the Food and Drug Administration and the production requirements of other regulatory bodies.

The system can be used not only to collect such information, but also to monitor various areas of the plant and pinpoint where a machine or an operator is pulling the wrong switch or entering the wrong instruction. It can even be used to let a user know that he or she has done something wrong and to provide instructions on how to correct the problem.

The value of such capabilities for quality control is obvious. Less obvious, perhaps, is the potential for the power of POMS to go to managers' heads. "POMS can be used to migrate control up the automation pyramid," says Walter Carey, director of manufacturing systems development. While "the idea of the chairman of the board tracking and controlling boilers in the factory is sublimely ridiculous," business managers could easily start using POMS to make their needs known directly to plant managers and operators — causing resentment and confusion.

Even the justified use of POMS for quality control can be taken too far, as supervisors use the system to keep a tight eye on operators — who thus become increasingly paranoid.

USERS MAY FEEL MORE ambivalent, however, about the fact that POMS can be used by supervisors to keep a tighter and tighter rein on their activities.

According to Industrial Computing Design Corp. President Curt Grina, a new capability slated for introduction this year will allow managers to send interactive video presentations, via POMS, to operators who need help with whatever they are doing.

"So at the appropriate time, instead of showing a document to a person on how to break a pump down," Grina says, "you get a movie with the supervisor telling you about which bolts to loosen. This naturally fits into the POMS procedure model, which is tracking what you're doing, any mistakes you are making and what you are supposed to do next."

All very well, particularly for inexperienced operators who need their hands held. However, if the monitoring and instruction are applied too enthusiastically, then valuable, experienced operators will stop valuing their workstations as empowerment tools and start resenting them as a combination of nursemaid, disciplinarian and corporate spy.

And those valuable people may decide to look for work at a less leading-edge organization.

Horwitt is a *Computerworld* senior editor, networking.

London Milano Sydney

Investing in good software is one thing. Finding software that's a good investment is another matter.



Conventional wisdom holds that software erodes over time. In just a few years, new technologies and the consequences of numerous and reckless code revisions chip away at the value of today's hottest sellers.

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EXECUTIVE TRACK



John E. Chay has been named president of **American Creative Enterprises, Inc.**, a New York-based consulting firm. Chay was previously vice president of information systems at the National Retail Federation (NRF), the largest retail trade association in the U.S. Before joining NRF 11 years ago, Chay held IS executive positions at several leading U.S. retailers.

Two IS managers were recently promoted at **McCormick & Co.**, a seasonings and specialty foods firm in Hunt Valley, Md.

Joseph H. Callaway was promoted to telecommunications manager. He had been MIS network manager since 1988. He joined the company in 1984 as operations support supervisor and was later promoted to telecommunications supervisor.

Callaway previously held technical positions at General Instrument Corp., Crown Central Petroleum Corp., W.R. Grace & Co., Maryland National Bank and Suburban Trust Co.

Michael M. Prime was named lead systems analyst in the MIS department at the McCormick Flavor Group. He had been manager of materials and logistics for the department since 1988.

Prime joined McCormick in 1986 as data processing manager for the Golden West Foods subsidiary in Bedford, Va. He previously worked at Roadway Package Systems, Inc. and Anchor Hockings Foodservice.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to *Clinton Wilder, Senior Editor, Management, Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

No dumping on this IS staff

Waste Management uses hybrid IS structure to run garbage business

BY ELLIS BOOKER
CW STAFF

Garbage. Trash. Waste. Taking care of the world's debris and hauling it away from millions of households in hundreds of cities and towns every day has made Waste Management of North America, Inc. the No. 1 garbage mover and landfill operator in the U.S., with revenue of $4.48 billion last year.

It is no surprise that this lowest-tech of all businesses requires a good-size information systems department.

"Understand, for all the garbage that's thrown on the trucks, there's a customer," explains Edward C. Bacom, staff vice president of IS, who heads a centralized IS staff of 400 at the company's Oak Brook, Ill., headquarters.

Yet hauling and dumping trash would appear to be one of the world's most decentralized business activities. How does Waste Management keep IS responsive? By being the new type of "centrally decentralized" IS organization described last year in a *Harvard Business Review* article by Ernest von Simson of The Research Board.



Michael Abramson

Waste Management's Bacom *runs a centralized IS staff of 400 but also has 10 managers reporting to him on the company's various regions throughout the country*

Waste Management's centralized IS operation in Oak Brook includes two broad functions: development and central services.

Development comprises microcomputer, midrange and IBM mainframe applications development for the divisions. Central support encompasses administration of the data center, a help desk and voice and data telecommunications.

In addition, the central group of the North American unit acts as a volume purchasing and agreement negotiator for the IS departments of Waste Management's three other business units in the U.S. and overseas. It also offers advice and counsel about IS architectures, standards and future technologies for those units.

"Operationally focused" is how Bacom describes this structure, which has been put in place during the past three years. The decentralized component consists of regional chief information officers responsible for each of Waste Management's nine regions throughout the country. A 10th regional CIO is located in Oak Brook.

"These individuals report to systems but have a strong dotted line [responsibility] to the business in the region," Bacom says.

The regional operations, made up of 550 field locations, are IBM shops as well. One of IBM's earliest and largest Application System/400 customers, Waste Management began looking at the AS/400 in late 1988 and had production installations by May of the next year.

The field operations will eventually claim about 500 AS/400s to be used for everything from scheduling trash trucks to maintaining local customer lists and managing some of the company's more than 125 landfills (see story below).

The firm's largest centralized database is the customer information system, responsible for recording and tracking 3½ million bills per month.

That customer system, originally a Cobol-based program running in VSAM and now a Software AG of North America Natural/Adabas database running under MVS/ESA, will soon find its way onto IBM's newest and largest mainframe, the Enterprise System/9000 Model 720.

The next-generation host will replace an IBM 3090 Model 400J sometime this year and will join the development platform, an IBM 3090 Model 200, now in the Oak Brook data center.

Continuing to build and rebuild applications using computer-aided software engineering and other structured methodologies, Bacom says, will set the foundation for "a way to take strategic

Continued on page 54

A landfill of logistics, legislation and limits

Two decades ago, a landfill was a dump. Today, driven by increasingly stringent local and federal pollution legislation and consumer worries, landfills are going high-tech and can cost as much as $40 million.

Information systems play a role here, too. "The systems help enforce controls around those restrictions," says Steve Michael, senior director of North American development at Waste Management.

Waste Management is moving to replace the computers at its landfills — now primarily IBM System/38s — with Application System/400s. It has already deployed the new IBM midrange system at 10 of the largest of its 125 landfills. Currently, the landfills communicate with the home office in Oak Brook, Ill., at night in batch mode. But Michael envisions a time when peer-to-peer cooperative processing will be the norm. This will be especially important in big cities, so daily and monthly limits on hazardous waste can be accurately monitored.

Computers are also handling the routing of trucks at the landfills. At one of Waste Management's newest facilities in Phoenix, for example, engineers sit at a control tower of sorts and use software to manage the red and green lights that direct trash trucks around the area.

"We're talking about high-speed transaction processing," Michael says, noting that trucks must be identified and their transaction entered within 15 to 20 seconds at the ticket-house window at the front gate. Many of the facilities also feature truck weighing scales integrated with the billing/accounting systems.

Other technologies at the landfills include radio-frequency identification of incoming trash trucks and video recording of the contents of the truck (integrated through the AS/400 along with the computerized transaction) that can be accessed on a terminal screen.

ELLIS BOOKER

Waste

CONTINUED FROM PAGE 53

advantage of these systems in the next time frame, 1993 to 1995." Among those future projects, he predicts, will be some kind of Systems Application Architecture-based executive information system.

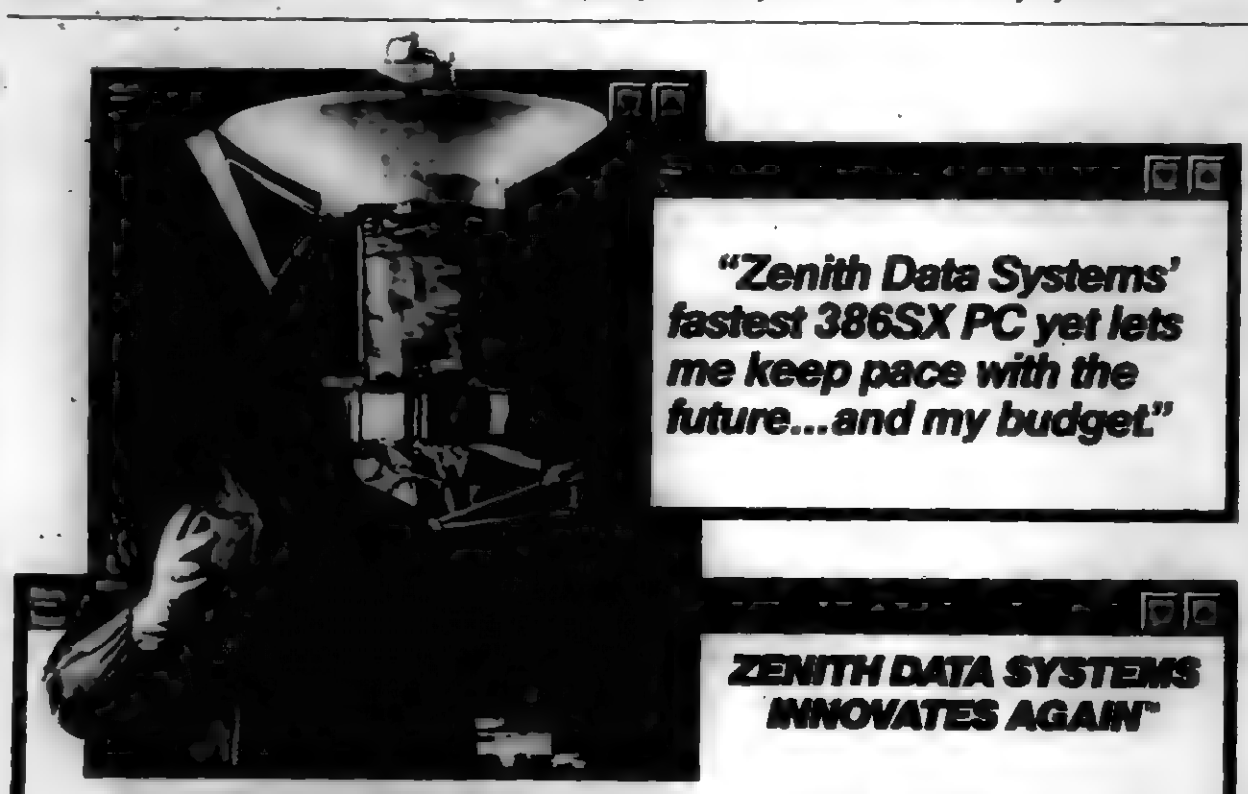
With 35,000 employees, Waste Management of North America is by far the largest unit of Waste Management, Inc. The parent also owns Waste Management International, which services a dozen foreign countries; a 79% stake in Chemical Waste Management; and a controlling interest in Wheelabrator Technologies, Inc., a $1.5 billion incineration company in Hampton, N.H.

Bacom, who has been in charge of Waste Management of North America's systems department since August 1988, joined the company in 1977 from Arthur Andersen & Co., where he was an auditor. Like the regional CIOs who report to him, Bacom has a very strong financial background. "The measure of a controller in our company," Bacom says, "is one who can pull off the financial portion seamlessly while giving most of his focus to the business."

The significance of IS at Waste Management is underscored by the presence of Bacom's boss, Executive Vice President Pat Payne. Payne joined the company last August from IBM, where he was a marketing vice president in the Midwest region. Although only 10% of Payne's activities revolve around IS, Bacom is glad to have such a knowledgeable advocate on the firm's executive committee.

The bottom line speaks for itself: Waste Management was the fifth most profitable publicly held diversified services firm in the U.S. in 1989. Its net income of $562.1 million, a margin of 12.6%, only trailed that of AT&T, Paramount Communications, Inc., The Walt Disney Co. and Dun & Bradstreet Corp.

Responding to the question, "Why does a garbage company need IBM's biggest mainframe and an IS staff of 400?" Bacom replies, "We have a couple of national customers who we service in dozens or hundreds of locations. To provide a central bill for that kind of customer is not a minor event by any means."



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Waste Management technology

Like other businesses that place a premium on operations and customer service, Waste Management is exploring several emerging technologies to maximize the efficiency of its systems and centralized services department.

Some of Waste Management's technologies include the following:

- **Intel Corp. 1486-based computing.** Right now, only a few of Waste Management's nearly 4,000 Hewlett-Packard Co. and Compaq Computer Corp. personal computers are 486-based.

These are being allocated to power users in the company, including the home-office systems development staff, the regional chief information officers and some corporate managers.

- **Computer-aided software engineering (CASE).** Waste Management has [illegible] vendors for different platforms: Software AG on the mainframe; Knowledgeware, Inc. and Synon, Inc. for the midrange; and Andersen Consulting for PC-based development.
- **Expert systems for logistics, telemetry and tracking.** Operating more than 125 landfills and about 14,000 collection and transfer trucks, Waste Management's scheduling demands rival that of many airlines. The company says it is exploring artificial intelligence technologies to optimize its scheduling.
- **On-board computers in trucks.** Waste Management would like to emulate Federal Express Corp. and others, but the harsh environments in which the garbage trucks operate — such as hot, dusty landfills — have proven too much for existing portables.
- **Private network.** The first node in Waste Management's private T1 wide-area network went on-line in December; the entire network is expected to be completed in July. The leased lines from MCI Communications Corp. and AT&T will carry the IBM Systems Network Architecture traffic between the home office and 550 locations throughout the country.
- **Electronic data interchange (EDI).** Waste Management provides some customers with EDI access into the garbage company's database to give real-time updates on billing information.
- **Database access.** The company and other garbage haulers can access the National Priorities Listing, a database of Superfund toxic waste dumps provided by the federal Environmental Protection Agency.

ELLIS BOOKER

BOOK REVIEW

Anecdotal advice for companies taking a global approach

THE BORDERLESS WORLD: POWER AND STRATEGY IN THE INTERLINKED ECONOMY
By Kenichi Ohmae
HarperCollins Publishers, $21.95

If you are an information systems professional who has the 'G' word — globalization — on your mind, add Kenichi Ohmae's latest easy-reading book to your list for the new year. But don't try to plan your firm's global expansion around it.

Although *The Borderless World: Power and Struggle in an Interlinked Economy* contains provocative observations on global business, it lacks the nitty-gritty detail business managers need to operate profitably worldwide.

Ohmae primarily relays anecdotes from his work as a consultant at the international firm of McKinsey & Co. He also serves up plenty of jibes at "Japanophobes" and preachy paragraphs on why government — particularly the U.S. government — should keep its paws off business.

Ohmae's ultraconservative political bent is obvious, but just in case you somehow miss his point, he does some evangelistic posturing: "Governments have become the major obstacle for people to have the best and the cheapest from anywhere in the world," he writes, adding that governments should stop protecting "certain industries and clusters of people."

Ohmae lets you know up front that in this reader/author partnership, he is the one with the wisdom, and you are the blank slate. This appears to correspond with his view of Japan's relationship to the rest of the world. He points out that with all the current hoo-ha over globalization, companies need role models. "With few exceptions," he says, "the models they have found and the examples they are studying are Japanese."

Wade through his arrogance, though, and you will fish out some solid ideas. The principle he harps on most is weathered, but it is sound advice nonetheless. He states that would-be multinational firms must serve their clients, not themselves. Instead of one-upping the competition by making a faster or smaller edition of the latest gadget, they should wow buyers with goods carefully designed for user needs and wants. The profits, we assume, will follow.

Another big idea of Ohmae's is not completely his own, but he does invent a snappy new buzzword for it. What he calls "insiderization" actually incorporates what Sony Corp.'s founder Akio Morita has termed "local globalization."

Basically, Ohmae says, if you are thinking of going into a new country, carefully study the habits and beliefs of the locals before trying to foist your products on them. Then set up self-sufficient manufacturing, marketing and distribution outfits within that country so you don't get stuck in the wait-for-the-OK-from-HQ trap. This practice, Ohmae says, is what will differentiate today's global corporations from their predecessors. He likens predecessors' efforts to the Roman Catholic Church in their manner of pushing central dogma down the throats of "barbarians."



The Borderless World would not be a book by a Japanese economic thinker without the requisite justification of Japanese investment in the U.S. or a pish-posh of businessmen who ask their governments for help to compete on foreign soil.

Ohmae returns to these themes many times in the book, although nowhere as succinctly as in the last chapter. Implying that the influx of Japanese cash can only strengthen the U.S., Ohmae writes: "Today's high-quality investments from overseas are like the immigrants in years past who helped build up America's economy and society."

If you're short on time, just read the first three chapters, in which Ohmae makes most of his salient points. Know, too, that he touches only superficially on any tangible steps a company can take to ease its trip to other lands, mentioning that firms should consolidate accounting systems at the divisional, rather than corporate, level. In addition, he advises companies to connect regional centers horizontally by networks.

There are only so many ways to say that to be globally successful, you need smart people who will put the customer first and an investment in long-term development strategies that may not pay off immediately. Yet Ohmae restates this tenet again and again. And again. He is rather like the dear old uncle who comes to holiday dinners, telling the same stories from his boyhood. Those tales undeniably hold good lessons, but your attention wanders with each repetition. You have to wonder whether someone who repeats himself so often really wants to teach or just likes to hear himself yammer.

KIM S. NASH

Nash is a Computerworld researcher, features.

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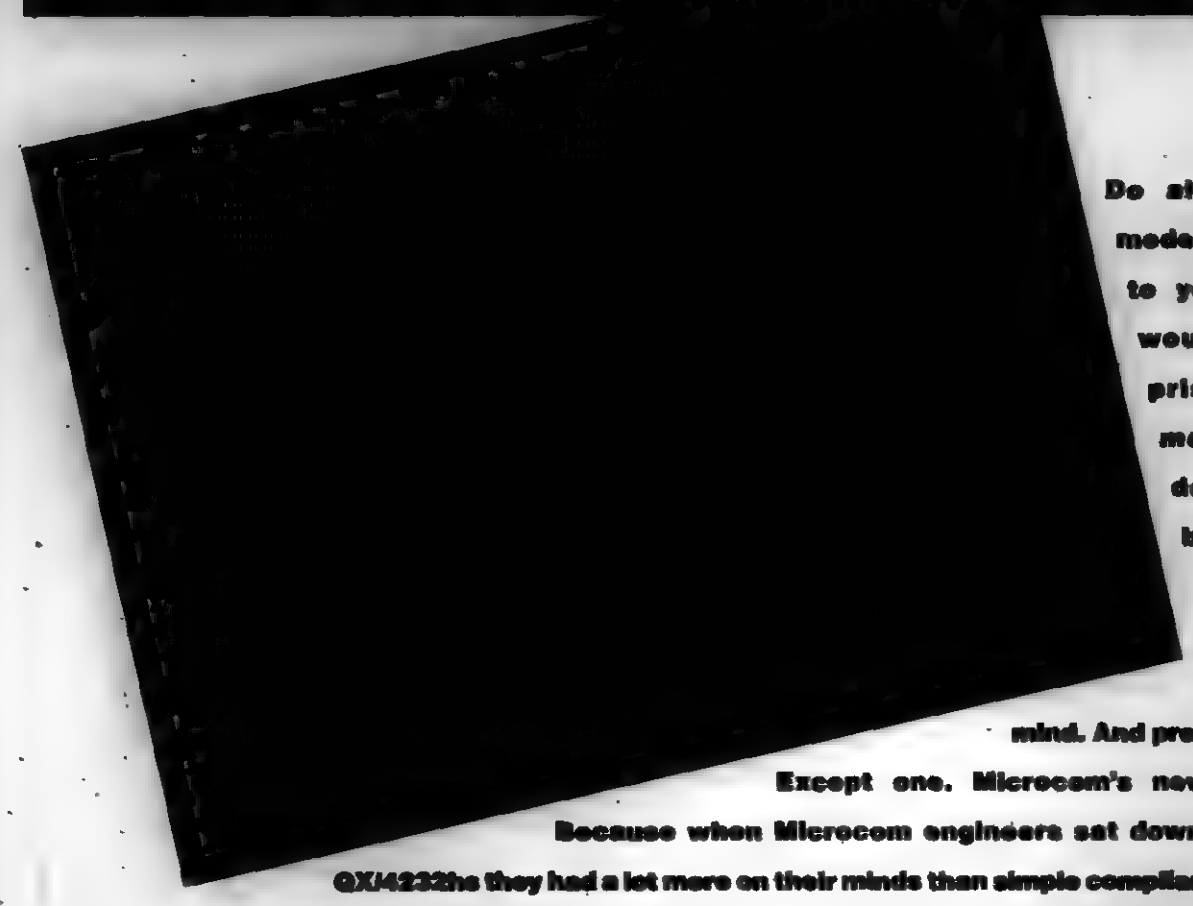
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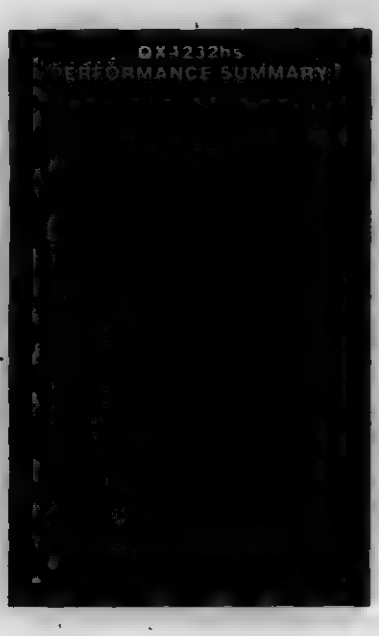
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HIGH-END MODEMS

Safe at any speed?

BY ROBERT FELDMAN

By the time V.32 bis — the proposed standard for dial-up modems that would define 14.4K bit/sec. throughput — builds up enough steam to become a real, as opposed to a declared, market standard, its moment of opportunity may have passed.

The Consultative Committee for International Telephony and Telegraphy (CCITT) is currently preparing to ratify V.32 bis, and a dozen assembly lines are gearing up for production of these modems. But there is considerable skepticism about its ability to spur a mass migration.

For many users, the incentive is less than compelling. Corporate penny-pinching is endemic, and most high-end sites have just finished replacing their V.22 modems with V.32 devices. On top of that, some observers warn that high transmission speeds can result in lost data.

Reasonable cost

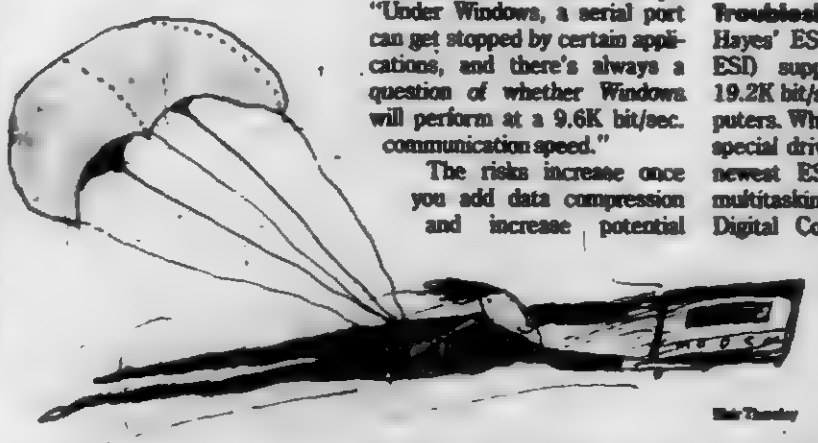
It's not as though the asking price is exorbitant. Modems are exploring new price depths, and while V.32 bis modems sell for a small premium over their younger siblings, the 9.6K bit/sec. V.32 modems, market analysts say that premium will evaporate during the next year.

Additionally, there is no doubt that certain users will be attracted to the speed of V.32 bis. The new standard is expected to find its way into industries needing speedy interactive communications, such as insurance, financial services, banking, brokerage, credit checking, automated teller machine networking and off-hour polling. V.32 bis is also aimed at bandwidth-intensive applications such as bulk file transfers and communications with multiuser sites.

Some corporations and government organizations are expected to embrace the enhanced throughput of the standard to cut line charges for the masses of files they transmit regularly. The faster they can get information down the line, the more money they save. With the 4-to-1 squeeze available from V.42 bis data compression, the theoretical throughput of V.32 bis rises to 57.6K bit/sec.

The higher speed will also attract people currently using V.32 modems to back up leased lines and will appeal to researchers engaged in data-intensive graphics and imaging as well as computer-aided design and engineering applications.

Another possible niche is transmitting cellular data from remote or mobile sites. The higher speed works well in remote connections to a local-area network; at 14.4K bit/sec., the remote personal computer essentially becomes a part of the LAN.



Blair Thornley

However, some analysts point to risks associated with high-speed communications. One barrier is buried within the microprocessor's circuits, especially in multitasking operations. If your PC is running IBM's OS/2 operating system or Microsoft Corp.'s Windows on top of a high-speed communications program in the background, interrupts will cause the processor to leave the communications program, even while the modem keeps transmitting. The result is lost data.

Stay in foreground mode

One simple way to avoid this is to not run communications in the background. "You shouldn't be doing serial communications while in some other program, because there are always parameter changes," says Thomas Nolle, principal at CIMI Corp., a consulting firm in Voorhees, N.J. "Under Windows, a serial port can get stopped by certain applications, and there's always a question of whether Windows will perform at a 9.6K bit/sec. communication speed."

The risks increase once you add data compression and increase potential throughputs. However, that sort of compression would never be done without V.42 error control, Nolle says, and the V.32 bis modulation scheme isn't any worse or more sensitive to line conditions than V.22 modulation. Yet there are caveats.

"Assuming you're using the new Trellis coding [error control], going faster doesn't mean more problems with the modems," Nolle says, "but at higher speeds, you have a higher sensitivity to line conditions. Then you'd better stay below the 9.6K bit/sec. rate entirely, since line impairments are more forgiving at slower speeds."

Another possible booby trap is that the original serial port on most MS-DOS devices in the IBM Personal Computer XT and AT classes, as well as some Intel Corp. 80386-based machines, will not operate at speeds higher than 9.6K bit/sec. This is overcome with the new enhanced serial port (ESI) specification, which is claimed to ensure data integrity at speeds as high as 38.4K bit/sec. Developed by Hayes Microcomputer Products, Inc., ESI is a system of communications software with a separate driver that supports data buffering and flow control.

Troubleshooting vendors

Hayes' ESP card (a version of ESI) supports operations at 19.2K bit/sec. on MS-DOS computers. When supplemented by a special driver, the firm says its newest ESP version supports multitasking operating systems. Digital Communications Associates, Inc. offers similar capabilities in its Crosstalk MK.4 Version 2.0 card.

Hayes, usually considered the industry's standard setter, is generally skeptical of the reliability of V.32 bis transmission. The firm says it will "support" V.32 bis and offer "an easy upgrade path" to it for current Ultra 96 owners, but it has yet to introduce a product.

Other vendors play down high-speed warnings, pointing out that V.32 bis is not a dramatic change in technology from other modem standards.

"Except for echo canceling, it's virtually identical to V.33, which has been used in leased-line, four-wire systems for the last six years," says Ken Krechmer, president of Action Consulting in Palo Alto, Calif.

Until the day that the CCITT ratifies the new standard, there will continue to be some fine-tuning of V.32 bis. This has also caused some foot dragging by major manufacturers. For example, the method of rate negotiation between modems may be modified, as could the procedure for arranging rate fallback under difficult line conditions.

Many vendors are simply encouraging people to use data

Continued on page 59

Feldman is a free-lance writer in Pittsburgh.

INSIDE

A Look at Fax Modems LAN-based systems are the new way to fax from a PC. Page 60.

What's New? Modem software has come a long way since the mid-1980s. Page 60.

Product Guide A comprehensive listing of modems running at 14.4K bit/sec. Page 61.

Looking at V.32 bis: The user point of view

While some buyers walk the V.32 bis fence, others are taking the plunge. At the Federal Aviation Administration (FAA), Judy Maske, an FAA systems analyst, has already recommended an upgrade to V.32 bis to the General Services Administration government procurement agency in Washington, D.C.

"We certainly won't throw away what we've got," Maske says, "but the V.32 bis products are downward-compatible, and they're 50% faster in communications with each other. That means we can cut line costs."

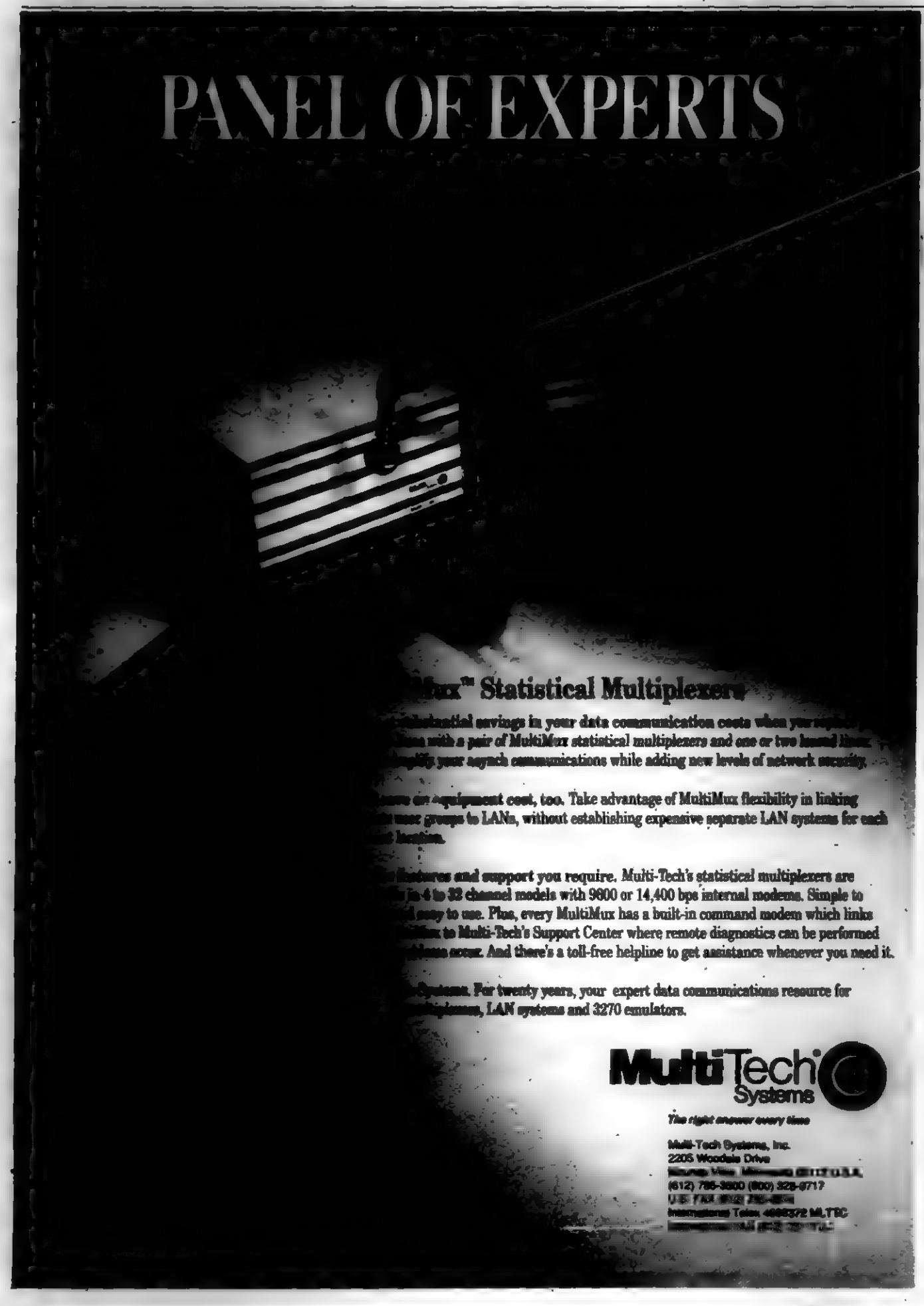
Currently, in the FAA's Southwestern region, several hundred V.32 modems from Practical Peripherals, Inc. — recently acquired by Hayes Microcomputer Products, Inc. — talk to similar U.S. Robotics, Inc. modems at a rate of 19.2K bit/sec. with the help of MNP-5, the de facto standard from Microcom, Inc. for error control and data compression.

Other buyers will wait. "We could use more speed," says John Tegeler, networking manager at American Door Co. in Walkerton, Ind., "but the system is doing the job, and I won't have to make a decision on the new modems for at least six months."

Tegeler says he is interested in testing V.32 bis, however. With a system built around the Telebit Corp. Trailblazer nonstandard modems, American Door does its heavy data transfers overnight on dial-up lines to 10 company sites nationwide.

Using the vendor's data compression protocol, Tegeler is seeing throughputs ranging from 4.8K to 13K bit/sec.

ROBERT FELDMAN



ASK THE VENDOR

Can I use Racal-Vadic's dial-up network management system to determine if my lines can support high-speed dial-up modems?

Joe Vicini
Chief of Applications
Office of Legislative Services
State of New Jersey

RACAL-VADIC, INC.: CMS 910 allows you to monitor real-time line conditions, change local and remote modem options, collect call statistics to monitor traffic patterns and test up to 16,000 modems in the system. With this information, you can change modem options to improve performance, evaluate the need for a programmable telephone connection or contact the carrier to determine if improvements are feasible.

I use the Worldport portable modem to connect my office computer with my home office. I would like to know when Touchbase plans to introduce 9.6K bit/sec., V.32 internal modems for laptops.

Sheldon Laube
Chief Information Officer
Price Waterhouse
New York

TOUCHBASE SYSTEMS, INC.: Internal modems are confined by size, shape and power consumption. They must fit into oddly-shaped spaces and connect to the computer via a proprietary interface. The modem is often restricted to a small amount of power because of the batteries' limitations.

These limitations and the high power and size requirements of conventional V.32 modems have restricted the availability of any internal V.32 models for laptop computers.

While there is no definite time frame, we are working closely with major laptop manufacturers to evolve a modem within their design criteria.

Continued from page 57

compression and error control on their V.32 modems to achieve the same throughputs as V.32 bis.

For example, NEC Corp.'s N9631 is a V.32 modem that can be used either as a two-wire dial-up or leased-line device. It runs four times as fast with MNP-5 at a cost of $150. Hayes offers the Ultra Fast upgrade, which for $299 can compress data on the Hayes Ultra 96 modem.

Compression cannot be used in all instances, however. Synchronous data and some types of asynchronous data cannot be compressed at all. On the other hand, compression works well in generalized file transfers and terminal-to-host access.

V.32 bis may become attractive, even to buyers not ready for it, via vendor-offered migration policies.

For instance, Codex Corp. says it will give liberal allowances for trade-ins of its V.32 2264 modems. Forval America, Inc. offers a telephone-upgradable product, Forval-Link, which is proprietary software that allows new modem enhancements and speeds up to 19.2K bit/sec. to be reconfigured and downloaded over phone lines.

One rule will never change: No matter how fast a device operates, someone will want to go faster. A CCITT group of rapporteurs will be meeting next month to consider the next V standard for switched connections. Its working name: "V.fast."

Dial-up V.fast is meant to modulate at 19.2K bit/sec. or faster, just as leased lines already do, but with the same reliability as that of switched V.32 bis. If a recommendation results, the specifications could be submitted to the CCITT governing body by the end of this year and ratified as a new standard before 1993.

What then? Will V.32 bis become obsolete? It depends on the cost, the state of the economy and the market. If V.32 bis is slow getting off the ground this year and next, V.fast could leapfrog it. ●

Latest standards

V.29: Defines 9.6K bit/sec. modems for point-to-point, four-wire leased lines.

V.32: Defines family of two-wire, up to 9.6K bit/sec. duplex modems for dial-up and leased lines.

V.32 bis: Defines 14.4K, 12K, 9.6K, 7.2K, 4.8K bit/sec. modems for dial-up lines.

V.33: Defines 14.4K bit/sec. modems for point-to-point, four-wire leased lines.

V.42: LAPM error control, 1,200 bit/sec. and higher.

MNP Levels 2, 3 and 4. Microcom, Inc.'s error-control recommendation; considered to be part of the CCITT V.42 standard.

V.42 bis: 4-to-1 data compression standard that works with 1,200 bit/sec. and higher modems.

MNP Level 5: 2-to-1 data compression for 1,200 bit/sec. and higher modems.

MNP Level 7: 3-to-1 data compression.

Sources: Omnicom, Inc. and U.S. Robotics, Inc.

Leased line holds high ground

If you're wondering where the action is in leased-line analog modems, you'd better look up — to 14.4K bit/sec. speeds and higher. That is where sales are forecast to remain steady through the end of the century, market researchers say. Anything slower will drop off in sales, according to Frost & Sullivan, Inc. in New York.

The word has been that new digital services and plummeting costs for these offerings will hit all leased-line analog modems where it hurts. However, Frost & Sullivan and International Data Corp. say they expect lower equipment costs to keep interest in at least the high end of this category at a steady level.

Digital transmission may be tempting, but economic uncertainties are tempering bold spirits. "A year or two ago, I was thinking how switched 56K bit/sec. digital could give me faster communications," says John Tegeler, networking manager at American Door Co. in Walkerton, Ind. "Now, I'm thinking about my company taking my job to pay for it."

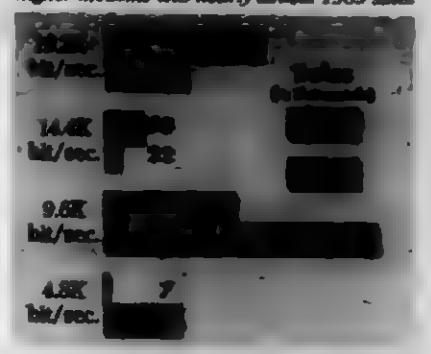
Network management will also keep customers interested in leased-line analog modems, Frost & Sullivan says.

The capabilities of leased-line modems will continue to appeal to large corporations with a low tolerance for time delays. ●

ROBERT FELDMAN

Leased-line forecast

According to a survey of 5,000 telecom employees, 1994 sales of 14.4K bit/sec. and higher modems will nearly double 1989 sales



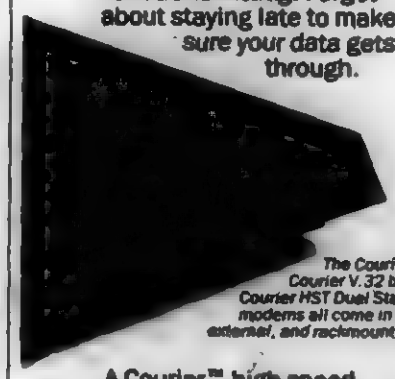
Source: Frost & Sullivan, Inc. CW Chart: Paul Mock



Turn it on and forget about it.

Forget about walking into work to find your message light blinking with last night's modem problems.

Forget about downtime. Forget about phone line problems and retransmitting. Forget about staying late to make sure your data gets through.



The Courier HST,™ Courier V.32 bis,™ and Courier HST Dual Standard™ modems all come in internal, external, and rackmount models.

A Courier™ high speed modem works so well, you can forget about it altogether.

It's reliable by design. The data pump has fewer parts. Less to go wrong.

And we test every Courier modem mercilessly before we send it out.

General Electric. Kodak. USWest. Forty-three of the Fortune 50 have relied on Courier modems for years, and they can't afford trouble any more than you can.

Only Couriers give you ASL™ to keep you at maximum speed.

You'll notice the difference the first time you dial. Modems with ASL™ connect up to three times faster than other V.32 bis modems. That irritating, expensive wait for the connection is over.

ASL is U.S. Robotics' Adaptive Speed Leveling.

All modems have to slow down for line noise. But two high speed Couriers working together will speed up again when conditions improve.

All other modems leave you stuck in "low" for the rest of the transmission. That can turn a $1 call into a $10 call.

So if you think a modem that gives you 38,400 bps throughput has to be temperamental, relax.

Nobody handles the hassle of dial-up lines better than U.S. Robotics.

We're proud to say we make the most forgettable modems in the world.

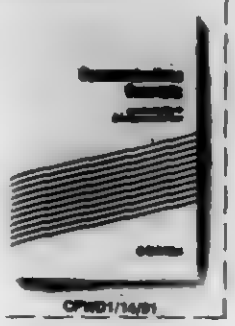
U.S. Robotics®
The Intelligent Choice in Data Communications

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Free Data Communications Reference Guide: This 108-page illustrated book quickly answers your data communications questions.

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City: State: Zip:
Phone: ( )

Mail to: U.S. Robotics, Inc., Attn: Marketing Dept., 8100 N. McCormick Blvd., Skokie, IL 60076, or call us toll-free at 1-800-DIAL-USR. In Canada: 1-800-553-3560. In the U.K.: Miracom Technology, Ltd. 0473 233-888.



CPWD1/14/91

PC fax modems gain votes

BY ERIC ARNUM

Personal computer facsimile modems have never won popularity contests since their 1986 debut. The problem is that they demand a lot of users, sometimes requiring them to open up their PCs and learn whole new command structures to operate them.

Even at $100 a pop, 1990 sales of these systems are forecast to barely hit $10 million, compared with conventional fax machines, whose 1990 sales will reach $2 billion in the U.S. alone.

Newer fax modem systems — from Gammalink Graphics Communications in Sunnyvale, Calif.; Brooktrout Technology, Inc. in Wellesley, Mass.; Biscom, Inc. in Billerica, Mass.; Castelle Systems in Santa Clara, Calif.; 3M Co. in St. Paul, Minn.; and Spectrafax Corp. in Naples, Fla. — are showing more promise. These are not stand-alone but are designed to be shared on a local-area network.

The word is that these systems are as easy to operate as a shared printer: The user simply sends the file and a telephone number. This is apparently of interest to users, with 1990 sales forecasts reaching the $100 million mark.

While these modem systems sell for as much as $4,000, they can save users money on phone costs. With users sharing the fax, high volumes may qualify the owner for a better discount on an AT&T WATS line.

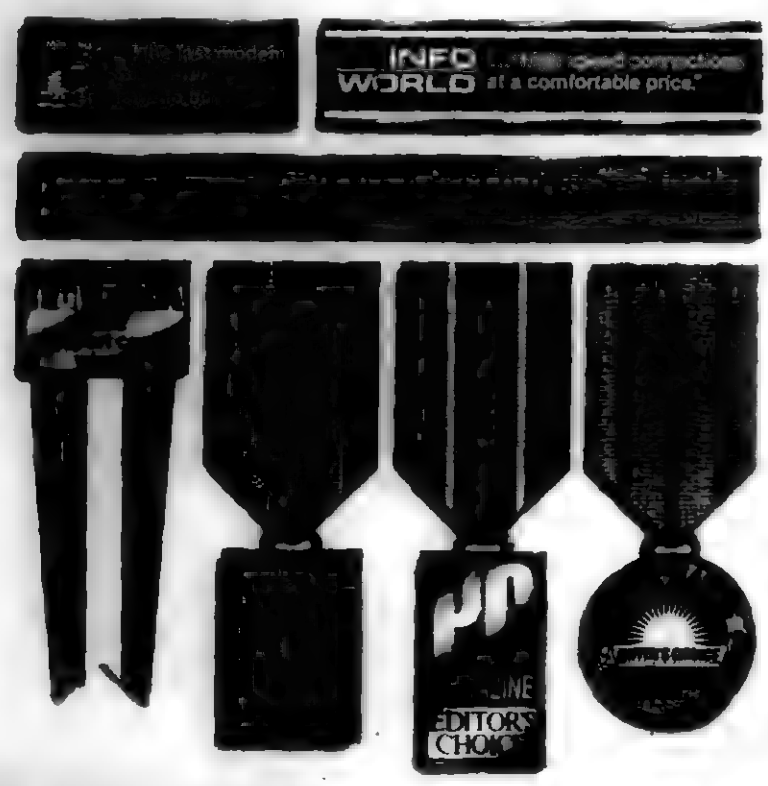
What makes the newer products even more viable is the enhanced quality and clarity of the computer/fax page. Teamed with sophisticated graphics packages and digitized Adobe Systems, Inc. Postscript images, the newest computer/fax systems can create documents that look like originals at the receiving end.

This has made graphics capabilities a big selling point. Faxcom/Publisher from Biscom, for example, is ideal for applications involving heavy graphical content. For about $200, the firm will create bitmapped images of business forms that the customer can store in Faxcom/Publisher. When the document is sent, it looks like a form filled in by a typewriter.

Xpedite Systems, Inc. in Eatontown, N.J., sells a service based on hardware from Gammalink. The service accepts virtually any computer document, including some computer-aided design and manufacturing images, and translates it into a fax format. Customers send files via a modem to the Xpedite network, which then forwards the files to as many as several thousand destinations.

Xpedite's graphics capabilities enable the system to accept a wide variety of word processor files as well as Postscript and Epson America, Inc. print files. ●

Arnum is editor of the "Electronic Mail and Micro Systems" newsletter in New Canaan, Conn.



UDS V.32 Modems: winners at 19.2 kbps—now FasTalk doubles the speed

From the day of its introduction, UDS' V.32 modem has gathered honors from leading computer publications and other industry watchers!

Initially it set the standard for 9.6 kbps, full-duplex traffic over dial-up lines. When MNP® level 5 data compression was added, throughput went to 19.2 kbps.

Now comes the FasTalk V.32/42b—a modem that is specifically designed for PC applications and is fully compliant with CCITT's V.42*bis* recommendation. Meeting this standard gives the V.32/42b a maximum data rate of 38.4 kbps!

The modem is particularly useful for bit-intensive data transfers, such as engineering graphics, image processing and complex financial operations. Data Rate is automatically adjusted to 9600, 4800, 2400 or 300 bps (CCITT V.32 and V.22*bis*). At the 9600 bps rate, trellis coding gives the FasTalk V.32/42b an exceptionally high tolerance for noisy lines.

For accurate communication over worst-case lines, the unit incorporates V.42 LAP-M and MNP 4 error control functions. A full complement of on-board test functions is included, and eight LEDs provide easy monitoring of the unit's operation and built-in diagnostic features.

Get acquainted with the latest winner in the UDS V.32 family. For technical details and quantity pricing, contact UDS, 5000 Bradford Drive, Huntsville, AL 35805-1993. Telephone 205/430-8000; FAX 205/430-8926.



UDS
MOTOROLA

MNP® is a registered trademark of Microcom Systems, Inc. Created by Digital Ad, Inc., Winter Park, Florida

Modem software

BY CHRISTOPHER HERBST

Communications software for modems has come a long way since its early days of transferring files among personal computers and allowing access to host computers.

The following specialized functions are found in dedicated programs:



• **Local-area network support.** This makes it possible for users to share a modem or set of modems. A few general-purpose modem programs, such as Digital Communications Associates, Inc.'s Crosstalk MK.4 Version 2.0, support LANs. Other vendors — such as Hayes Microcomputer Products, Inc., manufacturer of Smartcom — market special LAN versions of their products.

• **Remote-access software.** This allows the operator of a remote PC to dial in over a telephone line and take full control of the host PC.

CO/Session 5.0 by Triton Technologies, Inc. is the first remote-control package to provide remote mouse operation.

Microcom, Inc.'s Carbon Copy Plus Version 5.0 provides a universal graphics translator that displays identical graphics on host and remote computers.

Norton-Lambert Corp.'s Close-Up, The Modem Remote combines remote-control, automation and terminal communications in one package.

• **Windows support programs.** These packages allow data processing functions to be performed on local text and data files in a separate window during a communications

Future Soft Engineering, Inc.'s Dynacomm comes in synchronous and asynchronous editions and includes a number of advanced features, including windows support. Terminal, a subset of Dynacomm that does not include all of its features, is bundled with Microsoft Corp.'s Windows 3.0.

Herbst is a free-lance writer based in Washington, D.C.

Dial-up/leased-line modems running 14.4K bit/sec.

VENDOR	PRODUCT	MINIMUM/MAXIMUM DATA TRANSFER RATES[1]	FALLBACK RATES	FALL FORWARD CAPABILITIES	SYNCHRONOUS/ASYNCHRONOUS	HALF DUPLEX/FULL DUPLEX	LINE REQUIREMENTS	MODEM CONFIGURATION	MODEM PROTOCOLS SUPPORTED	ERROR CORRECTION PROTOCOL SUPPORTED	DATA COMPRESSION PROTOCOL SUPPORTED	BUILT-IN NETWORK MANAGEMENT CAPABILITY	COMPATIBLE WITH HAYES AT COMMAND SET	SECURITY FEATURES	PHYSICAL CONFIGURATION	DIMENSIONS (INCHES)/WEIGHT (POUNDS)	PRICE
AT&T Paradyne (813) 530-2000	Comsphere 3600	9.6K - 14.4K	12K, 9.6K	Yes	Both	Both	Leased-line/4-wire	Point-to-point	V.32, proprietary	Trellis coding	None	Yes	No	Front-panel lockout	Stand-alone	3.47 by 13.88 by 13.06/6	$4,100
	Comsphere 3600 TM	9.6K - 14.4K	NA	No	Both	Both	Leased-line/4-wire	Multipoint	Proprietary	Trellis coding	None	Yes	No	Front-panel lockout	Stand-alone	3.47 by 13.88 by 13.06/6	$4,100
	Comsphere 4464	9.6K - 14.4K	12K, 9.6K	Yes	Both	Both	Leased-line/4-wire	Point-to-point	V.32, proprietary	Trellis coding	None	Yes	No	Front-panel lockout	Rack-mount	15.3 by 19 by 16.8/107	$4,000
	Comsphere 4464 TM	9.6K - 14.4K	NA	No	Both	Both	Leased-line/4-wire	Multipoint	Proprietary	Trellis coding	None	Yes	No	Front-panel lockout	Rack-mount	15.3 by 19 by 16.8/107	$4,000
BCR Equipment Corp. (813) 530-0177	14.4S, 14.4M	2,400 - 14.4K	12K, 9.6K	No	Synchronous	Both	Leased-line/4-wire	Point-to-point, multipoint	V.29, V.fc	None	None	No	No	None	Stand-alone, rack mount	2.9 by 10.5 by 14.7/6	$1,295 (14.4S), $1,795 (14.4M)
British Telecom, Inc. (703) 918-1770	6142 TCE	4.8K - 14.4K	12K - 4.8K	Yes	Both	Full duplex	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point	V.32, V.32 extended, V.33	V.42	V.42 bis	Optional	Optional	Optional encryption, dial back-up	Stand-alone, rack mount	3 by 9 by 15.5/11.4	NP
Case/Datatel (301) 317-7710	DCM 4144	9.6K - 14.4K	12K, 9.6K	No	Synchronous	Both	Leased-line/4-wire	Point-to-point	V.29, V.33	Trellis coding	None	Yes	No	None	Stand-alone, rack mount	3.25 by 14.25 by 13.62/8.5	$3,396 - $4,596
Codex Corp. (800) 351-4900	3810C Family	1,200 - 14.4K (sync. discount)	14.4K - 7.2K	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point	Bell 103, 212, V.21, V.22, V.22 bis, V.32, V.32 bis	V.42, MNP level 4	V.42 bis, MNP level 5,	Optional	Yes	Password, callback	Stand-alone, rack mount (2 modems per card)	2.75 by 8.7 by 9.6/5.1	$1,395 - $1,995
Data Race, Inc. (512) 388-1900	Action 1405	1,200 - 14.4K	12K - 4.8K	Yes	Both	Full duplex	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point	V.29, V.32, V.33	V.42, MNP levels 2 - 5	MNP level 5	No	Yes	None	Stand-alone, rack mount	8.5 by 10.13 by 2/2.6	$1,795
DCB of Champaign, Inc. (217) 352-3207, (800) 637-1237	PL 14.4	14.4K	9.6K, 7.2K, 4.8K	No	Synchronous	Full duplex	Leased-line/4-wire	Point-to-point	V.29, V.33	None	None	No	No	None	Stand-alone, rack mount	2.25 by 10.25 by 9.75/4	$1,000
	PL 14.4 Plus	14.4K	9.6K, 7.2K, 4.8K	No	Synchronous	Full duplex	Leased-line/4-wire	Point-to-point	V.29, V.33	None	None	Yes	No	None	Stand-alone, rack mount	2.25 by 10.25 by 9.75/4	$2,000
Digicom Systems, Inc. (408) 262-1277	9624 LE+, 9624 E+	1,200 - 14.4K	12K - 2,400	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire (9624 E+)	Point-to-point	V.22 bis, V.32, V.32 bis	MNP levels 2 - 4	V.42 bis, MNP level 5	No	Yes	Callback	Stand-alone	1.5 by 6.5 by 8/3, 2.5 by 9 by 12/4	$695, $1,295
	9624 PC+	1,200 - 14.4K	12K - 2,400	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire	Point-to-point	V.22 bis, V.32, V.32 bis	MNP levels 2 - 4	V.42 bis, MNP level 5	No	Yes	Callback	Internal	1 by 4 by 12/1.5	$695
	9624 E+	1,200 - 14.4K	12K - 2,400	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point	V.22 bis, V.32, V.32 bis	MNP levels 2 - 4	V.42 bis, MNP level 5	Optional	Yes	Callback	Rack-mount	0.8 by 7 by 11/2	$1,295
Fastcomm Communications Corp. (703) 620-8000	FDX 9600LE	300 - 14.4K	12K - 300	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point	V.32, V.32	V.42, MNP levels 1 - 4	V.42 bis, MNP level 5	Yes	Yes	Password, callback, hardware check, manual lock	Internal, stand-alone, rack mount	1.5 by 6.5 by 10.3/8	$1,350
Forval America, Inc. (801) 861-8080	IM14400	14.4K	12K, 9.6K, 4.8K, 2,400, 1,200	No	Asynchronous	Full duplex	Dial-up/2-wire	Point-to-point	Bell 212A, V.22, V.22 bis, V.32, V.32 bis	V.42, MNP levels 2 - 4, LAP M	V.42 bis, MNP level 5	No	Yes	None	Internal	4 by 12.3 by 1/1	$1,045
	SA14400	14.4K	12K, 9.6K, 4.8K, 2,400, 1,200	No	Asynchronous	Full duplex	Dial-up/2-wire	Point-to-point	Bell 212A, V.22, V.22 bis, V.32, V.32 bis	V.42, MNP levels 2 - 4, LAP M	V.42 bis, MNP level 5	No	Yes	None	Stand-alone	2 by 10 by 8/2.35	$1,345
General Datacomm, Inc. (800) 998-1120	Datacomm 14420	9.6K - 14.4K	12K, 9.6K	Yes	Both	Full duplex	Leased-line/4-wire	Point-to-point	V.29	None	None	Optional	No	None	Stand-alone, rack mount	3.9 by 19.8 by 12.5/6	$3,595
	Multiport 14420	2.4K - 14.4K	12K, 9.6K	No	Both	Full duplex	Leased-line/4-wire	Point-to-point	V.29	None	None	Optional	No	None	Stand-alone, rack mount	3.9 by 19.8 by 12.5/6	$3,695
	9600 14420	14.4K	12K, 9.6K	HP	Synchronous	Full duplex	Leased-line/4-wire	Point-to-point	V.29, V.33	Trellis coding	None	Yes	No	None	Stand-alone, rack mount	3.9 by 19.8 by 12/7.3	$3,595 (rack mount)
	SDC 9600/ext 14420	1,200 - 14.4K	12K, 9.6K	HP	Both	Full duplex	Leased-line/4-wire	Point-to-point	V.29, V.33	Trellis coding	None	Yes	No	None	Stand-alone, rack mount	19.5 by 19 by 13.5/61.5	$5,495
HT Communications, Inc. (619) 450-0202	Pro 1000	4.8K - 14.4K	12K, 9.6K, 7.2K, 4.8K	Yes	Synchronous	Full duplex	Leased-line/4-wire	Point-to-point	V.29, V.33	None	None	No	No	None	Stand-alone, rack mount	2.4 by 8.5 by 11/1	$1,495
IBM (914) 766-1900	7855 Models 010, 020, 040	14.4K	12K	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point, multipoint	V.29	Proprietary LAPDA	None	Yes	No	Password	Stand-alone	4.37 by 8.69 by 14.57/7.37	$5,395 (010), $6,735 (020), $8,970 (040)
	7855 Models 020, 040	14.4K	12K	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point, multipoint	V.29	None	None	Yes	No	Password	Rack-mount	14.48 by 1 by 14.76/2.75 (1-port), 14.43 by 3 by 14.76/3.5 (3-port)	$4,970 (020), $6,515 (040)

[1] Does not include data compression.

[2] MNP stands for Microcom Networking protocol, a trademark of Microcom, Inc.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

HIGH-END MODEMS

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	MINIMUM/MAXIMUM DATA TRANSFER RATES[1]	FALLBACK RATES	FALL FORWARD CAPABILITIES	SYNCHRONOUS/ASYNCHRONOUS	HALF/FULL DUPLEX	LINE REQUIREMENTS	MODEM CONFIGURATION	MODEM PROTOCOLS SUPPORTED	ERROR CORRECTION PROTOCOL SUPPORTED	DATA COMPRESSION PROTOCOL SUPPORTED	BUILT-IN NETWORK MANAGEMENT CAPABILITY	COMPATIBLE WITH HAYES AT COMMAND SET	SECURITY FEATURES	PHYSICAL CONFIGURATION	DIMENSIONS (INCHES)/WEIGHT (POUNDS)	PRICE
[illegible]	[illegible]	0.6K - 14.4K	12K, 9.6K, 7.2K, 4.8K	No	Both	Both	Leased-line/4-wire	Point-to-point, multipoint	V.29, V.32	None	None	Yes	No	Password	Stand-alone, rack mount	2.25 by 11.75 by 17/9	$4,495 (stand-alone), $3,995 (rack mount)
	[illegible] 14.4A	4.8K - 14.4K	12K, 9.6K, 7.2K, 4.8K	No	Both	Both	Leased-line/4-wire	Point-to-point	V.32, V.32	None	None	Yes	No	Password	Stand-alone, rack mount	2.25 by 11.75 by 17/9	$4,495 (stand-alone), $3,795 (rack mount)
Micom Communications Corp. (800) 922-0882	MB-A96-1, MB-A144-DP, M4096/ V.29+	9.6K - 14.4K	12K - 4.8K	Yes	Synchronous	Both	Dial-up/2-wire, leased-line/4-wire	Point-to-point, multipoint	V.29, V.32	None	None	No	No	Configurable security ID number	Internal, stand-alone, multiplexer	8.75 by 2.25 by 11.25/3.5 (stand-alone)	$750 - $1,995
[illegible]	[illegible]	14.4K	12K, 9.6K	Yes	Synchronous	Full duplex	Leased-line/4-wire	Point-to-point	V.29, V.32	None	None	Yes	No	Password	Stand-alone, rack mount	1.75 by 8.5 by 10.5/3.5	$1,395
Octocom Systems, Inc. (800) 638-6660	OSI 8196	300 - 14.4K	12K, 9.6K, 7.2K	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire	Point-to-point	Bell 103, 2025, 212A, V.21, V.22 A/B, V.22 bis, V.23, V.32, V.32 bis	V.42, MNP level 4	V.42 bis, MNP level 5	No	Yes	Password, callback	Stand-alone	1.9 by 8 by 12.1/3	$1,195
	OSI 8596	300 - 14.4K	12K, 9.6K, 7.2K	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire	Point-to-point	Bell 103, 201C, 2025, 208B, 212A, V.21, V.22 A/B, V.22 bis, V.23, V.32, V.32 bis	V.42, MNP level 4	V.42 bis, MNP level 5	Yes	Yes	Password, callback	Stand-alone	1.8 by 7.8 by 10.9/3	$1,195+
	OSI 8696	300 - 14.4K	12K, 9.6K, 7.2K	Yes	Both	Both	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point	Bell 103, 2025, 208A/B, 212A, V.21, V.22 A/B, V.22 bis, V.26, V.26 bis, V.27 ter, V.29, V.32, V.32 bis	V.42, MNP level 4	V.42 bis, MNP level 5	Yes	Yes	Password, callback	Stand-alone, rack mount	1.8 by 7.8 by 10.9/3	$1,195+
[illegible]	CLP 14.4, CLP 14.4S	0.6K - 14.4K	12K, 9.6K	No	Synchronous	Full duplex	Dial-up/2-wire, leased-line/4-wire	Point-to-point	V.32	None	None	No	No	None	Stand-alone, rack mount	3.5 by 11 by 11.75/7.9, 1.75 by 8.5 by 10.5/2.1 (desk)	$1,695 (CLP 14.4), $1,895 (CLP 14.4S)
Patell Datacomm (301) 921-0660 (800) 473-8748	V.32/14.4	300 - 14.4K	12K	Yes	Both	Full duplex	Dial-up/2 wire, leased-line/2-wire, leased-line/4-wire	Point-to-point	Bell 103, Bell 208, Bell 212, V.21, V.22, V.22 bis, V.23, V.32, V.32 bis, V.33	V.42, MNP levels 1 - 4	V.42 bis, MNP level 5	No	Yes	Password, callback	Stand-alone, rack mount	2.5 by 9.7 by 10.1/2.2	$1,595
	V.32/14.4M	300 - 14.4K	12K	Yes	Both	Full duplex	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point	Bell 103, Bell 208, Bell 212, V.21, V.22, V.22 bis, V.23, V.32, V.32 bis, V.33	V.42, MNP levels 1 - 4	V.42 bis, MNP level 5	Yes	Yes	Password, callback, automatic security handshake	Stand-alone, rack mount	2.5 by 9.7 by 10.1/2.2	$1,695
[illegible]	Quadmodem 14.4	14.4K	12K	Yes	Both	Both	Leased-line/4-wire	Point-to-point	Proprietary	Trellis coding	None	Yes	No	Password, keypad encryption	Stand-alone, rack mount	2.5 by 17.5 by 15.5/10	$3,995
	Quadmodem 14.4 FP	9.6K - 14.4K	12K, 9.6K	Yes	Both	Both	Leased-line/4-wire	Point-to-point, multipoint	Proprietary	Trellis coding	None	Yes	No	Password	Stand-alone, rack mount	2.5 by 17.5 by 15.5/10	$3,995
	Quadmodem V.32	14.4K	12K	Yes	Synchronous	Both	Leased-line/4-wire	Point-to-point	V.29	Trellis coding	None	Yes	No	Password, keypad encryption	Stand-alone, rack mount	2.5 by 17.5 by 15.5/10	$3,695
	[illegible] 2212, [illegible] 2224	300 - 14.4K	12K - 4.8K	No	Both	Both	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point, multipoint	Bell 103, Bell 208 A/B, Bell 212A, V.21, V.22, V.22 bis, V.23, V.32, V.32 extended, V.33	MNP levels 2 - 5	MNP level 5	Yes	Yes	Password, callback, pass through	Stand-alone, rack mount	2.5 by 9.7 by 10.1/5	$1,595 (2212), $1,695 (2224)
	[illegible]	14.4K	12K	Yes	Both	Both	Leased-line/4-wire	Point-to-point	V.29	Trellis coding	None	Yes	No	Password, keypad encryption	Stand-alone, rack mount	2.5 by 17.5 by 15.5/10	$3,195
Racal-Vadic (408) 432-8008, (800) 482-3427	9642PA	300 - 14.4K	12K, 9.6K, 4.8K	No	Both	Full duplex	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point to point, multipoint	V.32, proprietary V.32 extended, V.33	V.42, MNP levels 2 - 4	V.42 bis, MNP level 5	Yes	Yes	Password, callback, transparent security handshake	Stand-alone	2.5 by 9.7 by 10.1/5	$1,595
	VA9642E	300 - 14.4K	12K, 9.6K, 4.8K	No	Both	Full duplex	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point to point	V.32, proprietary V.32 extended, V.33	V.42, MNP levels 2 - 4	V.42 bis, MNP level 5	Yes	Yes	Password, transparent security handshake, optional VA930 security system	Rack mount, dual modem card	7.1 by 0.8 by 15/1.5	$2,495 (two modems)
Tab Com/Procomm (408) 496-0300	TC 1496	4.8K - 14.4K	9.6K, 7.2K, 4.8K	No	Synchronous	Full duplex	Leased-line/4-wire	Point-to-point, full circuit	V.29	Trellis coding	None	No	No	None	Stand-alone, rack mount	3 by 8.5 by 10.25/5	$1,595
UDS Motorola (205) 430-8000	1480	9.6K, 12K, 14.4K	9.6K	No	Both	Both	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire	Point-to-point	V.29, V.33	None	None	No	Yes	Front-panel lockout	Stand-alone, rack mount	7 by 9.6 by 2.25/5	$2,195 (1 - 9 modems), $2,085 (10 - 24 modems), $1,975 (25 - 60 modems)
U.S. Robotics, Inc. (708) 982-5001, (800) 342-5877	Courier HST / / C	300 - 14.4K	12K, 9.6K, 7.2K, 4.8K, 2,400, 1,200, 300	Yes	Asynchronous	Full duplex	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire (with converter)	Point-to-point	Proprietary HST mode	V.42, MNP levels 2 - 4	V.42 bis, MNP level 5	No	Yes	None	Internal, stand-alone, rack mount	1.97 by 8.3 by 13.88/4 (stand-alone)	$999 (stand-alone, rack), $695 (internal)
	Courier V.32 bis	300 - 14.4K	12K, 9.6K, 7.2K, 4.8K, 2,400, 1,200, 300	Yes	Both	Full duplex	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire (with converter)	Point-to-point	V.32, V.32 bis	V.42, MNP levels 2 - 4	V.42 bis, MNP level 5	No	Yes	None	Internal, stand-alone, rack mount	1.97 by 8.3 by 13.88/4 (stand-alone)	$895 (stand-alone, rack), $695 (internal)
	Courier HST Dual Standard with V.32 bis	300 - 14.4K	12K, 9.6K, 7.2K, 4.8K, 2,400, 1,200, 300	Yes	Both	Full duplex	Dial-up/2-wire, leased-line/2-wire, leased-line/4-wire (with converter)	Point-to-point	V.32, V.32 bis	V.42, MNP levels 2 - 4	V.42 bis, MNP level 5	No	Yes	None	Internal, stand-alone, rack mount	1.97 by 8.3 by 13.88/4 (stand-alone)	$1,295 (stand-alone, rack), $1,349 (internal)

Visualizing information planning

Three strategic techniques that rely on graphics, not jargon

BY BOB CURTICE AND DAVE STRINGER

Has this ever happened to you? You're in a planning meeting with top business managers to brief them on the impact technology can have on the business. Your technical explanations are clear (after all, the information systems staff understood them). These same descriptions, however, are now being met with blank stares. You're frustrated, the executives are confused, and your plans for a new manufacturing system are looking dim.

Your effort is not at fault here; the way you package it is. How can you make clear to nontechnical managers the effect IS technology can have on a firm? We're proposing strategic planning techniques that graphically show how information can impact an organization.

There are lots of planning methodologies out there. Typical ones get down to the gory details of functions and data and systems — important parts of technology planning, to be sure. But they only scratch the surface. While these methods get business managers *involved* in IS planning, they don't help *them understand it.*

Curtice is vice president at Arthur D. Little, Inc. (ADL), a consulting company in Cambridge, Mass. Stringer is director of ADL in London.

Here's where IS chiefs can help. Technology managers can provide a big-picture view from which business executives can make informed decisions about future investments. Business managers are given the wherewithal to track, revise, shape and get up to their elbows in information technology planning.

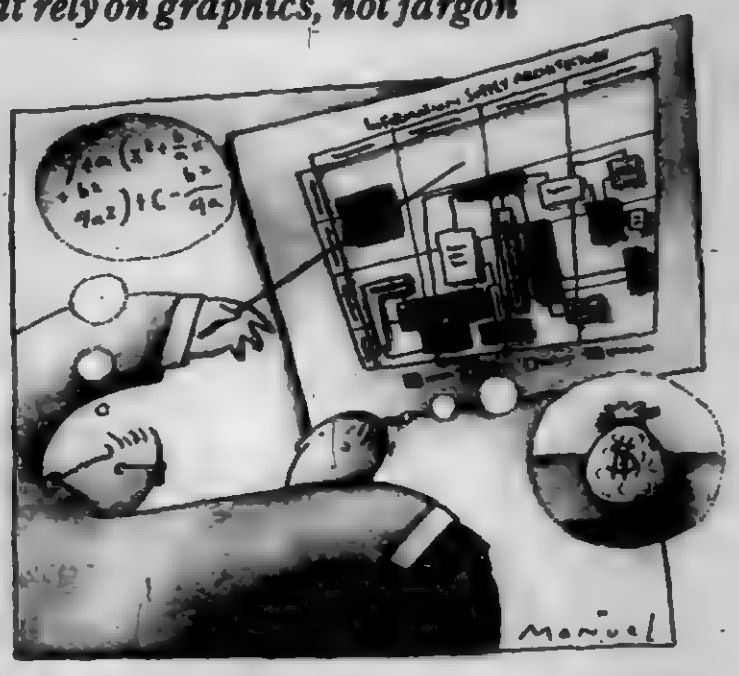
Layouts at a glance

The most effective strategic planning methodologies should provide comprehensive, graphical layouts of an organization's array of information at a glance. They should not only show where information is generated and needed by internal and external customers, suppliers, regulators and so on, but they should also depict where bottlenecks and opportunities exist.

The following are three such graphical planning methods:

■ **The information supply and demand matrix.** While other methodologies follow organizational boundaries, the information demand and supply matrix analyzes a business' information needs by function. This technique also points out how well IS is meeting those needs.

The *information supply and demand* chart pictured below represents the needs of a fictitious large manufacturing company, called Acme Manufacturing Co., but can be tailored to fit your organization.



Manuel Ruiz

The chart is structured as a matrix, with rows and columns. The columns should represent the six to 12 activities or high-level functions that collectively describe the processes of your business. For Acme Manufacturing, those functions include developing products and processes and managing finances.

There are always four rows in the matrix, characterizing the levels of management responsibility involved:

- Strategic functional level. Functions performed at this level are fundamental to the long-term performance and survival of the business and are integral to developing strategies and objectives as well as establishing new business directions. Examples for Acme include setting new product directions and long-term financing as well as developing marketing strategies.
- Planning and analysis functional level. Functions here establish how the company will meet long-term objectives as well as analyze internal and external events to *determine* their impact on achieving strategic goals.
- Control and monitoring functional level. Functions at this level ensure that the day-to-day business is carried out properly,

Information supply-and-demand matrix for Acme Manufacturing Co.

A technique for showing what the information needs of the business are by function and how well those needs are being met

	Develop products and processes	Produce products	Manage material	Market [illegible]	Manage finances
Strategic	Set new product directions [redacted] Social/economic trends Technology forecast		Determine sourcing strategy	Develop new product strategy Develop marketing strategy	Set long-term financing strategy [redacted] Economic forecasts [redacted]
Planning and analysis	Analyze new product opportunities Analyze new technology	Plan production schedule Analyze production problems	Qualify new suppliers Negotiate supplier contracts Plan material requirements Plan distribution requirements Set stock levels	Determine market segments Construct annual marketing plan Set product prices Forecast demand Plan advertising and promotions	Prepare budgets Analyze product costs
Control and monitor	Control development projects	Monitor production schedule Control production quality	Monitor distribution performance Control product quality Monitor supplier performance	Monitor marketing plan Report sales	Monitor budgets Control foreign exchange exposure
Operational	Specify new products Specify product process	Issue production work orders Manufacture products	Process purchase requisitions Process purchase orders Receive material Ship material	Conduct market research Administer promotions Arrange advertisements	Collect receivables Prepare financial statements

[redacted] Information is adequately supplied to the business function (not necessarily by computer)

Information is supplied but not adequately (inaccurate, late, incomplete or not usable)

[redacted] Information is not supplied

Source: Arthur D. Little, Inc.

CW Chart: Marie Hulsey



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efficiently and in line with plans.

• Operational functional level. Functions here execute the day-to-day routine transactions and activities that make up the business.

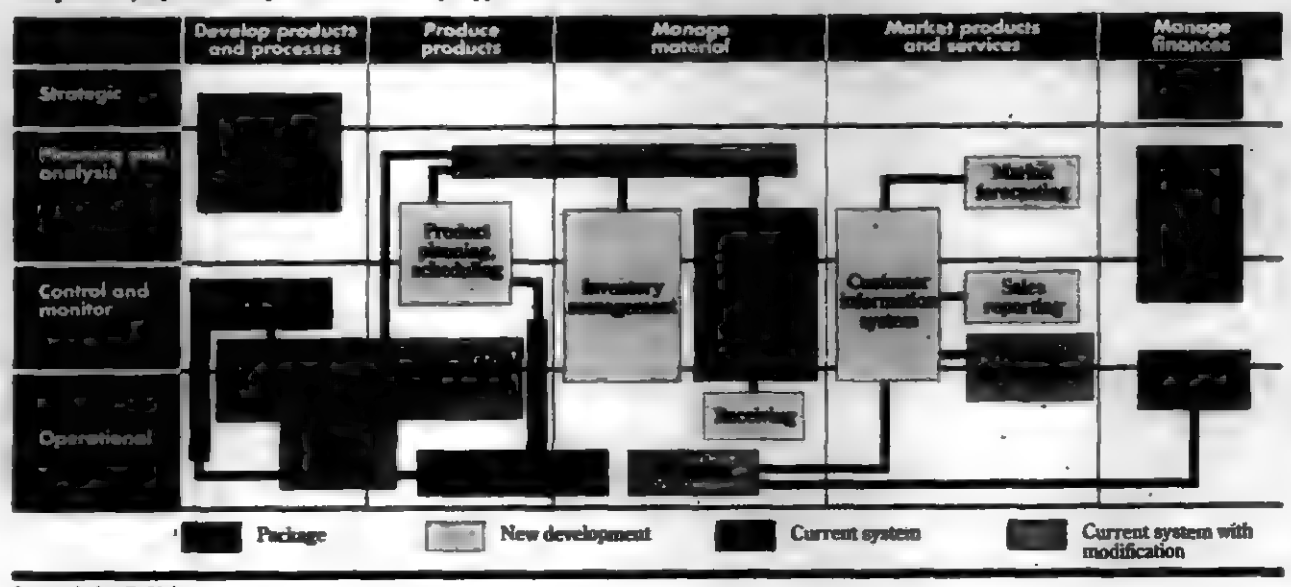
Nowhere on this chart is there a "managing information" function; managing information is something that occurs throughout the matrix (and organization).

Clearly, each level in the chart implies the need for different kinds of information technology support. Acme's technical and business management staff may find that there are many transaction-heavy on-line functions going on at the operational level. Therefore, an on-line transaction processing system may be appropriate here. Decision-support software, spreadsheets and the like may be the right fit at the strategic level in which there are fewer users and more universal needs.

Moreover, graphically showing these levels encourages company executives to identify functions that are overlooked in other technology planning processes. For example, there may not be any activities identified at the strategic level having to do with managing people. Such critical observations force business and technology managers into in-depth discussions of what appears in the chart.

Information supply architecture for Acme Manufacturing Co.

A depiction of information systems and how they support business activities



Source: Arthur D. Little

Three-part instruction

Each cell of the matrix has three pieces of information. First, it contains a list of the specific activities needed to perform all business functions; such a list appears at each functional level. In our example, in the planning and analysis category of the market products and services column, there is a list of activities such as determining market segments, constructing annual marketing plans and setting product prices.

Second, for each of these business activities, the matrix lists the information needed to carry it out effectively.

In this methodology, information needs are ascertained by an analysis of objectives, critical success factors, performance measures and knowledge of modern business practices. Other methodologies start with an analysis of the information and technologies users say they need. This analysis starts with the functions users perform, which in turn suggests to management the kind of information that's needed to do a better job.

For Acme Manufacturing, information needed to forecast demand includes customer orders by product, quantity and due date; marketing plans; historic demand forecasts; and planned promotions.

Thirdly, color coding is used to indicate how well information is currently supplied to each business activity.

Here, on a single chart, is a comprehensive picture of this business' activities, the information it requires and an assessment of how well that information is being supplied today. It serves as a basis for both management and IS to understand where problems with the quality and availability of information exist.

■ **The value matrix.** Strategic planning can also be done from a value perspective. The value matrix, set up like the matrix described above, shows senior managers where IS investments are likely to impact overall business strategy.

In the value matrix, planners assign a score to each cell. This score represents the value that the functions in that cell contribute to the firm's strategic business objectives. Thus, if a company's strategic objective is to improve its level of customer service, then cells with functions that concentrate on the operational aspects of logistics/materials management or the planning aspects of selling will receive a high value score.

One way to simplify the process is by using color to assign values to the cells. Different colors can indicate high value, average value or less than average value to the business.

The assessment of information quality (using the supply and demand matrix), combined with the value of business functions to strategic objectives (given by the value matrix), enable management to focus attention and priorities on those business areas that not only are needy but can also offer strategic benefits.

■ **The information supply architecture matrix.** Many managers have little grasp of the scope of systems, what business functions they support, how they interrelate or overlap and how newly developed systems fit into this picture.

The information supply architecture matrix (see chart page above) is intended to provide non-IS managers with this panorama. It uses a matrix with the same columns and rows delineated above, with each application system mapped out as a polygon. Each polygon overlaps cells containing functions supported by the application. One application may span many cells, and a cell may contain multiple applications. Connecting lines can be drawn between polygons to signify major interfaces between systems.

The information supply architecture is often prepared in two versions. One version depicts the current investment in applications, usually showing duplicate systems supporting functions and cells that have little or no systems support. The second version portrays a more planned state of affairs. Color coding can clue executives into the status of each application; it can tell whether the application is part of the current system, a new development, a modification and so on.

Such graphical portrayals of the IS environment form a clear and comprehensive picture without the need for technical jargon. Acme Manufacturing is not the only firm to capitalize on this kind of strategic planning methodology; real-life firms have made it work for them.

For example, following the use of such a graphical technique at the United Distillers Division of Guinness PLC in the UK, the company restructured the processing of 70,000 yearly export orders. Information now flows to a single customer administration executive, who handles all the activities involved in getting the goods to the customer. Benefits include lower order-processing costs, improved cash flow, enhanced customer service and growing market share.

Understanding, when communicated with pictures, enables executives and operating management to provide focus to the information management agenda. That's the kind of leadership and understanding IS needs if it wants to capitalize on today's information technology. •

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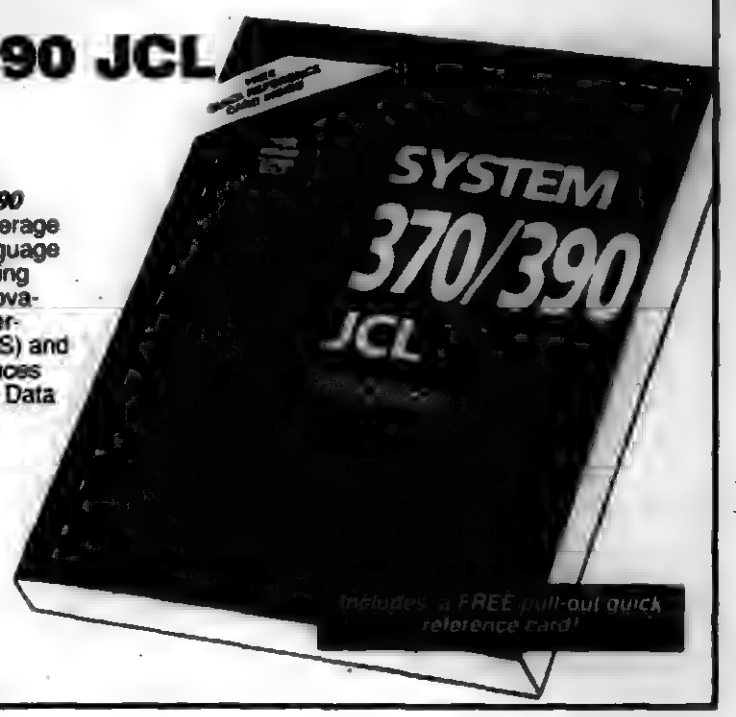
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NATIONAL BRIEFS

Numero uno in El Segundo

Industry veteran **Peter Tierney**, who started out at IBM and went on to occupy the top slots in marketing at database vendor **Ingres Corp.** (then known as Relational Technology, Inc.) and at rival **Oracle Systems Corp.**, last week took the helm at El Segundo, Calif.-based expert systems firm **Inference Corp.** As president and chief executive officer, Tierney replaces Inference co-founder **Alex Jacobson**, who will remain as chairman of the board and manage the company's international operations.

AT&T buys into Sun, Part 3

Sun Microsystems, Inc. is about to sell 491,755 shares of newly issued stock to longtime partner **AT&T** for approximately $13.7 million. The transaction, which completes the third and last leg of a three-year deal entered into by Sun and AT&T in January 1988, will give the telecommunications firm an estimated 15% stake in the workstation vendor. The agreement also allows AT&T to increase its Sun ownership to 20% through open-market pur-

Two into one will go

San Jose, Calif.-based disk drive player **Maxtor Corp.** last week drew its Maxtor Colorado operation (formerly **Miniscribe**) further into the California headquarters' fold. **Taroon Kamdar**, who has headed up Maxtor Colorado since its inception, will continue in that role, adding the newly created title of president and chief operating officer/Disk Drive Operations. As such, Kamdar will oversee Maxtor's information systems, operations, worldwide sales, product management and materials and engineering divisions.

Still Blue, but bigger

The third-party computer leasing sector last week continued to make prophets out of industry observers who see the near-future leasing market marked by increased offensive and defensive consolidation. Deerfield, Ill.-based **Meridian Leasing Corp.** scooped up the assets of Eden Prairie, Minn.-based **Dataserv Equipment, Inc.** According to Meridian, the acquisition adds some $100 million worth of assets — including IBM banking equipment — to a portfolio colored Big Blue and valued at $2.5 billion.

Intel anticipates 'biggest year ever'

BY MAURA J. HARRINGTON
CW STAFF

SANTA CLARA, Calif. — Recession? No recession here!

That is the underlying message from Intel Corp. Chief Executive Officer Andrew Grove, who recently told *Computerworld* that while the company is tightening up to prepare for the recession spreading rapidly throughout the U.S., 1991 is going to be Intel's "biggest year ever."



Intel's Grove *betting on success*

Analysts concurred. "Intel will probably be the fastest growing semiconductor company of its size," in 1991, said Drew Peck, an analyst at Donaldson, Lufkin & Jenrette, Inc.

John Girton, vice president of research at Van Kasper & Co., a San Francisco investment brokerage firm, said he expects Intel to grow 15% to approximately $4.5 billion in sales this year.

How will Intel be able to grow so much while other companies predict they will have to struggle just to keep from going under? "Focus" and "risk" are the two words Grove used to describe the firm's strategy.

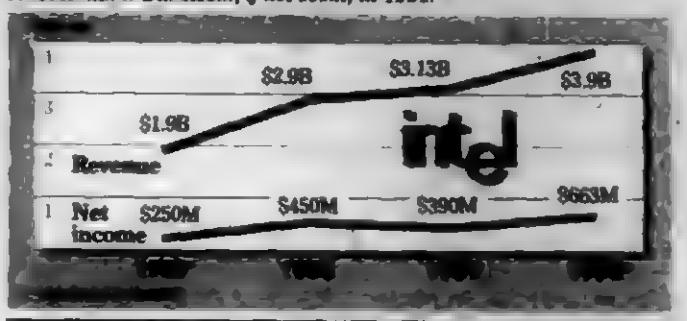
"For the past several months, we have tried to slow down growth of the 'business-as-usual' kind in preparation for the recession," he said. Now the company is poised for capital expansion.

In 1991, Grove said, Intel will center its attention on developing new products for the notebook and laptop computer markets — now the fastest growing segments of the microcomputer industry, according to analysts. Framingham, Mass.-based market research firm International Data Corp. estimates the total portable personal computer market will be approximately $3.9 billion by the end of this year and will grow to $5.2 billion by 1993.

"What we are pondering is mass production of connectivity solutions that can be installed as easily as a software disk," Grove said. Toward that goal, he said, Intel is currently developing the following products:

Against all odds

Recession not withstanding, Intel – and analysts who follow the firm – believes that it will bloom, if not boom, in 1991.



Source: Intel Corp. CW Chart: Paul Merck

- A network connectivity card for notebook computers that fits into a slot similar to a memory flash-card slot, allowing the computer to act as a wireless node on a network.
- A communications card or chip that could bring added communications capabilities such as online teleconferencing to the computer.
- The expansion of the 1486 microprocessor product line, aimed at bringing the high-end chip to an affordable level and shrinking it so that it will better fit in a PC.

Rosy expectations notwithstanding, however, Intel has a couple of thorns in its side. Sunnyvale, Calif.-based Advanced Micro Devices, Inc. (AMD), which has been wrapped up in

Continued on page 70

U.S. semiconductor firms show gains

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — For the first time in more than a decade, U.S. semiconductor companies posted a gain in the worldwide semiconductor market, jumping 1.6% to a 36.5% total market share, according to a recent report by market research firm Dataquest, Inc.

The gain for U.S. companies was partially a result of the sales of Metal Oxide on Silicon (MOS) microprocessors, which are produced by some of the larger semiconductor companies, including Motorola, Inc. and Intel Corp.

The survey, which analyzed 155 semiconductor companies worldwide and ranked them in order of worldwide market share, showed that U.S. companies also did well on their own, with Intel in fifth place, up from last year's worldwide rank of eighth.

Motorola, which was ranked No. 4 in the survey, posted an 11% worldwide gain and now holds 6.7% of the semiconductor market, the survey revealed.

Worldwide growth

On the whole, the worldwide semiconductor industry grew 2% between 1989 and 1990 and became a $58.4 billion industry. The increase was attributed to the 23% growth last year in the MOS microcomponent market, the report said.

However, Jerry Banks, Dataquest's director of the Semiconductor Group, said the MOS memories market — which includes static random-access memory and dynamic random-access memory (DRAM) chips — fell by 17% in 1990. Within the MOS memories category, DRAM chips fell 32% last year, he added.

"The companies that were strongly positioned in DRAMs were the ones that were hurt the most," Banks said, adding that Texas Instruments, Inc. was among those companies, losing 8% of its worldwide semiconductor market share to hold 4.4%.

Other companies that were hurt by the failing DRAM market included NEC Technologies Corp., Toshiba Corp., Hitachi Ltd. and Oki Corp., all based in Japan.

Unisys adds to sales force with resellers

BY JEAN S. BOZMAN
CW STAFF

SAN JOSE, Calif. — "Focus" is the theme of Unisys Corp.'s Computer Systems Products Group (CSPG), according to CSPG President Cyril J. Yansouni, who has responsibility for managing 20,000 of the firm's 70,000 employees.

Yansouni, 48, who moved into Unisys' top tier of management in May 1990, said he believes the firm must put its resources where they will deliver maximum benefit, or it will continue to falter. So even as the $10 billion company struggles to recover from a third-quarter loss of $356.8 million and a massive layoff of 5,000 employees [CW, Oct. 29, 1990], he plans to add new sales personnel.

"We're adding more soldiers to the army," Yansouni said. But the additions, which Yansouni would not quantify, are going to come in specific areas in which Unisys machines have sold well.

"We're going to come knocking on your door if you're a bank or an insurance company or an airline or a communications company," Yansouni said. "But if you're a small business that just wants to buy a computer, maybe one of our value-added resellers will come to see you."

That does not mean Unisys is ignoring its thousands of smaller user sites. By allowing VARs to sell into such sites, however, Unisys will be able to reduce its overall direct-sales overhead, Yansouni said. Unisys will continue to write its own off-the-shelf applications, however, particularly in the areas of imaging and financial and airline pro-

Continued on page 69



Unisys' Yansouni *focuses on gaining maximum benefits*

INTERNATIONAL BRIEFS

Out here on our own

The International CASE User's Group, founded three years ago by Bellevue, Wash., market research and consulting firm CASE Research Corp. to provide a vendor-blind educational forum for users trying to come to terms with the ways and means of computer-aided software engineering, started the new year on a new footing: independence. Started with an experimental Washington chapter in 1988, the group now boasts official status as an independent, nonprofit organization with approximately 9,000 members in 18 chapters in the U.S., Canada, Europe and Asia, with another 12 chapters being formed.

Not guilty

The proliferation of lawsuits that is by now a familiar feature of the U.S. computer industry could be spreading offshore. Witness last week's report from the UK that **The Halifax Building Society** was recently cleared of alleged data protection breaches. The society, which had been charged with contravening the UK's Data Protection Act by misusing personal information about its customers, was awarded $95,325 to cover costs. Summing up at the end of the five-day hearing, a Leeds Crown Court justice called the case "complete nonsense."

Rest in peace

More than 450 UK computer dealers went out of business during the first nine months of 1990, according to a study released by UK market research firm Romtec. However, Romtec indicated that it appears as though the number may have peaked. Although 281 dealers failed or were taken over between April and June, the number dropped to 78 between July and September.

Back to square one

Criticizing Netherlands-based **NV Philips**, France's **Groupe Bull** and Italy's **Ing. C. Olivetti & Co.** on its recent massive job cuts, the **European Parliament** has called on each firm to suspend and rethink its restructuring plans. The Parliament resolution said the three vendors, each of which has trimmed thousands of jobs, failed to achieve global restructuring plans and relied too heavily on the elimination of redundancies. Union negotiations should have been carried out on an international basis, with management information available throughout Europe, the resolution said.

Spain set to follow X/Open strategy

BY TERESA VALDEPERAS
SPECIAL TO CW

MADRID — The Spanish government has formally adopted X/Open — considered to be one of the most practical and viable ways to promote an open systems strategy — as its future purchasing strategy.

Consequently, the Spanish government is expected to make a transition from existing proprietary systems to open systems. At a recent meeting, Spain's Information Technology Council adopted the X/Open Transportability Guide for future multiuser system purchases made by the administration. Government support of Open Systems Interconnect/International Standards Organization communications rules was also adopted.

According to a recent market research study, Unix system purchases by the Spanish government increased significantly last year. The decision to go with an open systems policy puts Spain in accord with Germany, which adopted the open systems strategy in January 1990, and with the UK, which charted that path for itself in December 1989.

Valdeperas writes for PC World Espana, *an IDG publication based in Spain.*

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Unisys

FROM PAGE 67

cessing. "You can bet that we're not getting into any new business that isn't making money," Yansouni said.

In terms of products, Unisys has adopted the Integrated Information Environment architecture — a mixed-vendor, or open systems, strategy announced last year. Initially, executives were concerned that longtime Unisys users would be wary of such a nonproprietary stance. However, "We concluded that we were in danger of losing more customers without the open systems strategy," Yansouni said, "and all of those customers were vital ones."

Customers such as Pacific Bell, US West and Air France were already well on their way to a mixed-vendor environment when Unisys decided to push open systems solutions. "If you're trying to resist this idea [of open systems]," Yansouni said, "the genie's been out of the bottle for a long time." Also, unlike IBM, Unisys is hardly in the position of "dictating the architecture for customers," he said.

Marketing will push forward on a global basis, with emphasis on European and Pacific Rim accounts, including sites in Japan. Demand is there, Yansouni believes, citing a major Japanese company's resale of Unisys equipment as a $2 billion business for that Japanese firm. And even though Unisys' U.S. sales proved disappointing in 1990, Yansouni said he and Unisys Chief Executive Officer James Unruh "aren't losing any sleep over it. The only thing we can do is to put this company back in shape as quickly as we can."

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NCR exec takes over

BLUE BELL, Pa. — To lead its open systems charge, Unisys turned to former NCR Corp. executive Hugh Lynch, who was appointed senior vice president of the firm's Computer Systems Product Group last month.

Lynch, 56, was vice president and general manager for development and production at NCR's general-purpose systems division. During that stint, he helped develop NCR's Open Cooperative Computing Architecture, which was announced last year.

Lynch took early retirement and left the Dayton, Ohio-based computer company one year ago. "I'd been in the same central product job for 10 years," he said. "It was very much a personal decision." In 1982, Lynch's group brought forth the Unix-based Tower, NCR's first open systems product.

Lynch has a big job ahead of him at Unisys. He must coordinate open systems approaches across the computer company's fractured product line, which includes proprietary mainframes, Unix services, personal computers and networked workstations.

In addition, he will "look at the application of open systems and how to position those relative to other products," he said.

An open systems approach, Lynch conceded, can bring lower margins to "an old-guard vendor that does little more than produce a commodity product.

"But there's nothing about the notion of open systems that keeps you from building a technically superior architecture," he added.

Lynch, who has been at Unisys since November, will take responsibility for all open systems programs and will serve as a deputy to Computer Systems Products Group President Cyril J. Yansouni.

ELLIS BOOKER

Intel

CONTINUED FROM PAGE 67

several ongoing intellectual property rights lawsuits with Intel, will most certainly take at least a small bite from Intel's monopolistic control of the 80386 chip market.

However, Intel's latest marketing strategy may prevent AMD's gains from hurting it, according to Grove. While he said he expects Intel's low-end 386 chip, the 16-bit 80386SX, to be its best-selling chip this year, the firm's higher-level 32-bit 386 chip, the 386DX, could be overshadowed by the company's plans to build less-expensive models of its highest level microchip to date, the 486.

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"What we are doing is proliferating the 486 product line," Grove said. "Over the course of 1991, we are going to move both upward in terms of performance and downward in terms of price and performance."

Millard Phelps, an analyst at Hambrecht & Quist, Inc., said that a low-end 486 chip, similar to the 386SX chip in concept, is just what Intel needs to get the high-end chip off the ground. However, Phelps said, such a chip is probably at least a year away from volume production.

If the "focus" element of the firm's risk-and-focus strategy involves increased emphasis on the microprocessor market, Grove said, the "risk" side includes cutting back on projects unrelated to that market. He declined to specify which research and development efforts might be canceled. However, Intel recently halted a project in which it was exploring the possibility of developing its own Unix workstation. That project was axed, Grove said, because the market was too small and the workstations too costly to produce, compared with the volume production of its microprocessor-based products.

Not all analysts agree that such a focus is wise for Intel. Peck said it is dangerous and must be carefully monitored. "I generally regard Intel's focus as a negative, because if they ever stumble, that could hurt them," he said. "If I were Intel, I would be moving faster into the communications area," Peck said.

Indeed, that is exactly Intel's idea, according to Grove. Cutting back on the Unix workstation project and others, he said, will make more money available to complete two fabrication plants under development in Albuquerque, N.M.

Once completed, the plants will be used for volume production of notebook computer peripheral products, such as networking and communications cards for the small machines.

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Industry Agenda: 1991
Axel Leblois, Chairman and CEO, IDC

1991 U.S. IT Spending Outlook
David C. Moschella, Sr. V.P., Worldwide Research, IDC

The Shifting Fortunes of the Networking Industry
Kim Myhre, Sr. V.P., Worldwide Consulting, IDC

The Restructuring of the Computer Industry
Panel Discussion, Chaired by David P. Vellante, V.P., Systems Research, IDC

Perestroika Comes to the Data Center: IBM and the MIS Revolt of the 90's
Frank Gens, V.P., Technology Assessment, Technology Investment Strategies Corp.

Managing Channels for Growth
Lee M. Levitt, Dir., Distribution Channels Research, IDC

Workstation Evolution: Up or Down
Vicki J. Brown, V.P., Systems Research, IDC

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EXECUTIVE CORNER

Goodman leaves Bytex Corp. post

Jeffrey Goodman last week resigned his post as president and chief executive officer of Southborough, Mass.-based Bytex Corp. to take on the same title at another firm. Goodman, who came to Bytex in 1988 after serving as CEO at Software International, Inc. after that firm's purchase by Computer Associates International, Inc., spearheaded the matrix-switch vendor through more than 100% growth and an initial public offering. Goodman is succeeded by industry veteran and Stardent Computer, Inc. co-founder Arthur Carr, who will serve as a consultant to the board and acting president during the search for a permanent successor.

David G. Hargraves is the new chief financial officer at San Antonio-based **Datapoint Corp.** Prior to arriving at Datapoint in 1981, Hargraves — who will have overall fiscal responsibility for the company — spent nine years in corporate accounting at NCR Technologies, Inc., where he rose to become manager of international accounting.

Just in time for the onset of tax season, Kent, Ohio-based accounting software company **Cpaid** has a new president and chief executive officer: **John H. Graves**, formerly director of technical services at the American Institute of Certified Public Accountants (AICPA). Prior to his work at the AICPA, Graves served as president of Graves & Graves, PC, a CPA firm in Decatur, Ill.

Paul Folino took over earlier this month as president and chief operating officer at **Thomas-Conrad Corp.**, an Austin, Texas-based network products and services vendor. Folino, who formerly held the post of general manager at Xerox Corp.'s Office Systems Division, joined Thomas-Conrad last year as managing director at its European subsidiary.



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LIFE AFTER LAYOFFS

This is Part 1 of a three-part series tracking IS professionals' attempts to recover from job losses.

BY ALAN J. RYAN
CW STAFF

When Carlos Guerrero lost his programming job, he expected to land a new position without too much difficulty. After all, he had nearly 20 years of experience and had never run into problems landing a job in the past.

But things are different now. Like many of his peers, Guerrero has been forced to pound the pavement for a year looking for scarce positions and facing stiff competition.

Welcome to job hunting in 1991.

It wasn't as if Guerrero was unprepared for his layoff from Morse Shoe, Inc. in Canton, Mass. Like many workers facing a similar situation, he had seen the signs of the impending layoffs. Since he had been with the company for only a year, he figured he'd be among the first to be let go. By the time the ax actually fell, Guerrero had already begun his search for a new job.

However, his job hunt has been anything but easy. In 1990, he was granted only a handful of job interviews, despite the fact that he sent dozens of resumes and cover letters to prospective employers each month.

A struggling economy in the Northeast and many other parts of the country has brought with it layoffs in many sectors — from financial services to manufacturing.

Newspaper and magazine employment for programmers is answered by fierce competition for any openings, Guerrero says. At some of his interviews, Guerrero was told there were 30 or 40 candidates for the position, and the same position a year or two earlier would have drawn only three or four resumes.

"It is frustrating," he says. With a large pool of candidates for every job, Guerrero says, companies are asking for more experience than they used to because it is an easy way to narrow down the field.

Experience needed

"There is a qualitative change in the people that were laid off. Now, maybe because of the maturity of the computer industry, there are many people with 10 to 20 years of experience, and many of those people are out of work," Guerrero says. In turn, many of the highly qualified workers, frustrated by the same situation facing Guerrero, are accepting jobs below their qualifications.

Guerrero admits that his own experience — with heavy concentration in the shrinking Burroughs Corp. field — has not helped him find a job. He says he feels some resentment toward Morse Shoe because the company had brought him in and enrolled him in a training program to learn the IBM DOS operating system, only to eliminate his job halfway through the two-year program. "I had taken a course on VM/CMS [prior to Morse Shoe] but didn't have any hands-on experience, so they put me on the training track."

Morse Shoe made a decision to move to the IBM OS operating system, and the firm said it would take too long to train Guerrero, he says. So halfway through the program, "they hired people who already had a few years of experience with OS," he says.



Sally Johnson

After being laid off, *Guerrero faces the fact that he might have to take a lower-level job. But he remains upbeat: "I know I'm competent."*

Though he feels that with the OS training, he could have been an asset to the company for years to come, economics prevailed, and Guerrero was out on the street.

Guerrero lists his job strengths as two years doing project management, the ability to develop application software for accounting and payroll and an interest in programming standards, programming methods and logic software.

Now, Guerrero says, he is anxious to complete his IBM training and is prepared to take a lower-level job at a smaller company and at a lower salary if it is what he must do to become proficient in the IBM environment.

To that end, Guerrero visited a career consultant who helped him devise a strategy. He improved his cover-letter writing and learned how to construct a resume highlighting his most positive career experiences. Next, he began working with several employment agencies.

Though Guerrero has been mailing out five to 10 resumes per week for nearly a year, the response rate is low. "In most cases, they don't even send a 'Dear John' letter," he says.

For the 42-year-old Guerrero, a native of South America, the information systems field has been a way of life since 1971, when he got his start as a programmer in Caracas, Venezuela. Today, after working in the Boston area for 10 years, he finds himself facing the possibility of relocating and/or making a career alteration.

"I am convinced that I took the wrong career path; only now it is too late for me to start another career. So I just have to keep going," he says.

Some options he is considering include consulting, writing articles and books on IS-related topics, teaching programming or selling computer hardware and software. He has also been answering job-wanted ads in *The New York Times*, but he says jobs in the New York area are scarce, too.

Life has changed

After a year of struggling, Guerrero admits that his loss of income has left him with a very changed lifestyle in which it is sometimes difficult to make ends meet. Fortunately, his wife's salary helps pay the bills, and he has landed some free-lance work doing translations because he speaks fluent Spanish. He has also started writing a book on programming logic that he expects to finish this year.

Guerrero's daily life has become a routine of writing his book, reading want ads, constructing cover letters and mailing resumes. This month, he says, he will increase his output of resumes to 15 to 20 per week by sending companies blind inquiries.

Guerrero says the one thing that has remained constant during these trying times is his faith in himself. "I know I'm competent," he says.

Sooner or later, he says, he'll land a job. "But I also know that it is going to be difficult while the present economic condition prevails. It is a matter of luck."

Ryan is a *Computerworld* features senior writer.

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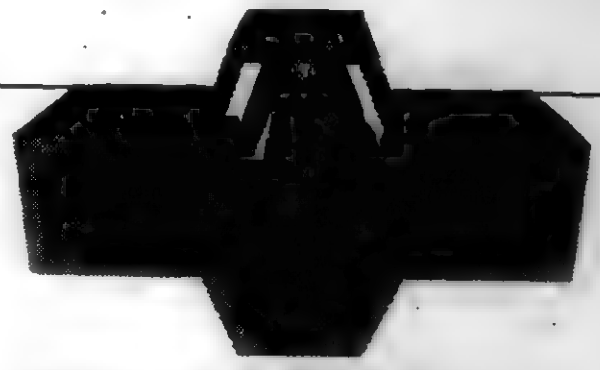
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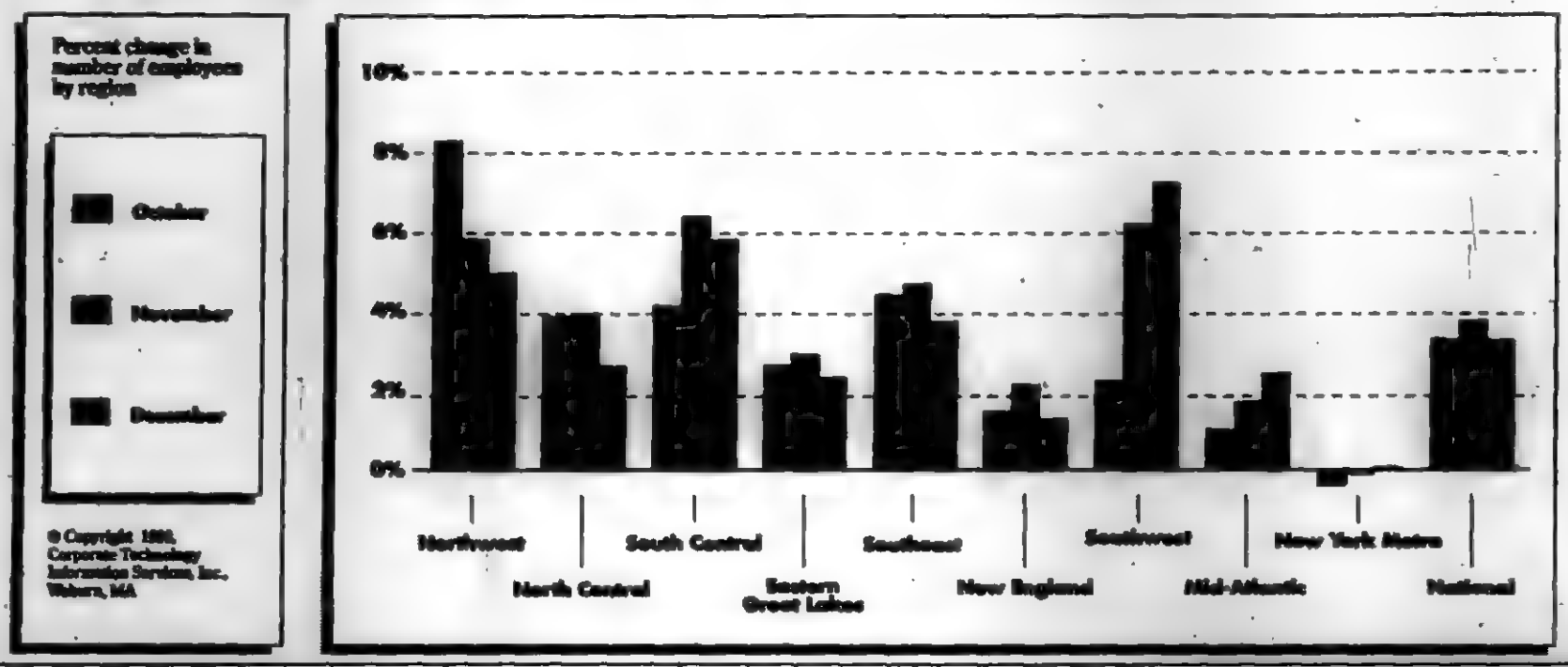
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System Software Engineer, Product Support Services Group. By February 14 please send resume to: Employment Security Department, ES Division, Attn: Job # 240992-L, Olympia, Washington 98504. Job Description: Assists in designing, implementing and testing complex and high level systems and software for micro computers. Works with other engineers to provide technical support for development of device drivers in multitasking environment, including Kanji drivers. works with Independent Software Vendors and Developers who are writing application and Systems software for Windows 386 operating system. Utilizes Windows operating system, "C" and 86 Assembler Series languages. Assumes major responsibility for: 1) analyzing technical problems presented, 2) communicating with other engineers regarding technical aspects of software design, and 3) providing written memos and articles in response to users' technical questions. Three positions available. Requirements: M.A. or B.S. in Electrical Engineering, Computer Science, Physics or Mathematics. Six months of work experience in computer design or programming utilizing MS-DOS, a multitasking operating system and "C" and 86 Assembler Series languages, providing technical support to computer users, designing software to support Kanji character applications. 20 course hours in device driver development. Must have legal authority to work permanently in the United States. Job location: Redmond, Washington. Salary: $35,000-$2,000 per annum, depending on experience. 40 hours per week, flex time. EOE

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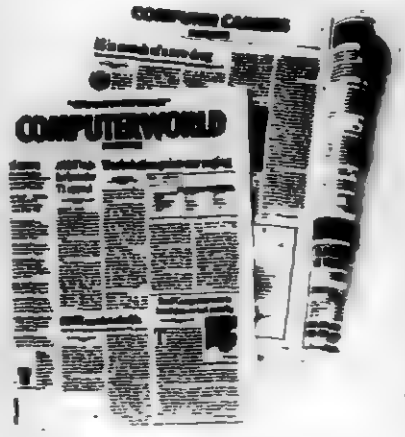
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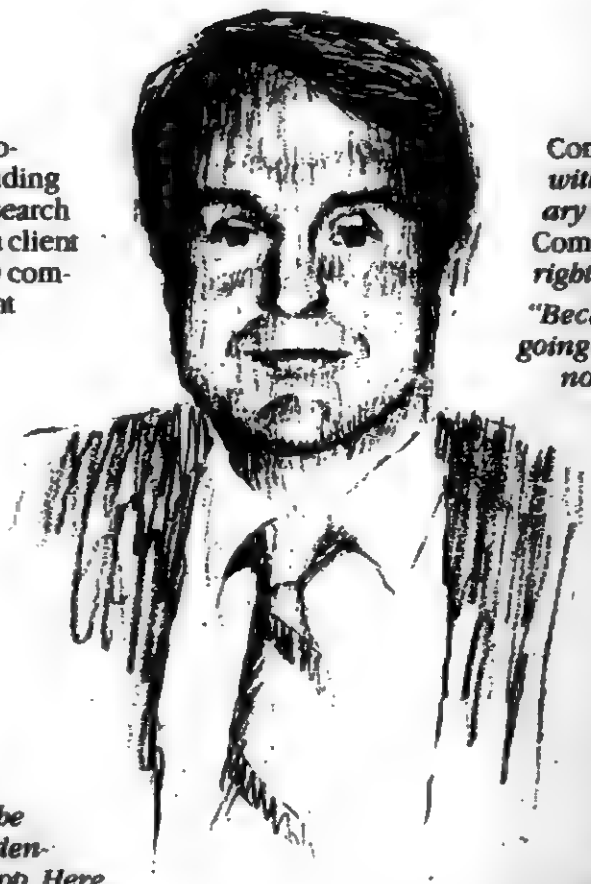
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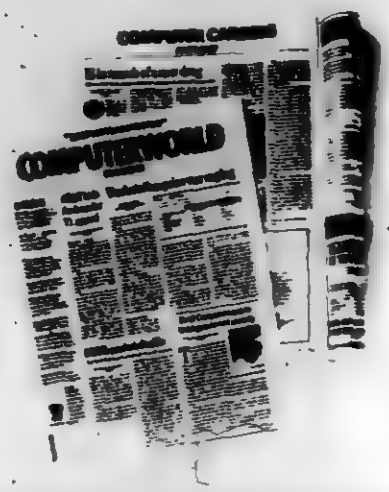
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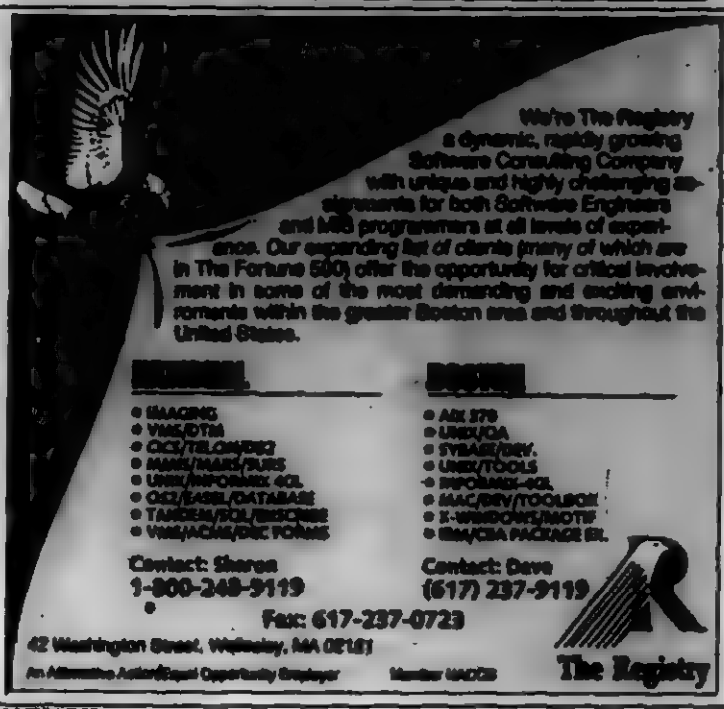
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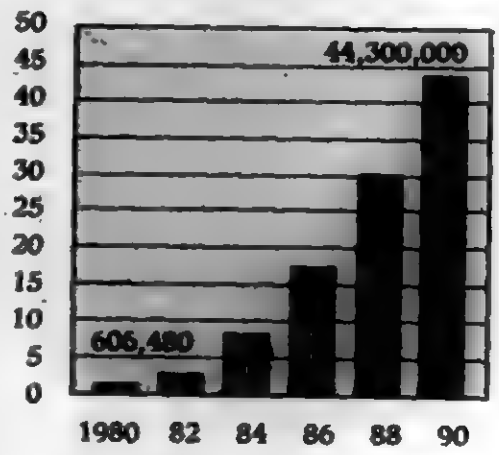
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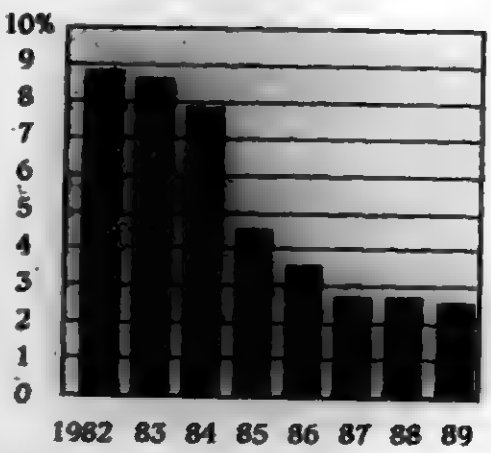
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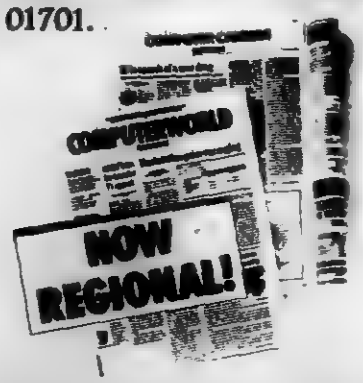
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MARKETPLACE

Desktop publishing for less than $200

BY JESSICA KEYES
SPECIAL TO CW

Information systems managers don't have to know a lot about publishing to provide their users with technology that can create professional-quality newsletters, fliers and documentation. In fact, a slew of easy-to-use, low-end desktop publishing software packages are available at a low price.

On the low end of the price scale is a desktop publishing package that costs nothing. Most firms already own word processing packages such as Microsoft Corp.'s Microsoft Word and Wordperfect Corp.'s Wordperfect, which come with built-in publishing capabilities that allow users to handle more than one column of text at a time, print different fonts and point sizes and integrate graphics.

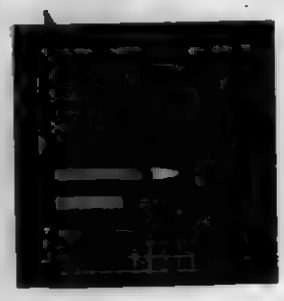
Some fairly sophisticated documents can be created with these packages, but there are limitations. For instance, higher end packages can handle many more fonts at a time, do indexing and handle sideways printing, to name a few features. Thus, for users who need more advanced publishing tools, word processing-style desktop publishing just won't cut the mustard.

Fortunately, the next level of desktop publishing software isn't very expensive: Packages are available for less than $200. In selecting a good desktop publishing package that falls into this low-end price range, buyers need to evaluate an array of features:

Most popular desktop publishing tools:
Software Publishing Corp.'s PFS First Publisher 2.1 — $129
Timeworks' Publish-It 1.13 — $200
Springboard Software's Springboard Publisher 1.01 — $129.95
Logitech, Inc.'s Finesse 3.0 — $179
Other available packages:
Array, Inc.'s Frontpage Personal Publisher
CSI Publishing, Inc.'s Pagebuilder 2.0
Data Transforms, Inc.'s Frontrix 3.0

- **What-you-see-is-what-you-get.** Make sure the desktop publishing package has the ability to display the final document on the screen. This WYSIWYG feature is extremely important, because it will save users time and much wasted paper. When someone is working on a document, he can see only one portion of it at a time. With WYSIWYG, users can see a miniature version of the complete page or series of pages.
- **Ability to import text.** There are few desktop publishing packages that have as robust a set of text-handling capabilities as word processing packages. Frequently, desktop publishing users type all the copy on their word processors and then import the text into their publishing packages. Automatic conversion of word processing formats is a convenient feature to facilitate this process.
- **Text-processing features.** Even though a large majority of users rely on their word processing packages for text processing, there are some desktop publishing packages that do sport some text-processing features such as control over hyphenation, kerning (distance between letters), word spacing, global search and replace, reverse type, automatic page numbering and tabbing.
- **Font limitations.** Fonts are the different typefaces used to prepare documents. A document prepared in only one font or size is rather dull and runs counter to the ideal presentation allowed in desktop publishing.

While many packages come with several built-in fonts, the final print quality is rather limited. To produce professional-looking documents, most users resort to buying fonts from other vendors.



The most popular package — and the standard for most desktop publishing — is Bitstream. Bitstream fonts are known as "soft fonts" and are downloaded into a laser printer. The time it takes to install and use these fonts is a bit of a nuisance, but the final product is definitely worth it.

- **Page design and layout features.** This is actually the user interface to desktop publishing. These tools are generally used every day, so it's important to ensure that the selected desktop publishing package has as many features as possible. Some of these features include text wrap around graphics, letter spacing, kerning and leading.
- **Landscape and portrait modes.** There are several considerations here: that users can display a reduced, expanded or zoomed version of the page; that the package allows users to add headers and footers; that the package has an automatic text-flow capability to permit text to be moved from column to column automatically; that the package comes with preconfigured style sheets; and that the package can show facing pages.
- **Ability to handle graphics.** There are two ways of manipulating graphics. One way is to import the graphic image directly into the publication. To do this, the desktop publishing package must have the ability to support graphics file formats such as EPS, PCX, PICT and Tag Image File Format (TIFF) — the most common being PCX and TIFF. If users do a lot of scanning, this feature becomes even more important, as most scanners save images in TIFF.

Heavy-duty desktop publishing packages carry a hefty price tag in terms of memory and disk requirements. Luckily, the less-than-$200 bunch provides all the functionality that the typical IS worker needs to create professional-looking documentation.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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XT Model 089	$550	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,100	$1,300	$1,025
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,000	$3,450	$3,000
Compaq Portable II	$800	$1,000	$675
Portable 286	$1,100	$1,400	$1,000
SLT 286	$2,300	$2,600	$2,000
Portable 386	$2,300	$2,600	$2,300
LTE 286	$2,000	$2,100	$1,800
Deskpro 286	$1,600	$1,900	$1,500
Deskpro 386/20	$3,000	$3,100	$2,600
Apple Macintosh Plus	$750	$975	$700
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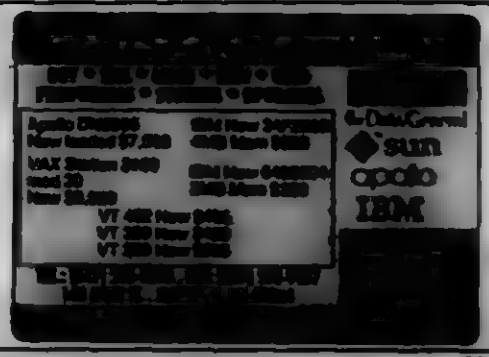
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Watching out for circus acts

Unexpected situations can be overcome with careful planning

BY TURI L. COWARD
SPECIAL TO CW

We all find ourselves, at one time or another, laughing at someone else's errors or mishaps. But we're not really laughing maliciously: We're just glad we're not in that person's place. As an information systems trainer for 10 years, I've stood in that person's place, bearing the burden of those unexpected slipups in the classroom. As a result, I know how to tap-dance out of some pretty tough situations.

For instance, have your computers ever broken down at the start of your training session? Have you ever dealt with a very resistant learner? Have you ever had to provide support for unfamiliar software or had to train people to use it *tomorrow*?

Every IS trainer will have his day (in fact, can you name a day when something, big or small, *didn't* happen?). But don't despair. Training nightmares can actually enhance your experience and make you become a more versatile trainer.

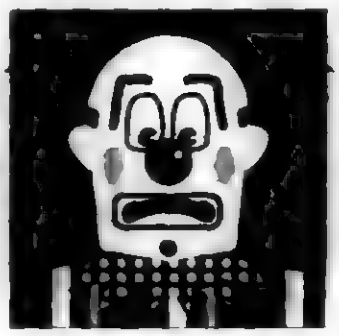
The next time you think, "It just couldn't get any worse than this," think of some of the following bloops and blunders (listing from least to most common), which may even help you in your travels.

• **Evacuation day.** One trainer had her class interrupted by a fireman who banged on the training room door yelling, "Evacuate — gas leak in the building!" She didn't argue with him and had the group meet outside. She continued the class in the parking lot, focusing her discussion on the computer center help desk.

• **Class act.** Certainly, training when you're ill or when you have a sore throat isn't a lot of fun. But recently, a seminar leader ate dinner at his hotel the night before the seminar and came down with food poisoning. Because many participants had flown in from out of state, he was determined to conduct class. After he went to the hospital, he held classes as scheduled the next day — by adding several additional breaks, of course.

• **St. Domino's.** During one training excursion, I returned a rental car just a few streets down from my hotel — or so I thought. I didn't mind walking a little way with my equipment, but I found out it was 10 blocks down (we're talking San Francisco now), and I wasn't used to walking at a 45 degree angle. After trying unsuccessfully to flag a cab, I noticed I was standing in front of a Domino's Pizza. I went in and asked them, "If I order a pizza, can you deliver me *and* the pizza to the hotel?" And they did!

• **Blame it on the rain.** During one training session, water started dripping from the ceiling. A leaky roof isn't so unusual, but suddenly it started raining inside



the classroom! The trainer and the learners disconnected the computers and fled from the room. They reassembled in the cafeteria and resumed the class. It was later determined that a water main had broken just above the training room.

• **Teachable moments.** Whether it's the computer system, printer, overhead projector or the audiovisual system, one of them is going to die sometime. And that piece of equipment is going to pick your session to collapse. What do you do? The best technique passed on through the training industry is called the "teachable moment." That is, when the system fails, teach the students *what to do when the system fails*. Do they call the help desk? Or check the manual?

Another approach is to switch the discussion to the concepts involved. Depending on the equipment that failed, try an alternate training approach, such as two per workstation or group exercises.

• **Apples with pears.** Another common nightmare is having to train students with different experience levels in the same class. Whatever technique you use, you must keep the advanced students occupied.

The technique I have found to be most successful is two people to a terminal. Pair an experienced learner with an inexperienced learner, and most often, you will find the experienced learner teaching and assisting the beginner. Further, the experienced student will also catch, prevent or correct wrong keystrokes that might have required your assistance.

• **An ounce of prevention.** Of course, if you thought of prevention, you wouldn't be experiencing a nightmare, would you? Here are some ways to avoid potential problems: Practice and rehearse your training session beforehand. Have a dry run, if possible, with a class made up of other trainers, technical experts and test students. Conduct an equipment check before every class, preferably the day before. Have someone else run through your exercise. Is it understandable? Any confusing points? Anything that doesn't work? Make sure you have more than enough materials, handouts, pens, etc.

Establish a "Plan B." Think of alternatives. Ask yourself: What if the projection system fails, what if the flip chart falls apart, what if the markers run dry, what if the bulb burns out?

• **The silver lining.** Remember how you never backed up files faithfully until the first time you reformatted your hard disk? Ever reformat it a *second* time? Not as likely. The good thing about handling nightmares is that they teach you to become a better, more experienced trainer.

Experienced trainers still have nightmares, but they are more prepared to handle them when they occur, prevent the common ones and recognise potential ones.

• **Lennon twist.** In conclusion, the trick to dealing with nightmares is to keep this in mind: Uncommon situations call for uncommon solutions and creative approaches. John Lennon sang, "There are no problems, only solutions." With that approach in mind, you will find solutions when faced with any difficulty.

Coward is a trainer and consultant at Tangent Computer Resources in Dallas.

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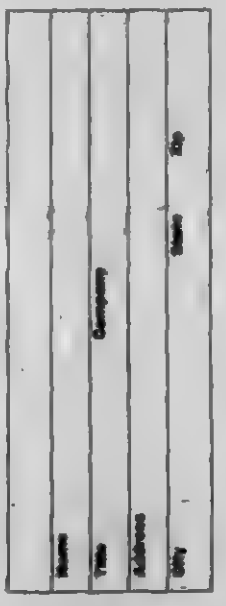
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

FROM HOLD TO AVOID: Sequent Computer Systems, Inc. (by Bear Stearns & Co.). Reason: Must rethink its pricing strategies and is undergoing product transition.

FROM HOLD TO BUY: Advanced Logic Research, Inc. (by Prudential-Bache Securities, Inc.). Reason: Net-income growth will be strong for fiscal first quarter as sales snap back after mid-year problems with its Intel Corp. 80386SX-based computer.

FROM SELL TO HOLD: Digital Equipment Corp. (by Bear Stearns). Reason: Decision to trim work force shows that the firm's top management has reached consensus about which steps to take to stop its financial troubles.

INDICATORS

The U.S. jobless rate rose to 6.1% last month — its highest rate in 3½ years. Nevertheless, employment for some software firms climbed during the first three quarters of 1990, according to the "Software Industry Bulletin." **Microsoft Corp.** hired the greatest number of new workers — 1,300 — which swelled its ranks by 28%. **Lotus Development Corp.** followed, up 23% with 648 new hires. **Paperback Software International, Inc.** slashed its work force by 62% — from 24 to nine employees. Employment at financially troubled **Ashton-Tate Corp.** was flat.

GUEST SPEAKER

Clifford Friedman, analyst, Bear Stearns, New York:

"If AT&T takes over NCR Corp. and NCR management stays on, there won't be much immediate effect on **Pyramid Technology Corp.**, even though Pyramid and AT&T have an OEM agreement for Pyramid's Miserver. NCR may benefit from the deal, however, because it will then be able to sell a large-scale, multiprocessing, reduced instruction set computing-based Unix machine — something it doesn't currently have."

"There might be trouble two or three years from now when NCR completes its transition to processors from Intel, because Pyramid has plans to commit to the **Mips Computer Systems, Inc.** processor."

ANALYSIS IN BRIEF

The move to open systems makes minicomputers more of a general commodity than a specialty purchase, which may increase sales. But the ability of individual minicomputer companies to remain profitable in the open systems market is unproven. By the mid-1990s, only the major companies, such as IBM, DEC and Hewlett-Packard Co., will have survived, and only if they can provide true multivendor networking at the enterprise level.

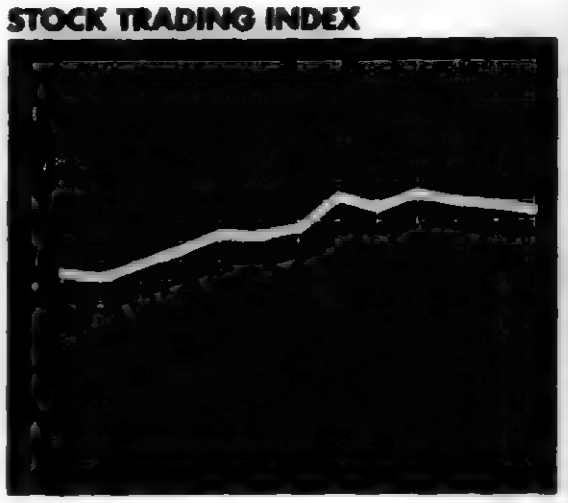
— S. G. Warburg, Outlook for Computer Stocks in 1991, Dec. 24, 1990.

Growth stocks in the technology sector may be good investments. Intel is booking record orders as buyers jump for high-end microcomputers. **Tandem Computers, Inc.**'s new mainframe-class system is developing ahead of plan. **Novell, Inc.** is beginning to include enterpriswide as well as personal computer-based networking products while controlling operations costs.

— Alex. Brown & Sons, Inc., Selected Investment Opportunities, December 1990.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- When Digital Equipment Corp. said last week that it must cut nearly 3,500 workers within six months, investors cut DEC stock loose, driving it down 2¾ points by Thursday to close at 53½.
- Microsoft Corp. shot up 2¼ points to 78¼ last week after unveiling its Excel 3.0 spreadsheet for Windows 3.0. Montgomery Securities analyst David Bayer predicted a profit hike of 40% for Microsoft when it reveals its quarterly financials Jan. 18.
- News of layoffs, organizational shakeups and an expected $40 million loss for its fiscal third quarter left 3Com Corp. down 2 points by Thursday, to 5⅜.
- Sequent Computer Systems, Inc. lost 41% of its value after reporting that fourth-quarter earnings will likely drop. Sequent plummeted 7½ points to 11.
- As the Macworld show began Thursday in San Francisco, Apple Computer, Inc. drew buyers, jumping 3¼ points to 47⅛.

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 9, 1991

TOP PERCENT GAINERS

Phoenix Tech.	31.82
Alloy Computer	34.80
Anacomp Inc.	21.43
Network Systems	11.36
Cognos Inc.	6.96

TOP PERCENT LOSERS

Sequent Computer Sys.	-57.84
Businessland Inc.	-33.33
3 COM Corp.	-28.79
Banctec Inc.	-28.19
Capital Associates	-22.22

TOP DOLLAR GAINERS

Adobe Systems Inc.	2.25
Xerox Corp.	2.25
Apple Computer Inc.	1.75
Comdisco Inc.	1.63
Texas Instruments	1.50

TOP DOLLAR LOSERS

Sequent Computer Sys.	-7.00
3M Corp.	-5.38
IBM	-5.25
AST Research Inc.	-4.38
Bell Atlantic Corp.	-4.13

Exch	52-Week: High	Low		Jan. 9 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Off 1 85%
OTC	19.00	5.38	3 COM Corp.	5.88	-2.38	-28.79
NYS	89.75	62.50	American Info Techs Corp.	83.38	-3.13	-4.70
NYS	44.13	28.00	AT&T	29.25	-0.50	-1.68
OTC	9.63	0.94	Ariel Communication Corp.	1.25	-0.25	-16.67
NYS	58.25	39.50	Bell Atlantic Corp.	48.50	-4.13	-7.84
NYS	57.63	49.00	Bellsouth Corp.	51.63	-2.75	-5.06
OTC	16.38	8.25	Compression Labs Inc.	9.25	-1.75	-15.91
NYS	36.38	23.38	Contel Corp.	24.63	-0.38	-1.67
OTC	4.38	1.75	Data Switch Corp.	3.38	-0.50	-12.90
NYS	28.75	8.88	Digital Comm. Assoc.	12.50	0.75	6.38
OTC	20.50	12.25	Dynatech Corp.	18.63	-0.63	-3.25
OTC	12.88	5.50	Fibronix Int'l Inc.	6.88	0.25	3.77
OTC	4.50	1.75	Gandalf Technologies Inc.	2.44	-0.06	-2.49
NYS	5.00	1.63	General Datacomm Inds.	2.13	-0.13	-5.56
NYS	34.13	23.50	GTE Corp.	28.25	-0.50	-1.74
OTC	6.50	0.88	Hitchcock Systems Corp.	1.00	-0.06	-5.83
NYS	60.88	40.25	ITT Corp.	46.13	-0.50	-1.07
OTC	44.13	18.38	MCI Communications Corp.	18.50	-1.25	-6.33
OTC	21.00	2.75	Microcom Inc.	4.00	-0.19	-4.48
NYS	34.38	9.00	Network Equipment Tech.	9.50	-0.25	-4.35
OTC	14.63	4.00	Network General	7.50	-1.13	-13.04
OTC	15.25	8.00	Network Systems Corp.	12.25	1.25	11.36
NYS	29.63	22.13	Northern Telecom Ltd.	27.13	-0.75	-2.69
OTC	34.00	13.75	Novell Inc.	30.75	-3.00	-8.89
NYS	69.50	57.13	Nynex Corp.	59.38	-2.13	-3.61
NYS	47.88	36.25	Pacific Telesis Group	41.25	-3.38	-7.56
ASE	9.25	4.75	Parcel Corp.	7.75	-0.75	-8.82
NYS	28.13	8.88	Scientific Atlanta Inc.	12.50	-0.75	-5.66
NYS	59.50	47.25	Southwestern Bell Corp.	52.25	-3.50	-6.28
NYS	46.38	30.63	United Telecom	22.13	-1.13	-4.84
NYS	40.50	32.38	U S West Inc.	36.75	-2.50	-6.54
Computer Systems						Off 5 84%
OTC	8.75	0.56	Alliant Computer Sys.	1.50	-0.16	-13.48
ASE	16.88	10.00	Amdahl Corp.	12.75	-1.25	-8.93
OTC	47.75	24.25	Apple Computer Inc.	48.25	1.75	4.02
OTC	13.88	4.25	Archive Corp.	6.38	0.00	0.00
NYS	7.25	3.88	Bolt, Beranek & Newman	4.63	0.00	0.00
NYS	11.88	4.50	Commodore Int'l	10.25	-1.13	-8.89
NYS	67.88	36.50	Compaq Computer Corp.	54.63	-1.63	-2.90
OTC	4.25	0.13	Computer Automation Inc.	0.88	-0.06	-6.27
NYS	21.63	7.13	Control Data Corp.	7.13	-1.75	-19.72
NYS	20.88	8.38	Convex Computer	10.38	-0.50	-4.60
NYS	51.25	20.00	Cray Research Inc.	30.63	0.13	0.41
NYS	13.25	3.50	Data General Corp.	4.00	-0.38	-8.57
NYS	4.38	0.75	Datapoint Corp.	1.63	0.00	0.00
OTC	16.88	4.63	Dell Computer Corp.	16.25	-2.00	-10.96
NYS	98.13	45.50	Digital Equipment Corp.	62.63	-2.25	-4.10
NYS	36.13	13.75	Harris Corp.	19.88	-0.75	-3.64
NYS	50.38	24.88	Hewlett-Packard Co.	30.75	-1.00	-3.15
NYS	123.13	85.00	IBM	108.88	-5.25	-4.60
OTC	14.00	8.00	Informix Int'l	8.13	-0.63	-7.14
OTC	23.50	10.50	Intergraph	13.75	-0.25	-1.79
NYS	3.88	0.88	MAI Basic Four Inc.	1.00	0.00	0.00
NYS	182.75	114.50	Matsushita Electronics	116.00	-2.00	-1.69
OTC	26.00	9.00	Mentor Graphics Corp.	14.00	0.38	2.75
NYS	92.88	44.50	NCR Corp.	86.00	-4.00	-4.49
OTC	36.50	11.00	Pyramid Technology	12.50	-0.63	-4.76
OTC	34.00	11.50	Sequent Computer Sys.	11.50	-7.00	-37.84
NYS	40.88	18.00	Silicon Graphics	24.50	-2.38	-8.84
NYS	29.00	14.63	Sirrus Computer Inc.	20.75	-3.00	-12.63
OTC	37.25	15.00	Sun Microsystems Inc.	21.75	0.38	1.75
NYS	30.13	9.88	Tandem Computers Inc.	11.00	-0.75	-6.38
NYS	39.50	23.50	Tandy Corp.	27.13	-1.38	-4.82
OTC	35.50	8.75	Teradata	11.00	-1.25	-10.20
NYS	9.00	1.38	Ultimate Corp.	1.88	-0.13	-6.25
NYS	17.13	1.75	Unisys Corp.	2.75	-0.13	-4.35
ASE	6.25	2.00	Wang Labs Inc. (b)	2.50	-0.13	-4.76
Software & DP Services						Off 3 89%
OTC	50.75	17.00	Adobe Systems Inc.	31.00	2.25	7.83
OTC	31.50	15.50	Aldus Corp.	26.00	-0.50	-1.89
OTC	19.75	10.50	American Mgmt. Systems	16.75	-1.13	-6.29
OTC	16.25	7.50	American Software Inc.	12.75	-1.38	-9.73
NYS	4.50	1.75	Anacomp Inc.	2.13	0.38	21.43
OTC	23.50	10.00	Analysts Int'l	12.75	-1.50	-10.53
OTC	15.13	4.88	Ashton Tate	5.63	-0.25	-4.26
OTC	10.25	4.50	ASK Computer Sys.	5.38	-0.50	-8.51
NYS	60.25	45.25	Auto Data Processing	51.50	-3.50	-6.42
OTC	60.25	32.00	Autodesk Inc.	47.75	-3.00	-5.91
OTC	25.50	12.00	BGS Systems Inc.	20.25	-1.25	-5.81
OTC	20.25	17.75	BMC Software Inc.	20.00	-1.25	-4.27
OTC	21.50	11.00	Boole & Babbage Inc.	12.25	-2.25	-15.52
OTC	32.00	10.63	Borland Int'l	28.38	-2.00	-6.58
NYS	11.88	1.00	Businessland Inc.	1.00	-0.50	-33.33
OTC	10.25	4.25	Cognos Inc.	9.13	0.75	8.96
NYS	16.88	4.38	Computer Associates	7.00	-0.75	-9.68
OTC	17.25	7.75	Computer Horizons	15.75	0.00	0.00
NYS	54.50	36.75	Computer Sciences	48.88	-0.50	-1.01
NYS	12.25	6.88	Computer Task Group	8.13	-0.25	-2.99
OTC	25.25	14.25	Comshare Inc.	15.00	-1.13	-6.98
OTC	18.00	3.75	Corporate Software	6.25	-0.25	-3.85
NYS	40.13	24.38	General Motors (cl e)	36.75	-1.00	-2.66
OTC	18.25	7.25	Goal Systems Int'l	10.25	-1.50	-12.77
OTC	4.75	1.88	Hogan Systems Inc.	2.06	-0.38	-15.38
OTC	9.75	5.00	Index Technology	8.00	-0.63	-7.25
OTC	16.63	7.75	Information Resources	9.88	0.00	0.00
OTC	17.50	3.50	Informix Corp.	3.63	-0.63	-14.71
OTC	7.88	1.38	Intelicorp Inc.	1.75	-0.13	-6.67
OTC	8.00	2.50	Interleaf Inc.	3.56	-0.06	-1.71
OTC	27.50	10.00	Knowledgeware Inc.	20.75	-0.50	-2.35
OTC	31.00	16.75	Legent Corp.	27.50	1.13	4.27
OTC	39.25	12.50	Lotus Development	16.75	-3.00	-15.19
OTC	29.25	13.63	Micrografx	21.25	-2.25	-9.57
OTC	80.75	42.25	Microsoft Corp.	74.00	-0.75	-1.00
NYS	11.38	4.00	On Line Software Int'l	5.38	-0.75	-12.24
OTC	29.38	4.88	Oracle Systems	6.63	-1.38	-17.19
NYS	17.88	7.00	Pansophic Systems	8.75	-0.88	-9.09
OTC	5.38	1.25	Phoenix Technologies	3.63	0.88	31.82
NYS	43.88	29.88	Policy Management Sys.	40.25	-1.50	-3.59
NYS	23.63	11.50	Reynolds & Reynolds	16.00	-0.75	-4.48
OTC	16.13	8.00	Sage Software Inc.	9.00	-0.75	-8.57
OTC	22.25	14.50	SEI Corp.	16.25	-3.25	-16.13
OTC	19.38	12.00	Shared Medical Systems	13.88	-1.25	-8.26
OTC	29.00	12.50	Software Publishing Corp.	21.25	-1.50	-6.59
NYS	11.00	5.50	Sterling Software	7.63	-0.69	-7.58
OTC	26.00	9.50	Sungard Data Sys.	11.75	0.50	4.44
OTC	29.50	16.00	Symantec Corp.	27.75	0.75	2.78
NYS	34.88	6.50	System Center Inc.	5.38	-0.38	-6.52
OTC	29.75	12.75	System Software Assoc.	27.00	0.25	0.93
OTC	27.38	4.75	Wang	7.75	0.00	0.00
Semiconductors						Off 3 95%
NYS	35.88	17.38	Advanced Micro Devices	20.63	-1.75	-7.82
NYS	8.75	5.00	Analog Devices Inc.	6.75	-0.13	-1.82
OTC	23.50	6.25	Chips & Technologies	7.25	-0.50	-6.45
OTC	62.00	28.00	Intel Corp.	39.38	-0.13	-0.32
NYS	13.00	5.13	LSI Logic Corp.	6.00	-0.38	-5.88
NYS	18.38	8.75	Micron Technology	9.75	-0.13	-1.27
NYS	86.38	49.00	Motorola Inc.	49.00	-3.00	-5.77
NYS	8.88	3.88	National Semiconductor	4.13	-0.38	-8.33
NYS	44.00	22.50	Texas Instruments	36.75	1.50	4.26
OTC	12.25	3.50	VLSI Technology	5.00	0.13	2.56
ASE	14.88	4.50	Western Digital Corp.	4.38	-0.63	-12.50
Peripherals & Subsystems						Off 4 06%
OTC	2.38	0.09	Alloy Computer Prod.	0.19	0.06	24.80
OTC	2.50	0.88	Apertus Technologies	1.25	0.00	0.00
OTC	37.75	12.38	AST Research Inc.	32.13	-4.38	-11.98
OTC	34.00	7.75	Banctec Inc.	7.75	-2.75	-26.19
ASE	7.63	3.13	Cognitronics Corp.	6.75	-0.38	-5.26
NYS	31.25	12.25	Conner Peripherals	22.38	-0.75	-3.24
ASE	22.00	7.00	Dataram Corp.	8.63	-0.13	-1.43
NYS	9.75	3.38	EMC Corp.	8.63	0.00	0.00
NYS	43.88	33.75	Eastman Kodak Co.	38.38	-1.75	-4.36
OTC	8.50	4.38	Emulex Corp.	5.38	0.00	0.00
OTC	34.50	14.00	Exabyte & Sutherland	17.25	-0.38	-2.13
OTC	8.25	3.13	Iomega Corp.	4.94	-0.19	-3.65
OTC	16.50	6.50	IPL Systems Inc.	13.25	-1.25	-8.62
OTC	2.25	0.13	Maxstor Systems	0.47	0.03	7.00
OTC	17.50	4.00	Maxtor Corp.	4.19	-0.94	-18.29
OTC	10.25	3.75	Micropolis Corp.	7.25	-1.00	-12.12
NYS	91.38	73.88	3M Corp.	78.50	-0.38	-7.51
OTC	14.50	6.50	Pyramid Inc.	8.75	0.00	0.00
NYS	21.25	8.00	QMS Inc.	14.25	0.00	0.00
OTC	23.75	8.88	Quantum Corp.	17.63	-0.25	-1.40
NYS	6.88	4.38	Recognition Equipment	4.88	-0.13	-2.50
OTC	9.88	4.00	Reuon Inc.	8.63	-0.88	-13.48
OTC	19.75	8.88	Seagate Technology	11.25	-0.38	-3.23
NYS	35.25	11.00	Storage Technology	10.88	-1.63	-7.35
OTC	4.06	0.63	Tandon Corp.	1.81	-0.06	-3.31
NYS	19.13	11.88	Tektronix Inc.	17.88	-0.25	-1.38
OTC	0.63	0.19	Televideo Systems	0.19	-0.03	-14.14
NYS	38.75	28.00	Xerox Corp.	28.50	2.25	8.21
Leasing Companies						Off 5 06%
OTC	10.50	6.88	Amplicon Inc.	8.00	-1.00	-11.11
OTC	4.38	0.31	Capital Associates	0.53	-0.16	-22.22
NYS	28.50	14.63	Comdisco Inc.	20.50	1.63	8.61
OTC	16.25	9.25	LDI Corporation	12.00	0.00	0.00
OTC	6.88	2.25	Selectarm Inc.	2.25	0.00	0.00

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Mattel VSAT net to be dismantled

BY ELISABETH HORWITT
CW STAFF

HAWTHORNE, Calif. — A 2-year-old satellite-based network that was supposed to meet Mattel, Inc.'s global communications needs for years to come is now heading for the scrap heap.

Responding to complaints from overseas sites of molasses-like file transfers and interrupted computer-aided design transmissions, the toy maker's information systems department has decided that its worldwide networking needs will be better served by a fiberoptic-based system, according to David Watson, director of communications systems.

About three years ago, Mattel decided to move its global communications to a single, private, satellite-based network, primarily because network costs were hard to track on the existing "hodgepodge of leased lines and value-added network" links, said Jeff Harris, who was then the toy maker's director of information technology.

The present very small-aperture terminal (VSAT) system connects Mattel's Phoenix data center to manufacturing and distribution centers throughout Europe, as well as to major manufacturing sites in the Far East.

The network supports a wide range of crucial IBM Systems Network Architecture interactions among Mattel's overseas sites and between those sites and the Phoenix data center.

The current system has three major drawbacks, according to Wolfgang Webber, manager of MIS at Mattel GmbH in Germany. First, response-time problems have resulted from the fact that most sites have only 9.6K bit/sec. or less with which to conduct all of their data communications. "Of course, that is not enough," Webber said.

Second, the VSATs are prone to failure, particularly under bad weather conditions. Third, all communications between European affiliates must go through the Phoenix satellite hub, causing serious response-time problems.

Quicker response

The new network is expected to trim response time significantly. For example, it will take German users four to six seconds rather than the current 20 to 30 seconds to access the Phoenix data center.

After careful study, Mattel concluded that the price of overseas fiber-based links has declined to the point where the medium provides a more cost-effective solution than satellite, Watson said. For example, a 64K bit/sec. link from Phoenix to the UK by means of a satellite costs $149,000 per year, while a comparable fiber-based link, based on a three-year contract with AT&T, will cost Mattel $92,500 per year, he added.

In addition, Mattel will be able to save money by moving voice communications onto its fiber-optic links, Watson said.

The new network will also provide German Mattel with a direct 128K bit/sec. link to the U.S., eliminating the need to go through the UK hub. In addition, European and Asian plants and affiliates will be able to communicate directly, rather than via Phoenix, Watson said. Overseas design engineers will be able to download CAD files directly from Phoenix's CAD system, rather than through a series of IBM Application System/400 SNA links, he added.

Mattel also plans to implement a network management "that lets the network control center in Phoenix monitor the entire global network," Watson said. Under the existing system, "Some locations would wink out, and we wouldn't know about it until they called," he added.

AT&T will provide the fiber connections between the U.S. and overseas through its Worldband program, which allows the customer to amalgamate bandwidth between different overseas links to qualify for price discounts. Links among overseas countries will be provided by a combination of international carriers such as Cable & Wireless PLC, with value-added network providers such as GE Information Services supplying packet-switched links to out-of-the-way locations such as Chile.

Mattel said it plans to choose either Timeplex, Inc. or Newbridge Networks, Inc. by Jan. 18 as the supplier for T1 multiplexers that will distribute bandwidth at various sites worldwide.

Travelers goes wireless

Firm chooses Token-Ring LAN for mobility

BY JOANIE M. WEXLER
CW STAFF

HARTFORD, Conn. — The highly mobile atmosphere at The Travelers Corp. has prompted the firm to seek wireless local-area networking to handle rapid-fire installations at its 21 field offices. The Travelers, an early IBM Token-Ring LAN adopter, is filling its need with the first IBM Token-Ring-compatible wireless network on the block, which starts shipping this week.

The Travelers has been beta testing BICC Communications' Infralan for nearly three months. The insurer has committed to installing six initial $2,995 base units, said Nick Blazensky, director of The Travelers' Telecommunications Division.

Since 1985, when IBM first introduced the Token-Ring network, The Travelers has installed 135 IBM Token-Ring LANs running at 4M and 16M bit/sec. speeds. BICC's compatibility with IBM Token-Ring standards thus was a key criterion for The Travelers.

Infrared technology

BICC's Infralan is based on infrared technology. Other emerging wireless LANs, such as NCR Corp.'s Wavelan and Motorola, Inc.'s Wireless In-building Network (WIN), are based on microwave technologies. Neither of the microwave technologies, however, are standards-based.

Cost-wise, Blazensky said, a cabled IBM Token-Ring network costs "anywhere from $325 to $1,100 per port." The Infralan configuration totals about $500 per port, "but, unlike cable, is a reusable resource that we will amortize over five years," Blazensky said.

"An upper-end cabled network could cost us $100 per month compared with $10 a month for the wireless network," he noted.

Blazensky remarked that "in 1990, we saw a need for 140 new links, mainly because of an explosion of new applications for Token-Ring networks."

Big payoff is speed

The real payoff of the wireless network, Blazensky said, was "being able to react to users' requirements in a hurry. This means not having to drill holes and get cable ordered and installed."

BICC said that installing an Infralan is a matter of aligning bar graphs on the base unit and optical nodes. Two optical nodes that interface the workstations with the base units ship with each six-port base.

The vendor said its LAN is Underwriters' Laboratories, Inc.-approved and requires no Federal Communications Commission licensing.

Blazensky and BICC said Infralan gets around at least part of the line-of-sight problem of infrared by mounting the optical nodes in a 7-ft, 6-in. cluster configuration.

The height is intended to prevent humans from walking through the transmission path.

Cables

FROM PAGE 1

Jan. 4 outage wondered why AT&T was doing its maintenance during prime time. "We never let anyone touch mission-critical applications during the day unless it's an emergency," he said.

Two large AT&T users — General Electric Corp. and United Parcel Service — said their AT&T representatives told them that close to 400 T3 circuits were impacted, although AT&T would not confirm that number. T3 circuits carry traffic at 45M bit/sec. speeds.

Frank Paccione, vice president in telecommunications at Banker's Trust Co. in New York, said a way to minimize disruptions would be for the carriers and the user community to work together. "Rather than digging in their heels saying it's their problem and they'll fix it, all the carriers should be more open with the network designers at user firms. Together, we should identify potential problems and come up with actions," he said.

"I have no concerns about fiber as a medium," said Joseph Gianotta, commissioner of the Computer and Data Communications Services Agency in New York. He did say, however, that the carriers need to work on providing alternate fiber paths.

> THE PROBLEM IS THAT "with fiber, you have so many eggs in one basket that it's much more dramatic when fiber breaks."
>
> JIM MORGAN
> CONSULTANT

A mayor's task group in New York is working to develop a cooperative plan under which competing carriers — interexchange, local and alternative — will back each other up in the event of a major outage. Thomas Dunleavy, assistant commissioner at the Department of Telecommunications and Energy, said the effort, begun last September, is slated to be completed at the end of the third quarter of this year, and implementation will begin immediately.

The problem is that "with fiber, you have so many eggs in one basket that it's much more dramatic when fiber breaks," said Jim Morgan, an independent consultant in Morristown, N.J. A single pair of fiber cables can support 37,500 simultaneous telephone calls, while a single pair of copper supports a paltry 24, according to Business Research Group in Newton, Mass.

"With the old system, you have a heavy network of alternate routes built over 100 years," Morgan said. "There has not yet been time to build in that redundancy with fiber."

AT&T spokesman Bob Nersesian — who estimated that AT&T has spent between $2.5 billion and $3 billion each year since 1984 on network reliability — said three major redundancy projects are in the works:

- A call-routing system that will provide more than 100 different ways to route over the network. Currently, AT&T provides 21.
- An expert system that mimics what network managers can do in a fraction of the time and can restore most calling in 15 minutes.
- A restoration system that will automatically draw upon spare AT&T circuits in hundreds of cables around the country.

AT&T also said it intends to offer customers more options for purchasing backup routes to the AT&T network.

U.S. Sprint said it is installing technology that will create a "self-healing" network. Central office hardware and software will give Sprint's network the ability to reroute traffic instantaneously, according to spokesman Steve Dykes.

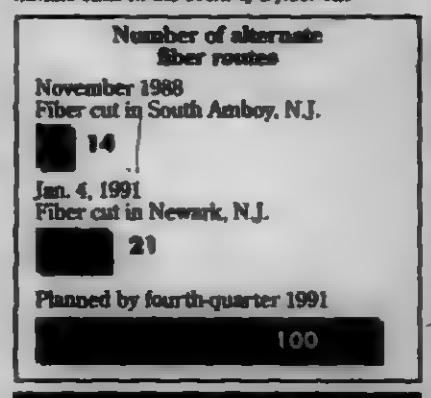
MCI Communications Corp. said the self-healing nature of its ring architecture, which loops traffic back from a point of failure, has thus far kept the impact of MCI fiber cuts to a minimum.

MCI, however, does plan to replace its infrastructure for network control during the next two years with an artificial intelligence-based system, said Fred Briggs, senior vice president of network services at MCI.

Higher in fiber

AT&T

AT&T plans to have 100 alternate routes by the end of this year to handle calls in the event of a fiber cut



Source: AT&T — CW Chart: Paul Mock

NEWS SHORTS

User alliance maps next move

The User Alliance for Open Systems announced a major conference last week that has been scheduled for March 12-14 in Dallas to write an implementation plan for breaking down the barriers to open systems computing. It will be the first meeting of the user group, once known as the Houston 30, since the group voted to join the Corporation for Open Systems in McLean, Va.

Commodore replaces president

Despite analysts' initial high hopes, the president of Commodore Business Machines, Inc. has apparently come up short once more. Onetime IBM and Apple Computer, Inc. executive Harold Copperman was replaced last week as Commodore's president and was reassigned as a vice president of parent Commodore International Ltd. The company also announced layoffs of 10% to 15% of its 600-person U.S. work force. Commodore earned a profit of $1.5 million for the fiscal year 1990, down 97% from the previous year. Copperman's successor, James Dionne, former head of Commodore's Canadian unit, becomes the fifth Commodore president in just over six years.

Pyramid tries high availability

Pyramid Technology Corp. is expected to announce its Minerver Reliant series of high-availability (but not fault-tolerant) computers next week. Unlike fault-tolerant machines, Pyramid's CPUs will all be shouldering work until a failure is detected, at which time the software will automatically switch applications to the remaining processor or processors. A four-processor package starts at $700,000. The system has about a three-minute recovery time, according to Pyramid, which recommends it for applications such as manufacturing, inventory and planning that can stand a few minutes of downtime. Sandy Gant, an analyst at Santa Clara, Calif.-based Gartner Group/Infocorp, said the idea of selectable and incremental high availability is a "good approximation of fault tolerance without paying a huge premium."

Steel maker outsources

Wheeling-Pittsburgh Steel Corp. announced last week that it has outsourced mainframe operations to Pittsburgh-based Genix Group in a multiyear contract. Wheeling-Pittsburgh will use Genix's mainframe CPU, operating system software, disk and tape storage, data communications and technical support, but it will retain in-house applications development and maintenance. Terms were not disclosed. Ironically, Genix originally grew out of the IS department of the former National Steel Corp., a Wheeling-Pittsburgh competitor.

IBM ties up with Ontologic

IBM made another move in the object-oriented technology market last week when it announced plans to jointly market Ontologic, Inc.'s database management system. Ontologic has been selling an object-oriented DBMS since the late 1980s and claims to have 350 licensees worldwide. IBM and Ontologic will jointly sell the company's software for the IBM OS/2 platform.

Martin Marietta restructures

Government contractor Martin Marietta Corp. announced a corporate restructuring last week that will merge its computer contracting and internal information systems units, now based in Chantilly, Va., with the Electronics and Missiles Group in Orlando, Fla. The move will cut overhead costs and eliminate 400 jobs but will not diminish the company's commitment to the IS business or affect its data centers, a spokesman said.

SQL/DS passed FIPS test

IBM Canada Ltd. issued a release last week stating its SQL/DS, the relational DBMS for the IBM VM environment, now fully complies with the Federal Information Processing Standard for both embedded and interactive SQL. The mainframe DBMS was developed at IBM's laboratory in Toronto.

Intel moves on mass memory market

BY RICHARD PASTORE
CW STAFF

Personal computer users looking for alternatives to pricey system-vendor memory upgrades can now turn to Intel Corp. for memory modules that plug into the motherboards of some IBM, Compaq Computer Corp., Zenith Data Systems and Hewlett-Packard Co. PCs.

Users needing 72-pin, 80-nsec memory modules have previously had to choose between the vendor's boards and those of relatively little-known third-party suppliers, Intel business unit manager Kirby Dyess said. Intel's Matched Memory series, to be launched today, will offer users big-name comfort and machine-specific design. "System-specific memory takes care of the quality concerns of users running mission-critical applications," Dyess said.

While the simpler, third-party 30-pin single in-line memory modules (SIMM) are quite reliable, the faster, 72-pin third-party modules will sometimes cause problems, noted Bruce Greif, project analyst at County Natwest, Inc. in New York.

Analysts said they expect Intel's name to provide its market leverage. "Because this is a large computer company with a history with chips, [Intel's SIMMs] will definitely have an impact," said Mark Levitt, an analyst at International Data Corp. in Framingham, Mass.

Intel has been marketing its Above Board memory upgrades for several years. These modules plug into expansion slots rather than the motherboard.

Intel is also hoping to compete on price. Intel set list prices of $225, $445 and $945 for its 1M-, 2M- and 4M-byte SIMMs, respectively. Compaq's equivalent products list for $299, $599 and $1,199. IBM's prices run slightly less than Compaq's.

While a random street-price sampling of 1M-byte Compaq modules yielded an average price of $260, an Intel 1M-byte SIMM will cost less than $157, a spokeswoman indicated.

Users said they are already using less-costly vendor alternatives. "Because Compaq and IBM SIMMs are so fiercely expensive, we go out to the market and find a discounter," said Stephen Anderson, information systems architect at the state of Washington's Department of Social Health Service.

"If I can get the Intel SIMMs at or near commodity prices, I can significantly cut my cost on the PC," Anderson said.

Compaq spokesman John Sweney cautioned users against installing non-Compaq boards. With third-party modules, "end users are creating potential problems for themselves in trying to diagnose problems and allocate responsibility," he said.

Dealers also face this consideration when deciding to configure PCs with third-party modules. "Some dealers want to have a complete IBM or AST system," Levitt noted. "But if the price is right, they'll be able to save some money."

Climbing through Windows

Intel perceives Windows 3.0 performance capabilities spurring user demand for added motherboard memory as shown by these benchmarks



Source: Intel PCSO

CW Chart: Doreen St. John

E-mail

FROM PAGE 1

Bonita Bourke and Rhonda Hall, former Nissan employees, claimed last week they were each shown a stack of their E-mail last year and told to stop their nonwork-related E-mail.

Days after filing grievances with Nissan's human resources department, Hall said she was fired and Bourke said she was offered the opportunity to resign. Hall and Bourke admitted to using E-mail for personal communication. Bourke said the messages Nissan collected included interdepartmental "business correspondence, messages people sent me [and] some wisecracks about the company."

Hall said management had told employees that confidential passwords protected their messages from any interception.

Last week, however, a Los Angeles County Superior Court judge dismissed a class-action lawsuit brought against Epson America, Inc. for allegedly violating its employees' privacy by intercepting their E-mail [CW, Aug. 13, 1990].

A spokesman for Epson in Torrance, Calif., said Judge Barnet Cooperman found on Jan. 7 that the company did not violate a state penal code prohibiting electronic eavesdropping on private communications. "In essence, the judge said companies have the right to manage their E-mail systems." Epson has maintained that it randomly intercepts messages in the process of maintaining its systems.

Simple misunderstanding

Noel Shipman, the Los Angeles attorney representing both the unnamed plaintiffs in the Epson case and Bourke and Hall in the Nissan case, said Judge Cooperman had misinterpreted the penal code. The suit arose from the firing of Epson employee Alana Shoars, who claimed she was terminated for protesting the alleged interception and printing of E-mail messages.

E-mail is widely credited with enticing technophobes onto computers by humanizing the devices. But if recent events are any indication, E-mail may be doing its job too well.

At Belmont, Calif.-based Oracle Systems Corp., an employee reportedly used E-mail to bare her feelings in a scathing message to her boyfriend, also an Oracle employee.

"Boy, did she let him have it," said one of the inadvertent recipients of the message. When the woman had finished her letter, she hit the wrong transmit key and broadcast the message to every computer user in the firm.

According to University of Washington at Seattle professor Mark Haselkorn, "People who use E-mail open up so much sometimes that it's too much." Haselkorn was part of a national congressional study on the effects of E-mail within the government and organizations.

While some firms take the position that personal use of E-mail is a waste of time and property, others seem willing to tolerate judicious use of the software for anonymous or open forums.

Interleaf Corp. takes the more liberal tack. As long as their work is done, employees can use the social communications branch of the firm's E-mail, or they can link to an outside bulletin board-type E-mail service that allows users to read about and transfer their feelings on an array of topics, including sexual fantasies, according to Leslie Valdes, a production editor.

Stolen laptop jeopardizes UK's Persian Gulf plans

BY RALPH BANCROFT
IDG NEWS SERVICE

LONDON — A military laptop computer has become the focus of one of the biggest security investigations in years, with hundreds of police officers working to recover data that could compromise secret plans for offensive action against Iraq.



Hundreds of known criminals have been interviewed along with their "fences" in an attempt to locate the computer, it was disclosed last week. The laptop was stolen from an official car on Dec. 17, but government officials were able to control news reports, convincing British newspapers to report only that documents had been stolen and subsequently recovered.

The computer was stolen from a car used to transport Royal Air Force Wing Commander David Farquhar, staff officer to Air Chief Marshal Sir Patrick Hine, joint commander of British forces in the Gulf.

The RAF officer had just left a briefing session with Prime Minister John Major at his Downing Street residence in Westminster and was returning to battle headquarters at RAF Strike Command in High Wycombe, Buckinghamshire.

Farquhar decided to stop at a car showroom to look at some second-hand Range Rovers. While he and his driver looked over some of the models for sale, the thief struck.

Not a plot

News reports here generally accept that the thief was a common criminal and not a secret agent hired by Saddam Hussein. Along with the laptop, two briefcases containing classified papers dealing with strategy and logistics in the Middle East were stolen; the briefcases were recovered within hours of the incident, discarded in a rubbish dump with the papers intact.

After a newspaper in Ireland ran the story, the theft became headline news in all the national newspapers. The ministry is not saying what information was held on the laptop, but most newspapers reported that it was even more sensitive than that in the stolen papers.

Bancroft is an IDG News Service European correspondent based in London.

Bank's IS awaits FDIC actions

BY CLINTON WILDER
CW STAFF

BOSTON — It was business as usual for the information systems department at the failed Bank of New England last week, but that stable-on-the-surface situation could change dramatically in the near future as the scenario of the bank's estimated $2.3 billion federal bailout unfolds.

The Federal Deposit Insurance Corp.'s (FDIC) Jan. 6 rescue of the $30 billion regional bank had no immediate impact on day-to-day IS operations, said IS executives at both Bank of New England — now renamed New Bank of New England — and the FDIC.

"The only change that I can foresee is that the FDIC, as the new owner, may ask us to run some special reports on our customer base," said Jack Martin, the bank's executive vice president for operations and technology. "There's no change in daily operations. We continue to service all our internal and external customers."

The future of IS and the status of the bank's vendor contracts remain question marks, however, as potential acquirers — most prominently Bankamerica Corp. — work with federal regulators on a possible sale.

Although a spokesman for San Francisco-based Bankamerica declined comment, another possible acquisitor, Banc One Corp. in Columbus, Ohio, said a Bank of New England sale could effectively cancel all of the bank's contracts with IS suppliers. In 1989, Banc One acquired 20 Texas banks formerly owned by Mcorp, the Dallas-based bank holding firm bailed out by a similar FDIC takeover.

"Everything that had to do with the old bank [ownership] is subject to renegotiation," said John A. Russell, vice president and director of corporate communications at Banc One. "All claims [from suppliers] would go against the old owner, which in this case would be the FDIC. This permits the buyer to take it free of litigation."

Outside help

Most of Mcorp's processing had been outsourced to Electronic Data Systems Corp. and was brought in-house by Banc One's IS subsidiary, Banc One Services Corp. By contrast, Bank of New England runs a large in-house operation, with an overall banking operations staff of about 3,000 and an IBM 3090-based data center in Malden, Mass.

However, Bank of New England outsourced its trust accounting and securities processing last year to SEI Corp., a services firm in Wayne, Pa. SEI is investigating the potential impact of the FDIC bailout on its multiyear contract, said Wayne Witherow, a vice president on SEI's legal staff. He refused further comment, although an SEI spokesman noted that SEI's work is "on a profitable side of the bank."

In a sense, the effects of Bank of New England's demise on IS have already occurred in the form of massive cutbacks and management changes during the past year or so, during which the bank reported huge losses.

The bank operations staff has been slashed from 4,200 to 3,000, and the programming staff has been cut nearly in half, from a high of 475 to 255. Martin, formerly at Bank of Boston Corp., was part of a new management team brought in earlier this year in a last-ditch effort to reverse the bank's slide toward bankruptcy.

One of Martin's key achievements was completing a credit support system designed to track the type of bad loans that got the bank into such financial trouble. The system prototype is currently running and is being evaluated by end users, Martin said.

William Synnott, a Wellesley, Mass., banking IS consultant and former Bank of Boston chief information officer, speculated that the FDIC would like to leave Martin and the management team in place even after a sale. "They have given them a vote of confidence so far and would probably leave them alone, although they would oversee them closely," he said.

The FDIC itself will probably end up owning some of Bank of New England's assets, which would become the FDIC's processing responsibility. The Washington, D.C.-based agency recently replaced an Amdahl Corp. 5990 Model 700 mainframe with the new IBM Enterprise System/9000 Model 720 and would be able to handle the additional transaction volume, said John N. Weiss, deputy director of the FDIC's management information services branch.

Bank of New England's misfortunes are largely blamed on the aggressive acquisition and lending policies of former Chairman Walter Connolly, who was fired last year. Connolly's right-hand man, President Gordon Ulmer, was a former IS executive who moved to general management [CW, Feb. 20, 1989]. Ulmer retired last month.

Army's IS

FROM PAGE 1

provides systems support for logistical functions such as supply, personnel records and administration. Much of the system is outdated by commercial computer standards and has never been used in a real war situation, according to Goyette.

Information Systems Operations personnel have been working with the Saudis to install networks and construct telephone, radio and microwave communications systems since August.

"We've had about 120 days to implement the kinds of systems we've had 20 years to put together in Europe," Goyette said, adding that Saudi Arabia's public telecommunications network has been unable to support many of the Army's needs.

The Information Systems Operations setup in the Middle East theater includes a mobile communications command, an IS engineering command and thousands of systems — including mainframes, minicomputers and personal computers — tied together on a sprawling network based on Transmission Control Protocol/Internet Protocol (TCP/IP).

THE LARGEST and newest of the U.S. Army's networks being used for Operation Desert Shield is the 2-year-old Defense Data Network.

"The people in the theater who are actually over there are working hard with the Saudis, putting in 17 to 18 hours a day. And they're breaking new ground for the army," Goyette said.

The largest and newest of the Army's networks being used for Operation Desert Shield is the 2-year-old Defense Data Network (DDN). The DDN is a TCP/IP-based international network that carries voice, video and data transmissions, including electronic mail, among Army units and between the Army and the other armed services. One element of the DDN is the Internet network.

One of the core application sets running over the DDN during Operation Desert Shield is the Army's Standard Information Management Systems (SIMS), which is used mostly in the mobile processing units for financial and personnel records and supply inventory. SIMS is based on multiple hardware platforms, including IBM and Unisys Corp. mainframes, and uses varied communications architectures, such as IBM's Systems Network Architecture.

However, not all Army units have access to the DDN. According to Goyette, some groups are still using batch applications that have not been upgraded to run over the DDN and therefore must rely on the batch-oriented Automated Digital Network.

The Army's own policies have presented still more problems. Procurement guidelines allow bureaucrats to take as long as six years to make a decision on a request for a purchase that a unit wants within a year.

"There is an existing system in the world that tests the effects of the use of biological and chemical weapons on the soldiers for the purpose of treating them that we wanted to build into our system directly," Goyette said. But that would have meant buying both hardware and software. Goyette had to settle for an interim solution — one that he is unhappy with — that has medical personnel depending on gateways to a program running here.

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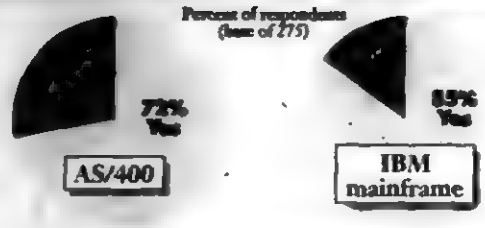
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TRENDS

AS/400 Software

Experiencing a backlog?

Percent of respondents (base of 275)



Average application development backlog

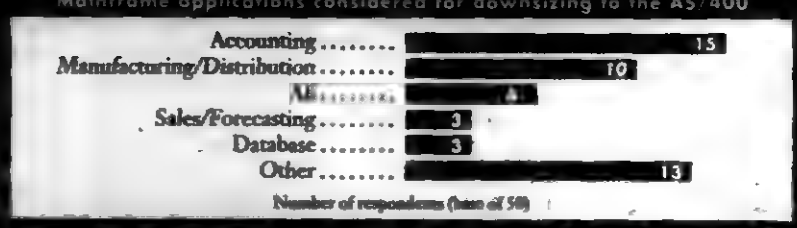
Platform	Months
AS/400 sites	10.3
IBM mainframe sites	14.1

Solutions to the backlog problem

Make more use of programmer productivity tools	57%
Purchase more packaged software	44%
Retain outside programmers on contract	42%
Hire more software and DP professionals	34%
Employ more PCs	14%
Other	7%

Percent of respondents (base of 275); multiple responses allowed

Mainframe applications considered for downsizing to the AS/400



Number of respondents (base of 50)

Source: Sentry Market Research, Westboro, Mass.

CW Chart: Marie Hanes

NEXT WEEK

Robert Henderson likes being in the information systems profession and works hard at his job as a senior systems analyst. But he, along with other minorities in the field, say working hard may not be paying off: Few minorities advance into upper management positions in IS. Read In Depth next week to find out what life is like for minorities in IS.



Katherine Lambert

Although many U.S. firms are just beginning to react to the troubled economy and changes in the marketplace, ITT Hartford began downsizing operations in 1987. Next week in Manager's Journal, John T. Crawford, vice president of information management, discusses maneuvering IS through company layoffs and attrition programs.

INSIDE LINES

An NBC bulletin

NBC-TV's Stations Division is the latest information systems organization to recentralize. NBC is expected to announce today that the central organization in New York will exercise more control over technology standards at the six company-owned stations around the U.S. The division decentralized when each station installed an IBM Application System/400 to replace a central Unisys mainframe, but now it will "go against the idea that everyone can have their own mini-MIS department," said Joe Harris, director of information technology.

Intercontinental missions

It looks like this will be an active winter of corporate wheeling and dealing on the other side of the Atlantic. According to European sources, Olivetti will be put on the block within the next three months, and a Japanese giant — possibly Fujitsu — has already expressed an interest in purchasing the Italian corporation. There has also been some speculation that a for sale sign is expected to appear on the front lawn of Bull, and sources indicate that NEC is a top contender to make the purchase.

Serving up everything

In a perfect world, DEC would use Connect '91 to launch its long-delayed Decnet Phase V for VMS — but that reportedly is still bogged down. Instead, the vendor is expected to announce its Commserver family of intelligent, multipurpose communications controllers for VAX/VMS systems. Each controller can be configured with eight out of a total of 14 common networking protocols, offloading the network processing from the VAX.

An IBM/Unix transaction

Question: How will IBM incorporate transaction processing capabilities into its Unix systems? Answer: With a new product slated for introduction this week by Transarc Corp. in Pittsburgh. The technology, which will be based on the Open Software Foundation's Distributed Computing Environment, will also be supported by Hewlett-Packard and Stratus Computer. Although the Transarc announcement will occur this week, look for more details about how IBM and friends are expected to use the technology when they make announcements during Uniforum 1991, a trade show to be held in Dallas later this month.

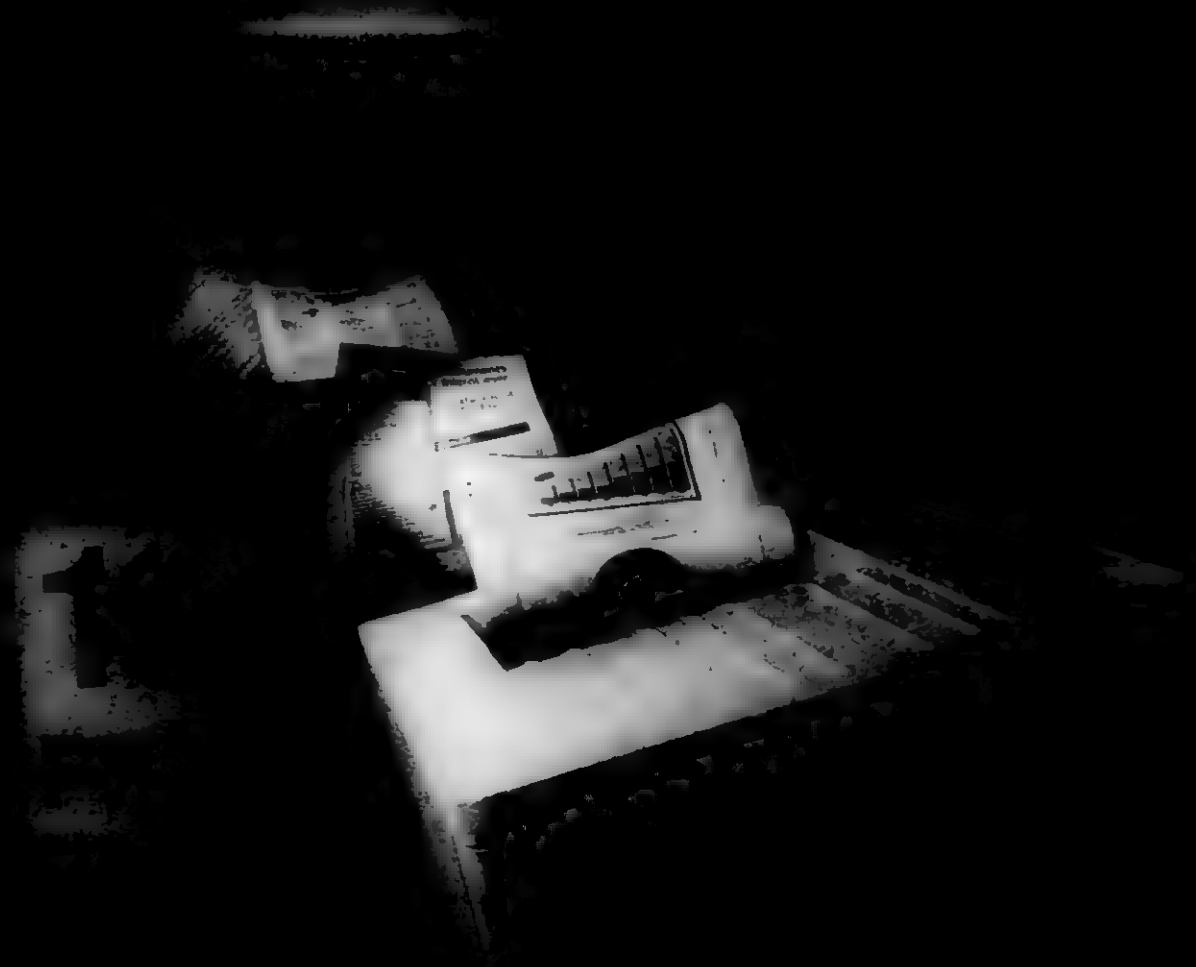
An IBM PS/2 transaction, missed

IBM must be having a hard time getting its new Personal System/2 Model 95s out the door. Gibson Greetings manager of business systems Robert Martin says he was all set to buy one of the new servers, but IBM couldn't find one to sell him. Despite calls to manufacturing sites, no boxes were found. Martin, who couldn't wait forever, took delivery last week of a Compaq Systempro instead.

Mea culpa

Dun & Bradstreet Software called us on a glaring error in this section last week about the departure of Vice President Dean Redfern. Our comment that Redfern was one of only two out of nine members of the board with roots in the old McCormack & Dodge was way off base. Just prior to Redfern's resignation, M&D-ites made up a five-man majority, which we certainly should have known, because we reported the rehiring of John Landry and the promotion to president of Henry P. Holland Dec. 17.

The beginning of 1991 is certainly primed to earn its place in the history books, with the Middle East crisis reaching a boiling point, the longest U.S. economic expansion all but done and buried, and some staid computer giants trying to turn a new page. But we're interested in good news, too; users who are employing technology to beat back the wolves have an open door here. Just contact News Editor Pete Bartolik, and we'll show others how to use your tricks. Phone (800) 343-6474, send a fax to (508) 875-8931 or message COMPUTERWORLD on MCI Mail, 76537,2413 on Compuserve or MHTS78A on Prodigy.



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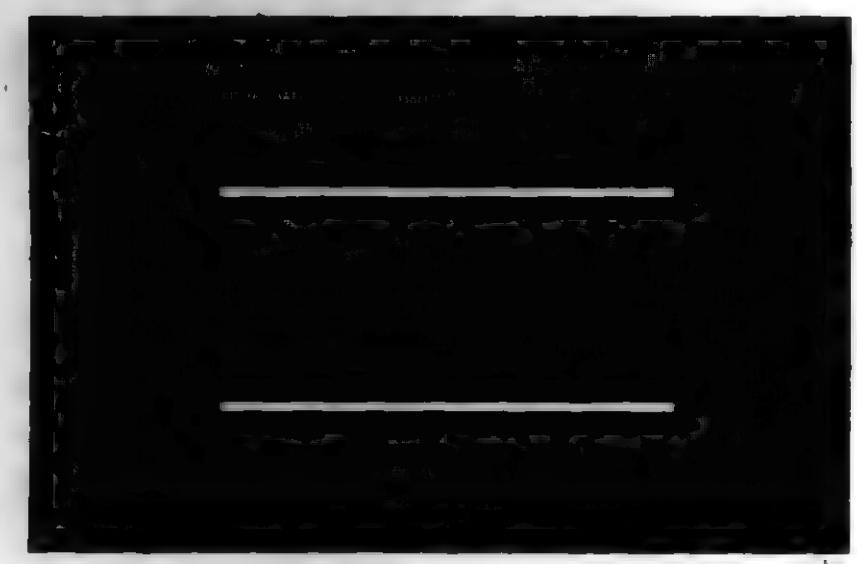
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COMPUTERWORLD

IS sites hear rumble of war

BY RICHARD PASTORE
CW STAFF

"We hear the flights taking off for Kuwait and Baghdad. You can't sit here and listen to these planes leave without being kind of anxious."

For Mark Ragel and other Americans working in data centers in the Middle East, growling U.S. warplanes and screeching air-raid sirens replaced the purr of printers and tape drives as U.S. military and allied forces bombed Iraq and Kuwait last week.

As of Thursday evening, these expatriates had finished battening down the information centers and were at home with their families waiting out the unfolding drama.

Ragel is a database administrator at the refinery site of Bahrain Petroleum Co. in Bahrain, a Persian Gulf island nation within sight of Saudia Arabia's eastern coast. The refinery is considered a primary target for Iraqi President Saddam Hussein in his bid to thwart efforts to force his occupying army from Kuwait.



Wide World Photos

High-tech weaponry *such as the Stealth fighter has quelled fears about U.S. military reliance on gadgetry, as various systems are proving effective in the Gulf war.* *Page 84.*

Correspondingly, the work force at the site has been reduced to a skeleton crew of essential personnel.

Leading up to the United Nations' deadline last week, Ragel backed up his refinery study data and, for the first time, moved it to an off-site vault in Bahrain. The firm also relocated its payroll and personnel records.

At Aramco, Saudi Arabia's oil conglomerate and site of one of the world's largest IBM installations, security has also been augmented, according to John Scarritt, business systems analyst in

Continued on page 84

Officevision on hot seat as SAA boss takes over

BY ROSEMARY HAMILTON
and PATRICIA KEEFE
CW STAFF

IBM's troubled Officevision project has been placed under the direct management of Earl Wheeler, the company's head of Systems Application Architecture strategy.

The second release of Officevision has experienced continued delays on most supported platforms.

Industry observers contacted last week said the recent management shuffle that removed development responsibility from the Applications Solutions Division is an attempt to rescue the development effort. IBM said the organizational moves are not directly related to Officevision delays.

Noting that Wheeler, general manager of Programming Systems, has a track record of getting tough jobs done, some analysts also pointed out that he is now managing all of the major SAA product lines.

The other major SAA initiatives are OS/2, AD/Cycle and Systemview. Unlike those systems-oriented development efforts, however, Officevision was the first user-oriented application suite that was intended to provide distributed access to electronic mail, group calendars and other office-oriented functions.

Several analysts and users

Continued on page 85

Windows role to grow

Microsoft looks to blend 32-bit version with OS/2

BY PATRICIA KEEFE
CW STAFF

Microsoft Corp. is pushing Windows 3.0 — not Presentation Manager — compatibility as the core of its so-called Portable OS/2, which it will detail next week, according to independent developers briefed by the firm.

Under Microsoft's plan, users would be able to run any applications based on DOS, Windows or OS/2 under what the firm is calling New Technology Portable OS/2. That version of OS/2, also referred to as OS/2 Version 3.0, will run on reduced instruction set computing devices and other non-Intel Corp. technology and Intel-based personal computers.

In a memo to independent developers obtained by *Computerworld*, Microsoft claimed it will be able to differentiate its high-end operating systems (New Technology Portable OS/2) and its low-end DOS operating systems in the market while providing single application programming interfaces for software developers to write to.

According to sources who were briefed by Microsoft, New Technology Portable OS/2 will

Continued on page 85

Morris case impact slight

BY MICHAEL ALEXANDER
CW STAFF

One year ago today, a jury in U.S. District Court in Syracuse, N.Y., found Robert T. Morris guilty of injecting a worm into a nationwide computer network that sabotaged thousands of computers. Though Morris clearly got the message that releasing a computer worm is a crime, legal and computer experts remain divided on whether the conviction has had an impact on computer crime and security.



Bob Mahoney

Morris sent *worm to more than 6,000 computers*

"It is disappointing to see how little the Morris case has done to energize government and industry to improve computer security," said Kenneth Rosenblatt, an attorney who heads the high-technology unit of the Santa Clara District Attorney's office in San Jose, Calif. "I am also concerned by how little effort there has been to teach ethics to computer users."

Immediately following the trial, prosecutors and computer experts predicted that the conviction would send a clear warning to the nation's hackers

Continued on page 4

VDT monitoring under stress

BY MITCH BETTS
CW STAFF

When VDT users call the Computer Spying Hotline, they unload tales about how demoralizing it can be when supervisors use computer software to monitor every keystroke and error, every transaction and work break — and then post the numbers on the company bulletin board.



"It's a nightmare," said a data entry clerk in Rhode Island who called herself Rita F. "Everyone knows how many seconds you spent in the bathroom. It's like kindergarten," she told the hot line, which is run by the union-affiliated National Association of Working Women, based in Cleveland.

Unions and other critics argued that computer monitoring of VDT work leads to stressed-out employees toiling in an electronic sweatshop, where failing to meet a production quota leads to dismissal.

But it does not have to be that way. Research shows that computer-based performance monitoring can be used effectively and humanely to supplement human supervision if managers involve employees in developing fair monitoring practices, keep the data confidential

Continued on page 14

INSIDE

Executive Report — How do you make a wild network behave or keep it from skittering out of control in the first place? Page 53.

In Depth — Trends show minorities rarely make it to the top spots in IS. Page 57.

AT&T claims victory in shareholder vote for NCR takeover, but final outcome remains elusive. Page 4.

IBM solid, DEC better than expected as financial reports come out. Wang, meanwhile, says latest layoff report reflects continuation of earlier plans. Stories, page 8.

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7 Feds finally acknowledge what businesses have known and have been handling for some time: Industry is in a slump.

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84 U.S. defense weapons have thus far more than allayed critics' fears that the high technology would prove too complicated and ineffective in actual combat.

Quotable

"The reliance on electronic monitoring is almost forcing managers to manage poorly in terms of human relations."

MICHAEL SMITH
UNIVERSITY OF WISCONSIN AT MADISON

On the problems with computer-aided monitoring of employees. See story page 1.

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The 5th Wave



"WAIT A MINUTE — SINCE WHEN DOES OUR LOCAL-AREA NETWORK INCLUDE SIX TERMINALS, TWO PRINTERS AND A MISTER BEAN ESPRESSO MACHINE?"

EXECUTIVE BRIEFING

■ **U.S. employees in Middle East data centers** watched anxiously on "a very high state of alert" as war broke out in the region. Corporate data sites in Saudi Arabia and other Arab nations, already reduced to skeleton crews before the fighting began, nevertheless ran operations pretty much as usual. Extra backup precautions have been taken, including off-site vault storage and preparation of disaster recovery sites out of the region. The early success of U.S. air strikes against Iraq allayed fears that sophisticated high-tech weaponry would fail under battle conditions. In Menlo Park, Calif., the Unix-based international network Peacenet brought war news advisories to systems users in 50 countries. **Pages 1, 84.**

■ **Veteran Mellon Bank IS Chief George DiNardo** is considering starting his own outsourcing company, among other options, after his surprise resignation from Mellon. The outspoken DiNardo is also mulling other IS management job offers and a consulting career. Mellon started its search for a replacement. **Page 6.**

■ **Microsoft will eventually merge Windows and OS/2,** sources said. In three to five years, what is now known as Portable OS/2 will support both Presentation Manager and Windows. In the meantime, the desktop migration issue will remain murky. **Page 1.**

■ **IBM is trying to jumpstart Officevision** with a change in management. It is now the province of SAA boss Earl Wheeler. The ballyhooed — but long overdue — application has some users saying, "We can no longer wait for IBM." **Page 1.**

■ **Network management's most difficult challenges** are often the most routine. Conditions resulting from fast growth, a proliferation of different LANs and neglect of documentation cause the greatest headaches, rather than exotic expansions such as ocean-floor cabling. **Page 53.**

■ **Computer-based performance monitoring** has come under fire from unions and employee associations. Although it is used effectively and fairly by some firms, it can cause employee stress and anger when Big Brother-type fears are realized. **Pages 1, 14.**

■ **Despite NCR shareholders' overwhelming** vote in favor of AT&T's takeover offer, NCR's board will continue to be able to resist the bid. The board holds the power to set the next meeting date, which analysts said may not be until May. Separately, 22 members of Congress called for a federal review of the proposed merger's impact on the competitiveness of the U.S. computer industry. **Page 4.**

■ **One year after the conviction** of hacker Robert T. Morris, computer security experts are disappointed at the lack of action taken by government and industry. But others say would-be hackers have gotten the message that computer crimes will no longer be dealt with as mere pranks. **Page 1.**

■ **Life after layoffs:** Part two of this series looks at how one IS professional made the best of a bad situation through contract work. **Page 67.**

■ **On-site this week:** Grid Systems' handheld Gridpad is the latest crime-fighting weapon in the arsenal of the San Jose, Calif., police department. **Page 37.** The Chicago public school system seeks to rebuild with the help of a Unisys 2200-based on-line student database and the placement of terminals in 17 schools. **Page 25.** Elsewhere in academia, Boston University is on a "no-tape" campaign to replace all of its storage media as part of a larger plan to implement unattended operations. **Page 29.**

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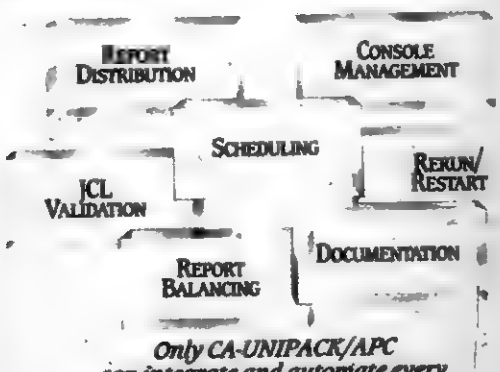
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AT&T pushes plan to oust NCR board

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — Despite the resounding "yes" vote NCR Corp.'s shareholders gave to AT&T's bid for control of the Dayton, Ohio-based computer maker, it appears that NCR can continue to shun the overtures of the giant telephone company until at least May.

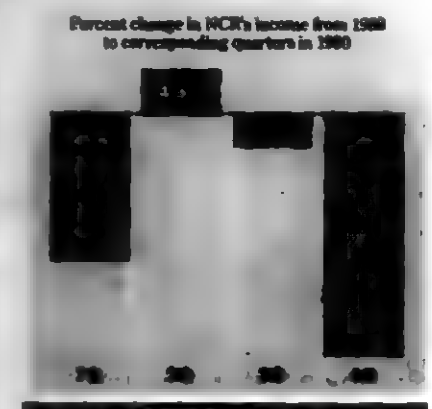
"Nothing has changed, except for the fact that in a fairly strong voice, the shareholders have said to the NCR board, 'We want this deal to go through,'" said David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago.

AT&T announced last Wednesday that it had received 44,688,030 — or 70% — of NCR's shares in response to its $90-per-share, all-cash offer for NCR. AT&T also extended its tender offer through midnight Feb. 15.

AT&T needed two-thirds of the shares to force a special meeting to remove a majority of NCR's board. But hours later, NCR's board came out of its regularly scheduled meeting insisting that AT&T's offer was "grossly inadequate" and reasserted its desire to keep the company independent.

Crumbling defenses?

Shareholder support for NCR's battle against AT&T's takeover attempt is unlikely to be bolstered by the fourth-quarter profit slide



Source: NCR Corp. CW Chart: Tom Monahan

AT&T said a separate proxy asking for a special board meeting had received a positive response from over 50% of NCR's shareholders — more than double the necessary 25%. However, to remove NCR's board at a special meeting would require that 80% of the shareholders vote in favor. Some analysts speculated that AT&T extended its tender offer to see if it could gain this margin of support on its tender.

Meanwhile, NCR posted record, but disappointing, revenue and earnings for 1990 on the Monday before AT&T's announcement. NCR showed a 6% jump in revenue over 1989, to $6.2 billion, and only a 1% jump in earnings per share, to $5.43. Analysts had expected as high as $5.75 per share. Earnings were inflated by NCR stock buy-backs during the course of the year, as actual income fell by 10% to $369 million.

Barry Bosak, research analyst at Smith Barney, Harris, Upham and Co., suggested that NCR's stance against the merger could be a delaying tactic.

"It's quite possible that NCR's board doesn't feel pressured right now to do anything," Bosak said. "They may need more time to arrive at a strategy — there's no gun at their head."

NCR holds discretion over the meeting date and does not have to call a special meeting for several months. It may not call one until after its annual meeting on April 17.

AT&T's offer remains conditional on NCR's board exempting the deal from Maryland anti-takeover laws and invalidating its poison pill defense. Cases filed by both parties are proceeding in federal district court in Dayton. AT&T has no control over any shares tendered until a deal is consummated.

In a move seemingly related to Congressional concerns (see story below), NCR last week charged in a court filing that AT&T's proposed financing violates prohibitions on the phone company using revenue of its regulated businesses to fund non-regulated businesses. Additionally, NCR charged AT&T should be classified as a bank-holding company because of its credit card business, and therefore prohibited from acquiring non-banking businesses.

Congress presses Bush to review AT&T bid for NCR

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Twenty-two members of the U.S. House of Representatives challenged the hostile takeover of NCR Corp. by AT&T last week and asked President Bush to review the proposed deal for its effects on the competitiveness of the U.S. computer industry.

"Hundreds of millions of dollars and tens of thousands of jobs have been lost in [previous industry mergers], substantially weakening the American computer industry," the bipartisan group wrote in a letter to the president.

Better uses

The lawmakers pointed out that NCR is a net exporter of computer equipment — deriving 60% of its revenue abroad — and suggested that this positive contribution would be jeopardized by the merger. They also said the $6 billion in debt needed by AT&T to finance the deal would steal scarce dollars from a pool better used to finance plant expansion, research and development and other investments needed for economic growth.

The letter to Bush asks that the merger be reviewed by the President's Council on Competitiveness, which is headed by Vice President Dan Quayle.

A spokesman for Rep. Tony Hall (D-Ohio) said the council's reply would probably not be a prelude to legislation blocking the merger but would help Congress decide what action, if any, it should take on the broad policy issues concerning computer company mergers in general. Such action could include hearings, letters to regulatory agencies or legislation, he said.

The letter is the second expression of concern about the merger from Capitol Hill. On Jan. 11, several members of the House Telecommunications and Finance Subcommittee asked the Federal Communications Commission to determine whether the takeover would serve the public interest.

A spokesman for the FCC would not comment on the letter but said last week that FCC Chairman Alfred C. Sikes would respond to the letter by Jan. 25.

Morris

FROM PAGE 1

that computer trespassing would no longer be tolerated and that it would also serve to heighten computer security at institutions all over the nation.

Thomas Guidoboni, the Washington, D.C., attorney who continues to represent Morris, said the impact of the case has been "virtually nil." Guidoboni filed an appeal in December, which is now pending.

Morris was the first person to be convicted of releasing a worm under a provision of the Computer Fraud and Abuse Act of 1986. Claiming the law is vague and should be revised, Guidoboni said Congress has failed to enact legislation aimed specifically at computer viruses and worms, despite recommendations by the U.S. Justice Department, the U.S. Government Accounting Office, security experts and others. Computer security measures on Internet has improved little as a result of the worm attack, he added.

More conscious

At the Lawrence Livermore National Laboratory, "we are far more security-conscious as a result" of the Morris case, said Kevin Oberman, network manager at the Lawrence, Calif.-based institute. The laboratory expended "hundreds of very expensive man-hours" battling the worm program, he said.

However, the conviction and subsequent sentencing has done little to deter hackers, Oberman said. "Probes [by hackers] on the lab's computers have grown more frequent."

Still, some hackers may have also gotten the message that releasing viruses and worms will no longer be viewed as mere pranks, said Cliff Stoll, an astronomer at Harvard University's Smithsonian Astrophysics Laboratory and author of the best-seller, *The Cuckoo's Egg*, which detailed hackers turned spies for the KGB. "In the past year, the Morris conviction has had an interesting effect, and that is that there have not been any copycats," he said.

While enrolled as a computer science graduate student at Cornell University, on the evening of Nov. 2, 1988, Morris set loose a worm that he later claimed he thought would deposit a single copy of itself on every computer it encountered on the Internet. However, a programming error caused the worm to replicate wildly and clog the memories of more than 6,000 computers. At his trial, Morris said the program was written as an academic experiment that quickly proved to be a "dismal failure."

Paying the price

Last May, Morris was sentenced by a federal judge in Syracuse to three years' probation and a $10,000 fine. In addition, he was ordered to perform 400 hours of community service and to contribute approximately $90 per month toward the cost of his supervision while he is on probation.

Morris is currently working as a programmer at a software company in Cambridge, Mass., according to Guidoboni. However, he declined to name the company.

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NEWS SHORTS

D&B Software restructures

Describing the move as part of a "strategic plan to better meet the worldwide needs of its customers," Dun & Bradstreet Software has restructured its U.S. and international field organizations into three regions: the Americas, Europe and Asia Pacific, with the divisions to be headed up by Tom McNeight, Pierre Donaldson and Roger Evans, respectively. In related news, Michael Hunt, executive vice president of D&B Software's International Operations, is leaving the company next month to pursue entrepreneurial opportunities. Hunt is departing after 13 years of service.

Novell to settle shareholder suits

Several class-action lawsuits that originally sought to stop Novell, Inc. from merging with Lotus Development Corp. last spring will be settled this week, according to Novell legal counsel David Bradford. Shareholders who filed the suits will receive "a very small sum of money to cover a small portion of their legal fees," Bradford said last week. He would not comment further on the settlement.

Prime ports Information Plus

Prime Computer, Inc. announced last week that Prime Information Plus, the company's Pick-based database management system, and Prime EXL Portable Netware are now available across the vendor's complete range of Unix systems. Prime has also extended its EXL MBX Unix-based product line with the EXL MBX 486. The system uses an Intel Corp. 1486 processor, supports as many as 74 asynchronous connections and offers up to 64M bytes of memory. Pricing starts at $15,900.

Sybase, NCR plan port

Sybase, Inc. and NCR Corp. said last week that they will work together to port Sybase's SQL Server database engine to NCR's 3600 and 3700 Unix machines. The NCR computers, based on the Intel 1486 chip, run Unix System V, Release 4. Sybase will be porting Release 4.8 of its relational DBMS to the NCR machines, a version that supports symmetrical multiprocessing but has not been shipped to end users. The Sybase SQL Server was previously available for some low-end MS-DOS NCR machines.

Portable lines grow

NEC Technologies, Inc. added an Intel 80286-based notebook, the Ultralite 286F, to its product line last week. The 12-MHz 286F weighs 6.8 pounds, has a battery life of 3½ hours and has an IBM Video Graphics Array-compatible screen. The machine is available now and retails for $2,999. Meanwhile, Fora, Inc. in San Jose, Calif., released a $4,995 laptop based on Intel's 20-MHz 80386 chip. The new machine, called the LP-386C, weighs 14 pounds, comes with 2M bytes of memory expandable to 8M bytes and a 40M-byte hard drive.

Low-end VAX 4000 due

Digital Equipment Corp. will add a low-end model to its VAX 4000 line this week, along with the first model of a Vaxstation 4000, company officials confirmed. Priced under $35,000, the VAX 4000 Model 200 will support 10 users. An upgrade to the Vaxstation 2000 line will add X Windowing terminal capabilities, while a later release of the X Window System upgrade will bring that ability to older Vaxstations as well.

Galvin chairs Sematech

You can still call him 'Mr. Chairman,' but say it twice: Motorola, Inc. executive committee Chairman Robert W. Galvin was elected chairman of the board last week at Austin, Texas-based semiconductor research consortium Sematech. Galvin, 51, spent three decades at Motorola's helm. He replaces National Semiconductor Corp. Chief Executive Officer Charles Sporck, who will remain a Sematech board member.

More news shorts on page 83

IS exec charts his own course

Mellon Bank's IS Chief DiNardo resigns his post to pursue new interests

BY CLINTON WILDER
CW STAFF

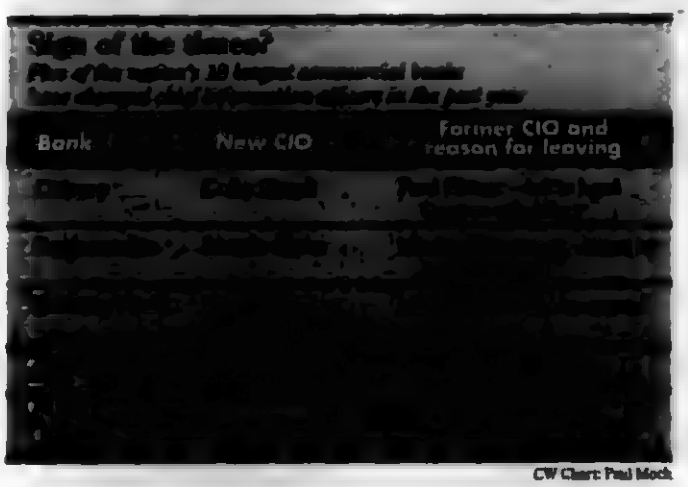
PITTSBURGH — Can a 21-year information systems veteran turn into an outsourcing entrepreneur? That is one of many questions George P. DiNardo is pondering after announcing his surprise resignation earlier this month from the top IS executive post at Mellon Bank Corp.

DiNardo, one of the IS community's most outspoken and colorful members, said he left to pursue a new interest — he just has not yet decided what that interest will be. The possibilities include starting an outsourcing firm, consulting or continuing in IS management as chief information officer at a new company. "There is nothing that's a boundary," DiNardo said.

DiNardo, 53, resigned as executive vice president of information management and research. His former boss, Keith Smith, vice chairman of service products, will run IS at Mellon until a replacement is found. A bank spokeswoman said the search will include both inside and outside candidates.

Although DiNardo said he left on good terms, industry sources speculated that he may have been stymied by senior management on some technology efforts. "George is one of the most capable technology guys around, and Mellon's environment right now is anything but 'let's foster technology,'" said banking IS consultant M. Arthur Gillis, president of Computer-Based Solutions, Inc. in New Orleans.

Before DiNardo's departure, he was aggressively expanding Mellon's business selling IS services to other banks and some customers in other industries.



CW Chart: Paul Mock

DiNardo recently hired R. Scott Thiessen, a former regional manager at IBM, to head up marketing for outsourcing services.

Mellon sold such services to smaller banks for many years before the current outsourcing trend took off. Last fall, Mellon scored a major win in outsourcing when Dollar Dry Dock Bank of New York, a $5 billion bank, signed a six-year contract for Mellon's outsourcing services.

DiNardo stressed that no matter what his next move is, he feels it is time for a change. "Some people have told me I'm nuts, but this was the last shot I had," he said.

The news caught DiNardo's longtime colleagues by surprise. "It just happened so quickly," said 30-year Mellon veteran David A. Moore, senior vice president of information processing.

"George provided the technology leadership that has taken us to our current position," Moore said, adding, "It has been a long, good relationship."

HP and CA team up on Unix effort

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — In the computer industry's latest marriage of convenience, Hewlett-Packard Co. and Computer Associates International, Inc. said last week that they will jointly develop Unix software for HP systems.

CA also said it has joined Unix International and the Open Software Foundation (OSF).

The development deal calls for HP and CA to work together on systems management, database and applications software. Neither party would release financial details of the arrangement, saying only that it calls for a commitment of technical expertise and personnel and for some money to change hands. Although both parties will market the software, CA will sell it.

The agreement was characterized by industry watchers as one that is likely to benefit both companies. It gives CA a broad-based entry into the Unix market and a new customer set and provides HP with mainframe-class systems management solutions to woo large commercial users to its 9000 series. The HP 3000 series is not included in the agreement.

"It makes sense," said Myron Kerstetter, an analyst at Gartner Group, Inc. in Stamford, Conn. "It moves to HP a set of technologies they're not building themselves, and it gives CA some new life potential."

Another observer agreed. "HP needs this stuff," said David Card, an analyst at International Data Corp. in Framingham, Mass. "This will provide mainframe-style systems management solutions for its distributed Unix systems."

What is the deal?

The deal means "Unix can compete with proprietary systems for [on-line transaction processors]," said Dean O. Morton, HP's chief operating officer.

The first phase of the agreement involves systems management tools for the HP/UX operating system to be delivered within the next 12 months. These include such tools as packages for tape and disk management, automated production control, security, data center administration and performance management and accounting.

These will mirror CA's existing packages on IBM mainframes and Digital Equipment Corp. machines. "The Unix software will be fully integrated into our products," said Charles Wang, CA's chairman and chief executive officer.

After the systems software has been delivered, HP and CA will work on HP/UX versions of CA's IDMS and Datacom database management systems and possibly a stand-alone database system for HP/UX. In addition, there will be a suite of business applications, including accounting, manufacturing and human resources.

Still, the implementation could be a bit tricky. HP has announced it will adopt the OSF's OSF/1 operating system as its base during the next few years. Both companies promised a more detailed schedule of what they will do and when by mid-year.

CA already sells two Unix graphics packages — Disspla and Intelligraf — in the scientific market, and last September, it announced it is working on Unix versions of its IDMS and Datacom database systems.

Finance review forces Informix to reduce work force, projects

BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — Informix Software, Inc. said last week that it expects to report at least three losing quarters for 1990 after restating its revenue and earnings in accordance with a revised revenue-recognition policy. The relational database management system company also did some internal restructuring, slashing 200 of 1,300 jobs and cutting back on marginal projects.

Informix Chief Executive Officer Phil White said the move came because the financial community was concerned about the firm's cash flow, which was reported as $145 million in 1989. Under the new rules, White does not expect profitability to return "any sooner than the second quarter."

Informix has virtually no direct sales force, relying instead on sales from a network of 2,000 value-added resellers, OEMs and distributors, which are also facing difficult economic times. As a result, accounts receivable stretched to 200 days instead of the preferred 90 days.

"We were basically financing our customers," Informix founder and Chairman Roger Sippl said. "We were signing contracts that recognized revenue within 12 months of the signing of a contract. That is typical of our market segment, but it's certainly way longer than the 30 to 90 days typical for most business transactions," he added.

The restructuring cost is expected to run to $6 million, not including the one-time 1990 charge caused by restating the firm's cumulative revenue since its inception 10 years ago.

White said the company had shifted nearly all of its customer support activities to its Menlo Park headquarters and had cut back on several research and development projects.

Users of Informix's office automation software, including the Wingz spreadsheet package, will now have to pay maintenance fees to receive telephone support.

A project that would have moved the Informix RDBMS to Digital Equipment Corp.'s VMS operating system was cut, along with one to develop some new natural language user interfaces.

The layoff of 200 employees comes two years after Informix laid off 110 workers — about 10% of its work force — following its merger with Innovative Software, Inc., in Lenexa, Kan.

IS holds steady during recession

BY CAROL HILDEBRAND
CW STAFF

The U.S. government has finally acknowledged a recession, but for most IS organizations, the budgetary fat-trimming has been going on for several years. For them, it is business as usual.

A report released by Input, a Mountain View, Calif., research firm, examined responses from approximately 100 companies spread throughout 13 market sectors on the impact a possible recession would have on information systems.

"For the most part, we did not find IS groups reacting significantly to the threat of a recession," said Doug Tayler, director of research. "Corporate IS has been under the budget eye for three years, and '91 might be another year like the last three, only just a little tougher."

Tayler said that given the current economic situation, he was surprised to find that 78% of the respondents lacked some sort of built-in contingency plan. "It's not as organized as it might have been in the early '80s," Tayler said.

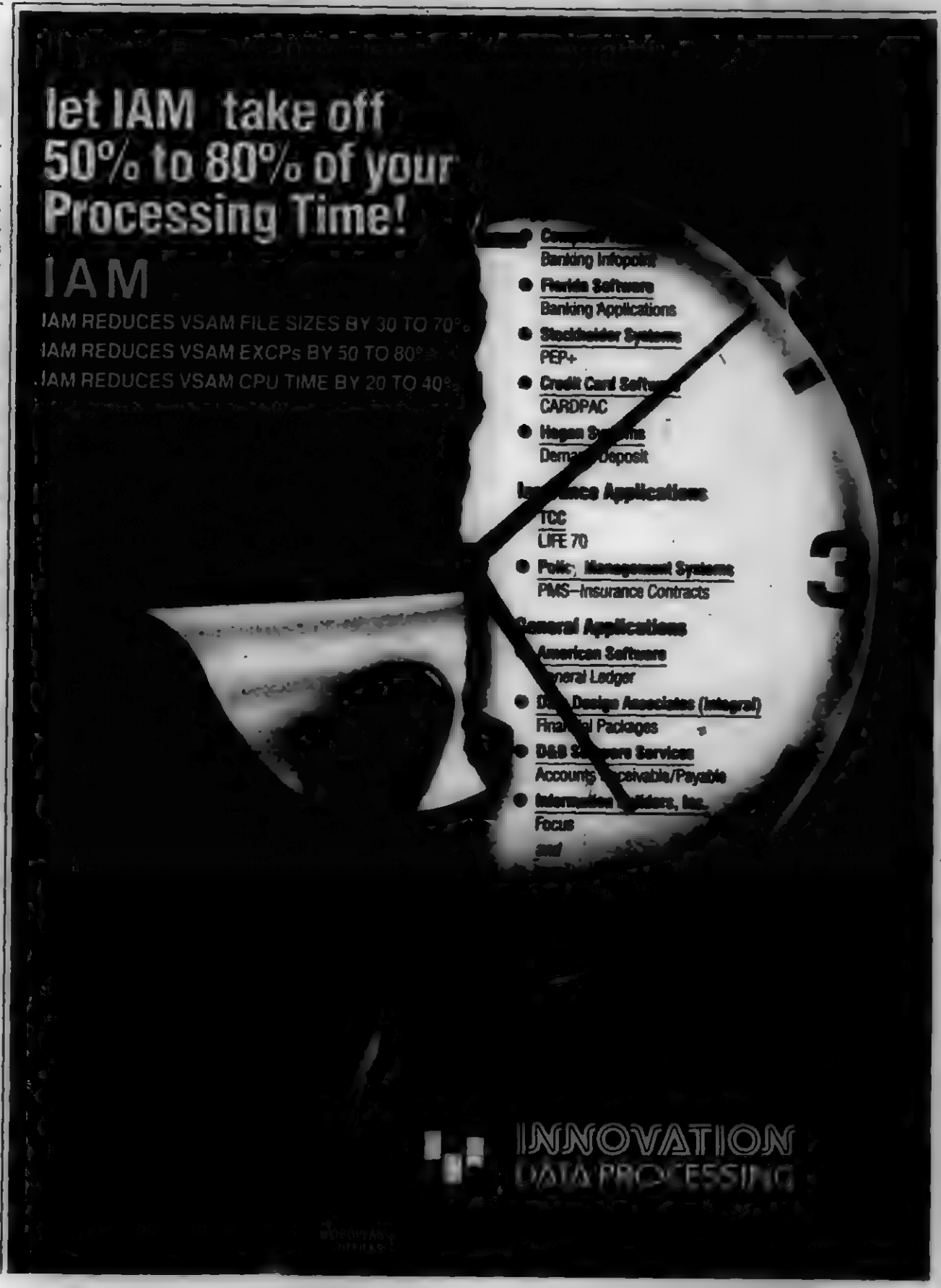
Stretching dollars, resources

At Southern New England Telecommunications Corp. in New Haven, Conn., some of the belt-tightening has come as a boon. Raymond Fletcher, general manager of information systems and technology, said his staff has been cut by a little more than 20% during the past three years.

Fletcher said that while the budget was remaining flat, he thought his staff was taking advantage of new tools to do more work on the same budget. He also said he makes the dollars stretch by getting resources from other parts of the company. For example, he has about 50 "vendor" programmers — employees who are supervised by his staff but paid for by other segments of the company.

Tayler said there has been enough concern in IS groups that it is beginning to affect prioritizing of application development. "Given recession pressures, there's a preference to get a fewer projects farther along," he said, adding that operating systems were frequently targeted for speed while administrative projects tended to land on the shelf or, in a few cases, were canceled.

Fletcher said he is not postponing any projects yet, but that will be the next step if the economy worsens.



IBM wary despite 1990 success

BY NELL MARGOLIS
CW STAFF

Although IBM last week reported double-digit revenue and profit surges for both the year and quarter ended Dec. 31, Chairman John Akers chose to look beyond the bottom-line rebound and focus on more worldly issues.

"For the future, I know we all hope for a rapid end to the fighting [in the Middle East], as few casualties as possible and quick restoration of an enduring peace," Akers said.

Fourth-quarter revenue of $23.1 billion marked a 12.7% increase for the firm. Quarterly net income climbed 316% from $591 million in last year's comparable period to $2.5 billion — an impressive leap, according to analysts, even considering that last year's comparable quarterly net income was depressed by a huge onetime restructuring charge.

Product sales, which rattled Wall Street by decreasing year-over-year last quarter, rebounded this quarter, increasing 8%.

Annual profit rose 60.2% to $6 billion, on revenue up 10.1% to $69 billion. Revenue from international operations, totaling $41.9 billion, was up 13.3% over last year — the first time in IBM history that non-U.S. revenue growth has surpassed growth in U.S. sales.

Despite the upbeat financial picture, Akers injected a note of caution. "Clearly, we are dealing with very uncertain conditions that are affecting our markets and economies worldwide," he said.

Robert Djurdjevic, president of Phoenix-based Annex Research, also warned against taking "this truly spectacular quarter as guidance for 1991."

"IBM's earnings were right about what we expected," said Jay Stevens, an analyst at Dean Witter Reynolds, Inc. "Their product comments, ditto. I share their concern with regard to the worldwide economic crisis."

"My one reservation is that I'm still not real happy with their cost and expense level," said Martin Ressinger, an analyst at Duff & Phelps, Inc.

However, he said he was heartened by the fact that IBM clearly shares that concern. Addressing analysts in a teleconference last week, Ressinger said, IBM director of investor relations Jim Clifford "told us, 'We're on a headcount vendetta — this is an ongoing thing.' "

In other earnings news, Microsoft Corp. reported a 53% increase in revenue, to $460 million, compared with the same quarter a year earlier. Profits were up 52%, to $112.9 million.

Microsoft officials said international revenue accounted for 55% of the total sales of finished goods. Additionally, the company said, more than two million copies of Windows 3.0 have now been distributed.

Apple Computer, Inc. reported fourth-quarter earnings up 21% to $150.5 million, on revenue of $1.7 billion — a 12% increase. Chairman John Sculley credited the well-received introductions of the Macintosh Classic, Macintosh IISI and Macintosh LC for the increases.

One analyst took a more cynical view. David Wu at S.G. Warburg & Co. said Apple looks "terrific in the comparison" to disappointing results one year earlier.

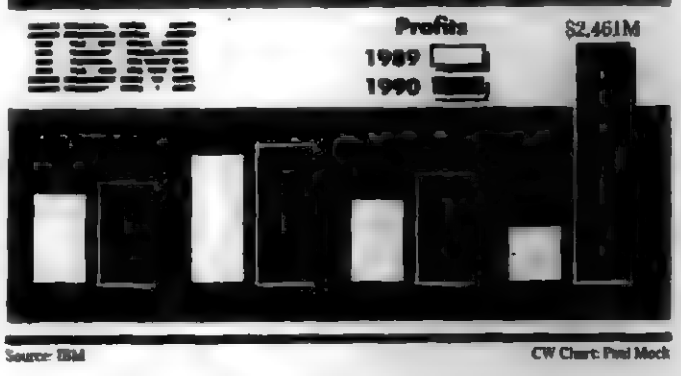
As forecast by analysts [CW, Jan. 14], Intel Corp. bucked the problems besetting many of its competitors in the semiconductor sector to log impressive quarterly and annual increases. Intel's $1 billion quarterly revenue and $164 million net income marked respective 17% and 34% rises. For 1990, the company posted revenue of $3.9 billion, up 26%, and net income of $650 million, up 66%.

On-line transaction processing player Tandem Computers, Inc. saw quarterly revenue edge up 2% to $443.8 million, as worldwide economic woes diluted the effects of cost containment.

Tandem's quarterly profits plummeted 77% to $7 million.

What a difference a year makes

With revenue of more than $69 billion in 1990, IBM profits tallied up to a solid $6 billion



Source: IBM
CW Chart: Paul Mock

DEC surprises Wall Street analysts

Despite success, questions remain on research and development cutbacks

BY NELL MARGOLIS
CW STAFF

MAYNARD, Mass. — A collective sigh of relief from Wall Street was almost audible last week as Digital Equipment Corp.'s fourth-quarter earnings met and beat analysts' expectations.

Analysts conceded that DEC's $11.1 million net income for the quarter ended Dec. 31 — down 28% from the figure logged in the comparable 1989 period — is not the stuff that raves are made of. Neither, they said, would the firm's 5.3% revenue rise to $3.35 billion usually spark such celebration. "The thing is," one analyst said, "we expected so much worse."

"I wouldn't say that DEC is out of the woods yet," said Marc Schulman, an analyst at UBS Phillips & Drew, "but it's out of the heart of the forest. I think in the past months we've seen the fundamental bottoming-out of DEC."

Encouraging remarks

More than from the bottom-line numbers, Schulman and others said, analysts drew encouragement from remarks made by DEC Senior Vice President of Operations Jack Smith during a teleconferenced briefing on the earnings report and from specific line item results that augured well for quarters to come.

While hardware revenue declined 1%, the company logged a 16% growth in software and services — the area in which DEC has repeatedly staked its future. Moreover, Labe, Simpson, Inc. analyst Jean Orr said, "Smith led us to believe that this is sustainable growth."

Also heartening, Orr said, were signs that DEC's cost-control initiative is having some effect. Quarter-to-quarter figures, Orr said, showed research and development expenses "basically flat for the past four quarters." Services, general and administrative (SG&A) expenses, "where the pressures are more difficult to control, showed relatively small quarter-to-quarter increases — another hopeful sign," Orr said.

Some analysts questioned the long-term prudence of DEC's selecting R&D expenses as the costs to contain. Nevertheless, they applauded the short-term implications.

"They've got to start holding the line somewhere," said John B. Jones Jr., an analyst at Montgomery Securities. "I'd rather see them get more aggressive on SG&A instead, but what can you say? A start is a start."

Users not worried

Users, too, appeared willing to give DEC the benefit of the doubt on R&D. "I would be very concerned if holding back on R&D in order to cut costs stopped research that leads to new products or to product upgrades," said Sho Itomura, section head in charge of computer operations at the Honolulu Board of Water Supply, a VAX user site. "But I haven't seen any decrease in DEC's support or products over the past year. I'm not worried at this point," Itomura added.

DEC's product plans could well render the question moot, analysts noted.

"DEC has set itself a rather ambitious development schedule," said Martin Ressinger, an analyst at Duff & Phelps, Inc. "It's difficult to see how the company can hold the line on R&D and still roll out everything they say they will, when they will."

Can the company hold the line on R&D? According to Jones, "not if they want to be Masters of the Universe."

Relief value

DEC closed out its second quarter with profits that exceeded expectations

digital

	Revenue	Income
Q3 '90	$3.26B	$24.9M
Q4 '90	$3.37B	$(256.7)M
Q1 '91	$3.09B	$26.2M
Q2 '91	$3.35B	$11.1M

Source: Digital Equipment Corp.
CW Chart: Doreen St. John

Wang addresses memo, squelches layoff rumors

BY NELL MARGOLIS
and SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. officials downplayed last week the existence of an internal memo confirming an upcoming 500-person work force cut.

Chief Executive Officer Richard Miller issued the memo to stanch a flood of rumors of massive layoffs about to hit Wang "in numbers that far exceeded anything that was actually going to happen," a spokeswoman said.

Wang officials maintained that the layoff of 500 employees over the next several weeks is not a new program but part of an ongoing one announced in late 1989 when Miller took the helm of the then-foundering firm.

Wang users appeared unruffled by the prospect of the coming round of layoffs, with some vowing loyalty to the vendor.

However, users were less than unanimous in declaring Wang's "Operation Customer" a success. In addition, statements contained in Miller's memo failed to reassure analysts, some of whom questioned whether Wang's recently regained toehold on profits and customer confidence can withstand the battering of recession and war.

Despite progress on product commitments, Wang "still has spotty and inconsistent quality in field organizations around the world," said Barbara Babcock, an analyst at Gartner Group, Inc., a Stamford, Conn.-based market research firm. Wang still has work to do, she said.

On a positive note

Jay A. Martus, an attorney and Wang user in Miami, said he has no complaints with the vendor. "They have been really terrific, especially the research and development staff," he said. Martus added that Wang is now sending consultants and systems analysts on sales calls, which he said makes a difference in the quality and accuracy of customer orders and installations.

Clem Kichuk, vice president at longtime Wang user site Marketcorp Systems, Inc. in Westport, Conn., backed Wang, saying, "Wang has awakened to the fact that you can't walk away from a lost sale without evaluating why the opportunity was lost."

However, David Wilson, vice president of data operations at Citizens National Bank in Evans City, Pa., took a dim view. "It's more and more difficult to get software support, particularly when it concerns the operating system," he said. "We had an operating system problem that caused our system to halt daily for seven months. There just weren't people available that knew how to fix it."

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Ashton-Tate Dbase appeal falls flat

BY JAMES DALY
CW STAFF

TORRANCE, Calif. — Ashton-Tate Corp.'s first attempt to reverse a court decision that stripped it of the copyright to its flagship Dbase product line fell flat last week when the federal judge who issued the initial ruling said he would not reconsider his verdict.

Ashton-Tate officials said they were "disappointed but not surprised" by U.S. District Judge Terrence J. Hatter Jr.'s refusal to reconsider his Dec. 13 ruling, which dismissed an infringement claim against Fox Software, Inc. The company said it would file a notice of appeal with the 9th Circuit Court of Appeals in Los Angeles. The appeals process typically takes approximately 18 months, an Ashton-Tate spokeswoman said.

In dismissing the 2-year-old case, Hatter ruled that when Ashton-Tate filed for its original Dbase copyright, it neglected to disclose that the program was a derivative of the Jet Propulsion Laboratories Document Information System (JPLDIS), a public-domain application developed at Jet Propulsion Laboratories in Pasadena, Calif.

Ashton-Tate President William Lyons claimed there was no deliberate intent to mislead the copyright office. Lyons also maintained that the copyright office would still have issued the application even if the JPLDIS had been mentioned.

Ashton-Tate officials claimed that as long as the case is being adjudicated, their products remain protected by license agreements under which users agree not to make copies except for backup purposes.

Separately, Ashton-Tate last week said it began shipping a version of Dbase IV for Sun Microsystems, Inc. computers that will sell for $995.

Tandem adds to 800 series

BY JEAN S. BOZMAN
CW STAFF

CUPERTINO, Calif. — Tandem Computers, Inc. drove the performance of its midrange CLX computers 40% to 50% higher with the addition of a new high-end 800 series of CLX machines last week.

At the same time, the company added support for X.400 networks to its Unix computers and Tandem-proprietary Guardian systems, allowing the transfer of data, text and images.

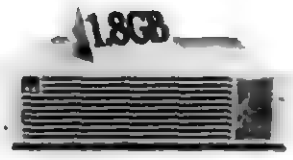
The CLX 800 computers range from two to 16 processors and include from 32M to 512M bytes of main memory, said Richard Hellyer, product marketing manager for Tandem's systems products. New 1-micron CMOS chips are 40% to 50% more powerful than chips used in the 18-month-old CLX 700 series.

Some industry analysts said they believe Tandem is positioning the CLX for a long-range upgrade path, even at the expense of older VLX models.

"It looks like the CLX will definitely close in on the [price/performance of the] VLX machines, and it may come to be seen by users as a more strategic system," observed George Weiss, program director for midrange computers at Stamford, Conn.-based Gartner Group, Inc.

"Our upgrade from the CLX 700s was just a board swap," said John Howe, chief technical officer at Applied Communications, Inc., an Omaha banking systems integrator and a Tandem value-added reseller that was a beta-test site. "There was no need to regenerate the system, but we did have to shut it down for a few minutes to do the swap." Howe said the operating system automatically reformatted the address space to match the new memory size.

CLX 800s are priced from $125,000 to $965,000, depending on configuration.



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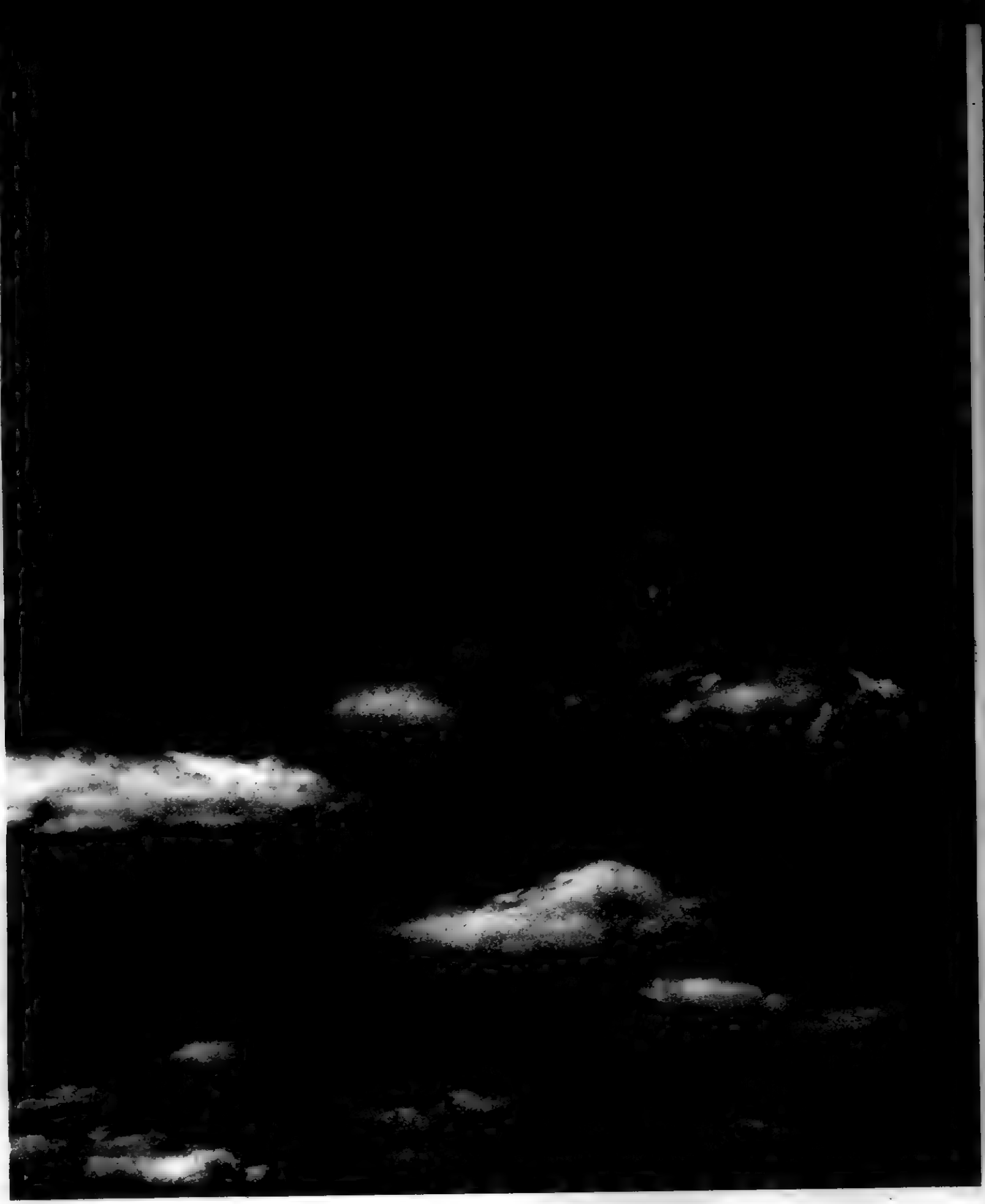
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HEWLETT PACKARD

VDT

FROM PAGE 1

and emphasize quality as well as quotas.

For example, Memphis-based Federal Express Corp. has a people-oriented VDT monitoring policy that is widely supported by the company's customer-service agents, according to studies by Alan F. Westin, a consultant and a professor at Columbia University in New York.

"Federal Express provides a practical model of adept and successful management of VDT use even in a cutthroat national and international competitive setting," Westin said.

However, firms known for their fair work-monitoring practices, such as Federal Express, IBM, Merck & Co. and American Express Co., seem to be in the minority, he said.

"It's a real mixed bag out there. Some companies do it very well, and some do it lousy," said Rebecca Grant, assistant professor of information systems at the University of Cincinnati and author of the forthcoming book, *Silicon Supervisors: Computer Monitoring in the Service Sector*.

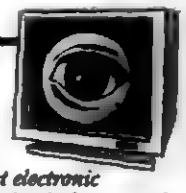
Computer monitoring is widespread in businesses employing data-entry clerks, reservation agents, insurance claims processors and customer-service agents. Typically, the software for processing these transactions includes, as a by-product, monitoring utilities that compile statistics about each terminal hooked to the host computer.

Fear of monitoring

For example, many insurance companies are installing imaging systems that include "work-flow software." At ITT Hartford's claims office in Pittsburgh, workers initially feared Big Brother-style monitoring with the installation of a Wang Laboratories, Inc. imaging system, but "we assured them that it was an evaluation tool to be used for personal work-flow changes," said Robert R. Lukas, assistant vice president of information services.

United Services Automobile Association has more than 2,000 employees working on an IBM Imageplus system with electronic monitoring.

"Employees tell us they love it," said Charles A. Plesums, senior director of image technology. Before imaging, workers had to rummage through stacks of paper to sort and arrange assignments, but the work-flow software "produces one document at a time and decreases the feeling of being overwhelmed with work," he said.



When someone is watching

A 1990 survey of 762 VDT users at telephone companies indicated that electronic monitoring increased the level of stress and stress-related pain

(Percent reporting complaints)

Complaints	Monitored	Non-monitored
High tension	83%	67%
Exhaustion	77%	63%
Neck pain	69%	41%
Sore wrists	51%	29%

Source: University of Wisconsin at Madison and Communications Workers of America

CW Chart: Paul Merck

The software produces more accurate measurements of performance and assures employees that "promotions and raises do come to those that are most productive," Plesums added.

Experts said employee reactions to computer monitoring are influenced by a variety of factors, including perceptions of how fair, accurate and appropriate the monitoring is.

Grant, who studied 1,500 employees in Canadian service firms, provided the following monitoring suggestions for management:

- Monitor only those important-but-routine tasks that can be quantified, and monitor them on a regular (rather than spotty) basis to fairly capture peaks and valleys in the work flow.
- During performance reviews, discuss the quality of the individual's work in addition to the productivity figures. Many supervisors are guilty of over-relying on the monitoring data.
- Employees should have a role in designing the monitoring program or have a thorough understanding of its design and use. They should be able to review the data and correct errors.

Some companies post individual performance data on bulletin boards, thinking this will motivate less-productive workers and reward higher producers. However, public displays are more likely to demoralize the laggards and prompt co-workers to ostracize the performance leaders, Grant said.

Hazardous to health

Besides being a morale issue, computer monitoring is also a health issue. Telephone operators subjected to electronic monitoring reported more stress and stress-related aches and pains, according to a study conducted by researcher Michael J. Smith for the Communications Workers of America.

"The reliance on electronic monitoring is almost forcing managers to manage poorly in terms of human relations. I question the assumption of managers that monitoring creates a more productive work force," said Smith, chairman of the industrial engineering department at the University of Wisconsin at Madison.

Grant cautioned that the issue of stress needs to be put in perspective. "People who are monitored are more stressed, but that is by no means the only cause of their stress. Some jobs are extremely stressful, and they just happen to be the kinds of jobs that are easier to monitor," she said.

Staff writer Sally Cusack contributed to this report.

Monitoring malaise

Legislation to regulate electronic monitoring — which includes computer monitoring as well as monitoring of customer-service telephone calls — has been introduced in several states and in the U.S. Congress, but it has not come close to passage.

"Policymakers generally like to see if the marketplace or technology will solve the problem," commented Robert Ellis Smith, publisher of the "Privacy Journal" newsletter in Providence, R.I.

However, one of the biggest critics of electronic monitoring, the Communications Workers of America (CWA), hopes that situation will change as a result of new studies showing the adverse health effects of monitoring.

David E. LeGrande, the CWA's director of occupational safety and health, said that the recent CWA study of telephone operators, as well as a forthcoming study from the National Institute for Occupational Safety and Health, "will give us a lot more muscle in the legislative process."

LeGrande said he also hopes to generate some data showing that curbing electronic monitoring actually reduces a company's health care costs. "When we get good cost data, which shows the benefits of eliminating these archaic monitoring systems, then it will be an easy decision for legislators," he said.

MITCH BETTS

Virtue triumphs

Back in 1983, Federal Express developed a remarkably comprehensive agenda for its VDT work policies — one that a majority of U.S. firms have yet to embrace, according to Alan F. Westin, a consultant and professor at Columbia University. Issues on the agenda, ranging from ergonomics and stress reduction to electronic monitoring, were given high priority for implementation throughout the 1990s.

But there was a time in 1985 when the company's "people-first" philosophy was in jeopardy. In an effort to cut costs and boost efficiency, the manager of customer service in Memphis set out to reduce the "average handle time" for customer-service calls and decided to base 50% of each employee's performance rating on this point.

The result was an increase in employee discontent and stress-related health problems, Westin said. When the problem was reported to Chief Executive Fred Smith, he ordered corrective actions that included a new performance-evaluation system, developed with input from employees, that is weighted 80% toward quality service and only 20% on work statistics.

The moves restored employee morale and — "as though to prove that virtue sometimes triumphs" — the average handle time at the Memphis center dipped below the level sought by the more coercive program, Westin reported.

MITCH BETTS

DEC improves its image

BY ELLIS BOOKER
CW STAFF

PHOENIX — Digital Equipment Corp. took steps to raise its visibility in the document-imaging marketplace last week, introducing its first preconfigured imaging product.

Although DEC has had an architecture encompassing imaging since 1984 and software development tools for imaging since 1989, it did not have a commercial package to sell. The omission, analysts said, has put the company behind other computer companies such as Wang Laboratories, Inc. and Unisys Corp.

Meanwhile, DEC and two other vendors at the IDC/Avante conference last week used the occasion to announce support for Microsoft Corp.'s Windows 3.0 environment. Wang and Filenet Corp. said they will use Windows 3.0 as the interface on the desktop. DEC will support it through a third party.

Meanwhile, the few users at the meeting were repeatedly urged to view the big picture and consider imaging applications as part of a department- or companywide flow of information. The future, speakers said, belongs not to imaging per se but to the work-flow software that will control its processing.

Targeting the midsize department of five to 20 users, Decimage Express can use either the VAX or the DEC Ultrix Unix platform as a server. DEC will use the Plexus XDP software from Recognition Equipment, Inc. to run on Ultrix. For the client, Express can use a variety of workstations and terminals under the Decwindows interface.

The Decimage Express software license is $5,000 per concurrent user.

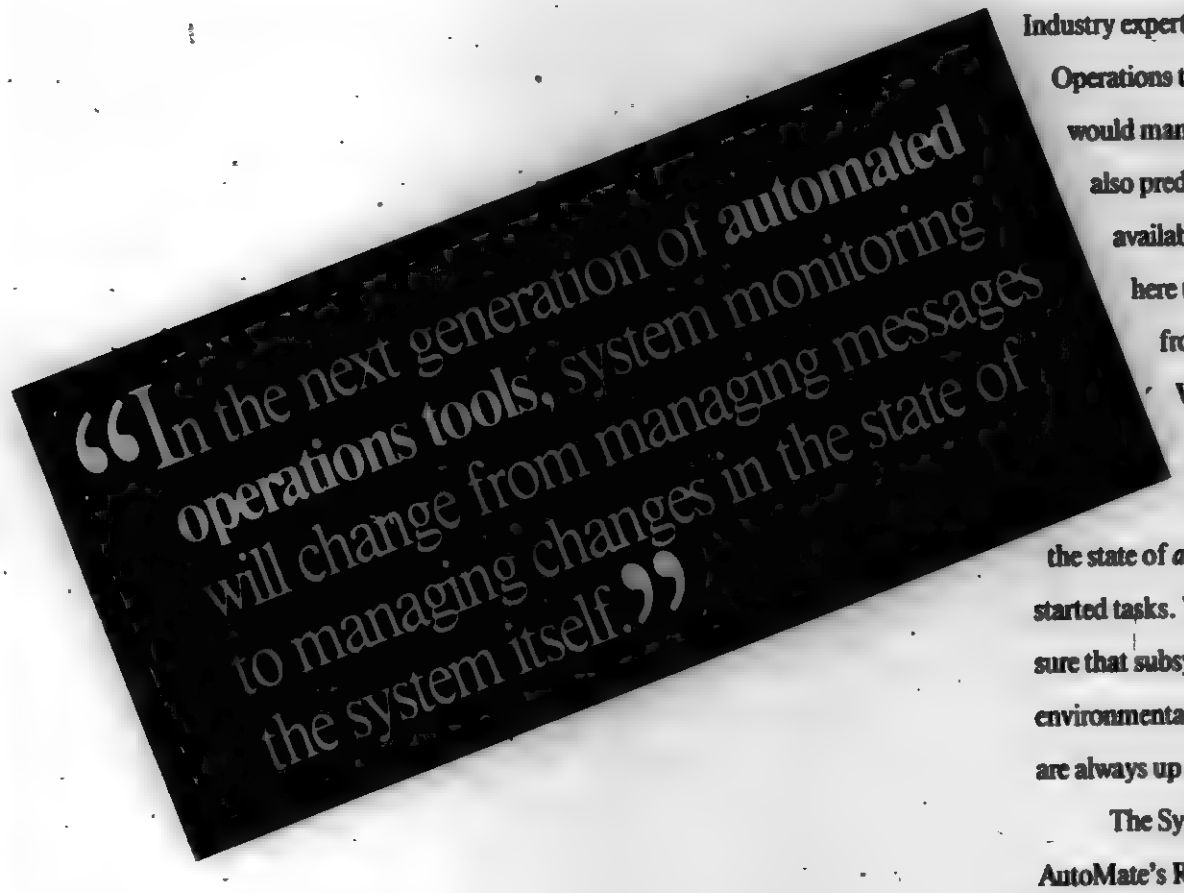
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IBM, HP to support Transarc

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — IBM, Hewlett-Packard Co. and other vendors said last week they will adopt a start-up firm's distributed transaction processing monitor throughout much of their product lines. However, the computer companies said, actual implementations of the monitor are about two years away.

The as-yet-unnamed monitor is based on the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) and is being developed by Transarc Corp. in Pittsburgh. The monitor will allow proprietary and Unix-based computers to run distributed, transaction-intensive applications, according to Transarc.

Besides IBM and HP, other Transarc backers include Stratus Computer, Inc., Informix Software, Inc., Ingres Corp., Independence Technologies, Inc., and JYACC, Inc. Also, Digital Equipment Corp. is "in negotiations" to use at least a portion of the technology, Transarc President Alfred Z. Spector said.

John Rymer, senior consultant at Patricia Seybold's Office Computing Group in Boston, said Transarc's product could make developing distributed on-line transaction processing (OLTP) applications easier and less expensive for both users and vendors because the base technology would already be in place.

"Today, much of this work is custom, and this [announcement] could lead to more generally available distributed OLTP software," Rymer added.

However, this scenario is at least a couple of years away from becoming a reality. Transarc is not shipping its monitor technology commercially yet. One reason is that it requires DCE, and the OSF is not scheduled to ship that until June.

IBM will incorporate the Transarc scheme into its proprietary systems and its Unix-based products, said Mike Sarianga, assistant general manager of systems structure and management at IBM's Programming Systems Group. "We view the DCE and Transarc services as an excellent base for future AIX on-line transaction processing software," he said.

Stratus and HP will also incorporate the Transarc monitor into their systems. In HP's case, it is expected to appear on both the 9000 and 3000 series systems within approximately two years.

At the heart of the monitor technology are three core elements: a transactional remote procedure call, which allows different computers to communicate; a distributed transaction service to coordinate multiple networked servers; and Transactional C, to provide interfaces for programmers.

"I HAVE TO FREE $750,000 FROM MY DATA CENTER BUDGET NOW..."

A USER'S CHALLENGE:

The director of computer operations at one of the nation's best-known on-line service companies had a serious problem last Fall. He had production-crippling paging problems, degrading response times on 1,000 3270 PCs, and a mandate to update five mainstream applications. He had enough budget to upgrade his System/3090 Model 200 to a 300E, but was still $750,000 short of his needs. His quick solution: STOR/9000 central and expanded memory from Cambex. He replaced and doubled original memory with Cambex STOR/9000 memory and had his answers: no paging problems; 3270s that fly; development going full blast. Once it's installed, users don't think about Cambex memory. They only think about the opportunities it gives them. Ask your Cambex sales representative for more information about this customer.



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Focus/EIS to target desktop

BY CAROL HILDEBRAND
CW STAFF

In a move that analysts predicted would shore up weaknesses in each component, Pilot Executive Software and Information Builders, Inc. unveiled plans last week to bundle key products to create Focus/EIS for Windows.

The package is made up of Lightship, Pilot's Microsoft Corp. Windows 3.0-based executive information system (EIS) for personal computers and local-area networks as well as a dynamic data exchange that links the system to PC/Focus, Information Builders' application development and decision support system.

Mainframe-based databases such as IBM DB2 and Information Builders' mainframe-based Focus can be transparently accessed as well, the companies said.

A perfect match

"I think it's a really nice marriage of products," said Ronni Marshak, editor in chief of the "Office Computing Report" at Patricia Seybold's Office Computing Group. "It gives Focus the front end that's easy to use and works on the Windows desktop, and it gives Lightship users access to multiple databases with a single product."

Users can use hot buttons and drill-down capabilities to access more detailed layers of data across multiple databases, a function that Bryce Segar at Infinity Data, Inc., a consultancy in San Antonio, said would add to the intelligence of the data. "It was something we couldn't do in Focus before," he said.

One weakness of the product is a lack of analytical abilities, according to analysts. "Lightship doesn't [give] full decision support," Marshak said. "The artificial intelligence aspects aren't there."

Focus/EIS could also present competitive problems for Pilot, said Cliff Conneighton, an analyst at Gartner Group, Inc. who predicted Focus/EIS for Windows would bump sales from Command Center, Pilot's mainframe-based EIS.

However, Marshak disagreed, saying that Command Center is targeted at a more traditional executive base and that as executives become more comfortable with technology, the need for such structured, preplanned systems would fade.

The companies said that Focus/EIS is scheduled for availability in late February and will sell for $895.

ADVANCED TECHNOLOGY

TECH TALK

It's Nice for Sequent

■ Sequent Computer Systems, Inc., in Beaverton, Ore., said recently that it plans to open a European development center this month in Sophia Antipolis, near Nice, France. The new center will initially focus on developing and distributing open systems-based communications software for the company's Symmetry series of computers. Later, the center will develop object-oriented database application software designed for a multilingual customer base.

Smart forms software

■ Researchers at Bellcore in Morris Township, N.J., have developed experimental software designed to automate the entire process of handling business forms: selecting the appropriate form, filling it out, routing it for approvals and even signing the form. Superforms, as the new software is called, uses scanning and image-processing techniques to recreate realistic blank electronic forms from paper copies. Electronically produced forms are more efficient than paper forms, the researchers said. The software uses encryption techniques to ensure that forms or parts of forms are seen only by authorized users. Users can be given tamper-resistant smart cards that contain the keys for encryption and authentication and that can also be used to sign the card with a forgery-proof digital signature.

Super chip

■ Xsirius Superconductivity, Inc., a superconductivity microchip manufacturer in Scottsdale, Ariz., said it is testing a superconducting microchip designed to boost the power of radars and other ultra-high-frequency microwave devices from 10 to 100 times their normal capacity. The chip "will probably first be used in U.S. military applications such as radar-based telecommunications systems," said Christine Barksdale, Xsirius' vice president of operations.

An inside view of neural technology

Still in their infancy, humanlike networks may soon provide practical applications

BY MICHAEL ALEXANDER
STAFF



Jamie Hayes

See if you can spot a pattern in the following three examples.

• Scientists at the University of Toronto are working on a computer that can translate the movements of a gloved hand into speech. The project, called "Glove Talk," may one day enable those with hearing or speech impairments to communicate using a voice synthesizer.

• Scientists at the Oregon Graduate Institute of Science & Technology are giving a computer a course in the linguistic structure of speech. The English Alphabet Recognizer is a step toward teaching a computer to understand human speech.

• Scientists at Sandia National Laboratories are developing a computer that is able to pick out a target in a video image. In addition, the computer could eventually be used to pinpoint incoming missiles and help guide a counteroffensive.

The pattern? Scientists are working on applications that one day could enable computers to take on more humanlike qualities. What is less obvious is that all of the above applications are based on neural networks, a technology that imitates the human brain's ability to sort out patterns and learn from trial and error.

The brain v. the computer

A neural network is an information processing system that is modeled after the human brain's interconnected system of electrically activated neurons. The human brain's neurons — there are billions — are either on or off, and to that extent, they follow the binary logic of computers. One key difference is that a conventional computer works on a problem in sequence, one step at a time. The brain, in comparison, contains an intricate web of neurons able to divvy up a task and work on it simultaneously.

There are perhaps as many as 300 applications of neural network technology under development, ranging from neural computers adept at predicting the direction of the stock market to airport sniffers that are able to detect explosives, according to Tom Schwartz, president of The Schwartz Associates, a consulting firm in Mountain View, Calif., that specializes in neural networking. Schwartz predicted that the neural networking market, including systems and services, will exceed $1 billion by 1995.

Other experts are not so optimistic, however. The technology is still in its infancy, and large-scale commercial applications remain at least five years away from being put to use, according to some observers.

"It is a low period for neural net technology," said John Gilmore, who heads the artificial intelligence branch of the computer science information technology laboratory at the Georgia Institute of Technology in Atlanta. Funding from the U.S. government, the primary backer of research for neural networks, has dried up, and the work that continues has little real-world application, he said.

"A lot of people in the industry thought the application was ripe to solve real problems, but it is far too premature [to start deploying neural networks]," Gilmore said.

One problem with existing neural networks is that they have too few neurons and are thus unable to learn rapidly or respond quickly enough to be useful in most business settings. The experts believe that a practical neural computer requires a network of at least 1,000 interconnected neurons.

It is tempting to compare neural networks to human thought processes, but the comparison is "incredibly misleading," Schwartz said. "The neurons in the brain are doing hundreds of functions, while those in neural networks are doing three or four functions at the most."

Over the past year or so, several firms have either introduced or have announced plans to develop neural networking chips that promise to overcome learning and response obstacles.

Neural networks need chips on the table

"When enough people think technology is interesting, they start doing chips," said Tom Schwartz, president of The Schwartz Associates, a Mountain View, Calif. consulting firm that follows neural networking.

Although neural networks are still five years away from being used in a big way, some experts said, the race to develop neural networking chips is already on. During the past year or so, about a dozen companies, including Intel Corp., Adaptive Solutions, Inc. and Science Applications International Corp. have introduced neural networking chips or announced plans to develop them.

Though the first neural-network chip was introduced in early 1989, a commercial market for the chips is "still only a vague shape on the horizon," Schwartz said.

Work on neural networking chips is being fueled by a need to develop networks that are capable of learning and responding faster than is now possible, Schwartz said.

The majority of neural networks under development today are capable of executing 10 to 20 million connections per second. At that rate, it often takes several hours for a network to respond. For the technology to be practical, it must be able to execute at 2 billion connections per second or more, according to the experts.

Researchers at Sandia National Laboratories have developed a target-recognition system that runs at 2½ billion connections per second and can pick out a target from a digitized video image in four seconds — still too slow if the target is an incoming missile, however. The system will need to process 1 trillion connections per second.

MICHAEL ALEXANDER

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EDITORIAL

Is bigger better?

PERHAPS NO OTHER industry in history was born, grew so fast and then consolidated itself as quickly as the software industry.

From the time the federal courts ordered IBM to unbundle software from its turnkey systems in the 1960s, companies sprouted like buds in spring, grew at supersonic speed while their founders became instant paper millionaires and then began withering ever so quickly to the point at which many became easy takeover targets.

While this mayfly life span has been primarily confined to the large systems software companies, the driving forces behind the rapid evolution of today's large systems software market are really no different from those in the personal computer market, according to one who should know.

On the opposite page, Computer Associates Chairman Charles Wang draws a compelling sketch of an industry drawn into consolidation by the need to provide integrated software solutions to satisfy today's customer — apart from the one-shot wonders of just a few years ago.

Does his model apply to the PC vendors as well? Consider the tremendous difficulty encountered by the leading PC companies such as Lotus, Microsoft and Ashton-Tate in bringing more broadly integrated products such as the current versions of 1-2-3, Windows and Dbase to market. Were it not for their sheer size relative to their smaller competitors, their success surely would be in doubt.

And note that although Wang authored this accompanying piece, it could have been written just as easily by the brain trust at D&B Software or Legent, which have also grown quickly via the acquisition route.

The benefit of consolidation to the customer, they would each say, is in their disposition toward producing software that is increasingly platform-independent as well as integrated in form and function with their own and other vendors' applications and network offerings. The smaller companies, the argument continues, have had their day in the sun, and their innovative panaceas more often than not are incompatible with market demands.

To a great extent, the forces of consolidation and bigness are inexorable in the software industry. Is that good for the customer? Ask yourself this: Did the customer benefit from the aforementioned instantaneous competition to the IBM software near-monopoly in the 1960s? Didn't IBM, in fact, argue the merits of its prodigious size and how it relates to the customer?

The answer to the question of size and competition lies somewhere between quasi-monopoly and completely free and open competition. As long as customers cast their dollar votes freely, it's our guess there will be plenty of room for companies of all sizes producing a very broad menu of product offerings, with the benefits of companies both very big and not-so big improving the marketplace as well as keeping one another honest.



LETTERS TO THE EDITOR

Poorly charted

The chart on page 98 of the Dec. 17 issue of *Computerworld* is obviously intended to be a satirical demonstration of "chartjunk."

With sly humor, your artist takes pie charts, which are not very rich in information to begin with, and shows how to make them even poorer. Each row shows three percentages of the same total — which traditionally would be shown as three wedges of a single pie. By giving each individual percentage its very own pie, you achieve a staggering threefold data dilution.

Visual comparison is impeded by skillful use of clutter (little gray buckets, funny cigar-shaped lines and triple blue railroad tracks); by having color increase as percentage numbers decrease; and by subtle variations in the orientation of the wedges. Glance at the purple wedges next to "system engineering" and "OSI support." Quick — which was rated as more important?

Next year, use ray-tracing software to render those ornaments as round and shiny. Give each ornament multiple reflections of checkerboards, surrounding ornaments and teapots. Put it all on a graduated background shading from red to green. Give us a chart that is truly dazzling ("dazzle: to dim the vision, to blind with intense light, to bewilder").

Daniel P. B. Smith
Norwood, Mass.

Dialing for dollars

I would like to join NASA in refuting the *Houston Chronicle* article that claimed NASA lost $12 million from fraud on its private branch exchange (PBX) [CW, Dec.10].

The reported "facts" — and especially the loss figures — did not come from me. I repeatedly told the writer that I could not give "average" losses in PBX fraud cases because the size of the loss varies with factors such as the configuration of the system, the nature of its outdial capability, whether it permits international calls, the type of security and audit trails in place and even the identity of the long-distance carrier. While we did discuss several recent cases of corporate and government PBXs being compromised, I also pointed out that the Federal Telephone System does not bill like standard commercial service.

When the writer called, I told him I had *no* knowledge of the NASA incident, agreed to help him with background material on PBX fraud in general and referred him to other sources. When I saw the article, I was shocked by its inaccuracy: Nothing in it bore any resemblance to my "background" conversation with the writer.

Gail Thackery
Assistant Attorney General
Organized Crime and Racketeering Division
State of Arizona
Phoenix

For the records

I recently read an article titled "Chief publishing officer to the rescue" [CW, Oct. 22, 1990].

I do not want this reply to sound like a reprimand, but it struck me as to the number of ill-informed people there must be when it comes to information management.

In the article, the writer makes a point that information services and the printing facilities are at different ends of the spectrum, and a new position should be created to regulate information and documents in the organization called the "chief publishing officer."

To start with, the IS and printing facilities are not at separate ends of the spectrum. They are at the same end, and that end is the creation end of information and documents.

Where the author and others miss the beat is by not looking in their own organization for an existing position. In most organizations, there is already a position that controls, regulates and has a good understanding of the entire spectrum of information/document management, and this position is the records information manager.

The records manager of today is a skilled professional who has an extremely broad spectrum of knowledge so that he or she can make intelligent decisions in the company's document flow to protect its assets and money.

Carl J. Elsbree
Manager, Operations
Records Management Services
Xerox Corp.
Rochester, N.Y.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

No software solution is an island

CHARLES B. WANG



Since its creation in the late 1960s, the independent software industry has grown into a likely candidate for the most dynamic and enterprising industry of its time. A rapid succession of software breakthroughs has propelled the sophistication of automated information processing. Over the years, however, isolated software solutions have opened a Pandora's Box of incompatibility that must be sealed if information processing is to deliver salvation to the business marketplace in the 1990s.

The "one-off" solutions of yesterday originated in response to a number of factors: the requirements of the single hardware platform environments of the past, individual needs identified by end users and data processing professionals and the vendors' need to carve out identities for themselves.

In addition to niche solutions developed by vendors, users developed systems to address unique needs, adding to a myriad of data processing configurations and software solutions.

Guided by these sources, the computer software industry is driven by "breakthrough" technologies designed to address an ever-changing procession of new business problems. Many of these "breakthroughs," however, were mistakenly presented as panaceas, positioned as replacements for widely implemented technologies without regard to the money already invested by user organizations.

In the 1970s, for example, it was predicted that fourth-generation languages would replace all Cobol-based applications. Other examples of "panacea" technologies include relational and object-oriented databases.

As history has demonstrated time and time again, breakthrough technologies, while clearly beneficial, have only limited utility unless they can be integrated with existing solutions.

Integrated solutions

No longer can businesses succeed with detached solutions intended to solve isolated problems. A single application that offers a solution to a single problem carries with it a world of new challenges in today's complex networked systems. We must consider the ways in which businesses actually process information to assist them in achieving the most benefit from existing technology while taking advantage of new technologies.

In an atmosphere of such rapid change, the software industry is obligated to integrate isolated islands into cohesive solutions to better serve business.

The demands of the user community have undeniably become more sophisticated. Vendors are beginning to address their real-world needs, acknowledging the necessity of providing total solutions that offer ease of use. To this end, many software vendors have aligned themselves with others to deliver more complete solutions. For example, applications suppliers are seeking alliances with vendors who can provide graphical user interfaces to front-end their systems for more "user-friendly" interaction.



Bob Dahm

Beyond these alliances, we have witnessed consolidation within the software industry because niche vendors simply cannot provide the required integrated solutions.

Some believe that consolidation is bad for the user and that software vendors possessing a wealth of technology merely function as so-called "software supermarkets," housing a mass of isolated products. On the contrary, consolidation does not lead to supermarkets; it resolves the existing product hodgepodge. It creates vendors with a technology base from which to develop integrated solutions for today and tomorrow. In reality, it is the small, single-product software vendors that fall increasingly short in providing comprehensive solutions.

Not surprisingly, development of integrated solutions has begun with the hardware vendors; they possess more software than any independent software vendor. And fortunately, these suppliers are following carefully designed frameworks and industry standards to develop solutions that bring some order to today's chaos.

Software architectures such as IBM's Systems Application Architecture and Digital Equipment Corp.'s Network Applications Support as frameworks for software development are important for joining technology islands and furthering the standardization of software.

Taking the lead

Building on the hardware vendors' initiatives, independent software suppliers must now take a leading role and bring the critical aspect of platform independence to the development of software solutions.

Business software solutions have been and always will be developed through an evolutionary process. Today we are witnessing a rapid reduction in the number of software vendors that sell only one-off products. In equal measure, we are experiencing a rise in the number of technology suppliers that are striving to deliver true integration across hardware platforms.

The companies working to provide these solutions through alliances, acquisitions and internal development are not creating software holding companies. Instead, they are establishing treasure chests of technology that will enable user organizations to develop cost-effective, strategic business/technology plans that will support their operations today and, as importantly, adapt to tomorrow's requirements.

Wang is chairman and chief executive officer of Computer Associates International, Inc. in Garden City, N.Y.

Recession offers chance for IS groups to triumph

PAUL BERGER



All signs indicate that the U.S. is in a recession. Layoffs, cutbacks and bankruptcies are increasing.

Although the economic indicators look bad, this business situation presents opportunities for information systems management. By taking the lead in the application of technology, an IS department can help its company do more than just weather the downturn: it can help the company come out of the recession in a stronger, more competitive position.

It has been demonstrated many times that successful companies use recessions to correct problems and reposition themselves for the forthcoming upturn in business. They move aggressively into new business areas.

This time, technology will be an important means of accomplishing the repositioning. Restructured and trimmer organizations depend more on technology than did their bloated predecessors. Cutting out layers of management may have been initiated as an economic measure, but quicker, more flexible and better-informed organizations make more responsive companies. In today's environment, that spells success.

True, IS departments are affected by the turndown in the economy. Head-count growth stops, and layoffs occur. Travel and training are curtailed. New acquisitions of equipment are slowed. Investment in new projects and infrastructure is delayed. However, this is not the time for IS to dive for the foxholes. The budget cuts can be turned around if IS demonstrates its ability to join in the restructuring and use technology to help make it work.

There are seven areas of opportunity for IS. They are: technology leadership, quality, networks, customer focus, new products and services, cost control and electronic data interchange (EDI).

- **Technology leadership.** During the late 1970s and the 1980s, IS managers attempted to overcome their "techie" image by downplaying their technical skills and emphasizing business and people skills. As a result, many corporate managers no longer consider their IS departments as sources of technical expertise. They look to vendors and consultants for this resource. The IS department has to re-establish its technical credibility.
- **Quality.** The IS department can participate in a company's quality program in two ways: supplying technology assistance to help other departments with their quality programs and implementing a quality program within the IS organization.
- **Networks.** The IS department should take the initiative to build this important part of the infrastructure that provides the telecommunications network capabilities required to run a modern company. To do this requires technical and business skills.
- **Customer focus.** Contemporary company management recognizes that the use of computers and telecommunications to support and service a company's relationship with its customers is essential. This covers a range of areas in which IS leadership and participation is essential, including development of integrated customer relationship databases, provision of on-line customer access to files and market analysis.
- **New products and services.** The opportunities for a company to use information technology to produce new products and services vary greatly from industry to industry. For example, companies in the service industry have an easier job of integrating technology into their product offerings. However, manufacturing firms and retailers can also be very creative in their use of technology to provide revenue-generating service offerings.
- **Cost control.** This is a more traditional area for IS activity, and there is still much to be done here — especially in the current business environment. Automating labor-intensive tasks and providing accurate and timely cost and expense data are time-honored pursuits that still need attention. Using technology to improve inventory, procurement and material control in a "just-in-time" implementation has payoffs in reducing material costs and increasing margins.
- **EDI.** There is much to be gained in the broad application of EDI for intracompany and intercompany communications. The broad application of EDI goes beyond procurement and purchasing to include provision of a full electronic highway for document exchange in all kinds of business transactions.

Now is the time for real and substantive returns on the investment of the last few decades. IS departments have to take action and seize the opportunities, putting their own houses in order and becoming full participants in business change.

The recession of 1990-1991 can be the door opener. If IS doesn't walk through that door, others will.

Berger is a consultant, writer and video producer devoted to the business use of information technology. His office is located in Lawrenceville, N.J.



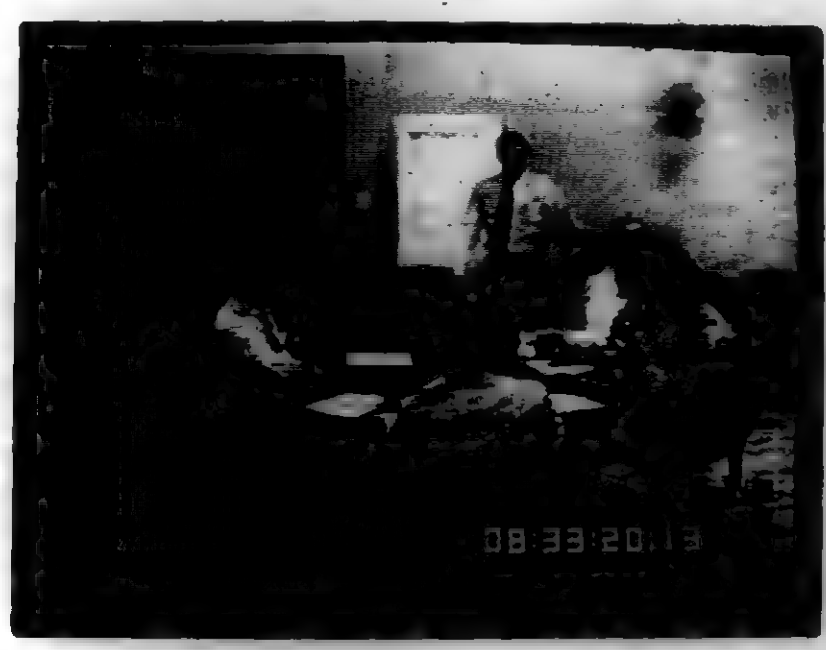
"My ultimate PC system? Well, for starters, it's got to be compatible with everything I've got already... so you can take a floppy from an old PC, pop it into a new one, and it will work."



"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work... and still connect with all the networks I've already installed."



"We've got plenty of data... the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."



"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

Hidden camera reveals the se

Not long ago, we invited hundreds of IS managers to talk about their wildest desires in a personal computer system.

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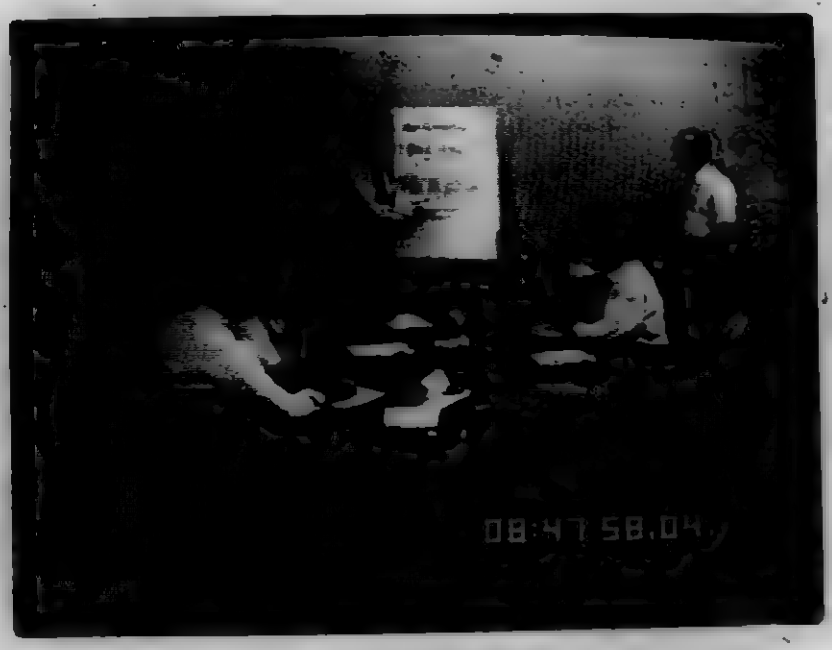
"A graphical interface is clearly important… users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."



"I'd like to see more discipline from software developers. Commands should be consistent for every application… it would eliminate the cost of constantly retraining."



"My company's needs go way beyond off-the-shelf software. I need serious development tools my existing programming staff can use to develop custom apps quickly and easily."



"Macintosh? No kidding?"

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Wang faces the need to serve two masters

Must deal with VS users while going 'open'

ANALYSIS

BY SALLY CUSACK
CW STAFF

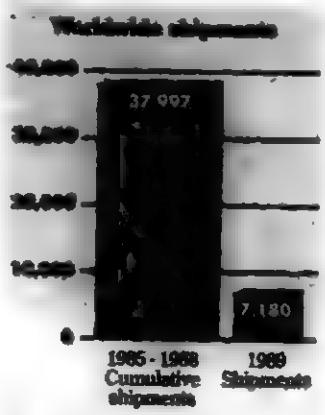
LOWELL, Mass. — Like several of its counterparts, a financially troubled Wang Laboratories, Inc., having once amassed large profits in the now dying proprietary midrange market, must satisfy its sizable midrange client base while simultaneously re-engineering products to comply with open systems concepts.

However, the computer vendor may have a bigger-than-average window to work in during the transition, providing it can keep its VS customers happy.

According to Matt Gillman, president of the U.S. Society of Wang Users, most VS users are not looking to move to open architecture platforms in the immediate future.

Opportunity

Wang's product line may be in transition, but there are still enough VS sites to hold the vendor's interest



Source: Dataquest, Inc.
CW Chart: Doreen St. John

Wang launched its line of VS minicomputers and superminis in 1977, and according to David Eulitt, an industry analyst at Computer Intelligence, a La Jolla, Calif.-based market research firm, Wang had a total of 18,655 VS installations worldwide as of July 1990.

While Gillman said he expects most VS users will have to move to open systems in the long run, he said they seem to be satisfied with the VS product line's open architecture.

Major change for mini

Wang announced its initial open systems/server strategy in December 1989, saying it would reposition the minicomputer as an application server while maintaining its role as a mini in traditional business data processing environments.

According to the company, the open systems/server products will include a family of industry-standard systems based on Intel Corp. microprocessors and will offer applications that are binary-compatible, from personal computers to larger, multiprocessing computers.

"Wang will look out for VS user concerns," said Thomas H. Willmott, vice president at Aberdeen Group, a Boston-based market research and consulting firm. "Its core business activity revolves around its VS customers, and the transitions will be gradual over the next few years."

Willmott noted that it is currently a tough selling climate for proprietary midrange vendors, all of which are facing heavy competition from Digital Equipment Corp. and IBM.

However, he said, the VS has taken Wang through the calendar year of 1990 with a decent stream of revenue, and in its own best interest, the company will continue to see to the care and feeding of its installed base through price/performance packages, upgrades, applications and services.

Most analysts seemed to agree that the bulk of Wang's recent VS sales is in its installed base. However, analysts said they do see some movement of the VS 5000 into new accounts with imaging-based applications.

It is no secret that Wang hopes to achieve success in targeted vertical markets, such as law, finance and insurance, by providing value-added services with its suite of imaging application products — once again positioning the VS as a server.

Robert Lukas, assistant vice president of information services at ITT Hartford in Connecticut, currently has 52 VS 8000s installed in the company's branch offices nationwide and is also piloting an imaging project on Wang's VS 7160 platform.

> "PROBABLY THE BIGGEST concern in the VS community right now is waiting for the new release of the Wang operating system."
>
> MATT GILLMAN
> SOCIETY OF WANG USERS

If The Hartford elects to go with the Wang system, it will automate all of the insurance firm's property and casualty claims processing functions.

While Lukas is enthusiastic thus far about the imaging project in the Wang environment, he indicated that it is important that a proprietary product should not restrict The Hartford from exploring and implementing other cost-effective opportunities in the market.

Lukas added that he feels the Wang VS is becoming as "open architectured [as] anything else that is currently advertised as 'open architecture.'"

"Probably the biggest concern in the VS community right now is waiting for the new release of the Wang operating system, which will double the num-

Continued on page 33

Chicago schools get Inform-ed

ON SITE

BY ELLIS BOOKER
CW STAFF

CHICAGO — Situated on the city's depressed Southwest side, the gigantic former armory that houses the administrative headquarters of the Chicago Public Schools has been an embattled target for years.

Some have called this city's urban educational system the worst in the nation: a bureaucracy too unwieldy to serve the needs of its 430,000 students.

However, optimism about Chicago's schools can be genuine. Just ask Clifford E. Cox.

As assistant superintendent of MIS — essentially, the school system's chief information officer — Cox has spent the past several years expanding the reach of his organization beyond the scope of traditional, back-office data processing.

"Ten years ago, there was tremendous emphasis on basic financial reporting," said Cox, who came to the system a decade ago from Arthur Andersen & Co., where he was a senior manager. Before that, he was a senior systems engineer at IBM.

Getting the financial and accounting systems in order was a top priority. The school system is a big business, with a budget of $2.5 billion, employing 40,000 people and running 600 schools. "But it seemed to me that key to any business is looking after clients or customers," Cox said. "And we had very little information on our students."



Cox says he would like to see terminals in all the Chicago schools

So Cox assembled a programming team, hiring teachers — not computer professionals — to develop a new application.

The result was the Comprehensive Student Information system (CSI), a centralized, online student database.

Originally run on a Unisys Corp. 11/94 mainframe, the CSI application grew and was moved to a larger 2200/622 mainframe last summer.

The system's database holds each child's record until he turns 21. The file then goes to tape storage, where it must be maintained until the individual reaches age 65.

Built in Mapper, Unisys'

Continued on page 33

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Paul R. Hessinger
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Division Head – MIS
Lubrizol



"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development.."

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Cleone Goldsborough
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"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

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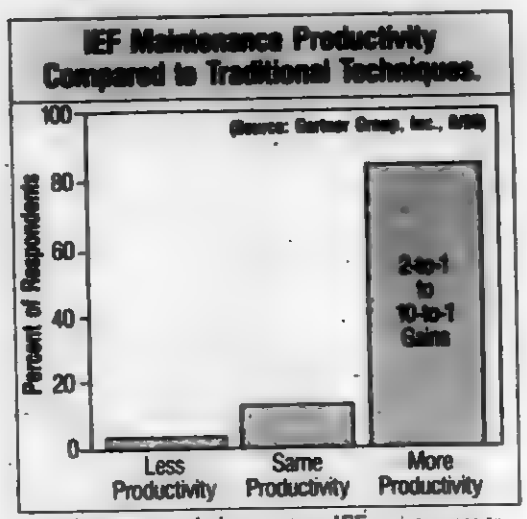
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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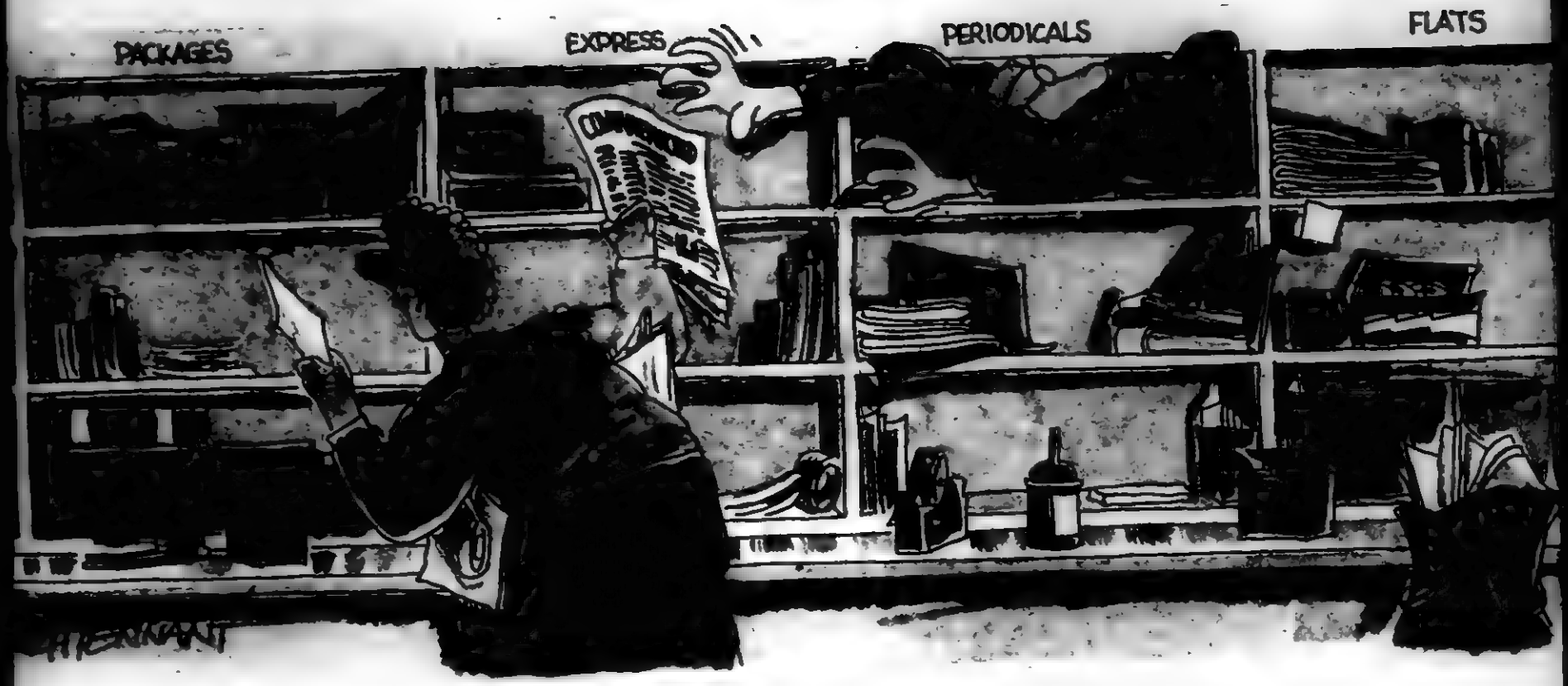
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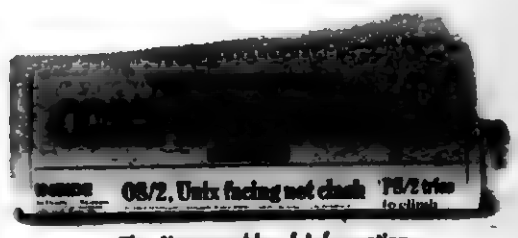
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- 20. Finance/Insurance/Real Estate
- 30. Medicine/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/ Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Distr./Retailer
- 75. User: Other _____
- 95. Vendor: Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
- 10. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
- 21. Dir./Mgr. MIS Services, Information Center
- 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Mgrs., Supvr. of Programming, Software Dev.
- 32. Programmers, Software Developers
- 99. Sys. Integrators/VARs/Consulting Mgt.

OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 51. Sales & Mktg. Management

OTHER PROFESSIONALS
- 76. Medical, Legal, Accounting Mgt.
- 89. Educator, Journalists, Librarians, Students
- 99. Others _____ (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
- A. Mainframes/Supermins
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Local Area Networks
- F. No Computer Involvement

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University erases tape from computer center

ON SITE

BY ROSEMARY HAMILTON
CW STAFF

Having more than one year without conventional tape behind it, Boston University's administrative computing center is working to convert other departments and outside service providers to its no-tape philosophy.

The decision to stop using conventional tape as a primary storage medium was one aspect of the computing center's bigger plan for unattended operations, which began three years ago, according to Howard Miller, assistant vice president of university information systems.

Miller said he wanted to rid the center of reel-to-reel and cartridge drives because they have hidden costs, are often inefficient for accessing historical data and require too much human intervention.

He set out to find a replacement for traditional tape and considered optical storage as well as additional direct-access storage devices (DASD). But a mass-storage device from Masstor Systems Corp. in Santa Clara, Calif., won out in terms of performance and cost. The computing center brought in two mass-storage devices to replace a 16,000-unit tape library.

Plenty of storage space

The Masstor units provide online storage of multiple gigabytes of data on a single storage device. The technique behind these devices uses tiny, bullet-shaped tape cartridges that hold much larger volumes of data through data compression and other alternative storage techniques. The Boston University units hold 220G bytes and 440G bytes each.

Miller said he hopes to extend his no-conventional-tape plans beyond the administrative center to other segments of the university, which has various small systems running in autonomous departments.

Eventually, he would like these systems to upload data to the mainframe, which could then back up and archive historical data on the mass-storage devices.

The trick, however, will be to figure out a way to allow the mix of systems, including several Unix variations, to communicate with the IBM mainframe.

Meanwhile, Miller is also working with outside service providers, including banks and software vendors, to move beyond the tape mentality. He said he negotiated with one bank to provide the university with electronic updates instead of sending paper or tape each month.

"This is a lot like electronic data interchange," Miller said. "There hasn't been a lot of incentive to exercise this. You can imagine that if you were receiving hundreds of tapes that there's a tremendous effort to handle it."



Boston University's Miller is espousing a no-tape philosophy

He said the idea of eliminating all tape drives was considered radical by both staffers and observers outside of the university. "Even here, this is not fully accepted," he said. "DP people are as resistant to change as anyone else. They are comfortable with tape. They've made large investments in education to be that comfortable with it."

However, Miller said that the benefits from the switch outweigh any discomfort with the change. The computing center eliminated six jobs once the tape drives were removed. The mass-storage devices also brought an unexpected DASD savings. Previously, it was impossible to keep up with the data-archiving task because it was time-consuming to load data onto tapes. Data would often stay on the DASD long after it should have been archived. The new devices presented an easier and less manual way of moving data off the DASD.

When Miller's team completed all the archiving, it discovered 11G bytes of extra DASD space. This windfall was used as last year's DASD upgrade instead of purchasing more disk capacity, Miller said.

A third benefit was the center's electronic vault, located one mile away from the center and connected via a fiber-optic cable. Miller's team now backs up data and electronically sends it to the off-site backup unit. It has its own hot site, which contains a 440G-byte storage unit.

Sybase makes New Year's resolutions

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Sybase, Inc. executives said recently that they plan to refresh their company's product line in 1991, revamping the 1-year-old Release 4.0 of the SQL Server database engine with two new releases. The company, which claims 2,300 user sites worldwide, also pledged to resolve ongoing customer complaints over support issues and product delays.

Mark Pine, Sybase's newly named vice president of engineering, said the aggressive product plans account for beta-testing periods of several months each. "You can base your business decisions on these [product] commitments and not feel you're making a mistake," Pine told the 600-plus users who were gathered for the annual user conference earlier this month.

Last year, a number of products, including enhancements for Sybase's SQL Server for OS/2, were delayed by lengthened development times.

While many users said they are happy with Sybase's product plans, they reported problems with the firm's technical support services. "Sometimes you get good support, and sometimes it feels like you're talking to a high-school student," one U.S. Department of Defense software manager said. "The intent to fix the problem is there, but sometimes the capability is not." Sybase promised its users that such problems would be corrected in 1991 and that new support services would be added to improve response time.

Sybase Chief Executive Officer Mark Hoffman also assured users that new products would be shipped in a "timely" fashion, without the delays that have slowed updates to previous products, including the SQL Server for OS/2.



Sybase's Hoffman promises new products without delays

The current version of SQL Server for OS/2, which is resold by Microsoft Corp. and its distributors, is based on the older Sybase Release 3.2 database engine. Sybase wants to port new code to the OS/2 SQL Server in an attempt to make it fully compatible with Sybase's 32-bit Release 4.0. But Sybase managers said that effort has been delayed as they wait for IBM and Microsoft to agree on a 32-bit hardware platform.

Among the products Pine said would be shipped to beta-test sites in 1991 are the following:

- Sybase Release 4.8, a new version that supports symmetrical multiprocessing on servers such as the multiprocessor Stratus Computer, Inc. and Pyramid Technology Corp. computers. It will be shipped to beta-test sites during the first quarter.
- Sybase Release 5.0, which will supersede 4.8 and include all of 4.8's features, is expected to be delivered to beta-test users during the fourth quarter. Release 5.0 will support as many as eight languages, including Japanese, Korean and German.
- The SQL Toolset 5.0 will be shipped to beta-test sites during the third quarter. It will include enhanced software tools and better support for graphical user interfaces. Because Release 5.0 is not scheduled to be shipped until late 1991, an interim version with some graphical user interface support, Release 4.2, will be shipped to users during the second quarter.
- Release 2.0 of the Sybase Open Server, a product that was announced last fall, is also planned for introduction during the third quarter. The Open Server connects workstation and personal computer "clients" in Sybase's client/server architecture with Unix and Digital Equipment Corp. VAX hosts in Open Systems Interconnect networks. Even more important for large users, the Open Server links Sybase products with IBM mainframes running the DB2 relational database in Systems Network Architecture networks.

Although industry analysts reported that Sybase had an unprofitable first quarter last year, the company's business has continued to grow quickly. Analysts said Sybase was able to increase sales from $57 million to more than $100 million because the firm is riding an industry tide toward downsizing mainframe applications for use on less expensive minicomputers and PC-based local-area networks.

NEW DEALS

Campbell upgrades

Campbell Soup Co. in Toronto recently licensed a set of systems utilities from **Goal Systems International, Inc.** The company selected the Goal products as part of its upgrade plans to the IBM MVS/XA operating system.

The University of Houston installed a Convex Computer Corp. C210 minisupercomputer recently. The system will be used at the university's Allied Geophysical Laboratories, which are currently involved in a state-funded project called the State Lands Energy Research Optimization Program. The goal is to find ways to produce more oil and gas from Texas-owned lands.

Hogan Systems, Inc. said the Banco de Columbia in Bogota recently installed its Integrated Banking Applications package, which includes nine modules. The bank also signed a contract for Hogan's professional services offerings. The agreement is Hogan's first in South America.

Rolls Royce & Associates Ltd. has purchased Unisys Corp.'s Unix-based Infoimage Engineering Document Management System (EDMS) for the Derby, England, manufacturer's nuclear-submarine operation. Rolls Royce, which recently completed a beta test of the Unisys system, will use Infoimage EDMS to store new engineering drawings and to help retrieve some of its existing library of more than 1 million drawings.

Kaiser Engineers Hanford Co. in Richland, Wash., announced a $1.4 million contract with Digital Equipment Corp. last week to provide Unix-based workstations and servers to engineers and architects working at Kaiser offices at the U.S. Department of Energy's Hanford Nuclear Reservation. DEC will supply a combination of 60 Decstation 3100s and Decstation 5000 workstations running the Ultrix operating system. The machines will be used as servers and high-end computer-aided design (CAD) workstations to deliver Autodesk, Inc.'s Autocad software to Kaiser's engineering staff, located throughout the 500-square-mile federal site.

When it comes networking solutions,

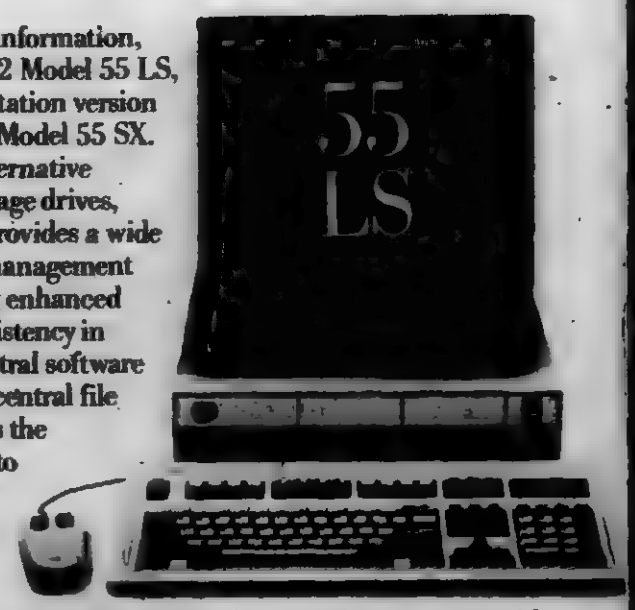
Recognizing the full potential of networking is one thing—actually realizing it is another. To truly fulfill that potential, every component of your network needs to turn in a great performance. That's why IBM offers a complete range of leading-edge LAN products in the desktop networking field—giving you the broadest range of solutions available to continually advance your system's possibilities.

Managers That Turn In A Great Performance.

At the heart of IBM networking are the members of the Personal System/2® family that act as high-performance LAN servers. The PS/2® Model 95 XP 486, IBM's sophisticated new 486™ computer, was especially designed to optimize network performance. The Model 95 features an Intel 33 MHz 486 processor or a 25 MHz 486 processor that's easily upgraded to 33 MHz, which quickens the pace of your LAN's operations. For your network's storage, not only are the Model 95's SCSI hard files lightning-quick, but the overall capacity is truly impressive—up to 1.6 gigabytes internally, and up to 8.96GB or more with IBM PS/2 External Enclosures. IBM also offers highly efficient, lower-cost server alternatives with the PS/2 Models 80 386 and 65 SX. All of IBM's PS/2 LAN servers feature the Micro Channel™ architecture, with its 32-bit data path and bus-mastering capabilities. The Micro Channel busmaster adapters allow you to expand your network's capabilities by adding multiple processors—like adding "computers" to your computer. It all amounts to highly reliable and powerful managers that inspire the same kind of performance from the rest of your network.

An Efficient Way To Bridle Your Data.

Whatever your needs may be, IBM has PS/2s that can serve as excellent client stations. And if you want to keep a tight rein on your network's information, IBM offers the PS/2 Model 55 LS, a medialess LAN station version of the best-selling Model 55 SX. A cost-efficient alternative to models with storage drives, the Model 55 LS provides a wide array of effective management controls, including enhanced data security, consistency in software levels, central software maintenance and central file backup. Not only is the Model 55 LS easy to hook up (it comes standard with a Token-Ring Network or Ethernet adapter), but should you need to modify your system, it's easy to upgrade with diskette and file storage devices.

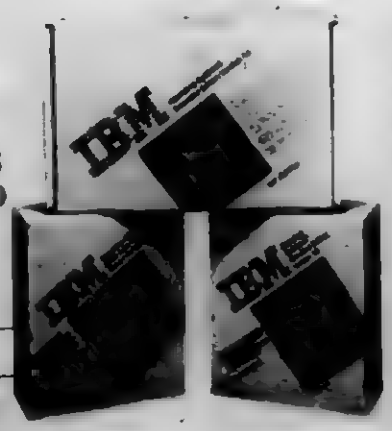


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to advanced IBM leads the way.

performance, less memory requirements, fewer DASD requirements and support for Adobe Type Manager™ fonts. And with support for 128 DOS requesters, LAN Server V. 1.3 can provide significant cost benefits for DOS network users. Compatibilities between IBM DOS LAN requester and the current version of Windows® 3.0 (LAN Manager 2.0 enhanced) have also been added, capping off the many ways IBM gives you greater flexibility in the LAN environment.



Printing That's The Best In The Field.

For a great finish to any project, IBM offers a full range of printers for client stations, as well as the speedy, large-capacity IBM LaserPrinter, an efficient printing station with immensely attractive LAN benefits. With a high-duty cycle and fewer parts for fewer breakdowns, it offers extremely reliable printing while still boasting a 10-ppm printing speed. The optional paper bins allow for more efficient collation, so there's no need to visit and rearrange the printing station prior to the particular job. You can also easily and inexpensively upgrade to Adobe PostScript.® It all adds up to a range of complete, reliable printing solutions that can handle the kind of workload that any network, large or small, can generate.

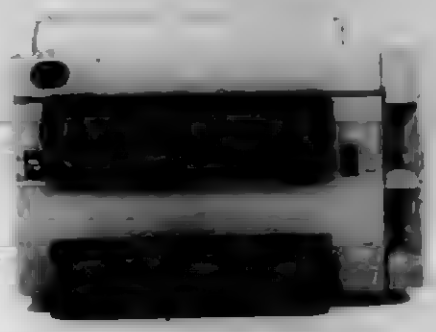
Step Up The Pace With Token-Ring Network.

To optimize the link between your LAN server and client stations, you need a hardware connection that gives you access to departmental and company data, as well as communication with your co-workers—in other words, you need access to a winner's circle: the IBM Token-Ring Network, the winner four years running of the *PC World Magazine* World Class Award. It's a reliable and flexible networking solution, one of the only connections with a data transfer rate of up to 16MB per second.

You can also diagnose, isolate and correct problems in one section of your LAN without affecting the rest of your network. A system you can build on, IBM Token-Ring Network provides a reliable connection that's as strong as your need to keep in constant touch with the people and information around you.

Communicate With Horses Of A Different Color.

Of course, IBM provides you with several ways not only to connect your PS/2 LAN to a multitude of mid-range and mainframe systems, but also to communicate with non-IBM systems as well. To conduct transactions such as hotel reservations, car rental and credit card authorization, an IBM communications adapter such as the IBM ARTIC Portmaster Adapter/A busmaster card, with the proper communciations software, can link your PS/2 with other companies' computers. With an Ethernet adapter, you can also connect to most Ethernet LANs. The integrated communications options of IBM OS/2 Extended Edition software can also allow your PS/2 to send mail, transfer files and access applications on other systems concurrently. So it's easy to benefit from the strengths of an IBM network while still having access to the rest of the computing world.



With the many components that constitute a Local Area Network, it's plain to see why a LAN is only as strong as its weakest link. That's why the IBM total LAN solution—LAN servers, workstations, networking software, printing stations and Token-Ring Network—is simply without peer: because there are no weak links. To find out how IBM can keep your network ahead of the pack, contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438.



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PRODUCT REVIEW

Tried-and-true Prokit falls short

McDonnell Douglas Information Systems International

This is the eighth in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whitside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at Prokit from McDonnell Douglas Information Systems International.

•

Carried out by McDonnell Douglas in Woking, England, its team of four people provided an attractive solution that was marred by an error in the batch interface that could not be resolved and a lack of adequate IBM DB2 expertise that resulted in certain elements of the application being inoperable on the mainframe. Taking these shortcomings into account, we awarded a grade of "fair" for the level of completion.

•

The team decided to use stand-alone personal computers for the application development. Crucial delays were caused by transferring solutions between the CASE tool, Prokit, and the implementation tool, Pro-IV, and were further aggravated by the manual exchange of data between stations. An excessive amount of time was spent on the interface section and in transferring the application to the mainframe environment. The benchmark and its enhancement were completed in 32 hours and 40 minutes. The overall effort of 66 hours and 50 minutes recorded for the team was pedestrian and thus was rated "fair."

•

A much improved picture emerged in the maintenance section of the testing, where randomly selected enhancements, previously unknown to the team, required a major rework of the solution. The actual maintenance speed was one of the shortest, compared with other benchmarks in the series. However, actual maintenance activity was restricted to the code and did not update the design. Nevertheless, the product's speed of maintenance had to be ranked as "very good."

•

There was plenty of documentation, although it was somewhat overwhelming. The graphics were certainly comprehensive, but the characters drawn in line graphics were hard to read. In contrast, the Pro-IV program listings provided a good picture of the detailed solution. On balance, we awarded a rating of "good" for documentation.

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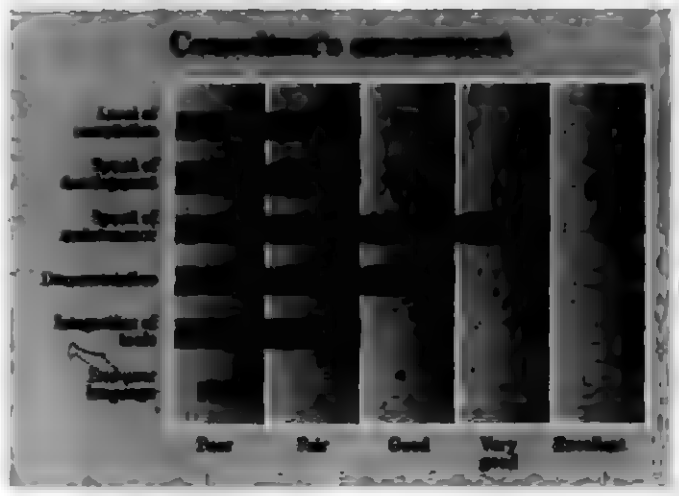
Data stores, entities and processes can be synchronized in the Prokit CASE tool and then downloaded to the implementation level. The downloading process, however, was unidirectional and not smooth. Although McDonnell Douglas has a well-established planning methodology (Stradia), it was not visible in the development environment. We marked the product's level of integration as "fair."

•

No end-user language was provided by McDonnell Douglas for running against DB2 files. IBM's QMF or SQL are normally the products employed for that purpose. Therefore, it received a rating of "not applicable."

•

In summary, the complexity of the task severely tested a well-proven product set. Despite the use of the well-established Prokit, the job was not completed without a considerable amount of trial and error. Perhaps in being "all things to all men," the benefits of mainframe environments have not yet reached their full potential.



The McDonnell Douglas tool kit

- Prokit — CASE tool
- Pro-IV — Fourth-generation language
- Progeny — Development utility
- Pro-aide — Development utility

Development and maintenance report card

Performance in each area is graded from A (excellent) to F (poor).

ANALYSIS AND DESIGN: C
The entities, data stores and the main processes were defined in the Prokit CASE tool and ready to be downloaded to the implementation phase. Unfortunately, any changes made during implementation were not incorporated automatically. This caused confusion, and an incomplete DB2 schema was generated by Prokit. The CASE tool graphics, produced on a McDonnell Douglas computer-aided design and manufacturing tool, looked a bit antiquated and were hard to capture for desktop publishing.
Strength: Prokit covers most aspects of the design.
Weakness: It is a single-user tool.

DATABASE SETUP: B
The design data structure was downloaded automatically but needed manual refinement to cater to details such as "null" field handling. Final transference of the personal computer-developed systems to DB2 on the mainframe entailed a lot of manual adjustment to adhere to naming conventions. Interesting items considered in file setup were volumes and frequency of use.
Strength: The product has a wide range of data attributes.
Weakness: Additional workaround is necessary.

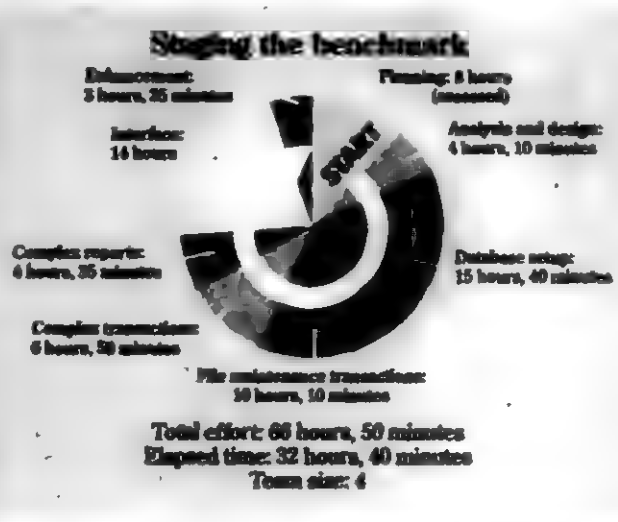
FILE MAINTENANCE TRANSACTIONS: C
This stage took an unexpectedly long time with much trial-and-error debugging before all the detailed rules were contained in the Pro-IV structure. Some overlays had to be used to handle screens with multifile data.
Strength: Single file transactions are highly automated.
Weakness: It is not always easy to manipulate the preset defaults.

COMPLEX TRANSACTIONS: C
Again, a lot of detailed work was required before a satisfactory solution was achieved. The Pro-IV concept of not displaying incorrectly entered fields was disturbing. A real expert saved the day.
Strength: Solutions are well-presented.
Weakness: It requires a lengthy debugging process.

COMPLEX REPORTS: C
The report layout was specified in "screen painter" fashion. However, some dummy files and fields confused the solution and contributed to a mediocre completion time.
Strength: It has a good report painter.
Weakness: An interim file is required.

INTERFACE: D
After several attempts, an Ashton-Tate Corp. Dbase file was finally converted but still caused some problems in distinguishing numeric and alphanumeric data. The batch processing logic was never completed, and therefore, the final results could not be checked.
Strength: It has good special batch processing facilities.
Weakness: It handles unfamiliar data poorly.

ENHANCEMENT: A
The selected enhancement was one of the most demanding so far in the series, yet it was handled with ease. Often, the design documentation was not consulted and remained unchanged.
Strength: Pro-IV solutions are very easy to change.
Weakness: Enhancements are restricted to the implementation level.



The solution was initially developed on three stand-alone IBM Personal System/2 Model 70s under DOS Version 4.0. The completed solution was then transferred and tested on an IBM 3090 mainframe under MVS/CICS and DB2.

Details about the product are available from McDonnell Douglas Information Systems International, Information Systems Engineering, Building 281, 5757 Phantom Drive, Hazelwood, Mo., 63042, (314) 232-2996.

Chicago schools

CONTINUED FROM PAGE 25

fourth-generation language, the database contains an impressive amount of information on each student and school, including anything from each pupil's transcript to "what language they speak at home," Cox said.

With his information infrastructure in place, Cox next wanted to provide administrators, teachers and students with direct access.

Called Project Inform, the system would seem fairly conventional at a college, where many on-line information networks have been created over the past 15 years. But few public school systems have stepped up to the challenge, according to Cox.

Project Inform has currently placed terminals in six high schools and 11 elementary schools. The hardware and wiring costs for six terminals — four for students, two for the librarians — is $8,000.

Bypassing expenses

Leveraging his school system's size, Cox approached database operators and purchased copies of their databases to run on the school system's computers. Doing so bypassed the communications expense involved in the normal dial-up access to those databases via information networks.

A school system network, now composed of 75 9.6K bit/sec. leased lines, carries the data between the schools and the Unisys and IBM hosts in the administration building.

Multiple Unisys distributed communication processors provide the Transmission Control Protocol/Internet Protocol and Systems Network Architecture gateway between the administrative and research databases on the 2200/622 and the financial applications on an IBM 3090 mainframe. It even allows a user to pull down information about the individual school's budget and salaries.

"I envision each [school] library with four terminals," Cox said. From the terminal, a student or school employee could, for example, access a card catalog of books in that library, other school libraries or the Chicago Public Library, as well as a growing list of databases.

In addition, the Unisys host contains on-line versions of the Grolier's Academic American Encyclopedia, the Chicago Public Schools' budget and the Educational Resources Information Center, a popular educational research index put out by the U.S. Department of Education.

Other planned offerings include the following:

- An index of local newspaper articles.
- A services directory listing public, nonprofit and private agencies.
- A public events calendar.
- Job and college course bulletin boards.

"If I had my druthers, I'd take three years and put terminals in all the schools," Cox said. Such a project, he added, would cost about $4.8 million over that period of time.

Wish list

More ambitious still would be to provide network-linked personal computers to each of the school system's 16,000 teachers. Cox estimated it would cost about $3,000 per teacher, or $48 million, to put a PC and wiring into the network on every teacher's desk. "Business routinely does that. It recognizes the need to put information systems technologies on every desk," Cox said.

Even so, Cox is optimistic that there will be a shift in public policy. "Eventually," he declared, "there'll have to be a statewide — if not federal — initiative to target substantial amounts for computer technology."

For now, however, Cox must make do with few computers in the classroom and a lean IS staff. His staff has shrunk over the past few years to 130, which includes 50 people in operations and 40 more in systems development. About 3% of Cox's $27 million annual budget for IS and telecommunications goes to Project Inform.

An important future step, Cox said, will be a system to automatically match students with various educational needs with the resources of the school system. "We have a database on students, and we have instructional software. The missing link is knowing the individual instructional needs of each student."

Wang

CONTINUED FROM PAGE 25

ber of end users that can reside on the system," Gillman said.

"This was a problem that was identified several years ago, and Wang said it would be available in the first half of 1991," Gillman added.

According to David Strohmeyer, VS product manager at Wang, a limited version of the operating system, designated 7.30.04, was released in early December, and a full production version will be available this month.

Willmott concurred that Release 7.30.04 will definitely make a significant difference to the installed VS base, where a major concern for Wang customers at present is getting the maximum bang for the buck.

With reference to Wang's future, Willmott observed that overall, the company's financials seem to have been put into place, but he cautioned that the company will have to continue to offer support, enhancements and services for its VS users in order to remain profitable during the transitory period to open systems.

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NEW PRODUCTS — HARDWARE

I/O devices

Advanced Technologies International, Inc. has introduced a 15 page/min. printer designed for distributed printing environments such as large offices.

The LC-6015 ($9,500) features a proprietary controller, the LC-6000, which enables the device to print graphics five times faster than comparable units, according to the vendor.

The product is equipped with 500-sheet input and output trays and includes emulation packages for Diablo Systems, Inc. 630, Hewlett-Packard Co. Laserjet 500/2000 and several other printers.

Advanced Technologies International
355 Sinclair-Frontage Road
Milpitas, Calif. 95035
(408) 942-1780

Interface Systems, Inc. has announced its ISI 8262-T series of band printers designed to be linked with IBM Application/System 400s, System/36 or 38 computers via a twinaxial connection.

The series includes the ISI 8262-T13, which can yield solid-formed letter-quality output at a rate of 350 line/min., and the ISI 8262-T03, which operates at a maximum speed of 700 line/min., according to the vendor.

List pricing for the ISI 8262-T13 and ISI 8262-T03 starts at $8,850 and $10,800, respectively.

Interface Systems
5855 Interface Drive
Ann Arbor, Mich. 48103
(313) 769-5900

NEW PRODUCTS — SOFTWARE

Development tools

Telesoft, Inc. has announced releases of Teleuse, its graphical user interface-based development tool, for the IBM RISC System/6000, Hewlett-Packard Co.'s Apollo and HP 9000 machines and Digital Equipment Corp. VAX/VMS platforms.

The four versions provide users with a set of tools to design, prototype, evaluate, code and maintain graphical user interfaces. An interactive graphical editor is also featured.

Pricing for Apollo, HP 9000 and IBM RS/6000 platforms is $7,500 per workstation. The VAX/VMS version costs $9,000 per workstation.

Telesoft
5959 Cornerstone Court, W.
San Diego, Calif. 92121
(619) 457-2700

Applications packages

Business Computer Design's recently announced Progen Plus Release 2.3 application generator enables users of IBM Application/System 400s or System/38s to save and reuse program design definitions.

The product also includes enhanced prototyping of screens and a flexible screen painter for designing subfile list panels.

Pricing is $2,950 or $4,500, depending on type of system.

Business Computer Design
950 York Road
Hinsdale, Ill. 60521
(708) 986-0800

Utilities

A/Soft Development, Inc. has announced a version of its Nu/TPU text editor that uses the same commands as Digital Equipment Corp.'s VMS Extensible VAX Editor and enables programmers to change functions assigned to a specific key.

The product is source code-compatible with DEC's VMS 5.0 Text Processing Utility, a tool that allows programmers to develop applications on Unix and DOS platforms while remaining in a VMS environment.

Pricing for Version 2.1 of Nu/TPU ranges from $499 to $5,000 for Unix-based platforms. MS-DOS-based versions cost $325.

A/Soft Development
11 Red Roof Lane
Salem, N.H. 03079
(603) 898-6690



Lotus says new Windows options beat all others

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — What, Lotus worry now that Microsoft has unleashed Excel Version 3.0? Its 1-2-3 for Windows spreadsheet is not even in beta testing yet, but a confident Jeffrey Beir, director of product marketing for Lotus Development Corp.'s Graphical User Interface Spreadsheet Group, claimed last week that Lotus "will provide capabilities in 1-2-3 for Windows not seen in spreadsheets before."

Expected to ship in June, 1-2-3 for Windows will be fully compatible with Microsoft Corp.'s Windows 3.0, according to Lotus. Beir said Lotus has shown the package to "several hundred" customers so far, and he expects it to go into beta testing in a few months.

"We recognize the need to get 1-2-3 for Windows out in the market," Beir said.

His goals for 1-2-3 for Windows include making it the best Windows spreadsheet and providing 100% compatibility with character-based 1-2-3 commands. "Microsoft can't do [the latter]," he said.

Noting that most users do not tap even 60% of the capability of their spreadsheets, Beir said his group is focusing a lot of effort on usability issues for existing and new classes of spreadsheets. Despite the one-upmanship practiced by Lotus and Microsoft marketers, Beir predicted future spreadsheet battles will focus less on features and more on ease of use and support.

Two weeks ago, Lotus announced a $49 upgrade to 1-2-3 for Windows for buyers of 1-2-3 Version 3.1. Lotus was encountering some resistance among users who were "stalling" migrations to 1-2-3 Version 3.1 because they knew 1-2-3 for Windows was coming, Beir said. The promotion is Lotus' way of telling them "not to worry, we'll protect your investment," he added.

Recognizing that many Lotus users are standardized on 1-2-3 Version 2.2 (v. Version 3.0 or 3.1), Beir also hinted that the $49 upgrade may be expanded to allow other Lotus users the same inexpensive upgrade to 1-2-3 for Windows.

He described the promotion as a break-even proposition, saying Lotus expects to amortize the cost over a large number of unit sales.

Overall, Beir said, Lotus does not expect to get a large percentage of its revenue from Windows in 1991 but will have different expectations for the 1992 to 1994 time frame.

Beir and many Lotus users were quick to deflate the notion that the microcomputer world is quickly migrating to Windows.

"Most users will be in a decision-making mode during the next six to 12 months," Beir said, adding that Lotus has plenty of time to make an entrance into the Windows market.

Forms processing use to grow

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

You might remember the forms processing market, the one that was going to be the next coming of the spreadsheet, the word processor and the like.

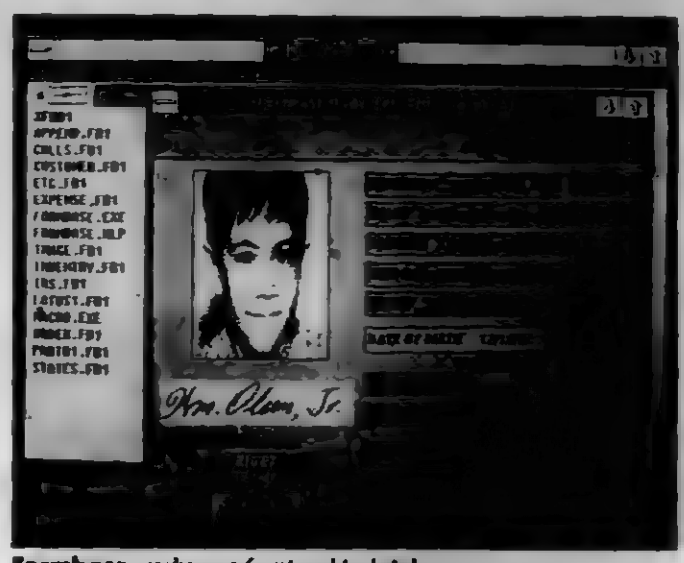
More likely, it has faded into memory as you puzzled over newer software markets that proponents claim are burgeoning, such as multimedia. But the market for forms processors remains alive, with new products and upgrades. Some advocates still say — though less loudly than once was the case — that forms processing packages will indeed become a hot application.

First, however, vendors and users have to agree on what a forms processor really is and what it does for them. This is no easy task because a form represents anything from a complex Internal Revenue Service 1040 form to a personal check or a telephone message.

"The forms processing market is one of these really weird markets . . . It's very hard to define," said Amy Wohl at Wohl Associates in Wynnewood, Pa. "When you say forms, do you mean designing forms, filling in forms, both of those things or fill in the form and save the data in the database so that the database is an important part of the exercise? Will it exist on the computer screen mainly, or only for the purpose of being a onetime master that will be on paper mainly?"

Wohl said she doubts that forms processors will be "the next spreadsheet market." However, she said she thinks that the opportunity to improve forms electronically will continue to generate good ideas.

"I'm not sure it's going to be a big market," Wohl said. "I think it's part of the database market. I think when you talk about forms, . . . what you're really saying is, 'please God, give me an easier way to use a database.' "



Formbase *works as a front end to databases*

While agreeing that forms processors seem easier to use than databases, Rich Finkelstein at Performance Computing, a database consultancy in Chicago, said he thinks they actually can make data use more difficult.

"There've been lots of products out in the last two to three years, and I look at them, but I just don't see the use for them," Finkelstein said. "What does it buy you? It appears to be simpler, but that's because you've eliminated all your editing and integrity constraints — the things that keep people from messing up databases."

The best known products, such as Xerox Desktop Software's Formbase, work as front ends to a database. Users confirmed that the products do not yet address their needs.

"There are issues I would like addressed along the lines of protecting us from user screwups," said John Marshall, vice president of Main Street, a caterer and food distributor in Kingston, N.J. Main Street uses Formtype, a database front-end package from Easy Automation Systems, Inc. in Norcross, Ga. Still, Marshall said, "I've been jumping up and down at the speed with which I can view dif-

Continued on page 40

Micro Focus brings 370 Assembler to the PC!

The Micro Focus 370 Assembler is a tool which helps maximize the productivity of both the mainframe Assembler programmer as well as the COBOL programmer whose application calls Assembler subroutines.

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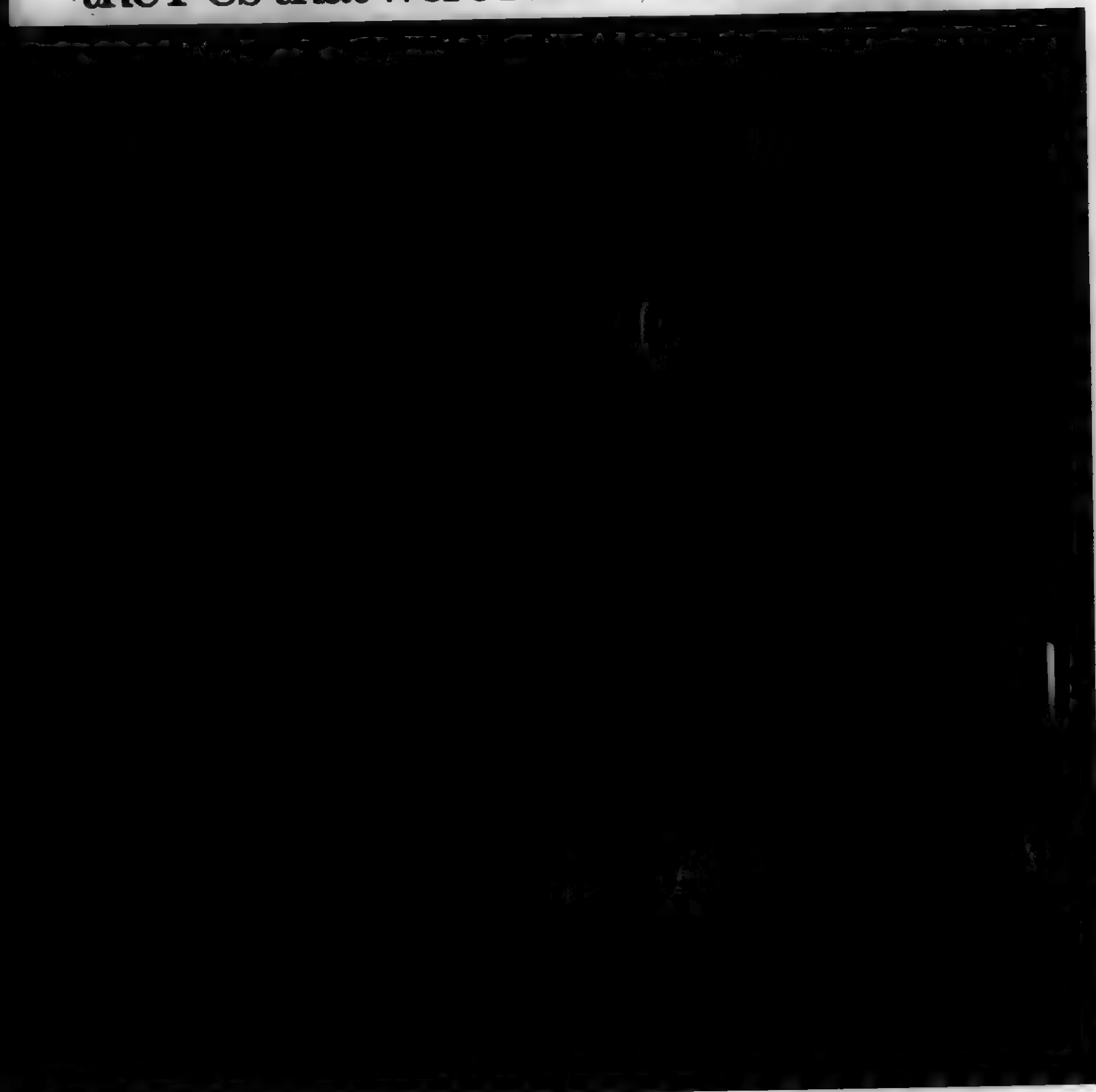
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HEWLETT PACKARD

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San Jose police first to use Gridpad

Pen-based handheld computer shortens processing time for paperwork

ON SITE

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — An amber dusk creeps over Northern California as a blue-suited San Jose police officer preparing for duty runs through a checklist of the tools needed for another 10-hour shift. Shield? In place. Service revolver? Tucked in the holster. Nightstick? Dangling loosely. Gridpad? Huh?

During the next week, the latest crimefighting feature of the largest police force in the Silicon Valley will be in place as the San Jose Police Department becomes the first major law enforcement agency to use Grid Systems Corp.'s Gridpad, the only pen-based handheld computer commercially available in the U.S.

Although the machine will not batter down the doors of drug czars or fell fleeing robbery suspects, the Gridpad will battle what is frequently regarded as an officer's most tiring enemy: paperwork. The 4½-pound Gridpad — which is about the same size as the clipboards the officers already carry — will be used to enter information directly into the computer at the crime or accident scene.

Unlike many portable computers, the Gridpad does not use a keyboard or mouse to enter data. Instead, information is handwritten into the computer using a pen and pad. Therein lies its potential for success.

"The processing of reports is quite a lengthy procedure," systems liaison officer Tony Weir said. A submitted report typically travels through a series of coding and quality-control steps. Inspectors may scrutinize the document to make sure the correct forms are attached or to see if any suspects immediately spring to mind. But such vigilance has its price: It often takes anywhere from three to five days from the time an officer signs his name on the report until it reaches an investigator.



Pen-based handheld *computers allow officers to enter information at the scene of a crime, significantly reducing their paperwork at the end of a shift*

With the Gridpad, a disk is popped out at the end of a shift and uploaded to the department's main record management system. Processing time is reduced to only a few hours. "With nearly 1,000 officers filing more than 100,000 reports per year, the time savings is going to be enormous," Weir said.

The department will test a handful of Gridpads through the middle of the year. If the program is successful, Gridpads will be mounted in nearly all of the department's 300 vehicles. During the assessment period, the Gridpad will take the place of half a dozen paper documents, ranging from accident reports to missing person write-ups. Software for the Gridpad has been supplied by The Windward Group, a Los Gatos, Calif.-based software development company.

The key to the program's success, Weir said, is getting the Gridpad to understand the officers' handwriting. At this stage in their development, pen-based computers work best when users carefully print the information, although the technology is evolving so that the recognition of even sloppy handwriting will soon be a reality.

Although each officer will be given several hours of training with the Gridpad, Weir will not be dealing with computer novices. The department's officers are already well acquainted with the world of high-technology law enforcement. All department police cruisers, for example, are equipped with Motorola, Inc. mobile data terminals, which are mounted on their dashboards.

To ease the transition, however, the Gridpad will include a keyboard, so officers will be able to key in data in adverse situations. "For instance, trying to write in a vehicle in pursuit could be quite a problem," Grid spokesman Dave Marino said. "I don't think anyone's handwriting would be readable when it's done from the front of a speeding car."

Vendor companies show off their wares at Macworld

BY JAMES DALY
CW STAFF

SAN FRANCISCO — Nearly 60,000 Apple Computer, Inc. Macintosh zealots gathered at the sixth annual Macworld Expo recently as more than 500 vendor companies came together to show off their latest and greatest achievements for the Macintosh line.

Meanwhile, Apple Chief Executive Officer John Sculley used the pulpit of his keynote address to sing the praises of the newly available Macintosh LC and to assure users that the firm is going to great lengths to ensure that it will not stagnate technologically. "We need to reach into the soul of Apple," Sculley said during the 50-minute address.

Sculley indicated that Apple is experimenting with infrared technology to produce wireless computer networks — a concept that has drawn attention recently throughout the networking industry — and that the Cupertino, Calif.-based firm's next major priority is to produce a lightweight notebook-size computer. Sources said such a machine could come as early as August 1991.

Early indications that Apple would use the four-day Macworld to introduce a new portable proved false. Although early press summations of new products listed an Apple portable introduction, none was scheduled.

This year's show bowed to the pressure of Macintosh enthusiasts, who complained that previous shows catered more to corporate users, and included expanded evening show hours and a weekend schedule. At the show, there was little in the way of breakthrough technology introductions or new applications. Most of the displays were concerned with upgrades and products that were announced months ago but which only began shipping recently.

Among the new Macintosh products introduced were Apple subsidiary Claris Corp.'s new version of Macdraw Pro; additions to Rasterops Corp.'s line of monitors; and Meridian Data, Inc.'s in-house compact disc/read-only memory mastering system (see story page 41).

Some of the other products introduced at Macworld included the following:

• On Technology, Inc., the latest brainchild of Lotus Development Corp. founder Mitch Kapor, introduced Meeting Maker, which helps network users schedule meetings by showing what times co-workers are available. Meeting Maker's suggested retail price is $495 per five-user pack and $895 per 10-user pack.

• Microsoft Corp. announced Microsoft Mail Version 3.0 for Appletalk networks. The product is expected to be available this quarter for approximately $395.

• Rochester, N.H.-based Cabletron Systems, Inc. brought the speed and efficiency of token-ring networks to the Macintosh II line's Nubus architecture environment with the introduction of the Token-Ring Network Interface card. The card is slated to be available in March for $1,295. The company also introduced several network monitoring and troubleshooting products.



Now you can do program development and maintenance on the PC the same way as you do on the mainframe with **SPF/2**, a new OS/2 alternative to working with ISPF/PDF.

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Micro Express' ME 486-25: Low-cost power

Technology Analysis — a roundup of expert opinion on new products. Summaries written by Computerworld staff member Derek Slater.

The Micro Express ME 486-25 is a low-cost XT/AT bus-based machine whose performance belies its price, leading personal computer publications say. The ME 486 outpaces many better-known systems in a number of benchmark tests. Though Micro Express' service policies fail to impress, the ME 486 is an excellent low-price option for power users, reviewers say.

Performance: The speed of the ME 486 is boosted by its 128K secondary memory cache. Disk-performance speed is outstanding when the system is configured with an enhanced small device interface disk controller.

Compatibility: *PC Week* reports a compatibility problem with a Colorado Memory Systems, Inc. tape drive.

Documentation: Micro Express provides technical manuals from the individual component manufacturers and a single illustrated manual covering the ME system.

Support: The company offers a two-year warranty and replaces defective parts by mail. However, it provides no on-site technical service.

Value: Despite minor complaints, reviewers agree that the ME 486 is an outstanding buy for the money: $5,570, including an IBM Video Graphics Array-compatible monitor and 100M bytes of hard disk space.

Server capabilities: The XT/AT bus architecture may limit the server efficiency of the ME 486. However, no tests were run using it as a server.

Reviews Summary

Criteria			
Performance	Excellent	9	Top-end performance
Compatibility			
Design	Average	NC	Quality system
Documentation			
Support	NC	NC	No on-site service
Value			
Reviewer's score	7.4	9	One you should definitely consider

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

- Users: Alan Dunn, Red Brick Systems (*performance*: 10, cost: 9); Ron Dimm, Trax Corp. (10,10); Jim Garrison, Freeman Hospital (10,9). "It's cheap, [Micro Express] gets it to you fast, and it's faster than the other machines," Dimm said.
- Analyst: George Thompson, Datapro Research Corp. (7,7)
- Financials: Matt Heidari, California Financial Corp. (*overall rating*: 8). "They are much smaller than the big public companies, but they are debt-free and have grown consistently," Heidari said. Micro Express reports current sales of $35 million per year — approximately double last year's rate. The company was founded in 1986 and has 50 employees.

ME-486

Points (maximum)	Category
25 (30)	Published reviews
14 (20)	Analysts' ratings
15 (15)	Users' ratings
18 (20)	Cost evaluation
12 (15)	Vendor financials

(Maximum score: 100)

Micro Express responds

Art Afshar, president of Micro Express:

Documentation: New documentation will be available by February.

Service: We're finding the people we sell to very competent at replacing defective parts, which we send by overnight express.

Server capabilities: We offer a special tower case with room for 10 drive bays, a 450-watt power supply and several cooling fans as a server configuration.

Dell's System 425E: Unix power quick and easy

Dell 425E

Points (maximum)	Category
25 (30)	Published reviews
16 (20)	Analysts' ratings
14 (15)	Users' ratings
18 (20)	Cost evaluation
12 (15)	Vendor financials

(Maximum score: 100)

Dell responds

Paul Rubin, director of product marketing:

Performance: The System 425E doesn't have integrated graphics; we offer both low- and high-resolution options.

Compatibility: The power supply is adequate. We haven't had any complaints from users.

Server capabilities: The large disk capacity and six Extended Industry Standard Architecture expansion slots make it excellent for networks of up to 20 users.

Reviews Summary

Criteria			
Performance	Excellent	8	You'll be impressed
Compatibility			
Design	Average	NC	Distinguishes it from competition
Documentation			
Value	NC	8	NC
Reviewer's score			

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

- User: Robert Ducate, Ducate Co. (*performance*: 10, cost: 10); Peter Kopplemann, Blackstone Group (9,10)
- Analysts: George Thompson, Datapro (8,8); Jerry Cuzzo, Faulkner Microcomputer Reports (8,8)
- Financials: Eric Zinita, Rauscher Pierce Refsnes (*overall rating*: 7); Bennie Lorenzo, Dillon Read (8); Jim Poyner, William Woodruff & Co. (8); Jim Weil, Soundview Financial Group (8). Dell's revenue was $378.9 million for the first nine months of fiscal year 1991 vs. $388.6 million for all of fiscal 1990. Net income for the same period was $18.6 million vs. $5.1 million total in 1990.

"Fiscal '90 was a difficult year — [Dell] overextended themselves. But they've turned it around," Weil said.

The Dell Computer Corp. System 425E is an unusual Extended Industry Standard Architecture-based 486: Its chosen operating system is Unix, although it can be bundled with software to run MS-DOS applications. Dell's machine is also notable for strong performance, expandability and compatibility, according to reviewers at leading personal computer publications. The system is priced at $6,499.

Performance: The System 425E achieves performance equal to most Intel Corp. 1486-based machines through the use of the standard 8K bytes of cache memory built into the processor chip. Video speed is outstanding, although *Byte* found resolution somewhat low.

Compatibility: Software compatibility is excellent. DOS applications, including graphics, run without a hitch. Networking the System 425E with DOS-based PCs requires an additional Partner Kit ($399). The low 230-watt power supply could also pose compatibility limitations.

Documentation: The documentation is praised for its completeness and simplicity. Dell provides manuals covering installation and user start-up as well as technical service.

Support: Dell offers one year of unlimited toll-free telephone support and next-day, on-site service through Xerox Corp.

Value: The system comes with a 100M-byte drive and 4M bytes of random-access memory.

Server capabilities: The Dell System 425E scores comparably with leading 486 systems in network benchmark tests. It is certified for use with networking products from Novell, Inc., IBM and Banyan Systems, Inc.

Methodology: *Published reviews: average of numeric scores from product reviews published by PC publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of analysts' ratings of vendor financials and ability to support product from financial analysts multiplied by 1.5.*



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CODE: ME26

Forms processing

CONTINUED FROM PAGE 35

ferent things in different ways" and added that installing Formtype has tremendously improved the company's order-processing efficiency.

Jeffrey Tarter, editor and publisher of "Softletter" in Watertown, Mass., agreed that forms processors have had trouble attracting buyers because of their vague nature.

"It's a product that falls across a traditional division of labor — forms drawing and database design," Tarter said. "Another problem is that creating a form or replicating a form . . . electronically is a huge job."

Tarter said he thinks the market has the potential to boom.

"We're awash in forms, and they should be ideal for automation," he said. Tarter added that he thinks the reason form processors have not been more popular is because they miss the basic point of a form: to communicate information.

"Forms are not really just a piece of a database. Probably the most important use of forms is in communications," Tarter said. "If you take most forms, they are simply a way of conveying a large amount of very structured information from one person to another."

Tarter said that the existing personal computer-based packages are largely lacking in communications facilities, unlike their bulky mainframe-based cousins. He said that vendors of PC-based forms packages are beginning to correct this and that the increase of networks will push forms processing into a more important role in corporations.

"Moving forms through a network is probably a lot more important than electronic mail," Tarter said.

MICRO BITS

Lotus adds to 1-2-3's list

Lotus Development Corp. announced plans last week to add another notch to its 1-2-3 belt of supported platforms. This time, Lotus is teaming up with Hewlett-Packard Co. to develop and market 1-2-3 for the HP/Apollo 9000 Series 400 workstation family and the HP 9000 Series 300 line. Delivery is slated for midyear. Lotus will also port its Dataless developer tool kit to the HP platform.

Mark Tolliver, marketing manager at HP's Workstation Group, said he sees a trend toward the purchase of workstations for commercial applications, adding, "We expect an enthusiastic response to 1-2-3 from our customers."

Radio Shack said its Tandy Learning Centers, located in 123 Radio Shack Computer Centers, will offer supervised, self-paced one-day instruction on a variety of software programs. This enables students to take a class on any topic on almost any date. Class fees range from $99 to $139 per student.

D&B enhances personnel system

BY SALLY CUSACK
CW STAFF

ATLANTA — Dun & Bradstreet Software last week released an enhanced version of The Human Resource, the company's personal computer-based human resources software package.

According to the vendor, Release 4.02 offers over 30 additional functions, such as screen painting, menu and database customization and field-level security.

Clare Gillan, a senior analyst at International Data Corp., a Framingham, Mass.-based market research and consulting firm, observed that traditionally, D&B Software has not been aggressively attacking the PC marketplace.

"They need a distributed PC application to be competitive and offer their customers flexibility," Gillan said.

The package, capable of running alone or in a distributed processing environment, consists of six integrated modules, including personnel, payroll, profit sharing, pension, Consolidated Omnibus Reconciliation Act, or Cobra, and flexible plan administration.

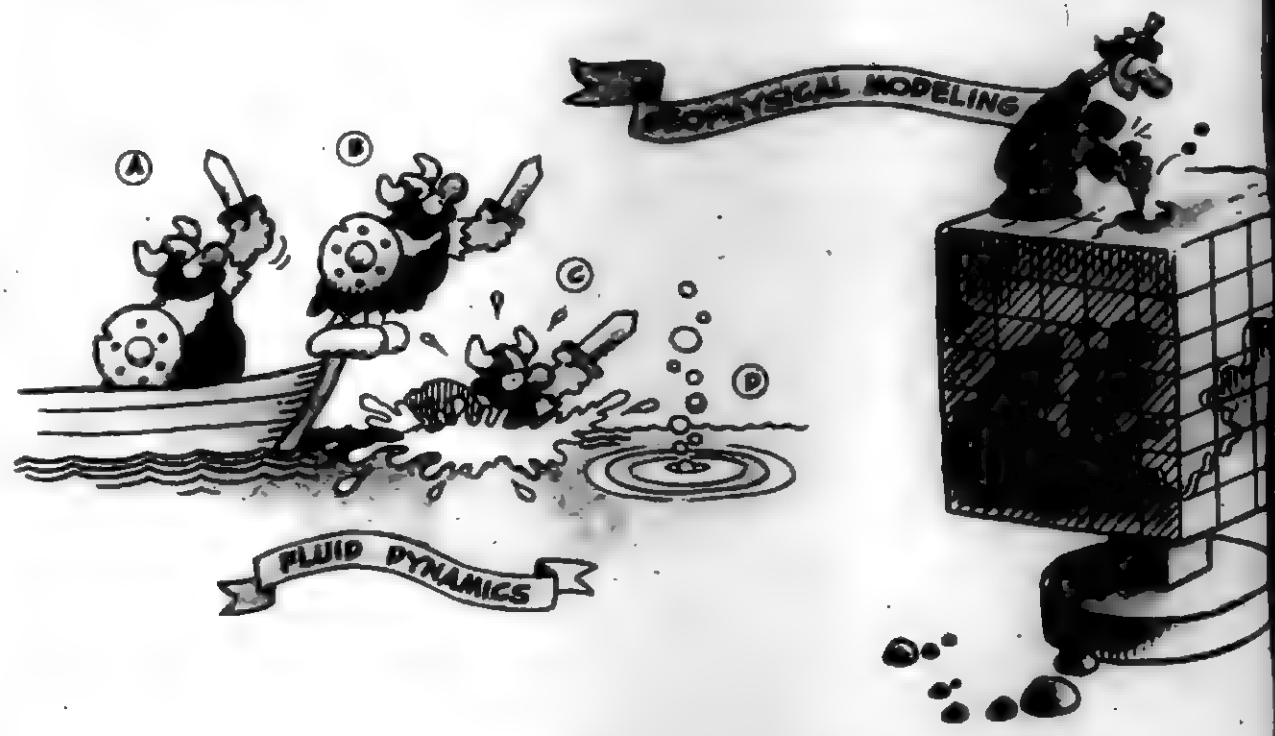
Lori Flynn, payroll supervisor at Keystone Provident Life Insurance Co. in Boston, started beta-testing the product last January and describes the latest release as "very easy to use."

"We're always in a crunch-time situation here in payroll, so it's important that the computer system is easy to work with," Flynn said.

Keystone Provident, with 254 active employees, is currently running the package on Intel Corp. 80286-based IBM-compatible machines over a six-user Novell, Inc. local-area network. According to Flynn, the company has received excellent support from D&B Software.

The software is currently available, and modules can be purchased individually or in combination, the vendor said. It requires a DOS-based IBM or compatible PC, with a hard drive and a minimum of 640K bytes of memory. Pricing ranges from $30,000 to $80,000.

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	MFLOPS	MIPS	SPECmark™
POWERstation 320	7.4	29.5	22.4
DECstation 5000-200	3.7	24.2	18.5

When it comes to porting, your ship has come in. Of course, all the speed in the world wouldn't mean much without the applications you need. So the RISC System/6000 family already has more than 2,000 of the most popular technical and commercial applications up, running and running fast. And if you think you know a good thing when you see it, so do software vendors. That's why you'll also be seeing more and more applications coming on board the RISC System/6000 platform all the time. And if you like to build your own solutions, there's a full arsenal of enablers and relational data bases from leading vendors, as well as CASE tools and a host of popular programming languages.

A smorgasbord of solutions. Applications already announced include the IBM engineering design packages CADAM™, CAEDS™, CBDS™,

MFLOPS are the results of the double-precision, all FORTRAN Linpack test 100x100 array data. The Dhrystone Version 1.1 test results are used to compute RISC System/6000 integer MIPS values where 1 MIP = 1 VAX 11/780. SPECmark is a geometric mean of ten benchmark tests. All performance data are based on published benchmark information.

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Peripherals debut at Macworld

BY GARY BYRNE
CW STAFF

SAN FRANCISCO — At the Macworld Expo held last week, Mountain View, Calif.-based Digital F/X, Inc. announced Soft F/X, an off-line video editing software package designed for Apple Computer, Inc. Macintosh II systems.

The product's disk-assisted editing feature enables users to edit complete video programs while using only a Macintosh II. Edited programs can be assembled by using Video F/X, the company's desktop video production system.

Soft F/X ($995) allows work groups to edit video projects simultaneously at their desktops and enables users to trim clips, superimpose graphics over live video and create transitions, the vendor said.

Other products introduced at the show include the following:

• Claris Corp.'s Macdraw Pro ($399), a software package designed to facilitate drawing and design applications on Macintosh systems. The product allows users to select from built-in colors, gradients and patterns that can be accessed from pop-up pallettes within a menu bar.

• Insignia Solutions, Inc.'s entry-level version of Softpc ($199.95), its personal computer emulation software for Macintosh Classic and LC systems, features complete Intel Corp. 80286-based system compatibility.

The product enables more than 50,000 MS-DOS off-the-shelf and customized PC programs to be run without modification on Classic or LC systems, the vendor said.

The company also introduced Version 1.1 of Accesspc ($129.95), a utility designed to allow MS-DOS files to be managed on a Macintosh. Both products are slated to ship next month.

• Norad Corp.'s Norad Shield Model 2524-P ($129) was designed with a monofilament metalized mesh to protect users of Macintosh Classic systems from radiation and glare. The platinum device features a flexible frame that can match the color and bezel shape of the Classic. A version for 16-in. monitors, the Norad Supershield, is priced at $249.

• Meridian Data, Inc.'s Macod, a compact disc/read-only memory (CD-ROM) mastering system designed exclusively for Macintosh systems, can accommodate low-volume, in-house CD-ROM production without requiring outside manufacturing facilities, according to the vendor.

The product is priced at $34,000.

• Rasterops Corp.'s 24STV complete real-time video processing system combines 24-bit video integration, graphics acceleration, video overlay and video compression in a device that fits into a single Nubus slot.

The product enables users to display 24-bit images, capture images or overlay graphics onto live video through a Nubus adapter. It supports 640- by 480-pixel screen formats at 72 dot/in.

The 24STV is scheduled to ship next month and is priced at $1,795.

Rasterops also announced the following products:

Clearvue/XL, a 21-in., two-page monochrome display system designed for the Macintosh II; the Clearvue/Classics line of 19- and 21-in. monochrome display systems and boards designed for the Macintosh Classic; the 8LC display board, which provides Macintosh LC users with 256 colors or shades of gray on a 19-in. monitor with a 75Hz refresh rate; and other 8LC, gray-scale and monochrome display boards and systems for the Macintosh LC.

Pricing ranges from $495 to $3,795, depending on configuration purchased.

• Sigma Designs, Inc.'s Sigma Bullet 3040 ($1,999) is a 40-MHz Motorola, Inc. 68030-based accelerator add-in board designed for Macintosh IICI and IISI systems.

The board features lossless data and image compression as well as a 32K-byte static random-access memory cache.

Toshiba enters chip set market

IRVINE, Calif. — Toshiba America Electronic Components, Inc., a U.S. subsidiary of Toshiba Corp. in Japan, entered the chip market recently with the introduction of its Intel Corp. I486-based peripheral chip set designed for IBM Micro Channel Architecture (MCA)-based computers.

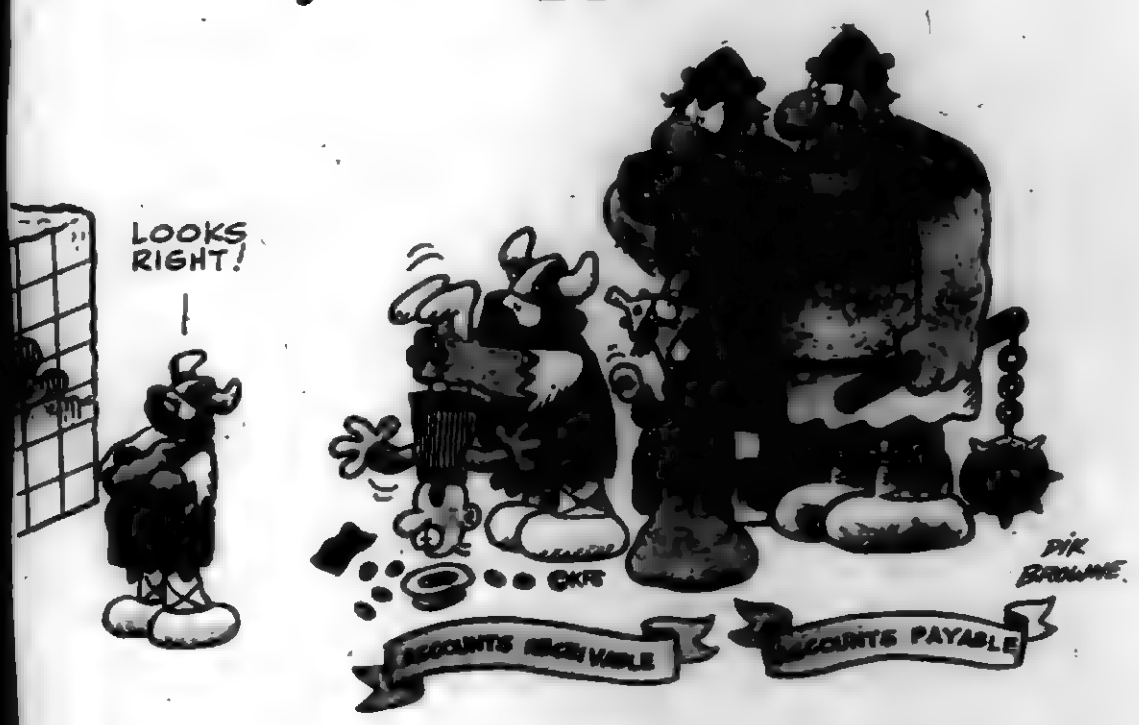
The four-chip package, which is scheduled for availability in July, is a peripheral chip set based on Micral's proprietary Short Line Interface Kernel systems architecture. It consists of a bus master direct-memory access controller, an address buffer/data buffer, a memory/bus controller and a peripheral support chip, according to Micral President Charles Smoot.

These chips replace 55-chip configurations that are found in other MCA-based personal computers and are packaged as a daughter card that can be varied, Smoot said.

The chip set will support an Intel I486 microprocessor operating at maximum frequencies of 25 or 33 MHz, according to the company. The cost is $250 per chip set in quantities of 1,000. Manufacturing and marketing will be done by Toshiba.

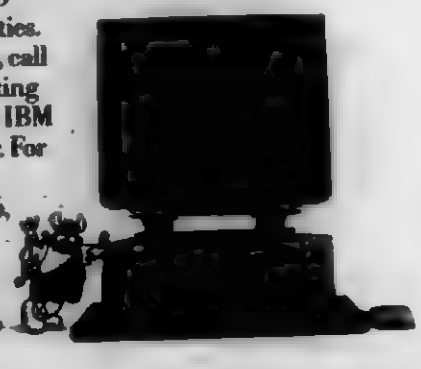
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Novell users await '91 products

ANALYSIS

BY JIM NASH
CW STAFF

Although much of what users and analysts expect from Novell, Inc. this year is simple delivery of promised goods, some hold out the hope for bigger things, such as a less expensive, downsized version of Netware 386 for smaller companies.

As 1991 moves into full swing, observers are confused about just where Novell stands in its product delivery cycle. Some packages, such as its naming service and remote management facility, are being quietly, belatedly shooed into the market.

Other products that have been expected for years, such as System Fault Tolerance Level III (SFT III), remain in alpha- or beta-test limbo. Novell has hinted that SFT III might exit beta testing this fall. However, the Provo, Utah-based company has adopted a stony silence on most products.

Several observers have noted the need to revamp Novell's packaging strategy for Netware 386. Officially, Novell refuses to comment on the likelihood of any 386 strategy changes.

Nonetheless, users and analysts said they have heard that the company will break Netware 386 out of its current large-corporation orbit. In 1991, observers predicted, Novell will reprice Netware 386 and offer options more in line with the needs of smaller companies.

Todd Booth, local-area network manager at Quotron Systems, Inc., a software developer in Los Angeles, said the idea makes increasing sense as Intel Corp. 80286- and 80386-based personal computers become more affordable.

"Some users are running Netware 286 on 386 machines," he said. Most would upgrade if Netware 386, with a list price of $7,995, was brought down from the pricing stratosphere, Booth predicted. Netware 286 Version 2.15 lists for $3,295.

"The key thing that Novell must do in 1991 is get the bulk of its sales based on Netware 386 and off Netware 286," said Craig Burton, an industry analyst and chief executive officer of Clarke Burton Corp. in Salt Lake City.

Burton said that although he had not heard Novell would stratify Netware 386, the move to market it to discrete groups such as large firms will become ever more important.

"They may have had the capacity in 1990 to milk Netware 386 at its luxury price," Burton said, but that will not last.

A different system

Burton said many Netware 286 users see Netware 386 as a virtually different operating system. When they decide an upgrade is needed, he added, many Netware 286 users will look at competing systems that may seem at least as foreign as Netware 386.

Darrell Miller, Novell's executive vice president of marketing and services, said a decision to change Netware 386's packaging had not been made. In the past, Miller said, he reviewed the product's marketing strategy regularly, but he has found no plan better than the current one. Today, Netware is marketed to discrete groups of users ranging from small offices and first-time buyers to massive, network-savvy corporations.

Miller said, however, that the company would field minor updates for Netware 386 and Netware 286 some time in 1991.

Information systems managers seem more confident about product expansion than Miller does. Booth said he expects to see a dual-protocol stack sporting Transmission Control Protocol/Internet Protocol (TCP/IP) and Novell's interpacket exchange (IPX) this year. A third-party kluge exists, he explained, but it is a cumbersome way for users to run TCP/IP applications from a single PC running Netware.

A spokeswoman for Novell said no announcement for a dual-protocol stack had been made, citing the company's policy about not commenting on products while they are in testing.

Most users said they expect Netware connectivity with Apple Computer, Inc.'s Macintosh line to be delivered in the first half of 1991 just as the naming service and remote management facility were delivered: without fanfare and behind schedule.

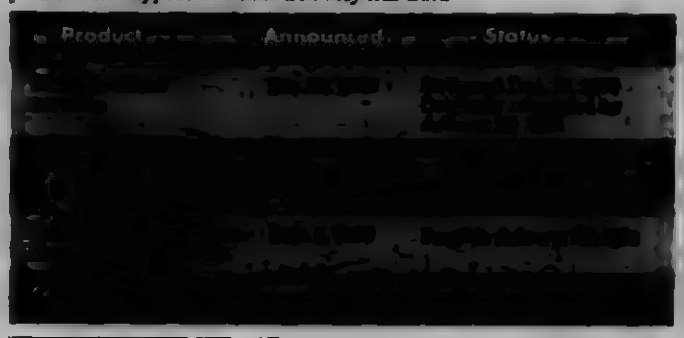
However, broad network interoperability remains an unfulfilled promise — one that many users and analysts do not expect to be delivered this year.

Novell appears likely to follow the lead of other computer companies that will "batten down the hatches" until the economy stabilizes, said Bill Lawrence, network engineer at Southern California Edison's nuclear power

Continued on page 47

Eyes on the calendar

Novell users have been watching to see when promised Netware 386 products will appear and how well they will work



CW Chart: Paul Mock

Microcom links worlds

BY JOANIE M. WEXLER
CW STAFF

HAMMOND, Ind. — Just a few years ago, Inland Steel Co. computer users swiveled between two terminals on their desks to access the notoriously discordant worlds of the IBM mainframe and the Digital Equipment Corp. minicomputer.

Today, 35 token-ring local-area networks later, 2,100 personal computers have replaced the terminals, and users are tapping into both environments from one desktop device. Part of that networking scenario now includes a recent addition to the Microcom, Inc. Relay Gold product line, a move that allows the financially faltering Microcom to compete with several other companies in the growing LAN-to-[illegible] market.

Inland Steel has been beta-testing the Relay Token-Ring Gateway for six months and is now in the purchasing phase, according to Edward Szymoniak, account manager for the company's computer task group.

Microcom announced the token-ring product, along with Relay Synchronous Data Link Control Dial-Up, last month, as well as Relay/Transfer for Customer Information Control System, a mainframe software package.

Advantageous addition

Szymoniak said his company derives two main benefits from the Microcom token-ring offering. The first is using just one software package to handle connectivity for the networks, dial-up modems and coaxial controller boards. "I can bring up mainframe, [DEC] VAX and printer sessions, dial out over modems and download files simultaneously," Szymoniak said.

The second advantage is the product's automatic log-on capability. The feature allows an expert to write a script — or macro — that hooks a user into a host without having to provide an identification code and password to the remote system.

Microcom acquired the Relay line when it purchased VM Personal Computing, Inc. in Danbury, Conn., two years ago. Microcom is bringing its industry-renowned data compression techniques to the table with a high-speed proprietary protocol called Relay Transfer, which can be substituted for IBM's IND$ File — a program running on the IBM mainframe to handle the host side of a file transfer.

EC plans strategy for telecommunications

BY ELIZABETH DE BONY
IDG NEWS SERVICE

BRUSSELS — The European Commission plans to use 1991 and beyond to consolidate its two-pronged telecommunications policy approach of standard harmonization and market liberalization to create a vast European Community (EC) market.

To further this drive, the EC may provide details this year of plans to promote the creation of truly Europeanwide services and infrastructure — a so-called European network system.

Specifically, commission activities in 1991 will concentrate on follow-up directives to its framework open network provisions (ONP) directive as well as overseeing implementation of a satellite communication directive and possibly starting work on a strategy for the entire public telecommunications sector.



EC officials said an ONP committee of national experts will soon give the commission a draft text implementing ONP for leased lines. The EC's ONP directive, adopted in July, provides a framework of principles that must now be implemented by way of specific directives for each liberated service containing the appropriate standards. The ONP framework established the principle that all operators had access to public networks provided they respected specific standards. However, the directive allows member states to subject access to a transparent and nondiscriminatory licensing system that has won prior commission approval.

After further study, Filippo Maria Pandolfi, EC's research and development commissioner, said more discussions regarding ONP were in order. These ended in December, and EC officials said draft directives will start surfacing by April. The directives will cover ONP for the sector, mutual recognition of licensing authorizations and a revised directive on the Mac-Packet of standards for high-definition television (HDTV). The existing EC directive on HDTV expires at the end of 1991.

Pandolfi also emphasized the need to work harder on standardization. Taking his cue from the commission's October Green Paper on Standardization, he has called for an acceleration of the European standardization drive. The paper called for a speeding up of the process by way of greater industry involvement and a transfer of responsibility for drafting standards from national standards institutes to a network of European institutions headed by a standards council.

Commission proposals to implement these objectives are expected in 1991. In the field of mobile communications, an EC official said the commission has

Continued on page 46



The 486™ PC. It may be a little

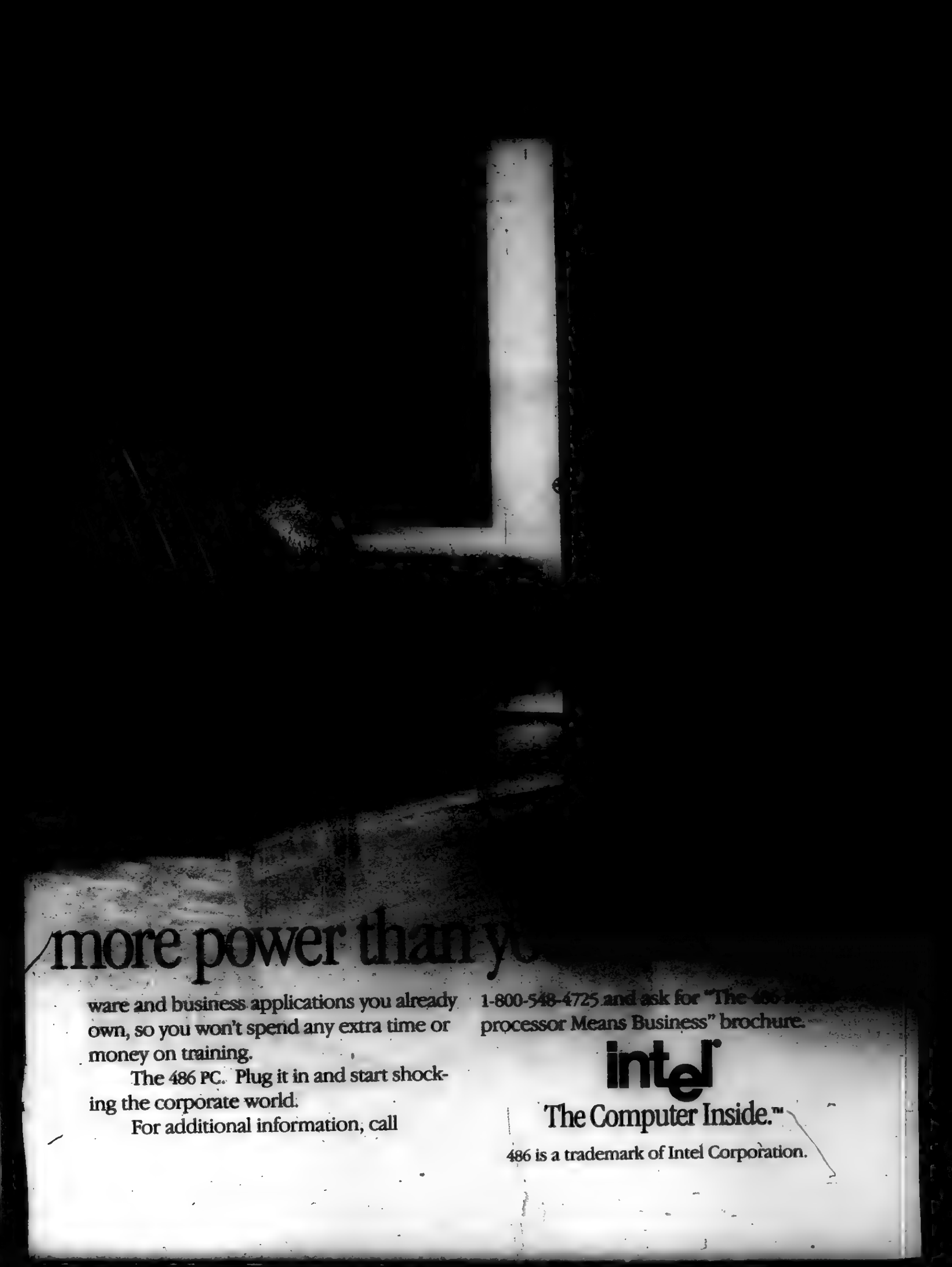
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EDI growth may be leveling off

BY JEM NASH
CW STAFF

Steam leaking from the slowly chugging electronic data interchange (EDI) locomotive could bring expansion of the technology to a halt before mid-decade.

While EDI proponents continue to advocate the universality of EDI, a new study indicates that the number of newcomers to EDI may have already peaked. That same study projects user spending on EDI services and equipment to grow at a 19% compound annual growth rate during the next four years.

Input, a market research firm in Mountain View, Calif., has published a report stating that the number of businesses plugging into EDI this year will hold to 5,000, the same number as last year.

"I think we are going to see a steady growth — not an exponential growth — over the next two years," Input consultant Torrey Byles said. The number of transactions conducted on EDI, however, is expected to grow at an exponential rate indefinitely, according to Byles.

"This has caused a stir," Byles said, "but we also got some positive feedback from vendors who said our past forecasts were a little [optimistic]." Without naming the companies, he said they agreed that this estimate appears to be more accurate.

Golden business rule

A basic business maxim known as the 80/20 rule explains why the growth in new EDI users is likely to level off and then taper off from its current high point, Byles said. According to the rule, 20% of an average company's trading partners are responsible for generating 80% of its business. He explained that companies typically use the 80/20 rule in deciding which partners should be linked via EDI.

The report indicates that because EDI is most cost-efficient for high-volume transactions, it is likely to remain a technology used primarily by the country's 1,000 largest companies, imposed on the 20% of their partners they consider key.

"As soon as we start hitting 35,000 users in the U.S. — maybe in about three years — we're going to see a slowdown [in newcomers]," he said. Input estimated that 20,000 companies now use EDI.

Donna Mog, systems designer at Revco Drug Stores, Inc. in Twinsburg, Ohio, disagreed, saying a new surge of users will come as the last of the major corporations climb aboard. Mog added she thinks a second wave will crest when EDI software and equipment become affordable for medium and small businesses.

That may be hopeful thinking. With about $2.5 billion in sales, Revco has five partners linked by EDI and another four in training. The company is operating under Chapter 11 protection, and like many companies, may be looking for significant savings through automated paperwork.

"There was a hell of a lot of infatuation with information processing in the '80s," which Byles said explains the overly optimistic predictions of replacing paper in most transactions. "But people aren't sure the investment has paid off," he said.

High-volume choice

While Byles admitted the chances of a surge among small businesses increase as technology gets less dear, he said he does not see that happening. "EDI is not cost-efficient to have when you only get a handful of orders in a month. It is competing with cheaper forms of order processing, such as phone orders, paper-based orders and walk-in orders."

"My gut feeling is that that is a little pessimistic," said Bill Nelson, senior director of network services at the National Automated Clearing House Association. "The market is so big," he added. Nelson said he sees the market hitting a plateau in "six or seven years."

Automated clearinghouses process electronic payments and debits under $100 million in much the same way Federal Reserve System clearinghouses process paper transactions. "We know that there are 100,000 companies using automated clearinghouses; not all are EDI," Nelson said. He added most of those firms would be candidates for EDI if the price were right. Input has offered annual assessments of the EDI market for the past four years. Byles explained that the company polled about 100 users, 30 trade associations and several EDI vendors.

EC strategy

CONTINUED FROM PAGE 43

issued standards legislation regulating cellular communications that will come into force by the end of 1991, rules establishing a harmonized pan-European paging system that takes effect at the end of December 1992 and plans to introduce common standards for digital cordless telephones by late 1992.

The commission is also expected to continue work on the development of advanced communication networks and integrated broadband communications.

The commission has identified telecommunications investments in Central and Eastern Europe as a priority because telecommunications is seen as key to bringing those regions' economies and business practices up to current EC and U.S. standards.

De Bony is a Brussels-based correspondent for the IDG News Service.



Protocol to benefit remote LAN users

BY ELISABETH HORWITT
CW STAFF

A de facto networking standard now coming into its own should help users access full local-area network services from a remote LAN or workstation.

Point-to-Point Protocol (PPP) was developed by the Internet Engineering Task Force to meet two important demands for the growing population of remote LAN users. First, it allows users to access the full range of LAN services such as file transfer, electronic mail and multiple server sessions over a dial-up line. This is of particular benefit to users — at home or on the road — who cannot justify a dedicated link to their office LAN. Without PPP or its equivalent, these users are limited to simple terminal-to-host access, said Jeff Fritz, a telecommunications engineer at West Virginia University.

An existing protocol called Serial Line Internet Protocol (SLIP) also allows users to access those LAN services over dial-up links. However, user-to-LAN communications via SLIP tend to be frustratingly slow because the protocol "takes up a lot of bandwidth and, in our experience, has lots of overhead," Fritz said. While vendors have avoided this problem by adding compression software to their SLIP products, PPP is said to have header compression built-in.

PPP also gives a remote workstation the ability to "negotiate" aspects of dialing into a LAN, including the following:

- Assignment of an address on the network by the LAN server. This is particularly applicable when the user is traveling and must request a new address to log onto the network.
- An identification number or password that will provide the user with access to restricted data or services.
- Compression of various fields defined by the protocol to cut overhead.

Widespread user and vendor implementation of PPP would help Merit Network, Inc. in Ann Arbor, Mich., in its administration of Michnet, system research programmer Glenn McGregor said. The network links users and computing resources at a number of academic, commercial and government centers.

Merit hopes to see enough user and vendor support of PPP to warrant replacing current SLIP installations with the newer protocol, McGregor said. PPP's support of password negotiation over dial-up lines will come in handy when Merit finishes implementing an identification system, he added. For example, the right identification will get a user beyond Michnet to Internet.

Also of value to Merit is PPP's ability to support multiple protocols, such as Transmission Control Protocol/Internet Protocol (TCP/IP) and Digital Equipment Corp.'s Decnet, over the same line, McGregor said. While Michnet has been testing PPP on TCP/IP systems to start with, the aim is to interconnect sites using Decnet, Open Systems Interconnect and Novell, Inc.'s IPX as well.

Compatibility a plus

The other major benefit PPP promises is interoperability between different vendors' routers. This could be very beneficial to companies that mix and match various brands of bridges and routers or wish to interconnect with business partners that use different types of equipment.

Menlo Park, Calif., router vendor Cisco Systems, Inc. claimed to have started shipping products with PPP support several months ago, while Wellfleet Communications, Inc. in Bedford, Mass., promised PPP support on all its interconnectivity products by the end of the second quarter. Other major router vendors either support PPP now or have announced their intentions to do so in the near future, McGregor said.

More recently, PTP Software, Inc. in Wakefield, Mass., announced a PPP version of its flagship TCP/IP software package for DOS-based personal computers.

Novell

CONTINUED FROM PAGE 43

generation department in Irvine.

That may leave more interoperability projects lower on Novell's priority lists, Lawrence said. Burton said it would be a mistake for the company to delay "interoperability products [that it was] talking about in 1984 and 1985." It is "absolutely essential that Netware 386 interoperate with Network File System, Appletalk filing protocol and system messaging block," Burton said.

Lawrence said one of the products he would settle for this year would be a naming service that goes beyond the version recently released. The present release is limited in several ways, particularly in its lack of automation.

Sheldon Laube, national director of information and technology at Price Waterhouse, said he expects little in the way of network management from Novell this year. Laube said users are getting impatient waiting for tools that allow them "to see exactly what's going on in all the other Netware 386 servers around the wide-area network."

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NEW PRODUCTS

Local-area networking hardware

National Semiconductor Corp.'s Computer Enhancement Group has introduced three adapter cards designed to connect Apple Computer, Inc.'s Macintosh systems to 10Base-T Ethernet local-area networks.

The boards incorporate connectors for thick coaxial and twisted-pair Ethernet cables and feature drivers that are compatible with Apple's Ethernet protocol, Ethertalk.

Prices range from $449 to $595.

National Semiconductor
2900 Semiconductor Drive
Santa Clara, Calif. 95052
(408) 721-2650

Diamond Micro Solutions has announced the Rocket 486/33 Model 433, an Intel Corp. I486-based 33-MHz Extended Industry Standard Architecture tower system designed to support Novell, Inc.'s Netware, The Santa Cruz Operation's Unix and Xenix, PC-DOS, MS-DOS and other major operating systems and software.

A basic configuration includes 8M bytes of random-access memory, a 1.2M-byte floppy disk drive, two serial ports, a parallel port and DOS Version 3.3 or 4.01.

The product is priced at $5,599.

Diamond Micro Solutions
1615 Alvarado St.
San Leandro, Calif. 94577
(415) 351-4700

Customer-premises equipment

Digital Link Corp. has announced a product that serves as a T3 multiplexer and data service unit and combines multiple data terminal equipment inputs onto a single 45M bit/sec. T3 line.

The DL3000 digital signal multiplexer can be programmed to accept data at speeds ranging from 300K bit/sec. to 44.2M bit/sec.

It can accept data from data terminal equipment such as local-area network bridges or routers, private branch exchanges or videoteleconferencing equipment.

Pricing starts at less than $15,000.

Digital Link
252 Humboldt Court
Sunnyvale, Calif. 94089
(408) 745-6200

Gandalf Data, Inc. has announced a Basic Rate Interface TA-1 terminal adapter that is compatible with AT&T or Northern Telecom, Inc. Integrated Services Digital Network central-office switches.

The product features an RS-366 autocall interface that allows users to dial automatically via one or both B channels.

The product is priced at $1,095.

Gandalf Data
1020 S. Noel Ave.
Wheeling, Ill. 60090
(708) 541-6060

Electronic mail

Biacom, Inc. has announced a communications software package designed to allow users of Wang Laboratories, Inc. VS systems to send word processing and other documents to facsimile machines.

Faxcom for VS is a fax server that features Faxcom Communication Language, a command set that allows programmers to control the intelligence and capabilities of the fax server. Faxes can also be scheduled to be sent after business hours, the vendor said.

The product costs $7,500.

Biacom
65 Rangeway Road
Billerica, Mass. 01821
(508) 670-5521

Host-to-host

Joiner Associates, Inc. has announced a line of software products designed to implement IBM's Network Job Entry protocols on Digital Equipment Corp. VAX/VMS systems.

Version 3.5 of the Jnet family features multiple transmission streams, a documented application programming interface and Vaxcluster transparency.

The new releases are scheduled to begin customer testing this month, according to the vendor.

Pricing ranges from $1,125 to $51,375 for Jnet Clusterwide licenses. Other versions cost $6,000 per node.

Joiner Associates
3800 Regent St.
Madison, Wis. 53705
(608) 238-8657

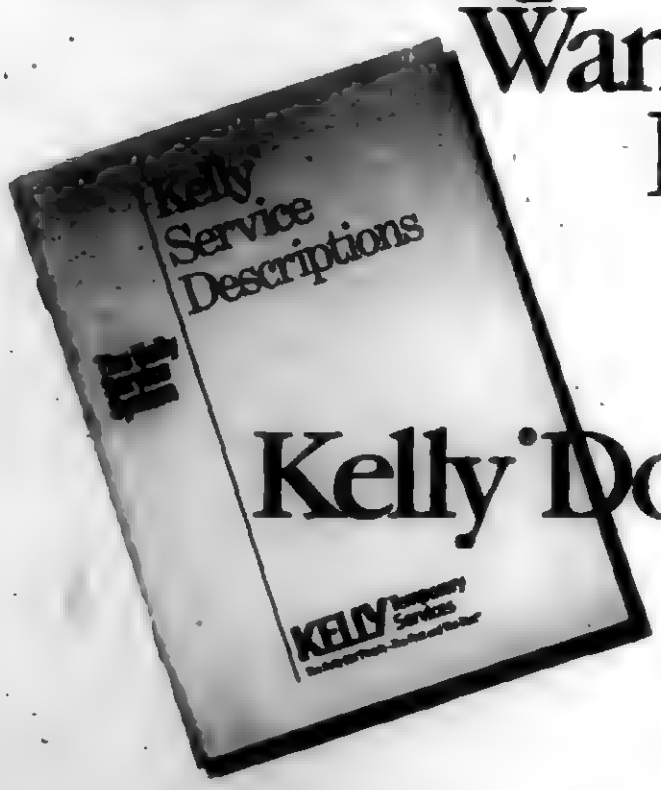
Micro Technology, Inc. has announced a computer interconnect product designed for Digital Equipment Corp.'s VAX 3000/4000 series and Microvax II machines.

The CIQBA provides VAX system users with a direct connection to a computer interconnect-based Vaxcluster, the vendor said.

The product is slated to begin shipping in the first quarter of 1991. Pricing ranges between $9,500 for Microvax II systems and $18,500 for VAX machines.

Micro Technology
5065 E. Hunter Ave.
Anaheim, Calif. 92807
(714) 970-0300

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MANAGER'S JOURNAL

EXECUTIVE TRACK



J. Raymond Caron, president of Cigna Corp.'s information systems subsidiary Cigna Systems, has been elected to **The Conference Board's Council of North American Information Management Executives.**

Founded in 1985, the council consists of prominent IS executives in the U.S. and Canada. Members meet three times per year to discuss issues, problems and solutions of common interest and to plan research among members on leading-edge issues.

The New York-based Conference Board is a worldwide business network connecting companies and senior executives from more than 50 countries.

Caron was promoted to his current job at Cigna in 1988. He is responsible for all systems development, data processing and telecommunications functions at Philadelphia-based Cigna. He joined Insurance Company of North America, a Cigna firm, in 1973 as a systems analyst.

.....

Jeff Wolf has been named vice president and controller at **Link Technologies, Inc.**, a computer terminals supplier in Fremont, Calif. He is responsible for MIS, finance, accounting and legal functions.

Wolf, 39, was most recently responsible for financial planning and analysis at Wyse Technology, which acquired Link Technologies in 1987. He previously held financial positions at Worlds of Wonder, Inc. and Zilog, Inc.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Downsizing now behind Hartford

Having achieved its IS staffing goal before the recession, The Hartford looks ahead

BY SALLY CUSACK
CW STAFF

In the wake of a national economic downturn and a recent wave of industry consolidation, insurance companies have been moving for some time to downsize operations and restructure products and services. ITT Hartford, namesake of the Connecticut insurance capital that serves as its corporate headquarters, is no exception.

"We had never had a major layoff since our founding in 1810," says John T. Crawford, vice president of information management at The Hartford. "When the first wave came in January 1987, it was a shock, particularly to the employees in information systems."

Cutting back is never easy, but The Hartford has one consolation: While other companies must look ahead to belt-tightening in IS during the coming year, The Hartford can look back on already having achieved it. The firm had 2,250 people on its information management payroll in 1985 and finished out 1990 with approximately 1,700.

"It's difficult to manage a downsizing," Crawford reflects. "The first 25 years in this business, I was always trying to find people to grow the organization bigger and bigger. I had no experience with downsizing."

According to Crawford, The Hartford's goal was to define plans for a cutback by the fall of 1987. Crawford deployed a reduction in force group, which was made up of IS senior management and a handful of staff members, to develop a strategy that included the following:

- Implementation of a corporate early retirement program to provide incentive for some employees to leave voluntarily.
- A freeze on all hiring.
- A calculation of what the company could expect to lose through normal attrition, which was about 8% annually.



Stella Johnson

The Hartford's Crawford *now runs a leaner IS function*

Crawford outlined several objectives for the downsizing effort, among them a thorough review of every job in the IS organization, a commitment to protect discretionary funds for research and development investment and a mandate to minimize arbitrary resource allocation to avoid across-the-board cuts.

"We wanted to use the crisis to strengthen the management team," Crawford says. "My direct reports worked together to fashion the organization they would drive." Management goals included the fair treatment of all individuals and an effort to minimize organizational disruption.

"One of the things we learned after the first wave of cutbacks was that we had to do a better job of communicating with our employees," Crawford says.

The first step in that direction was to create a quarterly newsletter for the information management community. The publication actively solicits contributions and ideas from employees as well as provides a communication vehicle for upper management.

Continued on page 50

Sun R&M pleased with outsourcing results

BY CLINTON WILDER
CW STAFF

Just short of four months have passed since Sun Refining & Marketing Co. outsourced its data center to Andersen Consulting. From Sun's perspective, the verdict is so far, so good.

Sun's plan to save up to 35% on its annual processing costs during the 10-year contract is proceeding smoothly, said Jack Donohue, vice president of information systems at Sun. His bosses think so, too. On a wall in his corner office overlooking downtown Philadelphia, Donohue displays the third-quarter 1990 "Best of the Best" award from Sun's president for managing the outsourcing decision.

"In four months, we haven't skipped a beat," Donohue said. All 70 employees at Sun's Dallas data center accepted job offers from Andersen.

However, Donohue is quick to say that he does not believe outsourcing is right for every company. Sun's IS department had several circumstances that made outsourcing to Andersen the right choice, according to Donohue.



Sun's *Donohue: Outsourcing works*

First and foremost, the Dallas data center had excess CPU capacity, making it attractive for Andersen to acquire and less attractive for Sun to keep. Sun no longer handled mainframe processing for its exploration and production company, which it spun off as Oryx Energy Co. in 1988. "Now Andersen gets the economies of scale that we used to have when we were a bigger company," which creates the savings in processing costs, Donohue said.

He stressed that outsourcing presents a huge management challenge to Sun. "This wasn't something to be delegated. We had our top people on it," he said.

Donohue also noted the proliferation of personal computer and local-area network-based applications at Sun. "We built our whole philosophy in the 1970s and 1980s around the data center, but now the real action is on the desktops," he said. "The data center is still important, but it's not strategic."

Still, Donohue concluded, "We wouldn't have done it if there wasn't a financial carrot."

Downsizing

CONTINUED FROM PAGE 49

In addition to the newsletter, Crawford has also initiated regular, ad hoc group meetings in which people are randomly selected to voice their ideas and concerns. These two-hour meetings are held on a bimonthly basis.

According to Robert R. Lukas, The Hartford's assistant vice president of information services, employees are becoming more comfortable with the idea of speaking frankly to upper management.

"Of course, there are still, and always will be, some skeptics," Lukas says. "If you tell them 60 positions will be eliminated, they'll believe 600. In general, though, I think people feel like they're on safer ice than they were a few years ago."

Crawford is not listening with an "ivory tower" perspective. He has held practically every type of position in IS: computer operator, programmer, systems analyst and program manager. He joined The Hartford in 1980 as an assistant vice president.

"With 1,700 people, I find it both essential and exciting to hear what they have to say," Crawford says, adding that he agrees up front to absolute confidentiality, regardless of what topic or problem the employee wishes to discuss.

The Information Management Division at The Hartford is perhaps a bit more complex than the average IS shop, as it is responsible for servicing the company's two disparate businesses: life insurance and property and casualty insurance.

Crawford reports to both company presidents, which gives him two sets of customers with two very different sets of needs, but he says he feels a centralized technology group provides for a strong working relationship with both firms.

The Hartford's data center has gone through some downsizing itself, from 20 mainframes in 1987 to eight in 1990. The Hartford relies on a combination of systems from Amdahl Corp. and IBM for mainframe processing. For claims processing, the life insurance side of the house has chosen Digital Equipment Corp. machines, while the property and casualty company has installed Wang Laboratories, Inc. midrange systems.

The Hartford is in the process of piloting an imaging system from Wang to fully automate the claims process.

Keeping informed is paramount for Crawford, and while logging in 55 to 60 working hours per week, he makes frequent use of his cellular car telephone and voice-mail technology when he is not actually in the office. An avid reader, he is famous for clipping technology- and management-related articles from newspapers and magazines and regularly sending them to appropriate staff members.

Better off than most

Crawford says he believes The Hartford is in a better position than most of its competitors because of conservative underwriting practices and investment policies. The Hartford boasts a solid balance sheet and remains free of junk bonds and real-estate speculation.

Although business growth is slow — total assets increased just 2% in 1989, to $8.69 billion — Crawford says he believes The Hartford is luckier than some corporations in that it did not wait for a total crisis situation before taking the necessary reorganizational measures.

Crawford is the first to acknowledge there is no magic. It basically comes down to hard work. Although his workday has been intensified during the past few years, he enjoys the challenges and opportunities as they arise.

"The world is exploding with new technologies, and it's exciting to explore what business opportunities they provide," Crawford says. "When we get past this current down cycle — and we will get past it — we will be back in a position to grow. One of my goals is to be a catalyst for the company in terms of trying to excite people about exploring new technologies for growth."

Recycled employees

In addition to a distributing quarterly newsletter for IS staff members and holding employee meetings, John T. Crawford has also recently participated in making a video to address employee concerns at The Hartford.

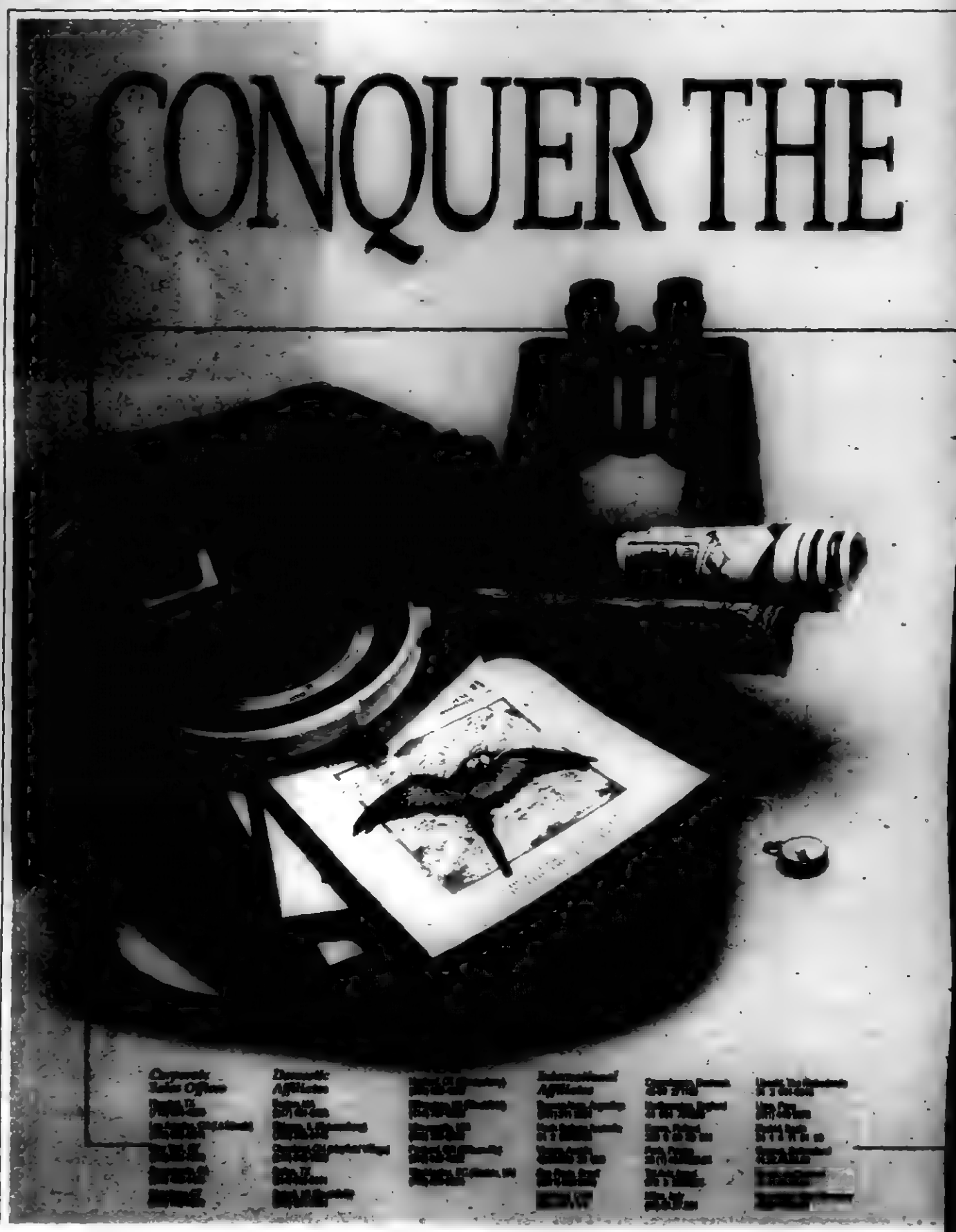
One of the main topics he addresses is employee questions on job retraining opportunities and how those opportunities can meet employee needs in the future.

This all falls into Crawford's definition of aggressive staff planning. By working with senior staff members to map out job skills and positions, the firm can target new areas where special skills are needed.

"This means that as people's jobs are eliminated, we can implement a retraining program using job counseling and testing to retrain them for employment in another area of information services," he says.

The Hartford has retrained approximately 60 people during the past two years — all employees whose traditional jobs in IS had been eliminated.

SALLY COUCH



CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"System project failure: The heuristics of risk"

By David McComb and Jill Smith
Journal of Information Systems Management

Winter 1991

■ Almost every information systems manager has experienced systems development projects that fail to meet deadlines or live up to user expectations. Some of the risk involved in development efforts can be eliminated through careful examination of the factors common to most failures.

The following are among the risks:

- Gross underestimation of the time required to complete the project. To avoid this problem, include as much detail as possible in the original estimate.
- Bid strategy. The automatic selection of the lowest bidder as vendor is usually a prescription for failure. The productivity of a better-quality candidate may be as much as 10 times higher.
- Lack of user involvement. End users will more eagerly adopt a systems project if they are involved in its development and if its implementation will offer them tangible benefits.
- Workarounds. It is better to confront a problem directly than to expend a great deal of effort or make design compromises in working around the obstacle.
- Experimentation with new technology. Exercise caution in installing unproven products. — Derek Slater

"The new quality landscape: Total quality management"

By Lawrence Tobin
Journal of Systems Management

November 1990

■ The latest buzzword in business, total quality management (TQM), is defined as an integrated effort to continuously improve every business process and strive for the goal of 100% satisfied customers. But what does TQM mean to the information systems function?

For one thing, it will not be enough for IS to deliver defect-free systems that meet user requirements. The IS department will have to look beyond its internal users and consider whether the system is "doing the right thing" for the business' customers as well.

Corporate executives embracing TQM will also be ordering a whole new set of information systems to capture and analyze data about customers and the quality of products and services. Because TQM projects are typically handled by multidisciplinary teams, there will be an even greater emphasis on networking across functional lines.

TQM can also be adopted by the IS department, empowering IS staff members to seek improvements in their processes. But the big payoff is that TQM gives IS an opportunity to play a role in how the corporation does business, as opposed to being isolated from the greater business environment. — Mitch Betts

"Why change programs don't produce change"

By Michael Beer, Russell Eisenstat and Bert Spector
Harvard Business Review

November/December 1990

■ A whirlwind of changing markets and sleeker competition is enough to make a firm reevaluate and refocus its strategies. The problem is that senior managers have waited for mission statements and highly structured training programs to filter down through the ranks.

However, managers should do just the opposite: They need to involve their workers in all facets of change. Rather than concentrating on formal structures, they should be creating ad hoc organizational arrangements to solve business problems. This focuses the change on the work, not the structure.

There are six steps companies can take to ensure effective change:

Step 1: Mobilize commitment to change by forming a shared diagnosis throughout the company of what the business problem is.

Step 2: Develop a shared vision of how to organize and manage for competitiveness.

Step 3: Foster consensus for the new vision, competence to enact it and cohesion to move it along.

Step 4: Spread revitalization to departments without pushing from the top.

Step 5: Institutionalize revitalization through formal policies, systems and structures.

Step 6: Monitor and adjust strategies in response to problems in the revitalization process. — Cathy Dufy

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CALENDAR

The perspectives on information technology of four chief executive officers will highlight Nolan Norton Institute's annual symposium in Tarpon Springs, Fla., Feb. 7-8.

Entitled "The Enterprise of the Future — Today," the event features speeches by the CEOs of Sea-Land Service, Inc.; Wrangler, Inc.; Thorn-EMI PLC in the UK; and Federconsorzi in Italy. More than 20 breakout sessions will feature case studies in information technology application at corporations and government agencies. The keynote speaker is scheduled to be author and futurist Alvin Toffler.

For more information, contact Lois Chase at Nolan, Norton & Co., One Cranberry Hill, Lexington, Mass. 02173 (617) 862-8820.

FEB. 10 - 16

The Development Center Institute Conference. Orlando, Fla., Feb. 10-13 — Contact: Development Center Institute, Indianapolis, Ind. (317) 846-2753.

Video Expo. San Francisco, Feb. 11-15 — Contact: Debbie Reede, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Managing Information Technology When the Going Gets Tough. London, Feb. 12 — Contact: Suzy Mayhew, London, England (071) 236-4080.

Frame Relay for LAN/WAN Internetworking. Washington, D.C., Feb. 12-13 — Contact: Telestrategies, McLean, Va. (703) 734-7050.

Networld '91. Boston, Feb. 12-14 — Contact: Annie Z. Scully, Bruno Blenheim, Englewood Cliffs, N.J. (201) 569-8542.

Infocomm. Orlando, Fla., Feb. 12-17 — Contact: The International Communications Industries Association, Fairfax, Va. (703) 273-7200.

Systems Leadership. Los Angeles, Feb. 13-15 — Contact: Mette Shillings, Index Group, Inc., Cambridge, Mass. (617) 499-1874.

FEB. 17 - 23

SAS Users Group International Conference. New Orleans, Feb. 17-20 — Contact: SUGI Registration, SAS Institute, Cary, N.C. (919) 677-8000.

Northwest Computer Show. Minneapolis, Feb. 18-19 — Contact: Judy Koch, Plymouth, Minn. (612) 420-5376.

C++ for C Programmers. Los Angeles, Feb. 19-22 — Contact: Short Course Program Office, UCLA Extension, Los Angeles, Calif. (213) 825-3344.

Texa: User Group Conference. Long Beach, Calif., Feb. 19-22 — Contact: Anne Silberman or F. Thomas Cox, Texa Software, Culver City, Calif. (213) 649-5900.

Planning and Selecting a Financial Information System. Louisville, Ky., Feb. 20 — Contact: Beth Daly, University Seminar Center, Boston, Mass. (617) 248-8085.

Image Scanning Conference. Monterey, Calif., Feb. 20-22 — Contact: IBS CAP International, Norwell, Mass. (617) 982-3500.

Multimedia '91. Orlando, Fla., Feb. 20-22 — Contact: Society for Applied Learning Technology, Warrenton, Va. (703) 347-0055.

FEB. 24 - MARCH 2

Computer Associates International's VSE/ESA Educational Workshop. New Orleans, Feb. 24-26 — Contact: George Janetakis, Computer Associates, Garden City, N.Y. (516) 227-3300.

Communications Connections '91. San Diego, Feb. 24-27 — Contact: Dimensions, Redwood City, Calif. (415) 817-2300.

IEEE Conference on Artificial Intelligence Applications. Miami Beach, Feb. 24-28 — Contact: IEEE Computer Society, Washington, D.C. (202) 371-1013.

Share 76. San Francisco, Feb. 24 - March 1 — Contact: Share Headquarters, Chicago, Ill. (312) 644-6610.

The State of The Practice/The State of the Art CASE Conference. Orlando, Fla., Feb. 25-27 — Contact: Extended Intelligence, Chicago, Ill. (312) 248-7090.

Sun Open Systems Expo. Boston, Feb. 25-27 — Contact: Sun Open Systems Expo, Austin, Texas (512) 331-7761.

Compcon Spring '91. San Francisco, Feb. 25 - March 1 — Contact: Roger Anderson, Livermore, Calif. (415) 422-BYTE.

SAE International Congress and Exposition. Detroit, Feb. 25 - March 1 — Contact: EDI, Inc., Ann Arbor, Mich. (313) 995-1940.

EDI and the Law '91. Washington, D.C., Feb. 26-27 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

European Wireless Systems Conference. Munich, Germany, Feb. 26-27 — Contact: Rita A. Tannenbaum, Prism Research, Cedar Knolls, N.J. (201) 285-1500.

Financial Market Data Conference. New York, Feb. 26-27 — Contact: Waters Information Services, Binghamton, N.Y. (607) 772-[illegible].

Working with Personal Computer Local-Area Networks. Milwaukee, Feb. 26-28 — Contact: John T. Sandeker, Center for Continuing Engineering Education, University of Wisconsin at Milwaukee, Milwaukee, Wis. (414) 227-3101.

The Restructuring and Outsourcing Conference. Orlando, Fla., Feb. 27-28 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Strategic Planning Systems Conference. Tempe, Ariz., Feb. 27 - March 1 — Contact: Pete Ashey, Conference Coordinator, Mardoni Associates, Lebanon, N.J. (201) 730-9444.

MARCH 3

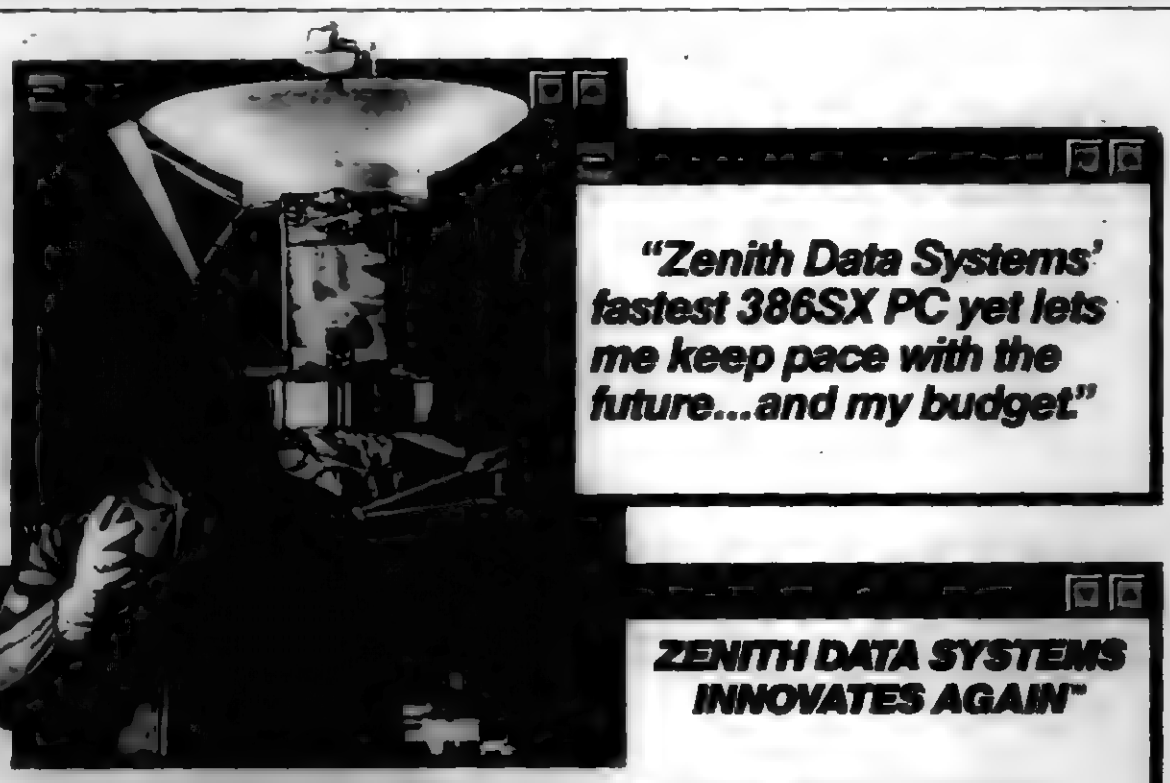
Seybold Seminars. Boston, March 4-7 — Contact: Seybold Seminars, Malibu, Calif. (213) 457-5850.

IS Performance/Capacity Management Conference. Mesa, Ariz., March 4-8 — Contact: Applied Computer Research, Phoenix, Ariz. (602) 995-5929.

ACM's Computer Science Conference. San Antonio, March 5-7 — Contact: Don Nowak, Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Technomart. San Francisco, March 5-7 — Contact: Technomart, Inc., Dallas, Texas (512) 343-9060.

Windows and OS/2 Conference. San Jose, Calif., March 5-7 — Contact: CM Ventures, Emeryville, Calif. (415) 653-6068.



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When the everyday turns treacherous

BY BARBARA FRANCETT

The most exotic network problems aren't always the hardest to tame. Often, the worst headaches for network managers result not from wrestling with nature or geography but from extreme versions of garden-variety phenomena, such as equipment diversity, rapid growth and poor documentation.

Just ask Andrew Maffei. As network manager at the Woods Hole Oceanographic Institute in Woods Hole, Mass., Maffei is responsible for communications from shipboard to a robot-manned deep-submergence laboratory on the ocean floor. Part of his network lies miles down in the frigid cold and high pressure of the deep-sea world.

As may be imagined, that kind of configuration presents very special challenges. The robots communicate with workstations and personal computers on shipboard two to six miles above via fiber-optic cable, a token-ring network using high-speed 80M-bit links and several 10M-bit channels and customized software from FTP Software, Inc. in Wakefield, Mass. The intense cold and high pressure requires the robots' computers to be housed in a titanium cylinder six inches in diameter. "We had to develop our own PC to fit inside that space," Maffei says. "To withstand the pressure, special cable has to be used for towing and to connect the robots."

However, projects like this aren't the ones that make Maffei shudder. "The real nightmare," he says, is onshore at the research facilities, "hooking together all the crazy stuff the scientists bring in."

Woods Hole researchers receive funding from various agencies and spend it on whatever equipment they deem most appropriate for their projects. "We try to set guidelines for connecting machines to the network, but we really don't have the authority," Maffei says.



Stella Johnson

Maffei says deep-sea networking beats handling onshore users

Among Woods Hole's 18 to 20 buildings on two campuses — which are 1½ miles apart — are 400 network connections and 800 to 900 users. Fiber-optic cable runs between buildings. The subnets within use varieties of Ethernet. "Everything is based on Transmission Control Protocol/Internet Protocol networking," Maffei says.

A complex mesh of bridges, routers and gateways maintains order among the network users, keeping some networks local and allowing access to others, as well as to four clustered Digital Equipment Corp. VAX hosts and a Convex Computer Corp. mini-supercomputer.

Documenting the diversity is top priority now, Maffei says. "We try to standardize the backbone as much as we can, but every local group doesn't have the same configuration," he says. "This makes it extremely difficult to provide services."

Operating in fast forward

At Blockbuster Entertainment Corp. in Fort Lauderdale, Fla., the corporate network staff also knows something about the troubles equipment diversity can cause. In its case, however, the culprit was not scientific individualism but rapid growth.

A year ago, Blockbuster had two Arcnet networks — one at its central information systems site in Dallas, supporting 15 to 20 people, and another at headquarters in Fort Lauderdale. Today, the Arcnets are gone, replaced by new cabling, a dozen token-rings and five Ethernets. These networks support more than 500 users, including personnel at zone offices in Fort Lauderdale, New York, Chicago, San Diego and Dallas. Microcom, Inc. bridges connect the token-rings and Ethernets, and a Novell, Inc. bridge links the two local-area network types.

Computer operations are split between Dallas and Fort Lauderdale. DEC VAXs in the zone offices poll the 1,500 stores, which retrieve film files and billing information processed by Decclusters in Dallas and Fort Lauderdale. Application System/400s in the headquarters locations perform finance and distribution applications.

Down more than up

Getting from then to now was a real struggle, says Rick King, manager of corporate networks. "We fought enormous problems with the existing cable — too many users and too many differences," he says. "We were fighting the network every day, with flaws in the cabling and too many hands in every change to the cabling. We were down more than we were up. Data was always corrupted."

Blockbuster operates in fast expansion mode, King says. "We go to a location and drop-ship a store into place, cookie cutter style. How do we develop the network to keep up with that entrepreneurial spirit? We absolutely have to be proactive when designing networks for maximum usage. With the right networks, we can handle dropping in new computers."

Getting those "right networks" in place was far from trouble-free, however. "When we put in the new cabling, we didn't get to move people out and start from scratch," King says. "We had to fight the existing gremlins while laying and testing new cabling. We migrated so fast, we migrated some problems into the new cabling.

"For instance, when we built the new wiring, we put a single outlet with four jacks into every office: one for the telephone, one for the token-ring, one for AS/400 terminals and one for DEC equipment. But we tried

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INSIDE

Rules don't always apply

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The stuff of nightmares

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Francett is a free-lance writer based in Bloomfield, N.J.

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to go so fast, we didn't label our work as we should have. We punched some telephones into the wrong jacks, so some telephone traffic mixed in with the data traffic. We document the network, but it changes so fast, it's hard to stay current," King explains.

The "game plan" is to give all users access to each other and any network they want to reach, King says. "The direction of the world is to use discrete networks and link them together, so we had to design a network that would do that. We're further out than we'd anticipated, but we're growing too fast to be slow."

It doesn't look as though the pace will slow. "My whole direction is to get a foothold and get out of the Dark Ages," King says. "Now we've brought the whole company into this network, although we're still clearing up some bugs. When everybody is capable of doing their work, then we can take a breath and upgrade."

The rocketing popularity of LANs represents a substantial threat to network performance and reliability. "Most networks aren't planned; they just happen," says Jeff Held, a partner in the network consulting practice of Ernst & Young in Fairfax, Va. "Users are having a very difficult time keeping track of what they have and what they've paid for what they have."

Trampled by demand

"Success is the most dangerous thing that can happen to a LAN," says Christopher Cleveland, a systems analyst at Arco Pipeline Co. in Independence, Kan. "Two years ago, we brought in our LAN, an IBM Token-Ring with gateways to an IBM 4381 host, to replace an IBM 5520 word processing machine with eight workstations and a Novell file server. Now it supports 500 people. Everybody wants to be on the LAN."

Network reliability suffered in the process. "Nine months ago, the LAN crashed 10 times a month. Sometimes it would crash three times in an afternoon," Cleveland says.

The cause of the crashes: Too many users at one time caused a phenomenon known as "jitter" that occurs when the upper end of the Token-Ring's user limit is approached, Cleveland explains. Switching from twisted-pair to IBM shielded twisted-pair cable extended by fiber-optic segments, as well as revamping the AC power to allow the computer system to have its own dedicated power sources, eliminated the problem.

"At the outset, we didn't know how big the network would get or what we'd use it for," Cleveland says. "The clue is to overbuild — go beyond your wildest imagination. Now we can plan downtimes. Recently, we moved 160 users' data and programs from one Personal System/2 Model 80 to another overnight, and nobody knew it. My boss is impressed," he adds.



Altering island culture

A 4,000-user population, 160 branches across three states and a diversity of businesses make building a new network at First National Bank of Maryland in Baltimore an extremely complex undertaking, according to William E. Spies II, who is the division vice president of telecommunications systems.

"This year, we're replacing 3270 workstations with PCs. We also have about a dozen LANs that were islands unto themselves," Spies says. "Now it's time to put diverse LANs together with the wide-area network, and that's easier said than done. We have over 4,000 internal users as well as clients of the Trust and Investments Division who use PCs to look up customer files and see account status."

The LANs will consist of Intel Corp. 80386-based PS/2-type machines as file servers and separate communications servers using a token-ring topology and software bridges. "We'll have a T1 backbone to IBM 3745 Model 130 front-end processors that interface to the host, an IBM 3090 Model 400," Spies says.

The backbone is a private, fiber-optic digital microwave network that uses T1 and T3 channels to connect the LANs. "Through the mainframe, we'll also have links to our DEC VAX 785 minis, AS/400s and Tandem Computers, Inc. Nonstop, so workstations can access those machines without going outside the LAN," Spies says.

The bank's geographic dispersion across Maryland, Delaware and Virginia creates an enormous network management problem. "We'll have systems administrators who aren't information



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technologists on-site to manage portions of the network. "How can we guarantee the same level of service for all?" Spies asks. "We'll have a centralized help desk, but the systems administrators will have to solve problems at the scene for themselves. Centralized management isn't possible when you're spread over three states."



On the edge

Of course, despite the initial disclaimer, unique circumstances such as extreme distances and geographic isolation can produce some real network puzzlers. Consider, for example, the communications challenge faced by Pacific Machinery Co. in Waipahu, Hawaii, a Caterpillar, Inc. construction equipment dealer and marine engine supplier.

Pacific Machinery has stores on four of the Hawaiian islands and one in Guam — more than 3,000 miles away. The construction business on Guam has experienced a boom in the last couple of years, mostly as a result of an influx of Japanese tourists, says Roger Staehle, senior analyst at Pacific Machinery. Suddenly, the Guam store needed to communicate more data about inventory, accounting and service to the IBM System/38 in Waipahu.

The staff at the Guam store had been communicating and transmitting records in rudimentary fashion by phone, facsimile and written communiques. With the increase in business volume, it became clear that electronic transmission was badly needed, but until recently, no adequate data transmission medium existed.

In May, Staehle implemented a 56K bit/sec. fiber-optic line front-ended by a voice/data multiplexer from Republic Telcom Systems Corp. in Boulder, Colo., which provides voice channels and high-speed data circuits. "On the mainland, this kind of solution is more common," Staehle says, "but 56K-bit services haven't been available in Hawaii very long." Pacific Machinery's next challenge is to extend the link via satellite to Caterpillar headquarters in Peoria, Ill. •

Breaking tradition

Sometimes, the best way to avoid network problems is to ignore conventional wisdom.

Consultants told Oregon Cutting Systems, Blunt Co. that its network plan was "too ambitious." However, according to telecommunications analyst Ed Nelson, the company was convinced that competition made the setup it envisioned "a strategic necessity."

So the Portland, Ore., manufacturer of cutting chains and bars for chain saws plunged ahead with construction of a 400-node network made up of four Ethernets and one token-ring, connecting users not only to the IBM 4381 mainframe and Application System/400s but also to its plant in Guelph, Ontario.

Nelson says the problems envisioned by the consultants never materialized. "Everything works and works great, with only a few minutes of downtime a month." This was achieved by a team Nelson says started with "zero expertise. It took us three weeks to figure out how to wire a connector."

How did they pull it off?

"Planning and testing is key," Nelson says. "We put a lot of time and effort into testing connections before adding them to the net." Guaranteeing ongoing accountability also helps, he adds. One aid to achieving this is a diagnostic tool, the Sniffer analyzer from Network General Corp. Another is a "simple but good documentation process," which Nelson says makes it possible to "trace any location in the company in 10 minutes by the way we identify our nodes."

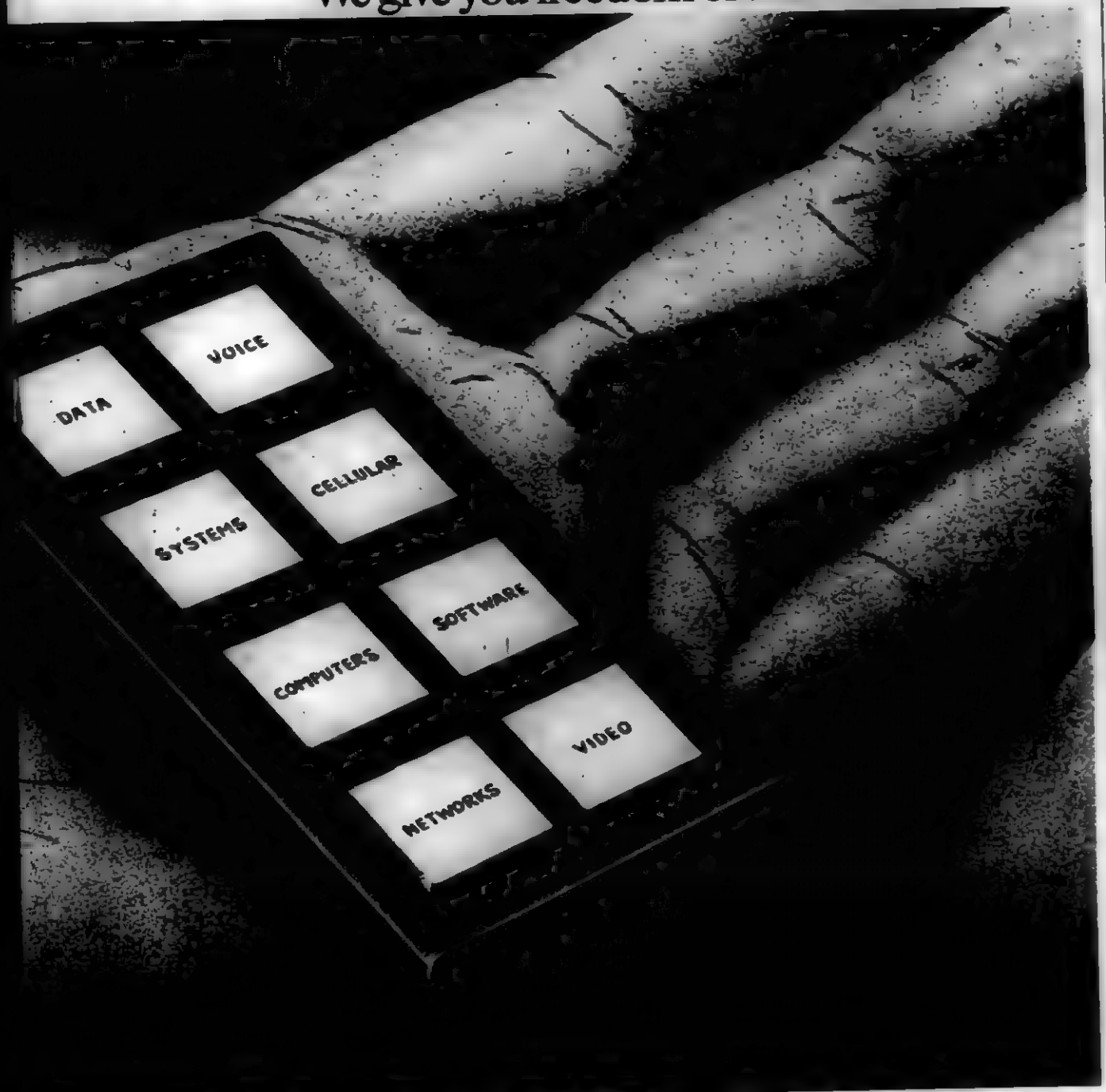
At First Boston Corp. in New York, Morty Eisen, manager of voice and data engineering, also broke tradition when implementing First Boston's backbone network.

"Historically, we had tried to standardize on the token-ring, but for application development, we wanted a Unix platform," Eisen says. The outcome was an inverted backbone that currently supports more than 270 users on a combination of token-ring and Ethernet subnetworks with connectivity to a data center in Princeton, N.J.

Eisen also says he has chosen to focus more attention on the physical layers of the network. "The philosophy we've employed goes against the industry trend. We've taken transmission people and cross-trained them on local-area network communications, focusing on cabling, bridging and routing — the physical connections," Eisen says. "On our preceding LANs, a lot of problems were blamed on the network, but most of the time they weren't there."

BARBARA FRANCETT

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Tackling the monsters where they live

BY BARBARA FRANCETT

Network nightmares generally divide into three categories: design and planning, implementation and management. The following is a roundup of network issues that have caused more than their share of sleepless nights:

• **Design and planning.** "We're always playing catch-up when it comes to planning," says John Bloodworth, office automation technical analyst at Universal Data Systems/Motorola in Huntsville, Ala. "Our network is growing by leaps and bounds — five to 10 users a week — and the departments don't coordinate their needs until they need them."

• **Implementation.** The school of network hard knocks teaches users to test, test, test if they want implementations to go smoothly. "When we installed the network, we knew what we wanted to do, but we didn't have the time to test adequately," says Rick King, manager of corporate networks at Blockbuster Entertainment Corp. "As a result, it took us longer to solve some problems because we didn't know why the equipment reacted the way it did."

"Cabling can be a big problem, especially on a new installation, says Christopher Cleveland, a systems analyst at Arco Pipeline Co. "Fifty percent of our cabling had to be sent back. You must test."

Making all the network pieces fit together can cause difficulties, Cleveland says. "Sometimes we can't use a product that's really good if it doesn't fit into the environment we've set up."



First National's *networking team is intent on securing data*

• **Management.** If setting up a network can be difficult, most agree that ongoing management is tougher.

"The three principal tasks of network management are performance monitoring, problem detection and handling and service restoration," says Jeff Held, a partner at Ernst & Young. "Products just aren't available that perform all those functions and integrate different vendors' equipment. And no big company is a single-vendor shop anymore."

"The complexity of managing the network is enormous," says Ernie Bolte, system designer at Bolden Engineers, an Atlanta-based consultancy. "It's not only how all the subnetworks are connected to the backbone. The other problem is the sheer numbers of people on the network. Some big nets have up to 10,000 drops to be managed."

Security is also a big management concern, says William E. Spies II, division vice president of telecommunications systems at First National Bank of Maryland in Baltimore. He says the question is this: "How can we make access secure without making it so cumbersome that it's not worth doing?"

Lack of documentation contributes to many network management problems. "Documentation is a problem, even on our small development network," says Rich Goddu, senior consultant at the application integration technical center of GE Information Services in Pleasanton, Calif. "You forget what's configured. We don't have the head count to have someone manage the LAN. On bigger LANs, it's a full-time job."

"The real issue is the growing diversity in networks," says James Herman, a principal at Northeast Consulting Resources, Inc. in Boston. "Users want to move toward interoperability, but they don't know how to manage that complexity," he explains. "Networks will get more complex over the next four years or so. Then the situation will improve as we move toward standardization." •

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The minority void

While professional-level IS opportunities for minorities exist, upper management ranks remain tough to break into

BY AMIEL KORNEL



At first glance, Robert Henderson's future seems assured. Hard-working and dedicated, he has advanced his 12-year career in information systems from night computer operator at an insurance firm to senior systems analyst at a state government agency.

Yet, while his job offers him the challenge he is looking for in IS, Henderson worries that further career opportunities may be limited. As a 29-year-old black man, he fears it will be difficult to reach the senior management ranks of a profession that is overwhelmingly white.

Line management, he suspects, marks the end of the career climb for a black man in IS. "We are not the ones typically in the VP of IS positions," he notes.

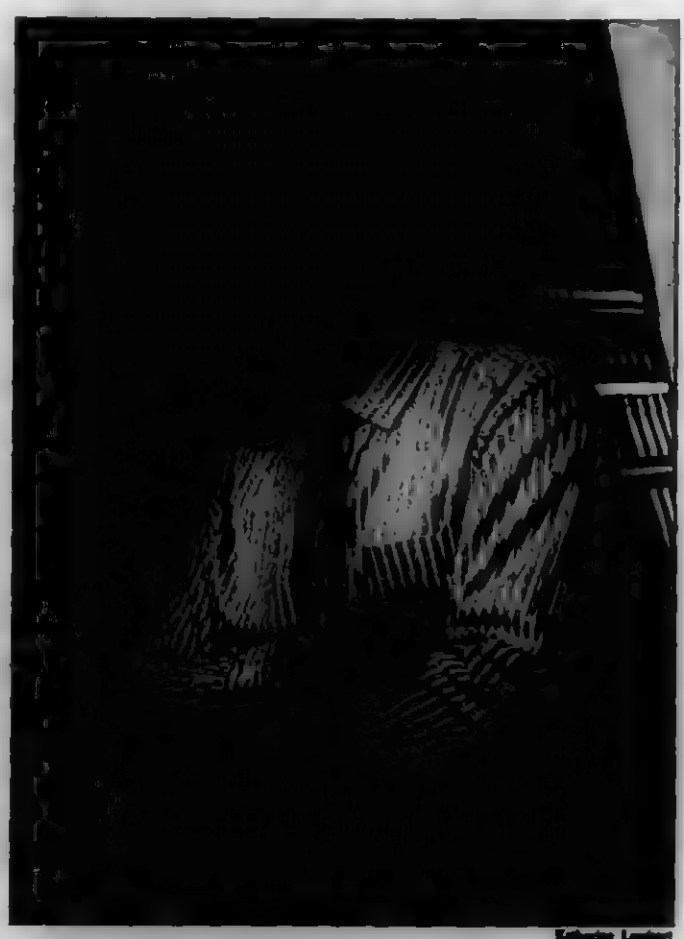
Bob Mathews, a black systems manager at Richfood Holdings, Inc. in Richmond, Va., agrees. "All things being even — experience, education and so on — the job would probably go to someone white," he says. "Your chance of gaining great rewards is probably not as good as in other professions," he adds.

Henderson and Mathews are not the only ones who have doubts about how much room there is at the top for minorities. Computer professionals, academicians and recruiters say minority men and women rarely reach the highest ranks of IS management.

Kornel is a former *Computerworld* features senior editor and is enrolled at MIT's Sloan School of Management.

According to U.S. Equal Employment Opportunity Commission (EEOC) figures, progress for minorities has been at a virtual standstill at the high end of the computer career ladder. In 1988, 92% of IS managers were whites, and 8% were minorities — the same percentage split found in 1980 and 1985 (see chart page 59).

"It's very hard to break into the bastion of white male dominance at the senior level," says Beverly Lieberman, an executive recruiter at Halbrecht Associates in Stamford, Conn. Lieberman says she needs only to look around at an IS executive conference to note how few minorities are present. She adds, however, that this is true of business management in general.



Katherine Lambert

Henderson doubts *the likelihood of his rising to upper management ranks in the IS field, though not for lack of desire*

Not for blacks only

The pattern of exclusion is not reserved for blacks. Asked what effect being Hispanic has had on his career, Nicaragua-born Julio Guillen, IS and telecommunications manager at Bio-Rad Laboratories in Hercules, Calif., says, "There have probably been certain situations when promotions have gone elsewhere."

Part of the problem is the lack of strength that comes from pure numbers. "Compared to other business functions, there are fewer minorities interested in information technologies," says James Senn, director of The Information Technology Management Center at Georgia State University.

Vivian Wilson, president of Black Data Processing Associates (BDPA), acknowledges that this is true in terms of blacks. "The field is attracting blacks, but not in the numbers it should be," she says. "Information processing requires a strong background in statistical, mathematical and science disciplines, and minorities are generally not in these areas in school."

Figures from the American Council on Education in Washington, D.C., bear her out. Of the 37,238 students who earned bachelor's degrees in science in 1987, 31,279 were white, 2,620 were Asian, 1,932 were black, 1,259 were Hispanic, and 147 were American Indian.

Minority women have found it particularly tough going in the trek to the top. When Halbrecht Associates was asked to recruit a minority woman as IS director for a quasi-governmental organization in New York, its search turned up only six potential candidates, Lieberman says. It figures: The EEOC reports that of the 8% minority IS managers, only 2.5% are women.

Any mentors out there?

For young minorities, a lack of role models in science- and engineering-related fields can pose a problem.

"Not being able to identify a mentor within the department is what keeps many blacks from

Continued on page 59

- **Lack of role models hurts**
- **Science and engineering education targeted**
- **Minority IS chiefs relay their experiences**

Striving against all odds

How minority IS chiefs overcame prejudice to reach success

BY LORY ZOTTOLA

Some members of minority groups have made it to top jobs in the information systems field. How? Mostly, they say, it was a matter of persistence and developing an eye for the main chance.

As Carl Williams moved up, the ranks thinned out. "A lot of talented blacks never got beyond a certain point in their IS careers," notes Williams, a former senior vice president and director of MIS at advertising agency DDB Needham Worldwide, Inc. in New York.

Subtle racism and sexism do exist at the high levels of IS, says Williams, now president of The Intertechnology Group, Inc., an IS consultancy in New York. However, he adds, you can't let the existence of those attitudes stop you.



Williams refused *to let racism impede his climb*

"There are always going to be those people who don't want to see you on executive row, who are waiting for you to stumble so they can say, 'See, I told you so,' " he says. To prove those naysayers wrong, Williams took charge of his own career during his 25-year climb.

Williams says his take-charge attitude was an integral part of his move up from programmer/analyst at Mead Corp. to various IS management positions at Xerox Corp. and American National Can Co. "I would sit down with managers at every level in my career and make them understand the contribution I thought I was capable of making to the company."

Those discussions, Williams says, were couched in business terms. "When I talked about my career objectives, I made sure those objectives were consistent with where the organization was going. You can't move your career forward in a vacuum."

Wilma Horne knows what Williams is talking about. She credits creating opportunities where none existed before as the key to her success in a white male-dominated business world. "Prejudices didn't stop me along the way," Horne explains. "I decided what I wanted to do, I prepared myself to do it, and then I did it." Today, 48-year-old Horne is IS director at the New York Port Authority.

The bottom line, Horne says, is that minorities must seize opportunities. "There's got to be something that makes you the one chosen for the job: willingness to take risks, taking on a job that others think is unpopular, your ability to relocate and yes, the fact that you are a minority."

Horne tells of the time in a meeting in which discussion centered on IS' inability to fill a position with a qualified minority. "I asked them, 'Why are you looking so hard when here I am sitting right across the table from you?' " She landed her first management job.

Both Horne and Williams stress that their audacity is backed up with solid education and experience compatible with the demands of a computer-related career.



Horne brought *herself to managers' attention*

Horne's background is in mathematics, a subject she taught for seven years in the Chesapeake public school system in Virginia. Her interest in computers became something more solid when she took a summer grant to introduce computing to that school system. She was hooked and left teaching to become a bureau programmer trainee at Air Products and Chemicals, Inc. in Allentown, Pa.

Williams holds a bachelor's degree in liberal arts, has a background in civil engineering and received an MBA from the University of Rochester in New York.

Pragmatism has also played a big part in their careers, both IS executives say. "You've got to talk to people about where you want to be," Williams says, "but if it looks like getting ahead is not going to be possible in that corporate structure, then go to where it will be."

Horne has moved six times in 20 years to get the kinds of positions she's wanted. "I took the risk. I had to go to where the opportunity was," she explains.

The fact that they've made it further than most minorities in their profession is not lost on either Williams or Horne. They say being role models for other minorities is important.

"For minorities in IS who think opportunities are limited, I hope my success will let them see that that's not 100% true," Horne says. Horne has spent time talking to juniors and seniors in high school about career opportunities in IS.

"It's a 'credibility factor,' " Williams says. "It's more credible for me to say to a young black MBA that hey, here are some of the things you're going to have to go through, and here are some of the options you have for handling those situations."

Neither downplays the existence of discrimination, but they say you can face prejudice and stare it down. "Knowing it's out there should keep you on your toes," Williams says. "Knowledge is the power you've got to make work for you." ●

Zottola is Computerworld's senior editor, in depth.

Ch



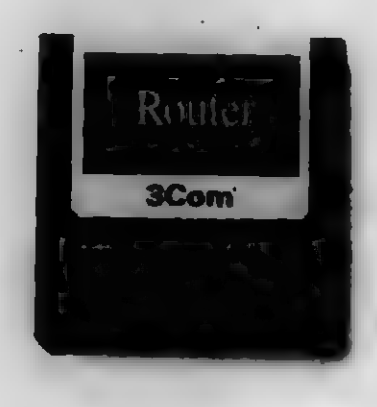
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Continued from page 57

moving forward," says Chet Holmes, an account manager at Candle Corp. in Los Angeles who started his career in IS.

While accounting for 10% of the total work force, blacks held only 2.2% of the nation's science and engineering jobs in 1986 (the most recent year for which figures were available), according to a report by the National Science Foundation.

"In a black household in the past," Henderson says, "it was very rare to find a college-educated black man who had anything related to scientific training."

According to the American Council on Education, between 1976 and 1987 there was a 16.9% drop in black science baccalaureates. Henderson says he hopes his experience and that of other minorities will change that trend. "We're starting the tradition now," he says.

Wilson agrees and points out that her organization — with a national membership of 1,400 — is actively working to encourage its members to become mentors to high school and college students.

BDPA also sponsors a national competition in computers and information processing for high school students and gives scholarships to winners. This year's competition involved more than 1,500 students in 18 cities. "The idea is to expose students to what it is like to work in this field and encourage them to go on to college with this in mind," Wilson says. "In this way, we act as role models."

For those minorities who do enter the field, climbing the corporate ladder often requires working extra hard to overcome doubts that some colleagues may have about their abilities.

Minority IS professionals report that their achievements and failures are often magnified in the eyes of white management. "They expect you to be more on the ball," says Debbie Gore, a black information security administrator at Federal Mogul Corp. in Detroit. "You have to prove yourself."

This intensive scrutiny, however, can be a benefit, she says. "If you end up getting a reputation for being very good, things move your way."

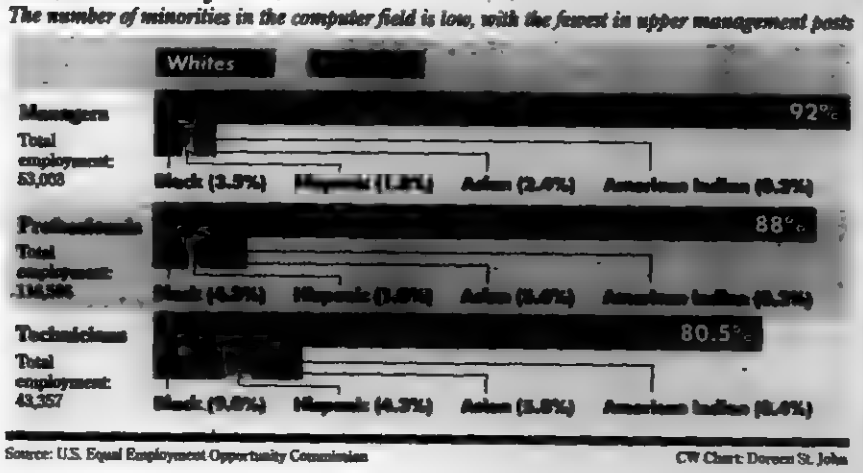
"I make sure that I perform at at least 120%," Henderson says. "I make sure that I break every kind of stereotype that anyone may have."

For some minorities, stereotypes can work in their favor. "I consider my Asian background an asset," says Duk Won, Korean-born president of Applied Systems Institute, a software company in Washington, D.C. He says he has gained an aura of competence because many people view Asians as gifted in technology-related

Continued on page 60

In the minority

The number of minorities in the computer field is low, with the fewest in upper management posts



Source: U.S. Equal Employment Opportunity Commission

CW Chart: Doreen St. John

IS resources for minorities

American Indian Science and Engineering Society
(303) 492-8658
Students and professionals in science, computing and engineering fields

Association for Women in Computing
New York chapter
(212) 482-4809

Black Data Processing Associates
(800) 727-2372

Council on Career Development for Minorities
(314) 631-3677
Counsels undergraduate students and recent graduates about jobs in business, including the IS field

Edgar Group
(212) 553-2365
Minority entrepreneurs and management personnel
Contact: Ramona Frazier

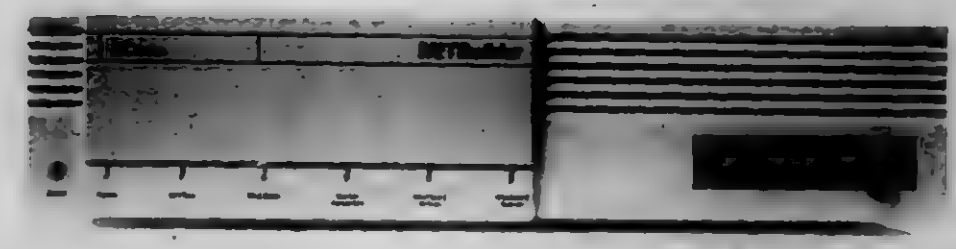
National Institute for Resources in Science and Engineering
(301) 770-1437
Technical assistance for minorities
Contact: Alvin Rivers

Society of Hispanic Professional Engineers
(213) 725-3970
Includes a data processing committee

Women in Information Processing
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Continued from page 59

areas. Some Asians say being characterized as technologists can become a liability when seeking a management position. In fact, while Asians have a large presence in IS in proportion to their total population, their numbers drop at IS management levels, EEOC figures show.

However, Ann Li, corporate vice president at Paine Webber, Inc. in Weehawken, N.J., says the problem is faced by "anyone who is a techie." Head of the brokerage's proxy department, Li previously managed IS at the Federal Reserve System.

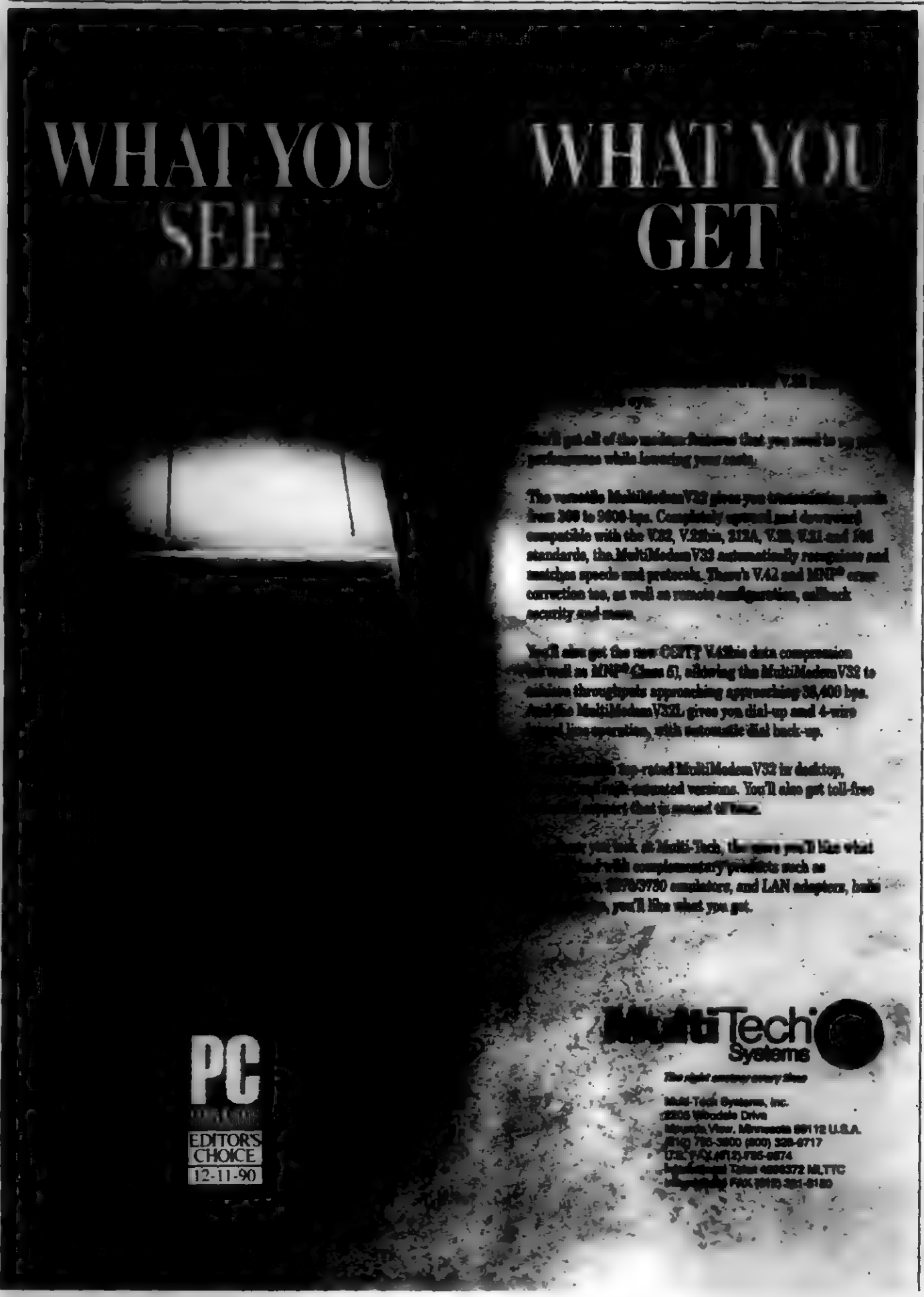
Prejudice rears its head

Nonetheless, the question remains: Why have so few minorities broken into senior management positions in one of the fastest growing professions?

Part of the answer, no doubt, lies in the intolerance bred by age-old prejudices. Blacks, Hispanics and Asians interviewed for this story, however, insist that they've rarely experienced open hostility and prefer using euphemisms such as "color sensitivity" and "traditional attitudes" when talking about what in an earlier era would have been simply labeled racism.

"You can't spend time placing blame on a mind-set that has been around for a couple of hundred years," Henderson says. "It's better to learn to work with or around that mind-set."

"No one is going to come out and say, 'You can't have this job because you're a minority,'" Mathews says. "The only person who can stop you is yourself."



Minority professionals assert that their career advancement depends at least as much on their skills as on their race. Some also say that part of the fault lies with cultural traits and traditions that are a poor match for the personality profile of top IS jobs.

Jauney Chew, a network switching director at US West who was born in China, notes that Asian culture emphasizes unquestioning obedience and silence, traits that are an anathema to U.S. management technique. "The American corporate environment is interested in having people take the initiative," she says.

Chew, who oversees a staff of nearly 400, has learned to make these differences work for her. "Some people will see the disparity in culture and say, 'What is there to do?' I try to take advantage of the best qualities of both worlds." Chew says that while she's working on being more assertive, she prizes her quietness because it makes her a good listener.

What the future holds

Learning to blend cultures in the business environment is one kind of education minorities say they go through to get ahead. As for more formal schooling, educators are paying closer attention to providing minority students with the math and science training they need to prepare for future careers in technology.

In the Washington, D.C., area, for instance, big businesses are funding an all-minority program in which 600 to 700 students are receiving help in developing their math and science skills, according to Lynford Lautz, executive director at the Fairfax County Public Schools Education Foundation.

Using grants from various businesses, the Washington, D.C.-based Quality Education for Minorities group has recently announced its goal to sponsor programs that will quadruple the number of minority students with degrees in science, math and engineering from about 17,000 in 1987 to 68,000 in the year 2000.

There are positive signs that changes are already occurring in education. While the number of science degrees for blacks is low, the number has grown between 1976 and 1987 for Hispanics (44%), Asians (112%) and American Indians (3%), the American Council on Education reports. Degrees in engineering for minority groups combined during that same time period have risen a whopping 208%.

Such measures leave room for hope, according to IS professionals. As attitudes change and training and education begin to bear fruit, minorities may finally appear in greater numbers at all levels of IS. "Sooner or later," Gore says, "the walls have to come down." ●



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NATIONAL BRIEFS

Backward march

Computer-aided software engineering products vendors who want to go forward are well advised to turn backward, according to a recent report from market research firm **Forrester Research, Inc.** During the next five years, the report says, reverse engineering capability — the automated ability to extract knowledge from already existing software code — will grow from a $34 million niche to a $700 million market.

It's a date

IBM and **Clayton & Dubilier, Inc.**, the company that is forming a firm to acquire IBM's typewriter and low-end printer business, announced last week that they expect to close their deal by March 31. The new organization, which will be called **Lexmark International**, will be headed up, as was stated earlier, by IBM veteran executive Marvin Mann.

A new Paradigm

Four-year-old start-up **Paradigm Corp.**, a San Jose, Calif.-based static random-access memory (SRAM) manufacturer, is among the latest Silicon Valley firms to attract trans-Pacific investment. Japanese steelmaker **NKK Corp.** will pay an unspecified sum for an approximate 10% stake in Paradigm, license rights to its current SRAM lines and their fabrication processes and co-development of a new generation of 4M-bit SRAMs.

Outlook for future quarters dim

BY NELL MARGOLES
CW STAFF

Computer industry earnings reports for the fourth quarter — traditionally the industry's strongest — are likely to limp in with less of their characteristic zing, according to analysts. Undeclared war and undesignated recession, said Byron Walker, an analyst at Moody's Investor Services, were nevertheless sufficient to put the fear of spending into the very customers whose usual zeal to "use up annual capital budgets before they lose them" fueled late-year surges for computer firms.

What's more, analysts widely agreed, the dimmed bottom lines in the quarter just closed are a good bet to be the brightest we see for several quarters to come.

"The chances of the first quarter being a black hole have gone way up," said David Wu, an analyst at S.G. Warburg & Co. "[Computer lessor] Comdisco, Inc., which picks up business whenever big companies need computers but can't afford to buy them, is doing very well. Wherever I look, I see the signs: People are feeling poor."

NCR Corp.'s fourth-quarter earnings are a case in point, Walker said. NCR's management has brought about one of the industry's more impressive turnarounds, according to industry observers. A barrage of new products helped boost fourth-quarter revenue 6% over last year's comparable quarter, to $1.9 million. Nevertheless, the high costs of corporate and product-line transition, coupled with customer budgets on hold, hammered NCR's earnings: The firm's fourth-quarter profits dropped 15%.

What should have been a strength for NCR is suddenly a liability, Walker said. "They've got these great niches: retail and finance," he noted. "For the last decade, these have been wonderful. They aren't wonderful right now."

Similarly, Beaverton, Ore.-based on-line transaction processing systems vendor Sequent Computer Systems, Inc., recently one of the computer industry's higher flyers, has warned that its fourth-quarter report will likely show a dramatic earnings decrease, revenue gains notwithstanding. "During the last few weeks of 1990, it became evident that concern over the economy had made customers much more cautious and that capital expenditure was being postponed," said Sequent President Scott Gilson in a prepared statement. Consequently, "intensified competition" and "more aggressive pricing" squeezed the firm's margins "significantly below expectation," Gilson said.

Budget paralysis in once-rich niches — particularly the financial industry, whose previously soaring fortunes buoyed many a computer company's bottom line — are by no means nightmares for NCR and Sequent alone, Walker noted. On the contrary, "this is a story we're going to be hearing over and over [with regard to the] fourth quarter," he said.

Recession tends to polarize markets, analysts said. Advantage shifts to large, well-entrenched companies with strong balance sheets and attractive new products, at one extreme, and to nimble entrepreneurial firms unencumbered by conservative corporate bureaucracies and huge investments in archaic technology, at the other.

This trend will mount over the coming months, Wu said. "The strong will get stronger; the weak will get devastated."

As the fear of war hardens into reality, analysts agreed, the first quarter — traditionally the computer industry's low point — could make the dull fourth quarter shine by comparison.

"If a prolonged war — more than four to six weeks — drives the price of oil up, consumer confidence will drop significantly, and we will face a protracted recession instead of the middle-of-the-road one that we thought was here," said John B. Jones Jr., an analyst at Montgomery Securities.

With little certain but uncertainty and with uncertainty one of the best recognized foes of capital spending, even the more glowing fourth-quarter numbers may not presage ongoing bottom-line strength, industry observers said.

"IBM had a great December quarter," Wu noted, "but it could be that all the business that could have been closed, was."

Industry observers hastened to add that the current convergence of factors — recession, war, industrial maturity, a financing sector in crisis and the industry's traditional slow season — is extraordinary and temporary. "When the recovery begins — possibly as soon as the second half of this year — the computer industry should emerge as one of the stronger survivors," said Richard A. Shaffer, president of New York-based Technologic Partners.

1990 fourth-quarter earnings

A troubled economy tarnishes the computer industry's traditional best quarter

Ameritech	$2.7B	(3.8%)	$286.8M	(13.5%)
Borland International, Inc.	$62.33M	106%	$7.8M	141%
Microcom, Inc.	$15M	(18%)	($1.3M)	-
Seagate Technology, Inc.**	$703.4M	.6%	$27.8M	(22%)

Parentheses indicate a reduction or loss
* Both revenue and net income for the quarter ended December 31, 1990 include extraordinary items
** Results include the operations of Imprimis Technology, acquired October 20, 1989

CW Chart: Paul Mock

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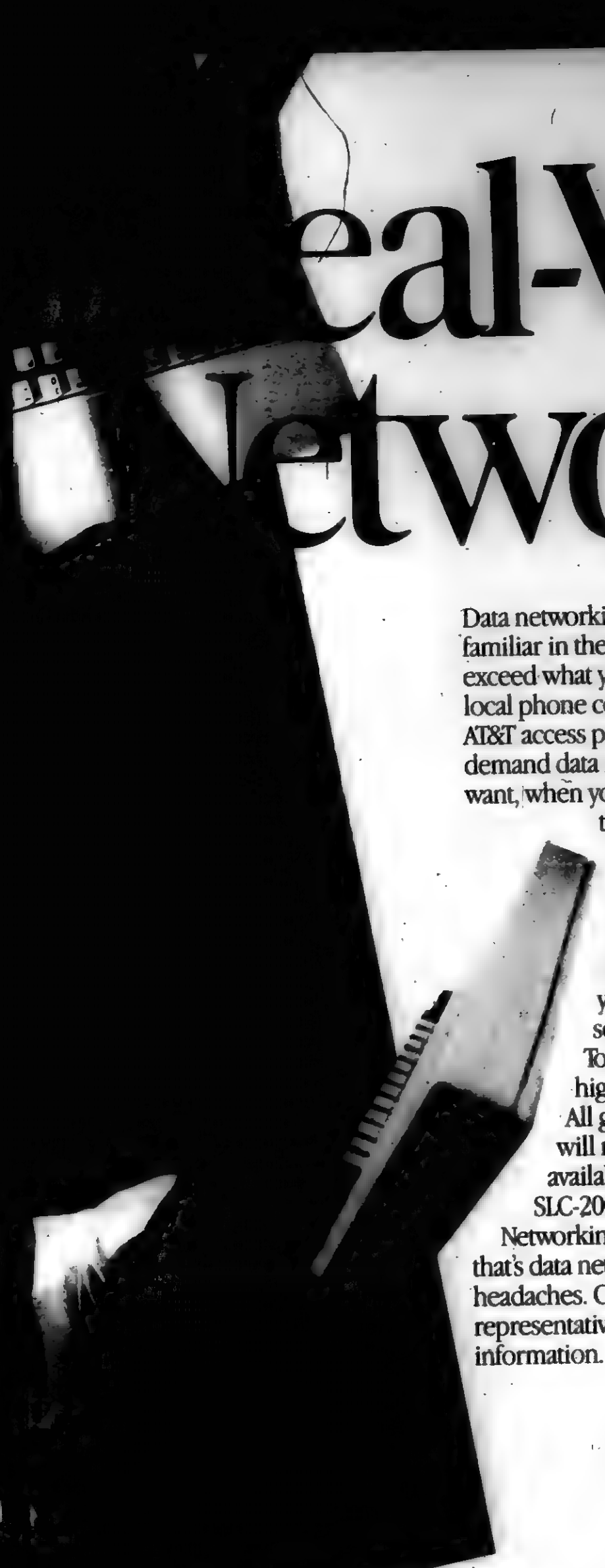
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Financial group seeks growth despite bank busts

BY JOHANNA AMBROSIO
CW STAFF

It is a scene that is almost stereotypical of a small, aggressive vendor: Someone gets a bright idea and tries it out. If it works — that is, if it contributes to the bottom line — the idea is institutionalized in a more formal way.

That was pretty much how the Financial Services Industries group was formed, except it was formed by IBM, a company that does not usually come to mind when small, feisty entrepreneurs are mentioned.

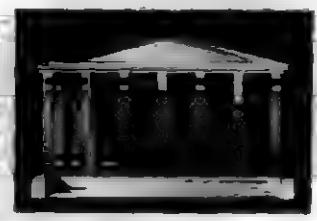
Moreover, despite current upheaval in the banking industry — in fact, to some extent, because of it — IBM Financial Services Industries plans to keep on growing.

"We see continued growth, if not in the double digits, then at least in the single digits," said T.G. Hudson, vice president of IBM Financial Services Industries. He said his group can survive the economic downturn by providing software and services to those banks and brokerages that can no longer afford to — or for other reasons choose not to — provide for themselves.

Formed in 1988, Financial Services Industries was originally chartered as a worldwide development organization for bank-specific products such as check readers and sorters.

New directions

Now the group makes, buys and gets other IBM divisions to develop products for this industry, Hudson said. "We're a newer part of the [IBM] organization, and we have responsibility for both products and customers." Development labs are running at various locations, including Charlotte, N.C., and Tampa, Fla. The idea to have one line manager accountable for both was first tried out in IBM's Asia Pacific group when Hudson was over there and has since been formalized.



Financial Services Industries and its sister divisions in insurance, manufacturing and distribution collectively account for 15% of IBM's revenue, Hudson said. And if Hudson has his way, that number will remain the same this year. One way Hudson hopes to attain that goal is by growing three new businesses formed within the services group: applications software, systems integration and outsourcing.

The group's software business, in which IBM buys or develops core applications such as retail banking and trust accounting, has grown fivefold during the last three years. Hudson said he expects it to double again this year to revenue of more than $100 million. The same general growth pattern holds true for systems integration, which is already a $100 million-plus business, he said.

In addition, outsourcing for banks and brokerages is "rapidly growing, with hundreds of millions of dollars of business in 1991." Hudson said he expects that number to grow to over $1 billion within the next few years.

Overall, the Financial Services Industries group is responsible for "a significant piece of the IBM customer set," Hudson said. "If it's not the largest, then it's the second largest next to manufacturing."

The division has a budget of "hundreds of millions of dollars" to invest in software — both homegrown and acquired through equity investments in IBM software partners (see story page 65).

Products in the works

On the product side, the group is working to round out its financial services architecture announced last year. It includes data models, hardware and software that allows banks to connect and use enterprisewide systems.

Also in the works is a project code-named Bankvision, aimed at integrating workstation technologies, artificial intelligence and a spreadsheet into an approachable front end for users such as loan officers.

"This is already being done in pieces," Hudson said; however, he added, Bankvision will bring all the pieces together into a coherent whole. He said it is now in a prototype stage and is being beta-tested at two banks. Bankvision will likely be demonstrated and might be introduced in March at IBM's banking conference in Albuquerque, N.M.

Hudson said his group's suite of products and service offerings could be just the right mix at the right time. "Traditionally, banks have tended to do it all themselves," he said. "But now there's more software available than there was five years ago, and many of the original banking systems are based on outdated technology."

Nor is Hudson overly worried about the economic downturn. "The merger and acquisition activity may force banks through an analysis of their systems to see if they're robust enough to take them through this period," he noted. Bad times for banks might mean good times for IBM Financial Services Industries.

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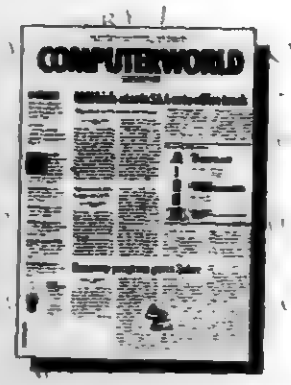
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BRIEFS

Quicker switch

Nippon Telegraph and Telephone Corp. (NTT) has moved up by approximately one to two years its schedule for switching its nationwide telecommunications networks to digital technology, the company has announced. Medium- and long-term digitalization plans were advanced in accordance with a Japanese government requirement to boost domestic market competition formerly dominated by NTT. Under the new plan, the first stage of a two-stage subscriber exchange conversion — consisting of the replacement of nonelectronic crossbar exchanges with stored program control exchanges — is scheduled to be completed by March 1995, one year ahead of the previously announced schedule.

Firsts in Brazil

An October 1990 **Brazilian government** decision to allow joint ventures between domestic and foreign firms recently resulted in a deal that logs three firsts in one. According to a report in the British financial press, **IBM's** microcomputer manufacturing venture with Brazil-based **SID** is the first deal announced under the new policy. The deal is also being recognized as Brazil's first joint venture in information technology and IBM's first joint venture aimed at producing one of the company's own principal product lines.

Not-so-tiny Tim

Japan's **Toshiba Corp.** and Taiwan's **Investa Electronics Co.** are joining forces to produce facsimile machines in **Malaysia**, the companies announced earlier this month. According to the plan, their joint venture company — to be called **Tim Electronics Sdn. Bhd.** and located on Penang Island — will make 100,000 fax machines annually, with that number scheduled to double in 1994. Toshiba, which will own 51% of Tim Electronics, reportedly turned to partnership to save on labor costs; 49% owner Investa reportedly was attracted by the chance to gain fax machine manufacturing know-how.

After the fifth generation

While still suing for increased commercial-sector attention for its fifth-generation parallel-computing technology, Japan's **Ministry of International Trade and Industry (MITI)** is about ready to set up a committee to study the possibility of developing a so-called sixth-generation computer that would more closely imitate the workings of the human brain, according to the ministry. The MITI, which is best known for backing Japan's strong buildup of high-technology industry, said it plans to open the project for joint study with European and U.S. researchers.

Hogan investment pays off

One key part of IBM Financial Services Industries' strategy is buying products by means of equity investments in other vendors rather than building everything itself. IBM has closed seven such deals to date.

In September, it bought a 5% stake in Dallas-based Hogan Systems, Inc., a longtime partner. The two jointly sell and develop Hogan's Integrated Banking Application. In addition, IBM and First Boston Corp. are joint-venture partners in a financial software firm called Seer Technologies, Inc. in New York.

A new departure for IBM, the equity deals mark the firm's "very strong effort to become a software and services vendor," Financial Services Vice President T.G. Hudson said.

The Hogan relationship has had its ups and downs. The original marketing and development agreement, which did not include an equity investment, was announced in May 1986.

However, as the publicity died down, so too, it seemed, did the IBM sales force's desire to pitch the Hogan software to customers. For several years the package appeared to languish.

According to Hudson, one reason for the admittedly long learning curve in the relationship was that responsibility for the Hogan deal had been split among seven different managers in two IBM divisions. "This was not a formula for efficiency and success," he said.

But all that is history, Hudson claimed. An infusion of money and development attention have made the IBM/Hogan relationship "an excellent [one] and very stable," he said. "We rallied behind the product as we took responsibility for it." Some 86 banks now use the Hogan package.

JOHANNA AMBROSIO

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The Shifting Fortunes of the Networking Industry
Kim Myhre, Sr. V.P., Worldwide Consulting, IDC

The Restructuring of the Computer Industry
Panel Discussion, Chaired by David P. Vellante, V.P., Systems Research, IDC

Perestroika Comes to the Data Center: IBM and the MIS Revolt of the 90's
Frank Gens, V.P., Technology Assessment, Technology Investment Strategies Corp.

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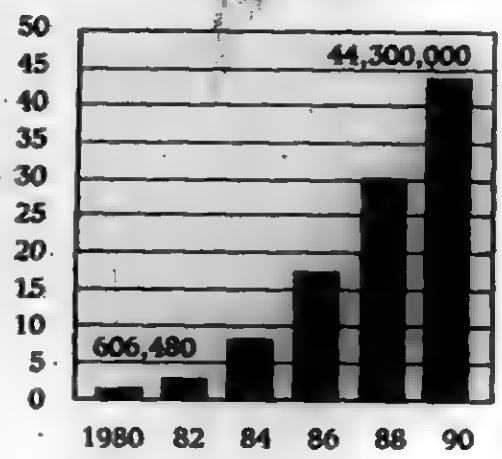
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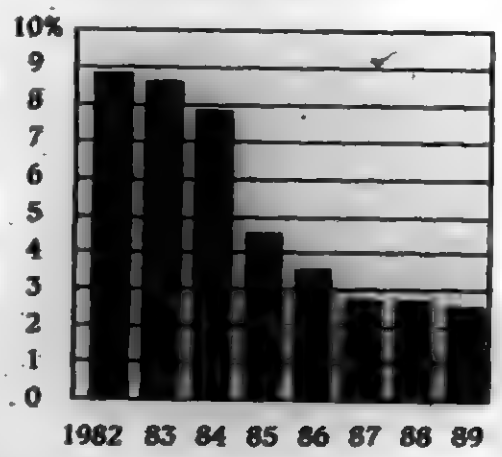
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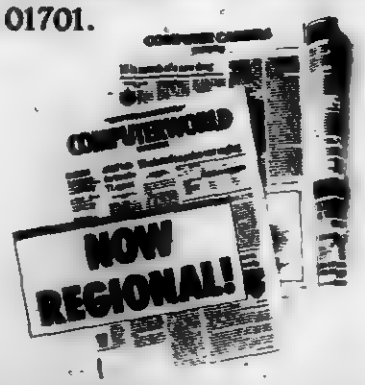
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LIFE AFTER LAYOFFS

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BY ALAN J. RYAN
CW STAFF

Nothing is permanent — *especially* a job. That's what Paul Styrvoky found out when a change in management at his company resulted in the loss of his position as manager of the corporate systems audit department last May.

After nine years at Ecolab, Inc. in St. Paul, Minn., Styrvoky's position was eliminated. Next week, Styrvoky will again face the prospect of being jobless when the temporary contract position that he has been holding for several months at St. Paul-based Land O'Lakes, Inc. — conducting an audit of the information systems department — ends.

When he joins the ranks of the unemployed this time, however, Styrvoky will view the situation from an enlightened perspective. Of his contract post at Land O'Lakes, he says, "This is temporary but so were the nine years at Ecolab."

Styrvoky is one of a growing number of IS workers left jobless because of a shrinking economy and who has turned to contract labor while conducting a search for long-term work.

For many who have been laid off, working on a contract basis is a good way to pay the bills. The hourly rate is often generous for IS professionals, the schedules allow flexibility, and some contracts last many months.

In addition, the contract laborer also has the opportunity to view internal postings at the company holding the contract and can sometimes apply for those positions as an internal candidate.

A drawback, however, is that the contract workers are rarely provided with company-paid health insurance.

Contracting the work is also a safe way for the employer to increase its work force temporarily on an as-needed basis, according to Jim Kwapick, director of IS recruiting at Robert Half International, Inc. in Minneapolis.

"It is easier, more cost effective and organizations can staff up and down less painfully," Kwapick says.

Recruitment push

Like most people who discover that their jobs are not secure, Styrvoky's first thought was to find another job. "The recruiters pushed me on the market pretty quick," he says.

However, after his layoff from Ecolab, Styrvoky realized he was not ready to launch another chapter of his career without first taking some time for himself and his family.

During the summer, he dabbled in some consulting work but did not begin looking for another full-time position in earnest until the fall. At that point, job placement specialists at Robert Half recommended him for the temporary post at Land O'Lakes.

In many ways, Styrvoky says, being laid off has been a positive experience, and working on a contract basis has kept him in the wage-earning category while also giving him the flexibility to continue his job search and go to job interviews.



Alvis Upitis

Turning misfortune into opportunity. *Styrvoky is using the extra time he has since his layoff to give more attention to his family and personal life*

Before accepting the temporary assignment at Land O'Lakes, Styrvoky says he made it clear to the company that he would need a schedule flexible enough to allow him time off to go to job interviews. "I told them I would not shut my job search down, so I do bop out of here a lot during the week."

Job hunting is time-consuming, and Styrvoky says he is lucky that his former firm has provided him with outplacement services. He can work on his cover letters and resumes on his personal computer at home, but the outplacement firm handles the typing and mailing of resumes and letters for him.

Styrvoky is optimistic that when his contract expires at the end of this month, he will be busy going to second-round interviews for jobs at other organizations and consulting companies. And he believes he will land a job soon.

He says he has had at least one interview per week since fall, and during the week prior to Christmas, he had interviews every day.

"I keep telling myself that the very good, professionally rounded people are employable."

Still, the pressure of uncertain employment is difficult. Styrvoky says he holds no animosity toward his former company, but he has faced a lot of personal pain in dealing with the loss of his job.

"I had made a huge investment in the previous employer," Styrvoky says, "and I walked away with nothing because I do not believe in taking things you build for somebody else."

What he did get, however, was a chance to re-examine his life and priorities. "It was a good time to take a look at things going on in the family and the marriage and get those things on track," Styrvoky says.

He admits he's always had a strong inner drive to create perfect products, which led him to work long hours at Ecolab. There he audited new systems being implemented and performed technical and general control reviews throughout the world.

"Now I've found that I can tone that energy down and still deliver what the employer wants but funnel my extra energy into family or church," says Styrvoky, who has four children.

With layoff, surprises

The experience of being laid off has been humbling, Styrvoky admits. "When I look back on this in a year or five years, it will be one of the most pivotal points of my life."

He was pleased to learn that people he had known in high school and college still remembered him and his skills. That network has been instrumental in his job hunt.

He has also contacted job consultants and recruiters on both coasts and locally, and he says he is willing to relocate for the right job.

Styrvoky's background experience includes being an applications developer, designer and technical systems programmer, but Styrvoky says he is also interested in continuing his work in systems auditing. Other possibilities include business management positions in nonprofit organizations, consulting or systems management in an IS department.

Ryan is a *Computerworld* features senior writer.

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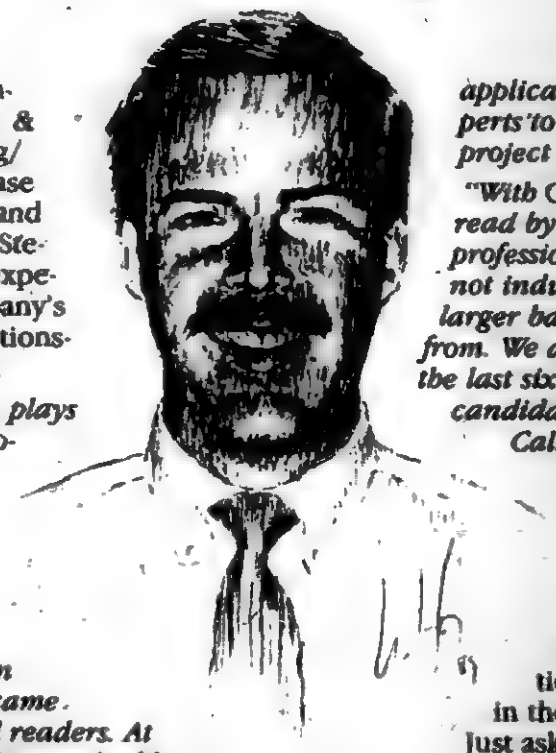
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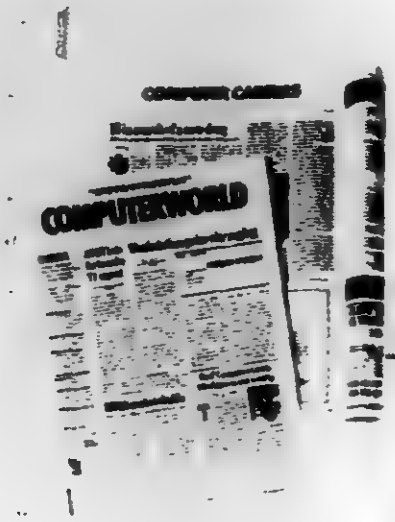
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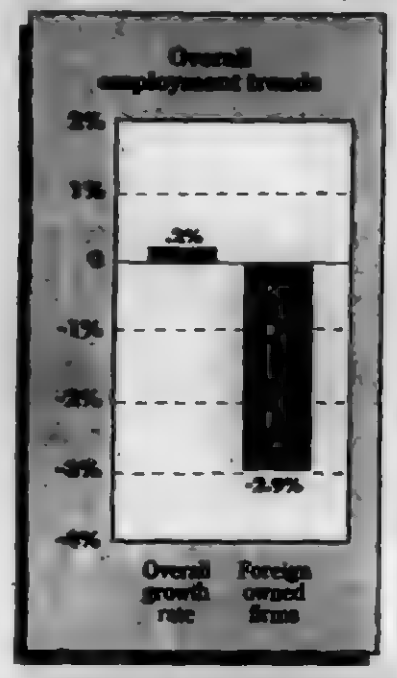
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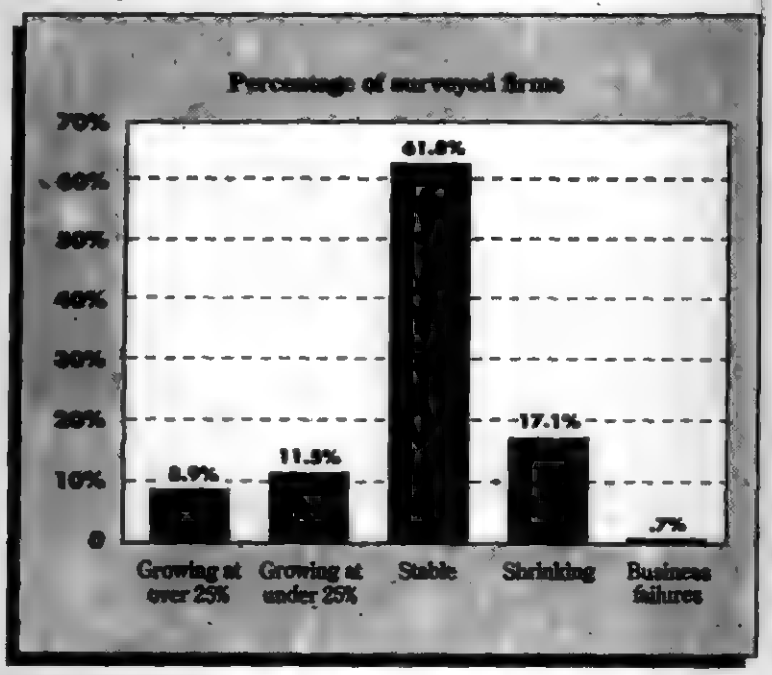
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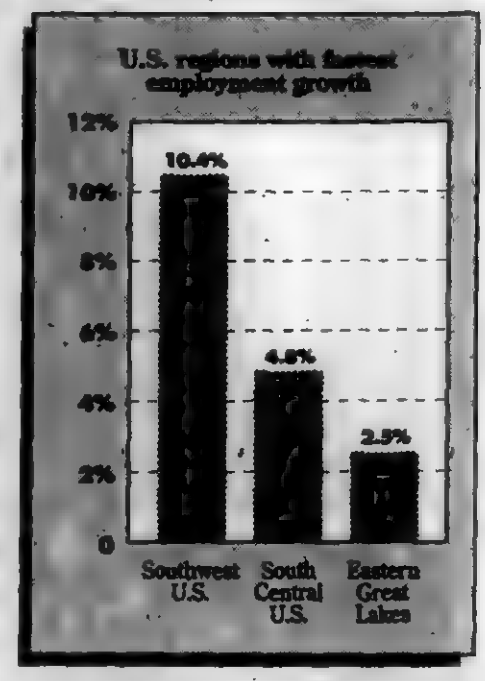
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Technology Career Index

More than one-fifth of small- and medium-size high-tech firms involved in factory automation are experiencing employment growth, based on a survey of 427 factory automation manufacturers







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The position will entail teaching undergraduate courses in Computer Information Systems, research and service responsibilities. It will be filled as soon as possible, but no later than August 1, 1991. Applicants should send a cover letter which addresses the applicants qualifications, a resume and the names, addresses and telephone number of three references to: William L. Duff, Jr., Dean, College of Business Administration, UNC, Greeley, Colorado 80639.

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Software Localization Manager for Spanish Speaking South America, International Product Group. By 2/20/91 please send resume to: Employment Security Department, ESI Division, Att: Job # 242085-R, Olympia, Washington 98504 Job Description: Manages subgroup of software company to localize U.S.-designed and produced software for micro computers for Spanish-speaking South American market. Works with software engineers and international testers to implement design changes. Manages localization associates, computer marketing specialists, software market analysts, translators, editors, typesetters, printers, and marketing personnel to produce Spanish manuals and marketing materials to accompany PowerPoint, PowerPoint Graph, PM PowerPoint software. Communicates with company offices in South America re software and marketing needs. Requirements: B.A. in Business Administration with a major in Marketing or Economics. Must be able to fluently speak, write and read Spanish (as used in South America) and English, including current colloquialisms, idioms and jargon, especially as it pertains to business usage. Six months of work experience in localization of business automation software products for the Spanish-speaking South American market. Must have legal authority to work permanently in the United States. Job location: Redmond, Washington. Salary: $33,500-36,000 per annum, depending on experience. 40 hours per week, flex time. EOE

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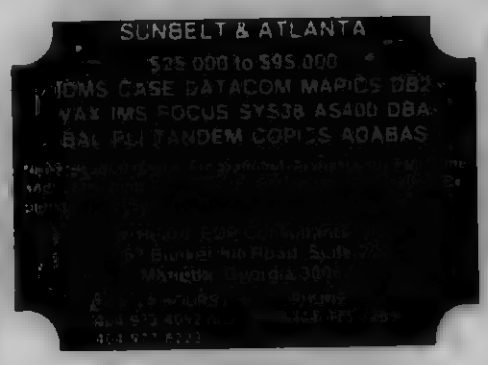
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Senior System Software Engineer, Printer Business Unit. By February 21st please send resume to: Employment Security Department, ES Division, Attn: Job # 240417-W, Olympia, Washington 98504 Job Description: Designs, implements and tests complex and high level systems and software for micro computers. Assumes senior responsibility to design and implement generic printer driver software including version of product for use with Kanji printers utilizing MS-DOS and Windows and OS/2 operating systems and "C" and Assembly languages. Assumes major project responsibility including: 1) requirements and analysis of project specifications; 2) product design; and 3) implementation schedules. Two positions available. Requirements: M.A. or M.S. in Electrical Engineering, Computer Science, Mathematics or Physics, Six months of work experience in computer design or programming utilizing windowing and multitasking operating systems and "C" and Assembly languages and in compiler design. Fluency in reading and writing Kanji characters and fluency in reading, writing and speaking English. Must have legal authority to work permanently in the United States. Job location: Redmond, Washington. Salary: $40,000-42,000 per annum, depending on experience. 40 hours per week, flex time. EOE

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Education Required: Master of Science in Mechanical or Civil Engineering. Academic course work must include 3 credit hours in each of the following: advanced dynamics of machinery, computer-aided design (optimization), computer graphics, robotics, and numerical methods in linear algebra.

Experience Required: One year as a Research Associate and must include work as a structural analyst in the areas of CAD/CAM/CAE.

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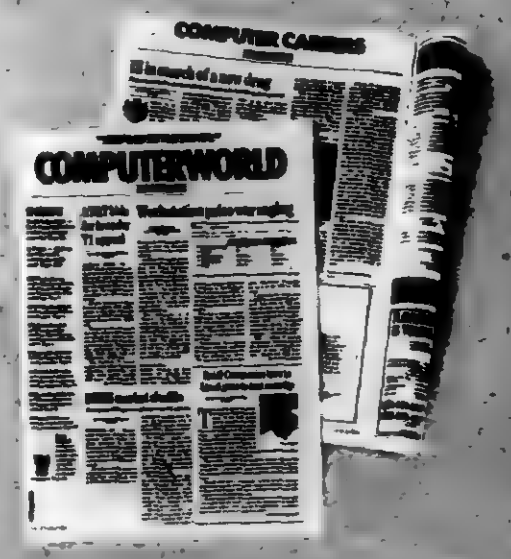
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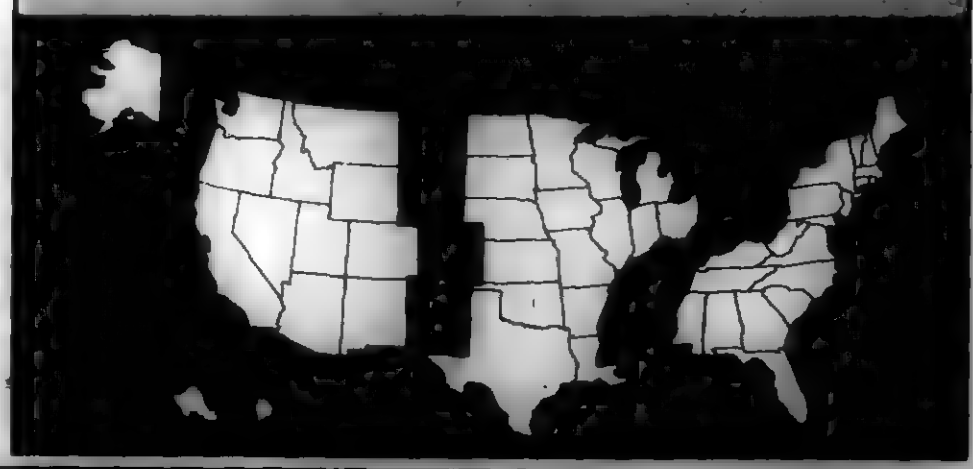
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COMPUTERWORLD
DIRECT RESPONSE CARDS

Court warns against abusive licensing

Editor's note: Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY HOWARD ZAHAROFF
SPECIAL TO CW

Information systems managers who are worried about the extent of control that licenses give vendors over use of their software packages can take solace from a recent court ruling that rejected an infringement claim because the vendor's license agreement was too broad in nature.

At first glance, the case of *Lasercomb America, Inc. v. Holiday Steel Rule Die*, tried in the 4th Federal Circuit Court of Appeals, involved a glaring example of infringement by the defendant. Here are the facts:

Lasercomb is a manufacturer of steel rule dies used to cut and score paper and cardboard for folding into boxes and cartons. It developed a software program known as Interact (the object of the dispute) to be used by a designer to create a template of a cardboard cutout on a computer screen and to direct the mechanized creation of the conforming die. Lasercomb's license agreement provided that during the term of the agreement, defined as 99 years, and for one year after it expired, the licensee would neither develop, sell nor assist others in developing or selling any kind of computer-assisted die-making software.



The agreement also required the licensee to restrict its directors, officers and employees from engaging in these activities during the term of the agreement. Thus, any customer wishing to use Interact would have to agree to refrain from developing a competitive program, whether infringing or not, for one century.

The defendant, Holiday Steel, also a manufacturer of steel rule dies and a competitor of Lasercomb, obtained four prerelease copies of Interact but never returned a signed license agreement. According to the case, "Lasercomb had sent the agreement to Holiday Steel with a request that it be signed and returned. Larry Holiday, however, decided not to sign the document, and Lasercomb apparently overlooked the fact that the document had not been returned."

Holiday Steel promptly circumvented Lasercomb's protective devices, made unauthorized copies to use on its own computer systems and finally renamed the program and marketed it as its own product. In light of this activity, the District Court found Holiday Steel liable to Lasercomb for copyright infringement and enjoined it from marketing this product.

The Appeals Court agreed with the District Court's findings of fact: "There is no question that the defendants engaged in unauthorized copying." However, to the surprise of many, the Appeals Court rejected the lower court's finding of infringement, reversed its award of damages and lifted its injunction.

The reason? Copyright misuse. Both copyrights and patents are forms of legally sanctioned monopolies. In order to encourage inventors to invent and authors to create, the law grants them certain exclusive rights in their inventions (under the patent laws) and works of authorship (under the copyright laws).

In last month's Legal Eye column [CW, Dec. 17], Raymond Nimmer explained why patents are a stronger form of protection than copyrights. For many years, courts have recognized that if a patent owner abuses this powerful monopoly — for example, by forcing everyone who wants to use the patented technology to purchase unpatented items from it — this abuse constitutes a defense against a claim of patent infringement. This defense is known as patent misuse.

In *Lasercomb*, the 4th Circuit became the second court to recognize explicitly that there exists a defense of copyright misuse analogous to the defense of patent misuse. (*Lasercomb* was soon followed by *Broadcast Music, Inc. v. Hearst/ABC Viacom Entertainment*, in which the District Court for the Southern District of New York also recognized that copyright misuse may be a permissable defense).

The court concluded that Lasercomb, by providing in its license agreement that the licensee not produce computer-assisted die-making software during the term, attempted to use its copyright to eliminate competition in the steel rule die business. Because this was beyond the scope of the rights the copyright gave it, the court deemed this a "misuse" of the copyright and a valid defense against Lasercomb's infringement claim.

Under the circumstances, perhaps most startling is that the court recognized this defense even though the defendant behaved so unreasonably and was not directly affected by the misuse. As the court wrote:

" . . . Lasercomb's anticompetitive clauses in its standard licensing agreement constitute misuse of copyright . . . The defense is available to appellants even though they were not parties to the standard licensing agreement."

BOTH COPYRIGHTS AND patents are forms of legally sanctioned monopolies.

The moral of this case is that IS managers and software suppliers should review license agreements to determine if any provisions could be interpreted as misuse.

Wise companies will consider revising their agreements to remove unreasonably broad restrictions to preserve their ability to assert their copyrights against infringers.

Zaharoff is an attorney at the Boston office of Brown, Rudnick, Freed & Gesmer. He practices, writes and speaks on computer law issues.

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The BoCoEx index on used computers

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XT Model 089	$550	$625	$400
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AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,100	$1,300	$1,025
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,000	$3,500	$2,500
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,450	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,800	$2,300
LTE 386	$2,000	$2,100	$1,850
Deskpro 286	$1,000	$1,200	$975
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh Plus	$750	$975	$700
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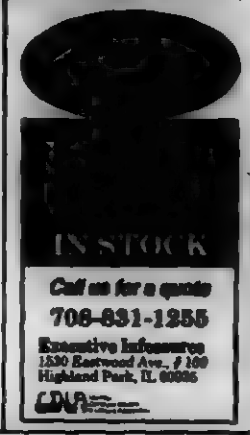
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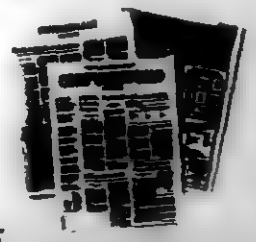
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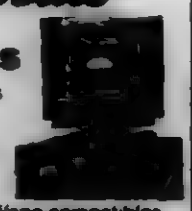
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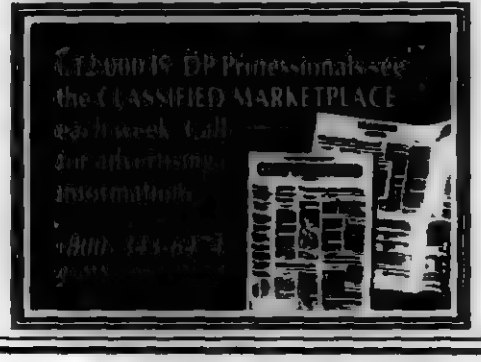
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To be considered, proposals must be received by Ms. Christensen prior to the close of business, 5:00pm, February 27, 1991.

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RFP No. 1691, due Tuesday, February 5, 1991 at 3:30 p.m. for the acquisition of 34 A-D size plotters for the MISSISSIPPI STATE HIGHWAY DEPARTMENT Project Offices statewide.

RFP No. 1692, due Thursday, February 7, 1991 at 3:30 p.m. for the acquisition of a 11x17 high-resolution laser printer and controller for the Print Shop at the MISSISSIPPI STATE HIGHWAY DEPARTMENT.

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RFP No. 1699, due Thursday, February 7, 1991 at 3:30 p.m. for the acquisition of a dot matrix printer to connect to an existing Wang VS5400 computer for the PUBLIC SERVICE COMMISSION.

RFP No. 1648, due Tuesday, February 5, 1991 at 3:30 p.m. for the acquisition of a 16-workstation microcomputer lab with printers and software for HINDS COMMUNITY COLLEGE RANKIN CAMPUS.

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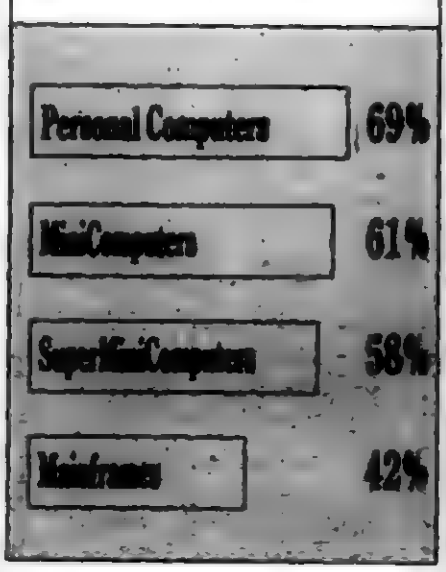
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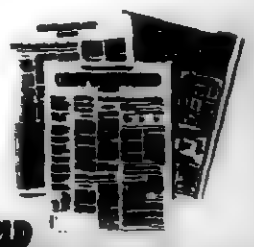
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Involvement in the Purchase of Computer Systems by Computerworld Subscribers in User Organizations*



* Source: STAT Resources Profile of Computerworld Subscribers, November 1987.

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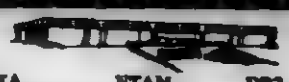
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A lean, mean training regime

A depressed economy is forcing IS managers to watch their bottom line

BY ALICE LAPLANTE
SPECIAL TO CW

First of a two-part series

Despite a tough economic road ahead, many companies are still keeping their information systems training programs on track. Rather than receiving the usual cutbacks, training managers are reporting significant support for their efforts.

However, the continued backing is coming with one caveat: Be prepared to reduce training programs if necessary in the future and do so without disrupting the company's ability to meet users' needs.

There are a number of methods by which managers can brace themselves for possible cutbacks and keep their training budgets lean:

- Hire outside consultants on a contract basis.
- Buy prepackaged training courses to be delivered either in an instructor-led classroom situation or using alternate media.
- Take advantage of free training offered by hardware and software vendors.
- Ask IS employees to stand in as trainers in their particular areas of expertise.

For example, at Johnson Controls, Inc., many training classes are required — not optional — and the number of training dollars is allocated as a percentage of annual gross sales.

"However, as a recessionary period begins to unfold, we're trying to use innovative ways to deliver training," says David Podeszwa, manager of the training and education division at the Milwaukee company.

Previously, employees would have traveled from a remote company office to the Milwaukee headquarters for a software training class. Now, an instructor is sent to the remote site to save travel expenses, says Podeszwa, who manages a full-time staff of 50 and is responsible for training more than 18,000 employees located at various sites around the U.S.

Johnson Controls has also found that delivering training via alternate media, such as interactive video or computer-based training, can be less expensive than instructor-led classroom training, according to Podeszwa.

Other IS managers find ways to reduce expenses by taking advantage of free services offered by hardware and software vendors.

"Training is a high priority, but individual managers must make what resources they have much more effective," says Patricia Macsisak, manager of the end-user support group at Amdahl Corp. in Sunnyvale, Calif. "For me, this means looking at the technical training needs of the organization and trying to find ways to leverage my 10-person staff and maximize the services end users can get for the money I am budgeted," she adds.



Freebies help

Macsisak says free classes for products offered by Microsoft Corp., Lotus Development Corp., Zenith Data Systems and other vendors help her train and educate end users with a minimum of cash outlay.

"Many vendors are finding that to be competitive, they need to provide their large corporate customers with free services such as training," she says.

Because of these free services, Macsisak says, she will be able to provide more training to Amdahl employees in 1991 for less money than she was able to provide it in fiscal year 1990.

One disadvantage to vendor training, Macsisak adds, is that vendors tend to offer generic classes that teach the "basics" of a product or technology. "But with the vendors' knowledge of the products and our knowledge of the company, we can usually create a very nice fit [of training to needs]," she says.

A temporary fix

According to IS trainers and managers, probably the most common way for a corporation to provide high-quality training is to keep a small full-time staff and hire part-time or contract trainers on an as-needed basis.

"We are organized so that we can easily scale back our operations if the company has to do some belt-tightening — which seems more and more likely," says David Stanfield, manager of the MIS education center at Glaxo, Inc., a pharmaceutical company in Durham, N.C. Stanfield's department has the responsibility of training more than 3,000 end users.

"Although we do a huge volume of training, we only have a small internal staff," Stanfield says, adding that he currently has 90 to 120 training instructors under contract.

"My company is committed to technical training in terms of dollars but not in terms of hiring permanent training employees," he says.

To control the quality of the training delivered to Glaxo end users, Stanfield and his staff prepare all course material themselves, hiring outside trainers to deliver it.

This arrangement makes it easy to scale back on expenses if necessary. "We simply schedule fewer classes," Stanfield says.

Other companies also use outside contractors but rather than develop course material themselves, they buy it from the vendor. The decision to make or buy in such cases usually comes down to cost.

For basic classes such as introduction to Lotus' 1-2-3 spreadsheet or Ashton-Tate Corp.'s Dbase, training materials can often be purchased for much less than it would take to reinvent the wheel in-house.

While companies have been slow to awaken to the need for training, current circumstances show a change in attitudes, IS managers and trainers agree.

"Fifteen years ago, I was constantly being asked to prove the value of my existence," Podeszwa says. "Now, every corporation knows that they have to provide high-quality training — or they will fall behind their competitors."

Part II will take a look at cost-justification methods that IS trainers and managers can implement.

LaPlante is a free-lance writer based in Palo Alto, Calif.

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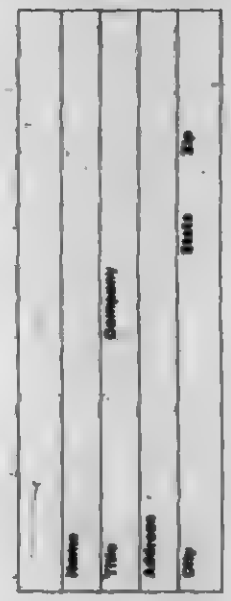
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

FROM HOLD TO BUY: GMR/Electronic Data Systems, Inc. (by Prudential-Bache Securities, Inc.). Reason: EDS is the outsourcing vendor of choice; stock will top its recent high of 40 within a year.

FROM OUTPERFORM TO AGGRESSIVE BUY: Aldus Corp. (by Montgomery Securities). Reason: New version of Pagemaker 4.0 for Windows is impressive; stock is expected to jump into the mid-30s within six months.

FROM BUY TO HOLD: Systems Center, Inc. (by Alex. Brown & Sons, Inc.). Reason: Fourth-quarter profits will fall short of estimates because of low revenue from new release of *Net/Master*, network and systems management software.

INDICATORS

The Dow Jones industrial average leapt just over 122 points — nearly 4.9% — last week, closing Thursday at 2,623.51. The *Computerworld* Stock Index, meanwhile, shot up 7.7% to 29.55 by Thursday, an increase of 2.11 points for the week.

GUEST SPEAKER

David Bayer, analyst, Montgomery Securities, San Francisco:

"Earnings reports from microcomputer software vendors look good, especially compared with the rest of the industry. **Borland International, Inc.** has stolen market share from **Lotus Development Corp.** and is expected to release Quattro Pro for Windows in the second quarter.

"The only question mark regarding earnings goes to Lotus. It'll have a tough first half in 1991 until 1-2-3 for Windows comes out, but it will not relinquish its leadership role in the spreadsheet market. Ultimately, the customer will have three very good spreadsheets to choose from: 1-2-3, Excel and Quattro Pro."

ANALYSIS IN BRIEF

Turnaround at **Ask Computer Systems, Inc.** will take several more quarters as the acquisition of **Ingres Corp.** smoothes out. Lotus stock may appear to be relatively cheap, but do not buy it now. Its Freelance Plus may eventually compete well among business graphics packages for Windows, but it will not ship until mid-1991. Lotus must release a Windows-compatible version of 1-2-3 as soon as possible to draw buyers from **Microsoft Corp.**'s Excel 3.0 for Windows.

— *Prudential-Bache, Software Snapshots, Dec. 28, 1990.*

Microcomputers and semiconductors have avoided a slowdown so far, mainly because of growing foreign sales and new product cycles. Firms selling notebook computers, file servers or **Intel Corp.** 1486-based systems look good.

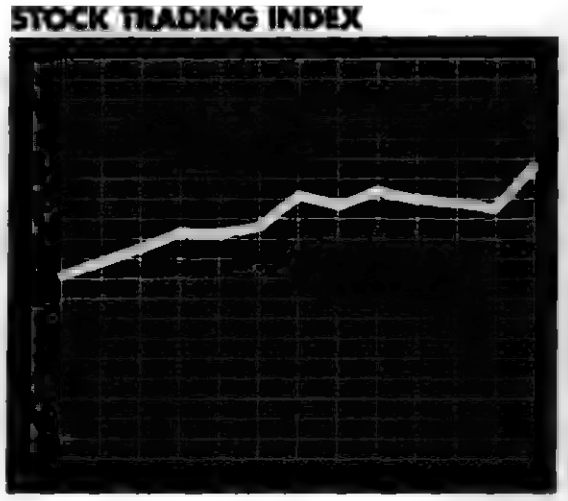
Intel and other semiconductor companies that are allied with major personal computer vendors should report positive earnings for the fourth quarter.

This year will bring a shakeout among disk-drive makers. **Seagate Technology, Inc.** appears to be taking market share from competitors **Western Digital Corp.** and **Maxtor Corp.**

— *Microcomputers, Semiconductors: What's Up, Tech?, Bear Stearns & Co., Inc., Jan. 11, 1991.*

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Technology stocks followed other frenzied markets higher last week. IBM shot up 7⅝ points to 115¾ after reporting better-than-expected fourth-quarter profits. Digital Equipment Corp. picked up 5⅜ points, closing at 61½.
- Dell Computer Corp. and Borland International, Inc. reached new heights. Borland soared 9¼ points to close at 39⅛; Dell gained 3 points to 20¼.
- AT&T said it has the NCR Corp. shareholder majority needed to call a special meeting of NCR's board of directors. AT&T added 2⅛ points to 31⅛. NCR added 1⅛ to 86⅝ after reporting that fourth-quarter earnings were lower than last year.
- Motorola, Inc. was among the few losers last week after posting quarterly profits below estimates, sliding 1⅞ points to 45⅞. Wang Laboratories, Inc. Class B shares also fell, slipping ⅛ of a point to 2½ after the firm said it would cut 500 employees.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, JANUARY 17, 1991

TOP PERCENT GAINERS

Alloy Computer	180.64
Borland Int'l	37.89
Compression Labs	28.38
Micropolis Corp.	27.59
Aldus Corp.	26.92

TOP PERCENT LOSERS

Computer Automation Inc.	-27.28
Capital Associates	-17.51
Printronix Inc.	-17.14
Oracle Systems	-15.09
Maxtor Corp.	-13.44

TOP DOLLAR GAINERS

Borland Int'l	10.75
Measurex Ms Elect.	10.50
Microsoft Corp.	10.00
IBM	8.88
Digital Equipment	8.88

TOP DOLLAR LOSERS

Motorola Inc.	-8.13
Printronix Inc.	-1.50
Oracle Systems	-1.00
Sage Software Inc.	-0.75
Sungard Data Sys.	-0.75

Exch	52-Week High	52-Week Low		Jan. 17 Close	Wk Net Change	Wk Pct Change
Communications and Network Services — Up 6.7						
OTC	19.00	5.38	3 COM Corp.	8.00	0.13	2.13
NYS	69.75	32.50	American Info Techs Corp.	65.88	2.50	3.94
NYS	44.13	29.00	AT&T	31.25	2.00	6.84
OTC	9.63	0.94	Ariel Communication Corp.	1.38	0.13	10.00
NYS	58.25	39.50	Bell Atlantic Corp.	52.25	3.75	7.73
NYS	57.63	46.00	Bellsouth Corp.	53.38	1.75	3.39
OTC	16.38	8.25	Compression Labs Inc.	11.88	2.63	28.38
NYS	38.38	23.38	Contel Corp	36.13	1.50	4.33
OTC	4.38	1.75	Datawatch Corp.	4.0	0.63	18.52
NYS	28.75	8.88	Digital Comm Assoc	13.00	0.50	4.00
OTC	20.50	12.25	Dynatech Corp.	19.25	0.63	3.38
OTC	12.88	5.50	Fibronics Int.	7.63	0.75	10.91
OTC	4.38	1.75	Gandalf Technologies Inc.	2.50	0.00	2.54
NYS	4.75	1.88	General Datacomm Inds.	2.25	0.13	5.88
NYS	34.13	23.50	GTE Corp.	29.63	1.38	4.87
OTC	9.25	0.88	Infotron Systems Corp.	1.00	0.00	0.00
NYS	60.88	40.25	ITT Corp.	46.25	2.13	4.81
OTC	44.13	18.00	MCI Communications Corp.	19.88	1.38	7.45
OTC	21.00	2.75	Microcom Inc.	3.75	-0.25	-6.25
NYS	34.38	5.00	Network Equipment Tech.	5.63	0.13	2.27
OTC	14.63	4.00	Network General	8.50	1.00	13.33
OTC	15.25	8.00	Network Systems Corp.	13.13	0.88	7.14
NYS	28.63	22.13	NorTherm Telecom Ltd.	27.63	0.88	3.84
OTC	37.88	13.75	Novell Inc.	37.88	7.13	23.17
NYS	86.50	67.13	Nynex Corp.	70.00	1.88	2.88
NYS	47.88	38.25	Pacific Telesis Group	43.00	1.75	4.24
ASE	9.25	4.75	Parvi Corp.	6.88	1.13	14.52
NYS	39.13	8.88	Scientific Atlanta Inc.	12.38	0.38	3.13
NYS	59.50	47.25	Southwestern Bell Corp.	53.38	1.13	2.16
NYS	46.38	30.63	United Telecom	32.38	0.88	1.13
NYS	40.50	32.38	US West Inc.	36.88	1.13	3.16
Computer Systems — Up 7.29						
OTC	8.75	0.56	Allard Computer Sys.	1.00	0.00	0.00
ASE	18.88	10.00	Amdahl Corp.	14.25	1.50	11.76
OTC	51.25	34.25	Apple Computer Inc.	51.25	6.00	13.28
OTC	13.88	4.38	Archive Corp.	6.50	0.13	1.96
NYS	7.00	3.88	Bolt, Baranek & Newman	5.00	0.38	8.11
NYS	11.88	4.50	Commodore Int'l	11.25	1.00	9.76
NYS	57.88	35.50	Compaq Computer Corp.	53.25	0.63	15.75
OTC	4.25	0.13	Computer Automation Inc.	0.50	-0.19	-27.33
NYS	21.63	8.75	Control Data Corp.	8.75	1.63	22.91
NYS	20.88	8.38	Convex Computer	11.75	1.38	13.25
NYS	61.25	25.00	Cray Research Inc.	35.25	4.63	15.10
NYS	13.25	3.50	Data General Corp.	4.38	0.38	9.38
NYS	4.00	0.75	Datapoint Corp.	1.63	0.00	0.00
OTC	20.38	4.63	Dell Computer Corp.	20.38	4.13	25.39
NYS	65.13	46.50	Digital Equipment Corp.	61.50	8.88	16.86
NYS	36.13	13.75	Harris Corp.	20.25	0.38	1.89
NYS	50.38	34.88	Hewlett Packard Co.	35.50	4.75	15.46
NYS	123.13	95.00	IBM	115.75	8.88	8.30
OTC	14.00	8.00	Information Int'l	8.00	-0.13	-1.54
OTC	23.50	10.50	Intergraph	14.88	1.13	8.18
NYS	3.88	0.88	MAI Basic Four Inc.	1.00	0.00	0.00
NYS	182.75	114.00	Matsushita Electronics	128.50	10.50	8.90
OTC	28.00	9.00	Mentor Graphics Corp.	14.00	0.00	0.00
NYS	92.88	44.50	NCR Corp.	86.63	1.50	1.91
OTC	35.50	11.00	Pyramid Technology	13.88	1.88	15.63
OTC	34.00	10.00	Sequent Computer Sys.	12.00	0.50	4.35
NYS	40.88	18.00	Silicon Graphics	27.13	2.63	10.71
NYS	28.00	14.63	Stratus Computer Inc.	23.50	2.75	13.25
OTC	37.25	15.00	Sun Microsystems Inc.	28.25	4.50	20.69
NYS	30.13	8.88	Tandem Computers Inc.	10.63	-0.38	-3.41
NYS	39.50	23.50	Tandy Corp.	28.13	1.00	3.69
OTC	35.50	8.75	Teradata	12.25	1.25	11.39
NYS	9.00	1.38	Ultimate Corp.	2.00	0.13	6.67
NYS	17.13	1.75	Unisys Corp.	2.75	0.00	0.00
ASE	6.25	2.00	Wang Labs Inc. (B)	2.50	0.00	0.00
Software & DP Services — Up 5.80						
OTC	58.75	17.00	Adobe Systems Inc.	33.50	2.88	8.68
OTC	33.00	15.50	Aldus Corp.	33.00	7.00	26.92
OTC	19.75	10.50	American Mgmt. Systems	18.25	1.50	8.96
OTC	18.25	7.50	American Software Inc.	14.50	1.75	13.73
NYS	4.50	1.38	Amscorp Inc.	2.13	0.00	0.00
OTC	23.50	10.00	Analysts Int'l	13.25	0.50	3.92
OTC	15.13	4.88	Ashton Tate	5.88	0.25	4.44
OTC	19.25	4.00	ASK Computer Sys.	4.75	0.63	11.68
NYS	60.25	45.25	Auto Data Processing	54.63	3.50	6.85
OTC	60.25	32.00	Autodesk Inc.	49.88	2.13	4.46
OTC	25.50	12.00	BGS Systems Inc.	20.50	0.25	1.23
OTC	39.88	17.75	BMC Software Inc.	33.88	5.88	20.98
OTC	21.50	11.00	Boole & Babbage Inc.	12.00	-0.25	-2.04
OTC	39.13	10.63	Borland Int'l	38.13	10.75	37.89
NYS	11.88	0.94	Businessland Inc.	1.00	0.00	0.00
OTC	10.25	4.25	Cognos Inc.	9.00	-0.13	-1.37
NYS	16.88	4.38	Computer Associates	7.50	0.50	7.14
OTC	17.25	7.75	Computer Horizons	15.50	-0.25	-1.59
NYS	84.00	39.75	Computer Sciences	52.25	3.38	6.91
NYS	12.25	9.00	Computer Task Group	8.25	0.13	1.54
OTC	25.25	14.25	Cornerstone Inc.	16.00	1.00	6.67
OTC	16.00	3.75	Corporate Software	8.50	0.38	4.60
NYS	41.50	24.38	General Motors (cl-E)	41.50	4.75	12.93
OTC	18.25	7.25	Goal Systems Int'l	12.25	2.00	19.51
OTC	4.75	1.88	Hogan Systems Inc.	2.38	0.31	15.12
OTC	9.75	3.00	Index Technology	7.75	-0.25	-3.13
OTC	18.63	7.75	Information Resources	10.50	0.63	6.38
OTC	17.50	3.31	Informix Corp.	3.31	-0.31	-8.61
OTC	7.88	1.38	Intellicorp Inc.	1.81	0.06	3.60
OTC	8.00	2.50	Interleaf Inc.	3.38	-0.19	-5.26
OTC	27.50	18.00	Knowledgeware Inc.	24.00	3.25	15.66
OTC	31.00	18.75	Legent Corp.	30.25	2.75	10.00
OTC	39.25	12.50	Lotus Development	18.38	1.69	9.70
OTC	28.25	13.63	Microgrids	24.00	2.75	12.94
OTC	84.00	43.63	Microsoft Corp.	84.50	10.00	13.51
NYS	11.25	4.00	On Line Software Int'l	5.75	0.38	6.98
OTC	28.38	4.88	Oracle Systems	5.63	-1.00	-15.09
NYS	17.38	7.00	Parasphic Systems	9.13	0.38	4.28
OTC	5.38	1.25	Phoenix Technologies	3.63	0.00	0.00
NYS	43.50	20.00	Policy Management Sys.	41.50	1.25	3.11
NYS	23.63	11.50	Reynolds & Reynolds	16.88	0.88	5.47
OTC	16.13	7.00	Sage Software Inc.	7.25	-0.75	-9.38
OTC	22.25	14.50	SAS Corp.	18.50	0.25	1.37
OTC	18.38	12.50	Shared Medical Systems	15.50	1.63	11.71
OTC	28.00	12.00	Software Publishing Corp.	24.88	3.63	17.28
NYS	11.00	5.50	Sterling Software	8.00	0.38	4.92
OTC	38.88	9.88	Sungard Data Sys.	11.00	-0.75	-6.38
OTC	32.50	16.00	Symantec Corp.	32.50	4.75	17.12
NYS	24.88	4.50	System Center Inc.	5.00	-0.38	-6.98
OTC	28.75	12.75	System Software Assoc.	27.38	0.38	0.69
OTC	27.38	4.75	Wang	8.63	0.88	11.39
Semiconductors — Up 9.17						
NYS	25.88	17.38	Advanced Micro Devices	20.00	-0.88	-3.09
NYS	8.63	5.50	Analog Devices Inc.	7.13	0.38	5.56
OTC	33.50	5.25	Chips & Technologies	8.25	1.00	13.79
OTC	52.00	28.00	Intel Corp.	42.00	3.63	9.45
NYS	13.00	6.13	LSI Logic Corp.	8.50	0.50	6.25
NYS	16.38	9.75	Micron Technology	11.38	1.88	16.67
NYS	68.38	45.88	Motorola Inc.	45.88	-3.13	-6.38
NYS	8.88	3.00	National Semiconductor	5.00	0.88	21.21
NYS	44.00	22.88	Texas Instruments	40.25	1.50	3.87
OTC	12.25	3.00	VLSI Technology	8.88	0.88	17.50
ASE	14.88	4.00	Western Digital Corp.	4.50	0.13	2.86
Peripherals & Subsystems — Up 7.19						
OTC	2.38	0.09	Alloy Computer Prod.	0.31	0.19	180.64
OTC	2.50	0.88	Apertus Technologies	1.44	0.19	15.00
OTC	40.00	12.38	ART Research Inc.	40.00	7.88	24.51
OTC	24.00	7.50	Banctec Inc.	8.25	0.50	6.45
ASE	7.63	3.13	Cognitronics Corp.	7.00	0.25	3.70
NYS	31.25	12.38	Conner Peripherals	28.50	4.13	16.94
ASE	22.00	7.00	Datatrom Corp.	8.63	0.00	0.00
NYS	10.00	3.50	EMC Corp.	10.00	1.38	15.94
NYS	43.88	38.75	Eastman Kodak Co.	38.75	0.38	0.98
OTC	8.50	4.38	Emulex Corp.	5.63	0.25	4.65
OTC	34.50	14.00	Evans & Sutherland	19.25	2.00	11.59
OTC	6.25	3.13	Exabyte Corp.	5.50	0.56	11.36
OTC	16.50	8.00	IPL Systems Inc.	16.25	2.00	15.08
OTC	2.19	0.13	Maxtor Systems	0.44	-0.06	-8.61
OTC	17.00	3.38	Maxtor Corp.	3.63	-0.56	-13.44
OTC	10.25	3.88	Micropolis Corp.	9.25	2.00	27.59
NYS	91.38	73.63	3M Corp	85.13	6.63	8.44
OTC	14.50	8.00	Printronix Inc.	7.25	-1.50	-17.14
NYS	21.25	8.50	QMS Inc.	10.50	2.25	15.79
OTC	29.75	8.88	Quantum Corp.	20.50	2.88	16.31
NYS	8.88	4.38	Recognition Equipment	8.13	0.25	3.13
OTC	9.88	4.00	Reson Inc.	5.88	0.25	4.44
OTC	19.75	5.63	Seagate Technology	13.00	1.75	15.56
NYS	36.25	11.00	Storage Technology	23.50	3.63	18.24
OTC	4.00	0.63	Tandon Corp.	1.94	0.13	6.89
NYS	18.13	11.63	Tektronix Inc.	16.88	1.00	6.30
OTC	0.63	0.16	Televideo Systems	0.22	0.03	16.49
NYS	86.75	28.00	Xerox Corp.	42.25	3.75	9.74
Leasing Companies — Up 1.16						
OTC	16.50	8.88	Amplicon Inc.	9.00	1.00	12.50
OTC	4.38	0.31	Capital Associates	0.44	-0.09	-17.51
NYS	28.50	14.63	Comdisco Inc.	23.00	2.50	12.20
OTC	16.25	9.25	LDI Corporation	11.75	-0.25	-2.08
OTC	8.50	2.25	Rabobank Inc.	2.75	0.50	22.22

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NEWS SHORTS

And don't pass Go

Claris Corp. President and Chief Executive Officer Bill Campbell announced last week that he is leaving the Apple Computer, Inc. software subsidiary to take on the same titles at Go Corp., effective today. At Go, a Foster City, Calif.-based developer of pen-based computer technology, Campbell will succeed S. Jerrold Kaplan, who was named chairman of the board.

Bush pushes telecommuting

President Bush last week issued another in a series of messages that promote telecommuting [CW, Nov. 26]. In a letter to the Pacific Telecommunications Council's conference in Honolulu, the president noted that technology can provide people with "a more flexible workplace." White House aide William Eagle said that more presidential endorsements of telecommuting are likely to appear in the forthcoming National Energy Strategy document and at other conferences this year.

General Motors audits PCs

General Motors Corp. has finished an audit of the personal computers at its corporate headquarters. GM chose its corporate headquarters as the first site for a companywide internal audit program based on the Software Publishers Association's Spaudit package, to make sure the corporation is in line with licensing policies. GM tested 4,000 PCs with preliminary results showing few systems with illegally made copies. GM will begin testing other sites next month.

Building DOS/Mac bridge

A Palo Alto, Calif.-based start-up is working to span the gap between the DOS world and Apple Macintosh users. Userland Software has begun shipping the IAC Toolkit, which is a development tool designed for "interapplication communication" of Macintosh and Microsoft Corp. Windows environments.

Pesatori heads Zenith Data

Zenith Data Systems pulled off a bit of a surprise last week with its choice of Enrico Pesatori, former head of North American operations at Ing. C. Olivetti & Co., as its new president and CEO. Analysts had expected parent company Groupe Bull to replace former Zenith Data CEO and President John Frank with someone from within its ranks or an executive at a U.S. PC maker. Pesatori, 50, has been at Olivetti for 21 years.

Novell signs vendors

Four vendors — IBM, Netframe Systems, Inc., Data General Corp. and AST Research, Inc. — announced last week that they joined Novell, Inc.'s Strategic Engineering Support program. Through the program, the vendors work more closely with the networking firm to ensure compatibility between Novell's Netware products and their hardware. The program involves testing Novell products before they are released.

Norman expands role at Racal

Racal-Milgo President James K. Norman has been named president of $550 million Racal Data Communications, U.S., the domestic parent of four Racal data communications firms. Norman will reportedly take on operational responsibility for the four U.S. companies, which include Racal-Milgo, Racal Interlan, Racal Quanta and Racal-Milgo Skynetworks. He will retain his role as president of Sunrise, Fla.-based Racal-Milgo, a wide-area networking company.

Software Publishing spins off PFS

It must have liked the cut of the PFS jib. Spinnaker Software Corp. in Cambridge, Mass., will purchase the PFS product line from Software Publishing Corp., based in Mountain View, Calif. Software Publishing will receive approximately 16% of Spinnaker's stock in exchange for the product line as well as royalties on PFS sales. Spinnaker has plans for Windows 3.0 applications to be marketed under the PFS name.

'A la carte' broadband to be served at Comnet

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — Several products and services designed to support broadband networking a la carte — providing users with the ability to call up the bandwidth they need when they need it at a price commensurate with their use — are expected to be introduced next week at Communications Network '91 (see story below).

The offerings are geared to applications such as videoconferencing, network backup and local-area network interconnections, which require large amounts of bandwidth for short periods of time. While the major carriers have produced a growing flock of switched digital high-speed services recently, users complained that so far, such offerings are too pricey, are available only in limited areas and take too long to set up.

Charles Schwab & Co. is very interested in "on-demand, multimegabit/sec. carrier services" that could provide backup links to connect users to a backup data center, said John Payne, a telecommunications analyst at the investment firm. "The problem is that current offerings are too expensive. You have to reserve the bandwidth and pay a monthly cost and give the carrier at least two hours notice," he said.

What Schwab users really need is the ability to call up 45M bit/sec. bandwidth within 30 minutes "and really pay on a usage basis," Payne said.

Meeting needs

Exhibitors at Comnet are expected to respond to the needs of companies such as Schwab with the following announcements:

- Teleos Communications, Inc. and Ascend Communications, Inc. will display rival boxes that are said to amalgamate multiple 56K bit/sec. switched links into Integrated Services Digital Network and T1 pipelines.
- MCI Communications Corp. is reportedly preparing an enhanced version of its Digital Reconfiguration Service, which will promise users the ability to call up between 56K and 1.5M bit/sec. of dedicated bandwidth within five minutes. A typical wait for existing on-demand services from MCI and others has been up to 15 minutes.

MCI also said it will announce a global networking service that will combine a variety of its offerings, including those of Infonet, in which MCI has a 25% stake.

- British Telecommunications PLC subsidiary BT Tymnet is expected to lay out its strategy for bringing out frame relay and other broadband switched digital services. Frame relay is said to support speeds of up to 2M bit/sec. over a switched network, but Tymnet "was very careful to say that they are not limiting themselves to frame-relay technology" in their broadband offerings, said Berge Ayvazian, an analyst The Yankee Group in Boston.
- AT&T is expected to introduce its switched T1 service, which the company said would be out sometime in the first quarter of this year.
- Network Systems, Inc. announced a series of LAN-to-LAN routers and bridges that are said to support throughput of 50,000 packet/sec. over a Fiber Distributed Data Interface connection and 15,000 packet/sec. over an Ethernet or long-distance link. The whole product line will support frame relay 90 days after a carrier introduces frame-relay services, a Network Systems spokesman said.

Show aimed at LAN-hungry buyers

BY JOANIE M. WEXLER
CW STAFF

The internetworking market is expected to thrive in an otherwise fragile economy, and vendors exhibiting at next week's Communications Networks '91 event in Washington, D.C., said they are filling the bill with next-generation mousetraps.

Start-up firm Coral Network Corp. in Marlboro, Mass., for example, is betting product differentiation against vendor longevity with its firstborn offering, the Broadband Enterprise Switch. The fiber-based, modular device bundles local- and wide-area networking interfaces, bridging, routing and packet- and circuit-switching technologies into one system.

Coral's product reportedly allows LANs — including the 100M bit/sec. Fiber Distributed Data Interface (FDDI) — to communicate at full network speeds with no throughput degradation because of its 800M bit/sec. bus architecture. It will accommodate current and imminent wide-area transmission technologies such as T3 (45M bit/sec.), T1, fractional T1, frame relay and Synchronous Optical Network by August 1991, the company said.

The $20,000 to $100,000 switch can also reportedly be configured for any degree of fault tolerance.

Rosemary Cochran, a principal at Vertical Systems Group, a Dedham, Mass.-based consultancy, said while vendor stability is an issue with users, Coral is competing in the router market where "most of those vendors are small start-ups, as well."

> "WE'RE SIMPLIFYING the network and not requiring users to spend an extra $10,000 for [LAT] gateway functionality."
>
> JEFF PAINE
> CISCO SYSTEMS

Internetworking innovations from Proteon, Inc., Cisco Systems, Inc. and Network Systems Corp. will also emerge at next week's show.

Proteon said it plans to unveil a reduced instruction set computing-based bridge/router based on the Advanced Micro Devices, Inc. 29000 microprocessor. The Pronet CNX line, which the vendor said routes more than 100,000 packet/sec., was also created to handle emerging high-speed applications over T3, FDDI and metropolitan-area networks.

Cisco said it has bundled a software gateway option into its IGS multiprotocol bridge/router. The module — which will replace the vendor's $10,925 stand-alone gateway — translates Digital Equipment Corp.'s notoriously "unroutable" Local Area Transport protocol into Transmission Control Protocol/Internet Protocol or X.25 so that it can be routed.

"We're simplifying the network and not requiring users to spend an extra $10,000 for [LAT] gateway functionality," said Jeff Paine, Cisco's manager of marketing communications. The IGS router with the translator option costs $6,595.

Network Systems said it is announcing a bridge/router line with a 400M or 800M bit/sec. chassis that supports a combination of interfaces, including up to four FDDI links.

These and other products will address the 42% growth rate predicted by Boston-based consultancy The Yankee Group for the 1991 LAN-to-LAN communications market. The firm places internetworking investments second only to network management in user firms' communications budgets.

U.S. high-tech weapons pass trial by fire

Sophisticated armaments reported to have performed well in early days of war with Iraq

BY JAMES DALY
CW STAFF

Despite last week's Iraqi missile strike against Israeli cities, the devastating effectiveness of the armaments employed by U.S. military forces in Operation Desert Storm quelled long-standing fears that reliance on technology would lead to tragic foul-ups under real battle conditions.

"Our technological superiority quickly outclassed the Iraqis' ability to defend themselves; there's no doubt about it," said Bill Oliver, a researcher at the Center for Defense Information in Washington, D.C.

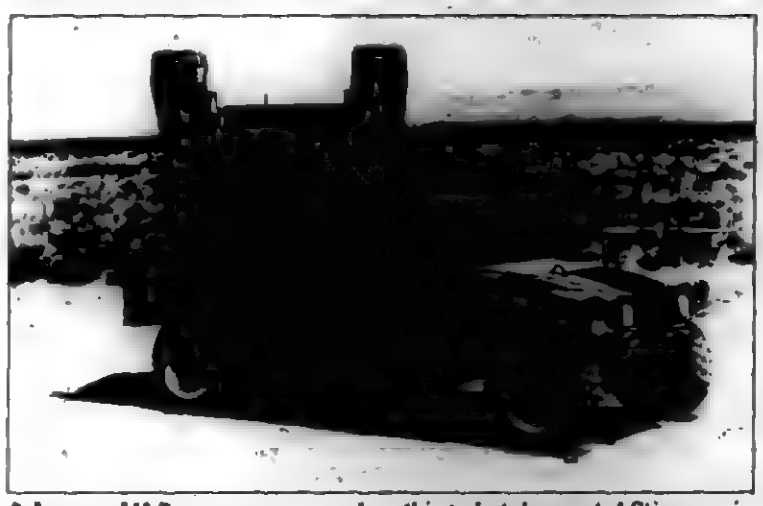
The first wave of late-night attacks against Baghdad — reportedly led by cruise missiles and radar-evading F-117A Stealth fighters — highlighted the U.S. Air Force's ability to technologically outfox Iraqi planes, which reportedly do not have the equipment needed for effective nighttime air-to-air battles.

Night warfare is becoming one of the Pentagon's favored military tactics: The military spent $235 million on night-vision equipment in fiscal 1990, according to research firm Frost and Sullivan, Inc. in New York.

Critics have long argued that the Pentagon's supersophisticated armaments have become so complicated that they have outgrown the ability of pilots, soldiers and sailors to use them. The Stinger anti-aircraft missile, for instance, requires its gunner to complete 18 steps before it can lock onto its target.

This time around, however, there was nothing but praise for the equipment. "The high-tech weapons did their job and did it very effectively," said the Strategic Air Command's Maj. Robert Staal at Offut Air Force Base in Bellevue, Neb.

That was borne home to U.S. television viewers late last week when shortly after reports of Iraqi missiles landing in Tel Aviv and Haifa in Israel came word — and later video footage — of a U.S. Patriot air-defense missile successfully intercepting a Scud missile aimed at forces in the Dhahran area of Saudi Arabia.



Advanced U.S. weaponry, *such as this pedestal-mounted Stinger missile system, reportedly functioned well in early attacks on Iraq*

The ability to effectively and easily use their weapons is not the only challenge facing Operation Desert Storm troops. The whirling sands of the Middle East can quickly clog moving parts, create electrical disturbances and limit the effectiveness of even the most advanced gear.

Military personnel also face a foe brimming with technical acumen. Analysts said Iraq has some very sophisticated weapons, and it was unclear in the first days of the war how much the U.S. and its "coalition" allies had been able to eliminate. Individual units of Iraq's air-defense system are reportedly armed with sophisticated missiles and radar, but its overall effectiveness is undermined by inadequate communications.

Peacenet usage soars as war erupts in Iraq

BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — As the first reports of U.S. attack on Baghdad began filtering in last Wednesday, the news flashed across the screens of Peacenet, a computer network linking peace organizations around the world.

During the first few minutes after the attack was announced, activity on the network node became so intense, there was a shutdown of the system for several minutes.

"Usage has gone up dramatically in recent weeks, and it's really taxing the system," explained Steve Fram, technical director at the Institute for Global Communications (IGC) in San Francisco, which funds Peacenet.



The system is surprisingly small: There is just one Intel Corp. 1486-based supermicrocomputer at the heart of this data-processing center. That supermicrocomputer, running AT&T's Unix System V Release 3.2, is loaded with 16M bytes of memory, 16 communications ports and 2.5G bytes of hard-disk storage.

Peacenet, founded in 1986, links Unix machines and personal computers based in 50 countries, stretching from the U.S. to Brazil to Australia.

Last week, war advisories on Peacenet's hundreds of electronic-mail "conferences" were posted by users in the U.S., UK and Canada. "The computer breaks the geographic barrier," said Jo Anne Scott, a Peacenet volunteer. "It alleviates the isolation people may feel in their own communities."

The California network exchanges information with other Unix-based networks, such as Usenet, communicating over X.25 networks. These data exchanges take place several times daily via automatic dial-ups.

"We're acting like a public utility," said Scott Weikert, who manages Peacenet's data center here. "Peace groups all around the world call us on high-speed modems to post their information on our bulletin boards, and we try to keep up with them."

Keeping up will indeed be a challenge, because Peacenet's central node can only handle 30 logged-on users at a time. To match last week's unprecedented user demand, Peacenet bought additional capacity with U.S. Sprint Communications Co., according to IGC executive director Geoff Sears.

The computer age seems to have brought lasting change to the peace movement, which operated largely by word of mouth during the Vietnam War. In June 1989, the same system was used by Chinese students in the U.S. to send messages to Beijing, China, at the time of the bloody Tiananmen Square protests, Sears said.

IS sites

FROM PAGE 1

the materials systems group in Dhahran, Saudi Arabia.

"We have a disaster-recovery plan which calls for the relocation of database information to various sites around the kingdom," Scarritt said. "But late last week, we added a new out-of-kingdom location somewhere in Germany."

In a worst-case scenario, the group's information systems duties could be conducted from Houston or the Germany location, Scarritt said.

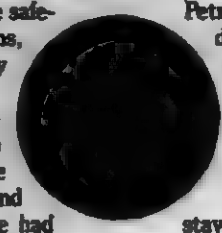
While Aramco security in the Dhahran compound has been increased since the crisis began Aug. 2, "we are on a very high state of alert right now," Scarritt noted. "Until we see how everything is going, everyone is staying close to home and keeping inside most of the time."

Leading up to the United Nations deadline of Jan. 15, the Aramco data centers experienced little or no interruption in normal operations. "Things have been operating every bit as well if not better than they were a number of months ago," said Ted Valentiner, a computer user in his role as capital construction project coordinator at Aramco.

Despite the interception of an Iraqi Scud missile launched at Dhahran late Thursday, there had been no reports that Aramco would not resume business here as usual following the weekend, Valentiner said.

The main data center in Dhahran, 170 miles south of the Kuwait border, had not been considered a risky location, according to an Aramco spokesman. However, the company does have a contingency plan for evacuating employees from areas hit by hostilities, he said.

While some expatriates have left their IS posts and Middle Eastern homes for the safety of other regions, many have reportedly elected to stay on.



This expatriate loyalty is difficult to explain, but these "are folks who were born and raised there and have had kids there," said Peter Fingar, director of computing and information services at the University of Tampa in Florida. Fingar spent 15 years working in the Middle East and has about two dozen close friends in the area.

While the U.S. ambassador in Bahrain reportedly saw little risk for U.S. citizens there, the British and French embassies urged their countrymen to depart. Attrition has been high at Bahrain Petroleum, which is predominantly staffed by British and Asian nationals. About 20% of the IS staff alone has left since August, Ragel said.

Those who have stayed behind are growing more concerned as Iraq flexes its military muscle. In Dhahran, "The incoming missile has obviously increased tension," Valentiner said. "The assumption has been that the missiles would be targeted for military facilities, but that wasn't the case."

Wall Street cheers

Wall Street girded against possible terrorist attacks and wild trading swings as the world waited for war to break out in the Persian Gulf.

WEDNESDAY: Rumors of military engagement prompted strict travel advisories and extra safety precautions at New York finance houses, along with plans to briefly halt trading to dampen any sudden surges. Analysts reported the sudden proliferation of guards in the lobbies of their buildings and beefed-up identification requirements for all visitors.

THURSDAY: The Dow Jones industrial average rocketed 114.6 points on exceptionally heavy trading; volume reached 318,890,000 shares. The rally marked the second-largest single-day point gain in U.S. stock market history.

The New York Mercantile Exchange, which handles the trading of oil futures contracts, reportedly implemented circuit breakers — provisions set to suspend trading for one hour should oil prices alter by $7.50 per barrel. Oil prices, in fact, barreled down $10.56 — the biggest one-day drop ever.

FRIDAY: In light of a widening war, gold prices soared, bonds dropped and the Dow Jones average was up again by 26 points.

BILL HARKINS

Officevision

FROM PAGE 1

contacted last week said they continue to believe that the concept of SAA remains sound. However, some suggested that IBM has all but lost its chance to become a desktop office system provider because of its Officevision woes.

Others point to the very long-term goals of SAA and IBM's stated determination to make it fly. "I would not expect any miraculous expediting now that it's there, but it fits with their general SAA direction," said Paul Hessinger, a consultant at Computer Task Group.

Can't wait any longer

Some users are clearly becoming irritated with the series of delays announced by IBM. "We have bought into the SAA concept, but we and a lot of other companies have issues that have to be addressed today, and we can no longer wait for IBM," said a Midwest information systems manager at a Fortune 500-class firm that has invested heavily in IBM mainframe and midrange equipment.

IBM restated last week that it will provide an Officevision status report in the second quarter but would not say if it will provide shipment schedules for the long-awaited Release 2, which was to provide the critical OS/2 direct-connect capability. More recently, IBM has been quietly shipping Officevision updates to host customers. The updates are called Release 2 but do not include the OS/2 direct-connect feature.

Despite IBM claims that it has approximately 1 million Officevision users, analysts said the majority of these are users who merely upgraded from Application System/400 Office and Professional Office System (Profs), indicating that IBM has failed to attract a substantial number of new accounts to the Officevision concept.

Tom Aser, IBM's director of marketing for Programming Systems, rebutted analysts' opinions that Wheeler took on the additional responsibility because the Applications Solutions Division stumbled in its delivery of the software. Aser claimed that Programming Systems has "felt all along that Officevision belonged here."

Yet IBM is currently conducting a survey of attitudes toward office integration, according to a developer who took part in the survey. One of the questions he was asked was: "Has Officevision hurt SAA's chance of adoption?"

Whether or not that is the case, opinion among users and analysts seemed unanimous that Wheeler can only help Officevision. "Earl Wheeler has a record of delivering the essential components of what others have promised," said George Sekely, vice president of computers and communications at Canadian Pacific Ltd., who said he has known Wheeler since the 1960s. "He's a no-nonsense guy who concentrates on reality," he said.

The users best served by and most taken with Officevision tend to be MVS and Profs users. But however tempting, even some of those types of users contacted last week termed the Officevision suite of applications "immature" and of more smoke than substance.

Turned off

Users concerned with personal computer implementation are generally even more turned off, according to industry analysts. Robert Holmes, a computer analyst at Southern California Gas Co., said his primary gripe with Officevision is the lack of support for Microsoft Corp.'s Windows. "We don't want to have to switch all our workstations to OS/2 just to use Officevision 2.0," he said.

Beyond these user complaints, Officevision problems are a symptom of what may be a bigger problem for IBM in delivering the grand-scale SAA solutions as real products in a timely fashion.

"They are attempting something that has never been done before," said George Schussel, president of Digital Consulting, Inc. in Andover, Mass. IBM, he said, "can't get away from the absolute bare-bones fact that these are very expensive solutions, especially if they aren't real and provable yet."

Past time

Officevision, particularly the local-area network segment, is plagued by design flaws, sluggish performance and delivery problems, according to industry analysts.

Release 2 of Officevision platforms was — as Officevision/2 LAN still is — late. What IBM has failed to deliver users said they can get from other vendors.

IBM is missing the boat by not meeting the needs of LAN users, said Judith Hurwitz, editor of "Unix in the Office" at Patricia Seybold's Office Computing Group in Boston.

Both Seybold and Forrester Research, Inc. recently recommended that users not tie themselves to Officevision. Instead, those who are not committed to a host-centric strategy should look elsewhere or at least proceed with extreme caution, Hurwitz and Forrester analyst Stuart Woodring agreed.

The real value for these users lies in the so-far unsuccessful implementation of Officevision LAN. However, Woodring predicted, it will be 1992 before users will be able to derive massive benefits from Officevision LAN.

Hurwitz noted that "after spending a few minutes with OV/2 running on OS/2 Version 1.2, we quickly understood why IBM pulled the release. It was unacceptably slow and dysfunctional."

What are the alternatives? Hurwitz and Woodring cited the following options: Hewlett-Packard Co.'s New Wave, NCR Corp.'s Cooperation, Lotus Development Corp.'s Notes and AT&T's Rhapsody. "It will be hard for IBM to compete with these innovative applications," Hurwitz said.

"IBM must bite the bullet and re-architect and rebuild the product in a pure object-oriented language like Digitalk's Smalltalk or a hybrid language like C++," Woodring said.

Additionally, Woodring said, Officevision must be extended to work through non-IBM environments. Forrester said IBM is trying to address this through a rollout of clients through 1992: Microsoft Corp.'s Windows 3.0 in the first half of 1991, Unix (Open Software Foundation/Motif) in the second half of 1991, Novell, Inc.'s Netware in 1991 and an Apple Computer, Inc. Macintosh client in 1992.

PATRICIA KEEFE

Windows

FROM PAGE 1

provide support for two graphical user interfaces on the front end — OS/2's P sentation Manager and Windows — on top of a back end consisting of the 32-bit OS/2 kernel. But as Microsoft wrote to developers, "clearly we place the Windows application programming interfaces at the center of our strategy."

Furthermore, Microsoft suggested in its memo to developers that Portable OS/2 will serve a small portion of the high-end market but will "only win over the competition because it runs Windows applications natively."

In a briefing slated for Jan. 29, Microsoft is expected to detail plans for a 32-bit Windows, called Windows 3.2, or Win32, and New Technology Portable OS/2. A spokeswoman said Microsoft will continue to support and place the Presentation Manager application programming interfaces in future products.

However, sources interviewed last week said they remain convinced Presentation Manager could wither on the vine unless IBM steps in. Developers said Microsoft's software merger plan is targeted at pushing Windows applications.

During the next 12 to 18 months, users will still be faced with two very similar 32-bit options as Microsoft's Windows and IBM's OS/2 Presentation Manager continue battling to claim the desktop standard.

Both systems will run DOS and Windows applications and feature preemptive multitasking, multiple threads, the High Performance File System and Named Pipes support, sources said. But Win32 is expected to improve on OS/2's graphics.

During the last two years, Microsoft and IBM have publicly attempted twice to patch up their differences over Presentation Manager and Windows. In September, IBM took control of the 32-bit OS/2 2.0, while Microsoft received responsibility for its successor, Portable OS/2.

There has been a growing debate for some months as to whether Microsoft will wash its hands of future Presentation Manager application programming interface support. "From the documents that we have seen from Microsoft, it is clear that Microsoft is not going to do anything at all on OS/2, that OS/2 will stop playing a role in their future operating system strategy," one source claimed.

Still, Microsoft has to be sensitive, Diamond said. "They sold 4,500 OS/2 developer kits and another couple of thousand OS/2 32-bit developer kits. Now they are going to turn the tide around and tell these people that if they are smart, they'll develop for Windows."

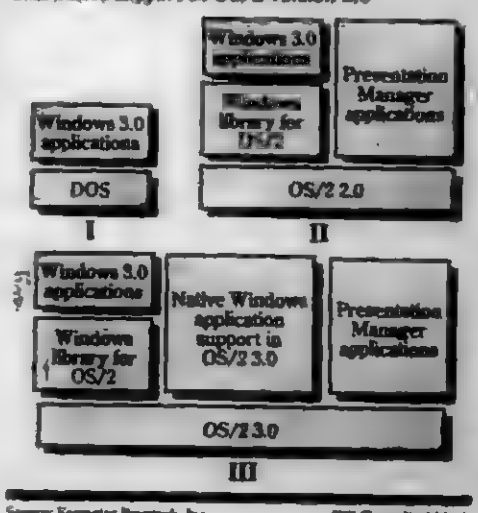
These developers and users are being briefed by IBM on its plans for OS/2 2.0. IBM began shipping early releases of OS/2 2.0 to select customers late last month and is expected to ship an upgrade in March.

According to sources briefed by IBM on OS/2 2.0, key changes will show up in a more attractive OS/2 2.0 will include:

- Full support for commercial DOS- and Windows-based applications running in virtual mode. "We are committed to providing that," an IBM spokeswoman said.
- A Virtualized Device Driver, which will ensure that users will be able to take any DOS-based card or device driver and run it under OS/2 2.0.
- Simultaneous support for OS/2 LAN Server and Novell, Inc.'s Netware.

Triple-glazed Windows

Microsoft's Windows applications are envisioned gaining some compatibility with OS/2 Version 2.0 and native support in OS/2 Version 3.0

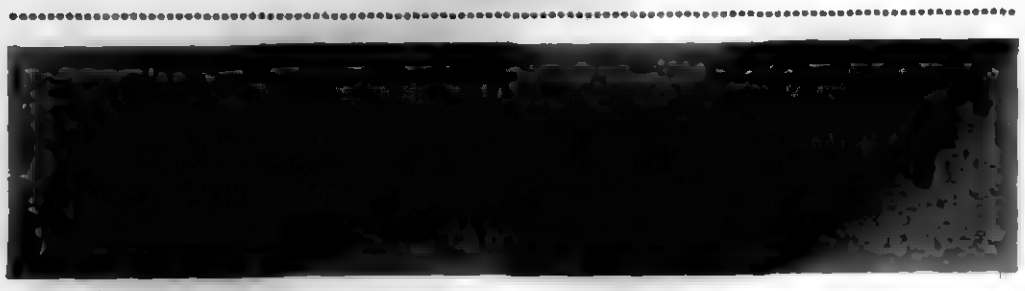


Source: Forrester Research, Inc. CW Chart: Paul Mock

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TRENDS



Despite the considerable investment in the data center, many IBM plug-compatible mainframe sites have not committed to any formal backup plans

Disaster recovery use

Percent of U.S. IBM Plug-compatible mainframe sites
(Base: 1,800)



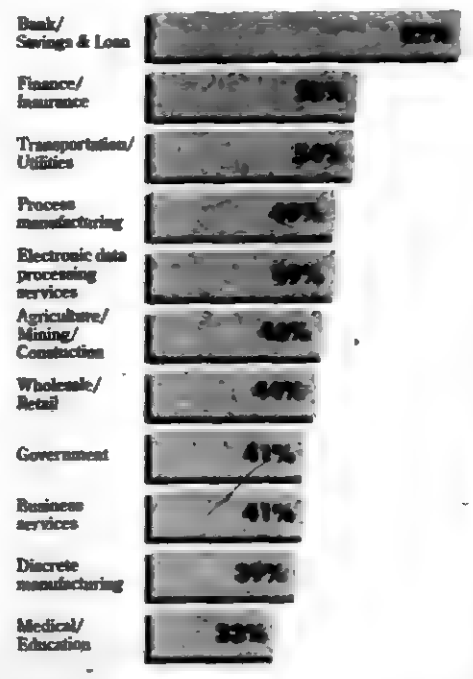
Implemented contingency plans

Percent of U.S. IBM Plug-compatible mainframe sites
(Base: 736)



Industry penetration

Percent of U.S. IBM Plug-compatible mainframe sites with a contingency plan
(Base: 736)



Common attributes

Does your site employ contingency plans?
(Base: 736)



$5 million and higher — Less than $5 million
(Estimated purchase value of installed systems)

3090 series sites — 9370 sites
(Size of mainframe processor)

Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

Out of work? Keep your chin up, believe in yourself, assess your skills and take your job hunt seriously, advises George Francis in next week's Careers section. After seven years at the same firm, Francis was laid off and spent nearly a year seeking another job. In the end, the 30-year IS veteran discovered his niche and wound up with three offers.



Rosalind Spiegler

Hospital emergency rooms might seem an unlikely place for information technology. But health care administrators and information systems managers are waking up to ways in which IS can be used to assist emergency room documentation — and hospital profits. Find out more in an Industry Closeup: IS in Emergency Care, in Manager's Journal.

INSIDE LINES

Let me see your books

Oracle found itself caught between a rock and a hard place last week, as the international banking syndicate that had loaned it $250 million last summer demanded to audit Oracle's books before securing a renegotiated loan. Oracle had spent $170 million of that amount by December, according to a recent report just filed with the U.S. Securities and Exchange Commission. "The banks will secure the loan with the company's accounts receivable balance," said Mike Musson, director of investor relations at Oracle. "People are concerned because Oracle burned a lot of cash in the first part of the year, but we're moving toward positive cash flow from operations."

Movement at the top

Rumors are circulating among the Wang user community that Wang is secretly working on a new high-end VS system. Sources were undecided whether it would be a replacement or an upgrade for the company's top-of-the-line VS 10000.

Learning the OSI language

After talking a good Open Systems Interconnect (OSI) game for years, Ungermann-Bass should finally come up with some beef at Connect '91 next week. The LAN server vendor is reportedly going to deliver on its promise to implement the OSI Common Management Interface Protocol on its network management system so that it can feed alerts and alarms to other OSI-compliant network management platforms.

Nervous employment ranks

War, recession and IS executive unemployment. So far, these may be the three major themes of the year. Art Gillis, a veteran consultant and former IS executive in the banking industry, had this to say last week: "We're in the 17th day of the year, and I've already had more [IS managers] calling me for job [illegible]."

Chief consulting officer

As if IS positions in the banking industry haven't been volatile enough, now a top banking IS consultant has switched jobs. Bill Synnott has left Nolan, Norton & Co. to start his own firm, W.R. Synnott & Associates. He remains a Nolan, Norton associate. Synnott is sometimes credited with coining the term "CIO," and he was one himself — at Bank of Boston.

Getting down to business

Early next month, Hewlett-Packard will unveil low-end reduced instruction set computing (RISC) systems, according to analyst John Dean at Salomon Brothers. Analysts have said that HP lost market share in 1990 [illegible] RISC line did not extend down to inexpensive workstations.

Programming Windows

Borland International is expected to stake out a claim as a major player in the Windows development world next month at the Software Development Expo when it rolls out Windows programming extensions atop a new version of Turbo C++.

Good timing

Just as word went out that Informix Software was in a mighty deep financial stew (see story page 7), along came the news that HP will team up with the relational database management system vendor at Uniforum this week to unveil their Opencase strategy for providing commercial-grade Unix computer-aided software engineering tools on HP platforms. Third parties will also be involved.

As the flood of financial reports crested last week, many noted the Gulf situation and its impact on the world economy, some whined about its expected impact on future reports, but only IBM Chairman John Akers had the class to lead off his report offering up prayers for U.S. military forces in the Gulf. As a former Navy jet pilot, Akers may have a better perspective on the bigger picture than other CEOs, some of whom weren't even eligible for the last Selective Service draft. Computerworld *contacts: News Editor Pete Bartolik, (800) 343-6474; fax, (508) 875-8931; Compuserve, 76537,2413; Prodigy, MHTS78A; MCI Mail,* COMPUTERWORLD.



for the Terminal Blues

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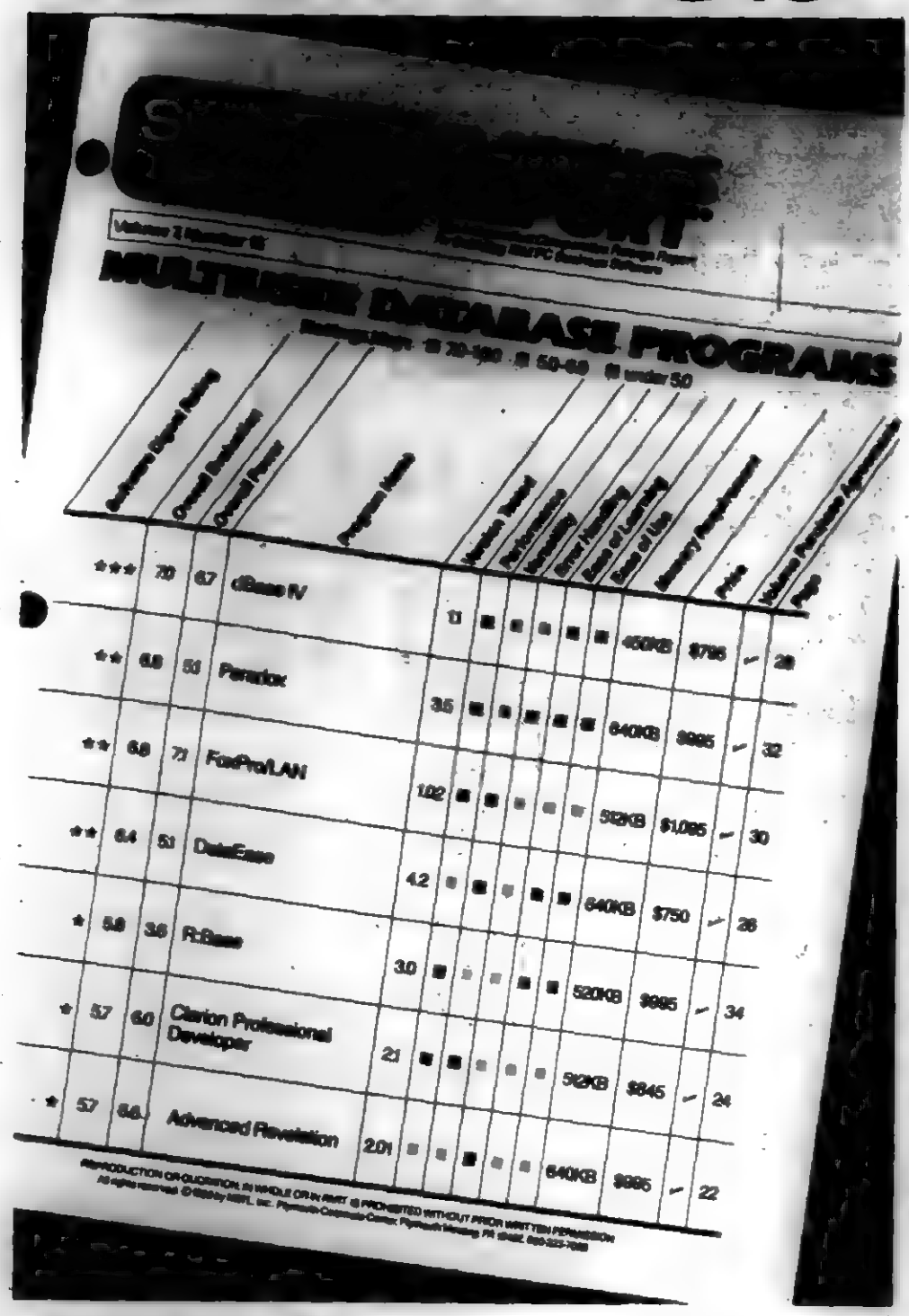
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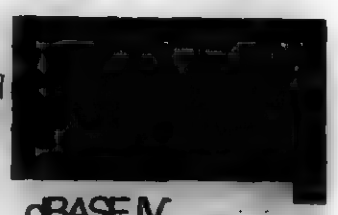
In summation, their 75-page report says: "Among the top ranking programs, dBASE IV (version 1.1) is the most well rounded, with solid performance, versatility, and usability." Commenting on speed, Software Digest points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use/Ease of Learning, dBASE IV scored as many times in the Excellent range as any other database product tested.

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COMPUTERWORLD

SPA to crank up efforts in copy crusade

BY MICHAEL FITZGERALD
CW STAFF

WASHINGTON, D.C. — The Software Publishers Association is expected to announce today the results of the first action in what it calls "a stepped-up campaign against unauthorized corporate copying" of software, which it claims costs software publishers $3 billion per year in lost sales.

An official at the SPA said the association is also planning to conduct another round of search-and-seizure raids, hitting sites in Minneapolis; Seattle; Portland, Ore.; and Norfolk, Va., during the next two weeks.

The SPA will release details of a $75,000 settlement against the Kemper Lesnik Organization, a sports management and marketing group based in Northbrook, Ill., that manages golf's Kemper Open. Besides paying the settlement, which will go into a fund used by the SPA to fight illegal copying, Kemper will

Continued on page 92

Changing times take toll at DEC

Part 1 of a three-part series researched and reported by Computerworld's Maryfran Johnson, Alan J. Ryan and Sally Cusack

Three years ago, Ralph Dunlap took over a key sales operation at Georgia Pacific Co. and ran smack up against "mainframe thinking" from Digital Equipment Corp.

"DEC's solution for us was a Vaxcluster and a computer room, but our whole direction was decentralized computing," said Dunlap, an information-resources project manager at the Atlanta-based conglomerate. "I kept asking, 'Why can't I do this with workstations?' The real answer was, 'We don't make any money that way.'"

Dunlap's tale and the fact that Georgia Pacific saved $100,000 by settling on 108 Vaxstations running VMS cut to the heart of DEC's struggle to conform to new computer industry realities.

With hardware profit margins sinking, DEC's mainstay VAX minicomputers cannot sustain



their past levels of profitability. The company is also weighted down with too many employees, a fact DEC painfully confirmed earlier this month when it announced plans to lay off up to 3,500 employees by midyear.

DEC President Kenneth H. Olsen, who enjoyed several years of double-digit revenue growth fueled by the proprietary line of minicomputers, now acknowledges that the money makers of the future are no longer in hardware. Services, software and "open systems" are the new darlings at the Maynard, Mass.-based firm.

DEC's service revenue grew by 16% last quarter to $1.36 billion, and its software business already accounts for 20% of revenue, company officials said. Unix-based hardware and software brought in $1.3 billion in 1990, they said, and grew by more than 300% between the first two quarters of 1991.

Chris Christiansen, an analyst at Westport, Conn.-based Meta Group, Inc., said it is "absolutely critical" that DEC make this

Continued on page 89

IBM sues lessor over parts sales

Challenge to Comdisco may limit user options

BY ROSEMARY HAMILTON
CW STAFF

IBM Credit Corp. filed a suit against the largest independent lessor of IBM mainframes last week, charging Comdisco, Inc. with illegally selling and re-leasing IBM parts. Observers expressed concern that the move could stifle leasing competition and reduce users' options when they move to upgrade or to buy new equipment.

In a filing with the Court of Chancery in Delaware, IBM's leasing and financing subsidiary charged that Comdisco hatched "elaborate schemes" of stripping, disassembling, selling and re-leasing computer equipment. ICC characterized Comdisco's actions as "taking property that belongs to someone else."

Comdisco denied the charges and said IBM has grossly mischaracterized Comdisco's business practices.

"If IBM Credit Corp. wins, then it could make it difficult for customers who want to get competitive bids for upgrades," said Frank Gens, who is a vice president at Technology Investment

Continued on page 8

HIGH-TECH BATTLEFIELD

Computers map out Gulf war plans

BY MITCH BETTS
CW STAFF



Early every morning, Lt. Gen. Charles A. Horner, U.S. air commander in Saudi Arabia, passes a computer printout the size of a small telephone book. The military calls it the daily Air Tasking Order, but *The Los Angeles Times* calls it "a hit list, a catalogue, a shopper's guide to Iraqi assets marked for destruction in the following 24 hours."

The intricate report is assembled by computer from a mass of incoming data, including digital photographs of enemy targets taken by spy satellites, damage assessments, the speed and armaments of the allies' aircraft and even a count of how many Patriot missiles are left in the stockpile. It is a key Pentagon weapon in what is coming to be known as a high-technology war.

Americans have been mesmerized by video footage showing the pinpoint accuracy of computer-guided weapons in the Gulf war. However, the role of computers in orchestrating up to 2,000 sorties per day involving 24 types of U.S. aircraft with different capabilities and missions — as well as the air forces of the allied nations — has been just as important.

"Computers give you more flexibility to mix

Continued on page 90

ISDN to reach the masses

BY ELISABETH HORWITT
CW STAFF

In a move that could finally make Integrated Services Digital Network technology worth installing for a significant number of users, the majority of regional Bell operating companies are preparing to extend their ISDN services beyond Centrex enclaves and out to the world at large by year's end.

Existing Centrex ISDN services are geared to large customers whose sites are conveniently clustered around one central-office facility. Not only does this exclude small business sites and telecommuting users, but it also leaves out large businesses that want ISDN connections among various sites outside their area, according to Bob Beman, ISDN product manager at US West.

A number of BOCs are preparing ISDN services to address this larger user population. Among the new capabilities being planned by one or more BOCs are the following:

- A site or user with limited networking needs will be able to order a single ISDN line instead of having to order a 20- or even 200-line ISDN Centrex service. Southwestern Bell Corp. is planning such an offering by year's end.
- ISDN connections will extend beyond the local central office to other areas: first within the BOC's region and then out to the interexchange carriers' ISDN services. Bell Atlantic Corp. and US West expect to roll out both

Continued on page 6

The cost of connection
Which LAN SNA gateway offers the best cost per workstation?

Vendor	Score
DCA Irmalan	56
Novell Netware	55
Attachmate Extra!	46
IBM PC 3270 and OS/2 Extended Edition	41

Responses based on 187 users surveyed in *Computerworld's* Buyers' Scorecard (page 62). Each respondent group rated only their own products

CW Chart: Paul Mock

INSIDE

OSF probed by feds, according to an industry report and third-party firms that say the Federal Trade Commission is looking at how the anti-AT&T Unix alliance prices the technology it buys from small firms. Page 93.

Product Spotlight — How to steer clear of dead ends when interconnecting local-area networks. Page 57.

IBM's reaction to Microsoft's plans for a 32-bit Windows is up in the air, according to industry sources who perceive a widening schism between the two. Page 4.

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6 Despite its Nexrad radar program being behind schedule and over budget, the U.S. Weather Service still elicits confidence from the federal government.

8 NCR continues to put up a fight against AT&T, filing antitrust suits and refusing cooperation with requests for its shareholder list.

10 Although it still falls behind Sun, HP and DEC in the workstation market, IBM is happy with its runaway sales of RS/6000s.

12 Thanks to Apple and AT&T Computer Systems, the Macintosh won't have to stand alone on the network much longer.

16 A bill supporting supercomputer development stands an excellent chance of becoming a law this year.

90 Computer technology has come a long way since Vietnam, as former data processing officer Gary Anthes can testify.

91 Operation Desert Storm's successful defense can be largely attributed to its intelligent spy satellites.

92 The forces of war and recession — while taking a toll on Wang's returning wave to profitability — could be its salvation, buying it time to meet deadlines.

Quotable

"I look at DEC as the perfect example of tremendous products and lousy marketing."

KEN KRALLMAN
CARLETON TECHNOLOGIES

On DEC's struggle to conform to the new realities of the computer industry. See story page 1.

SYSTEMS & SOFTWARE

25 Users are taking the slow boat to Escon architecture — which is fine, since its real power won't be available until later this year.

PCs & WORKSTATIONS

35 Intel's 386DX chip is facing oblivion, overshadowed by less expensive chips with equally satisfactory performance.

40 Technology Analysis: NCR's Micro Channel PC offers strong performance, and ALR's Powercache 4 is a solid workstation, but not the best server.

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53 To avoid getting rear-ended by poor financial management, emergency health care departments are beta-testing and custom-designing information systems.

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PRODUCT SPOTLIGHT

57 Guide to choosing LAN interconnection equipment, as well as a listing of electronic-mail gateways.

IN DEPTH

67 You'll find poor management at the root of most lousy technology implementations. By Vicki McConnell and Karl Koch.

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The 5th Wave



"THE TROUBLESHOOTERS FROM THE VENDOR AND THE PHONE COMPANY ARE HERE."

EXECUTIVE BRIEFING

■ **DEC's struggle to make the transition** from hardware seller to systems integrator is causing pain for both the company and its customers. But while DEC President Ken Olsen admits the process is "massive" and slow, users are sticking by the vendor. **Pages 1 and 89.**

■ **When IS projects fail,** it is often because top executives have mismanaged the relationship between the technology and its users. Management has to better define what is expected of technology and how user behaviors will change. It also has to think about the effect technology will have on middle management, which is where change will have the biggest impact. **Page 67.**

■ **Economies of scale** strike Wall Street's fancy as Prudential-Bache and Shearson Lehman confirm they are considering merging their back-office operations. Though the technical problems are large, the firms apparently believe the cost savings outweigh the risks. **Page 92.**

■ **The Open Software Foundation is being investigated** by the Federal Trade Commission for unfair trade practices, sources say. Independent software firms have been grumbling about the OSF's policies for dealing with them. **Page 93.**

■ **The drought of Unix applications** appears to be easing. Last week's Uniforum show featured imaging, multimedia software and computer-aided software engineering tools. **Page 93.**

■ **The Software Publishers Association** is stepping up its crackdown on businesses whose employees pirate software. Sites in Minneapolis, Seattle, Portland, Ore., and Norfolk, Va., will be raided over the next two weeks. **Page 1.**

■ **A rift between IBM and Microsoft** over personal computer user interfaces is widening. Sources say Microsoft is committed to enhancing Windows to be more OS/2-like, which goes against IBM's plans to promote an operating system upgrade. **Page 4.**

■ **Mainframe users are in** no rush to install IBM's Escon channel architecture. That's probably good because the biggest benefits of Escon will not be available until late this year. **Page 25.**

■ **The middle-of-the-road 386DX chip** is the odd man out of the PC race. Buyers seem to be opting for the lower end SX and more powerful i486 chips for their desktop needs. **Page 35.**

■ **Northern Telecom regroups** after failing several times to make a go of the end-user data networking market. The firm's new focus is on central-office equipment and a single customer premises product. **Page 47.**

■ **Data General surprises** Wall Street with a $12 million quarterly profit, but Wang slips back into the red, which prompts more rumors of layoffs. **Page 92.**

■ **Some physicians are** discovering that voice recognition is the cure for emergency room paperwork. Technology improvements have cut down on errors and have freed doctors' hands for more important business. **Page 20.**

■ **How do you find a job** after a year-long hunt? One IS professional who's been there says the key is to specialize and find your skills niche. **Page 74.**

■ **On-site this week:** World Vision catches open systems fever, ditching a proprietary setup, switching to Unix and giving corporate sponsors a window on its own database. **Page 27.** A sports apparel maker hopes that equipping its sales force with laptop computers will reduce the volume in those marked-down bins of extra large sweatshirts in the campus store. **Page 35.** The University of California at Santa Cruz, eyes the benefits of IBM's and DEC's Project Athena scalable software but puts it on less-expensive Sun workstations. **Page 37.**

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OS/2 partners hit roadblock

BY PATRICIA KEEFE
CW STAFF

Microsoft Corp.'s relentless Windows drive has forced IBM between a rock and hard place, according to knowledgeable sources who said the two hit an impasse last week. "They are diametrically opposed," one source said.

Why? Because IBM has millions of dollars and a lot of end-user faith invested in the survival of OS/2's Presentation Manager interface. It functions as a unifying thread in Officevision and AIX, and Open Software Foundation/Motif look and feel was modeled after Presentation Manager.

However, sources briefed by Microsoft recently are equally convinced Microsoft will not accommodate the Presentation Manager graphical user interface at the expense of Windows.

During the last two months, sources explained, Microsoft has dropped the artificialness of two separate products targeting separate needs. It has forged ahead with plans to extend the functionality of Windows into the 32-bit arena, incorporating key OS/2 features. There are even plans to move beyond into an applications server operating system. In fact, Microsoft reportedly expects that when pitted against Unix, this server operating system will garner 15% to 20% of the market.

Specifically, OS/2's functions will be absorbed into a 32-bit Windows, which may or may not support 16-bit OS/2 calls. Portable OS/2, which will be renamed, is expected to feature a lot of minicomputer-style services. A separate module that may or may not be bundled will allow OS/2 Extended Edition applications to run on it, sources said.

"Microsoft is honestly trying to provide a coherent message to reposition Windows over time, and OS/2, for what they feel will address the majority of the market's needs," said David Cearley, an analyst at Gartner Group, Inc.

Yet if Microsoft continues to push an enhanced Windows at large accounts and independent developers, then "it's an absolute fantasy" for IBM to think it can push OS/2 on the client, Cearley said.

Avoiding commitment

Microsoft has also backed away from promises of binary compatibility between OS/2 and Windows. For now, users and developers must make do with the Windows Libraries for OS/2, which provides tools for linking Windows applications to OS/2.

IBM, meanwhile, is forging ahead with plans to release a 32-bit OS/2 in December.

Microsoft will publicly outline its position at a briefing tomorrow in Bellevue, Wash., most likely couching it in terms of a response to market demands, sources said. Afterward, industry observers and users alike will await IBM's response. As of late last week, no response had been formulated, sources close to IBM said.

In an effort to win IBM's support, Microsoft met with IBM's OS/2 executives last week. "IBM and Microsoft [went] at it hammer and tongs," a briefed source said. "I don't think [Microsoft] fully understands the depths of IBM's feelings of animosity and betrayal toward them," another source said.

Despite having two opposing agendas — Microsoft's personal computer-centric views vs. IBM's need to support host attachments — the two will likely try to avoid an all-out clash, predicted Frank Dzubeck, a consultant at Communications Network Architectures.

CICS pact announced

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — Boole & Babbage, Inc. said last week that IBM had asked the $94 million Silicon Valley company to develop performance management products for IBM's CICS teleprocessing products.

IBM confirmed the technology agreement but declined to give details. Boole & Babbage said it has agreed to work with IBM's CICS development laboratory in Hursley, England.

Jack van Kinsbergen, Boole & Babbage's chief technical officer, said the future products would help information systems managers at IBM mainframe centers gain control over ever-widening distributed data networks. The CICS subsystem, which directs network requests to mainframe applications, currently lacks utilities that would automatically balance the work flow, van Kinsbergen said.

Cooperative processing applications that link hundreds of OS/2 machines with active CICS "regions" also need to be closely monitored to prevent system slowdowns.

The new Boole & Babbage products, which will appear over a multiyear period, are intended to aid systems operators in preventing system bottlenecks.

"As users build CICS applications that span multiple [hardware] platforms, the people in the data center need to be able to manage that environment," van Kinsbergen said.

Go releases pen-based operating system

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — On the eve of the birthday anniversary of the man with the most famous signature in the U.S. — John Hancock — Go Corp. announced Penpoint, its handwriting-based operating system for notebook computers.



However, a demonstration showed that "John Hancock" could easily be mistaken for "John Hedgehog."

Three hardware companies, Grid Systems Corp. in Fremont, Calif., IBM and NCR Corp., have promised notebook systems using Go's operating system. Grid said prototypes of the computer would be available late this year. IBM and NCR had no definite dates for availability.

Norman Vincent, vice president of data processing at State Farm Mutual Automobile Insurance Co. in Bloomington, Ill., is working with IBM to develop a pen-based system to estimate automotive repairs. He said the potential market for these computers at State Farm alone is 30,000 agents and adjusters.

While users and analysts said they see a huge market looming for the computers, pen-based software will be dogged by its inability to recognize handwriting. "The handwriting translation is not perfect," conceded Robert Carr, vice president of software at Go, after the software mistook his careful printing of "simple" for "gimple" at a demonstration.

Go's operating system will soon be competing with Pen Windows, a pen-based extension to the next version of Microsoft Corp.'s Windows.

Despite impending competition, IBM's licensing of Penpoint will "give Go a tremendous boost," said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif. He added that IBM will not necessarily be burning business partner Microsoft by backing Go. "There will be a choice of operating systems."

Pac Bell integrates Windows into Starlink user interface

BY MAURA J. HARRINGTON
CW STAFF

SAN RAMON, Calif. — After denouncing Microsoft Corp.'s graphical user interface last year, the information systems department at Pacific Bell has begun integrating Microsoft's Windows 3.0 into its 3-year-old, homegrown Starlink user interface.

Michael Evans, technical director of the user interface development group of the customer service automation project, said the department changed its mind and decided to adopt the software giant's upgraded version of Windows despite onetime criticisms that Windows, then in Version 2.0, was too slow.

Starlink is a generic windows-based user interface management system built to support Pacific Bell's disparate protocols and its simultaneous IBM 3270 and Digital Equipment Corp. VT100 terminal emulations.

"[Windows] 3.0 was a major breakthrough as far as we are concerned. It made a quantum leap in terms of its performance and . . . it became incredibly cost-effective to spread throughout the company," Evans said.

Events that spawned the decision included the expansion of Pacific Bell's Starlink user base, making Starlink the company-wide user interface standard rather than reserving it exclusively for the customer service representatives, according to Evans.

Jeff Ironfield, an associate systems analyst and project leader for the Windows conversion project at Pacific Bell, said cost-effectiveness was one of the key reasons to include Windows 3.0 in the decision.

"I think the commercial software industry is actually catching up [to corporate in-house IS shops]. So we're beginning to look at how we can integrate some of these applications into our system where they are needed," Ironfield said, adding, "After all, we're in the phone business first, not the software business."

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ISDN

FROM PAGE 1

types of ISDN interconnect services by year's end.

• Primary Rate Interface ISDN services that support 23 64K bit/sec. B channels plus a separate 16K bit/sec. D channel. Currently, most BOC services support the Basic Rate Interface of two B channels plus a D channel. Pacific Bell already offers Primary Rate Interface services; Bellsouth Corp. plans to tariff a Primary Rate Interface service in the third quarter.

Behind these developments is a recent agreement among various industry players to use a limited subset of ISDN specifications rather than waiting for the leading switch vendors to implement the full standard. While the original deadline for full standard support was this month, the switch vendors acknowledged last spring that 1993 was a more likely time frame.

Late last year, AT&T, Siemens AG and Northern Telecom, Inc. committed to implementing an ISDN subset, called Year 0, on their switches by first-quarter 1992. This will allow BOCs to set up ISDN links between their central offices even if different offices uses different brands of switch.

Extra! Extra!

This is good news for several business users whose long-term telecommunications strategies are built on ISDN's ability to deliver flexible amounts of voice, data and video bandwidth from one user desktop to another — even if those desktops happen to be in remote locations.

For example, Schindler Elevator Corp. is already setting up overseas ISDN links and plans to roll out ISDN Basic Rate Interface connections to its U.S. sites as soon as the BOCs make them available, according to Edward Hodgson, manager of computing and communications. Among the applications Schindler hopes to implement are "screen sharing for programmers working at home" and automatic call-up of customer data on service representatives' terminals.

Hardee's Food Systems, Inc. wants to use local Basic Rate Interface services to connect restaurants in 42 states to its seven regional data centers for polling purposes, said Martin Jackson, director of telecommunications at the Rocky Mount, N.C.-based firm. After a 14-month trial of this application, Hardee's "thinks it will be a winner," Jackson added. However, Hardee's rollout plans await a broader ISDN rollout from the BOCs.

ISDN services will never take off until the technology is available wherever users want it, industry sources said. At the end of last year, only 110,000 ISDN Basic Rate Interface lines were in service across the U.S., according to Dataquest, Inc. (see chart below).

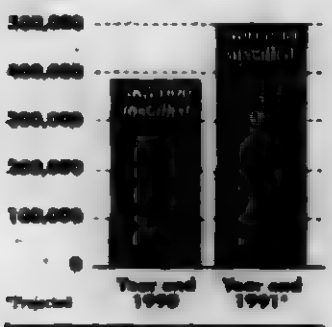
It is true that Year 0 only supports ISDN services on a limited basis, analogous to "a dune buggy without fenders or doors," said Ted Shelton, Bellsouth's ISDN operations manager. However, that stripped-down buggy will be able to carry such key applications as voice-data integration, video and desk conferencing, links between personal computers, PC-to-host links and local-area network interconnectivity, he added. IBM threw some more of its weight behind ISDN last week with the announcement of several products.

More significant, however, was the announcement that users will be able to use local ISDN services to access IBM's Information Network value-added network service, according to Thomas Nolle, president of Voorhees, N.J.-based research firm CIMI Corp.

The ISDN connection will provide most users with access to the Information Network at 19.2K bit/sec. rates — twice the present speed supported, IBM said. Personal System/2s equipped with the new ISDN interface card can attain the full 64K bit/sec. speed of an ISDN B channel, according to IBM spokesman David Hart.

Crucial year

Although many installed lines are still not being used, the use of Integrated Services Digital Network could almost double in the U.S. this year



Source: Dataquest, Inc.
CW Chart: Darren St. John

Weather agency shakes up tardy radar project

BY JIM NASH
CW STAFF

The U.S. government continues to express confidence in its weather prediction capabilities, despite financial, technical and personnel setbacks for its new radar program.

However, controversy continues to roil over the U.S. Weather Service's next-generation computerized radar program (CW, July 16, 1990), commonly referred to as Nexrad. Sam Williamson, administrative leader for much of the program, said a major reorganization of the program is being considered.



Williamson was scheduled to complete a two-week leave from Nexrad last week and is awaiting reassignment to another project. Government reports last summer indicated that Nexrad is at least six months behind schedule and $80 million over budget. Williamson answered criticisms of his three-year tenure by saying, "I cannot be an incompetent manager and still get outstanding ratings every year."

Nexrad, which encompasses the installation of new radar systems at 175 weather stations, is currently expected to cost almost $450 million rather than the planned $359 million. The project is supposed to offer meteorologists a look at violent and distant storms, far exceeding conventional radar systems.

Gray Castle, deputy undersecretary at the U.S. Department of Commerce, verified that program changes are being discussed. Williamson said Nexrad might be run from the Department of Commerce, which is funding the project with the U.S. Air Force and the Federal Aviation Administration.

At the same time, Nexrad officials are busy putting out other grass fires. Since last year, the project's prime contractor, Unisys Corp., has been trying to overturn the government's decision to invoke a contract clause requiring Unisys to proceed with full-scale production. Unisys has claimed that the project does not have multiyear funding authorization from Congress.

A spokesman for Unisys acknowledged that the company is requesting more money to pay for corrections and enhancements required to get Nexrad past earlier flaws.

Separately, Weather Service employees contacted by the press claimed that a work-force reduction policy of attrition has left the agency short by hundreds of employees.

Frame relay turbocharges public data network services

BY ELLIS BOOKER
CW STAFF

Public data networks will get considerably faster this year as value-added network providers begin to deploy frame-relay services.

Both Compuserve, Inc. and U.S. Sprint Communications Co. announced their intention to use frame relay — a turbocharged packet protocol — on their public data networks. The services will become commercially available by the end of the year and by the end of the third quarter, respectively. Meanwhile, BT Tymnet, Inc. will announce its frame-relay service this week at the Communications Networks '91 show in Washington, D.C., a spokesman confirmed last week. Tymnet's commercial service will be ready in the second quarter, he said.

Frame relay is much faster than the ubiquitous X.25 packet protocol because it does away with error checking and correction at each node in a network. More significant for users, however, is the fact that the frame relay permits a much more seamless interconnection of local-area networks across wide-area networks.

Up until now, public networks have been too sluggish to support LAN-to-LAN connections, according to Richard J. Malone, principal at Vertical Systems Group in Dedham, Mass., who said users have had few options to building private networks.

"Today, to transmit one [data] packet coast-to-coast through an X.25 network — assuming four to six hops — takes about one second," Malone said. By comparison, a frame-relay network could send the same data in 6 msec, he said.

Another driving force behind frame relay, Malone and others said, has been the increasing interest in document imaging.

"We think our business will shift to being a LAN/WAN networking company," said Andrew S. May, director of marketing at Compuserve's Network Services data network unit.

Sprint's Data Group, which sells its packet network services, said last week that its frame relay service would achieve commercial status by the end of the third quarter. A company spokeswoman said the Sprint X.25 packet switches will be modified through software to support the protocol, which will be deployed ubiquitously through the Sprint network.

More releases

Sprint also released a frame-relay service specification to makers of customer premises equipment last week and said it would have a certification testing program for the vendors.

The announced frame-relay services all require customers to use dedicated data lines to the WANs nearest frame-relay node. Switched virtual circuit access into a frame-relay network is technically feasible but has not yet been addressed by the standard and is two or three years away, industry observers said.

DEC unveils VAX 4000

BY MARILYN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. accelerated its drive toward small-business customers last week with the introduction of the VAX 4000 Model 200, a low-end deskside system that replaces the Microvax 3400 — doubling its performance for the same price.

"The 'gotcha' on this box is that it is not upgradable" to the more-powerful VAX 4000 Model 300, said Terry Shannon, an analyst at International Data Corp. in Framingham, Mass. Microvax customers, however, will be able to upgrade their 3000-class machines to the Model 200 at $15,000 for a server configuration or $21,000 for a time-sharing model.

DEC also rolled out lower-priced storage technology for the VAX 6000 midrange line and promised to deliver a high-performance Fiber Distributed Data Interface (FDDI) adapter for the VAX 6000s this spring. The ability to directly connect high-speed FDDI to the XMI bus on the VAX 6000 would boost the midrange machine's abilities in transaction processing and imaging applications.

The new storage products, delayed for several months because of technical problems, are based on Digital Storage System Interconnect (DSSI) technology. Moving DSSI onto the midrange gives users who need to cluster VAXs together a 40% savings over Computer Interconnect devices.

DEC acknowledged that the VAX 4000s will take a bite out of midrange sales, except in cases where customers need VAX 6000 capabilities.

"If I was going out and buying a machine for most server applications, I wouldn't look at the 6000s," said Kevin Obermann, a network manager at Lawrence Livermore Laboratories in Livermore, Calif., which is installing two VAX 4000 Model 300s to replace 8800 series hardware.

DEC said a fully configured VAX 4000 Model 200 will cost between $21,000 and $33,000.



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NEWS SHORTS

Understanding Officevision

The twice-delayed Officevision Release 2.0 is being held up because of its complexity and lack of diagnostic tools, IBM executives said at a briefing last week. "The LAN adds levels of complexity," said Tony Mondello, vice president of office systems development. Another factor was trying to integrate Officevision's approximately 13 modules. "As we brought all the applications together and integrated them, we underestimated how the system would react. That's the truth. That's why we missed the date," Mondello said. He refused to say when the software will be ready. "We've learned our lesson; we're just not going to predict anymore."

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AD/Cycle tool also delayed

IBM confirmed last week that it has delayed shipment of Developmate, one of the few IBM-made products for its AD/Cycle strategy, until March. Delivery of this prototyping tool, which was supposed to have shipped by year's end 1990, was put off because customer feedback was not satisfactory, a spokesman said.

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Oracle wallets look thin

Oracle Corp. is giving discounts to customers who place large orders and then pay in cash a few days later. The move, disclosed by Oracle's top executives at a briefing last Friday, is part of a rush to build up Oracle's dwindling cash reserves. Geoff Squire, president of Oracle's world sales division, told analysts that Oracle's cash on hand has been as low as $15 million, down from $50 million in late November. At the same time, Oracle executives outlined a stark cash position: They have just $5 million left to spend in their $170 million line of credit, financed by a world banking syndicate, and they face an independent audit of their accounts receivable.

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Andersen, Microsoft team up

Andersen Consulting and Microsoft Corp. said last week they would join forces in providing systems integration services for customers developing client/server applications. Andersen will become a reseller of Microsoft products as part of its systems integration engagements. In addition, Microsoft's Information Technology Integration Services Group will work with Andersen on some joint projects.

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Sun up, but cautious on outlook

Noting that "obvious external factors" — that is, the Gulf war and the economy — could affect near-term demand for Sun Microsystems, Inc.'s products, the company released a profitable second-quarter report last week. Sun reported revenue of $753.5 million this quarter, up from $595.4 million for the comparable quarter last year. Net income grew by $18.9 million from last year's second quarter, to $39.1 million.

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New York Life promotion

New York Life Insurance Co. last week named Julia A. Romano as a vice president in the information systems and services department headed by Senior Vice President Thomas Pettibone. Romano, a 25-year veteran at the company, has worked in IS since 1966 and became a corporate vice president in 1990. She replaced Robert Hollinger, who resigned late last year.

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SEA sues Mobius

Software Engineering of America (SEA) last week filed suit against Mobius Management Systems, Inc., charging Mobius with making "materially false and disparaging remarks about SEA products." SEA and Mobius compete in the report management market. The suit, which was filed Friday in Manhattan Federal Court seeks undisclosed damages. A Mobius spokeswoman said she was not aware of the suit.

More news shorts on page 92

NCR files antitrust suit, loses its shareholder list

BY MICHAEL FITZGERALD
CW STAFF

DAYTON, Ohio — An antitrust suit filed against AT&T by NCR Corp. last week was seen by analysts as little more than a delaying tactic in its struggle to remain independent from the giant telecommunications firm.

Meanwhile, in a separate case, a federal judge ruled that AT&T is entitled to NCR's shareholder list. NCR had been refusing to give the list to AT&T.

NCR's suit claimed that the combined companies' share of the commercial Unix application-specific integrated circuit and certain sectors of the telecommunications and on-line transaction processing markets would constitute a monopoly. According to NCR's suit, the two companies combined have a 40% market share for commercial Unix systems that cost less than $100,000 — their best combined market.

More than enough

The suit was filed the day after AT&T presented NCR with written requests for a special meeting of NCR's board from 51% of the computer maker's shareholders. AT&T needed only a 25% vote to mandate a special meeting.

AT&T, which has cleared antitrust reviews under the U.S. Hart-Scott-Rodino Act, the Canadian Competition Act and the European Community's Merger Regulations, issued a statement saying it believed the antitrust allegations were without merit.

One legal scholar concurred. "NCR has one enormous problem that has nothing to do with these markets: It will be the beneficiary of these monopolistic practices if they occur," said Herbert Hovenkamp, professor of law at the University of Iowa and an antitrust law specialist. Hovenkamp said most federal courts rule that the beneficiary of an alleged monopoly cannot sue an aggressor, but he added that the 6th Circuit U.S. Court of Appeals, which has jurisdiction in Ohio, has allowed such suits to stand trial in the past.

Meanwhile, NCR has yet to respond to the requests for a special meeting and is under no obligation to do so, according to analysts, except that it must call one within a "reasonable" period of time. NCR also issued a strong denial of published reports that its resolve in the struggle might be slipping.

Merger scorecard

During the past two weeks . . .

- AT&T said more than 70% of NCR's shares have been tendered, and it will extend its tender offer until Feb. 15.
- AT&T has also asked to convene a special meeting of NCR's board for the purpose of removing the board members. AT&T said it has more than twice the required 25% of NCR shareholder requests it needs to convene the meeting.
- At the special meeting, AT&T could only remove a majority of NCR's board if 80% of the stock is voted against the board. However, four of NCR's 13 board members are up for re-election at NCR's annual meeting on April 17. A 51% vote would be needed to oust them.
- NCR filed a complaint charging that AT&T's credit card business makes it a bank holding company and prohibits it from buying a nonbank holding company.
- NCR filed an antitrust suit against AT&T charging that the combined companies would dominate certain markets.
- A New York court told NCR to give AT&T its stockholder list.

IBM

FROM PAGE 1

Strategies Corp.

"This is clearly another step in ICC's attempt to gain account control," said Shao Wang, an analyst at Smith Barney, Harris Upham & Co. Even if IBM's allegations are correct, said Patrick Burton, an analyst at Piper Jaffray & Hopwood in Minneapolis, "there could be some antitrust actions" if IBM can prevent third parties from subleasing IBM machines.

An IBM spokeswoman said IBM is determined to stop Comdisco from "illegal" activity that has gone so far as to result in bidding wars between the two, in which IBM is bidding against its own "misappropriated" parts.

IBM maintained that a customer must return a leased asset in the exact condition in which it was originally leased. This means if a customer were to make any changes during a leasing period that resulted in a different, although equivalent, system configuration, it would be in violation of the lease.

Jim Matsey, corporate director of information systems at Reynolds Metals Co., said he stopped leasing equipment because of these restrictions. "We buy because there were too many restrictions placed on the hardware," he said.

Kenneth A. Bouldin, president of the Computer Dealers & Lessors Association (CDLA), issued a statement saying that IBM began enforcing replacement part provisions one year ago, and CDLA views its actions as "an unreasonable restriction that not only affects CDLA members . . . but more importantly, penalizes lessees of ICC-owned machines."

Between-lease changes

Changes that could occur during a lease period include upgrades, replacement parts from a third-party source and subleasing activity. Often, existing parts are taken out and re-leased, either by the customer or by a third party, Gens said.

However, once the lease expires, a customer must return equipment with the exact IBM parts that were originally shipped with the machine. This could become an almost impossible task if equipment went out to the leasing market and moved about through several customers during the time period of the original customer's lease.

The IBM spokeswoman said IBM does not accept equivalent configurations when assets are returned because it could put IBM at risk. "It's not acceptable, because when IBM gets the asset back, we have no idea where those parts have been nor do we know if we have clear title to them," the spokeswoman said.

She said IBM first suspected Comdisco of "illegal" activity in 1989 because of "anecdotal evidence." IBM saw an increase in activity last year when it liberalized its leasing terms and conditions.

At that time, IBM announced that ICC customers could sublease parts of a system in addition to a complete system. Previously, customers were only allowed to sublease an entire system. They were also allowed to modify a system by adding third-party products such as memory upgrades.

However, in all cases, a customer must receive IBM approval for its activity and must ensure original parts are with the system when it is returned to ICC.

Senior Editor Nell Margolis and Midwest Bureau Chief Ellis Booker contributed to this report.

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RS/6000 shipments soar

BY MARTFRAN JOHNSON
CW STAFF

DALLAS — IBM boasted last week about the runaway success of its RISC System/6000 workstation line, which company officials said moved 25,000 machines during the past six months and raked in $1 billion in 1990 revenue.

In their most optimistic scenario, industry analysts had predicted that IBM would ship only 15,000 of the Unix-based Powerstations and Powerservers. Even with its unexpected success, however, IBM is still in fourth place in workstation market share.

The No. 1 workstation vendor is still Sun Microsystems, Inc., with a 38% market share and 141,800 machines shipped last year, according to figures from Framingham, Mass.-based market research firm International Data Corp. (IDC).

Hewlett-Packard Co. took second place with a 20% share of the market and 75,550 systems shipped, while Digital Equipment Corp. is third in line with 17% of the market and 62,500 workstations shipped in 1990.

"It's clear they have momentum, and I think [IBM] will ship 50,000 workstations and servers in 1991, plus another 10,000 to 20,000 multiuser systems," IDC analyst Vicki Brown said.

"Open systems is the future, and IBM's future is in open systems," said C. Michael Armstrong, president and chairman of IBM World Trade, during an address at the Uniforum show last week.

Counting loaner and demonstration machines, Armstrong said IBM actually shipped 40,000 of its new Unix boxes last year. He said the company will address users' demands with delivery this year of greater performance for high-end systems, new entry-level desktop models and improved graphics capabilities.

Building more integrated software packages with a "common look-and-feel" interface is a primary goal of the workstation division, company officials said.

The success of the RS/6000 came as no great surprise to Equitable Real Estate Investment Management, Inc. in Atlanta, which is migrating from Wang Laboratories, Inc. minicomputers to distributed RS/6000s in more than a dozen regional offices nationwide.

"From a business standpoint, the price/performance is getting us a lot more power per dollar from the RS/6000 than from our 3090 mainframe," said Equitable Senior Vice President Robert E. Mat[illegible].

The RS/6000 also scored a hit in corporate America last week with the announcement that it will join Unix-based workstations from DEC in a worldwide General Motors Corp. information systems project.

"Our overall aim is to connect GM around the world — 100%," said Ruth Stanton, a GM spokeswoman in Detroit. "Each Unix server will be attached to 40 desktops in an office and another 10 desks in an engineering area."

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IBM workstation to manage nets

BY JOANIE M. WEXLER
CW STAFF

Souped-up wide-area networking technologies will cause IBM to tap the power of its RISC System/6000 workstation to run a mainstream network management product for the first time, the company said in a statement of direction last week.

The network management system for the vendor's forthcoming T3 multiplexers is slated to run on the RS/6000, which uses IBM's version of the Unix operating system, AIX.

T3 multiplexers concentrate multiple data or voice signals onto a single wide-area 45M bit/sec. circuit — a performance leap over widespread existing T1 networks that run at 1.5M bit/sec. T3 and other high-speed technologies are quickly cropping up because of the growing need to interconnect high-speed local-area networks over wide areas with a modicum of performance degradation.

IBM, which has resold Network Equipment Technologies, Inc.'s (NET) IDNX line of T1 multiplexers since 1987, said it plans to start reselling NET's IDNX/90 T3 multiplexer in June under its own label. However, the company would not pinpoint a time frame for the accompanying network management system.

"Officially, within IBM, a statement of direction means 'within two years,'" IBM spokesman Dennis Drogseth explained. "But this will not be one of those cases where we barely make the deadline. We can't have products available with no management for very long."

Drogseth pointed out that most network management products run on IBM Personal System/2s, which use IBM's OS/2 multitasking operating system, but added that T3 technology "requires the power of the AIX platform."

In a pinch, NET's Series 5000 network management system could be swapped in to manage the T3 gear, according to Karyn Mashima, vice president of corporate marketing at NET. She added, however, that "IBM isn't likely to ship a product with no management."

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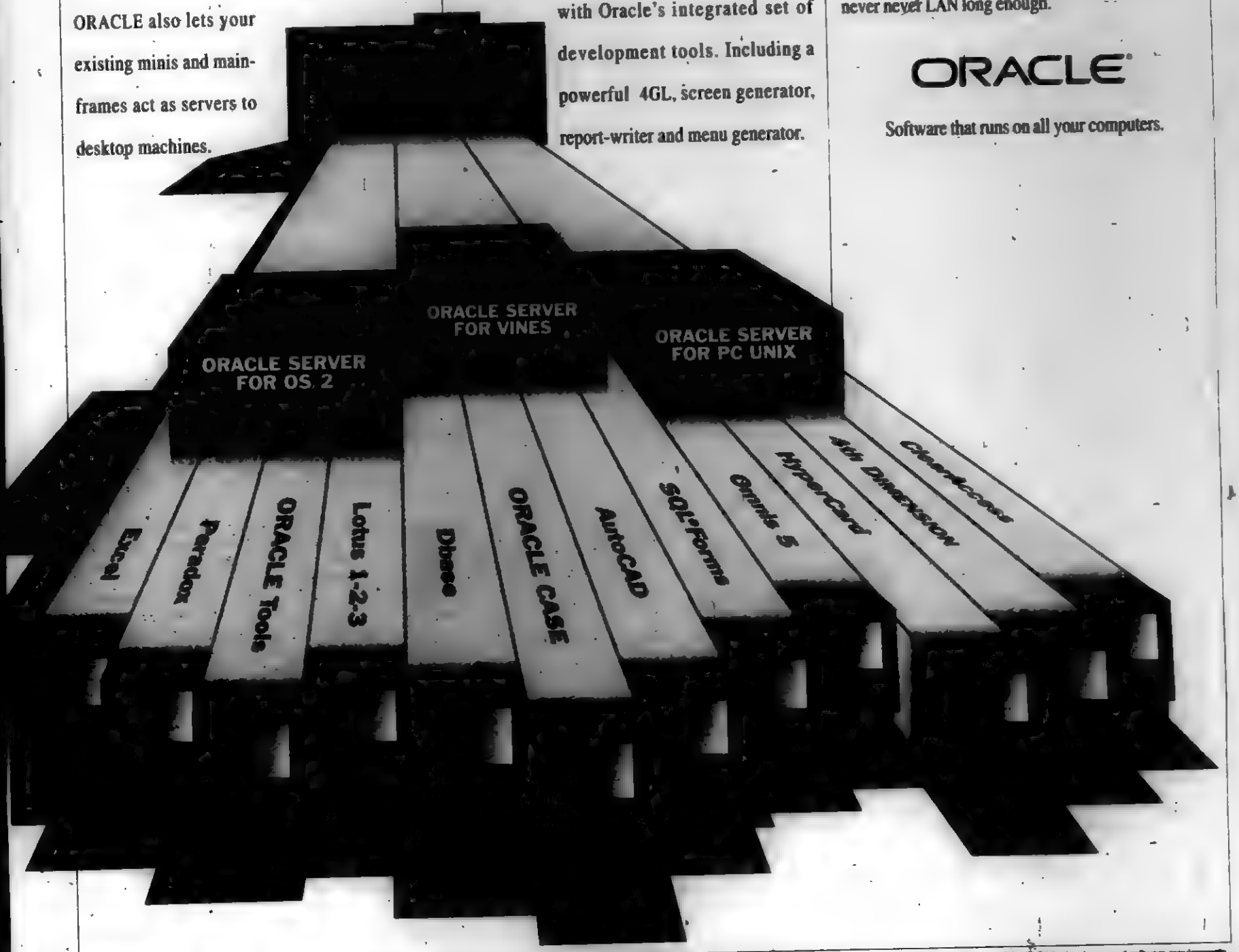
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Macintosh joins Unix System V-based networks

BY JOANIE M. WICKLER
CW STAFF

DALLAS — Long the wallflower of the corporate network, Apple Computer, Inc.'s Macintosh will likely get chummier with its MS-DOS and OS/2 peers because of a move from AT&T Computer Systems and Apple at last week's Uniforum trade show.

The two vendors have opened up an application programming interface (API) to third-party developers that will ultimately allow organizations with islands of stand-alone or networked Macintoshes to integrate Macintosh, DOS and OS/2 clients on one network running a Unix System V, Release 4 server.

An API defines how an application — such as a spreadsheet or word processing package — talks to communications software. The use of standardized APIs allows applications to be developed independently of the underlying method of communication.

AT&T has already implemented the API for Appletalk — Apple's proprietary networking architecture — in its Stargroup Server for Macintosh Clients, which is part of the company's Stargroup LAN Manager Server network operating system.

AT&T will now allow developers of other servers running Unix System V, Release 4 to use the API in designing applications that can be accessed by Macintosh, DOS and OS/2 clients on one network using the interface and commands native to the client operating system.

Even without AT&T

One user running AT&T's Stargroup Server for Macintosh Clients said the move should "bring all the things I like about my Mac serving to anyone who doesn't happen to have AT&T hardware."

Bernard Hecker, director of academic computing at Trinity College in Hartford, Conn., commented that "if you're doing all your serving in one server, you only need one set of disks, printers, backups and eventually electronic mail. That's a leap in efficiency and integration."

The first release of Unix System V, Release 4 Appletalk APIs will be on NCR Corp.'s System 3000, according to AT&T.

New horizons for Unix group

BY SALLY CUSACK
and JOHANNA AMBROSIO
CW STAFF

DALLAS — Unix International, an AT&T-backed association of Unix System V users, vendors and developers, announced a program last week that will establish an umbrella architecture for developing open system software environments that will operate in conjunction with Unix System V, Release 4.

Dubbed the Open System Architecture, the program extends Unix International's interests beyond the core Unix operating system. It defines three major areas of computing:

- Distributed computing, for addressing end-user needs for transparent networking, data transfer functions and software interoperability within a heterogeneous environment.
- Corporate hub computing, which will target mission-critical applications.
- Desktop computing, which focuses on connecting desktop users to any service resident on the network.

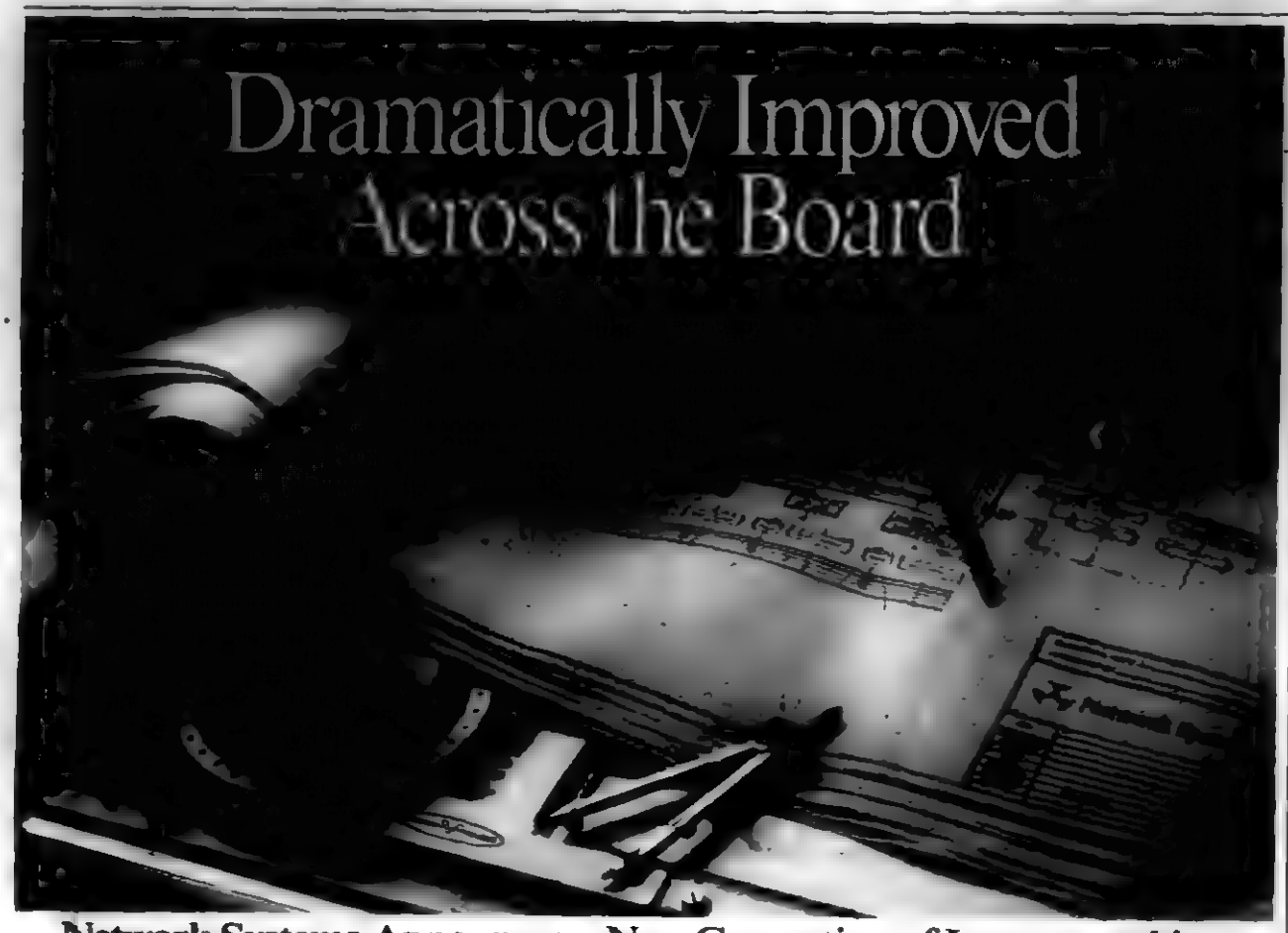
Keeping up with X/Open

The Open System Architecture will maintain compatibility with X/Open Corsortium Ltd.'s Common Application Environment and will reportedly allow any software developer to produce industry-standard products compliant with X/Open's Portability Guide.

Unix International's decision to broaden its technology base "is a sign that Unix International and the Open Software Foundation are as competitive as ever and that any possible merger between the two probably won't occur," said Wayne Kernochan, a senior analyst at Boston-based The Yankee Group. The comment was made in reference to persistent rumors that the rival Unix groups would eventually join forces.

David Sandel, vice president of marketing at Unix International, noted, "I'm not worried about what the critics say about our motives. We have a proven track record with [Unix] System V, [Release] 4, and our distributed computing strategy will be compatible with [IBM Systems Application Architecture], Decnet and OSF's DCE. And the graphical user interface will not necessarily be Open Look."

"There's a mistaken perception that we're in that camp," Sandel added, "but we don't have an issue with Motif. Many of our members have implemented it. The industry needs a virtual [application programming interface] to develop both Open Look and Motif applications without having to write new code. We're looking for a longer range solution."



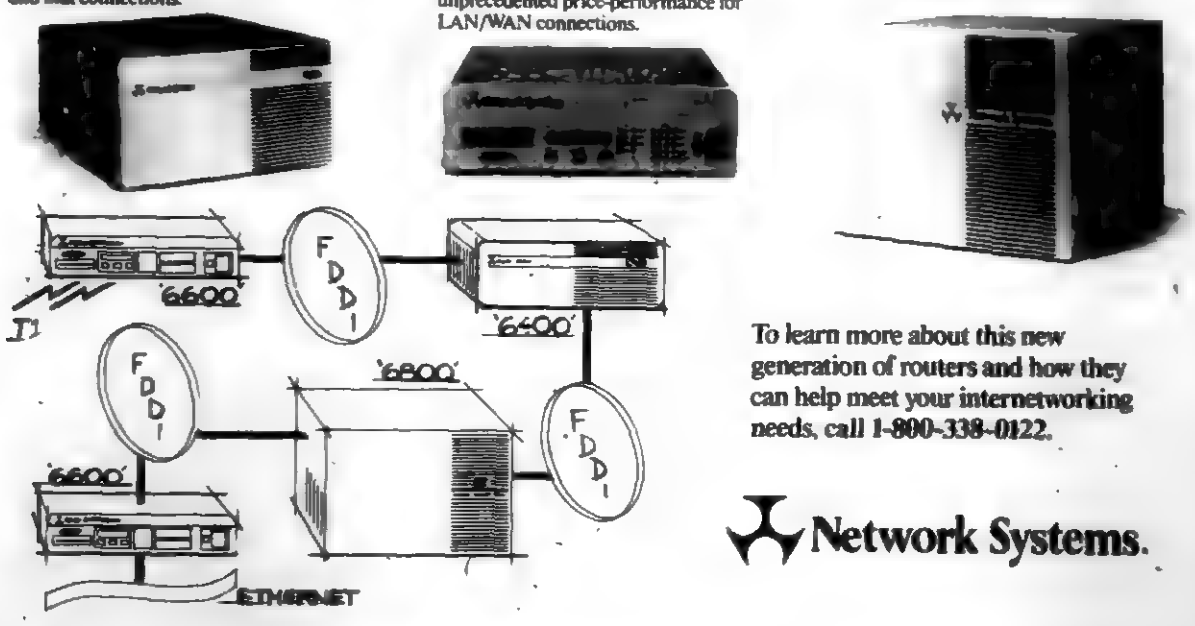
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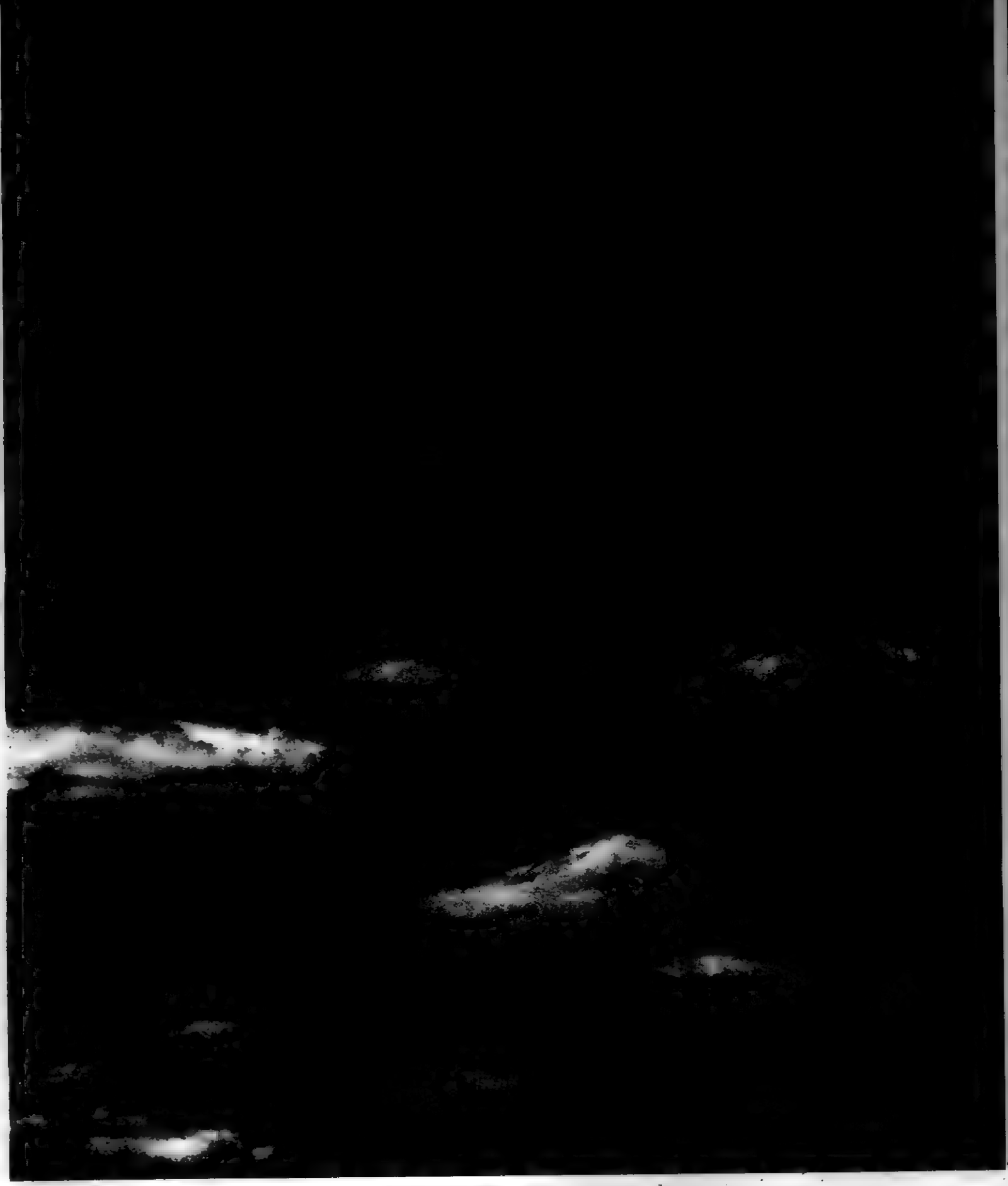
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HEWLETT PACKARD

Path smoothed for Mac clones

Nutek claims chip engineering method is legally sound

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — A small Silicon Valley start-up will test the mettle today of Apple Computer, Inc.'s tenacious refusal to permit Macintosh clones.

Nutek Computers, Inc. plans to unveil what has been called a cleverly engineered hardware and software strategy, one that it claims will allow manufacturers to legally produce personal computers that are functionally indistinguishable from the Macintosh.

Nutek President Benjamin Chou said that by the end of the year he will begin shipping the chip set, operating system and screen display needed to manufacture functionally equivalent Macintosh clones. If successful, analysts said, the move against the proprietary Apple architecture could dramatically widen the Macintosh side of the PC market in much the same way that cloning IBM Personal Computers has created a multibillion dollar international industry.

"Nutek will do for Mac users what the first IBM-compatible developers did in the early 1980s: open up the market to increased innovation and competition by enabling major independent third-party manufacture," Chou said from an office located only a few miles from Apple's corporate headquarters.

Apple officials said they have neither seen nor evaluated the Nutek product and refused to comment.

Chou said his firm will slip through Apple's legal noose because of its "clean-room" development methodology, a two-year effort through which Nutek engineers built a read-only memory (ROM) chip from only publicly available sources and without references to the Macintosh's internal code. The ROM chip contains a copyrighted program that controls the basic hardware operations and standardizes the user interface.

Additionally, Chou said, he will neatly sidestep the look-and-feel screen appearance lawsuits that Apple leveled against Microsoft Corp. and Hewlett-Packard Co. because Nutek's user interface is based on the Open Software Foundation's OSF/Motif interface.

So far, no independent supplier has legally and successfully developed a Macintosh-compatible operating system and user interface, although Sony Corp. and Apple are reportedly producing a notebook PC incorporating Apple ROM chips. The only solution now available is produced by Boulder, Colo.-based Outbound Systems, Inc., but it requires users to cannibalise ROM chips from Macintoshes and place them in an Outbound system.

Analysts said that although Apple is likely to file a copyright or patent infringement suit, Nutek has its defenses in place. "Their approach to handling the look-and-feel issue is ingenious," said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif. "The real nitty-gritty is whether Nutek's ROM chips are truly clean-room developed. If they are, we've got a legal solution to cloning the Mac."

Some observers said Nutek has a good chance of prevailing because its actions are analogous to those of Chips and Technologies, Inc., whose successful replication of the chip sets of the IBM PC led to aggressive cloning.

Analysts said Apple will most likely not wield a big legal stick until after the chip set and software ships, but Nutek could face OEM reluctance in the meantime. Nutek officials said they will indemnify OEMs from any copyright infringement relating from an Apple suit.

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Network bill in Congress

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A bill that would establish a multigigabit/sec. National Research and Education Network and foster the development of new supercomputers has a good chance of becoming a law this year, sources said last week.

The bill, which was introduced in the U.S. Senate and the U.S. House of Representatives last week, authorizes $988 million over five years to the National Science Foundation and the National Aeronautics and Space Administration for the National High-Performance Computing Program.

The bill's supporters would seek to get an additional $1 billion for the Defense Advanced Research Projects Agency and the U.S. Department of Energy — the other chief participating agencies — through separate legislation.

Last year, a similar bill, introduced by Sen. Albert Gore Jr. (D-Tenn.), was passed unanimously by the Senate, but was not taken up in the House [CW, Dec. 24/Jan. 1]. A Senate staff member said the bill's chances of passage through the House this year are greatly enhanced by its having Rep. George Brown (D-Calif.) as its key sponsor on the House side. Brown is chairman of the House Committee on Science, Space and Technology.

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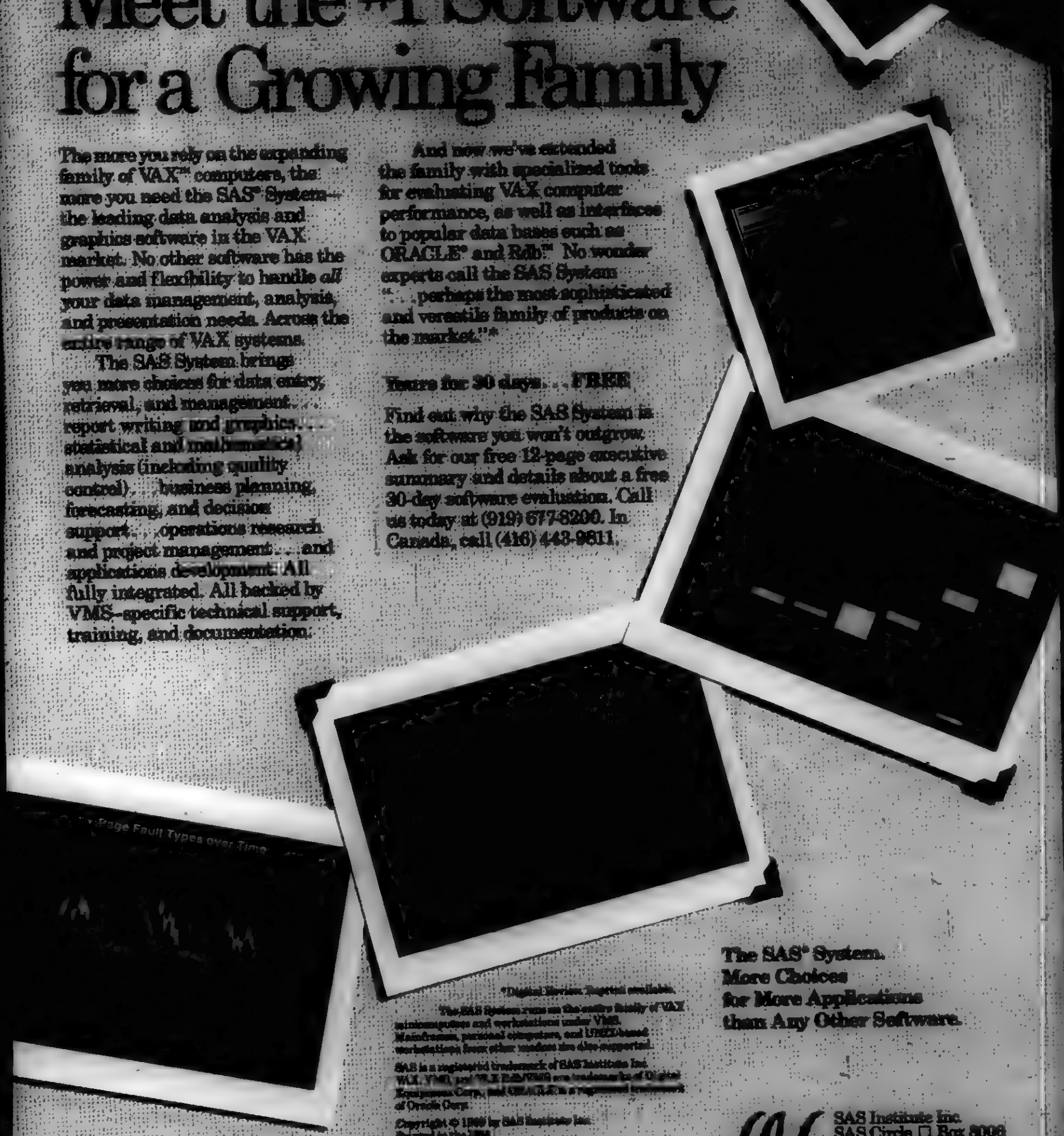
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TECH TALK

Faster car design

■ Evans & Sutherland Computer Corp. said it recently received more than $3.4 million worth of orders for its conceptual design and rendering system (CDRS) and workstations. The systems were purchased by Ford Motor Co., Volkswagen AG and Audi for automotive and product design. CDRS is a computer-aided industrial design system that enables designers to create and visualize surface models that can be transferred directly to engineering for analysis or to manufacturing for tool preparation. The system can potentially shave 26 or more weeks off the time it now takes to design new cars, Evans & Sutherland said.

Mail machines

■ The U.S. postal service has announced plans to fund a computer vision laboratory at the State University of New York in Buffalo. Researchers at the university will develop computer systems capable of deciphering handwritten addresses. The laboratory aims to have prototypes within two years of computers using artificial intelligence and neural networking technologies that will be capable of reading up to a dozen pieces of mail per second. The initial funding will be $3 million.

Flat panels rise

■ Sales of flat-panel displays will increase from $1.96 billion in 1990 to $8.7 billion in 1997, according to a new report being marketed by Information Associates, Inc. in Menlo Park, Calif. The number of units shipped will increase from 17.6 million to 47 million during the same period. LCDs, which now account for 60% of the worldwide market for flat-panel displays, will increase their dominance in the market, according to the report. Plasma displays account for 30% of the market, and vacuum fluorescent, electroluminescent and other technologies account for the remainder, the report said.

Doctors save time writing without pens

Physicians discover that using voice-recognition technology can omit paperwork

BY MICHAEL ALEXANDER
CW STAFF

The physician speaks distinctly into the telephone handset, pausing imperceptibly between words. Her words instantly appear on a computer monitor, and in less than one minute, she has completed a report on the patient who was seen by emergency room staff members.

Voice recognition has not caught on in corporate America in a big way, but the medical profession is increasingly enthused about the technology because it enables physicians to not only speedily compile reports but also to save money and help guard against malpractice suits, according to Dr. John Holbrook, director of ambulatory care at Mercy Hospital in Springfield, Mass.

Twenty-two physicians and others at Mercy Hospital are using four computers on a Novell, Inc. network that have been equipped with a voice-recognition system developed by Kurzweil Applied Intelligence, Inc. in Waltham, Mass.

Increased accuracy

Voice-recognition systems, now in their fourth generation, are much improved over earlier generations. The systems now coming to market are "speaker independent," which means they require little training. They also have larger vocabularies and are more accurate.

Emergency room physicians at Mercy Hospital see 30 to 50 patients per day and compile a report on each case. With the voice-recognition systems, physicians can create and print a standard one-page report in about two minutes.

The system also makes use of "trigger phrases," a form of verbal shorthand that enables the physician to compile a report using fewer words in less time. A single word or phrase can trigger an entire report segment that can be modified to describe the condition of individual patients.

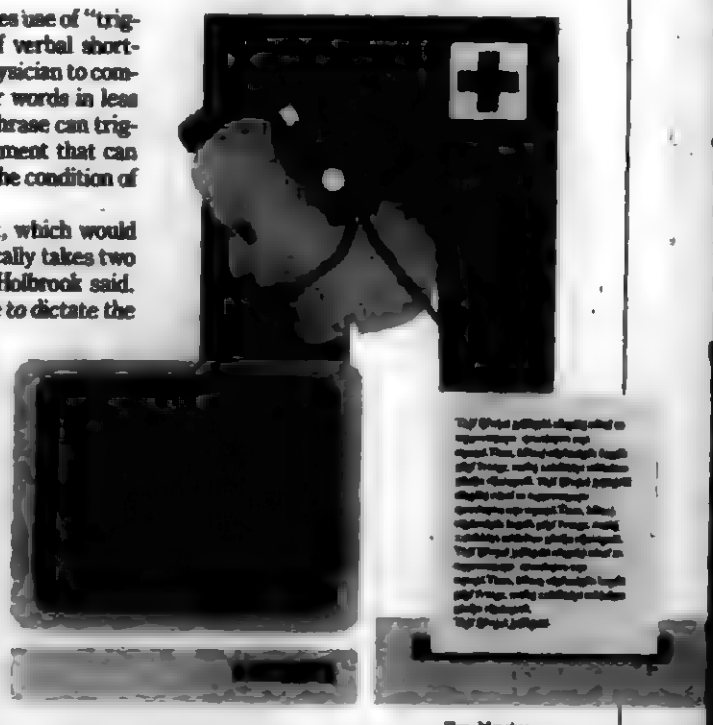
A handwritten report, which would not be as complete, typically takes two to three times as long, Holbrook said. The alternative would be to dictate the report into a tape recorder and have it transcribed, returned for corrections and typed in its final form, a process that often takes up to five days. Transcription costs amounted to $75,000 to $100,000 per year, Holbrook said.

The system also automatically inserts codes that are required by insurers to determine reimbursement of medical expenses. "The cost of assigning billing was $50,000 to $100,000 per year," Holbrook said.

One unexpected benefit of using voice-recognition systems is that by producing more polished reports, the physicians have been able to save about $4,000 per doctor on annual malpractice premiums. "Once in every 30,000 times — twice a year in our case — a lawyer will send for a transcipt of a report," Holbrook said. "Many cases are lost where the care was good but the documentation was terrible. The reports won't stop malpractice suits, but our model is that it should cut them by approximately 45%."

Insurance companies that specialize in malpractice insurance are offering discounts of up to 40% on premiums to physicians who have completed a course in risk management. The physicians must also consistently produce case reports that fit specific guidelines. Automating report-writing procedures has facilitated meeting guidelines, Holbrook said.

More than 300 Kurzweil Voicemed systems are in use at over 200 sites nationwide, according to Bernard Bradstreet, president of Kurzweil. The systems, which are built around Hewlett-Packard Co. Vectra personal computers, range in price from $12,900 to $30,600.



Tom Monahan

Voice recognition gets faster and better

Voice-recognition technology has improved considerably in recent years. The systems now coming to market are faster, more accurate and have larger vocabularies than ever before.

The first speech-recognition systems to debut were "speaker dependent" and had to be trained by the speaker. The user provided at least one spoken sample of each word in an application and then templates or word models were made from the samples. The technology is still being used widely, typically for applications requiring dozens instead of thousands of words. In comparison, speaker-independent systems can be used without training. With so many variations in the way people speak — ranging from regional accents to speech impediments — earlier speaker-independent systems did not have large (more than 1,000 words) vocabularies.

"Size of the vocabulary is no longer a problem," said Bernard Bradstreet, president of Kurzweil Applied Intelligence.

However, thanks to the availability of greater processing power, some large-vocabulary, speaker-independent systems now have up to 30,000-word vocabularies. Also, some systems can adapt over time to accommodate varying speech patterns of various users and have thus become more accurate. "The accuracy rate is 90% or better the first time out."

The systems also recognize speech that is either discrete, connected or continuous. Discrete speech consists of words that are spoken one at a time and punctuated by noticeable pauses. Connected speech is spoken in short strings of words that are sometimes separated by beeps. Continuous speech is normal conversational speech. Most systems recognize discrete or connected speech. "Continuous speech needs more processing power and further development," Bradstreet said.

The goal of automatic speech recognition is to have a highly accurate system that contains an unlimited vocabulary, is able to detect and correct its own errors and can process continuous speech, according to a report called "Speech Recognition: Principles and Commercial Applications," published by New Science Associates, Inc., a technology analysis firm in Southport, Conn. Achieving that goal will require blending speech recognition with other advanced technologies such as natural language processing, neural networking and knowledge representation systems, the company said.



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EDITORIAL

Lessons of war

THE VIDEOS SHOWN last week by the U.S. Department of Defense attest beyond a doubt the unreal accuracy of our high-tech weaponry in the Gulf war.

But that performance also begged a question that will continue to be heard long after the bombs stop raining on Iraq: Why are we as a nation so damn good at producing weaponry second to none in the world and at the same time unable to compete effectively in so many important commercial manufacturing markets?

The computerized electronics and circuitry in those weapons are mind-boggling. Yet in commercial electronics, our products offer only token competition to Japanese goods.

Our tanks can fly across the desert at 50 miles per hour, firing on the run. Yet our carmakers lose market share year after year and still rely on the "voluntary" quotas our foreign competitors impose on exports to the U.S. Our steel industry is a shadow of what it should be.

Hopefully, the true peace benefit in time will be effective transfers of this weapons technology to *our* struggling industries. After all, it's been paid for with U.S. tax dollars.

When the smoke of battle finally clears, a nagging reality will again come into focus: We dominate in only two areas — weaponry and computer products. Effectively deployed in the greatest ongoing struggle, the economic wars, these two can play off one another and be used as leverage for a much-needed competitive edge where it really matters to Americans — in the workplace.

Editor's note

Of all the upstarts and mavericks the computer industry has produced, it could be argued that none has had more lasting impact than DEC. For even though the firm has long since shed its rebel mantle, perhaps no other firm has been more influential in breaking the old centralized mainframe mold and paving the way for the distributed computing paradigms that dominate the corporate world today.

It is ironic that some 20 years after DEC launched its assault on the mainframe bastion, it finds itself struggling to be a bigger part of the new wave of distributed computing. This struggle finds the company smack in a state of transition across the board — from product strategies to internal management to corporate culture.

Beginning today on page 1 and continuing for three weeks, *Computerworld* takes a look at DEC in transition. Our DEC team, headed by Maryfran Johnson, conducted more than 50 interviews with customers, analysts and the very top brass at the company.

As you'll see, the problems raised by the customers in today's installment are fully acknowledged by company executives, who are readying a batch of fixes in hope of strengthening the company for the 1990s so they can say once again, "DEC has it now." You be the judge.



LETTERS TO THE EDITOR

Funny problems

Your "Forecast 1991" [CW, Dec. 24, 1990/Jan 1, 1991] issue was amusing but hardly entertaining. It was too much work correcting the inaccuracies. Why, in "Microsoft Claims the Desktop Mantle," do you insist on comparing workstation to personal computer sales one-for-one? How about measuring it in millions of instructions per second as well?

In "Faster Than a Speeding . . ." you enumerate the problems of Unix: Hard to learn? Most workstation vendors I know provide a slick graphical interface that is like the Apple Macintosh, only more powerful. Difficult to use? Unix has modular tools that fit together in generally compatible ways with gateways to other systems.

Please try to maintain accuracy and broad scope in dealing with these issues. Software engineers read your publication, too — maybe some should write for it.

P. Joseph Argenio
Health Information Technologies
Princeton, N.J.

Multitasking Mac?

When I read your quote of Patrick Lee ("You can do multitasking with Windows, and you can't with Apple.") in your article "Users' trust in Mac slip sliding away" [CW, Jan. 14], I had to wonder. As I word process this on a Mac Plus, an Excel macro is running in the background creating and updating files, two different printer spoolers serve a page and dot matrix printer simultaneously, and Hypercard waits in the wings. If multitasking is the ability to have different applications executing at the same time, then I have it and have had it for the last two years. Any arbitrary Macintosh has this ability, too, which is not the case for micros running DOS.

Certainly Windows is a major advance in system software for PCs and is deservedly popular. On the other hand, if you lived all your life with candles, you'd think an oil lamp was hot stuff if you'd never seen an electric light.

Bruce A. Dunk
S. R. Comerford Constructors Corp.
Marina Del Rey, Calif.

Blind faith

As a board member of the International Users Group for Repository and AD/Cycle, I want to thank Rosemary Hamilton for covering our first annual conference. I commend her for pointing out (and questioning) the blind faith many people seem to place in IBM. [CW, Oct. 29] The founders of the user group hope we can become a force in defining repository-based application development, for we aren't all as docile as Ms. Hamilton portrayed.

Over the past few years, many of us have provided input to IBM on how we want the process of building and maintaining systems to work. Many participated in "customer councils." One of the conference speakers, Dan Tasker, a consultant from Australia, led the Guide project that developed a massive entity/relationship model of a repository. Another speaker, Ed Peters of Manufacturers Hanover Trust, chaired the worldwide IBM Users Group Application Development Joint Project (ADJP), in which representatives from Guide/Share organizations from around the world, including myself, developed an "Application Development Strategy" paper, which was specifically mentioned in the Sept. 19, 1989 AD/Cycle announcement.

IBM and the ADJP built on the work of the user groups in the '80s such as "Guide/Share Language Futures Task Force," "Integration of Development Tools Strategy," "Repository Data Model Strategy" and on work done inside IBM.

So this is not "a trip back in time." We IBM customers asked for AD/Cycle. We welcome it as IBM's recognition of the vision many of us have of a model-driven repository-based application development environment.

We also can't complain if the solution delivered so far is not complete. The ADJP told IBM, point blank, "Don't wait until it is perfected! Get pieces out to us so we can learn and get ready."

Many people may "simply follow IBM's lead," but many of us have a strategy and are deeply involved with IBM and other vendors to make our vision happen.

Richard Stromberg
Information Systems Dept.
Du Pont Co.
Wilmington, Del.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

Fighting terminal terrorism

WINN SCHWARTAU



The word terrorism elicits vivid front-page images — murder, kidnapping, hijacking and suicide missions. However, now that the planet is connected by an ad hoc global network, a more effective terrorist assault would be one that attacks the inherent vulnerabilities of the world's information processing systems. To the discredit of those who created the information infrastructure and of national governments, which have been largely inactive, there are no defensive mechanisms in place to thwart such an attack.

It is almost inconceivable that society could function as we know it without the data processing systems upon which we rely. Information, whether in the form of raw data or well-correlated intelligence, is the key building block on which modern society rests.

It is also implicitly evident that maintaining the sanctity and privacy of data is crucial to the continuation of a well-ordered society.

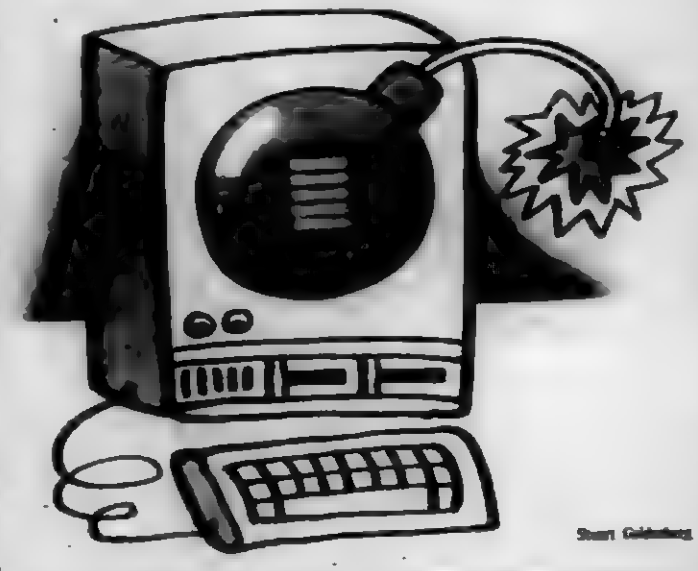
For an attack on an information processing-intensive society to be truly crippling, it would require assaults on multiple fronts. This should not be taken as a comforting thought, however. Such a well-coordinated and well-financed attack is now a distinct possibility, and we have many points of vulnerability.

There are methods and techniques that have been shown to be quite capable of inflicting massive damage on the world's information systems with a relatively minor investment of time, manpower and resources. Such an attack can also be launched by remote control, with little or no ability to identify and retaliate against the perpetrators. It may be weeks, months or years before an attack is detected, and then, if properly effected, the source of the attack is completely disguised, rendering a response impotent.

Using Trojan horses, bombs, crystal viruses, macro viruses, worms, data viruses and a host of other well-documented influenza-like computer diseases, a computer terrorist would hope to widely proliferate hundreds or more diseases in an incubation mode, perhaps for months or even years, before the first symptoms became manifest.

Another often-overlooked mechanism for compromising systems is aerial assault. We often forget that communications systems use cellular technology and satellite transmissions. Local-area networks are using radio frequencies in increasing numbers and phone lines transmitting data are up-down linked, as are wide-area networks.

Radio frequency interception is a nearly trivial task today. Using an "intercept/transmit" model, viruses can be injected into communications systems with relative ease. The U.S. government has issued contracts for studies on methods of infecting enemy military computers with viruses in hopes of shutting down battlefield computing and communications capabilities.



Stuart Goldenberg

Furthermore, it has been conclusively demonstrated that computer video terminals (personal computer, minicomputer or otherwise) emanate a distinct electromagnetic radiation pattern that is detectable and permits recreation of the data.

Covert detection of pixel radiation is not a complex affair and is well within the financial reaches of the amateur hobbyist using even the most primitive equipment. The copious use of coherent monitor radiation detection equipment would be an integral part of any coordinated attacks against an information processing society.

The manpower resources and the technical and mercenary skills needed to launch such attacks are known to be widely available. So are the means to protect the world's information base, but those whose task it is to protect have been lax, even derelict, in the execution of their fiduciary, legal and moral responsibilities.

Most major computing centers, especially in the U.S., have wide-open doors that invite invaders. The state of computer security and access control is dismal. It is no wonder we hear daily of computers being compromised and/or damaged by outsiders or of banks being held hostage by hackers.

It is indeed incumbent upon the data processing manufacturers, with the appropriate demand and concern from their customers, to build protection mechanisms into their systems that will largely render such attacks impotent. Manufacturers are providing industry with massive computing power, and the power of the systems increases daily. So far, however, they have ignored the value of the contents of the systems they sell.

Unless industry and its customers implement superior defense mechanisms, they will find themselves potentially on the defensive side of a devastating attack against which there is no winnable defense. In other words, they and we will all lose.

For a motivated individual or organization, an assault on our information processing capabilities would be an effective attack on a global Achilles Heel, an electronic Pearl Harbor.

Let's see if we can change that before it's too late.

Schwartau is the author of *Terminal Compromise* and executive director of the International Partnership Against Computer Terrorism.

Dating problems now? Wait 'til the year 2000

RANDALL L. HITCHENS



The turn of the century will not be business as usual for many businesses. The year 2000 will be the first century change ever endured by an automated society, and if your organization uses computers, that means you are sitting on a time bomb.

Defusing the bomb may be easy and inexpensive for some companies, but for many others, it could be a human and financial disaster.

The problem is that dates are stored with only two-digit years (omitting the century digits). As an example of the problem, suppose you hire someone on 11-26-98 and are tracking five-year vesting rights on some benefit. The logic is to subtract one date from another and look for five or more years difference. So 99 minus 98 is one year. But what about 11-26-00? What's 00 minus 98?

Standard-setting bodies now recognize the problem. In 1988, for example, the Federal Information Processing Standard Publication 4-1 adopted the American National Standards Institute's X3.30 standard, specifying that four-digit years be used. The fact, however, is that such rulings have little impact on many of today's production computer systems, which were written anywhere from 10 to 30 years ago.

Difficult to comply

In practice, maintenance programmers have little opportunity to keep up with standards publications. Most of their time and effort is focused on reducing storage requirements, improving performance or meeting other unique requirements of the system at hand. Not incidentally, the same activities that distract programmers also help to produce a hodgepodge of custom date formats and algorithms, which would make compliance more difficult even if standards were known.

Many people who hear about this problem for the first time dismiss it as trivial or nonexistent.

In part, this attitude seems to stem from an unwillingness to borrow trouble from the future. Several key information systems managers have told me that because they're not going to be in their job in nine years, they're not worrying about it. Others complain that they are so busy keeping their heads above water today, they don't have time to worry about nine years from now.

The major reason many people consider the century change a nonissue, however, is that the solution seems simple from a technical viewpoint. There are, as many people are quick to point out, relatively simple ways to adjust programming to accommodate the turn of the century. The crux of the problem, however, is not technical difficulty but the number of places in which such changes will need to be made and the number of steps involved in the process.

Practically every data-entry screen uses some sort of date arithmetic to validate entries. Most systems have date comparisons and computations of some sort. Worse, though, are systems that use identifiers with dates embedded in them. For example, one corporation tags stock trades with sequential numbers containing the date of the trade. That tag is used to identify dozens of aspects of the trade through many systems made up of thousands of programs.

No easy way out

Most older and larger systems will, at a minimum, have to be reconstructed. Even setting aside larger questions, such as how changes to something like a tag number will affect day-to-day operations, reconstruction efforts can entail massive effort.

First comes the sizable job of simply identifying where changes need to be made. You have to inventory all lines of code referencing dates either as fields in files or as computations and decide which ones need adjusting. This task is complicated by the often bizarre way dates are stored and operated on, the inconsistent and frequently illogical names given to such fields and the analyst's probable lack of familiarity with all the purposes and uses of each field.

Having made an inventory of required changes, you must mesh the list with the 10-year plans for programming development and then determine how to handle each instance. The appropriate choices range from doing nothing at all (when dates are used for display purposes only and people know what year 00 means) to completely reorganizing files and programs and writing utilities to migrate them to the newer version.

Of course, no changes should be implemented without testing them. And for large, complex systems that interact with other systems, the testing will be a very large project itself.

What we have here is a massive IS problem that is very much like a computer virus designed to work on a specific date. The good news is that we have two advantages over a virus. First, we know about the existence of the problem. Second, we know we have a certain number of millions of lines of low-level code to comb through to locate required changes. The bad news is that given the amount of territory to be covered, nine years is a rather short time.

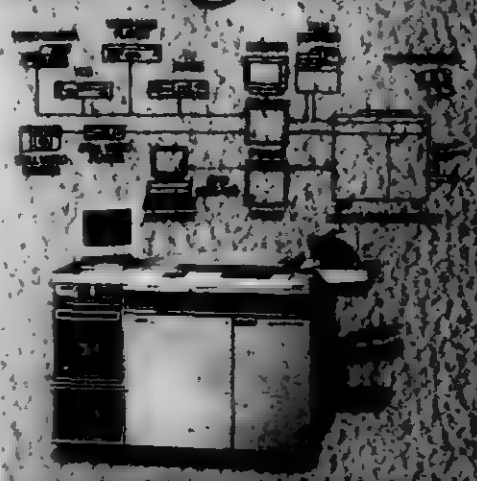
Hitchens is a managing partner at the management consulting firm of Sundance Software, Inc. in Armonk, N.Y.



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Users taking a slow approach to Escon technology

ANALYSIS

BY ROSEMARY HAMILTON
CW STAFF

Several information systems managers recently contacted said that while they are looking forward to Escon, IBM's new channel architecture, they are in no rush to implement it.

That is good news, since most of the real Escon power is not available. The start date for the true Escon benefits — very high data transfer rates and great distances between processors and peripherals — will not really begin until later this year.

Dan Cefola, an Escon planning manager at IBM, said users can begin implementing Escon today, but it will have only limited capabilities.

However, that suits some users just fine, because they want to take a cautious approach to the new architecture.

Doug Underhill, an assistant vice president at CSX Technology, a subsidiary of CSX Corp., said he expects to implement Escon in phases, perhaps beginning later this year. He said the company will decide on specific Escon plans "within the next 90 days."

"We had a look, and we are reasonably impressed," added William Simpson, manager of computer facilities at Kemper National Insurance Cos. in Long Grove, Ill. "We don't have any present need. I don't suspect we will until mid-1992 at the earliest."

According to Technology Investment Strategies, Inc., a market research firm in Framingham, Mass., it would make sense for most users to wait until equipment with native Escon support is available, unless they have serious space or performance issues.

The company is recommending that in most cases, users should move to Escon as they purchase new, Escon-ready equipment instead of retrofitting existing hardware.

A big year expected

Frank Gens, a vice president at Technology Investment Strategies, said he expects the first wave of Escon migration to take place in late 1991. Furthermore, he said, many large shops with space problems have already implemented fiber extenders from IBM, which existed before Escon and bring some relief.

Escon is the first major architectural change in two decades for communication between processors and peripherals. With today's technology, the average data transfer rate is 4.5M byte/sec., and a peripheral can be no more than 400 feet from the processor.

Escon is intended to greatly improve that transfer rate as well as the distance limitations. As it was initially set up by IBM, Escon will deliver data transfer rates of up to 10M byte/sec. Second, it will allow users to place peripherals, including direct-access storage devices (DASD) and tape controllers, several miles away from the host.

Analysts said they expect those features to be expanded in the future. Technology Investment Strategies predicted IBM will increase the data transfer rate to 18M byte/sec. within the next 12 to 18 months.



Full Escon *availability will highlight advantages over copper wire*

For now, however, users will be limited by the Escon availability.

Fiber cable, two versions of the Escon Director and Enterprise System/9000 and 3090J models built to accommodate this new architecture are available today. This gives users the option of installing fiber that can directly connect to an Escon-ready processor.

Also, users can set up their Escon hub, which is essentially the service performed by the Escon Director.

Two versions are available, with prices of either $45,000 or $135,000 for the higher end model that supports up to 60 ports.

Limitations hit when a user moves beyond this point. The fiber cable can attach to various peripheral controllers, but these existing devices do not recognize the Escon protocols. The Escon-ready peripherals will not be available until later this year or next year.

Nonetheless, a user could go ahead with the non-Escon peripherals by using one of two Escon converters, which would essentially shift the system back to the older technology so that data would move across fiber lines at the older transfer rate.

In other words, virtually no performance improvement would be achieved.

A latecomer

Furthermore, one of the converters, designed specifically for DASD units working with non-Escon processors, will not be available until the second quarter of 1992. The other converter, available now, can be used with any peripheral and an Escon-ready processor.

Cefola said using Escon converters is intended for those with substantial space problems in the data center. In addition, it would allow any users to begin their move to the new architecture and get familiar with it.

However, gaining that familiarity could be costly. Bob Callery, an analyst at Technology Investment Strategies, suggested that using converters is an expensive, temporary fix that will not be needed once the devices with native Escon support become available. Each converter sells for $15,000.

One IS manager seemed to agree. David Moore, a senior vice president at Mellon Bank Corp., said he opted not to retrofit existing 3090 channels at his company.

"In my case, it's probably not a good investment," Moore said. "I made a decision to wait until I installed new processors."

Mips, assured of ECL supply, introduces enhanced server

BY J. A. SAVAGE
CW STAFF

SUNNYVALE, Calif. — Declaring that the problems it had with a reliable supply of emitter-coupled logic (ECL)-based processors for the last six months is over, Mips Computer Systems, Inc. recently expanded its line with a second server based on that technology.

Robert Miller, Mips' chief executive officer, acknowledged processor supply problems for its original server, the RC6280, introduced last November. However, he said that Bipolar Integrated Technology, Inc., Mips' CPU manufacturer in Beaverton, Ore., "has substantially improved production, and there is going to be a second source for the processors from NEC Technologies, Inc."

The original ECL-based server performs at 95 Dhrystone millions of instructions per second (MIPS), and prices started at $150,000. The new computer, the RC6260, runs at 68 Dhrystone MIPS, with prices beginning at $140,000.

Analysts such as Omri Serlin in Los Altos, Calif., said ECL technology is difficult to make reliable because of cooling problems — although it does allow for faster CPUs. "I tend to doubt ECL will go anywhere. CMOS technology is catching up in speed."

Temporary help

This new server, as well as one based on Mips' regular CMOS processor also introduced last week — the RC3360, running at 32.8 Dhrystone MIPS for $65,500 — are interim machines while the firm tries to get out its next processor.

That CPU was expected by analysts in mid-1990, and its tardiness has taken away some of the firm's early momentum.

John Dean, an analyst at Salomon Brothers, Inc. in San Francisco, said he now expects the CPU to be announced early next month but added that it will not ship until the end of the year.

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*Gartner Group's *Software Management Strategies*, P-480-866, "LEGENT's ASO Products Take the Lead," 8/29/90.

LEGENT

A World Vision that's wide open

ON SITE

BY CAROL HILDEBRAND
CW STAFF

To get potential donors to open their wallets, World Vision first had to open its systems.

The nonprofit relief and development agency is migrating from a mixed proprietary IBM/Sperry Corp. environment to one running Unisys Corp.'s Unisys System 5 Unix system and Informix Corp.'s Online relational database engine. The agency, which raised roughly $200 million in 1990, derives a large portion of its funds from individual sponsorship of needy children.

World Vision is betting that corporatewide access to donor and project information will not only funnel more money directly into relief but also help the agency target fund-raising activities more effectively.

According to Bob Willcox, system conversion planner at the Monrovia, Calif.-based group, the process of migrating from its Sperry platform about two years ago triggered the realization that its information systems structure and its company goals were at loggerheads.

"More than anything else, we're a purely informational organization," Willcox said. "We don't have a product per se. We're selling information on how people can help others. So it became very important to be efficient at how we were getting, using and sharing information."

The old environment, which was very centralized, did not lend itself to the idea of information sharing, Willcox said.

Even if World Vision had chosen one of its two environments and upgraded on it, it would still be facing a conversion, which is an expensive proposition, he said.

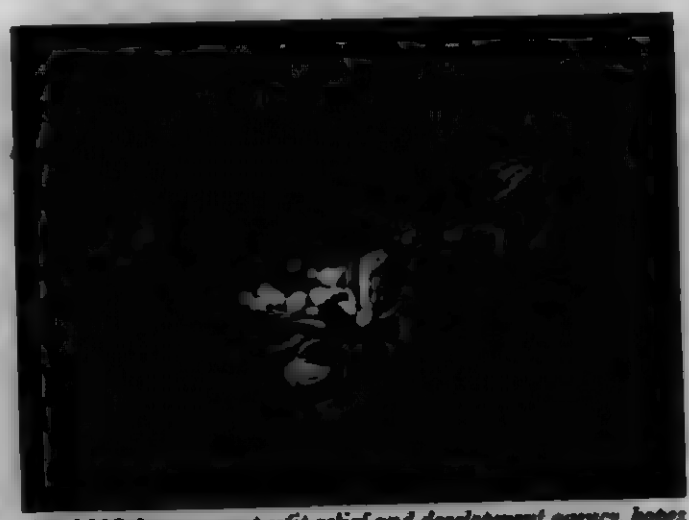
"We saw an opportunity through open systems to hopefully do this one last time and not have to face this [conversion] again. We basically threw out all the old models and said, 'OK, if we had to start over again, how do we want to do business?' "

The way the agency wanted to do business is on three Unisys 6000/70s and one 6000/80. Still in the middle of the conversion process, World Vision has targeted several functions as key.

Its most critical application, which involves donor enrollment and matching needy children with potential sponsors, has been up and running on the new system since mid-October 1990. Radio, print and television requests for pledges run a toll-free telephone number, and donor responses are then stored and tracked on the database.

Willcox said the agency chose a telemarketing package from Brock Control Systems and telescoped the conversion process to 3½ months, down from an estimated nine.

Willcox said the excitement generated by the new application among the 60-odd users was critical to the success of the conversion. "End users can destroy any process they want if they don't get excited," he said. He added that the IS staff made a real effort to sit down with users to make sure they were comfortable with the screen modifications.



World Vision, a nonprofit relief and development agency, hopes to improve efficiency with a new relational database system

World Vision is also trying to manage its money more effectively through use of the common database. Willcox said the ability to analyze the success rate of a given campaign as it is being conducted will allow World Vision to do a much better job at [illegible].

Analysis of donors and giving patterns is another of the critical applications currently targeted for conversion. Presently done by batch processing, Willcox said he is aiming for on-line analytical capabilities. So, for example, the system will be able to "tell me about all the donors in certain ZIP codes who have given more than $20 for clean water projects in Africa in the last six months," and have the information in real time.

The agency, which sponsors 5,500 projects in 89 countries worldwide, will eventually convert more than 400,000 lines of code, but the end result is worth it, Willcox said. He is hoping to have the ability to do an immediate match when a potential sponsor places a call to the agency, a process that now takes a matter of days.

"We recognize that the sooner we can make the ID between a donor and a child, the more committed that person will be to that child."

Must Software enhances VAX, PC Nomad packages

BY JOHANNA AMBROSIO
CW STAFF

Must Software International's latest versions of Nomad, which were introduced recently, sport enhanced communications with other vendors' database management systems.

Version 3.0 of Nomad for Digital Equipment Corp.'s VAX/VMS computers includes interfaces and servers to DEC's RDB relational DBMS. The interfaces and servers work with DEC's personal computer integration software, Pathworks, to provide record-level access to RDB from terminals and MS-DOS-based workstations. A version of Nomad for OS/2 is also available.

The new version of Nomad for the VAX is better integrated with the VAX environment, Must said. For example, users can now install Nomad with a standard DEC installation facility. It also has a new application development tool kit.

Nomad for VAX is available now, and sells for $3,000 and up, depending on the hardware configuration. RDB servers and interfaces are included at no charge or can be purchased separately for users of older Nomad versions. Prices range from $900 to $50,200.

PC Nomad Version 3.0, also has a new interface to RDB and to Gupta Technologies, Inc.'s Sqlbase server. The PC version includes a new applications development tool kit supporting IBM's Common User Access.

The new OS/2 package is identical to Version 3.0 of the PC software, Must said. The OS/2 and MS-DOS versions are available now for $995 each.

Early users of the new versions gave it high marks. "I'm really impressed. The speed is up there, and the tools are really solid," said Dan Astley, senior programmer/analyst at Lee County's MIS group in Fort Meyers, Fla. He is using the new versions of Nomad VAX and PC VAX to help downsize a mainframe-based Nomad application.

The county is rewriting its criminal justice information system — which tracks courts, judges, witnesses and other information — to "take advantage of the VAX's networking capabilities," Astley said.

Astley said Nomad is helping the conversion effort because the VAX and PC packages are "similar enough to the IBM version so it doesn't slow you down."

He mentioned one glitch, however. "We made a mistake because we used Nomad behaviors when we were coding," Astley said. "When we had to go against an RDB engine — oops. There were some differences we had to correct, and now we're aware of them."

Mary Kilbourn, data management supervisor at the University of Texas M.D. Anderson Cancer Center, also uses Nomad's new RDB interface. "Our data is stored in RDB, and this now allows multiuser applications and simultaneous updates," she said. The center is using Nomad VAX 3.0 to track patient trials with experimental and other types of treatments.

Interlisp support shifts once again

BY JEAN S. BOZMAN
[illegible]

SAN CARLOS, Calif. — Since 1981, a hardy group of approximately 1,200 users has weathered three shifts in software support — first getting support from Xerox Corp., then from a Xerox spin-off and now from a start-up support firm. And it has all been done for their love of Interlisp.

Interlisp, a 10-year-old interactive version of the LISP programming language, allows users to debug and program new code interactively, without compiling. The tool can be somewhat habit-forming, its users reported. "It's truly painful to learn LISP at first," said Craig Givens, a systems developer at government contractor Systems Control Technology in Palo Alto, Calif. "But with Interlisp, you get the feeling of writing something and watching the results happen on-screen."

The users are scattered at 200 sites worldwide. Interlisp was developed at Xerox's Palo Alto Research Center in the late 1970s. Today, its users communicate by electronic mail over the Usenet network for Unix users and meet once a year at the American Association for Artificial Intelligence conference.

A changing of the guard

However, the Interlisp world was shaken by Xerox's discovery in the late 1980s that its AI business was unprofitable. "We found that AI could no longer be in our mainstream product line," a Xerox spokeswoman said. And so, in 1988, Xerox formed a spin-off firm to support the user base.

After nine months of operation, the spin-off, Envos, Inc. in Mountain View, Calif., closed its doors, and support nearly came to a halt. "We had to choose between bringing the product to the end of its life and creating a support alternative," said Joe McGrath, vice president of Xerox's Integrated Systems Operations in Sunnyvale, Calif. The option taken was to contract with start-up, Venue, Inc., staffed by former Xerox employees.

Interlisp users seem pleased the situation has again stabilized. "If Venue happens to disappear, we would be in a pretty difficult situation," said Takamichi Ariga, a systems developer at the University of Toronto's Dictionary of Old English project. "We have invested a fair amount of time and money in the system over the last seven years."

The University of Toronto project uses six Xerox workstations and several Sun Microsystems, Inc. Sun-4 workstations to catalog Old English, as spoken in medieval times. A homegrown database, programmed in Interlisp, stores most of the surviving Old English texts in the world, Ariga said.

The university used to pay nothing for Xerox support because of a special grant arrangement for universities, but it now pays several hundred dollars per month to Venue.

Venue's latest Interlisp release, Medley, also supports Common LISP, the industry-standard LISP language used by Symbolics, Inc. and Texas Instruments, Inc., according to Arun Welch, a computer scientist at Ohio State University. Xerox managers said they hope the Interlisp support problem has been solved. Venue President John Sybalsky has been calling users on Xerox's mailing lists and offering support contracts.

Helping hospitals share information

System collects data, makes it available for access by member institutions

BY ELLIS BOOKER
CW STAFF

IRVING, Texas — The challenge of controlling information at a single hospital pales in comparison to the job of sharing information about clinical performance and operating costs among medical institutions.

At the Voluntary Hospitals of America, Inc., a national healthcare alliance, the ability to exchange this information among its hundreds of member hospitals was deemed vital to keeping costs down and better identifying effective ways to care for patients.

Earlier this month, the company announced that it had begun deploying a software system called the Clinical/Financial Information System to its 650 not-for-profit hospitals and their more than 185 affiliates.

Merged databases

Chicago-based systems integrator Andersen Consulting developed the centralized relational database package, which takes data from a hospital's existing clinical and financial systems and processes it into a common clinical/financial database.

Voluntary Hospitals of America holds the rights to the software and has no plans to market it to others, company officials said.

To date, approximately 85 Voluntary Hospitals of America institutions have installed or are installing the software; another 105 hospitals have signed five-year contracts for the software and data processing service.

According to Bradley Petersen, Voluntary Hospitals of America's vice president of Managed Information, work on the software began in 1986, when hospitals in Minnesota, North Dakota and South Dakota began looking for ways to share information and ideas.

"Most hospitals do not have clinical and financial [data] in one place," said Petersen, who noted that the system will use custom interfaces to extract information from each hospital's existing information system.

Data from patient accounting, medical records and general ledgers will be reformatted into a common database by Andersen Consulting at its Minneapolis data center.

The common databases will then be loaded onto an IBM 3090 mainframe at the University of Michigan, where they will be available for on-line queries by planning personnel at the individual Voluntary Hospitals of America institutions, which will tap into the database over public packet networks.

The hospitals will use a relational database developed at the University of Michigan for querying the central database.

Each quarter, a comparative database will be created using the International Classification of Clinical Services, a proprietary coding system from Healthcare Knowledge Resources in Ann Arbor, Mich.

"The biggest value is that our hospitals can not only share data but also their collective wisdom and knowledge," Petersen said.

Eventually, Petersen added, Voluntary Hospitals of America hopes to use the comparative database to examine the efficacy of different medical approaches.

The cost to each hospital for the information system is a one-time installation charge of $94,000, plus ongoing fees of $30,000 to $35,000 annually.

The 10-year, $50 million contract with Voluntary Hospitals of America is the largest won by Andersen Consulting's healthcare practice. In addition to installing and operating the system, Andersen will also train hospital personnel how to use the database.

Separately, Healthcare Knowledge Resources signed a 10-year contract with Voluntary Hospitals of America to administer the on-line query system.

"Have You Seen What Th

Work-flow system market grows

BY ELLIS BOOKER
CW STAFF

Digitizing paper documents and putting them on local-area networks makes sense only if those images appear on the computer screens of the people who need to see them.

Work-flow systems — software environments that enable companies to script the routing of images, documents, spreadsheet results or digitized video and voice to workers — will be needed to keep the paper jungle from becoming an "electronic" jungle, experts said.

In 1992, there will be a lot of work-flow architectures and products, said Scott McCready, principal at Avante Technology, Inc. and director of Image Management Technology at IDC/Avante Technology, which sponsored a conference on imaging in Phoenix earlier this month.

McCready estimated that the total work-flow market was $42.1 million in 1990, with $40 million of that being image-related. By 1993, he predicted, the market will total $583.3 million, with $350 million coming from imaging. McCready goes so far as to suggest that work-flow software will cause a renaissance in office automation.

Apparently agreeing with this assessment, Filenet Corp. — the firm that claims to have pioneered the work-flow concept in 1984 with Workflo, a scripting language for image document management — announced a general-purpose work-flow product based on Microsoft Corp.'s Windows 3.0 environment at the conference. Although personal computer-based Windows is the client platform, users will not have a choice for the server, which continues to be based on Filenet's Unix system.

Filenet's Workflo Business System consists of an application development environment called Workshop and an end-user-oriented application called Workforce Desktop. Filenet officials said Windows 3.0, with its Dynamic Data Exchange feature that allows automatic transfers of data across applications, finally brings the functionality of Unix to DOS environments.

Hopes to leverage

While not the first to have a work-flow product using Windows 3.0 — for example, Laserdata, Inc. has been shipping a Windows 3.0 work-flow developer's kit since November — Filenet hopes to leverage its Workflo Business System against general-purpose office automation tools such as AT&T's Rhapsody and NCR Corp.'s Cooperation.

"That's the future of this company," said Robert L. Castle, vice president of marketing. Castle said the Costa Mesa, Calif., company is focusing on customers who demand image capture and image manipulation, for which the usefulness of work-flow systems has been most clearly demonstrated.

Filenet claimed that about three quarters of its 400 production installations worldwide currently use Workflo language.

Workforce Desktop beta-test customer Burroughs Wellcome Co., a pharmaceutical firm in Research Triangle Park, N.C., reported a substantial increase in productivity under the system, which automates the routing of the 2,500 pages of clinical reports it receives daily from doctors participating in drug trials.

"The faster we analyse those results and get them to the [Federal Drug Administration], the faster we can get a drug approved," said John Cavallito, assistant department head of clinical data processing.

The savings include speed — the ability to call up a document in 18 seconds instead of waiting one day — and a reduction in the 6 million photocopies the company makes each year. Also, the system's ability to provide an automated audit trail for documents "is a tremendous savings for us," Cavallito said.

ey Did With CA-IDMS?"

COMPUTER ASSOCIATES

NEW PRODUCTS — SOFTWARE

Utilities

Help/Systems, Inc. has added an additional component to its Robot Operations Automation package designed for the IBM Application System/400 environment.

The Robotsave AS/400 disaster protection and recovery system comprises five modules: automatic backup and recovery, tape management, disaster recovery planning, object archive and data set management. The product automates disk drive backup, system restoration and tape management tasks.

The product is priced at $6,950 for AS/400 Models B/C10 to B50 and costs $9,950 for AS/400 Models B60 to B70.

Help/Systems
210 Baker Technology Plaza
5101 Baker Road
Minnetonka, Minn. 55345
(612) 933-0609

Cybra Corp. has announced Marksmagic Version 1.2, an on-line bar-code software package that supports Monarch Marking Systems Thermal/Thermal Transfer Printer Models 9401 and 9402 as well as Models 9425, 9445, 9465 and 9474.

Features include one-step label file creation, point-and-shoot database field selection, preloaded graphics, box fields and format rotation.

Prices range from $2,395 to $4,595, depending on CPU size.

Cybra
One Riverdale Ave.
Riverdale, N.Y. 10463
(212) 601-7100

Britz Publishing, Inc. has announced a software package designed to enable users of IBM Application System/400s or System/38s to save and restore entire output queues.

SOQ (Save Output Queue) Release 3.0 allows multiple SOQ operations to be performed on a single disk and provides an option for checking spool entry attributes. The product is priced at $199.

Britz Publishing
P.O. Box 1156
Madison, Miss. 39130
(601) 853-1394

Kisco Information Systems, Inc. has announced a source file compression program designed for all models of the IBM Application System/400.

Squash enables AS/400 users to store source programs in a compressed format to create more disk space for other uses. The program features compression and decompression procedures and allows individual members, generic members or an entire source file to be processed.

A onetime license fee costs $500.

Kisco Information Systems
120 Beverly Road
Mount Kisco, N.Y. 10549
(914) 241-7233

NEW PRODUCTS — HARDWARE

I/O devices

Tektronix, Inc. has introduced its Phaser II series of modularly configured thermal wax transfer color printers designed for heterogeneous office environments.

Midrange models include the Phaser II DX, designed to connect to workstations; the Phaser II PXN and Phaser II DXN, which feature Ethernet connectivity; and the Phaser II PXS, which features IBM host connectivity. All four models feature 300 dot/in. resolution.

Pricing ranges from $8,995 to $11,995, depending on type of model.

Tektronix
26600 S.W. Pkwy.
Wilsonville, Ore. 97070
(503) 685-3585

RGB Technology Dba/RGB Spectrum has announced a video windowing system equipped with a television tuner for workstations.

The RGB/View 2050 ($9,495) was designed to accept video from cameras, tape recorders, interactive video discs and video-teleconferencing systems. It can also accept live TV signals from its built-in TV tuner, the company said.

The product supports workstations equipped with up to 1,280- by 1,024-pixel resolution monitors.

RGB Spectrum
2550 Ninth St.
Berkeley, Calif. 94710
(415) 848-0180

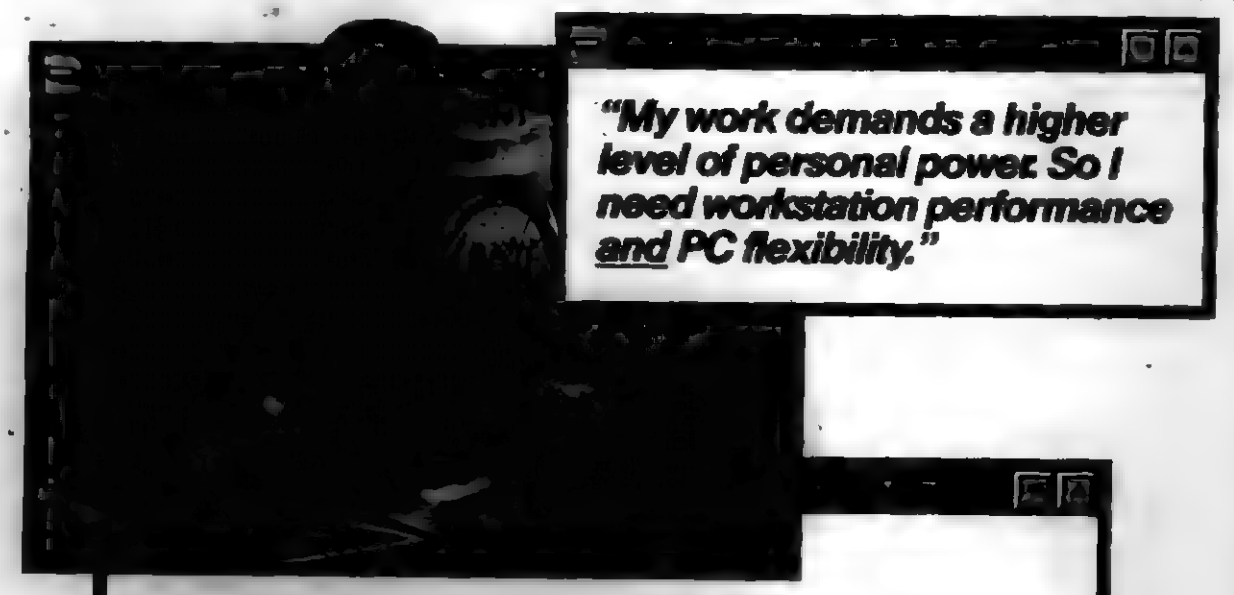
Power supplies

Elgar Corp. has introduced an uninterruptible power supply designed to control networkwide power parameters from a single terminal.

The IPS/AI 600 and 800 series include an English-language inquiry system equipped with artificial intelligence. The system's 2K-byte, 16-bit microprocessor allows local and remote system settings, collection and analysis of power data and two-way 9.6K bit/sec. communications via an RS-232 port.

Pricing for the IPS/AI 600 and 800 is $699 and $899, respectively.

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Your engineering or statistics group gets upset when terminals or workstations are out of action in a client/server environment. And when the system goes down, everyone loses everything—from electronic mail to spreadsheets, from word processing to calendar management. Senior managers lose an expensive econometric model just when they need it. An executive vice president loses crucial figures for a financial analysts' meeting.

These scenarios can be avoided. You *can* ensure your investment in office productivity—by protecting it with fault tolerance.



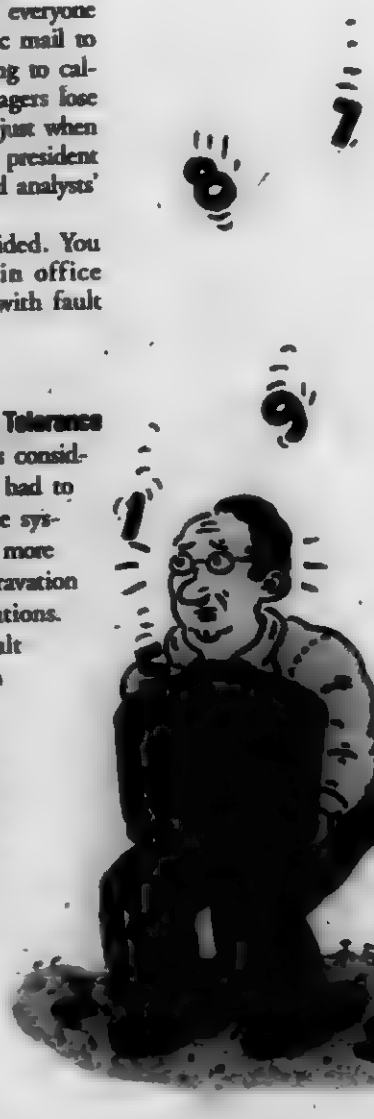
VAXft Series

Extending the Boundaries of Fault Tolerance

At one time, fault tolerance was considered a major undertaking. You had to install yet another incompatible system—that meant more expense, more training, and the ongoing aggravation of maintaining unique applications. No wonder you went into fault tolerance only if your application made it absolutely imperative.

But today things are different. Digital's VAXft 3000 Model 310 offers fault tolerance to relieve you of the costly disruption of downtime—without the difficulty of installing an incompatible system.

The VAXft 3000 is more than the price/performance leader for traditional mid-range fault-tolerant applications. It is a full member of the VAX system family, so it extends the benefits of fault tolerance into entirely new fields. It will run whatever applications you have on a VAX system today, and it will do this with no single point of hardware failure to interrupt the application—even if the power gets cut off. You won't have to learn new skills, write new code, or install a new power supply.



Easy Installation, Easy Operation

Installing the VAXft 3000 is as easy as installing systems of lower availability, without the bother and expense of traditional fault-tolerant implementations. Here's why:

- The VAXft 3000 is the only fault-tolerant system to run an international standard operating system—VMS. This means you can run any of more than 6,000 available applications with the assurance of knowing that they will never go down because of hardware failure. And because the VAXft 3000 runs on VMS, you don't need to retrain your staff to use a unique operating system.
- The VAXft 3000 is the only fault-tolerant system that is engineered to continue application service—even while maintenance takes place. This is because it is the only one on which every component is duplicated, including the backplanes and power cords.
- The VAXft 3000 provides transparent failover in milliseconds, and maintains the same performance level. If a hardware failure occurs, your users won't even know it's happened; they will see no difference in the quality or speed of their service. The application will continue running on the still-functioning system elements through automatic hardware reconfiguration.

Flexibility, Too

The flexibility of the VAXft Series opens up a whole new way of thinking about applications. Instead of just considering the need for capacity and performance, you can tailor solutions for your users—solutions that have the right level of availability.

For example, you could install a VAXft 3000 system as a front-end to a mainframe running a major transaction processing system. The VAXft 3000 could handle data acquisition and local validation. Then, even if the mainframe went down, your users would continue to be serviced by the VAXft 3000. It would store transactions, and bring the mainframe databases up to date as soon as they were back on line. Only you would know if the mainframe stopped processing. To your users, it would seem as if service had never faltered. And you can provide this level of fault-tolerant protection for little more than the cost of a conventional solution.

Digital is committed to expanding the performance spectrum of fault-tolerant systems. In fact, the VAXft 3000 is the first in a series of fault-tolerant systems. Future systems will be state-of-the-art and completely compatible with the VAX architecture—making downtime a thing of the past.

DSSI: Big System I/O Power for Smaller VAX Systems

You know how important I/O power is for such key applications as transaction processing and decision support. But for years, strong I/O power was available only if you bought large, expensive systems, which were not suitable for open-office computing. Now, the Digital Storage Systems Interconnect (DSSI) changes all of that.

DSSI is the second-generation implementation of the Digital Storage Architecture (DSA) family of storage products. This low-cost, high-performance subsystem connects disk and tape Intelligent Storage Elements (ISEs) to mid-range VAX and MicroVAX systems, in single-host or dual-host packages ideally suited for open-office computing.

With DSSI, you can build full-featured, dual-host VAXcluster systems, sharing disk and tape resources. And you can achieve exceptional levels of data availability and performance at very competitive prices.

Your Data: Available

The functionality built into the Digital Storage Architecture, and into all Digital software, enables DSSI to deliver all of the data you need, when you need it. Dual-host VAXcluster systems are particularly well-suited to client/server and production computing. Such clustered systems have automatic failover capability; if one of your systems fails, you still have access to your data. In addition, VMS Host-Based Volume Shadowing and Digital's predictive maintenance facility, VAXsimPLUS, provide protection against the loss of a disk.

Your I/O Power: Strong

DSSI is a low-latency bus that multiplexes command and data packets at very high speed. Performance does not degrade when you add storage devices. Double your number of disks, and you double your I/O request-handling capability.

Integrated, intelligent DSA controllers, with internal caching, enable DSSI to achieve linear, predictable I/O performance when you add storage devices. Performance optimization tools, such as the VAX Performance Analyzer (VPA) and the VMS Striping Driver, balance the I/O power of the DSSI subsystems with the processing requirements of the CPUs. This becomes especially important when you're running I/O-intensive applications.

Figuring Cost of Ownership

You can use DSSI across a range of systems and technologies—with our newest VAX 4000 or with members of the MicroVAX family. So not only can you take advantage of DSSI on new systems, but you can also upgrade your older systems and later migrate the storage. This is one more example of Digital's commitment to protecting your investment in existing equipment, one more example of how the Digital Storage Architecture lets you benefit from new technologies—without changing your current applications.

When you compare the full cost of ownership—including purchase price, maintenance expenses, residual value, *and* the cost of downtime, you'll see that raw specs and upfront prices may not be the most critical factors when evaluating the efficiency and cost of ownership of storage products.

The Future: A Family of DSSI Products

Digital is committed to continue introducing new DSSI devices—and faster VAX systems to run with them. For more information about DSSI, contact your Digital sales representative.



wide range of vendors to interconnect and share resources in a local area or a globally-connected environment. To date, products from the PATHWORKS family have been sold to more than 500,000 users.

Welcome CADRA CAD/CAM

CADRA CAD/CAM software is now available through Digital, thanks to a Digital Distributed Software (DDS) agreement with Adra Systems, Inc. The CADRA family of mechanical CAD/CAM applications comprises CADRA-III and CADRA-NC products that support design,

ems. These communications products are an ideal match for OLTP systems where industry-specific communications are required; they provide the flexibility and connectivity necessary for applications using VAX 9000, VAXft 3000, and MicroVAX 3100 systems.



On the Road to Innovation

Digital Technology on Tour

Digital is "hitting the road," bringing an informative, day-long event to cities throughout the U.S. and Canada.

This gives you a convenient opportunity to discover the total information system solutions available today. You'll see the latest in live technology demonstrations as well as presentations by industry leaders. Product experts will also be on hand for breakout sessions and to answer questions. Topics include: client/sever computing, the latest RISC/ULTRIX systems, imaging systems, networks, and high-performance media like FDDI.

Check the schedule to find out when the Digital tour will be in your area, then contact your local Digital office for complete registration information.

Digital on Tour 1990 Schedule

Date	United States
2/5	Charlotte NC
2/7	Orlando FL
2/12	Miami FL
2/14	Atlanta GA
2/16	Tulsa OK
2/20	Minneapolis MN
2/28	Phoenix AZ
3/5	Los Angeles CA
3/7	Costa Mesa CA
3/13	Santa Clara CA
3/19	Albuquerque NM
3/21	Denver CO
3/26	Seattle WA
4/2	Pittsburgh PA
4/4 or 4/5	Detroit MI

Date	Canada
4/12	Halifax NS
4/16	Ottawa ON
4/18	Montreal PQ
4/26	Toronto ON
5/1	Winnipeg MN
5/7	Calgary AB
5/9	Edmonton AB
5/16	Vancouver BC
5/22	Victoria BC

VAX Vectors: For the Sheer Speed of It

VAX Vector Processing Brings Supercomputing Performance to Engineering

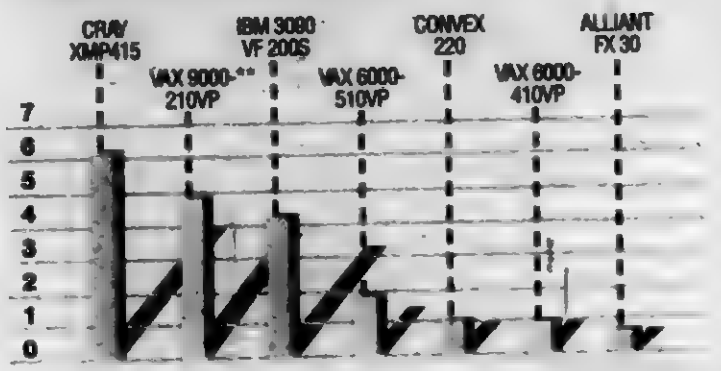
Shortly after the VAX-11/780 was introduced, it became the system of choice for engineering departments. While VAX engineering customers have benefited from significant performance increases over the years, it wasn't until just recently, with the introduction of VAX Vector Processing on VAX 6000 and VAX 9000 systems, that Digital entered the realm of supercomputing. Now, for example, a VAX 9000-210VP with vector processing offers up to 400 times the performance of the original VAX-11/780.

This level of supercomputing performance is critical for compute-intensive applications such as finite element analysis (FEA). FEA is at the heart of the engineering design and refinement process, where speed is of the essence. And speed is what VAX Vector Processing provides: an FEA run that once took 12 hours on a VAX-11/780 now takes less than two minutes on a VAX 9000-210VP.

In the past, such speed was available only from specialized supercomputing systems from Cray, Convex, and IBM. Today, with VAX Vector Processing, engineers and scientists can have supercomputing performance on a general purpose system—at a fraction of the cost of supercomputing systems from competing vendors. As a plus, popular FEA applications, including ABAQUS, ANSYS, and I-DEAS, are now available on VAX Vector systems. MSC/NASTRAN is targeted for availability this summer.

The accompanying chart shows how the VAX 6000 and VAX 9000 Vector Processors perform against the competition in industry-standard benchmarks for engineering design applications.

Perfect Benchmarks: Engineering Design (Baseline Results)*



*Relative positioning: VAX 6000-410VP=1.0
**Preliminary results

Notes on chart:
ALLIANT, CONVEX, CRAY results taken from March 1990 Perfect Report 2, Technical Report 964, Center for Supercomputing Research and Development, University of Illinois at Urbana-Champaign. IBM results taken from July 1989 Perfect Report 827.

Printing Good News

Here's a quick look at ways to maximize printing capabilities—while saving time and money too.

Fast, Affordable Printing within ALL-IN-1

If you use ALL-IN-1 V2.3 and V2.4, you can now expand your range of printing options with the ALL-IN-1 Printing Enhancements ASSETS Package from Digital's ASSETS program.

This package allows access to such DECIaser and PrintServer printer features as tray selection, envelopes (access through DECIaser only), two-sided printing, and all of Digital's value-added printing capabilities. These include the ability to print multiple pages of output on a single sheet of paper, and the ability to load and use soft fonts and soft letterheads. (The accompanying chart shows additional capabilities that come with this package.)

The *ALL-IN-1 Printing Enhancements* ASSETS Package greatly improves performance for multiple print operations with PrintServer printers. The package is easy to install and easy to learn, with a customizable, menu-driven format. And, since it's compatible with ALL-IN-1 V2.3 and V2.4, the package can use ALL-IN-1 upgrades.

The ASSETS part number for the ALL-IN-1 Printing Enhancements ASSETS Package is A1_PRINTING0. For more information, contact your Digital sales representative.*

FREE PrintServer Client Software

Digital is now providing *FREE* PrintServer Client Software for both TCP/IP and DECnet, bundled with *ULTRIX* V4.0 and above.

You can create print queues for PrintServer networked PostScript printers using the lpsetup utility. You're then ready to take advantage of our 20- and 40-page-per-minute PostScript printers. (The chart details the range of features at your print command.)

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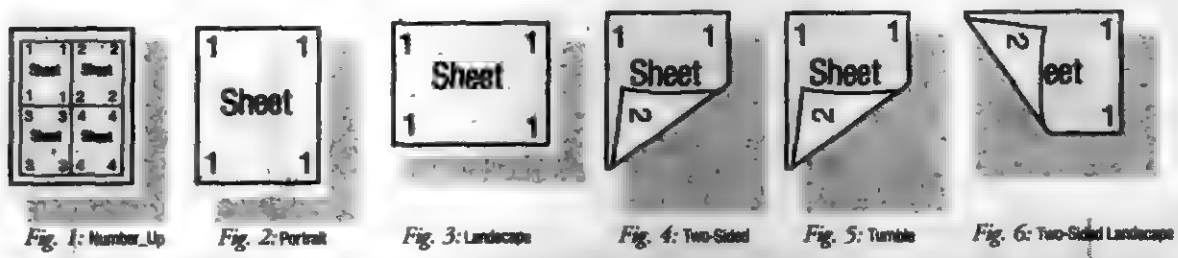
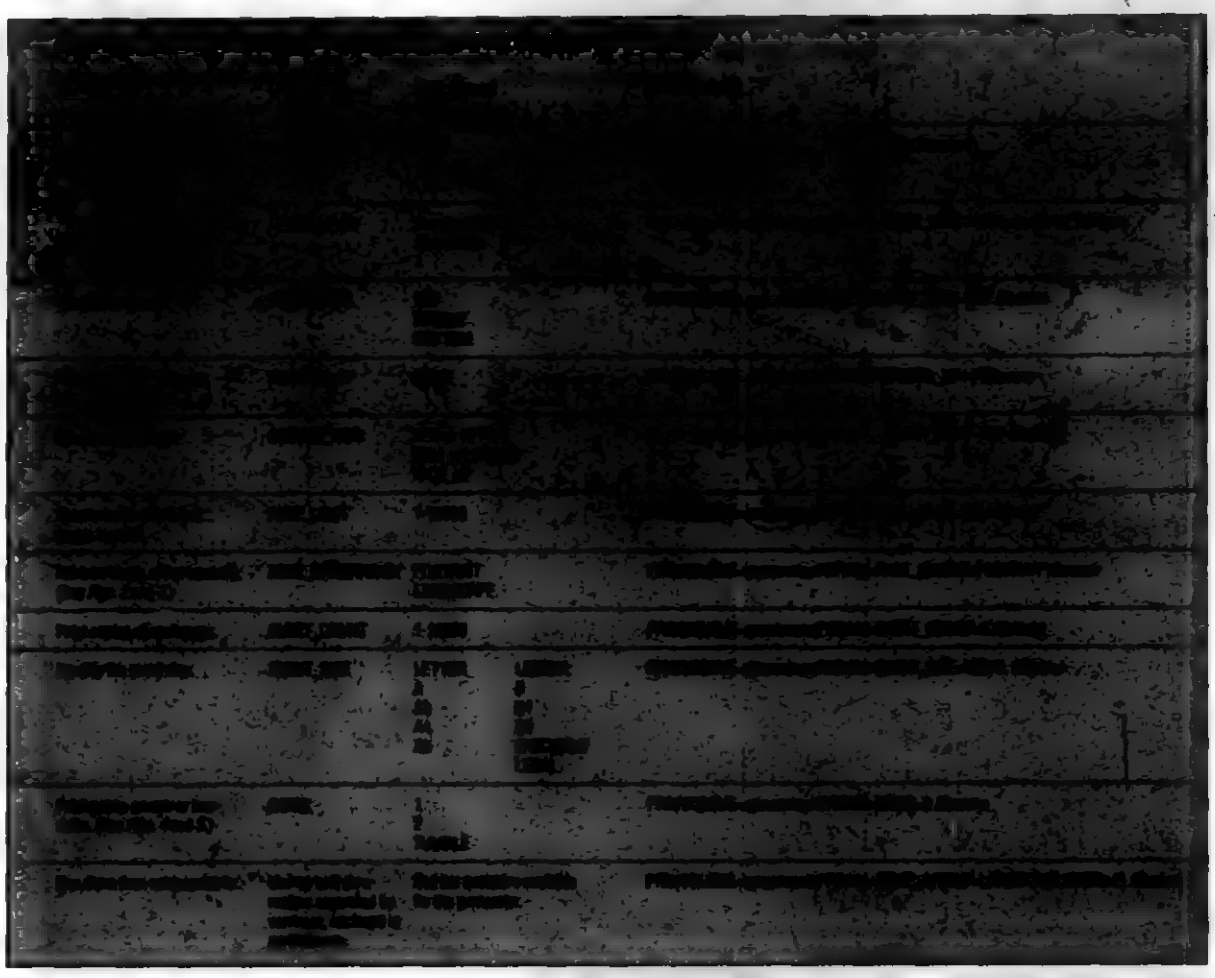
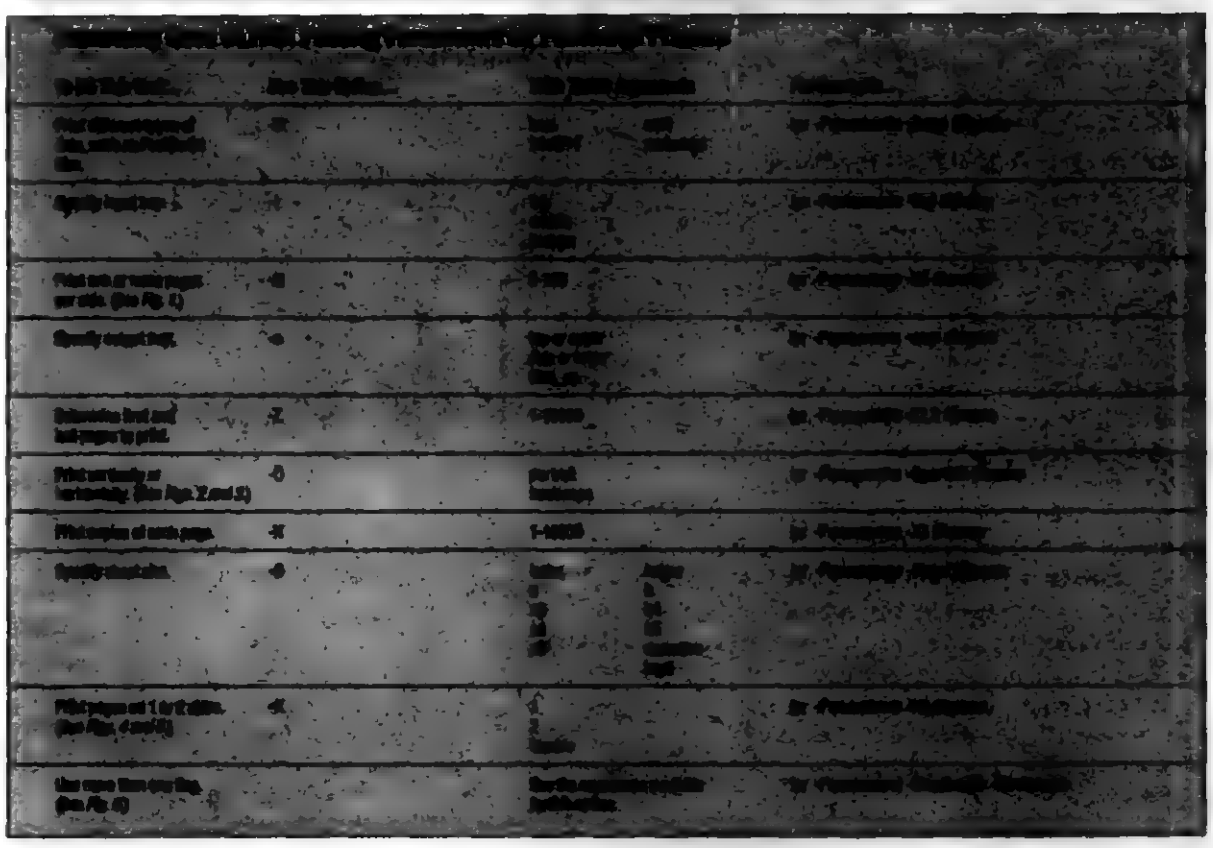


Fig. 1: Number_Up *Fig. 2:* Portrait *Fig. 3:* Landscape *Fig. 4:* Two-Sided *Fig. 5:* Tumble *Fig. 6:* Two-Sided Landscape

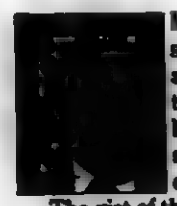




COMMENTARY

Michael Fitzgerald

Palmtops are not games



Most of us have seen one of those advertisements that show a notebook computer sitting in a briefcase.

The gist of these ads is that a notebook computer is as portable as anyone could need. And indeed, smaller computers — "palmtops" such as the Atari Portfolio and the Poqet Computer Poqet — and personal information managers such as Sharp's Wizard are typically sneered at by IS managers who find notebook computers perfectly acceptable.

So why, then, is Dataquest predicting that some 400,000 palmtops, or what it calls "subnotebooks" (not including products like the Sharp Wizard), will be sold in 1991?

And why does Gilbert Hoxie, an independent consultant in Los Angeles, predict that by mid-1992, these small systems will make up more than half the portables sold? The answer to this, perhaps, comes in part from the Japanese enthusiasm for palmtops from NEC and Fujitsu that weigh under 2½ pounds. But more likely, user demand will drive the market here.

"I have 350 field engineers, but they won't touch even a notebook computer. What am I

Continued on page 38

386DX faces looming shadow

ANALYSIS

BY RICHARD PASTORE
CW STAFF

Will the Intel Corp. 80386DX chip be the next obsolete technology? Many users appear to be passing over personal computers based on the 386DX in favor of its lower and higher end cousins. While some observers claim the 386DX is on its way out, others say it still has its place in niche applications.

The 386DX "is definitely being squeezed. The 20-MHz 386SX is moving upward, taking business away from the 20-MHz DX market," said Mark Levitt, an analyst at International Data Corp. In turn, increasing popularity of Intel I486-based PCs is eroding sales of 25- and 33-MHz 386DX systems, he said.

User buying patterns bear this out at the low end. "The platform we're moving to is the 386SX for our regular workstations," said Michael Purcell, manager of technical planning and information resources at Baxter Healthcare Corp.

"As stand-alone boxes, the SX has definitely taken a big piece of that market away," said Pat Calabrese, a PC sales representative at dealer Monterey Waldec in Tampa, Fla.

Although the 386SX employs only a 16-bit bus compared with the DX's 32-bit bus, in many cases there is little difference in functionality, observers said.

"Today, the customer loses very little in classic, single-user applications by moving to an SX over a DX," said Steve Lair, an analyst at Dataquest, Inc. "A 386SX 20-MHz PC will do the job for 95% of the users today."

One year ago, there was a noticeable difference in performance between the SX and DX chips, said Bruce Greif, project analyst at County Natwest, Inc. in New York. But with caching upgrades available today, the performance of the SX has caught up with that of the DX.

Side-by-side comparisons also showed up the 386DX. Comparing a Compaq Computer Corp. 20-MHz 386DX-based box with a Deskpro 386SX system, Robert Martin, a consultant at Deloitte & Touche in Cincinnati, said, "We really couldn't see any difference in performance running Microsoft's Excel product."

Narrow niche

Yet the 386DX still finds a narrow niche as a server in mid-size networks and for certain engineering applications. Also, the CPU-intensive Microsoft Corp. Windows 3.0 will eventually drive users to upgrade their SX platforms to 386DX systems, said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass.

The 386DX is also being pressured from above. As prices drop on 486-based PCs, they will further eclipse the 386DX in some managers' high-end plans.

Once the average price of a 486-based PC drops to $5,000, "you're going to see the 486 quickly become the next standard," predicted Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn.

Some users are already being won over by competitively priced 486s. "I just bought an AST Research, Inc. Bravo 486/25 for evaluation," Greif said. With the box's attractive price/point, "why should I bother with a 386?" he asked.

For network servers, 386DX systems had been de rigueur at the State of Washington's Department of Social and Health Services. But the department recently switched its standard to what it considers to be the more cost-effective 486.

"Our local-area networks grow so quickly that [386DXs] rapidly run out of gas," said Stephen Anderson, the state agency's information systems architect. "If the price of the 486 keeps dropping, it won't be very long before you don't see a 25-MHz or 33-MHz 386."

Intel Chief Executive Officer and President Andrew Grove said in 1991, "the dominant chip will be the SX."

Some observers said they think Intel's rumored 486SX chip will further render the 386DX irrelevant.

West Coast Correspondent Maura J. Harrington contributed to this report.

T-shirt company Champions automated ordering process

ON SITE

BY RICHARD PASTORE
CW STAFF

ROCHESTER, N.Y. — If someone gave you the wrong-size



Champion trims order errors with automated order entry

Three Stooges sweatshirt for Christmas, you have probably already returned it. You are satisfied, but the T-shirt company is stuck with a slightly used Moe.

The losses get serious when customers such as Notre Dame's Fighting Irish football team return mismatched jersey orders. Champion Products, Inc., a manufacturer of silk-screened T-shirts, jerseys and Champion-emblemed sweatshirts, is hoping to trim costly order mistakes by equipping its field sales representatives with laptop personal computers and an automated order-entry system.

The number of variables in jersey specifications makes ordering as complicated as a trip to a tailor shop. "It's very easy to make mistakes," especially

Continued on page 43

Investing in Tomorrow's Bottom Line



Jerry Barnes, Chrysler Corporation

MICRO FOCUS®
A Better Way of Programming™

Micro Focus Workbench Provides Chrysler Corporation with a Competitive Edge

In the fiercely competitive auto industry, programmers at Chrysler Corporation are using Micro Focus PC-based productivity tools to cut program development time and help move products from the drawing board to the showroom floor faster.

"The bottom line is that our business needs change quickly and we want to streamline the software development process as much as possible so Information Systems can be responsive to all of our operating units," said Jerry Barnes, Chrysler's Manager of Systems Engineering Technology.

Moving application development to a workstation environment allowed Chrysler to use its mainframe resources more efficiently and speed up development cycles by taking advantage of productivity tools not available in the mainframe programming environment. With this solution, programmer productivity improves greatly without a large investment in additional mainframe resources; an important consideration in uncertain economic times.

"The mind-set here a few years ago was, 'why would anyone want to do anything away from the mainframe.' Now, we have over 200 trained COBOL/2 Workbench users."

With the Micro Focus COBOL/2 Workbench, programmers can develop and maintain full-scale CICS/VS and CICS DL/I applications independent of the mainframe in a fraction of the time.

"We quantified the time spent on typical software development activities. We showed how we could make a code change, compile the program, detect an error, correct the error and recompile the program again in less time than it would take someone to logon to the mainframe and submit the first compile. In many cases, the developer would make the change on the PC in two to three minutes, while it could take close to 20 minutes on the mainframe."

Jerry Barnes made his case for Micro Focus COBOL/2 Workbench based on greatly improved productivity. The Micro Focus edit-check-debug cycle, now an industry standard for PC-based programming made a big impact on throughput and costs.

Make the case for Micro Focus COBOL/2 Workbench in your company. Call to get your "Makecase" kit today: 800-872-6265.



Before we could satisfy the Baldrige Quality Award judges, we had to please an even more demanding panel of experts. Our AS/400 customers.

It's easy to say the customer comes first, but in the case of the IBM AS/400® computer system, it's literally true. Before there ever was an AS/400, there were customers helping us design it. And they've had a firm hand on the helm ever since.

At every step—from planning to production, from testing to retesting—our customers participate, telling us what they want and don't want, what works and what needs working on.

Then after we install an AS/400, we call the customer within 90 days to ask how things are going and to offer whatever help may be needed. As a result, customer satisfaction is virtually 100%.

These procedures are based on a simple notion: that quality is defined not by the people who make a product, but by the people who use it.

Not coincidentally, customer involvement and satisfaction were key to helping IBM Rochester, Minnesota, which designs, builds and supports the AS/400, win the 1990 Malcolm Baldrige National Quality Award.

Clearly, a lot of the credit must go to our customers, along with our business partners and suppliers. Their help has been essential to our success. Which is why our Baldrige award is their award, too.

To learn more about the IBM AS/400 quality story, call us at 1-800-365-4 IBM.

Malcolm Baldrige National Quality Award 1990 Winner

IBM

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Plenty of help available for Windows 3.0 users

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

You have read the product reviews, wallowed in the hype about graphical user interface-inspired productivity hikes and perhaps even cracked the shrink-wrap on Microsoft Corp.'s red-hot Windows 3.0. The more adventurous may have dived right in, but for now, many companies are either evaluating Windows or politely recommending its adoption.

It has taken six years and three major releases for Microsoft's DOS-based Windows environment to finally catch fire. It has taken this long for the concept of a graphical user interface to seep into the mostly character-based user community's collective consciousness. For many people, then, Windows is not only new — it is foreign.

Help is out there, in forms ranging from vendor support, newsletters, bulletin boards, user groups and the Windows Users Group Network (Wugnet), an organization that claims to champion and support users.

Microsoft forms the first line of defense. In addition to telephone and field-support services that can reportedly handle up to 6,500 calls per day, there are classes available through the Microsoft University Program and several Microsoft forums on Compuserve. Other on-line services with forums include Genie and Byte Information Exchange.

Microsoft uses the forums to download updates, "application notes" and other technical information, but many users log on to learn from the "unbiased" experiences of other users, said Frank Riedelberger, manager of information systems development at Northern Telecom, Inc.'s Outside Plants Division in Morton Grove, Ill.

A wave of calls relating to early bugs overwhelmed Microsoft and overloaded Compuserve following the May 1990 release of Windows 3.0. Microsoft responded by opening a 24-hour automated hot line and expanding support hours.

A handful of publications specialise in Windows gazing. These include "The Wugnet Journal," Computhink, Inc.'s "Windows Watcher," "Acknowledge, The Window Newsletter" and "The Windows Shopper's Guide."

Playing a big role

User groups, with their access to peers' expertise and libraries of free programs and tips, play the biggest role in acclimating users to Windows. Casey Burns, the group leader for the Windows special interest group of the Pacific Northwest PC Users Group, said that for a time, his group was fielding questions that should have gone to Microsoft. "Most problems involve getting a certain program to work in a certain way vs. having problems with [Windows] from the start," Burns said.

These groups can be found in most major metropolitan areas, and others are still being formed. For example, Riedelberger, a Wugnet member, is launching one in the Chicago area. The group's first meeting was last week. He is being assisted by Wugnet. "They provided me with names of other users, helped us get in touch with users and provided insight into organizing a group," he said.

According to spokesman Joel Diamond, Wugnet functions as a "mechanism for other user groups around the world." Among Wugnet's services are discounts on software, a biweekly conference on Compuserve's Zenith Forum and its technical journal.

Corporate memberships are available for groups ranging from three users (starting at $250) to 100 users.

College takes cheaper road to Athena

ON SITE

BY J. A. SAVAGE
CW STAFF

SANTA CRUZ, Calif. — A nation away from here, MIT, Digital Equipment Corp. and IBM have so far spent eight years and about 80% of the more than $100 million needed to develop scalable client/server software for the university environment, called Project Athena.

The University of California at Santa Cruz gladly picked up the code for free from MIT. But when it came to laying out money for the hardware to base it on, the university went with cheaper workstations — not systems from Athena pioneers DEC or IBM. Santa Cruz spent its money on Sun Microsystems, Inc., opting for low-priced workstations.

"DEC had the advantage because parts of Athena already run on it; however, Sun's cost was better," said Tim Garlick, network analyst and project manager at the university.

The purchase, made in mid-January, followed a mid-1990 request for information from vendors and a November 1990 request for quotes from DEC, IBM and Sun.

Garlick said that moving to new equipment was necessary because the university's six DEC VAX 11/750s and two VAX 11/780s used on the academic systems are "really obsolete" and cost about $72,000 per year in maintenance. Five other VAXs used on the administrative side will be replaced as soon as possible.

In an ad hoc committee, Garlick, associate development engineer James Haynes and two computer science professors surveyed the available hardware and decided to implement an unusual configuration. Instead of using higher priced dedicated servers, the university will use Sun's basic workstations as servers. "We decided that the smaller machines will probably work," Haynes said.

"We can get more millions of instructions per second for the dollar by getting [Sun] IPCs rather than Sun servers," Garlick said. "If we find that it's not enough power, then we can incrementally add more relatively cheaply. That's more palatable to the people with the purse strings."



Andy Freeberg

Garlick is using cheaper workstations to employ Athena at the University of California at Santa Cruz

In all, the initial system will include 21 Sun SLCs, the vendor's lowest priced computer. It has no disk storage, although a 100M-byte disk will be added for booting the system, access to the network and short-term file storage, Garlick said. The SLCs will be end-user workstations.

Five larger Sun IPCs will be used as servers. One will be used to download programs to the SLCs, three will be file servers, and one will be a spare. Each will have a 397M-byte hard disk.

Each major campus division will have a Sparcstation 2 for academic use. Two more workstations will be available for student and faculty remote access.

Eventually, the sprawling, forested campus will have hundreds, if not thousands, of workstations — added a few at a time, according to Haynes.

From their basement offices next to the computer room, Garlick and Haynes will be taking on the project of switching to workstations practically by themselves during the next few months. They hope to get the help of a graduate student or two and to hire someone during the summer from MIT for software expertise.

"For the last year, we've been grabbing pieces of Athena and implementing it," Garlick said. The campus will use all of Athena's major components: Kerberos, a security system; Hesoid, a program to take the Internet academic network naming system and use it as a general service database; Moira, which automates routine management tasks; and Zephyr, the mail program.

At some point, Athena software will have to be redone because Sun will be moving to AT&T's Unix System V, Release 4 by the end of the year. At this point, the university is lobbying for Sun's help in porting Athena, but the company has not committed to it.

When it is completed, the university will have a large computer room with very little equipment in it. Garlick is not sure anyone will want the old VAXs. They may suffer the fate of the school's old IBM 4341, which has been turned into furniture: It is being used as a table for workstations so that they do not have to sit on the floor.



Fitzgerald

CONTINUED FROM PAGE 35

going to do?" asked the executive vice president of a midsize Midwestern building company at a Poqet-sponsored executive briefing.

Poqet sales executives jumped at the question like starving dogs at bones, which is understandable because Poqet's sales have so far been smaller than its one-pound, 8½- by 4-in. DOS computer.

The sales probably have been hurt by Poqet's apparent decision to design its machines to the exact physical needs of 12-year-olds. The screen even rivals that of Nintendo's Game Boy for starkness and lack of grace, although it is still usable, like the Game Boy. Still, few corporations employ 12-year-olds, and still fewer 12-year-olds can afford a Poqet, even at the newly reduced list price of $1,500.

The IS executive's question was so sanguine it seemed scripted, but the business card is real, as is his business' need for a small computer that does real work. A recent chat with the executive revealed that for him, the Poqet will be a real solution once 4M-byte flash memory cards become available later this quarter.

Currently, Poqet computers can only access information from flash memory — a credit-card-size, power-saving integrated memory circuit.

But it's difficult to see where 400,000 people like him will come from. And so Houle's prediction of market dominance looks rather dim on the surface.

According to Andy Seybold, portable computing analyst at Dataquest, the technology is there to go to the "companion" PC — a two- to three-pound full-function machine. But he says two things need to happen first: "There's got to be a change in people's philosophy and much better [data] communications."

Seybold says today's notebooks, with their ever-increasing storage capacities, lead most people to expect their portable to now be a lightweight version of their desktop PC, which is not going to happen in the palmtop market for the foreseeable future.

However, Seybold says that although users feel they need to have all that data with them on the road, they really do not need it; they just need to be able to get at it.

Seybold adds that as wireless communication improves, people will gain access to all of the data on their machines in their offices, making palmtops viable. The time line? 1991.

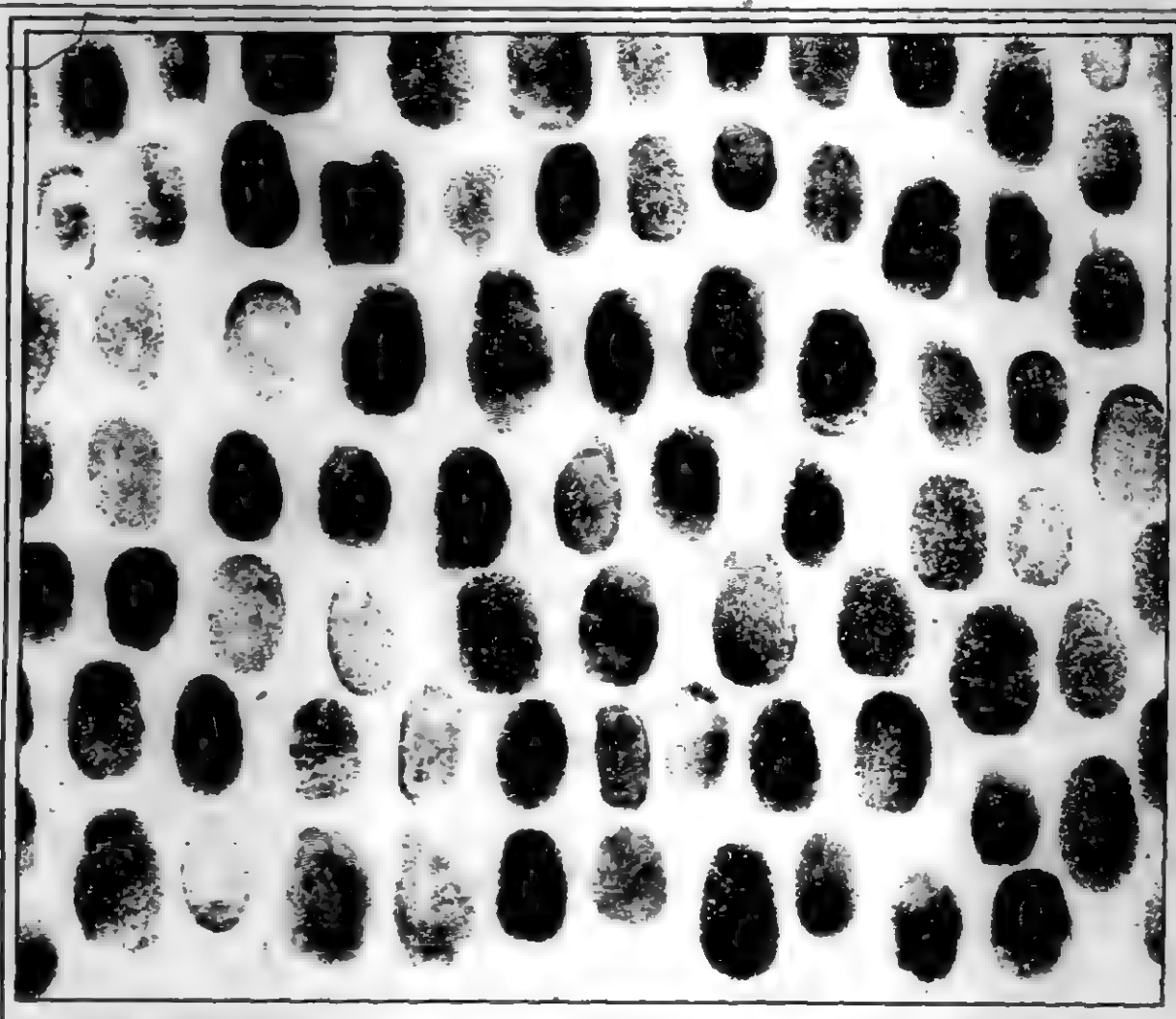
Houle points to the flash card.

"[It has] the potential to revolutionize the portable market," he says. "Rotating memory and backlight are the bane of batteries. This thing gets rid of two kinds of rotating memory: hard disk and floppy."

Still, there is the obvious problem of available software for the flash card medium. But Houle, Seybold and others say that a breakthrough product in what they call the "convenience computing" field will hit the market by May, giving users — maybe even 400,000 users — a reason to buy palmtops.

That, plus upwards of a dozen vendors rumored to be developing palmtops — including Dell Computer, Toshiba America and Hewlett-Packard — might have a significant number of palmtop users saying, "It ain't heavy; it's my computer."

Fitzgerald is a Computerworld Midwest bureau correspondent.

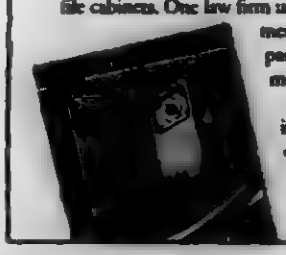


Without a computer, finding the two that match could be murder.

Just ask the detectives who spent three years looking for the killer of a New Jersey prosecutor. All they had to go on was a fingerprint left at the crime scene. But with a million prints in police files, how could they make a match?

Only with the help of a computer. One that did what computers of a few years ago couldn't do: Compare millions of images for similarity. The computer nailed the murderer.

Police work isn't the only line of work that can benefit from the harnessing of computers to images. As Forbes pointed out in its November 26th cover story, oceanographers used this computer imaging technology to turn a warehouseful of data into a couple of file cabinets. One law firm used it to scan 325,000 pages of documents—a search that would have kept 100 paralegals busy day and night for four months.



The applications for computer imaging systems are so dazzling that one day nearly every office worker could be connected to or near one. What all this means to a sluggish computer industry is growth. The kind of growth that will propel it into the year 2000, and beyond. The Forbes article contradicts Wall Street's conclusion that computers are just another cyclical capital goods industry.

Anyone can tell you what technology does today. Forbes tells you what it will do tomorrow. With gutsy, hard-hitting reporting.

As independent study after study shows, Forbes gives top executives better information and more insights than any of its competitors. In fact, Forbes carries far more editorial on computers than the others—47% more per average issue than Business Week, 89% more than Fortune.

Perhaps that explains why Forbes was the only major business magazine to show a gain in computer ad pages for 1990.

What's more, Forbes was the only major business magazine up in total ad pages last year.

So if you want to make sure your ads really stand out, run them in Forbes. The magazine that's programmed for the future.

No guts. No story.

Forbes
Capitalist Tool™

Floppyworks eases file shift

BY CAROL HILDEBRAND
CW STAFF

Next, Inc. users can now get there from here a whole lot easier.

With the advent of Floppyworks file-transfer software from Digital Instrumentation Technology, Inc. in Los Alamos, N.M., users can now take a more direct route when transferring files to their black boxes.

The package particularly simplifies the transfer process between Next and Apple Computer, Inc. Macintoshes using 1.44M-byte floppy disks.

According to company spokeswoman Liz Shrum, Floppyworks obviates the need for Apple File Exchange software, which requires a user to switch a Macintosh file to MS-DOS before it can be transferred over to the Next environment.

With Floppyworks installed on a Next machine, users call up two browser windows that show the Next files and the floppy files.

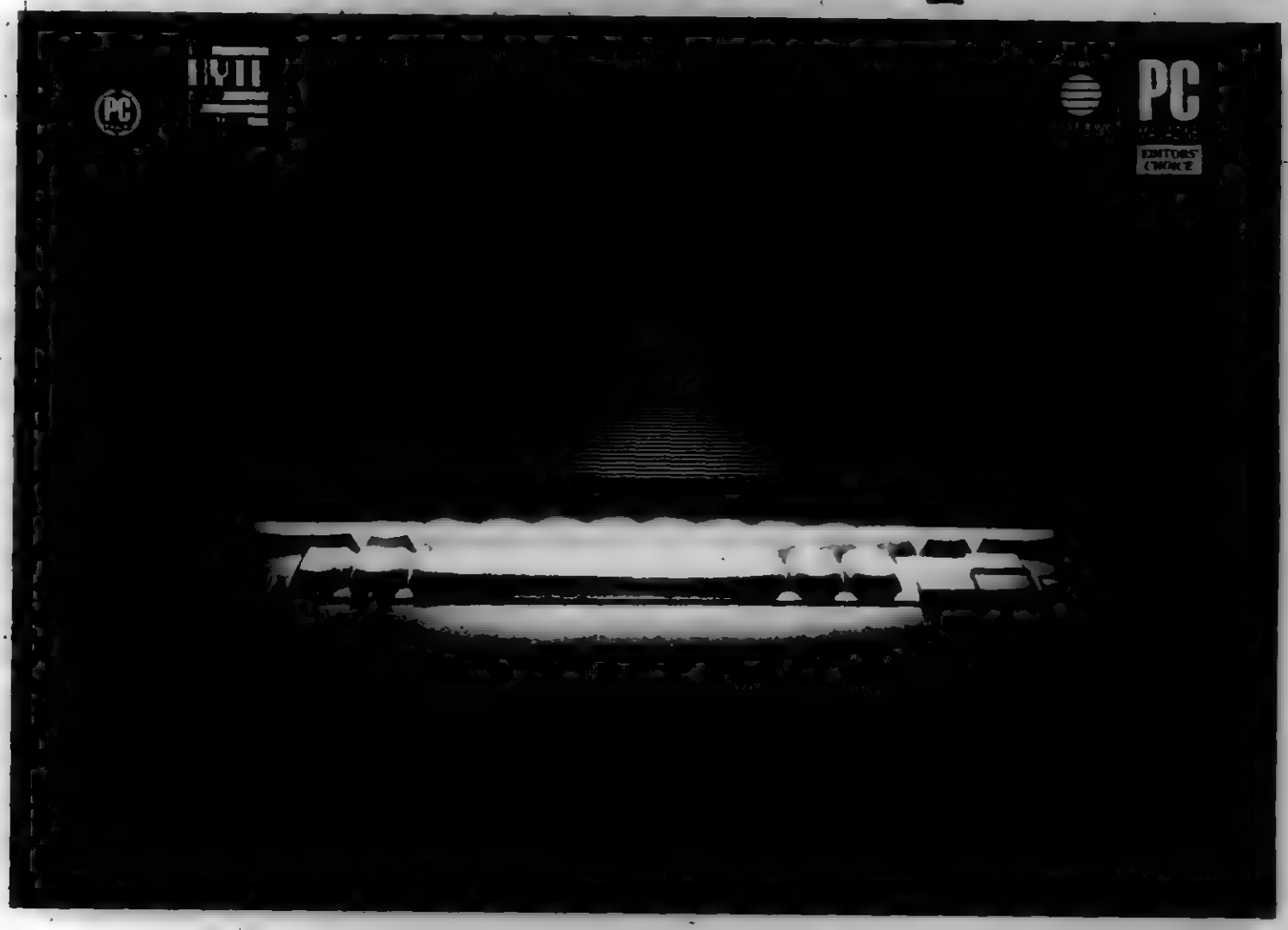
"Say you want to put a Mac file on the Next system," Shrum said. "You just highlight that Mac file, push the copy button, and it will copy over to the Next system and show it in the Next window."

A filter function aids in translating information among different formats such as word processing, graphics and databases, and a duplicating feature allows multiple copies of a floppy disk.

The package will also format, read and write MS-DOS and OS/2 files in 720K, 1.44M- and 2.88M-byte formats. It will run on the Next machines's internal disk drive, as well as drives from Digital Instrumentation and Peripheral Land, Inc.

Floppyworks retails for $250, the company said.

The new look of power.



286 processing in a computer that's notebook size, 1.4" thin and 4.4 lbs. light.

Introducing the TI TravelMate™ 2000 notebook computer — from the company that pioneered portable computing solutions.

Since inventing the first portable data terminal in 1969, TI has led the way in packing more and more functionality into smaller and smaller products. Now TI brings you the next generation in portable computing – the TravelMate 2000.

This sleek, 4.4-lb. notebook computer gives you the power of a PC-AT® in an ultrathin 8½" x 11" package. It's designed to fit your workstyle – wherever you work – in the office, at home or on the road. Just slip it in your briefcase with your file folders, journals and other business materials, and you're ready to go.



Large VGA screen with leadership display technology.

You'll appreciate the technology behind the 10" diagonal VGA display. It's a remarkable feature for a computer that's notebook size. The high-resolution 640 x 480 supertwist screen easily handles demanding windowing and graphics applications.

More features to meet your application needs.

The TM 2000 has the power to run your favorite software – 12 MHz 80C286 processor, 20MB hard disk drive and 1MB of RAM. A built-in, rechargeable battery lets you work up to two hours. With an optional add-on battery, you can work up to five hours – enough for coast-to-coast flights.

You also get a full-function AT enhanced keyboard, so you can work with the same feel of your desktop PC.

In addition, we've loaded MS-DOS® and LapLink™ in ROM, and preformatted the hard disk.

For more information call 1-800-527-3500.

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Few flaws in NCR's powerful Micro Channel PC

Technology Analysis — A roundup of expert opinion on new products. Summaries written by freelance writer Suzanne Weissl.

NCR Corp.'s PC486/MC25 combines the power of Intel Corp.'s 486 microprocessor with Micro Channel Architecture to achieve what most reviewers agree is an impressive piece of technology.

Performance: The PC486/MC25 has a 128K-byte interleaved secondary memory cache designed to handle sustained transfers of data to match the 486 processor's 128-bit burst mode. According to reviewers, this feature really boosts speed. In addition, the PC486/MC uses a small computer systems interface controller, and although it is slower under DOS than enhanced small device interface controllers, it can manage up to seven devices simultaneously.

Compatibility: According to *PC World*, the NCR PC486/MC can function as a server with an IBM Token-Ring board installed. It is also compatible with the Hayes Microcomputer Products, Inc. 2400P internal modem.

Support: NCR offers free on-site service — a big plus, according to reviewers — but there is no telephone support line.

Value: The NCR PC486/MC25 is a well-designed, compact desktop unit. For $14,389, you get a standard configuration that delivers much better OS/2 performance than an Industry Standard Architecture-based 486 system.

Server Capabilities: Because of its compatibility with networking hardware and software, reviewers consider the PC486/MC25 well suited to the job of a network server.

Reviews Summary

Criteria			
Performance	Good	Very good	Good
Compatibility			
Design	Good	Stands out	Good
Support			
Value	Fair	NC	NC
Reviewer's score			

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

- Users: Paul Gallico, Toys 'R Us (*performance:* 10, *cost:* 10); Sree Raghavan, Beatrice/Hunt-Wesson Foods (8,7); Ken Albright, Great Lakes Bancorp (9,8) "We use it to run a time-consuming analysis package that used to take an eight hours. Now it takes two," Albright said.
- Analyst: Egil Juliussen, Workstation Labs (7,7)
- Financials: William O'Connor Jr., Fourteen Research, Inc. (*overall rating:* 9); William Baker, McDonald & Co. Securities, Inc. (8)

NCR had $6.3 billion in revenue for 1990, compared with $5.9 billion in 1989. Net income was $369 million in 1990 and $412 million in 1989.

NCR PC486/MC

score:

Points (maximum)	Category
22 (30)	Published reviews
14 (20)	Analysts' ratings
14 (15)	Users' ratings
16 (20)	Cost evaluation
13 (15)	Vendor financials

(Maximum score: 100)

NCR responds

Comments from Bruce Langos, director of product-line management:

Performance: In a multitasking environment, the small computer systems interface controller really shows its capability.

Support: As far as whether the possible AT&T acquisition would have any impact on the sales, service and support of PCs, logic would say not. Why would anyone want to disrupt a good thing?

A poor server, ALR's clone succeeds as workstation

ALR Powercache 4

score:

Points (maximum)	Category
23 (30)	Published reviews
18 (20)	Analysts' ratings
12 (15)	Users' ratings
16 (20)	Cost evaluation
8 (15)	Vendor financials

(Maximum score: 100)

Advanced Logic responds

Comments from David Kirkey, vice president of marketing:

Support: Our dealers are highly qualified to support the product. They offer on-site service.

Server Capabilities: We have large, successful installations using Powercache 4 systems on Netware networks. People often question the capabilities of the Micro Channel Architecture; we think it is powerful and dependable. If our customers asked for a case lock, we would put one on.

Reviews Summary

Criteria	Infoworld 8/27/90	PC World [illegible]	LAN Times [illegible]
Performance	Excellent	Very good	Excellent
Compatibility	Very good	NC	[illegible]
Design	Satisfactory	Optimum flexibility	Average
Documentation	Very good	NC	NC
Value	Very good	NC	NC
Reviewer's score	7.5	[illegible]	NC

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

- Users: Bruce Groll, County Network, Inc. (*performance:* 8, *cost:* 8); Michael Vandermaas, Diversified Computer Services (10,10)
- Analyst: Egil Juliussen, Workstation Labs (9, 6.5)
- Financials: Eric Zinnis, Rauscher Pierce (*overall rating:* 5); Jim Weil, Soundview Financial Group (6).

ALR's revenue was $172 million for 1990, compared with $73.1 million in 1989. Net income for 1990 was $11.5 million, compared with $2.8 million in 1989. "[ALR] seems to be doing quite well, but they're less financially mature than Compaq or Dell. Their gross margins were low for the past quarter due to aggressive discounting," Zinnis said.

Advanced Logic Research, Inc.'s Powercache 4 may fall short as a network server, but as an Intel Corp. 486-based workstation with Micro Channel Architecture (MCA), it offers exceptional performance and a competitive price, reviewers say.

Performance: The Powercache 4 comes in desktop and tower models. It supports up to 32M bytes of random-access memory and is among the fastest 486-based PCs tested, according to reviewers.

Compatibility: The Powercache 4 offers excellent software compatibility, but, according to *Infoworld*, it would not work with an IBM 8514/A MCA video adapter.

Documentation: The spiral-bound documentation that comes with the Powercache 4 is well organized and easy to read.

Support: Reviewers report that the swing-out arm design on the tower model makes servicing the Powercache 4 very easy. Basic support policies include a one-year warranty and free (but not toll-free) telephone support.

Value: The Powercache 4 is priced from $9,500 for a desktop workstation model up to about $16,500 for a tower case with a 650M-byte hard disk and controller with a 32K-byte cache. However, for a comparable price, ALR's Powercache 4e — the same system with an Extended Industry Standard Architecture bus — offers far superior server performance.

Server Capabilities: According to reviewers, the Powercache 4 has serious performance problems as a server for Novell, Inc.'s Netware 386 Version 3.0. In addition, it has only four open expansion slots after configuration and does not have a case lock.

Methodology: *Published reviews: average of numeric scores from product reviews published by PC publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of analysts' ratings of vendor financials and ability to support product from financial analysts multiplied by 1.5.*

The new look of power just got more powerful.

BYTE Award of Merit

PC Computing MVP

The new TravelMate™ 3000 notebook computer packs 386™SX power into 1.8" and 5.7 lbs.

Finally. A truly portable 386SX notebook computer attractively packaged in a sleek, breakthrough design that complements your workstyle – TI TravelMate 3000. This latest addition to TI's powerful new look of notebook computers packs 20 MHz, 386SX processing power into a convenient 1.8" thin, 5.7-lb. package.

Portable power for power users.
Now you can easily carry desktop performance in an exceptionally lightweight package. Run power-hungry applications with 2MB of RAM (expandable to 6MB) and a 20MB, 40MB or 60MB hard disk drive. Get the full effect of Windows® and graphics-intensive software on the TravelMate 3000's big, bright 10" diagonal VGA display with 32 shades of gray.



The new 20 MHz 386SX TM 3000 is just 8.5" x 11", a mere 1.8" thin and weighs an easy-to-carry 5.7 lbs. (including battery)!

Loading application software and file back-up are easy with the built-in 3.5" floppy diskette drive. The internal battery lets you work up to three hours nonstop. Plus, the TravelMate 3000's full-function AT®-enhanced keyboard lets you do it in comfort.

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To see the new look of 386SX power, call TI for the name of a TM 3000 dealer near you.
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EDI comes to the Mac

BY JAMES IVALY
CW STAFF

SILVER SPRING, Md. — The emerging world of electronic data interchange (EDI) technology, which allows electronic documents to be exchanged from one computer system to another without manually relaying the information, reached the Apple Computer, Inc. market recently with the introduction of the first EDI product for the Macintosh line.

Digit Software, Inc.'s Mac EDI is an EDI management system that was designed for application-to-application exchange of routine business transactions, according to Digit Software President Todd Ross. It is built around the ANSI X12 syntax standard and is now available for $1,904.

EDI differs from facsimiles and electronic mail in that its transactions are intended to be read by computers rather than humans. Virtually any type of transaction can be exchanged using EDI, including purchase orders and invoices.

The technology has been catching on in recent years as a way to streamline intercompany business communication. Input, a Mountain View, Calif.-based market research firm, estimated that 20,000 companies use EDI and said it expects 5,000 new businesses to add EDI capabilities this year.

The advantages of EDI, however, have so far eluded Apple users. While EDI has made inroads among networks of IBM Personal Computers and their clones, a similar product has not existed for the Macintosh. Why? "Look at the numbers: The Mac only makes up 10% of the market, if that," Ross said.

Early Macintosh EDI users said it is a product that has been worth the wait. At Bloomingdale's department store in New York, Macintosh EDI is used to replenish empty store shelves by communicating purchase orders to clothing and linen vendors.

Multiprocessors get boost

DALLAS — The Santa Cruz Operation (SCO) and Corollary, Inc. introduced a jointly developed multiprocessing operating system at Uniforum last week designed to run on Intel Corp. 1486-based machines.

The operating system combines the SCO Unix operating system with Corollary's proprietary multiprocessing kernel. The software is designed to allow SCO Unix users to run off-the-shelf software without any adjustments. It was also designed for use with a special chip set made by San Jose, Calif.-based Chips and Technologies, Inc. that is designed to boost the power and performance of up to six microprocessors in any commercially available 486-based multiprocessor machine, according to a Chips and Technologies spokesman.

The four-chip Multi/Processor Architecture Extension (M/PAX) chip set can help boost the power of a multiprocessor machine by balancing the shared system functions.

M/PAX chip set also has the firm's proprietary Modular System Architecture, which allows symmetrical attachment of either complex instruction set computing or reduced instruction set computing processors within the same system. Pricing and availability have not been announced.

Kodak network printer debuts

BY RICHARD PASTORE
CW STAFF

To distinguish their entries in the crowded page-printer market, vendors have been adding multiple capabilities to new printers, including network support as well as facsimile and copier operations. While some multifunction printers have already debuted — Xerox Corp. announced its $220,000 Docutech last fall — Eastman Kodak Co.'s new offering will be considerably lower end and lower cost.

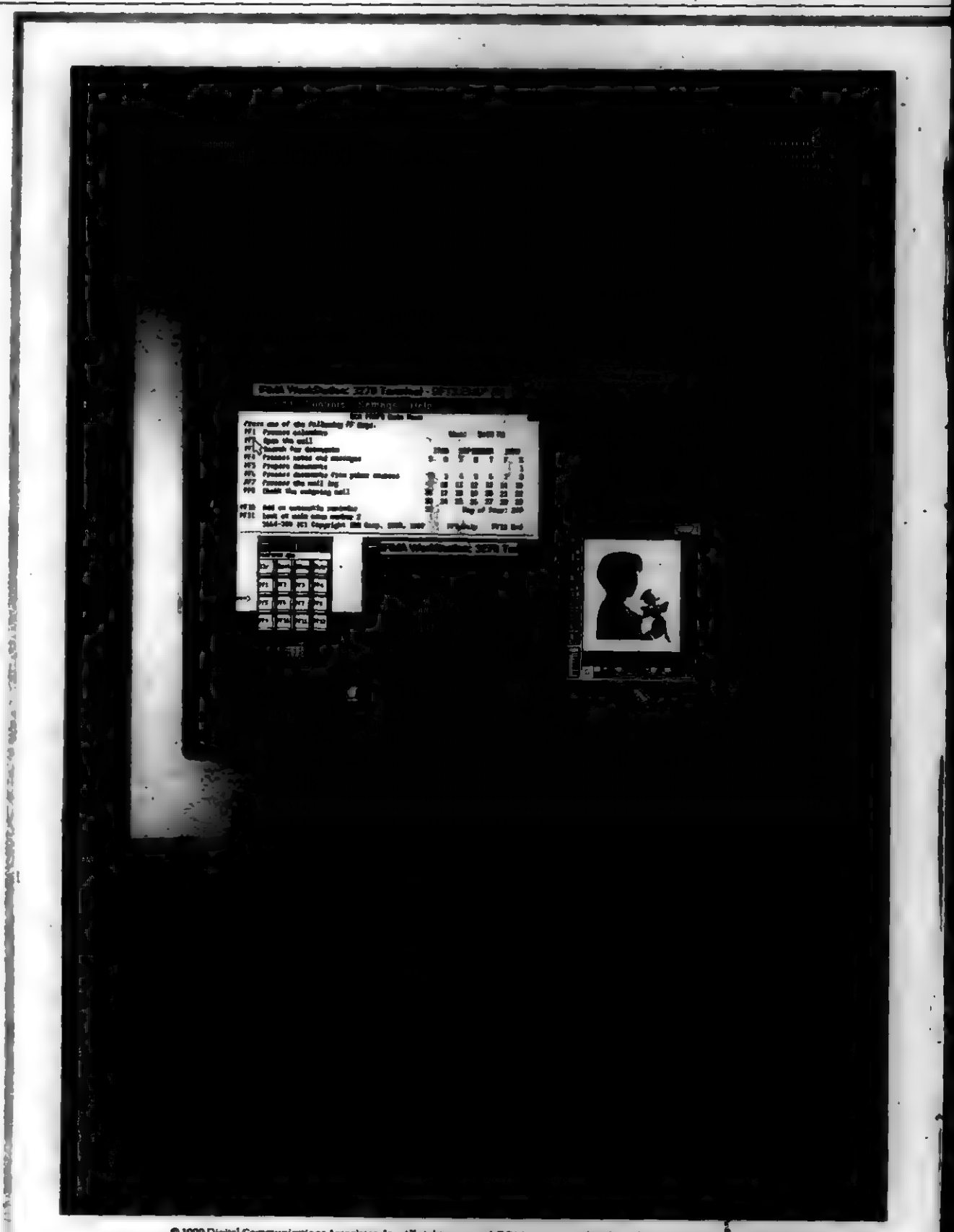
The Kodak Ektaplus 7016, announced last week, is a desktop 16-page/min. printer that supports up to four individual IBM Personal Computers and Apple Computer, Inc. Macintoshes or four separate networks. The Ektaplus also features a built-in 6-page/min. copier that can be used for ordinary photocopying.

The printer, which starts at $5,495, is Kodak's first desktop multifunction printer and its first to support networks.

Kodak's target markets for the Ektaplus are small work groups with mixed DOS and Macintosh environments in medium to large-size companies.

While the firm is emphasizing the machine's networking ability, its distinctiveness stems more from its copier capability, said Marc Boer, an analyst at BIS CAP International, Inc. in Norwell, Mass.

Based on a Kodak-built LED engine, the printer features 30 resident fonts and for $1,995, optional Adobe Systems, Inc. Postscript fonts. The unit includes emulations such as Hewlett-Packard Co.'s Printer Control Language, Epson America, Inc.'s FX80 and IBM's Proprinter.


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Champion

CONTINUED FROM PAGE 35

when the representatives were doing everything manually, said Peter Youngman, director of major projects at Rochester, N.Y.-based Champion.

The homegrown mesa system eliminates the need for representatives to write or type any of the complicated style, size and color codes for the 42,000 retail shirt designs. "They don't type 003 for a code or b-l-a-c-k for a color," Youngman said. "All you have to know is where the enter key is and the arrow keys."

The company, now a division of Sara Lee Corp., recently finished equipping its 60-person retail field force with Compaq Computer Corp. SLT 286s. Beginning this month and extending through the year, Champion will roll out 100 SLT 386SX machines to its athletic and institutional sales group.

Faster with less mistakes

The total reduction in order errors among both field sales groups will pay for the system in just under three years, said Michael Moore, vice president of MIS.

The representatives access headquarters and upload orders via a 24-hour, toll-free, 2,400 bit/sec. line. The orders are updated nightly to Champion's Unisys Corp. A17 mainframe. From there, mainframe-based applications process the order fulfillment.

The SLTs provide inquiry access to the mainframe as well. A salesperson can check order status and current and projected inventories over the same dial-up lines.

"If a customer says he needs a shipment Aug. 15, you can look at what's available in inventory for Aug. 15 and make your promises from there," Youngman said. Field representatives previously had to rely on paper inventory updates that were two weeks old by the time they arrived in the mail.

The mainframe, which holds the customer and master product databases, can download data such as design changes, customer address changes and the locations of new customers to the laptops. Champion is establishing a CC:Mail, Inc.-based electronic-mail service that will alert sales representatives to updates.

The laptops also save time in up-front order processing. "Prior to the SLT, they had to handwrite orders and mail them into a central office, or as we called it, 'the black hole,'" Youngman said. The orders would then languish on office desks for up to three weeks before data entry personnel could retype them into the mainframe.

With lead time reduced to 24 hours, Champion's internal reaction time is more immediate. "We have a hold on customer demand that much quicker," which leads to better inventory planning, Youngman said.

All hands in the pie

The system design and implementation were a team effort, Moore said. A task force of sales representatives was assigned the job of shaping the parameters. Because the resulting system was not an information systems design, the sales staff was told to direct any complaints to fellow sales representatives who helped set the parameters.

In addition, Champion's information center manager Chris Kletz and her staff members provide all training in-house. Field representatives fly into Rochester in groups of six and spend 70% of class time just working with the machines. The information center also runs a field representative support hot line.

The MIS department recommended the hardware for the task force's review. Compaq's SLT had the 40M-byte disk capacity necessary to contain a database of English descriptions of 42,000 designs. Also, "we felt it was a solid piece of equipment," Youngman said.

Because it experienced only a few minor mechanical problems with the LTE 286s, Champion has ordered 100 SLT 386SXs for its next rollout. The 386SXs will be equipped with 100M-byte hard disks, a capacity required to hold the athletic and institutional line's 500,000-design library.

Champion's IS group is now evaluating installing a minicomputer or high-performance PC at headquarters to act as a bridge between the laptops and the mainframe, Moore said. The new machine would handle all file transfer and inquiries processing, reducing contention for time on the mainframe, which already supports more than 500 users.

For once, an announcement that will have businesspeople jumping into windows.

Until now, a lot of businesses have been hesitant to take the plunge into Windows. People have wondered, for instance, whether critical applications and viable communications would become available.

Well, if we may be so bold, we'd like to give you a little push – by introducing you to DCA®'s new IRMA™ WorkStation for Windows.

A BREAKTHROUGH IN 3270 CONNECTIVITY: IRMA WORKSTATION FOR WINDOWS.

In the Windows 3.0 operating environment, only IRMA WorkStation for Windows gives you a choice of single (CUT) or multiple (DFT) sessions via coaxial cable, remote SDLC or token-ring connections, as well as asynchronous connections.

It also gives you 3270 terminal, 3270 printer and asynchronous terminal emulations, and an extensive range of 3270 and asynchronous file transfer protocols, including DCA's and IBM®'s. Both DCA and IBM hardware are supported, as well.

All of which means that you won't have to keep reinvesting in new software as your business's needs change.

In addition to its tremendous flexibility, IRMA WorkStation for Windows is quite simple to use, which helps boost productivity.

For instance, mainframe data can be directly embedded into a word processor or spreadsheet, using DCA's QuickScript™ and Windows Dynamic Data Exchange.

Only IRMA WorkStation for Windows supports APPC and supplies you with a user interface that conforms to IBM's SAA/CUA standard. It also provides you with a transparent migration path to OS/2,® using DCA/Microsoft® Select™ Communications Workstation.

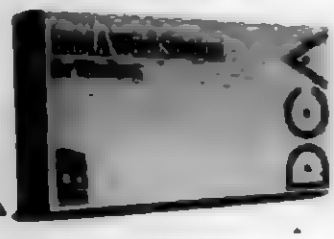
TRADE UP TO THE MOST FEATURE-RICH SOLUTION FOR ONLY $149.

Best of all, from now until March 29, 1991, you can trade in your old 3270 communications software – regardless of who you bought it from – and receive IRMA WorkStation for Windows for just $149 (suggested retail price $495). If, within 60 days, you're not completely satisfied, return it for a full refund. For more information or to order, call **1-800-348-DCA1, ext. 66E.**

It's easy. Just take a deep breath. Close your eyes, if you feel like it.

And jump.

DCA



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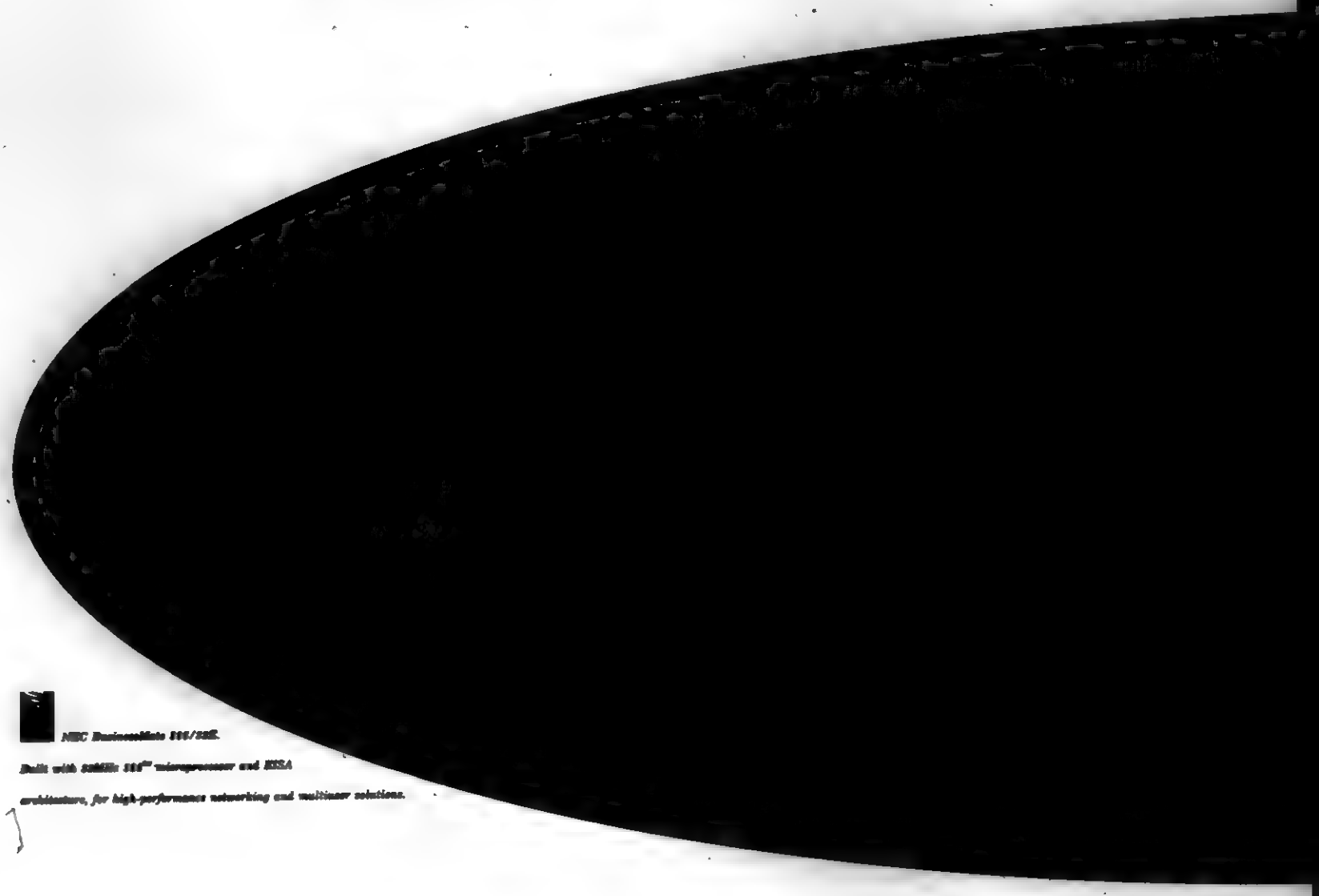
Bull develops DOS/Unix system

BILLERICA, Mass. — Hoping to emerge as a serious contender in the vendor race to bridge the DOS and Unix worlds, Bull HN Information Systems, Inc. recently unveiled the DPX/Prestation, a system that comes bundled with several popular software packages.

Positioned as a workstation for business applications, the Intel Corp. 25-MHz, I486-based platform combines The Santa Cruz Operation's SCO Unix with MS-DOS support via the Locus Computing Corp. Merge Version 2.0 program. Prices start at $12,995.

Programs bundled with the system include Ingres Corp.'s Ingres SQL database, Informix Software, Inc.'s Wingz spreadsheet, Frame Technology Corp.'s Framemaker publishing package and Alfalfa Corp.'s Poste software.

Perhaps its best fea



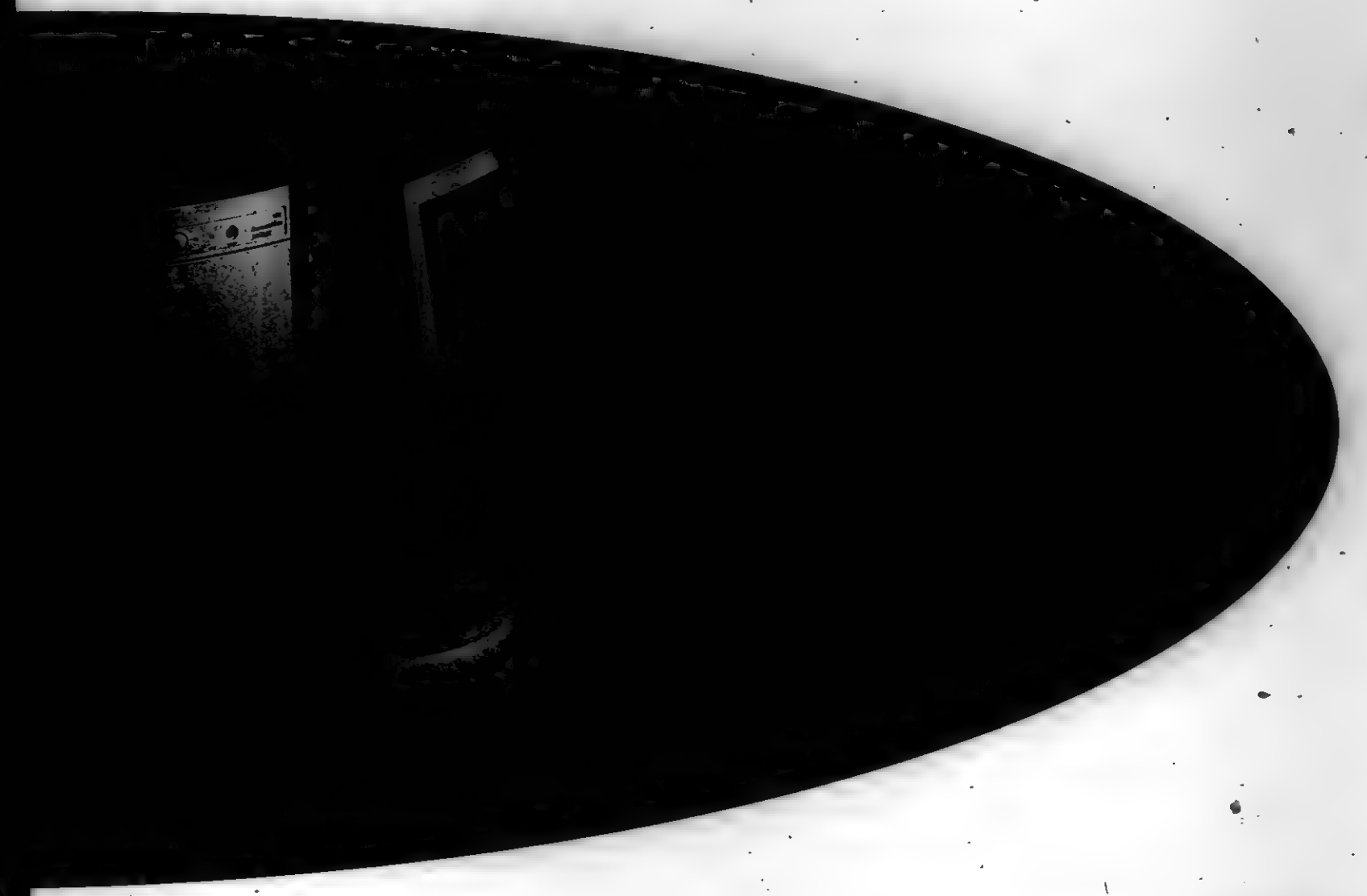
NEC BusinessMate 386/33E.
Built with Intel 386™ microprocessor and EISA
architecture, for high-performance networking and multiuser solutions.

If you see networking and multiuser solutions in your company's future, there's no better investment than the NEC BusinessMate® 386/33E. Because it gives you the performance, capacity and expandability these environments demand.

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expansion slots. And its NEC Host Adaptor supports up to seven SCSI devices, for increased flexibility with no sacrifice in performance.

In short, with support for thousands of applications, you'll have the power to make your system grow and change as your needs do. Best of all, you'll have a system that offers something no one else can offer at any price: NEC. Which may be the most attractive feature of all.

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NEW PRODUCTS

Software utilities

Alpha Software Corp. has announced Dbquick, a memory-resident utility program designed for IBM Personal Computer XTs, ATs, Personal System/2s or compatibles.

The product enables users to browse and access data stored in Ashton-Tate Corp. Dbase-format database files by allowing the information to pop up over on-screen word processing and spreadsheet applications, the vendor said. Users may also reportedly display records in form views or table views and paste a formatted address from a database into a word processor.

Dbquick is priced at $99.

Alpha Software
One North Ave.
Burlington, Mass. 01803
(617) 229-2924

Insight Development Corp. recently announced Mosaic for Macintosh, a software package that enables Apple Computer, Inc. Macintosh users to print documents from any application on Hewlett-Packard Co. Laserjet and Deskjet devices attached to a Novell, Inc. network. A copy of Novell's Netware Desk Accessory is being bundled with Mosaic for Macintosh.

System requirements include a Macintosh system with a minimum of 1M byte of memory and Version 6 or higher of the Macintosh operating system.

The product is priced at $395 for three users and $595 for 10 users.

Insight Development
2200 Powell St.
Emeryville, Calif. 94068
(415) 652-4115

Data storage

Tradewinds Peripherals, Inc. has announced two hard disk drives that can be externally connected to IBM Personal Computer XTs, ATs or compatibles.

Pocketdisk Model PD20-1 ($895) was designed exclusively for desktop systems. Model PDH20-1 ($950) can also be used with any laptop system that can accommodate a half-card expansion board. Both 20M-byte drives feature 23 msec access times.

Tradewinds Peripherals
2633 E. 28th St.
Long Beach, Calif. 90806
(213) 595-7272

CD Technology, Inc. has introduced its 200M-byte HD Porta-Drive, a portable hard disk drive that operates with a small computer systems interface that ensures Apple Computer, Inc. Macintosh and IBM Personal Computer compatibility.

The device includes a Conner Peripherals, Inc. CP-3200F drive mechanism that enables it to yield an average access time of 15 msec, the vendor said.

The product's list price is $1,995, and a 100M-byte version costs $1,195.

CD Technology
780 Montague Expwy.
San Jose, Calif. 95131
(408) 432-8598

Mega Drive Systems, Inc. has announced a 3½-in., 425M-byte portable hard disk drive designed for systems such as IBM Personal Computer XTs, ATs, Personal System/2s, Intel Corp. 80386- or 1486-based compatibles and Apple Computer, Inc. Macintosh systems.

The MDS-P425 features a 9-msec access speed and has been tested at a 75,000 hour mean time between failure, according to the vendor.

The drive is priced at $4,999.

Mega Drive Systems
1900 Avenue of the Stars
Los Angeles, Calif. 90067
(213) 556-1663

Peripherals

Sony Security Systems has announced three video printers designed for various printing tasks.

The UP-910 black-and-white printer can yield 6- by 8-in. prints in fewer than 25 seconds, according to the vendor. It also features 128 levels of gray.

The UP-610 is a small-format black-and-white unit that produces 2⅝- by 3⅛-in. prints and peel-off, adhesive-backed prints. The UP-3000 color printer reportedly produces color outputs of photographic image quality.

Pricing ranges from $2,000 to $3,895, depending on model.

Sony Security Systems
3 Paragon Drive
Montvale, N.J. 07645
(201) 358-4954

Advanced Vision Research, Inc. has announced two scanners designed for Apple Computer, Inc. Macintosh environments.

The AVR 3000/CL Plus color scanner ($2,590) can reportedly scan an 8½- by 11-in. page in less than 100 seconds. The AVR 3000/GS Plus gray-scale model ($2,090) can be equipped with a field service upgrade that enables it to scan color. The color upgrade is priced at $995.

Adobe Systems, Inc.'s Photo Shop LE, a gray-scale/color image editing software package, is being bundled with both scanners.

Advanced Vision Research
2201 Qume Drive
San Jose, Calif. 95131
(408) 434-1115



UDS V.32 Modems: winners at 19.2 kbps—now FasTalk doubles the speed

From the day of its introduction, UDS' V.32 modem has gathered honors from leading computer publications and other industry watchers!

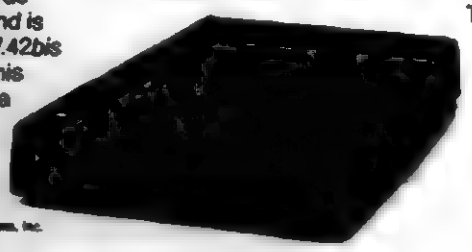
Initially it set the standard for 9.6 kbps, full-duplex traffic over dial-up lines. When MNP® level 5 data compression was added, throughput went to 19.2 kbps.

Now comes the FasTalk V.32/42b—a modem that is specifically designed for PC applications and is fully compliant with CCITT's V.42*bis* recommendation. Meeting this standard gives the V.32/42b a maximum data rate of 38.4 kbps!

The modem is particularly useful for bit-intensive data transfers, such as engineering graphics, image processing and complex financial operations. Data Rate is automatically adjusted to 9600, 4800, 2400 or 300 bps (CCITT V.32 and V.22*bis*). At the 9600 bps rate, trellis coding gives the FasTalk V.32/42b an exceptionally high tolerance for noisy lines.

For accurate communication over worst-case lines, the unit incorporates V.42 LAP-M and MNP 4 error control functions. A full complement of on-board test functions is included, and eight LEDs provide easy monitoring of the unit's operation and built-in diagnostic features.

Get acquainted with the latest winner in the UDS V.32 family. For technical details and quantity pricing, contact UDS, 5000 Bradford Drive, Huntsville, AL 35805-1993. Telephone 205/430-8000; FAX 205/430-8926.



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Northern refocuses on networking strengths

Synergizes data products with office offerings

ANALYSIS

BY ELISABETH HORWITT
CW STAFF

RICHARDSON, Texas — After several ill-starred attempts to invade the end-user data networking market, Northern Telecom, Inc. has fallen back, regrouped and focused on synergizing its one successful data networking product, Data Packet Network (DPN), with its mainline central office offerings. This is the strategy being followed by Michael Doss, the recently appointed vice president and general manager of the company's data networking division. The strategy could turn out to be a winner.

By far, the biggest portion of Northern's revenue over the past few years has come from its central-office business, which held about 42% of the total U.S. market and made up 64% of the firm's $6.8 billion in revenue last year, according to Michel Guite, a vice president at Salomon Brothers, Inc.

In contrast, the customer premises equipment (CPE) side of Northern's business contributed about 24% of 1990 revenue, Guite said. The lion's share of that segment came from the private branch exchange (PBX) — or voice networking — side of the business. The data side shrank even further recently when Northern discontinued Lanstar [CW, Dec. 10].



Northern Telecom's Doss *regroups and tries new success strategy*

The decision to jettison Lanstar was part of an overall strategic direction to get out of those market niches that have no clear demand for Northern's strengths, Doss said. Lanstar, a high-speed, twisted-pair offering, was losing ground to the emerging 10Base-T products.

Lanstar was the latest in a series of withdrawals on Northern's part (see story this page).

"In 1983, it seemed as if Northern had as good a chance in customer premises equipment as in the central office," said Joaquin Gonzalez, vice president of global networking strategies at Meta Group, Inc. in Westport, Conn. Unfortunately for Northern, it made the mistake of trying to tie its PBX products in with its data communications equipment, he added.

Not that Northern was the only vendor to make that mistake. Indeed, Northern's loss of approximately $300 million was small compared with the "several billion dollars" that companies such as NEC Corp. lost from trying to combine computing and networking into one system, Guite said. "And IBM's loss from the Rolm venture was also substantial."

However, while competitors either cut their losses, which IBM did, or found successful niches, as AT&T did, Northern continued to flounder in the end-user data networking field, because it never quite identified

Continued on page 52

Wasted efforts?

If Northern has not managed to cut a swath in the customer premises data networking market, it is not from lack of trying. Its less successful efforts in that direction have included the following:

- In the *early* 1980s, Northern made a push to convince users that PBXs make great data as well as voice networking devices. It upgraded its existing SL family of PBXs to handle data and image as well as voice. However, users turned instead to local-area networks, which were designed to support data from the start and did not share PBXs' throughput limitations.
- In 1985, Northern introduced the DV-1, a combination switch and proprietary minicomputer targeted at the office automation market. However, users were not interested in running their office applications on a PBX switch, however intelligent, and the DV-1 died a quiet death.
- Also in 1985, Northern introduced Lanstar, a proprietary data networking hub that was said to deliver 2.5Mbit/sec. rates over unshielded twisted-pair wiring. While Lanstar gained several enthusiastic supporters in the user community [CW, Dec. 10], their numbers barely exceeded 100 last month when Northern officially pulled the plug on the product.
- In the fall of 1988, Northern announced the Meridian Data Networking System, a multipurpose, proprietary switch that was designed to link LANs, hosts and personal computers to wide-area networks via a variety of protocols. The system was quietly discontinued in the summer of 1989.

ELISABETH HORWITT

Novell networking strategy questioned

BY JIM NASH
CW STAFF

Novell, Inc. promised last week to address users' concerns about what they perceive to be a meandering network management strategy.

A Novell spokesman said the Provo, Utah-based company will unveil its first "formal network management [strategy] statement in a matter of weeks." Gerry Machi, director of marketing for Novell's communications products, said much of the company's management work has been done behind the scenes, without fanfare.

Dissatisfied users have pointed to the late delivery of two management applications, Netware name service and remote management facility, as indications that management is not a priority. Novell's statement may come in the nick of time.

Tom Wood, an analyst at Business Research Group in Newton, Mass., said a study of 500 large companies indicated that Novell could fall from a solid 57% installed base in the nation's biggest firms down to 44% within 18 months. Wood said Novell losses are likely because of aggressive development from competitors Microsoft Corp. and Banyan Systems, Inc.

"Our largest development team is working on network management," Machi said. That team has pushed out Name Services, Lantern, Communications Service Manager and Remote Management in the last year, he explained.

Dissatisfied customers

Analyst Mary Modahl at Forrester Research, Inc. in Cambridge, Mass., said managers are growing impatient with incomplete management tools. She noted that a recent study showed that most vendors at best target their own product line with such tools. In some cases, vendors have management software and hardware for individual product lines.

"I want to be able to see what's going on in all of the other [Netware] 386 servers around the network," said Sheldon Laube, national director of information and technology at Price Waterhouse. Laube said he does not have that ability from his New York office. Ideally, he said, he would like to configure and manage his work groups as a wide-area network without the need for dial-up communication.

Jeff Larimore, information systems director at Home Intensive Care, Inc. in North Miami Beach, Fla., said management does not appear to be a priority for Novell. Larimore is in the midst of upgrading his Netware 286 to Netware 386. He said Netware 386 does not have the same management utilities found in 286.

For example, Larimore said, File Server Console, a utility in Netware 286, is absent from the upgrade. F Console, as the utility is known, "gives you some pretty comprehensive statistics, like current server utilization. You can look at file-lock connections, and there are some remote console abilities," he said.

Some of those capabilities are standard on Netware 386, and some are available as Netware Loadable Modules, according to Larimore, but others seem to be missing from Netware 386 altogether.

Available tools are not user-friendly, he said. "You have to know [Netware 286] pretty well to understand [management screens] very quickly," Larimore said. "It's difficult to interpret stats and act on the data."

Analysts look to Netware Name Service as an indication of Novell's intentions. Craig Burton, chief executive officer at Clarke-Burton Corp., a network consulting firm in Salt Lake City, has criticized the utility as a late and incomplete entry into the naming game. As an extension of Netware, Burton has argued that it should have been introduced long ago. It was, in fact, delivered last month — six months behind schedule.

He referred to the naming utility as a "tactical" product, one that does not offer global naming as does competitor Banyan Systems' Streettalk.

Falling behind

David Eison, telecommunications coordinator at Memorial Medical Center in Jacksonville, Fla., said Novell "is either slow to deliver or slow to develop." In the face of a flurry of third-party management tools, Eison said, Novell seems to be bringing up the rear.

While Novell "is not too adept at getting its products shipped," said Frank Michnoff, an analyst who covers networking markets at Meta Group, Inc. in Westport, Conn., it would be a mistake to conclude that management is not a priority. He added, "management for networking companies in general is a priority."

Hotel adopts AT&T server

BY JOANIE M. WEXLER
CW STAFF

BETHESDA, Md. — An AT&T Starserver E has started zipping through the work of three personal computers for Fairfield Inn's reservations system and back-office applications. The Unix-based symmetrical multiprocessing computer will allow Marriott Corp.'s economy lodging chain to expand the number of properties it supports from 75 to about 100 by the end of 1991, according to Fairfield.

Starserver, based on Intel Corp.'s 1486 microprocessor technology, will link Fairfield's properties with its central reservations center in Omaha and its central accounting system here.

"We'll be able to double the number of reservation clerks and modems we can handle, which will let us communicate with greater numbers of properties," said Molly Fine, vice president of systems development at Fairfield.

Fine said the choice of a Unix-based system was important to Fairfield because all of its

Continued on page 51

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E-mail for UPS business only

BY ELLIS BOOKER
CW STAFF

PARAMUS, N.J. — Forget about using the electronic mail system at United Parcel Service, Inc. to advertise that you do magic at kids' parties and that your stage name is Moffo the Magnificent.

Every time UPS E-mail users log onto the in-house service, they are greeted by a short statement reminding them the system is strictly for UPS business and that UPS retains the right to monitor the content of all messages.

In light of recent publicized cases concerning corporate and public network E-mail systems and the rights of users [CW, Jan. 14], the UPS approach may be an idea whose time has come.

"I think it's a smart idea to notify people," said Walter E. Ulrich, director of Arthur D. Little, Inc. in Los Angeles. "Certainly it makes [the policy] clear."

Restricted to business

The UPS policy was established one year after the system went on-line in 1987 and was part of a companywide rewriting of employee guidelines. The E-mail rule is comparable to the one governing UPS' interoffice mail, which likewise is restricted to business use.

"It's consistent with other UPS policies," said Steven Heit, the company's information services planning manager. Heit said UPS has not assigned any employees to peruse electronic correspondence, and he added that he is unaware of any problems with the policy since it was instituted.

Because the technology is relatively new for many, E-mail users may misunderstand or not even know the corporate guidelines for its use, said Eric Arnum, editor of "Electronic Mail & Microsystems," a monthly newsletter.

Arnum said UPS is unique in putting its privacy statement on its log-on screen. UPS, like many other companies, has witnessed a massive increase in its E-mail traffic since the system was first deployed to 120 users in 1987. By the end of 1993, UPS expects to have more than 30,000 electronic mailboxes. Currently, the system handles 100,000 messages per week.

"Our intention in the next year or two is to give all managers direct access to E-mail," Heit said. In fact, Heit calculated that because of departmental mailboxes, there will be mailboxes for more than the 20,000 to 25,000 managers at UPS.

While UPS saw some cost savings from paper reduction, the real benefit of the E-mail system was how it tied together its far-flung enterprise, which includes operations in 180 countries and 7,000 operating centers in the U.S. "Because of time-zone differences, [E-mail] has become critical," Heit said.

AT&T Tridom uses VSATs

MARIETTA, Ga. — AT&T's satellite subsidiary recently entered the disaster recovery services business with a system using very small-aperture terminal (VSAT) networks. AT&T Tridom said its Host Interface Disaster Recovery Service uses VSATs interfaced to a user's host computer and can be configured on-site at the customer's data center. The service costs $375 per month.

Tridom also announced that Farm Credit Bank in Columbia, S.C., had become the first customer of the service. The bank will use the VSAT network to link 170 of its remote offices through AT&T Tridom's shared hub here.

In a recent test held in conjunction with Rosemont, Ill.-based Comdisco Disaster Recovery Services, Inc., Farm Credit Bank data traffic was redirected from Columbia to Comdisco's Atlanta recovery center over a combination of the VSAT network and terrestrial lines.

ELLIS BOOKER

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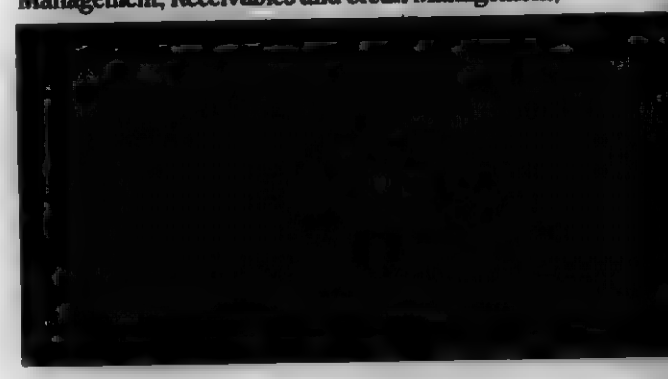
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Tymnet desktop packet switch debuts

BY ELLIS BOOKER
CW STAFF

SAN JOSE, Calif. — British Telcom PLC's acquisition of Tymnet, Inc. from McDonnell Douglas Corp. in November 1989 was capped last week with its introduction of a desktop communications processor.

The new PXL line marks BT Tymnet, Inc.'s final transition away from McDonnell Douglas' Computer Systems Corp. (CSC) as a manufacturer of its products. Guntersville, Ala.-based Comptronix Corp. will build the PXL. For the past 18 months, Comptronix has built BT Tymnet's two high-end communications processors, the Compact XL and Dual Compact XL, in an assembly plant in San Jose.

According to BT Tymnet hardware products manager Jeff Zanardi, the PXL — ranging in price from $7,500 to $12,000 — will be able to compete with fixed-application packet assemblers/disassemblers as well as hardware-configurable processors from Timeplex, Inc. and others.

The software-configurable PXL processor replaces the Micro 3, Micro 4 and Pico Tymnet processors. BT Tymnet said it will support the discontinued lines, which represent about 30% to 35% of its installed base. However, an upgrade policy to the compatible PXL family has not been decided, company officials said.

The base PXL, which will be available next month, comes with two network connections and can be upgraded to a 32-line node. The processor supports up to 32 asynchronous or 16 synchronous devices at 19.2K bit/sec. or eight synchronous devices at speeds of 64K bit/sec.

Network line cards, in increments of four network connections each, can be installed in the single motherboard VME chassis of the PXL. The PXL supports a variety of terminal and host protocols including X.25, asynchronous, 3270 BSC, 3270 SNA, Synchronous Data Link Control and Burroughs.

The PXL is expected to be demonstrated this week at the Communications Network '91 show in Washington, D.C.

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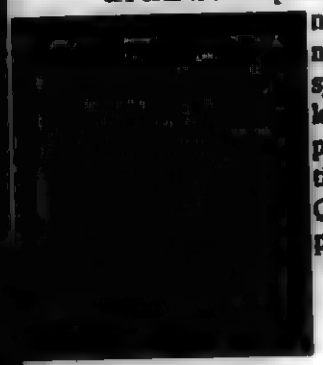
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Hotel

FROM PAGE 47

operations currently run over the Xenix operating system, a flavor of Unix from The Santa Cruz Operation and Microsoft Corp. While the Starserver runs AT&T's Unix System V — another Unix version — "Xenix and Unix System V played together OK in the benchmarks," Fine said. "We've ported over our current applications, which we designed around the Computer Lodging System, and we're passing data."

Fine added that with the installation of Starserver in the back office, the lodging chain will have "better accounting control and a more effective tool for communicating with the properties through plain power and manipulation capability."

She explained that the Starserver will run an Informix Corp. database to enhance those capabilities.

Tough competition

The Starserver was up against competing machines from IBM and NCR Corp., according to Fine. The pending hostile takeover of NCR by AT&T, she acknowledged, had not yet reared its head at the time Fairfield ran its benchmark testing.

Now, she said, "it is a matter of concern for some folks at Marriott because while there are some synergies between the two companies, there are also some differences in the way they handle support and maintenance. We also wonder which equipment will survive."

Fairfield's wide-area communications are handled by the BT Tymnet, Inc. public data network. The chain's Starserver-based reservation system is replacing a three-PC Ethernet local-area network.

Northern

FROM PAGE 47

the needs of its customers, Gonzalez said. The company's decision to sell most of its CPE, including PBXs, through the regional operating companies, had the effect of distancing it from end users, he added.

Nevertheless, Northern does have one clear success in the end-user data networking market, which is now Doss' primary responsibility: the DPN switch, whose sales reached $100 million worldwide last year, Guite said.

That represented about 20% of the worldwide packet switch market, which totaled $489 million last year, according to Vertical Systems Group, a Dedham, Mass.-based research firm.

Furthermore, as a high-end packet switch that serves both value-added network services and high-end users, DPN is collecting an impressive array of Fortune 500 customers.

Both American Airlines and United Parcel Service, Inc. decided within the past couple of years to build their worldwide networking systems on a DPN foundation. Both are in the midst of a gradual rollout of some 100 DPN nodes and report satisfaction with the packet switch's performance and Northern's service and support.

Doss' "direct responsibility" is to develop and implement a strategy to ensure that the DPN product line continues to satisfy such customers. A major element of that strategy, which extends to Northern's central-office products, is to provide users with a "switching fabric and core that will support digital voice all the way through broadband data switching both for central office and CPE," Doss said.

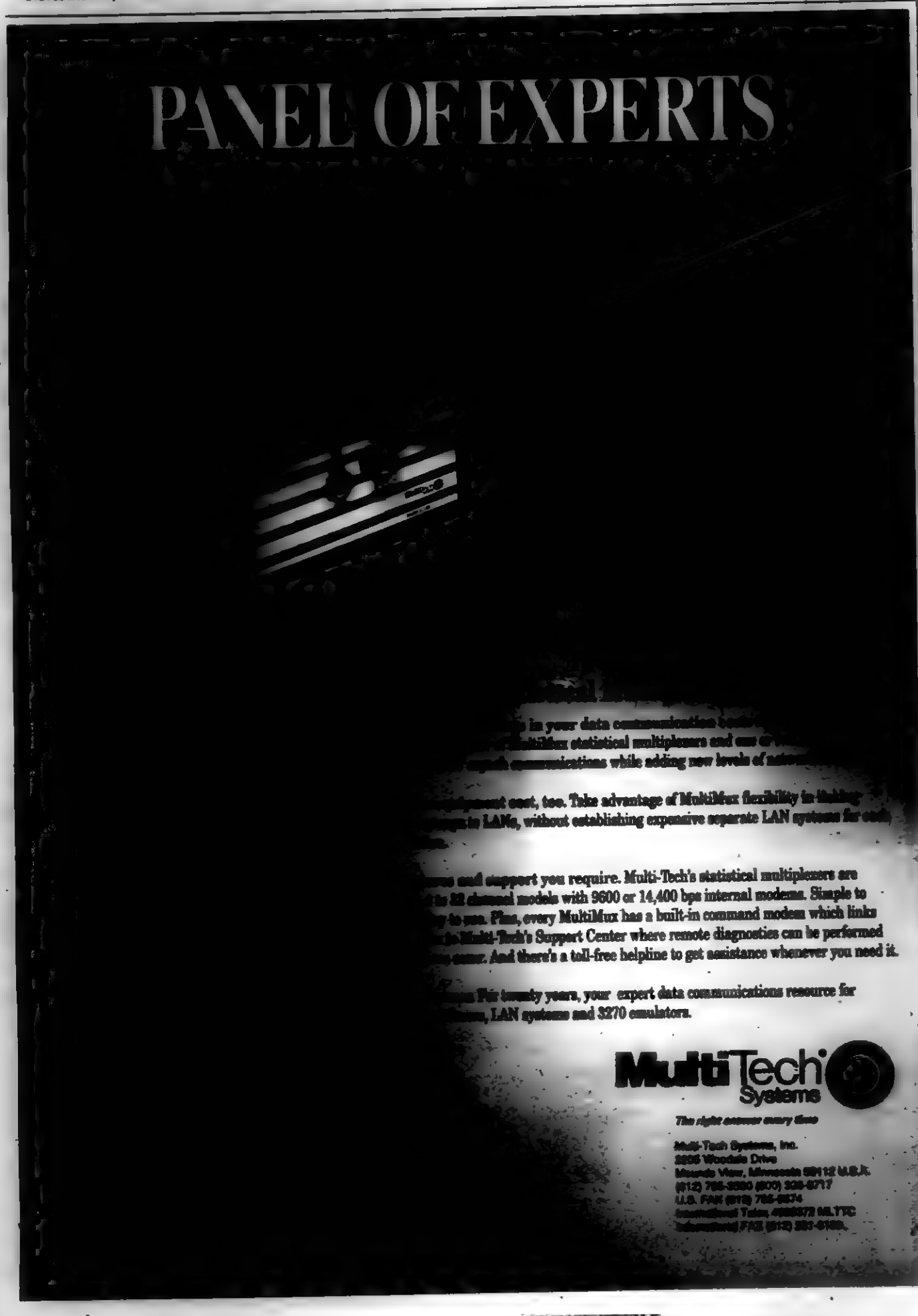
To this end, Northern has been aggressively implementing the latest high-speed technologies, such as Synchronous Optical Network, frame relay and broadband Integrated Services Digital Network (ISDN).

This strategy seems to sit well with large corporate users who appreciate Northern's assurance that their data networking needs will be met.

"We are certainly very interested in seeing Northern pursue technologies such as frame relay and cell switching as well as a continuing policy of ISDN compatibility," said Douglas Fields, manager of telecommunications at UPS.

"We chose DPN because it had the future directions we were looking for and because of Northern's strength as a manufacturer, installer and maintainer," Fields added.

While the sledding has been tough during the past year or two, Northern's lean and mean strategy "will serve it in the long run," Guite said. Indeed, the firm's 1990 revenue bettered its 1989 performance by 11%, setting a new record.



AT&T adds to network line

SCOTTSDALE, Ariz. — AT&T Computer Systems expanded its scope in the internetworking arena earlier this month at the Network Users Group/AT&T meeting.

Among the company's announcements was a 12-port managed multiport repeater that supports 10Base-T local-area networks — 10M bit/sec. local area networks that run over unshielded twisted-pair wiring. The $2,600 wiring concentrator is slated to ship in May and will be available with a $1,200 Simple Network Management Protocol-based network-management module.

The company also announced a token-ring interface, available now, and a frame-relay interface, scheduled to be available in April, for its Starwan family of bridge/routers.

The frame-relay interface — aimed at equipping users with next-generation "fast" packet-switching transmission technology — reportedly conforms to a set of specifications made public in September by Digital Equipment Corp., Cisco Systems, Inc. and Northern Telecom, Inc., to which several other vendors have pledged conformance.

JOANIE M. WEXLER

MANAGER'S JOURNAL

EXECUTIVE TRACK



Richard G. S. Robinson has been promoted to vice president of management information systems at Live Home Video, Inc. in Van Nuys, Calif., which is a subsidiary of Live Entertainment, Inc.

In his new position, Robinson oversees all operational and financial computer systems and office services. He reports directly to David Mount, president and chief executive officer.

Before the promotion, Robinson was the company's director of MIS. He joined Live Home Video in 1989 after a stint as an independent consultant.

He was the director of MIS at Symbolics, Inc. until 1989.

.....

Michael A. Studney has been named director of MIS for the automotive, specialty products and marine divisions of Castrol, Inc. in Wayne, N.J.

Studney was most recently director of technology planning at the Schering Laboratories division of Schering-Plough, Inc., where he had been employed for 15 years.

Studney's positions at Schering-Plough included acting vice president of MIS, director of information services, director of information processing facilities, manager of support services and manager of technical services.

Before joining Schering-Plough in 1975, Studney spent six years in IS positions at Western Electric Co. He holds a bachelor's degree from Youngstown State University in Ohio.

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Emergency care gets a shot in the arm

Hospitals are using technology to improve response in critical situations

INDUSTRY

BY CHRISTINE CASATELLI
SPECIAL TO CW



Emergency health care is one service that many people cannot live without. Yet most hospital emergency departments have traditionally operated in the red.

Why? Because they are often unable to track costs during urgent care, and they have a mandate to treat all patients who pass through their doors regardless of their ability to pay the bill. In 1989, nearly 90 million patients throughout the country went to hospital emergency departments.

To remedy the situation, budget-conscious emergency departments are turning to technology to help them operate as efficiently as possible and keep expenditures down. Staff shortages, fixed-scale reimbursement and competition from alternative health-care providers for quality medical personnel and paging business are also forcing hospitals to rejuvenate the efficiency of their emergency departments.

"The focus has changed to managing hospitals more as businesses," says Ijaz Bokhari, director of management engineering at Alexandria Hospital in Alexandria, Va.

Emergency departments, for their part, can play an integral role in that business. They have the potential to generate as much as 40% of a hospital's revenue in inpatient referrals, says Keith L. Goding, vice president at Spectrum Emergency Care, a St. Louis provider of emergency physician and management contract services.

However, finding the information systems that emergency departments need is no easy task because of the nature of the emergency room — erratic work flow and fast turnaround of patients. Most off-the-shelf packages targeting emergency patient tracking, documentation and staffing are still in test phases. So, many hospitals have found themselves acting as test sites or developing their own systems to get what they need.

Focus on patients

With more than 160 emergency patients to care for each day, St. Elizabeth Hospital in Beaumont, Texas, needed to help staff members spend more time on people and less time on paperwork, says Dr. Charles Owen, the physician director of the emergency department at St. Elizabeth.

For four years, the hospital has been

Continued on page 54

Insurance firm comes home to better systems

BY CLINTON WILDER
CW STAFF

The challenge of making information technology a strategic resource is one thing, but when Thomas Gaughan arrived at The Home Insurance Cos. in New York 13 months ago, he faced a more urgent need. The company's systems were running out of gas.



Gaughan focuses on strategic IS at Home Insurance

Gaughan quickly began working to solve that problem, replacing an IBM 3084 mainframe with a 3090 Model 400E, installing 15 Application System/400s in Home's branch offices to displace System/36s and bringing in seven Novell, Inc. local-area networks to link disparate personal computers. "That was the immediate priority," Gaughan said.

Gaughan, Home's senior vice president and chief information officer, can now concentrate on more strategic information systems initiatives that began last year. That is a big challenge for the veteran executive, who spent most of the 1980s heading IS at Primerica Corp. and its previous incarnation, American Can Co.

"Like many insurance companies, [Home] had many embedded systems from the 1970s and early 1980s," Gaughan said. "We were information-rich and access-poor. There hasn't been an integrated approach linking the process flows to a strategy. It has just been passing information back and forth."

The cornerstone of Gaughan's strategy to help re-engineer Home's $2.5 billion property and casualty insurance business is the development of a LAN-based "claims workstation." The project's goal is to give professionals in the firm's 30 branches throughout the U.S. access to data residing in all three tiers of the information architecture and to automate many of the functions currently done manually.

The system's business goals are to reduce paperwork, improve customer service and increase productivity in the branch offices. Using a natural language front end, branch officers will be able to access Home's core IMS-based claims database and information residing on the branch AS/400 and LAN.

"Our objective is to really exploit the connectivity," Gaughan said.

The firm developed a demonstration prototype workstation last year and has plans for a full-production prototype this year and fully operational workstations in all of the company's branch offices by 1992.

Emergency

CONTINUED FROM PAGE 53

a test site for Clinical Resource Systems Inc.'s Emstat, an emergency department clinical information and patient tracking system that records data at networked workstations as patients move through different phases of their treatment. It runs on Hewlett-Packard Co. Series 9000 computers using touch screens.

"We're anticipating a return on investment within 18 to 24 months," Owen says. The greatest return of all, however, has been that emergency patients spend only an average of 25 to 30 minutes in the department.

Fast and friendly

Quick, caring service is also important at Cedars-Sinai Medical Center in Los Angeles. Cedars-Sinai uses an on-line interactive information system to admit emergency patients swiftly so treatment can begin at once, says Ash Dave, vice president of information systems and chief information officer at Cedars-Sinai.

The Cedars-Sinai emergency department system was developed in-house as part of the hospital's integrated IBM and Digital Equipment Corp.-based information system. The system, whose interface is a light pen, also contains indexes on poisons, drugs and procedures on-line for instant answers to life-threatening questions. The emergency room component can tap the hospital's administrative database, so staff members have access to 750,000 patient records.

The information system also keeps track of the bottom line for the busy emergency staff. When a test is ordered, the system automatically generates a charge and computes the bill. Dave estimates that as a result of this compatibility, the hospital is recouping roughly 10% more on expenditures than in the past.

Such bottom-line benefits are important in terms of investment justifications. "It's increasing difficult to justify the cost [of return] of emergency department information systems," says Frank Cavanaugh, national director for health care information systems at Coopers & Lybrand in Chicago. The challenge for IS chiefs is to combine quality of patient care with income enhancements.

One way hospitals are tying together patient care and economics is by zeroing in on illegible, incomplete and erroneous paperwork. By improving this, emergency departments can make quantifiable gains in patient care and profits, emergency room managers say. Coding estimates that hospital collection rates of only 50% are not uncommon.

"For reimbursement purposes, for legal purposes, for accreditation purposes, the documentation in the emergency room is becoming more critical," says Larry Pawola, vice president at Sheldon I. Dorenfest & Associates, a health care IS consulting firm in Chicago.

Documentation, which generally takes the form of requisition slips, hospital forms and staff notes, is now being replaced with electronic files that can be transferred among departments.

The emergency care staff at Lakeview Hospital, a 200-bed health care facility in Bountiful, Utah, was feeling the weight of growing documentation requirements.

In 1989, Lakeview, which sees 20,000 emergency patients yearly, became a test site for Dictaform software developed by Dr. Robert Rothfeder and Dr. Dennis Wyman, Lakeview emergency physicians.

Rothfeder describes Dictaform as a word processing program that prompts doctors with a series of categories to help them document a patient visit. Each category must be completed using a keyboard before the user can move to the next screen, which makes the medical report more thorough and legible.

Dictaform runs on one Intel Corp. 80386- and one I486-based IBM Personal Computer. Because the software can log more data on treatment and tests, Lakeview has been able to recover more reimbursable charges and has noted a 21% increase in gross emergency room revenue during the six months of its operation, Rothfeder says.

Increasingly, legal liability is as much of an issue as profitability. Illegible or incomplete reports can be a problem if hospitals are hit with malpractice suits.

Dr. Robert Rosen, director of emergency medicine at Riverview Medical Center in Red Bank, N.J., opted for a voice-activated medical reporting system called Voice Em. The system allows physicians to dictate trigger phrases into a telephone handset to generate emergency department patient records.

On order

If IS managers at hospitals could get the perfect emergency department system, here is what they say they would want:

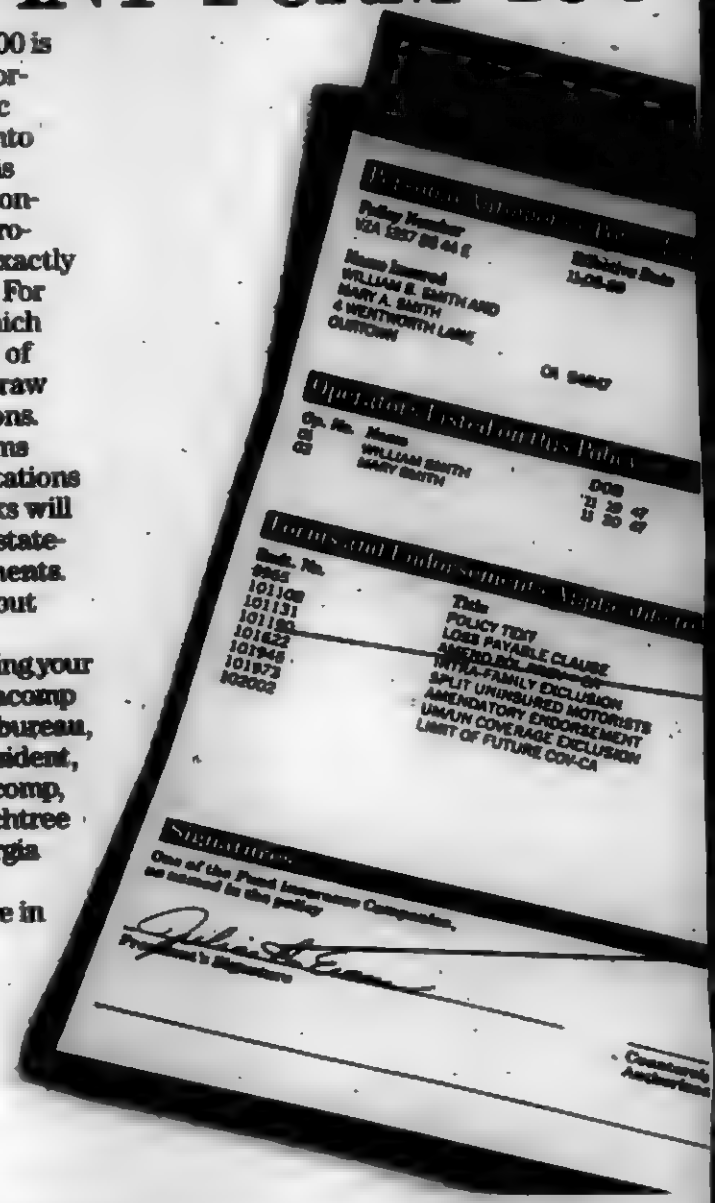
- More emergency-department-specific systems.
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Developed by Kurzweil Applied Intelligence, Inc. in Waltham, Mass., Voice Em uses voice recognition technology to skip traditional tape transcription and prepare clean reports faster. Voice Em's knowledge base contains more than 100 common words and phrases specific to emergency medicine. Physicians recite key words such as "chest pain" to activate the voice-to-text technology.

Riverview, whose emergency room deals with 35,000 patients annually, spent roughly $50,000 for the two stand-alone Voice Em desktop systems it put in place in 1989. Each package runs on a stand-alone HP Vectra 386 personal computer.

Because the voice system helped 492-bed Riverview avoid hiring two transcribers — at approximately $25,000 each per year — Rosen estimates the system's return on investment to be less than one year. Also, "if it prevents one lawsuit, then it more than pays for itself," he says.

In fact, says the American College of Emergency Physicians' Massachusetts chapter, a doctor using voice-activated systems in one of the state's emergency rooms may save $2,400 in annual malpractice premiums.

Staff troubles

To provide the kind of care that emergency departments demand, IS managers have begun the search for systems to help personnel who are stretched to their limits because of staff shortages.

That's why Alexandria Hospital is looking to implement an emergency system soon.

Despite hefty costs associated with putting in an emergency room system — projected to be as much as $300,000 — Bokhari estimates that the system will pay for itself in one year in recovered charges and staff costs. According to a 1990 study by the hospital, it would take staffers one-third the time to review an electronic patient chart than it would to review a written one because the former would be more complete and legible. Furthermore, the study found, automation would save eight hours of nursing time each day, which translates to one full-time nurse earning $50,000 per year.



St. Elizabeth Hospital's *emergency staff can track patient progress with touch screens*

By matching the number of staff members to the predicted work load, emergency departments can also determine staffing needs with more accuracy. For two years, administrators at Northwest Hospital in Seattle have been using a decision-support tool called Emerge to match staffing levels with patient populations in its emergency department. A product of Medicus Systems Corp. in Evanston, Ill., Emerge runs on an IBM mainframe or PCs.

"The system can tell you what the case mix is, and it's able to determine at what time of day the most severe cases appear," says Edie Gamble, head nurse manager at Northwest. "By mixing up the hours, you make sure you have the most staff on when you're the busiest," she says.

Northwest is gearing up to use Emerge to charge according to patient type and the amount of nursing time required. In the weighted scale, a patient with a sprained ankle would be billed less than another patient who had a severe laceration because the former would take less time to treat.

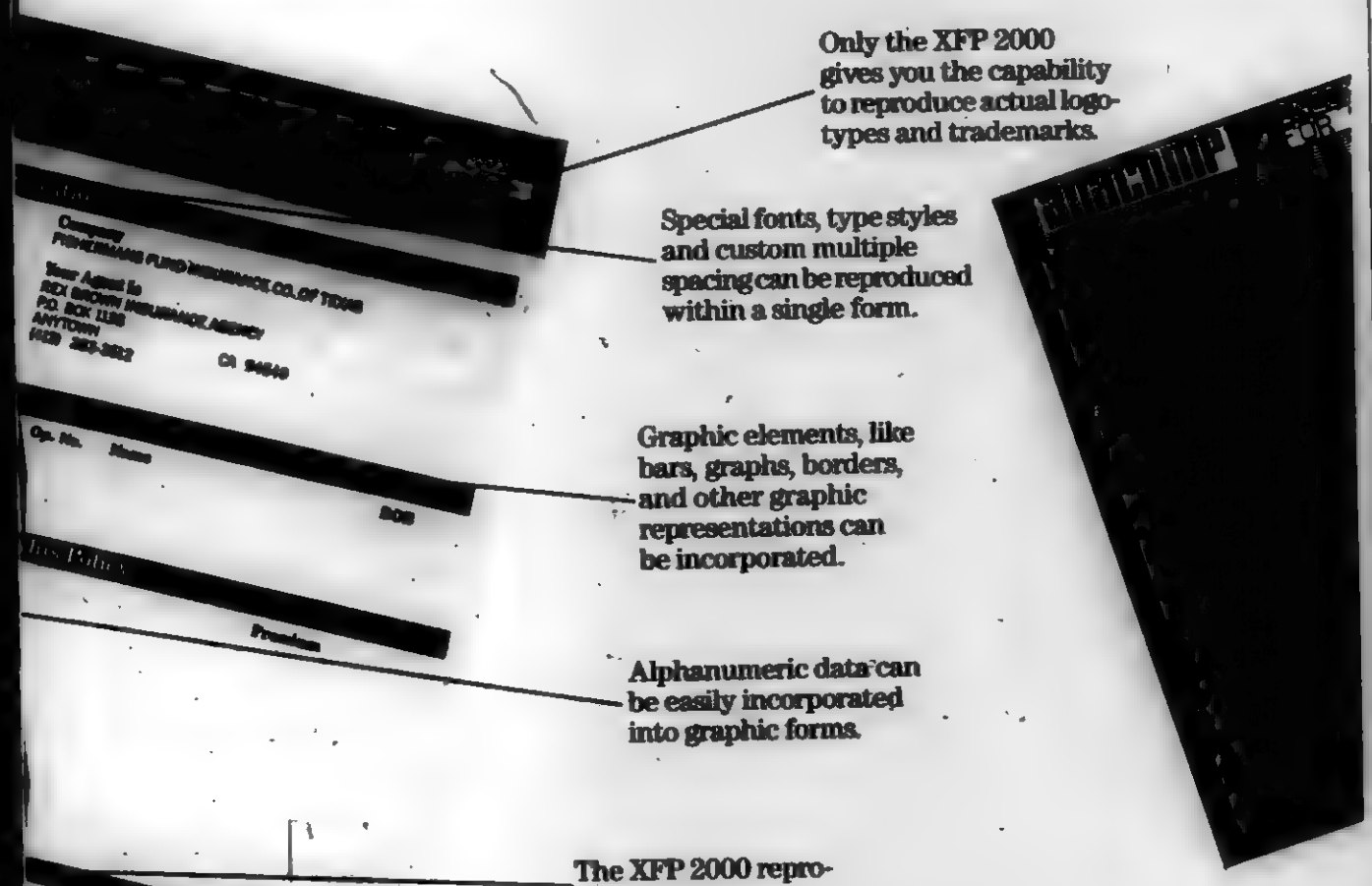
Costello is a free-lance writer based in Washington, D.C.

Help, stat!

The following trends are driving the need for emergency department automation, according to Keith Goding, vice president of Spectrum Emergency Care, a contract emergency department personnel company:

- Volume of visits per year is rising. Numbers have risen from 83 million in 1981 to slightly less than 90 million in 1989.
- Increase in acuity. Emergency departments are seeing more acquired immune deficiency syndrome, drug and violent crime cases in high-volume urban areas.
- Poor collection rates. Although each hospital is different, it is not unusual to find some institutions with collection rates of 50% or less.
- Getting the most out of emergency rooms. Emergency rooms can contribute nearly 40% of revenue because many emergency room outpatients eventually become hospital inpatients. Faster, more personal service bolsters the hospital's reputation, attracting patients and quality staff.

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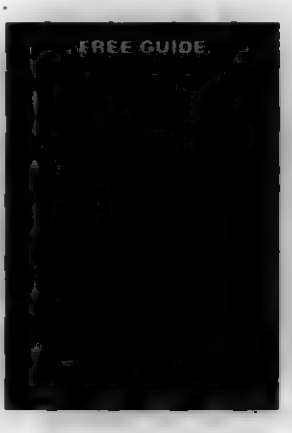
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NETWORK CONNECTORS

Don't let standards tangle traffic patterns

BY ERIC ANDREWS

Rotaries, five-corner traffic lights and one-way streets can be easily negotiated — once you know and can follow their rules. In order to avoid snarled traffic on local-area networks interconnected with bridges and routers, it is just as crucial for you to understand the various standards and protocols to which these devices adhere.

Internetworking devices today combine bridging and routing functionality (see story page 59). To keep the purchase issues simple, it is best to focus not on the label but on the functionality of the device, including how it supports multiple protocols and incompatible bridging and routing standards and how it provides integrated network management.

The biggest distinction between bridges and routers is that bridging devices can connect LANs regardless of which upper-layer protocol the LAN supports, be it Novell, Inc.'s Netware or Transmission Control Protocol/Internet Protocol (TCP/IP).

Routing devices, on the other hand, support these upper-layer protocols and connect only LANs of similar protocols.

To address this limitation, many routers have added support for a variety of protocols, terming their products "multiprotocol routers." Some vendors have added bridging capabilities for those protocols that are not supported. While supporting user protocols is important, issues that often evade users are the incompatible internal protocols used by bridges and routers.

In connecting any LANs, bridges and routers need to talk to each other to ensure they can deliver packets to their proper destination. Standards have developed for this "internal" communication; unfortunately, they are incompatible.



Mark Fisher

For bridges, the prevalent standards are Spanning Tree and source routing. Spanning Tree, which is incorporated into the Institute of Electrical and Electronics Engineers, Inc.'s (IEEE) Transparent Bridging standard, is used in most Ethernet environments, while source routing is an IBM strategy used primarily in Token-Ring environments. With source routing, the originating node participates in finding the path to the eventual destination, whereas Spanning Tree puts that burden on the bridge.

Although IBM nodes will probably never communicate with non-IBM nodes, these incompatible standards prevent even the use of a common LAN internetwork to simultaneously support both environments. This is primarily an issue in token-ring environments supporting IBM and non-IBM devices and also in bridging Ethernet and token-ring environments. Many token-ring bridge vendors have begun supporting Spanning Tree, including Vitalink Communications Corp. and Crosscomm Corp.

Andrew Corp. and IBM bridges, on the other hand, have chosen to stick with source routing. Token-ring bridge vendor Halley Systems, Inc. uses a proprietary source-routing encapsulation technique for nonsource-routed traffic, thereby supporting both environments.

These approaches may soon be made obsolete by a bridging method under review by the IEEE — Source Routing Transparent (SRT), which will allow bridges to forward both source-routing and Spanning Tree bridging frames.

While the standard is about six months from being approved, Crosscomm has already released a token-ring bridge based on this standard, and most token-ring bridge vendors intend to support it.

Beware the expense

There are some caveats surrounding SRT, however. While upgrading Spanning Tree bridges to SRT will be a simple software upgrade, upgrading source-routing bridges will involve hardware upgrades as well, costing $1,000 to $2,000 per bridge. Furthermore, SRT bridges will not interoperate with older source-routing bridges.

SRT is only a partial solution, however, for bridging Ethernet to token-ring. In addition to handling source routing and Spanning Tree, bridging devices must also convert between different frame formats.

Products that address this issue include IBM's 8209 bridge, Ungermann-Bass, Inc.'s Net Access and Crosscomm's ILAN-H. While these products currently use proprietary algorithms, they need to support SRT to become truly useful in a mixed environment.

As in the bridging world, routers need to communicate with each other via standard protocols that play a critical role in

Continued on page 58

Andrews is a manager at the Network Strategies practice of Ernst & Young in Vienna, Va.

INSIDE

Blurry Vision Bridge, router similarities extend into price, performance. Page 59.

Buyers' Scorecard Users choose Attachmate as favorite SNA gateway. Page 62.

Product Guide A comprehensive list of electronic-mail gateways. Page 65.

Continued from page 57

the overall performance, bandwidth efficiency and network control capabilities of the router.

The current industry standard is the TCP/IP's Routing Information Protocol (RIP). Because of limitations in RIP, however, vendors such as Cisco Systems, Inc. have developed their own versions of this protocol.

Link-state protocols on the way

An exciting new breed of standards is arriving, however, that significantly improves performance and efficiency: TCP/IP's Open Shortest Path First (OSPF), Open Systems Interconnect's (OSI) IS-IS and Digital Equipment Corp.'s Integrated IS-IS.

These three protocols — called "link-state protocols" — use a more sophisticated algorithm than RIP and IGRP, which are "distance-vector protocols."

The link-state protocols require significantly less overhead because they require less routing information to be transmitted less frequently between routers. They also enable networks to converge much faster, reducing the time it takes for all the routers in a network to dynamically adapt to network configuration changes. (Such delays can lead to randomly lost packets.) The newer breed has also added network control features.

It has yet to be determined how these new protocols will position themselves in the marketplace. OSI's IS-IS is the fledgling international standard, but a significant installed base of routers need to support TCP/IP.

DEC's protocol is a version of OSI's IS-IS that incorporates support for TCP/IP, whereas OSPF is designed specifically for TCP/IP.

Most router vendors have announced support for OSPF and IS-IS, whereas support for Integrated IS-IS is limited to DEC and Wellfleet Communications, Inc.

BRIDGES & ROUTERS

Most router and smart-hub vendors, as well as some bridge vendors, have rallied around the latest standard for network management: TCP/IP's Simple Network Management Protocol (SNMP). This standard allows a single network management control station to manage a campuswide or enterprisewide LAN internetwork architecture.

Users have to be careful, however, when purchasing "SNMP-compliant" products. It is easy to claim SNMP compliance, but to be useful, vendors must incorporate proprietary characteristics of the interconnect devices. These characteristics are handled by proprietary Management Information Base (MIB) extensions. Purchasers need to ensure that the SNMP workstation they are considering supports the standard as well as proprietary MIB items for all of their SNMP bridges, routers and wiring hubs.

The benefits of LAN internetworking are plentiful. Properly built, they can provide users with access to and management of a broad range of computing resources from a single workstation or personal computer. It is not so easy, however, to select the necessary equipment and then configure and manage it.

Certainly, you can't depend on the traditional definitions of bridge and router. Instead, users must define and weigh functional requirements for protocol support as well as standards compliance and network manageability. •

Solving issues on remote links

When it comes to connecting local-area networks over remote links, a new set of issues appears. Because remote links are typically slower, more expensive and less reliable than LANs, the bridging or routing protocol must be extremely bandwidth-efficient and robust.

Newer router protocols were designed to accommodate the characteristics of remote links, allowing load sharing across redundant links and limiting overhead. However, bridging protocols are not. Consequently, remote bridges — offered by Cryptall Communications Corp., Halley Systems, Inc., Microcom, Inc., RAD Data Communications, Inc., 3Com Corp. and Vitalink Communications Corp. — are different than local bridges.

These typically come in pairs and are used to connect two LANs over a point-to-point circuit. While they maintain the appropriate bridging protocol on the LAN interface, they use proprietary protocols over the wide-area network link.

These proprietary protocols add features such as load sharing across redundant links, intelligent routing of the Open Systems Interconnect Data Link Layer address, data compression, multiplexing, alternate routing and autodial backup.

It is unlikely that these proprietary protocols between bridges will be standardized, although the Institute of Electrical and Electronics Engineers, Inc. is looking into standardizing communications between clusters of remote bridges from different vendors.

Another protocol intended for remote LAN linkage is frame relay, which packetizes data more efficiently over a WAN [CW, Dec 3]. Advanced Computer Communications, Inc., Cisco Systems, Inc., Digital Equipment Corp., Proteon, Inc., RAD, 3Com, Vitalink and Wellfleet Communications, Inc. have announced support for the standard. •

ERIC ANDREWS



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Is it a bridge or a router? Increasingly, it's both

The bridge/router duo has officially extended its membership, as witnessed by the many combinations bearing a resemblance to the original names.

The essential differences among the available products include the following:

- **Bridges** work at the Data Link Layer of the Open Systems Interconnect model to pass data to another local-area network. They are best used on a small number of LANs with limited complexity.
- **Brouters** are bridges that offer intelligent routing based on the Data Link Layer address.
- **Routers** work at the next level — the Network Layer — to address and forward packets of data.
- **Hybrid bridge/routers** bridge unsupported protocols, making them appear as "protocol-transparent" as the simpler devices. Advanced Computer Communications, Inc., Cisco Systems, Inc. and Wellfleet Communications, Inc. offer this feature on their routers.
- **Multiprotocol routers** route several protocols at the Network Layer. Most vendors are moving to announce these products.

The overlap between bridges and routers extends into price and performance. While routers are considered slower than bridges, improvements in hardware architecture have enabled them to achieve performance comparable to bridges.

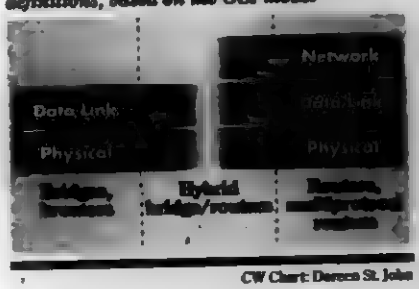
Performance for both devices is measured by filtering and forwarding rates measured in packets per second. These rates are only meaningful if you know the packet size used for the measurement — in fact, that is one of the ways vendors skew their performance specifications.

Because of price slashing, routers have started to compete in price with high-end bridges. In addition to knowing the sticker price on both devices, however, be sure to understand the configuration you will require — number of cards and adapters, network management costs and the indirect costs of efficiency over expensive wide-area network links. •

ERIC ANDREWS

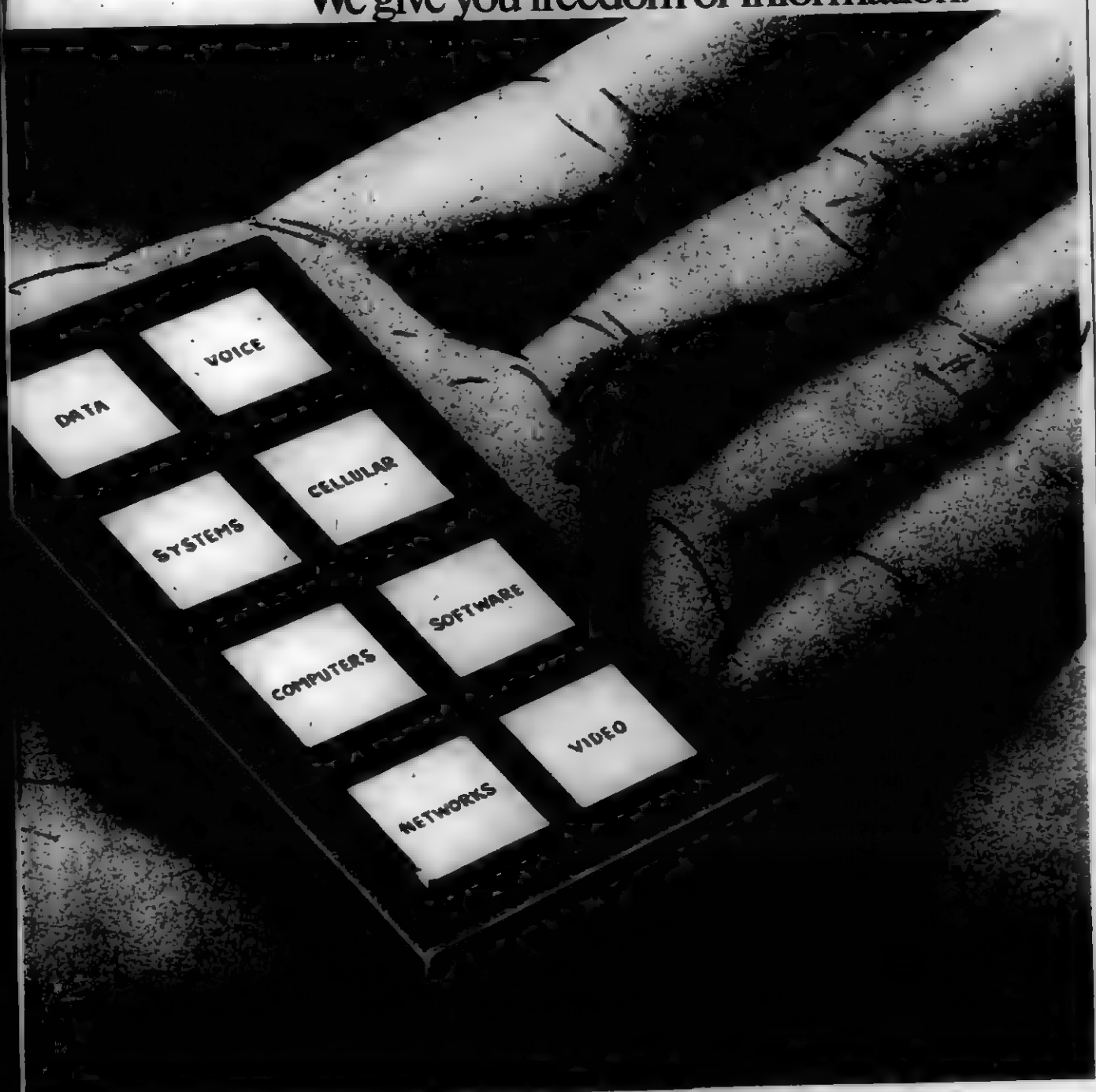
Throw out the rulebook

Vendors have added routing functionality to bridges and vice-versa, blurring traditional definitions, based on the OSI model



CW Chart: Doreen St. John

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In progress

Vendors are responding in a number of ways to user requests for faster and more reliable connections between local-area networks as well as communications between incompatible network platforms.

- **Switched Multimegabit Data Service (SMDS).** SMDS allows private network users to communicate over public packet-switched lines. Most major manufacturers are considering SMDS support, although Advanced Computer Communications, Inc. is one of the few to announce such support on its Series 4000 bridges/routers.
- **PU2.1.** This IBM protocol will allow devices such as Application System/400s already connected on a Systems Network Architecture (SNA) backbone to communicate directly with each other without going through the SNA host.

While PU2.1 is the topic of much discussion among bridge and router vendors, none have made concrete announcements of delivery dates for supporting the protocol.

Cisco Systems, Inc. plans to add a software feature called Synchronous Data Link Control Transport to all of its routers in mid-1991. Proteon, Inc. will offer a similar feature on its Pronet CNX 500 router.

- **Communications functionality.** Vendors point to an overall industry trend of integrating as many hardware functions as possible into internetworking products.

For example, Network Equipment Technologies, Inc. plans a Communications Network '91 demonstration of a bridge/router that will be included within a T1 multiplexer, yielding a "hybrid multiplexer" able to perform circuit- and packet-switching functions, depending on the software inserted.

Cisco has announced the addition of Layer Seven protocol translation to its low-end IGS router. Advanced Computer Communications is considering integrating modems into bridges and routers.

DEREK SLATER

Slater is a *Computerworld* staff member.

Gateways aren't the only way to get PCs and hosts talking

BY SIDHU BANARJEE

Bridges and routers are fine for getting data to the right place across diverse local-area networks. But for personal computers on the LAN to share data in a meaningful way with other PCs, servers or hosts on another network, you need to consider two alternatives: gateways or a native-mode interoperability strategy.

Banerjee is a manager at the Network Strategies practice of Ernst & Young in Vienna, Va.

Gateways serve as interpreters between incompatible devices. The basic strategy requires terminal or workstation emulation software to reside on the PC. The emulation data is formatted by gateway software into a host network and session-level protocol and then encapsulated into packets for transmission over the LAN.

At the gateway device, the host data is separated and further formatted, and the resultant host-protocol traffic is transmitted to the host.

A native-mode strategy alleviates the need for encapsulation. Instead, it allows the machines to agree on a set of protocols and application interfaces supported directly on the LAN.

At first glance, gateways provide a lower level of service and functionality, but the benefit of gateways is that they provide a straightforward means of PC-to-host connectivity without major revisions to host or PC software.

Furthermore, application functionality is not affected by the gateway. Host security is also increased because users must pass through both LAN and host security measures before gaining access.

However, these devices are infamous for causing bottlenecks. Performance problems can be alleviated by choosing a gateway that works on a high-performance server rather than on a PC.

Other performance factors must be addressed when implementing gateways. Gateway buffer sizes should be set according to network speeds to avoid performance degradation. Timing parameters should be set according to the network environment to avoid excessive retransmits or retransmit time-outs.

Network management, while never simple, can be twice as difficult with gateways. They do not adequately support either LAN management systems or host management systems.

Another problem with gateways is interoperability. Gateway software in the PC and the gateway device are vendor-specific and cannot be mixed and matched.

GATEWAYS

While Transmission Control Protocol/Internet Protocol (TCP/IP) emulation packages recognize most common TCP/IP applications, not all packages support the same implementations.

Native-mode strategies such as Novell, Inc.'s LAN Workplace for DOS or OS/2, 3Com Corp.'s Demand Protocol Architecture and products from IBM and Attachmate Corp. hold some appeal over gateways.

These solutions augment LAN operating system protocols and traditional host protocols such as Systems Network Architecture or TCP/IP, and they provide feature-rich protocols and applications interfaces for PC and host connectivity.

This alternative is not without a price, however, both in cash and system resources. IBM versions require controllers and front-end processors, which are more expensive than PC gateways. Also, software for native-mode protocol drivers requires additional PC memory.

There is an availability problem as well. Only a handful of software products provide direct TCP/IP PC-to-host connectivity and full coexistence with other LAN protocols. Over time, more of these will become available, however, and native-mode strategies address many gateway limitations, including the following:

- **Increased throughput.** There is no need for encapsulation or analysis of LAN packets, so speed is increased.
- **IBM LU6.2 PC connectivity.** This protocol provides a platform for distributed processing and emerging client/server applications. IBM Personal Computer-platform gateways do not generally support LU6.2 connectivity.
- **Network management.** Because bridges and routers can replace gateways in a native-mode strategy, greater integration with host resources and management systems can be achieved.

As with gateway devices, device tuning and performance parameter setting can require effort. This task is made easier, however, with the increased control and management functions available with routers and bridges.

The decision to connect LAN-based PCs with a host computer via gateways or a native-mode solution depends on a number of factors, including how much money you have to spend, the size of your network, network management needs, performance requirements, existing equipment and product availability. ●

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HOW AVATAR SEES IT.

When it comes to system integration, you don't have to treat the Mac differently than any other device on your network. Introducing the MacMainFrame Series, the broadest range of Macintosh-to-mainframe connectivity options available.

MORE CHOICES. MORE SOLUTIONS.

Now, in an integrated set of solutions, local or remote Mac users in Token Ring, SDLC or coax environments can tap centralized information to make every Mac user's desktop more powerful.

MacMainFrame distributes terminal emulation, file transfer, printer emulation and mainframe graphics across a wide variety of networking schemes.

Since it's fully AppleTalk compatible, EtherTalk, TokenTalk and LocalTalk networks are part of the solution, too.

For customization, there's Avatar's Programmer's Toolkit, a full range of Applications Programming Interface (API) tools. For example, Avatar's Hypercard API has been used to develop a front end system to PROFS, IBM's electronic mail system.

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Unlike some Mac-to-mainframe connections, MacMainFrame enhances the benefits of the Macintosh user experience.

Since MacMainFrame is completely IBM 3270 compatible, it has no impact on normal mainframe operations. The result? An integrated working environment that increases productivity and reduces headaches.

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With eight years of experience, Avatar offers something beyond products and technology. It's called responsiveness. You see, as the 3270 connectivity specialists, we have helped to integrate Macintosh computers and PC printers into many different environments. Which means we can do the same for you. With a single integrated set of solutions for Token Ring, SDLC, and coax, both standalone and via gateway.

To find out how, call this number toll free at

1-800-289-2526.

You'll find that we understand Macintosh-to-mainframe connectivity like no one else. So as your network options continue to grow, Avatar can help you see the forest through the trees.

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BUYERS' SCORECARD

Extra! tops LAN SNA gateway ratings

LAN Gateways to SNA

Scores reflect all criteria and their user-assigned importance
Response base: 50 per product set, except Irmalan (37)

Product	Three highest ratings	Three lowest ratings
Attachmate's Extra! SCORE 57	User configuration options Terminal and printer emulation Protocol compatibility	Network management capability Cost per workstation Efficient use of memory
Digital Communications Associates' Irmalan SCORE 56	Reliability Ease of use Terminal and printer emulation	Network management capability Efficient use of memory Gateway configuration options
Novell's Netware SNA Gateway SCORE 55	Ease of use Reasonable line speed Reliability	Efficient use of memory Network management capability Service and support
IBM's Personal Communications 3270 & OS/2 Extended Edition SCORE 53	Reliability Reasonable line speed Protocol compatibility	Cost per workstation Network management capability Efficient use of memory

BY MICHAEL L. SULLIVAN-TRAINOR
CW Staff

The latest technology isn't everything. That's what buyers of local-area network gateways seem to be saying in *Computerworld*'s Buyers' Scorecard on LAN Systems Network Architecture (SNA) gateways. The 187 gateway users surveyed did not rate the products with the most advanced features highest. Instead, Attachmate Corp.'s Extra! — which does not support hot options such as LU6.2 — received the highest score.

Extra! came out on top in a close race, scoring 57 points — only one more than Digital Communications Associates, Inc.'s (DCA) Irmalan and two more than Novell, Inc.'s Netware SNA Gateway. Trailing the top three products was IBM's Personal Communications 3270 for DOS and OS/2 Extended Edition, with a combined score of 53.

The scores are based on totals from 50 users of each product, except for DCA's Irmalan, which had 37 respondents. IBM product ratings are based on responses from 39 users of PC 3270 and 11 users of OS/2 Extended Edition gateway features. Respondents were asked to rate only the products they use. Final scores were calculated by multiplying the individual product group ratings by the importance ratings that all 187 users assigned to all criteria. Only gateway products that link LANs to IBM's SNA were covered (see methodology page 63).

Bellevue, Wash.-based Attachmate is known for its full-featured 3270 products. User ratings bear out this perception by giving Extra! top scores in seven of the 13 criteria, including scores of eight or better (based on a scale of one to 10, where 10 is excellent) in a list of *significant gateway features*: ease of use, response time, service and support, terminal and printer emulation, protocol compatibility and user configuration options.

Extra!'s weaknesses were also revealed in the lowest rating for network management capability (6.1) and second lowest in cost per workstation (6.3).

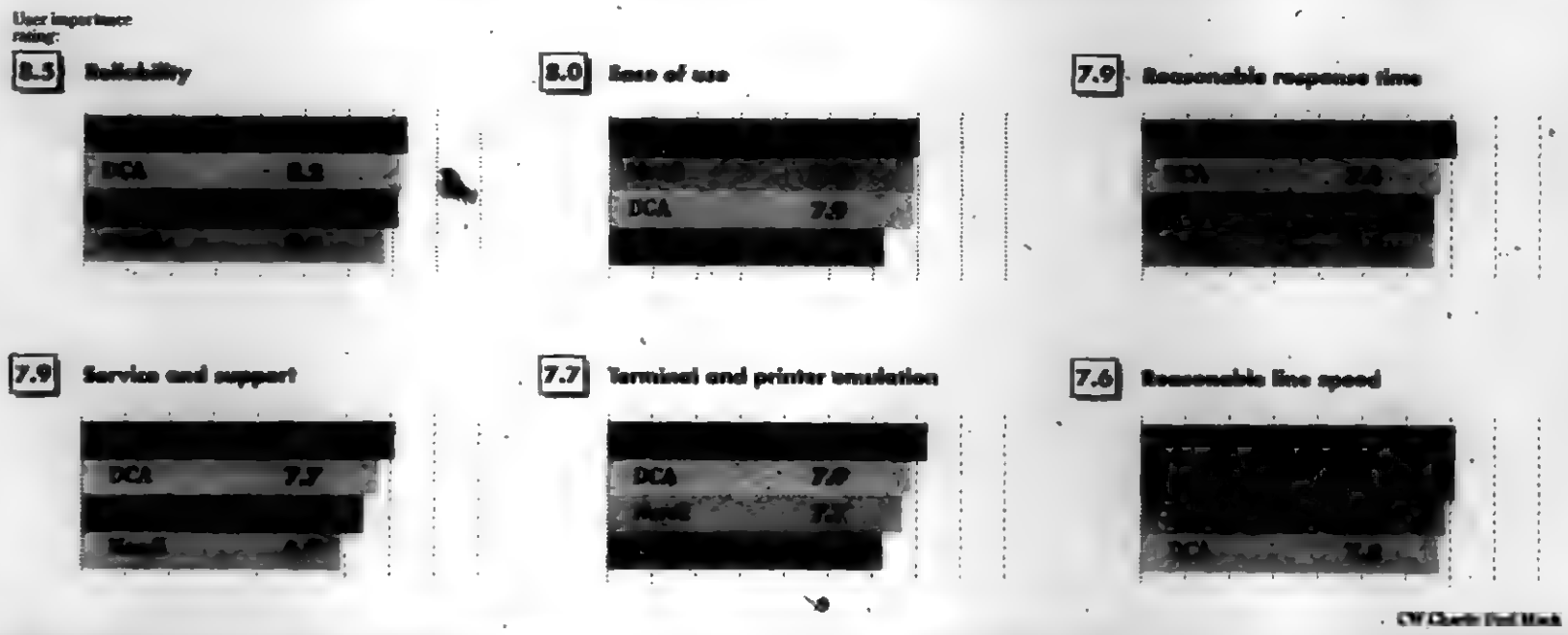
Scoring second highest among the four products was DCA's Irmalan, which has been in use for several years at many DOS-based gateway installations. Irmalan topped the cost per workstation and ease of installation categories with scores of 7.7. The product also received the second highest ratings in key areas such as reliability (8.2) and emulation (7.9).

LAN leader Novell provides an SNA gateway capability for its Netware network operating systems customers. Users gave the product the third best score (55) and rated it highest in network management capability (6.4). The Netware SNA Gateway also finished second in ease of use and cost per workstation. However, users placed the product last in reliability and protocol compatibility.

The owner of the SNA side of the network, IBM finished last (53) with its pair of gateway products, OS/2 Extended Edition and PC 3270, but not without topping the most critical category for users, reliability, with an 8.3 rating. However, seven last-place finishes reveal weaknesses in areas such as cost per workstation (5.6, the lowest rating for any category), ease of use and terminal and printer emulation. ●

KEY RATINGS

IBM's products receive the highest rating in the category most important to gateway users – reliability. Attachmate's Extra! places third in that category but tops the four categories that follow in terms of user-assigned importance



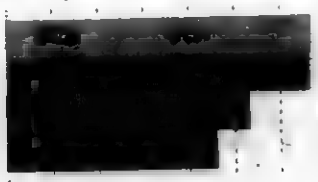
CW Chart: Paul Black

A CLOSER LOOK

In the remaining ratings, Novell, Inc.'s Netware SNA Gateway receives the highest rating for network management capability. DCA tops two categories – cost per workstation and ease of installation. Attachmate again achieves the top score in four categories – protocol compatibility, efficient use of random-access memory, gateway and user configuration options. IBM's PC 3270 and OS/2 Extended score lowest in all remaining categories, except third-place ratings in protocol compatibility and network management.

User importance rating:

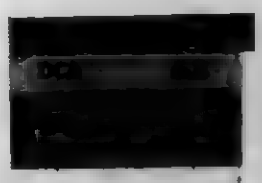
7.3 Cost per workstation



7.2 Efficient use of RAM



7.1 Network management capability



6.9 Ease of installation



6.7 User configuration options



6.6 Gateway configuration options



7.6 Protocol compatibility



Loyalties

How likely would you be to purchase this product again if you were making the decision today?

(Reasons based on most frequently stated responses)

Attachmate's Extra!

Response base: 50



Likely
The reason:
It works/service and support

Unlikely
The reason:
Incompatibility with other network operating systems

Number of respondents

DCA's Irmalan

Response base: 37



Likely
The reason:
Works well/ reliability

2 – Unlikely
The reason:
Not very responsive

Number of respondents

Novell's Netware SNA Gateway

Response base: 48



Likely
The reason:
Works well/ meets needs

9 – Unlikely
The reason:
Service/support from Novell

Number of respondents

IBM's PC 3270/A OS/2 Extended

Response base: 50



Likely
The reason:
Works well/ meets needs

9 – Unlikely
The reason:
Not as flexible as others

Number of respondents

Verbatim

What do you like best/least about this product?

(Responses are based on the most frequently stated answers)

Likes
Ease of use
Excellent memory management
Compatibility

Dislikes
Price per workstation
Too technically-oriented
Memory consumption

Likes
Ease of use
Compatibility
Service and support

Dislikes
Memory consumption
Printer support
Installation difficult

Likes
Price
Service and support
Compatibility

Dislikes
Service and support
Memory consumption
Documentation

Likes
Compatibility
Reliability
Service and support

Dislikes
Heavy use of resources
Inflexibility
Cost

Vital statistics

Total number of respondents: 187

How long have you been using this product?

One year or less	77
Two to three years	86
Four to five years	20
More than five years	4

What is your position?

LAN manager	75
Data communications manager	51
IS manager	59
No response	2

How do you use this gateway?

(Response base: 186)

On each workstation as a stand-alone	22
Several workstations on a LAN	125
Both	39

METHODOLOGY

Products rated in *Computerworld*'s Buyers' Scorecard on Systems Network Architecture gateways for local-area networks were selected on the basis of an installed base among Fortune 1,000 companies and sales during the last three years as measured by International Data Corp. in Framingham, Mass.

Ratings were obtained from 50 users of each product, except for Digital Communications Associates, Inc.'s (DCA) Irmalan. In that instance, the response base was reduced to 37 because of a lack of available installations. The respondents were drawn from random samples of gateway users provided mostly by nonvendor sources. The exceptions were Attachmate Corp.'s Extra! and DCA's Irmalan, where random lists of users provided by the vendors produced less than half of the respondents.

The survey was conducted by First Market Research Corp. in Austin, Texas, an independent telephone research firm. Results were tabulated with the assistance of IDG Research Corp. in Framingham, Mass.

Total weighted scores were computed by multiplying the mean scores users assigned to the importance of each criterion by the mean scores each user group gave its own products. Ratings are presented in order of importance to all users.

RESPONDENT PROFILE

Most of the 187 respondents currently use DOS-based gateways, and 46% of them plan to stick with DOS. Eighteen percent said they plan to move to OS/2 within a year, another 8% plan to move within two years, and 10% plan to switch to OS/2 within more than two years.

The respondents currently use the following LANs: token-ring only — 62%; Ethernet only — 20%; both token-ring and Ethernet — 16%; other — 12%.

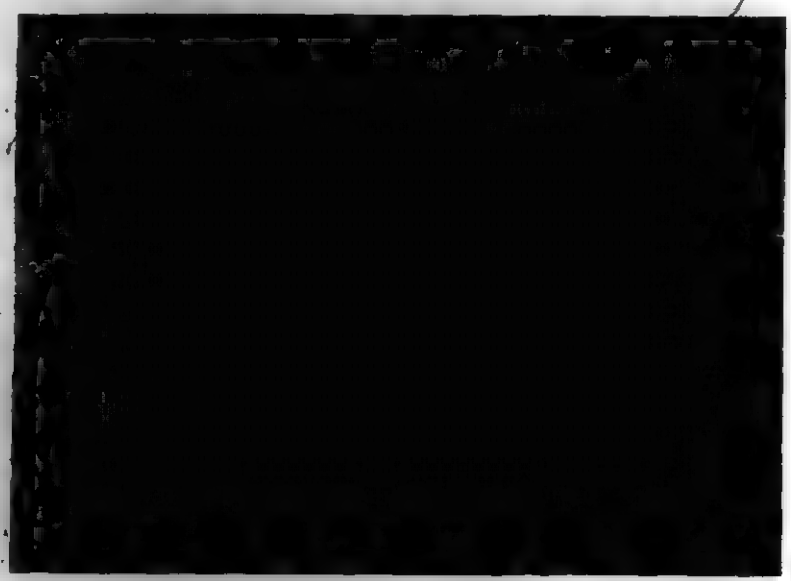
Eighty-seven percent of the respondents access a mainframe over their SNA gateways, and 26% access a minicomputer.

ACKNOWLEDGEMENTS

Computerworld would like to acknowledge the assistance provided by the following individuals and companies: Bruce Coughran, Computer Intelligence; Datapro Research Corp.; Installed Technology International; David Passmore, Ernst & Young; Lucinda Santinario, International Data Corp.; and Kevin Tolly, Virtual Systems.

"Our man in Geneva can now get vital information right to the desks of our traders on four continents. In seconds."

"Only BANYAN could have done it."



From an interview with Eric Dickstein of Continental Grain.

"The ability to get information to the right person at the right time—all the time—is critical to our business. For us, Banyan's VINES is a strategic component of our information network."

How big is your network?

"We have over 700 users worldwide on our network, with 24 servers in New York alone. 4 each in Chicago and Geneva. Plus single servers in another 12 offices. Recently we added Zaire, and we've discussed putting them in Hong Kong, Singapore, and South America."

Do you use third-party lines?

"Yes, depending on needs and economics. Mostly, it's GEIS, plus some point-to-point lease lines and dial-up facilities. Even a dedicated 56KB satellite link. And it's all totally transparent."

Why did you select VINES?

"When we started this network 5 or 6 years ago, Banyan was the only company that could satisfy our needs. Today, in my opinion, it still is."

Banyan's VINES is the only network operating system that can effortlessly grow as your company does—even on a global basis. For a further description of Continental Grain's networking challenges and solutions, write or call us at 800-828-2404 (in MA 508-836-2828).

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Electronic mail gateways

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEMS SUPPORTED	RAM REQUIRED (BYTES)	SYSTEMS FOR WHICH TRANSLATION IS PROVIDED[1]	E-MAIL STANDARDS[2]	SOURCES FOR FILE ATTACHMENTS	SPECIAL CHARACTERS TRANSLATED	PREPROGRAMMED MESSAGES	ADMINISTRATIVE FEATURES[3]	OTHER FUNCTIONS	NETWORK OPERATING SYSTEMS SUPPORTED	TRIAL PERIOD	PRICE	MAINTENANCE FEE[4]
Alisa Systems, Inc. (818) 792-9474	[illegible]	Apple Macintosh Plus and higher	Macintosh OS 6.0.2 and higher	1M	From Macintosh Mail to DEC VMSmail, All-in-1, Ethernet Mail	Proprietary	None	Tilde, DEC multinational characters	Yes	Finds cause of failed transmission	None	Appletalk, Decnet	30 days	$499 - $4,999	$499 for phone support
	[illegible]	Apple Macintosh Plus and higher	Macintosh OS 6.0.2 and higher	1M	From Quick Mail or Inbox Plus to DEC VMSmail, All-in-1, Ethernet Mail	Proprietary	None	Tilde, DEC multinational characters	Yes	Same above	None	Appletalk, Decnet	30 days	$499 - $4,999	See above
Caymen Systems, Inc. (617) 494-1999	Gator Mail-M, Gator Mail-Q	Apple Macintosh Plus and higher	Macintosh OS 6.0.3	2M	From CE Quick Mail, Microsoft Mail to SMTP-based, Unix mail	SMTP	Databases, spreadsheets, word processing packages, any binary files	Underline	Yes	Finds cause of failed transmission, uses error correction protocol	Fax	NP	None	$995 - $7,995	None
CC:Mail, Inc. (415) 961-8800	CC:Mail Link to MCI Mail	IBM PCs and compatibles	DOS	640K	From CC:Mail to MCI Mail	MHS	See above	Tilde, foreign language keys	Yes	Finds cause of failed transmission, uses error correction protocol	Fax, telex, voice	Netware, Vines, 3+Share, 3+Open, LAN Manager	None	$1,295	$499
Computer Mail Services, Inc. (212) 889-2300	V-Bridge, V-Bridge/MHS	Banyan CNS server, 80386-, 80486-based Vines servers	DOS, Unix	640K	From Banyan Network Mail to MCI Mail; from Banyan Network to MHS	Proprietary, MHS	Any ASCII or binary files	All ASCII characters	Yes	Finds cause of failed transmission, uses error correction protocol	Fax, telex, postal and courier mail; none on MHS	Vines 3.1 and higher	30 days	$1,495 - $4,995	First 90 days free, then $495
	S-Bridge	PCs with simultaneous connections to local-area and TCP/IP networks	DOS 3.0 and higher	640K	From MHS to SMTP	MHS, SMTP	Any ASCII or binary files	All ASCII characters	Yes	See above	None	Netware, MS-NET	30 days	$2,495+	First 90 days free, then $495
	M-Bridge	PCs running Novell or Action Technologies MHS	DOS 3.0 and higher	640K	From MHS to MCI Mail	MHS	Any ASCII or binary files	All ASCII characters	Yes	See above	Fax, telex, postal and courier mail	Netware, MS-NET	30 days	$995	First 90 days free, then $195
[illegible] Inc. (914) 688-8540 (800) 999-8888	The Network Courier Gateway	IBM PCs and compatibles	DOS 3.1 and higher	640K	From Microsoft Mail to Prodigy, X.400, SMTP, MHS, and MCI Mail MHS	X.400, MHS, SMTP	Databases, spreadsheets, word processing packages	All ASCII characters	Yes	Finds cause of failed transmission, uses error correction protocol	Fax, telex	3+Open, Vines, DCA, MS-Net, PC LAN, Netware	30 days	$695 - $6,000	$500 of price
Digital Equipment Corp. (800) 344-4825 (603) 884-6660	Message Router/Mema	DEC VAX	VMS	NA	From DEC Mailbus to Verimation's Memo	X.400	Word processing packages	Tilde, bold, underline, math symbols	Yes	Finds cause of failed transmission, identifies message origin address	None	Decnet, SNA	None	$20,000	Variable
	VAX Message Router VMSmail Gateway	DEC VAX	VMS	NA	From DEC Mailbus to VMSmail, PCMail, Decwindows VMSmail	X.400	Databases, word processing packages	Tilde, bold, underline, math symbols	Yes	See above	None	Decnet	90 days	$600 - $30,000	Variable
	VAX Message Router/S Gateway; P Gateway	DEC VAX	VMS	NA	From DEC Mailbus to IBM Disnet; from DEC Mailbus to IBM Profs	X.400	Databases, spreadsheets, word processing packages, DOS files	Tilde, bold, underline, math symbols	Yes	See above	None	Decnet, SNA	90 days	$3,200 - $200,000 for S Gateway; $2,500 - $96,000 for P Gateway	Variable
	VAX Message Router X.400 Gateway	DEC VAX	VMS	NA	From DEC Mailbus to X.400	X.400	Databases, spreadsheets, word processing packages, DOS files	Tilde, bold, underline, math symbols	Yes	See above	None	Decnet, OSI	90 days	$1,900 - $80,000	Variable
	Message Router gateways for CC:Mail/MHS, Network Courier, 3Com 3+Mail	DEC VAX, IBM PCs and compatibles	VMS, DOS	NP	From DEC Mailbus to CC:Mail, MHS, Network Courier, 3Com 3+Mail	X.400, MHS	Word processing packages	Tilde, bold, underline, math symbols	Yes	See above	None	Decnet, Pathworks, Netware, OSI, 3+Share	None	$50,000	Variable
[illegible] Inc.'s Mailbus Router	[illegible]	IBM PCs and compatibles	[illegible] DOS	[illegible]	[illegible] MHS, SMTP, Mail, MCI Mail	Proprietary	Databases, spreadsheets, word processing packages	None	Yes	Finds cause of failed transmission, uses error correction protocol	Fax	Netware, Vines, 3+Open, LAN Manager	None	$995+	None
Hewlett-Packard Co. (800) 752-0900	HP X.400	HP 9000 series	HP-UX	8M	From HP Desk Manager, Open Mail, Unix Mail to X.400	X.400, SMTP	Databases, spreadsheets, word processing packages, binary, ASCII files	Any characters known to X.400	Yes	Finds cause of failed transmission, uses error correction, allows departmental billing	Fax, telex	OSI	Variable	$6,500+	NP
[illegible] Inc. (408) 996-9770	[illegible] Gateway MHS	[illegible] VAX	[illegible]	[illegible]	[illegible] MHS, SMTP	X.400	None	All ASCII characters	Yes	Finds cause of failed transmission	Fax, telex, voice	SNA	None	$50,000 - $84,500	20% of price
Isocom Information Corp. (415) 969-4768	Bypass	Tandem machines	Guardian	256K	From MHS to Tandem machines	MHS	Databases, spreadsheets, word processing packages, binary, ASCII files	Foreign language keys	No	Finds cause of failed transmission, uses error correction protocol	Fax	Netware	None	$1,500	15% of price
[illegible] Inc. (408) [illegible]	[illegible]	[illegible] VAX	[illegible] VMS and higher	[illegible]	[illegible] Microsoft Mail, Wordperfect Office, Banyan Mail, Network Courier, The Coordinator will relay MHS messages to DEC All-in-1, VMSmail	MHS	Databases, spreadsheets, word processing packages	None	Yes	Finds cause of failed transmission	None	Netware, PCSA	30 days	$6,000	$1,500
Management System Designers, Inc. (703) 281-7460	Promulgate	Sun3/60	SunOS 4.2	NA	From 3Com Mail to Unix-based mail	SMTP, UUCP	Databases, spreadsheets, word processing and graphics packages	Foreign language keys	No	Finds cause of failed transmission, uses error correction protocol	None	3+Open, 3+, XNS, TCP/IP	None	$31,500	Variable
	Promulgate/PC	IBM PCs and compatibles connected to Unix host	DOS	640K	From 3Com Mail to Unix-based mail	SMTP	Databases, spreadsheets, word processing and graphics packages	Foreign language keys	No	Finds cause of failed transmission, uses error correction protocol	None	3+Open, 3+, TCP/IP, Unix BSD, XNS	30 days	$5,995 for 50 users, $9,995 for unlimited users	Variable

[1]Messages can be exchanged bidirectionally between the electronic mail systems listed. [2]X.400 = messaging standard from the Consultative Committee for International Telephony and Telegraphy; MHS = Message Handling Service from Action Technology, Inc. and Novell, Inc.; SMTP = Simple Mail Transfer Protocol, which is the mail system for Transmission Control Protocol/Internet Protocol; UUCP = Unix to Unix Copy Program. [3]All products listed record the start time of each transmission, except gateways from Consumers Software, Inc. and Rational Data Systems, Inc. All products record the duration of each transmission, except those from Alisa Systems, Inc., CC:Mail, Inc., Consumers Software, Inc., MCI Communications Corp. and Rational Data Systems, Inc. The LAN Office Gateway from Wang Laboratories, Inc. and the Mail Link Mac and Mail Link MHS from Starnine Technologies, Inc. do not record duration of transmission. [4]All maintenance fees are per year, unless otherwise noted. [5]Mail Link SMTP is also sold by Sitka Corp., which can be reached at either (800) 445-8677 or (415) 769-9669.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEMS SUPPORTED	RAM REQUIRED (BYTES)	SYSTEMS FOR WHICH TRANSLATION IS PROVIDED[1]	E-MAIL STANDARD[2]	SOURCES FOR FILE ATTACHMENTS	SPECIAL CHARACTERS TRANSLATED	PREPROGRAMMED MESSAGES	ADMINISTRATIVE FEATURES[3]	OTHER FUNCTIONS	NETWORK OPERATING SYSTEMS SUPPORTED	TRIAL PERIOD	PRICE	MAINTENANCE FEE[4]
Microcomputer Systems Engineers, Inc. (Cont.)	Prestigio (Cont.)	IBM PCs and compatibles	DOS	640K	From XCom Mail to Empire Vision	Proprietary	Databases, spreadsheets, word processing and graphics packages	Tabs, bold, underline, foreign language keys, math symbols	No	Finds cause of failed transmission	None	3+Open, 3+, Vines, TCP/IP, XNS	30 days	$9,995 for unlimited users	Variable
MCI Communications Corp. (510) 989-6489	Mail Messenger/3000 for MCI Mail	HP 3000	MPE	NA	From HP Desk Manager and Postmaster to MCI Mail	Proprietary	Databases, spreadsheets, word processing packages	None	Yes	Finds cause of failed transmission, uses error correction protocol, logs files sent	Fax, telex, produces hard copy	NA	30 days	$10,000	First year free
	VAX Mailgate for MCI Mail	DEC VAX	VMS 5.0 and higher	NA	From DEC All-In-1 and VMSmail to MCI Mail	Proprietary	Databases, spreadsheets, word processing packages	None	Yes	See above	Fax, telex, produces hard copy	NA	30 days	$11,242	Variable
Retrieval Corp. (617) 924-6117	Retrieval MHS Gateway	IBM PCs and compatibles	DOS	5K	From Retrieval to MHS	MHS	Databases, spreadsheets, word processing packages, binary files	Foreign language keys, tabs	Yes	Finds cause of failed transmission, uses error correction protocol	Fax	Netware 2.0, 2.0	30 days	$199	None
Power Software, Inc. (800) 999-3366	Power Post	DEC VAX, Apple Macintosh	VMS, Macintosh OS	1M	From Microsoft Mail to VMS Mail, Message Router	Proprietary	Databases, spreadsheets, word processing packages	Tabs, foreign language keys, math symbols	No	See above	None	AppleTalk	30 days	$2,000 - $4,000	15% of price
Prime Computer, Inc. (800) 800-8900	X.400 Gateway Program for Message Handling Services	Prime EXL series	Unix	NA	From CCMail, Da Vinci, Higgins to X.400, MHS	X.400, MHS	Databases, spreadsheets, word processing packages	Any characters known to X.400	Yes	Records event time and duration of transmission, uses error correction protocol	NP	Prime EXL Portable Netware	None	Less than $9,000	$70 per month
	X.400 Gateway Program for Simple Mail Transfer Protocol	Prime 50 series	Primos	NP	From SMTP to X.400, MHS	X.400, SMTP	Databases, spreadsheets	See above	Yes	See above	None	NP	None	$9,000+	$60 per month
National Data Systems, Inc. (415) 490-3364	CEO/MRS Gateway	Data General MV series	AOS/VS	NA	From DG CEO to MRS	MRS	Databases, spreadsheets, word processing packages	None	No	Finds cause of failed transmission, uses error correction protocol, generates error reports	None	Any that supports MRS	None	$5,000	$1,250
Retix (310) staff-6000	Open Server 400	80486-based PCs and Web host	BSD, Unix	64MB	From CCMail, Da Vinci, MHS, SMTP to X.400	X.400	Word processing packages, other E-mail systems	Tokyo, MS characters	Yes	Finds cause of failed transmission, notifies sender of delivery status	None	Netware, SP, PC LAN, Ofnet, Vines, Newtalk	30 days	$6,000	$600 with warranty; $750 without warranty
	MHS Gateway (SC-100)	IBM PCs and compatibles	DOS	640K	From MHS to X.400	MHS	Word processing packages, other E-mail systems	Tokyo, MS characters	Yes	Finds cause of failed transmission, uses error correction protocol, notifies sender of delivery status	None	Any that supports MHS	30 days	$995	$100
Starnine Technologies, Inc. (415) 548-0391	Mail Link SMTP	Apple Macintosh Plus and higher	Macintosh OS 6.0.1 and higher	300K	From Quickmail, Inbox, Microsoft Mail to SMTP	SMTP	Databases, spreadsheets, word processing packages	All 8-bit characters	Yes	Finds cause of failed transmission	None	Network independent	None	$995 for 10 users, $4,950 for 100 users	None
	Mail Link Mac	Apple Macintosh Plus and higher	Macintosh OS 6.0.3 and higher	300K	From Quickmail, Inbox, Microsoft Mail to Unix mail systems	UUCP	Databases, spreadsheets, word processing packages	All 8-bit characters	Optional	See above	None	Network independent	None	$195 for 10 users, $995 for 100 users	$30 - $150
	Mail Link MHS	Apple Macintosh Plus and higher	Macintosh OS 6.0.3 and higher	300K	From Quickmail, Microsoft Mail, Inbox Plus to MHS	MHS	Databases, spreadsheets, word processing packages	All 8-bit characters	Optional	See above	None	AppleShare, Netware	None	See above	None
Sun Microsystems, Inc. (415) 960-1300	Sunlink MHS 6.0	Sun-2, Sun-3	SunOS 4.0 and higher	8M	From SMTP to X.400	X.400	None	None	Yes	Finds cause of failed transmission	None	OSI, TCP/IP	Variable	$6,500	$1500
The Beame Software Works, Inc. (617) 367-6846	Interoffice	Wang VS System 5300 to 10000 series	VS OS 7.20	NA	From Wang VS Office to Unix-based mail	UUCP	Any ASCII files	Tabs, bold, underline, foreign language keys, math symbols, special word processing symbols	No	Finds cause of failed transmission, uses error correction protocol, synchronizes user directories	None	Any that support UUCP	30 days	$6,500 - $22,900	20% of price
	Interoffice/VS	Wang VS 5300 to 10000 series	VS OS 7.20	NA	From Wang VS Office to IBM Office Vision/400, HP Desk Manager, DEC All-In-1	Proprietary	Any binary files	See above	No	See above	Fax, telex	Wang systems networking	30 days	$4,500 - $21,500	20% of price
	Interoffice/XL	HP 3000 922XL to 960/100 series	MPE/XL	NA	From HP Desk Manager to Wang VS Office, IBM Office Vision/400, DEC All-In-1	Proprietary	Any binary files	See above	No	See above	Fax, telex	HP's MPE-XL network	30 days	$4,500 - $19,000	20% of price
	Interoffice/VAX	DEC 11/725 to 9000 series	VAX/VMS	NA	From DEC All-In-1 to HP Desk Manager, Wang VS Office, IBM Office Vision/400	Proprietary	Any binary and A1 files	See above	No	See above	Fax, telex	Decnet	30 days	$5,500 - $21,500	20% of price
Reich Communications, Inc. (408) 395-8800	Worldmail 400 family	80386-based PCs	DOS, Unix	4M	From X.400 to MHS, SMTP, CCMail, Microsoft Mail, Quickmail, Higgins, Inbox Plus	X.400	Databases, spreadsheets, word processing packages	Tabs, bold, underline, foreign language keys, math symbols	Yes	Finds cause of failed transmission, uses error correction protocol	Fax, telex	Netware, 3+Open, Vines, LAN Manager	None	$10,000+	$2,000+
Unisys Corp. (201) 994-4210	MHS-6000	Unisys V6000 series	Unix SVR.3	800K	From X.400 to Unix-based mail	X.400, MHS, SMTP	None	Tabs, bold, underline, foreign language keys, math symbols, all 16-bit characters	No	None	Fax, telex	Any 802.3, asynchronous, X.25	None	$2,000 - $10,800 for five-year license	$35 - $152 per month
Wang Laboratories, Inc. (800) 451-9264	LAN Office gateways	IBM PCs and compatibles	DOS 3.3 and higher	NP	From LAN Office to VS Office	Proprietary	ASCII files	Tabs, bold, underline, foreign language keys, math symbols	No	Finds cause of failed transmission	None	Netware, Vines, 3+Open, PC LAN	None	$695	None
	Wang Office/X.400 Gateway	Wang VS machines	Wang VS 7.14.04 and higher	NA	From Wang Office to X.400	X.400	Databases, spreadsheets, word processing packages	Tabs, foreign language keys	No	Finds cause of failed transmission, uses error detection protocol	Fax	Any supported by Wang VS	None	$1,200 - $17,000	None
Wordperfect Corp. (801) 225-5000	Wordperfect Connectware MHS Gateway	IBM PCs and compatibles	DOS 3.0 and higher	640K	From Wordperfect Office to MHS	MHS	Databases, spreadsheets, word processing packages	Tabs	Yes	Uses error correction protocol	Fax, telex	Netware	None	$495	None

Misuse of power

Poor IS and business management leadership can doom a technology implementation before it starts

BY VICKI MCCONNELL and KARL KOCH



Frank Vitz

There is an abuse problem in corporate America today that nobody likes to talk about. Computers and information technology have been misused and underused by those who are ill-prepared to use them. In addition, computer users have been abused by the manner in which technical systems are implemented. What most companies don't realize is that this dysfunctional relationship between users and technology is not a technological problem. It is a problem of poor leadership at all levels of business and information systems management.

The reality is that companies know a lot about a few aspects of implementing computer systems and a little about the rest. The knowledge base they have is poorly organized. Most businesspeople cannot point to one document in their corporate files that gives complete guidelines on how to go about implementing a computer system. Yet many organizations (dare we say *all*?) have voluminous records of implementations gone awry, of applications unused and underused and of the stated dissatisfaction of users.

To ease the implementation process, IS and business managers need an inventory of what can go wrong, an organized methodology for implementing computer systems and information technologies and a rigorous argument for proper and effective procedures for implementing information technology.

What can go wrong

The IS professional typically views the problems of computerization in terms of the technology rather than in terms of the business. That is, when an implementation falters or fails, it is seen as a missed opportunity to use the technology.

What has really happened, however, is a failure of the company to manage the relationship between its technology and its users.

Top business and IS management must set the criteria for technology use and implementation — that the technology serves the product or service of the business and that it serves the organization's human system. Executives also need to make sure that IS staffs are educated and trained in the business. When the technology invades every area of the business, the technician must be schooled in all areas of the business.

One of the best ways for an organization to educate its technical staff about the business is through a collaboration between technician and user during systems development. They can train each other in the business of the organization.

Action at all levels

Computer implementations have their own set of management requirements. There are certain actions that must be taken at the operational, tactical and strategic levels of an organization's management if computer implementations are to work. When the proper issues are addressed at all three levels, the implementation will succeed. When they are not, it will fail.

The operational requirements involve the setting of clear and stated expectations for the user. Two items must be included: what worker behaviors will change and what benefits the company will accrue from technology implementations.

Abuse occurs when user managers are unclear about the expectations they have of their employees (see example below). They either narrow their focus and expect too little of their users, or they fail to define the new behaviors they expect once the computer system is implemented. Only when user managers learn to set broad and comprehensive behavioral expectations for end-user staff will there be a more effective use of information technology (see story page 69).

Setting the requirements for managing computer implementations is more difficult at the tactical management level of organizations. Firms everywhere are redefining the role of middle managers. Most of them are also seeking to eliminate layers of middle management. What is rarely recognized is that information technology is affecting this change because it provides many options for the way in which middle management can be handled and grouped.

Top management must set the goal of changing the manner in which middle management functions. First, it needs to analyze the changes needed in middle management, then apply information technology as one tool in that change.

Middle managers will not necessarily be replaced by computers because the basic functions these people provide — consistency in the work and behaviors

Continued on page 68

EXAMPLE 1

Crossed communications lines

Want to know what can happen to a technology implementation when user managers have unclear expectations of their users? Read on:

An on-line inventory control system was implemented in a Midwestern farm equipment manufacturing company. The inventory control personnel who were going to use the system had little or no knowledge of basic computer terms and terminal operation. Before system implementation, they received no computer education and minimal training. As a result of management's failure to prepare users, the inventory control system was not fully operational for 10 months beyond the original start date, and the cost of the system skyrocketed from $250,000 to $1 million. The users were frustrated and angry because they did not receive proper support during the system's installation. They did not understand what management expected of them, nor did they know how to relate to the company's IS staff, who designed and implemented the system.

McConnell and Koch are co-founders and principals of The Mentor Group, a management consulting and training firm in Columbus, Ohio. They are also co-authors of the book Computerizing the Corporation: The Intimate Link Between People and Machines (Van Nostrand Reinhold).

Continued from page 67

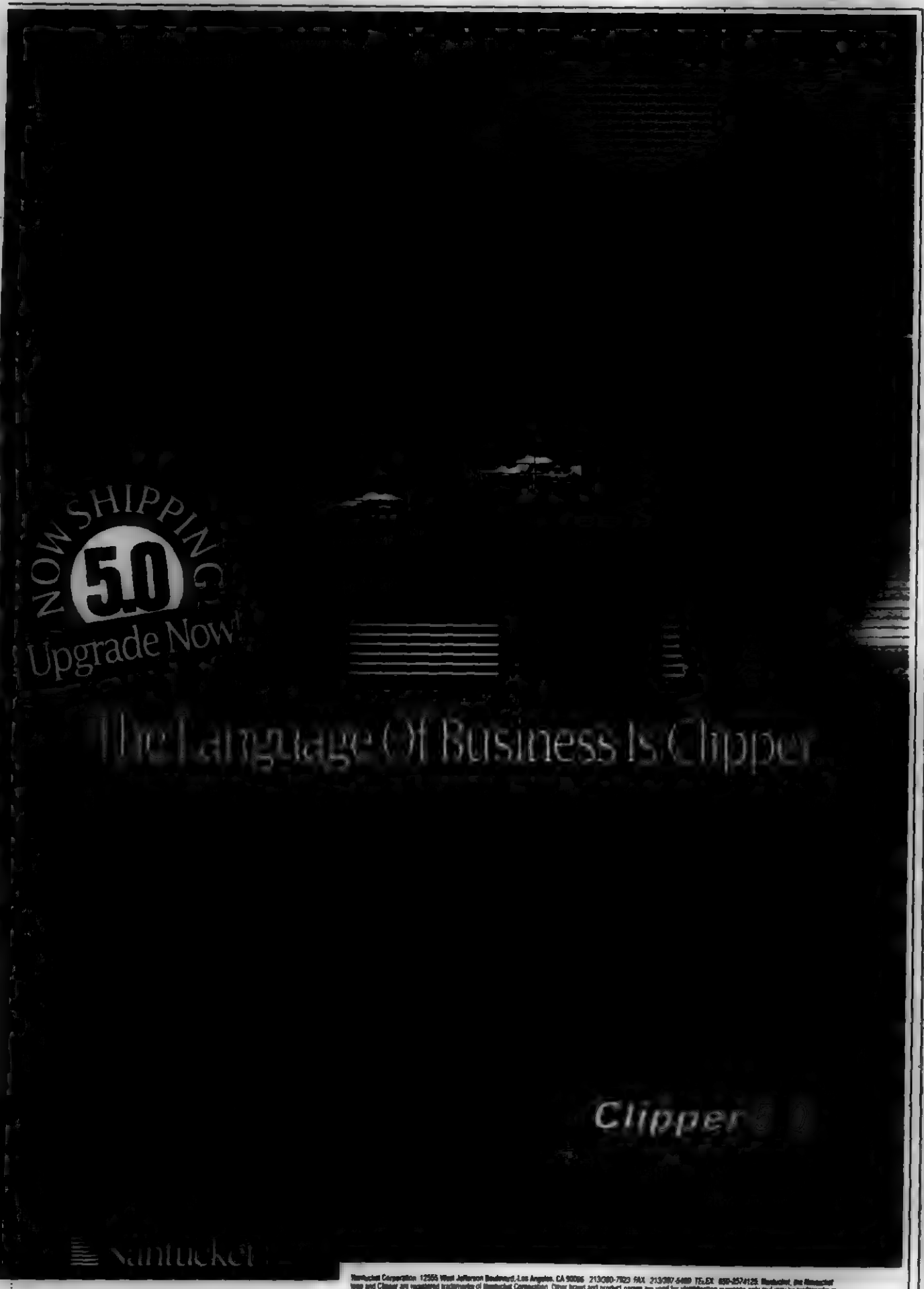
of the firm — are important. Rather, a successful implementation of information technology can bring a whole new range of skills and capabilities to middle managers, such as the following:

- Decision thinking. The redefinition of planning. Rather than focusing on making decisions, the middle managers are more concerned with thinking toward a decision.
- Data interpreter. The supplier of new knowledge.
- Organizing responsibility. The new way to delegate. Focus on responsibility, not tasks.
- Front line. The new management style. Empowering and supporting those operational workers with customer contact.
- New knowledge skills. The real flattening of the hierarchy.
- Continuous learning. The ultimate challenge.

CHOOSE THE BATTLEFIELD. The true battle is not over technology; it is about the kind of business management wants and the kinds of employees management wants.

Always remember: Whatever is done to middle management will change the entire organization. Top IS and business management should not implement technical systems in middle management until they have analyzed the impact of automation on the quality of the organization's human interaction.

Technology cannot have this kind of effect on an organization without a driving vision of what the corporation intends to achieve in its business, with its technology and through its



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EXAMPLE 2

Fiascos

Technology implementations, when done correctly, should not disrupt strategic management of an organization.

But when done poorly, they certainly can, as the following examples show:

- An international fast-food chain introduced a computerised system for retrieving store operations information. The system was intended to move information up through the organization to senior management. Instead, the information jumped management levels and was sent directly to corporate headquarters. As a result, senior managers had much greater detail on store operations than the store managers had. This information was then used by some senior managers to reprimand store managers' performance.
- A major Midwestern manufacturer decided to computerise its production management systems. Approximately half of the affected employees were convinced that they would lose their jobs. They assumed cost cutting and staff reductions were the main reasons why management had instituted the change. The installation of the new system caused a number of employees to retire or quit. Those who stayed rebelled against the technology, causing a five-fold increase in the cost of the system and an extra seven months of installation time.
- A state bureau of motor vehicles computerised license plate records and sales information. During the planning phase, the administration solicited ideas and opinions of line workers and supervisors. Although their input was used, they got no feedback. They came to the conclusion that their participation was a waste of time because management never listened to them anyway.

employees. That vision must exist at the strategic management level to direct the development and use of the corporation's technology. Automation will not disrupt strategic management of an organization. However, improper management of a technology implementation will (see example page 68).

Management at all levels must prepare its people and its organization for a future of constant technological pressures. This will be facilitated if management has a methodology for implementing computers and if employees know the value of and concepts behind this methodology (see outline below).

Controlling corporate change

There are dynamic ways of managing change that can help corporate leaders gain control over the future of the corporation in a world of changing technology. Top management must recognize that change is most effective when it is cyclical and iterative. People require time to practice the new forms of work. They must be cycled and recycled through the process of learning a change.

Change is also most effective when it is incremental and planned. In other words, people will respond positively when the change fits into the vision of the corporation and occurs in reasonable steps leading in that direction. Change is most effective when it leads to an openness to future change and creates a corporate climate that accepts and prepares for change.

To maintain control of the company's technological future, top management must do the following:

- Set common expectations regarding technology.
- Control technology through management of people.
- Recognize trends in technology development as they relate to the business.
- Recognize the need to organize the entire business to control its technology.

Creating a corporate climate that accepts changing technologies will require three executive management decisions. The first is decide who is in charge. The technology takes charge only when top management defaults on decision-making. Top management will be in charge of its technology when it decides to be.

The second decision is choose the battlefield. The true battle is not over technology; it is about the kind of business management wants and the kinds of employees management wants. Management will be in charge of technology when it develops its business and employees.

The third is kick the dependency habit. No business needs technology. Management will be in charge of its technology when it considers itself free to accept — or reject — any new technology. Management may choose more often than not to use new technologies, but this must be a choice made freely. Only a free choice leaves management in control.

The problems involved in implementing computer systems and information technology are only the symptoms of a larger issue: whether top management stays in control while constantly changing and upgrading its information technology. The answer lies in the values of the corporation. People must be valued above machines, the business above its technology. Then, the corporation must have a way to implement information technology that honors and supports these values. ●

Great expectations: How users will behave

Technology will be used effectively if managers know what kinds of behavior to expect from employees.

Managers can use the following categories to help them set behavioral expectations:

- **Productivity.** Once started on a specific computer task, how productive is the employee in a given time period?
- **Proficiency.** How much of a specific software application has the employee mastered?
- **Efficiency.** How well can the employee use all functions mastered in a given software application, moving from one task to another with ease?
- **Effectiveness.** How well can the person choose between options in mastered software applications?
- **Attitude.** Given past experience with computers, how positive is the employee's attitude toward present and future performance with the technology?
- **Quality.** How well can the employee perform according to corporate and work-group standards?

The Technology Implementation Life Cycle*

A guide for implementing information technology

Leadership stage

Phase 1: **Pre-implementation**
Goal: Determine planning alternatives, needed resources and possible roadblocks
Activity: Gather data on workplace, personnel, work, tasks

Phase 2: **Human design**
Goal: Eliminate deterrents and establish incentives for worker productivity and wellness
Activity: Study automated workplace and establish criteria for its human design

Phase 3: **Marketing**
Goal: Introduce technology so that the employee "buys" the system and "owns" the system
Activity: Develop and implement a strategy for "selling" technical systems and the changes they cause

Phase 4: **Education**
Goal: Reduce employee stress concerning technology and increase confidence in their ability to use it productively
Activity: Educate employees about the demands new technology will make on them and the benefits it will provide

Administrative stage

Phase 5: **Training**
Goal: Develop employees who are minimally computer competent and primed to learn additional computer skills
Activity: Develop and implement a sequential, natural program of skill growth

Phase 6: **Documentation**
Goal: Provide easy access to and effective assistance from reference materials so that employees can complete automated tasks
Activity: Compose and distribute documents that explain how the system works

Phase 7: **Human communication**
Goal: Create opportunities for dialogue between employees and information technology, technicians and management
Activity: Establish and maintain continuing means of communication with employees

Phase 8: **Postimplementation**
Goal: Feed forward evaluation results to improve the next technology implementation
Activity: Compile the evaluation of each phase into one document and review entire implementation process

*This method is a registered trademark of The Meister Group

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BIMSPOOL — Prints output in POWER/VSE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1992).

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BIMSPOON — On-Line to Batch Print Spooling. Prints data passed from CICS application programs into the POWER spooling queue.

BIMSPLIT — May be used separately or with BIMSPOOL to print parts of an existing job to terminal printers at separate sites.

BIM-PDQ — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue.

BIM-PASS — Automatically alters or deletes DOS POWER spooled job entries at preset intervals.

BIM-ODIS — Comprehensive problem analysis and display of operational CICS system. ODISTRAK is an optional historical reporting feature to be used with BIM-ODIS to generate reports relating to system usage. DOS and OS.

BIM-BUFF — Significantly increases the performance of VSAM under DOS by dynamically managing VSAM buffers.

BIM-PACK — Automatically compresses selected VSAM files transparent to applications and end users under DOS.

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BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. DOS and OS.

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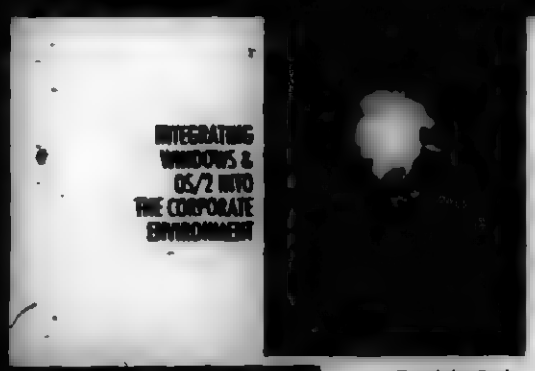
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TRACKS		PRODUCT PROMISES & REALITY		INDUSTRY ISSUES		NEW TECHNOLOGY & MEDIA
TUESDAY, MARCH 5						
9-10 am	KEYNOTE					
10:30-Noon	Branching From Mainframes & Minicomputers	Beyond Politics—OS/2 Windows vs. OS/2 PM—The User's Perspective	A Day in the Life of a LAN Manager	Windows Licensing		Directions in Multimedia
2-3 pm	Cost-Justifying the Graphical User Interface	Facts & Figures: Graphical Spreadsheets	The Future of GUI Workstation Connectivity		Working GUI	Digitized Video
4-5:30 pm				State of the Channel	Development of Portable Software	Corporate Education & Multimedia
WEDNESDAY, MARCH 6						
9-10:30 am	PLENARY SESSION					
11-12:30 pm	Word Processing Solutions		Global Connectivity Under OS/2: Is this Package Real or Better Real?	Can Windows Win the GUI War?	Windows or OS/2—Which is For You?	Authoring Tools
2-3:30 pm	Everything You Always Wanted to Know About Windows But Were Afraid to Ask!					
4-5:30 pm	Security Concerns	Presenting—PM & Windows Presentation Programs		What's Hot & What's Not in Windows	Development Using Windows Macro Languages	Distributing Multimedia Applications
THURSDAY, MARCH 7						
9-10 am	DEVELOPER'S KEYNOTE					
10:30-Noon	End User Development	Programming for the Rest of Us	Network Management Under Windows & OS/2	Managing the Migration	Development Using High Productivity Programming Languages	
2-3:30 pm	Database Server Inspiration	Visual Representation of Data		Marketing Windows in the USA & Europe	Windows/PM Development Using the SDK	Sound & MIDI

KEYNOTE



Directions For The Decade

Cheryl Currid,
Director, Applied Information Technology, Coca Cola Foods

PLENARY



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Windows 3.0—The Second Year

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Panelists:
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Paul Grayson,
President, Micrografx, Inc

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DEVELOPER'S KEYNOTE



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NATIONAL BRIEFS

I'm outta here

In what the company stated were wholly unrelated moves, three of **LSI Logic Corp.**'s top executives unexpectedly left the Milpitas, Calif.-based semiconductor firm earlier this month. **William O'Meara**, who co-founded LSI and was serving as president of its Headland subsidiary, departed on a six-month sabbatical. Whether he will return to LSI at the end of that time and in what role was left open. Marketing Vice President **Brian Connors** left to take on the U.S. sales vice presidency at Mountain View, Calif.-based Synoptics, Inc. Meanwhile, LSI's loss is **Businessland, Inc.**'s gain — former Chief Financial Officer D. Scott Mercer is taking on the same title at the computer reseller.

Ready, steady, go

This month marked the third and final stage in the melding of **Control Data Corp.**'s third-party computer maintenance business with the former Sorbus to create Frazer, Pa.-based **Bell Atlantic Business Systems Services**. Also effective earlier this month: the post-consolidation elimination of 240 out of a total 3,600 jobs at Philadelphia-based **Bell Atlantic Corp.**'s new computer services subsidiary. The firm, reconfigured and renamed in the wake of the communications company's January 1990 acquisition of the CDC division, is now pared of redundant operations, slimmer by an entire level of management and well positioned for decision-making closer to the customer, according to Bell Atlantic.

Lesser is more

Some analysts and most leasing companies have spent the past few recession-shadowed months contending that when the economic going gets tough, the tough start leasing. No one is going to prove that theory wrong by the 1990 financial results posted last week by the computer leasing industry's runaway up-and-comer, **IBM Credit Corp.** The IBM leasing subsidiary reported volume up 14% year-over-year to $10.6 billion, and portfolio assets of $11.1 billion — an 18% increase. IBM Credit Corp.'s net earnings jumped 21% to $166 million.

Interleaf theme: Turn, turn, turn

A new president is the most recent change intended to reinvent the firm

BY PAUL GILLIN
CW STAFF

WALTHAM, Mass. — When Interleaf, Inc. employees arrived for their first day of work at the company's new headquarters early this month, they found that more than just their surroundings had changed.

Posters around the building broke the news that Robert Weiler, who engineered a top-to-bottom overhaul of the company in 1990, was leaving the president's post after just 15 months to take a job as senior vice president of sales and marketing at Lotus Development Corp. He was replaced by Mark Ruport, 38, an ex-Cullinet Software, Inc. and Informix Corp. executive who had been at Interleaf just seven months.

At some firms, revolving doors in the executive suite prove jarring. Interleaf employees and customers, however, are getting used to all kinds of changes these days as the company struggles to reverse a two-year slide.

Interleaf built a reputation for highly functional publishing software in the mid-1980s but has since suffered intense competitive pressures and been ravaged by internal cost inefficiencies.

Ex-Cullinet President Weiler was tapped in October 1989 to turn the firm around. "When I got here, the company was portrayed as stalled," he said in an interview last month. "What I didn't realize was how fast it was spiraling downward."

Weiler and a new management team took dramatic steps to reverse the spiral. Since Weiler took over the company has laid off 18% of its employees, dumped a hardware business that had become an earnings albatross, replaced five of its six vice presidents, overhauled its sales force and begun a campaign to become hardware independent.

"They have a [turnaround] strategy, but it is a long process," said David S. Nelson, vice president at Shearson Lehman Brothers, Inc. The strategy appears to be progressing. Interleaf reported a narrow $670,000 quarter profit last week, its second straight quarter in the black.

Now it is up to Ruport to make the changes work. "My strength is in implementation, and we're in an implementation phase now," he said.

Interleaf has little margin for error. Low-end desktop publishing competitors are challenging it with increasingly elegant functions at a fraction of Interleaf's premium price ($2,400 to $15,000 for the workstation software, depending on features). Big firms such as Xerox Corp. and IBM are showing increasing interest in getting a piece of the document preparation business. And Interleaf's financial health is shaky. The company's stock is trading at less than $4 per share against an all-time high of more than $25.

Interleaf's comeback strategy is to distance itself from the commodity desktop publishing market and target high-end document management, including graphics, version control and routing — the kind of heavy tracking that is typical of government contract work. "The major thing we have to address is the transition from electronic publishing into something that's much broader," Ruport said. Interleaf released its first major product in this area last year — a $70,000 piece of mainframe software called Relational Document Manager.

The company is also putting a lot of faith in the new release of its mainstream publishing system, called Interleaf 5. The package, which shipped late last month, features a data-sharing technology called "active documents," which allows documents to be linked to each other and to other applications in such a way that sharing data and moving around is very transparent.

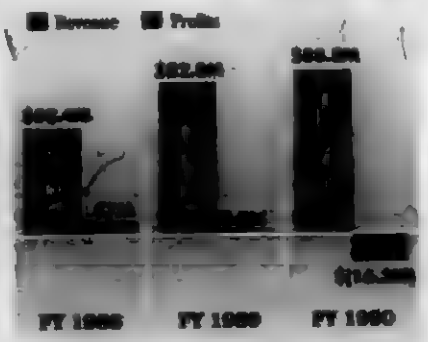
Grumman Corp.'s Electronics Systems Division in Melville, N.Y., has used that technology in a hardware/software product it created for customers who do their own maintenance of Grumman products. The Portable Maintenance Aid puts more than 100M bytes of documentation on a portable Sun Microsystems, Inc. workstation with

Continued on page 73

Turnaround time

Interleaf President Mark Ruport (right) faces the task of reversing an earnings trend that has been heading steadily downward



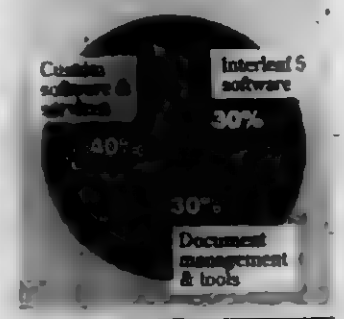


CW Chart: Doreen St. John

Priority shift

Having left the hardware business, Interleaf is eyeing a radically different revenue mix by 1992

1992
Revenue breakdown goal



CW Chart: Doreen St. John

Mac Classic is shining star in Apple's sky

BY JAMES DALY
CW STAFF

PALO ALTO, Calif. — Apple Computer, Inc.'s low-cost Macintosh Classic is gunning to become the best-selling Macintosh ever, and Apple's two highest executives said it is only the beginning. The company is planning an aggressive series of introductions this year designed to pump technological adrenalin into its product line.

Chairman John Sculley and Chief Operating Officer Michael Spindler said at a recent briefing that Apple is hard at work on infrared technology to produce wireless computer networks and a lightweight notebook-size computer that sources said could arrive as early as August. Additionally, the System 7.0 operating system update should be in users' hands by the summer.

Sculley said the moves will play a vital role in counteracting the myopia that has crept into the Cupertino, Calif.-based organization. "We've been looking inward too much," he said. "We've been trying to sell to people who already own a system, and if we only do that, we're not going to be an important player."

Despite the mounting recession, Sculley said he expects that Apple's new economic model — cutting prices in order to increase market share — will help the company maintain a 10% growth rate for 1991. "Everything we do is aimed at gaining market share," he said. Sculley added that Apple's most intense competition will come from makers of IBM Personal Computer-compatible clones.

Despite the challenges ahead, Sculley and Spindler were upbeat and confident about current Macintosh sales. Demand for the Macintosh Classic — which was introduced in October along with the Macintosh LC and Macintosh SI — has been "stupendous," Sculley said.

In the quarter ended Dec. 31, 1990, Sculley said Apple shipped more Classics than the total number of Macintosh Pluses shipped in its best year. The company also expects 1991 Classic shipments to exceed the annual sales record of the wildly successful Apple IIE, which Sculley said sold more than 500,000 units in its best year.

The downside of the Classic's success, however, has been a widespread shortage of both the $999 floppy-based and $1,499 hard drive versions. Spindler noted that the backlog will not be eradicated until March. He added that when Apple did its initial market demand forecast last spring, "things looked different." He added that the firm "would have been crazy" to gear up for maximum demand.

During the last few months, Apple has tried to boost production of the Classic by increasing operating hours at manufacturing facilities and streamlining delivery channels. The lessons learned from the Classic shortage, however, have allowed Apple to plan large shipments of the Macintosh LC in February, one month earlier than the general availability date.

COMMENTARY

J. A. Savage

Taking what you're given



Take a couple of hypothetical users: Jane from Dungeons University and Dick from the Institute of Dragons. Both are charged with taking care of the technical computing needs of their students. Jane has a stock of Hewlett-Packard/Apollo workstations; Dick has workstations from Sun Microsystems.

Pretend that both Dick and Jane have the same budgets and needs. Where they differ is in what they expect — and what they get — from their vendors.

Jane expects HP to make the migration to the next version of the Open Software Foundation's OSF1 operating system easy. She screamed after being told that OSF1 would not be available on all the old versions of the workstations. When HP heard the piercing cries of its users, it scrambled to satisfy them. In the end, the firm compromised, saying it would offer the new operating system on older machines that upgraded to the Motorola 68040 processor.

Dick was barely faxed when Sun told him older Sun models would not get an upgrade to AT&T's Unix System V, Release 4 operating system — period. "That's progress," he said. And when Sun said all new software, including the operating system, would be available only on compact disc/read-only memory (CD/ROM), Dick shrugged again. "What's another thousand bucks for a CD/ROM drive?" he asked.

Sun is out to make money, and it won't take any whining from users. These are the breaks in the real world. Sun Chief Executive Officer Scott McNealy cynically said to one such user, "We apologize that technology moves forward."

HP, on the other hand, takes whining seriously. Old products are offered for decades to please small groups of users. This impacts HP's resources and, quite likely, its profitability. For instance, a Unix-based minicomputer rollout was recently delayed for four months because the firm simply didn't have the engineering resources to get it out on time.

McNealy intimated that Sun does not have the resources to port software to all of its platforms in the future. "In five years, we may have to port software to five different platforms; that's not trivial," he said. So instead of spreading its resources thin, Sun will likely cut off older products from new software.

McNealy also suggested that users not only provide for maintenance of current Sun systems with separate hardware budgets, but that such budgets should include the cost of hardware upgrades every six months.

I'm still trying to figure out why Dick is happy with a vendor that asks him to make these cold, hard changes so quickly. All I can divine is that it must be his attitude toward money. Dick is spending other people's money and can always figure out a way to carve it up to accommodate whatever Sun throws at him. Jane also spends other people's money, but she takes it personally — as if her sofa dealer suddenly said that she had to buy a new sofa while her old one was still perfectly good.

Savage is a *Computerworld* West Coast senior correspondent.

INTERNATIONAL

BRIEFS

Taking care of Businessland

Computer reseller **Businessland, Inc.** will continue its fight back to the black ink that has eluded it in recent quarters with a new lieutenant. **Wayne P. Henry**, who came to Businessland one year ago as part of the firm's acquisition of Springfield, N.J.-based Data Systems Computer Centre, Inc., will replace Robert Henderson as senior vice president and general manager at **Businessland Canada Ltd.** Chief Executive Officer David Norman, to whom the new head of the Canadian subsidiary will report, noted that Henry's former position as Data Systems' chief financial officer will give his new corporate charge "the needed focus on profitability."

Robocoup

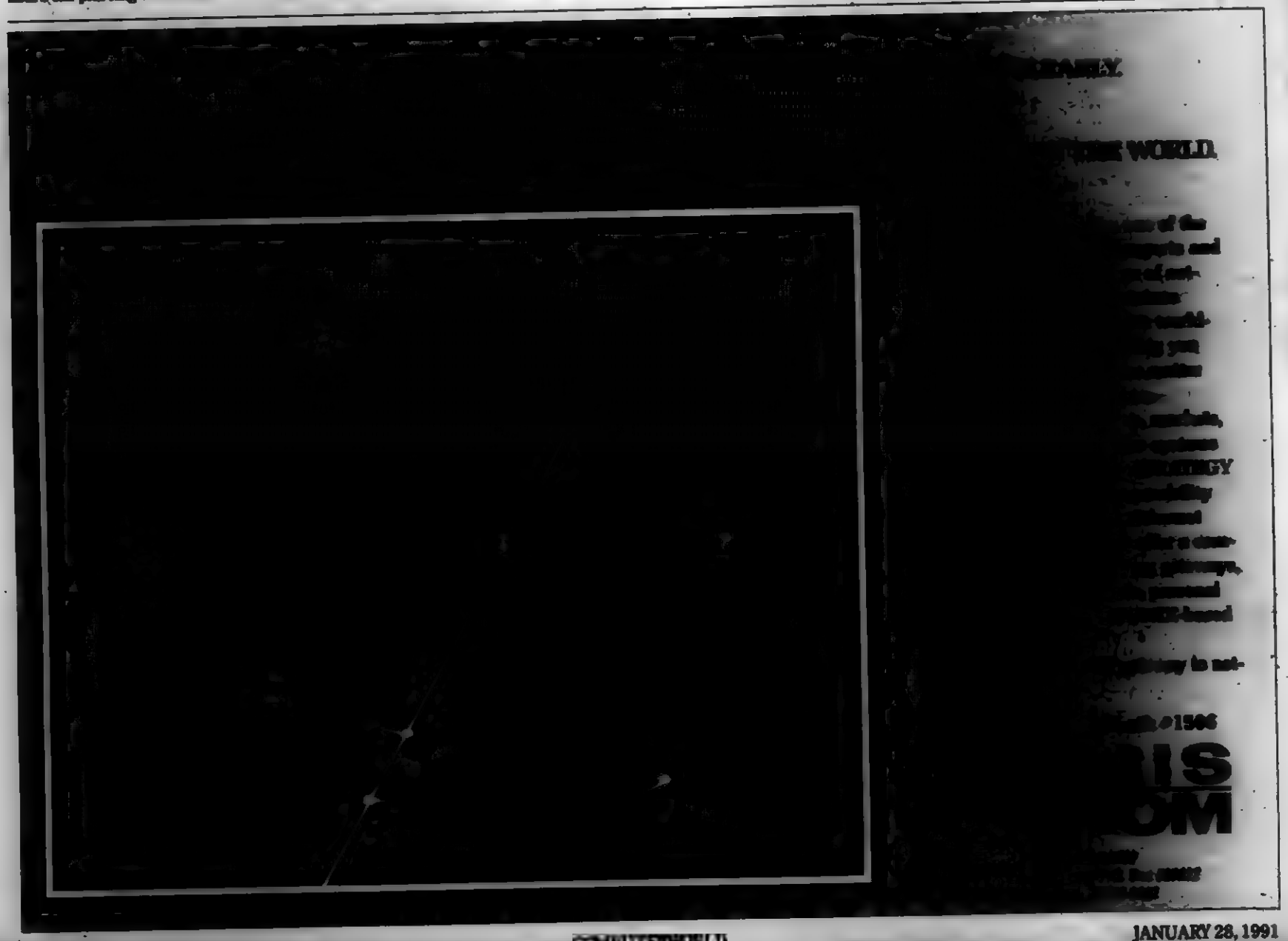
IBM German subsidiary **IBM Deutschland GmbH** earlier this month signed a joint venture deal with three sales firms that once belonged to East German electronics group **Robotron**. According to IBM, the new Berlin-based firm — called **Computer Service Partner GmbH** — will offer computer services in what used to be East Germany. It will employ about 150 people. State-owned Robotron, which once employed 68,000, has shrunk to a work force of 15,000, leveled by subsidiaries' cooperation with Western firms or declarations of independence in the wake of the reunification of the two German economies last year.

Hang-up

The UK government recently abandoned plans to introduce a nationwide voice and data network serving approximately 800 sites. The project, hailed on announcement as evidence of the government's commitment to new technology, reportedly was put on permanent hold when **Racal Electronics UK** — the only company invited to tender for the contract — failed to come to terms with the government on price.

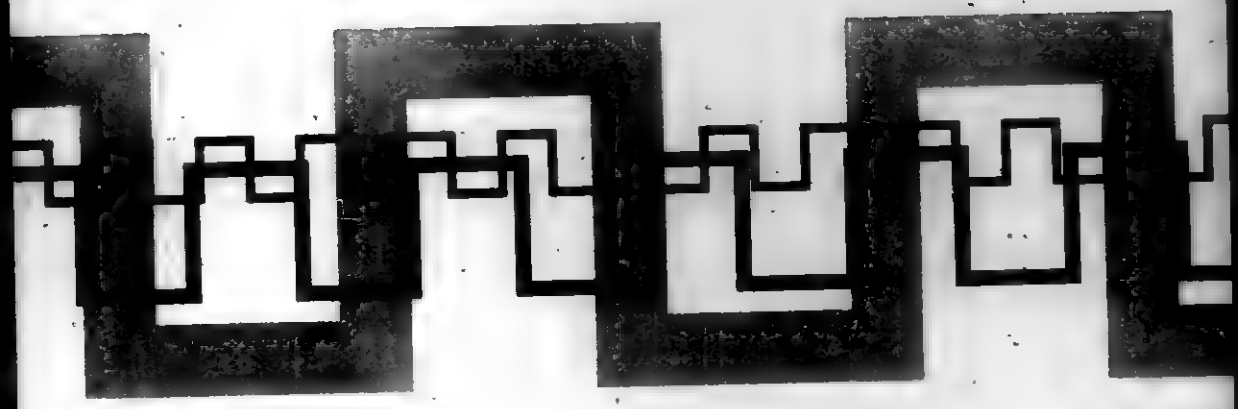
Too much

Nihon Unisys Ltd., Unisys Corp.'s Japanese subsidiary, has been slapped with a $13.1 million tax penalty for overstating expenditures on its fiscal 1989 tax return, according to the Japanese press.



Connections

INSIGHT



DATA

The 1990s—
The Decade of Data

Information is a valuable commodity. For the Management Information Systems (MIS) manager or other information broker, the ability to process data as easily as voice is vital in today's information marketplace.

Business users are in a constant search for new services and techniques that will help them move information easily, quickly, and cost effectively. When searching for these solutions, MIS managers are concerned about being locked into a single approach or choosing an approach that will be obsolete tomorrow. And the rapid growth in the industry means the equipment they choose must be compatible with equipment from a variety of vendors.

The business industry is finding that the answer to all these concerns can be provided by the local telephone office. Data users are demanding speed and flexibility. In addition to speed and flexibility offered at a reasonable price, the public network provides data services with the same reliability and universality as voice calls switched through the central office.

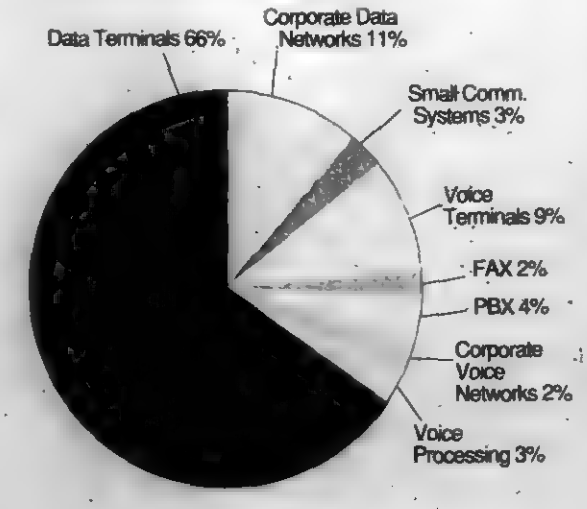
Recent studies show that in a United States business telecommunications market worth more than $80 billion, data terminals account for 66 percent of all sales, and corporate data networks another 11 percent. The significant growth in the demand for data is due to the almost universal penetration during the last 10 years of personal computers (PCs) into the workplace.

This proliferation of desktop PCs has increased the need for easy, universal access to mainframes, on-line information services, Local Area Networks (LANs), and Wide Area Networks (WANs). Perhaps the most urgent capability for users today is the ability to interconnect LANs. According to industry experts, the projected compounded annual growth rate for the data market is from 17 to 30 percent. Within that market, LAN interconnect is expected to grow 35 to 45 percent.

Along with maximum speed at a low cost, data users are looking for ease of installation. Security is another requirement, necessitating closed user groups that restrict data communications to selected telephone numbers. For IBM, DEC, HP, Apple, and other computer manufacturers, the need for standard interface specifications and compatibility is a primary requirement.

Data communications solutions for the 1990s must meet these demands and more.

1990 US Office Communications Market $80.5B—Growing at 12%



Compounded Annual Growth Rate

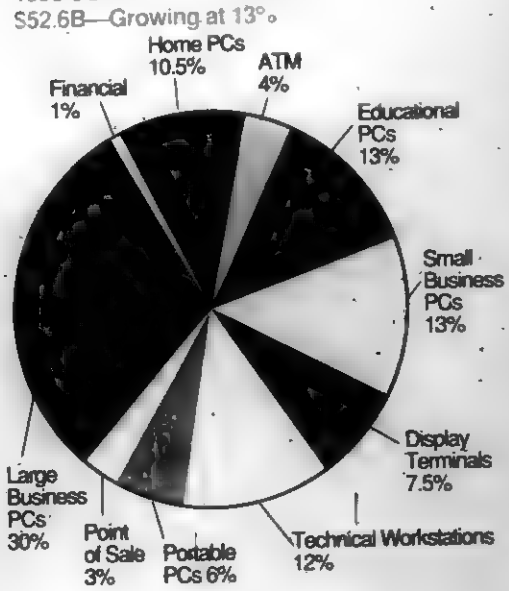
The Central Office Solution

Now the telephone company offers users a powerful data network—an alternative solution to expensive private networks with dedicated or leased lines. New digital technologies have placed the public network in an unparalleled position of strength.

In addition to cost savings, the public network option enables businesses to buy service on demand, offer its customers the most up-to-date features and technology,and provide 24-hour maintenance and emergency power supplies. Advantages include:

- nationwide coverage, with data access and connectivity extending everywhere the public network reaches;
- multiple data services and technologies that flexibly match different users' needs;
- on-demand resources that can quickly be adapted to the changing requirements of business; and
- adherence to standards and common interface specifications that allow the interworking of equipment from multiple vendors.

1990 US Data Terminals Market
$52.6B—Growing at 13%



Compounded Annual Growth Rate.

Solutions Applied. With the growth of computing resources, the data user has become more and more sophisticated, causing a corresponding increase in the demand for sophisticated data communications services. Today's data requirements include LAN Interconnection, screen sharing, Group IV facsimile, 7.5 KHz wideband audio or high-grade audio, disaster recovery, and video conferencing capabilities.

LAN Interconnection gives business a way to link together several LAN sites. Industries—such as banking, insurance, health care, and others—have come to rely extensively on their LAN networks to support day-to-day business transactions. As the number of LAN installations increases, MIS managers are using LAN interconnection to create a seamless corporate-wide data network.

Multilocation Screen Sharing can be used by organizations with branch facilities to cut costs, increase productivity, and improve coordination of activities. Screen sharing allows users at different locations to view and alter the same file on their PCs. Through ISDN, voice and data can run simultaneously on the same line. For example, managers at head offices can review reports with regional representatives. Loan officers and real estate agents at different sites can review documents required for loan approvals. Legislators holding a committee meeting by conference call can examine proposed bills on computer screens and observe revisions immediately.

Group IV Fax provides a high-resolution image that can be switched inexpensively over the public telephone network at speeds up to 64 kbps—one page in three seconds. Group IV facsimile machines, which use laser printing to produce high-quality images, can cut equipment costs by 25 percent compared to conventional computers.

With this ability, engineers and designers can send detailed schematics to distant manufacturing plants. Professors and

students can transmit materials to colleagues. Sales representatives in the field can respond to customer inquiries quickly with detailed product information, including half-tone photographs and high-resolution drawings. Physicians can exchange and discuss patient records.

A dramatic testament to the quality of Group IV fax is its use by law enforcement agencies to distribute fingerprints and photographs of missing children, and known or suspected criminals. With the broadcast feature on some machines, such as the NEC BIT-IV fax machine, as many as 10 groups—each containing 200 recipients—can be sent documents at the same time. While in the confidential mode, the document can only be printed when a user enters the correct password.

High-Grade Audio allows users to obtain broadcast-quality sound through a dial-up, digital connection. In the past, radio stations relied on dedicated lines or satellite transmissions, which are more expensive and lack the flexibility of the public network link.

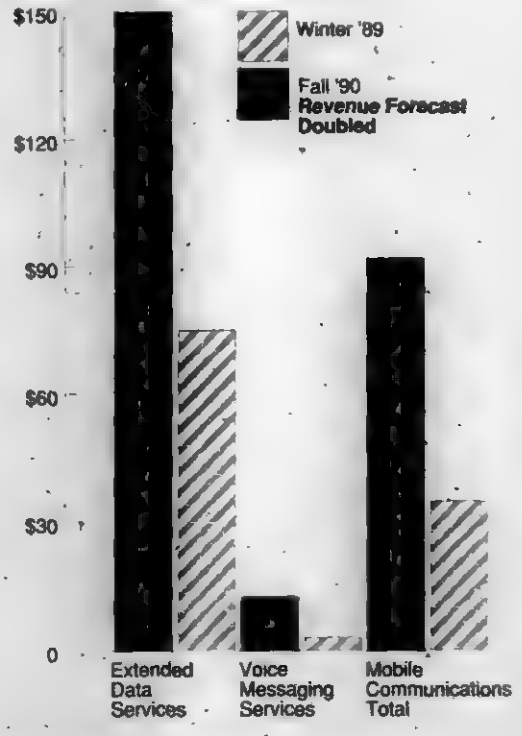
This advanced technology enables radio correspondents in the field to file reports with broadcast-quality sound, easily and quickly. Micro[56]—a microcomputer audio compression device that fits into a briefcase and is made by Corporate Computer Systems—converts the analog audio signal into a digital data stream at the sending point. A companion microcomputer reconstructs the audio signaling at the receiving end. This data technology allows individual radio or television stations to supply voice programming to the network quickly and economically through dial-up digital audio.

Disaster Recovery is a process that offers a critical backup option for businesses involved in vital transfer of information, such as banking or financial institutions. A data line from the telephone operating company can provide a flexible, economic means of supplying backup circuits in case dedicated lines are lost. With Automatic Disaster Recovery, an intelligent A/B switch monitors the dedicated circuit and automatically switches service to the public network when a dedicated connection is broken.

Video Conferencing saves businesses time and travel costs. Dial-up Video Conferencing, through the public network, offers the additional savings made possible by using central office lines instead of private or leased DS-1 circuits.

With this capability, corporate training courses can be offered to regional offices, businesses can conduct interviews at college campuses, real estate agents can provide a client a video tour of a home located in a distant city, or a witness can testify or give a deposition.

Five-Year Revenue Forecast ($B)



Data's Newest Technology: Frame Relay

Frame relay is a wide-area packet switching technology that provides performance equal to dedicated private-line networks, but does so more efficiently

Technology. Frame relay's rapid and efficient method of data transport assures reliable delivery and substantial performance improvement compared to current LAN interconnect solutions. The 1.5 Mbps bandwidth handles the average 1 Mbps LAN speed, and can easily accommodate bursts up to 10 Mbps. Frame relay uses statistical multiplexing, which provides dynamic bandwidth for handling the "bursty" nature of LAN traffic.

According to Terry Sweeney, *Communications Week's* Public Networking Editor, "Frame relay is viewed by network planners and switch buyers as an important logical step in public-network evolution." Nick Lippis, a principle consultant with Northeast Consulting Resources, concurs, "Carriers have been looking for a way out of the high-expense, low-profit [circuit-switched] private-line business and into true bandwidth-on-demand services."

The technology provides a common transport service for all LANs and allows MIS departments to establish a single interface architecture for a corporation. In addition, frame relay significantly improves information concerning volume and usage patterns on traffic flowing onto the LAN.

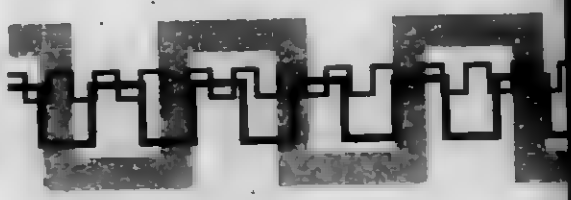
The Alliance. To ensure compatibility between public and private networks, four key manufacturers—cisco Systems, StrataCom, Digital Equipment Corporation, and Northern Telecom—have agreed to a common user-network interface specification.

Steve Sazegari, an analyst with Dataquest Inc., says, "This is a powerful alliance that will set a de facto standard. This team-up is telling telephone companies and users that the whole network will support frame relay." According to Berge Ayvazian, an analyst with the Yankee Group, "This alliance helps accelerate the introduction of frame relay services both at the central office and at the premises. This creates potential for a hybrid [network], where it was ambiguous before if the public and private pieces would be compatible."

Events since the announcement of the consortium in September bear this out with 24 more network interface vendors joining the group. This consortium represents a powerful influence in today's communications industry.

By installing frame relay circuit packs with the appropriate software, the telephone operating company can offer a high-performance, high-speed LAN interconnect service. This provides a powerful data networking strategy for distributed data networks and enables the telephone operating company to offer effective data solutions.

With frame relay, options for business are expanded. John Shaw, staff director for data services, NYNEX Service Co., says, "Frame relay is important in that it can address a broader, more near-term market." Shaw points out that frame relay makes the public network a viable, present-day alternative to expensive private solutions.



Northern Telecom's DMS Data Services Offering

Northern Telecom's DMS Data services portfolio, delivered through the public network, offers central-office reliability, along with the flexibility of multiple technologies and access techniques that complement in-place systems. The services in the DMS Portfolio interwork completely, and deliver connectivity for desktop LANs.

The high-speed transmission of the DMS Data technologies over both dialable and dedicated lines moves data at speeds up to 64 kbps synchronous and 19.2 kbps asynchronous. DIALAN and ISDN allow voice and data transmission over single, twisted-pair wiring.

DMS Data solutions are effective alternatives to transmitting data over expensive coaxial cable, private leased digital lines, or less reliable analog modem communications. DMS Data will evolve with central office technology to function in ISDN environments, offering frame relay and Dialable T1 capabilities.

DIALAN (DMS Integrated Access Local Area Network) provides the user the ability to transmit data over a standard telephone line while talking on that same line, using DIALAN software and replacing a standard modem with an Integrated Voice and Data Module (IVDM). With DIALAN, data travels over a telephone line at speeds up to 19.2 kbps synchronous and asynchronous—16 times faster than 1200 baud (1200 bps) modems. The time required to transmit a 40-page document, for example, drops from 20 minutes to 1:15 seconds.

Multilocation screen sharing and LAN interconnection are also possible on the public network through DIALAN technology.

DIALAN supports the same popular communication packages—such as Smartcom, Procomm, Crosstalk, MacTerminal, PC Anywhere, and Carbon Copy—that are used with modems, and offers high-speed PC-to-PC file transfer. This addresses the increasing demand for networking by providing asynchronous PC-to-PC file transfer and PC-to-host access.

Datapath offers direct digital data communications over twisted pair wiring between the user's desktop computer and a DMS-100 Family central office host switch, which gives users a clear, digital path through the network. The result is a cost-effective network using existing voice network wiring for data transmission.

Datapath services also can be deployed in a non-DMS-100 office by installing Datapath extension cards in channel banks or SLC-96s.

The Datapath terminals connect to the network through standard wall jacks, eliminating the need for expensive coaxial cable, while providing an easy and cost-effective way to increase terminal applications. Also, Datapath provides high-grade audio, dial-up compressed video conferencing, Group IV fax capabilities, disaster recovery, and LAN Bridging for Ethernet, Appletalk, and Token Ring LANs.

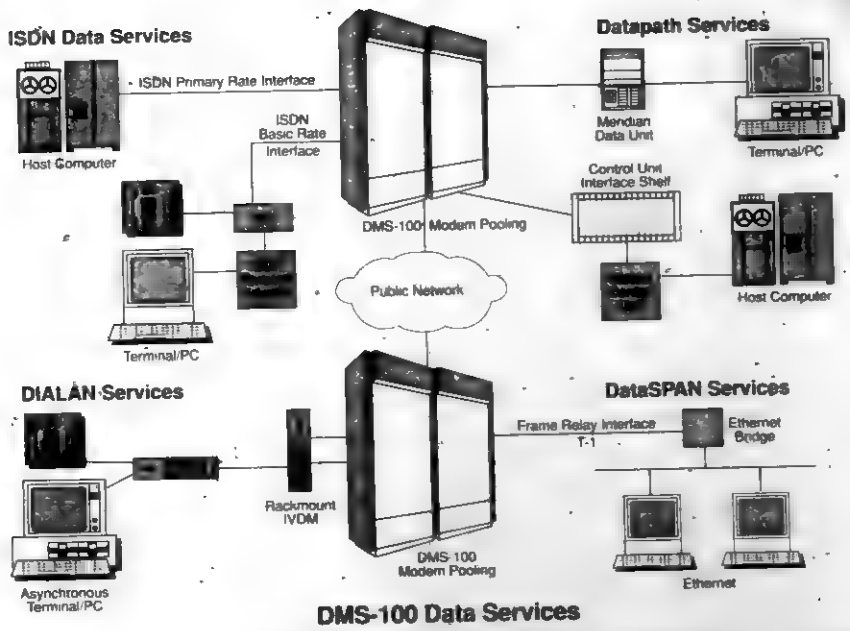
Analog facilities in the data connection present no problem for Datapath. Modem pools located in the telephone switching centers provide cost-effective analog-to-digital conversion between Datapath access lines and modem-based applications.

A Datapath connection offers a range of transmission speeds:

- 300 bps to 19.2 kbps—provides asynchronous end-to-end digital transmission capabilities; and
- 1.2 kbps through 19.2 kbps and 48, 56, or 64 kbps—provide clean, synchronous transmission, at prices often less expensive than other technologies.

Northern Telecom's ISDN is standards compliant, operating to a set of CCITT-defined (International Consultive Committee for Telephone and Telegraph) interfaces and protocols. ISDN is a unified, all-digital communications network that allows single-plug access for exchanging voice, data, video, and image information. With Northern Telecom's DMS multiplex switching, data can be circuit- and packet-switched at speeds up to 64 kbps.

A Basic Rate Interface twisted pair loop can support up to eight ISDN terminals, two of



DMS-100 Data Services

which can be voice. Through Primary Rate Interface links, used mainly for trunking, customer premises equipment—such as a private branch exchange, a LAN gateway, or a host computer—can be connected to the public switched network.

Northern Telecom's ISDN can provide all the capabilities that are supported by DIALAN and Datapath, such as screen sharing, LAN interconnection, Group IV fax, disaster recovery, compressed video conferencing, and high-grade audio capabilities.

The Future. DataSPAN; a new DMS SuperNode "fast packet" service based on frame relay standards recommended by the CCITT and the American National Standards Institute, is the ideal service for the emerging high-speed LAN interconnection market. DataSPAN provides end-users with up to 1.5 Mbps bandwidth for high-speed data communications.

Prior to DataSPAN, corporations faced with connecting several data sites usually chose to lease fixed-bandwidth, dedicated lines. However, with DataSPAN, a data site can be connected with all other sites through a single access line to the frame relay network. DataSPAN also offers dynamic allocation of bandwidth, or bandwidth-on-demand. This eliminates the necessity for an expensive high bandwidth leased line to every other site to meet the needs of a few large transactions.

DataSPAN is accessed through switched 56 kbps services (Datapath), ISDN "B" channels, channelized or non-channelized T1 lines, or private lines. Services made possible by DataSPAN include:

- LAN Interconnection Service—this bridges or interconnects similar types of LANs over a wide area, making them function as a single large LAN.
- SNA Connectivity Services—now IBM connects their products using modems and private lines in a system known as System Network Architecture (SNA); with SNA Connectivity Services, IBM customers can build high-performance virtual private networks to replace the low-performance, multi-drop networks.

DataSPAN is scheduled for trial in early 1991, with commercial availability by the end of 1991.

Dialable T1 (PRI). Dialable T1 extends the coverage of plain old telephone service to wideband access facilities. The end-user can dial-up a wideband facility and use it for applications such as on-demand video conferencing, high-speed file transfer, or LAN interconnect. The call is similar to dialing normal voice calls except the end user will specify the number of channels/bandwidth.

The control interface for Dialable T1 is by way of Q.931 signaling through Primary Rate Interface ISDN, which allows the service to be used in conjunction with the growing base of Primary Rate ISDN customer premises equipment.

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EXECUTIVE CORNER

Maxtor goes on CEO search

Maxtor Corp. founder and Chairman **James M. McCoy** last week stepped back into his former job as president and chief executive officer of the San Jose, Calif.-based disk-drive company. He replaces **George M. Scalise**, who resigned for personal reasons, while the company searches for a permanent successor, according to Maxtor.



Effective this month, **Brian Lacey** is the new president and CEO of Billerica, Mass.-based **Atex Publishing Systems**, an **Eastman Kodak Co.** subsidiary. Lacey, a former high-tech consultant and corporate executive with a turnaround track record both in the U.S. and abroad, will spearhead a restructuring aimed at boosting Atex's stance in the electronic publishing systems market, the company said. He succeeds acting President **John LeTourneau**, who will return to the chief financial officer's post he held before stepping into the breach during Atex's executive search.

Computer industry veteran executive **James D. Norrod**, most recently a venture capitalist at Palo Alto, Calif.-based Merrill Packard Anderson and Eyre, took on the top position at another computer company last week: San Diego-based storage management software vendor **Emerald Systems Corp.**

Bridge/router products vendor **Advanced Computer Communications** appointed **Osama Hassanein** president and CEO earlier this month. Hassanein, a Northern Telecom, Inc. veteran, has served on Advanced Computer Communications' board of directors since 1987. That year, the firm's founder and Chairman Roland F. Bryan noted, marked the start of Advanced Computer Communications' diversification from defense communications into internetworking — a move in which Hassanein was influential.

Earlier this month, Rolm Corp. veteran **Anthony V. Carollo** became executive vice president and chief operating officer of **Fujitsu Business Communication Systems, a Fujitsu America, Inc.** subsidiary headquartered in Phoenix. In his new position, Carollo will be charged with implementing Fujitsu Business Communication's telecommunication strategy. He will also be reunited with an old colleague: former Rolm vice president and current Fujitsu Business Communication Vice President of Sales Larry Jernigan, who joined the firm last fall.



San Francisco-based **Bank of America** this month named former International Private Banking head **Thomas M. Quigg** to head up its U.S. division's High Technology Group. A "high-tech bank since the industry's beginnings" according to Executive Vice President R. Thomas Decker, the bank views Quigg's new assignment as an emblem of its commitment to expanding its technology industry presence. Quigg will be responsible for credit and marketing activities targeted at high-technology businesses, the bank said.

Zenith Data targets commercial

BY MICHAEL FITZGERALD
CW STAFF

Two days into his new job, Zenith Data Systems Chief Executive Officer Enrico Pesatori last week said he will make increased strength in the commercial market his "absolute" top priority at Zenith Data.

While he intends to build on strategies already in place at Zenith, Pesatori said, "I think there are many things that should be done and be improved."

Zenith Data, he said, will actively pursue strategic and technical alliances with other vendors as part of refocusing its product line strategy. In addition, Pesatori said he intends to see the company accelerate what he called a "rapid" expansion of its market share, especially in Europe. "The commitment and financial resources of [Zenith Data's French parent company] Groupe Bull," Pesatori noted, will be a significant asset on which to rely.

Recent shifts in the firm's sales strategy will hopefully be helpful as well. In a letter circulated to employees outlining the shift, Vice President of Sales and Marketing Arthur Lambert said the company will move from its regional sales strategy to a two-channel approach focused on sales in the commercial and education/state government areas. Zenith Data's government sales force is unaffected by the change, which will result in the layoff of 50 salespeople and possible cuts in support staff as well.

Computer firms continue to post fourth-quarter earnings

Microsoft exceeded expectations, Picturetel boomed, Silicon Graphics got tough and Stratus hung on as fourth-quarter computer industry earnings reports showed some bright spots in turbulent times

Cognizant, Inc.	$33.1M	21%	$2.3M	(18%)
Cypress Semiconductor Corp.	$93M	24%	$8.2M	1%
Maxtor Corp. **	$261.1M	111%	$(3.9M)	—
Network Equipment Technologies Corp.	$35.4M	(22%)	$(5.6M)	—
Silicon Graphics, Inc.	$136M	38%	$10.4M	44%
Stratus Computer, Inc.	$118.5M	21%	$13.5M	32%

Parentheses indicate a reduction or loss
* Company estimates
** Results include the operations of Maxtor Colorado Corp. (formerly Miniscribe Corp.) acquired in June 1990

CW Chart: Paul Mauk

European software plan receives mixed reviews

ANALYSIS

BY EMMA WOOLACOTT
IDG NEWS SERVICE

LONDON — Industry reaction is mixed so far on the European Commission's recent compromise agreement on software protection. Under the agreement, reverse engineering will be banned if the intention is to develop, produce or market a program substantially similar to an existing product. It will be allowed, however, if the creation of a compatible system would be impossible otherwise.

The interworking issue has been a contentious one. The commission's original proposal called for a total ban on reverse engineering. Both the UK and Ireland supported it. Nevertheless, the UK Department of Trade and Industry has said it regards the more moderate version as satisfactory and is not pressing for further changes.

IBM, which has been vocal in its opposition to reverse engineering, has also said it is satisfied with the agreement, although a spokesman said the company would have preferred to see traditional copyright laws applied.

However, the European Committee for Interoperable Systems (ECIS) has reservations about the decision. Mark Deering, a partner at Adamson Wacker, the law firm representing ECIS members, called the agreement "a major victory." However, he added, ECIS has "certain problems" with it. "Third-party maintenance is not included," he said. "Systems integrators or third-party maintainers cannot maintain software because they can't run a memory dump. What does exist is error correction, but it's not sufficient from our point of view."

More problems

Another problem for ECIS is the question of the circumstances in which reverse engineering can be used to create interworking. While the preamble to the directive uses the word "product," implying that it applies to both hardware and software, the body of the text refers to the "interoperability of an independently created program with other programs." This means that, strictly speaking, the analysis of software, such as operating systems to ensure hardware compatibility, will be forbidden.

A third issue for the ECIS is the wording of the section referring to interfaces, which, Deering said, "may lead to the interpretation that interface specifications may be copyrightable."

The directive will receive a second reading before its final adoption some seven months from now, and changes are still possible. Deering said the ECIS will push for amendments that take its misgivings into account.

Woolacott writes for PC Business World, *an IDG Communications British publication.*

Interleaf

FROM PAGE 71

Interleaf software. Using hypertext, users can quickly find the needed documentation electronically without leafing through thousands of printed pages, said Emil Pavlik, a Grumman operations support manager.

"Active documents truly change the way you look at information," said Gerald Michalski, a vice president at Southport, Conn.-based market research firm New Science Associates.

However, even Interleaf officials acknowledged that hot technology is not going to turn the company around. The bigger task for Interleaf is to fundamentally change the way the company sells products. Interleaf took a $13 million write-down in 1989 to rid itself of an unprofitable hardware business that was contributing 65% of revenue but driving costs sky high.

Also gone are the firm's huge inventories and lavish spending habits: for example, the move that gave each employee, clerical staff included, a costly Unix workstation instead of a personal computer.

The company has also adopted conservative accounting practices that it said should minimize earnings surprises.

In addition to releasing several niche-oriented new products this year, Interleaf is aggressively courting value-added resellers (VAR) as a way to boost volume without increasing staff. The changes have caused turmoil in the direct sales-oriented sales force, but VAR revenue is now 8% of sales, up from 2% one year ago. Ruport said he expects VARs to eventually contribute 20% of revenue.

Interleaf is also narrowing its market focus to a few select industries, including aerospace/defense, electronics, commercial aviation, pharmaceuticals, manufacturing and utilities/telecommunications.

The company has been less successful in addressing a big strategic gap at the low end of its product line. Although it has introduced products for both the Apple Computer, Inc. Macintosh and IBM Personal Computer in the past, neither has sold well.

Interleaf will try to turn that around this summer, when it is scheduled to ship an entry-level publishing system for the PC. A Macintosh version should follow later in the fall. "We need a low-end product," Ruport acknowledged. "Long term, it's very important to our success."

Industry observers agreed. "Interleaf can position themselves as being a provider of customised solutions, but they will not grow to be $200 million doing that," said Mark Walter, associate editor of "The Seybold Report on Publishing Systems." "They're going to need a successful mass-market product."

Success story: Hunting for a skills niche

LIFE AFTER LAYOFFS

This is the conclusion of a three-part series tracking IS professionals' attempts to recover from job losses.

ALAN J. RYAN
CW STAFF

Being laid off with few job prospects in sight is not necessarily the end of the world or your career.

Five or 10 years ago, having any unexplained time lapse on a resume was the "kiss of death," says Jim Kwapick, director of information systems recruiting at Robert Half International, Inc. in Minneapolis. Many employers would express little interest in an employee who had been "let go" by another company, often assuming there was more behind the separation than economics.

Today, with thousands of workers displaced by layoffs throughout the nation and with more and more high-level workers having experienced layoffs at some point in their careers, prospective employers are more receptive to workers who have been laid off, Kwapick says.

"I think it is easier to gain other employment if you're employed vs. not being employed, but it is no longer the stigma that it once was to be unemployed," Kwapick says. "Everybody gets hit at some point."

That news comes as no surprise to George Francis, who was laid off by Kidder, Peabody & Co. as part of a firmwide workforce reduction after seven years at the New York company.

It has taken nearly a year for Francis to find a new job, but the wait proved worthwhile when he found himself weighing three job offers from large, nationally known firms.

While the outcome of Francis' job search was happy, the hunt itself was not easy, he says. Five months into the process, Francis admits, he became discouraged. "I thought I would find a job in three to four months," he says.

Fortunately, Kidder had provided Francis with a severance package that included outplacement services, his annual bonus and four weeks' severance pay for every year he had worked at the company.

"I didn't realize how long it would take to build the relationships and contacts necessary" to find new employment, he says, adding that those first six months went by very quickly while he worked on networking.

Initially, Francis says, he concentrated his efforts on finding a chief information officer-level position. With 30 years of experience in the computer field — from development and management to security, disaster recovery and quality improvement — he believed he had the skills required to be a successful CIO.

Francis had also completed a data center move for Kidder prior to being laid off, and he thought that experience might make prospective employers sit up and take notice. But CIO jobs are few and far between, and Francis discovered that experience in relocating a data center is a skill shared by many IS professionals.

By the time his severance expired and he was officially removed from the Kidder payroll, Francis had begun to rethink his job-hunting strategy and his own career expectations. "At that time, I realized I had a unique speciality within my 30 years of MIS experience" — bringing quality processes to the IS function, Francis says.

At Kidder, bringing in quality improvement programs was only part of Francis' duties, but he had become a strong proponent of such activity. Additionally, he had given many presentations on the topic of IS quality before members of the IBM user group Guide International. He had made many contacts in the field, and he realized that this was a specialized skill he could use to sell himself.

"I put together some literature on my approach and methodology, and I took the presentation I had made on the changing role of quality and started giving people that information along with my resume," Francis says. "And the interest in George Francis grew proportionately as a result."



Randolph Langlois

After being laid off, *Francis spent nearly one year job hunting. He was hired recently as manager of quality assurance at Computer Sciences Corp.*

Francis, who is involved in teaching a course in management decisions at New York University's graduate school, says unemployed people "have to overcome inertia, build a plan, work to it and keep the faith." Part of the plan-building can include using specialized skills the worker has acquired and seeking out a job niche that uses those skills.

"If you try to build a plan and work to it, it will come together," Francis says. "You can't just say you'll take off three weeks to go to Florida with your family — you really have to work" at finding a job.

Use your contacts

Networking is a big help in terms of generating job leads and friendly support. In one instance, Francis says, he met someone who had been out of a job for seven months.

"He was very dispirited. I told him to work hard but then turn it over to the man upstairs. Otherwise, you'll drive yourself to jumping out a window." The man called Francis a couple of weeks later to say he had found a job. As Francis' own job search dragged on into its seventh and eighth month, he had to remind himself what he had told the other man just two months earlier, he says.

Francis focused on his quality improvement skills and continued his search. He finally accepted a position as the manager of quality assurance at Computer Sciences Corp.'s Communications and Integration Services Division in Piscataway, N.J.

Ryan is a *Computerworld* features senior writer.

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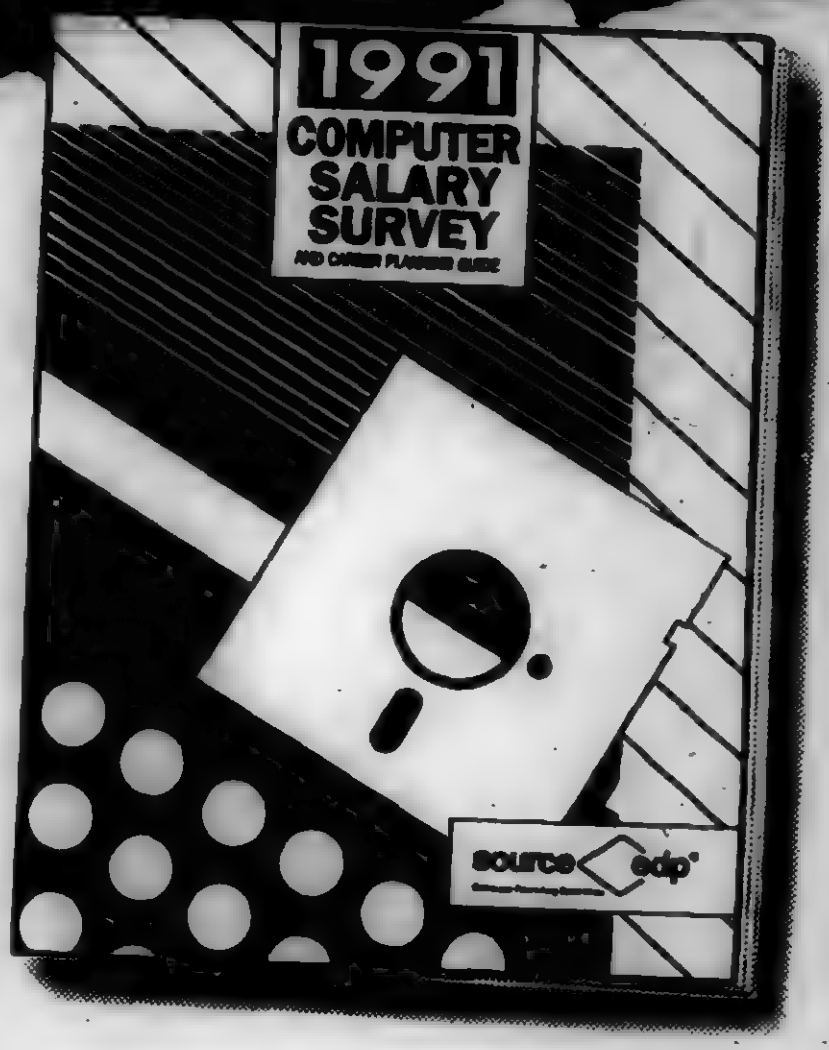
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SYSTEMS ANALYST wanted. Duties: Lead analyst for system analysis, design, development, data conversion, user training and documentation of Financial, Payroll, Personnel and Purchasing Applications. The responsibilities include process flow & data flow design, data modeling, database design, system testing, data conversion & user acceptance. Need Bachelor's degree in Computer Science or Engg. and 2 yrs. exp as Systems Analyst or Programmer Analyst. Related exp. must include using the following Unisys hardware/software: A-Series, LINC14, and it's utilities; DMSII, COBOL, ALGOL, COMS, ERGO, DMINTERPRETER, DMANALYZER. Exp. must also include LINC on V-380 & 61800 plus development of Payroll and Personnel Information Systems & Ins. Applications. Gen. Ledger, Inv. Mgmt., Accts Receivable and Accts Payable. Pay is $32,300/yr. 40 hrs/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #101080. Employer Paid Ad.

SYSTEMS ANALYST wanted. Duties: Redesigning the systems architecture for a distributed object oriented database management system for automotive manufacturing quality control purposes using C language. Includes meeting with user management and electronic data processing personnel to analyze the requirements, participating in the development of specifications, then applying database design and analysis principles to the system architecture problems. Need a Bachelor's degree in Computer Science or Engg. and six mos. exp. as a computer Programmer. Must have 1 univ course in quality control and must have at least one semester of independent research pertaining to the development of the architecture for a distributed object oriented data management system using C language. Pay is $30,000/yr. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #080690. Employer Paid Ad.

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data processing

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The expansion of our corporate computer center in Evansville, Indiana, has created openings for experienced systems programming professionals at all skill levels, up to positions requiring a minimum of five years experience. Systems programming experience in operating system (MVS or VM), interactive data base systems (IMS, CICS or DB2) or data communications (LARGE SNA NETWORKS) together with a degree in Computer Science or Engineering is required.

You'll be part of the Bristol-Myers Squibb worldwide computer center providing software and technical support for operating divisions. Responsibilities could be in data base or operating systems or data communications utilizing large scale IBM mainframe computers with MVS/ESA, VM/XA and vector processors. Our corporate and computer center growth will continue to create advancement opportunities.

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Requires a BS degree in Computer Science or related field. Must have 5 years experience in a COBOL environment, with 3 years on a VAX and 3 years in project management. Candidate should have a background in business applications with an emphasis on transportation, accounting, and/or sales systems.

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Requires a BS degree in Computer Science or related field. Candidate must have 5 years of experience in developing business applications in a mainframe environment, with at least 3 years in NATURAL and ADABAS. Experience with NATURAL 2 is preferred. Responsibilities include application design, task delegation, and some programming.

NATURAL/ADABAS DBA

Requires a BS degree in Computer Science or related field. Candidate must have 3 years of programming and DBA experience in a VAX/ADABAS environment. Experience with NATURAL 2 is preferred. In addition to programming and database design, responsibilities include NATURAL/ADABAS product installation, security and recovery planning.

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You will manage the Information Systems Support Department. This will involve developing departmental goals, establishing priorities, planning schedules and creating budgets. You must have a BS in Computer Science or a related technical field (MS preferred) and a minimum of 10-15 years experience in systems/applications development. Knowledge of at least three 3rd generation languages, two data base tools, 4gl languages and relational data bases is required. A demonstrated ability and experience installing, supporting and managing large business systems, experience with multiple computer environments and multiple technology platforms, and strong communication, leadership and motivational skills are also required.

MANAGER, MICROCOMPUTER TECHNOLOGY

You will be responsible for providing technical training, research and microcomputer-based solutions to business problems. You must have a BS in Engineering, a technical or business field (MS preferred) and a minimum of 10 years experience in microcomputer technology (applications development preferred). You should also be a CNE (Certified Network Engineer) or have previous mainframe experience on either the VAX or IBM Host platforms. Experience developing, supporting or implementing a microcomputer-based training program is also essential. Familiarity with other network environments such as Token Ring and Ethernet is desired, and knowledge of CAD, CAM, CAE technology and/or UNIX-based workstations would be helpful.

SYSTEMS MANAGER, PROJECT CONTROL SYSTEMS

You will be responsible for the identification of Project Control Systems requirements, the formulation of systems solutions, developing cost schedules and technical implementation plans for solutions, as well as final delivery of the product. Requires a BS in a technical or business related field and a minimum of 10-15 years of systems management and implementation experience. Your background must also include the successful implementation of a project control system in an IBM Host or VAX environment. Previous supervisory and project management experience is essential.

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- IBM MVS/ESA or MVS/XA experience
- Bachelor's degree
- 3-5 years project management experience
- Insurance industry experience desirable
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Denise Vanderloop
SECURA Insurance
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EOE

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Your experience must include PC programming in C/C++, software engineering (Modularity, Data Abstraction), Language Theory (FSA, Parsing) and Microsoft Window programming. You will also be familiar with Interactive Systems. Along with a 2-year or BA Degree, a solid mathematical aptitude is essential.

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SYSTEMS ANALYST wanted. Duties: Design, development and implementation of a micro-frame network involving the integration of Unisys 6020 cluster, IBM DOS PC's OS/2 LANS, IBM mainframes and Unisys mainframes. Specific duties will include: 1) develop all IBM mainframe related software; 2) Design and develop network scenario; 3) Installation of the network at five sites. The software is to be developed on the IBM 3090 and IBM 4381 in COBOL using command level CICS, DB2 Database Management system and SNA protocols. Need a Bachelor's degree in Computer Science, Engineering, Physics or Math and two yrs exp as a Systems Analyst or Systems Engineer. At least one year of the related exp. must involve designing business applications software using each of the following hardware, software and languages: IBM 4300, IBM 3090, Unisys 6020, MVS, DOS/VSE, CICS, SNA, BTOR, DB2. Pay is $42,000/yr. 40 hrs/wk. Resumes to 7310 Woodward Ave., Rm 416, Detroit, MI 48202. Ref. #98190. Employer Paid Ad.

SYSTEMS ANALYST/PROJECT LEADER (Irving, Texas). Responsible for team of 4-8 Systems Analysts assigned to design, development and implementation of client customized financial and accounting applications computer systems (on-line and batch) in NATURAL/ADABAS on Mainframes. Conversion of existing COBOL/CICS Systems to NATURAL/ADABAS with associated interface. Required: 2 yrs. exper. in job offered. Resume to C. Katz, c/o Triad Data, Inc., 515 Madison Ave., New York, N.Y. 10022

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The preferred candidate should have a graduate degree in Computer Science or Electrical Engineering. Knowledge of airline information processing and decision-making technologies is desirable along with knowledge of "C", UNIX and relational databases.

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DSP Engineer. 40 hrs/wk. 9:00am - 5:00pm. $32,000/yr. Research/development of real time digital signal processing (DSP) algorithms for communications, speech, high-quality speech compression, text-to-speech and recognition applications. High data transfer rate in software. Tools: CAINIX; Sun Workstation; C-28/C-30 Assembly; TI TMS 320, 2nd & 3rd generation. MS in Electrical Engineering as well as six months experience as a DSP Engineer or as a Trainee Engineer required. Previous experience must include software design/development. Graduate education must include one project each in: development/implementation of image processing/digital signal processing algorithms in CAINIX using Fourier transforms; development/implementation of digital signal processing algorithm using LPC. Send resume to: Ms. Pat Gianno, Job Service of Florida, 2312 Gulf-to-Bay Blvd., Clearwater, Florida

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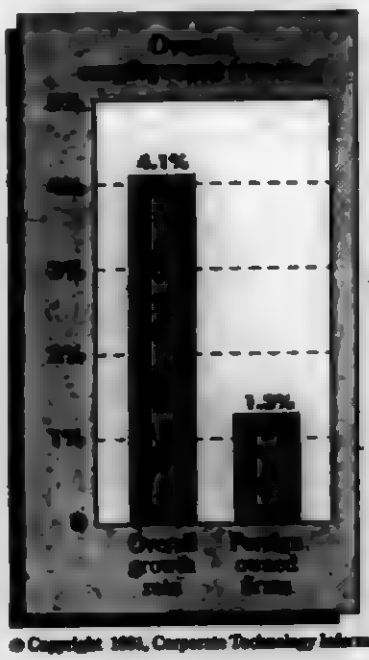
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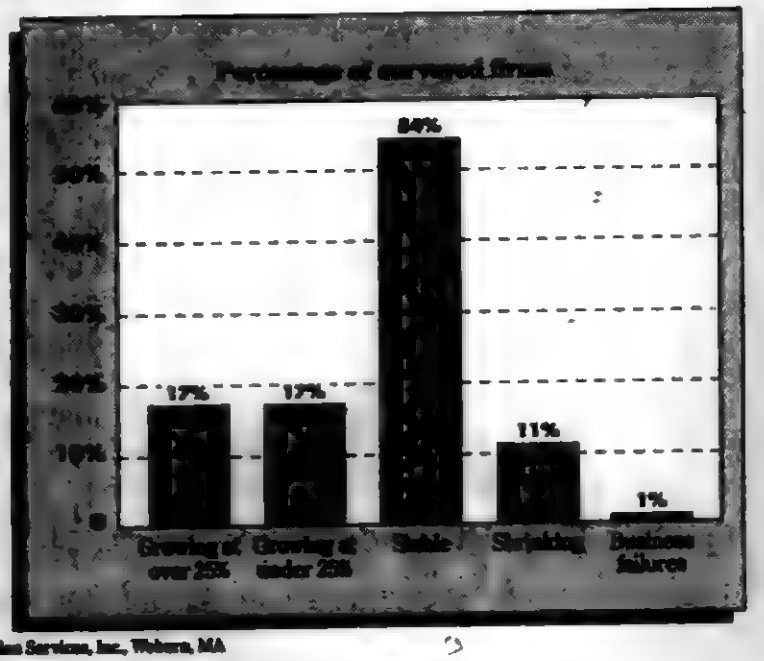
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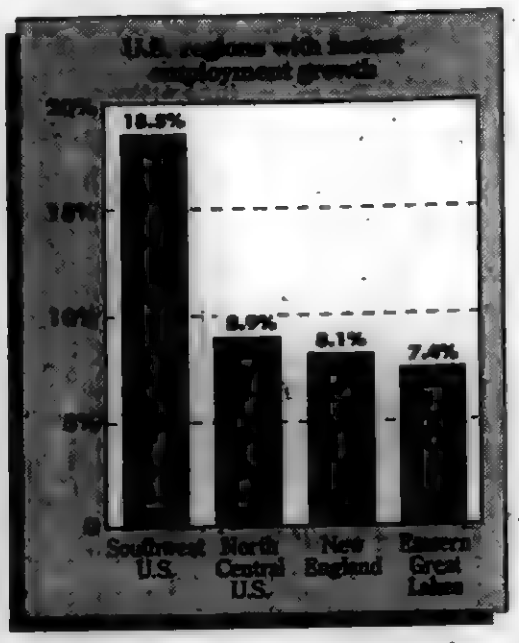
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Systems Engineer

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Education: Doctorate in Mathematics. Academic course work must include 3 credit hours in basic real analysis, basic topology, basic complex analysis, differential geometry; college level programming course in one of the following languages: PASCAL, COBOL, FORTRAN or PL/1.

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Please refer to job #1851-90

Final filing date is 2/8/91

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EOE M/F/H

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EOE M/F/H/V

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560 East 34th Ave, Suite 200
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Phone (800) 999-7756
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ComRimSystems,Inc.

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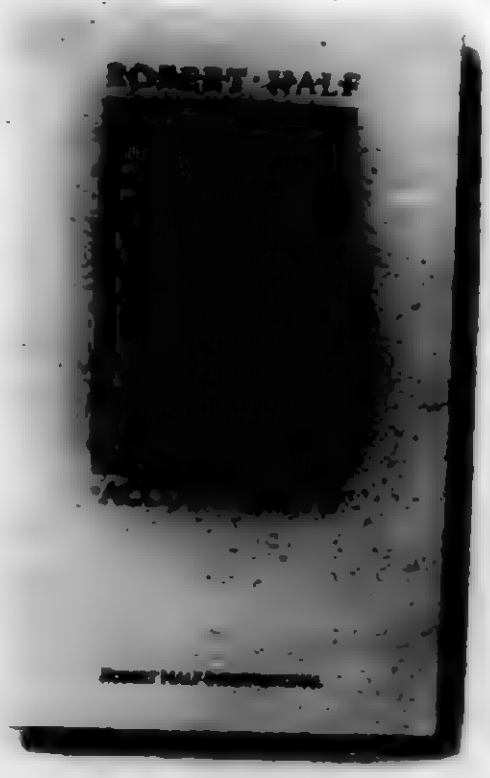
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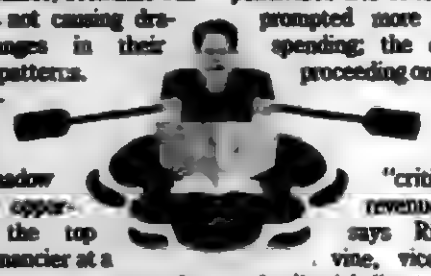
Managers not rocking the IS spending boat

Internal cutbacks are becoming more common

BY CORINNE WINKLER
SPECIAL TO CW

Now that we're in a recession, information systems managers are going to be more aggressive in their equipment purchasing strategies, fighting harder to get the best deal. Right?

Wrong. Based on the comments of several IS managers at major companies, economic conditions are not causing dramatic changes in their purchasing patterns.



"Our demands for processing far overshadow [illegible] opportunities," the top computer financier at a giant oil company says even as he acknowledges that these days are especially volatile for oil producers in light of the Persian Gulf war.

Simply because of its size and that it is running five IBM mainframes, this Houston company is not going to shake up its lease/purchase mix of hardware despite the fact that it may get a better deal in today's economy.

In fact, rather than looking in the market for ways to cut costs, many IS managers are focusing on cutting costs internally to survive the crunch.

Limited spending

For example, at Dow Jones News/Retrieval service in South Brunswick, N.J., a freeze on capital expenditures and salary increases prompted more limited IS spending; the company is proceeding only with projects and capital expenditures "critical to new revenue streams," says Richard Levine, vice president and editorial director of the IS group. For instance, IS will continue to enhance the front-end user accesses to its successful full-text news retrieval and search services.

While many companies are just struggling with cost reductions, Denver-based United Banks of Colorado has been fighting Colorado's oil and real estate recession for the past five or six years. "We've been in a severe recession; there's been an awful lot of pressure for cost control," says Richard S. Watt, president and chief executive officer of United Banks Service Co., the operations arm of the $6 billion United Banks.

In 1990, Watt's group kept costs only 3% higher than they were in 1986, while the internal IS services business grew 25%.

One way United Banks was able to keep costs so low was by enhancing existing equipment rather than buying state-of-the-art personal computers.

"In a recession environment, there was no way we could justify the added features and functionality of PCs at $8,000 to $10,000 per employee," says Watt, noting that those estimates included training and support.

According to plan

United Banks' hang-tough, stick-to-their-knitting strategy apparently worked: Last year, Norwest Bank Corp. in Minneapolis, which was looking to expand, acquired United Banks. And the Colorado economy seems to be improving in small steps.

Likewise, Pepsico, Inc. is ready for the recession after tailoring its operations four years ago to adjust to a tighter economy. The IS operations that grew out of the rethinking are now poised to support the company in a more competitive marketplace.

For example, Pepsico downsized applications from mainframes to PCs to provide more processing control at the departmental level at lower cost.

With the recession in full swing, the changes are paying off: The beverage and food company is now prepared to handle tightened consumer spending in 1991 that could prompt consumers to switch from expensive restaurants to Pepsico-owned Pizza Hut, Taco Bell or Kentucky Fried Chicken fast-food chains.

> RATHER THAN LOOKING in the market for ways to cut costs, many IS managers are focusing on cutting costs internally to survive the crunch.

"Over the last three or four years, we've taken steps across the enterprise to trim things down before we had to," says Bill Dean, director of management technology services at Pepsico's Purchase, N.Y.-based headquarters.

Gaining an edge

Dean also cites Pepsico subsidiary Frito-Lay, Inc. as another example of rethinking systems to gain an edge in the marketplace. At Frito-Lay, route sales representatives now carry handheld computers storing precise inventory and sales figures. The latest figures are sent back to regional offices each night so the corn chip and potato chip producer can quickly respond to changes in consumers' tastebuds or sales declines with cents-off specials or other incentives.

Other IS managers are trying to work within changes mandated by senior management. For example, Amax Coal in Indianapolis is undertaking a corporatewide decentralization that includes all computer operations. The systems changes primarily involve moving applications off the mainframe, says Joseph Rosio, director of IS.

Approximately one dozen operations sites and three regional offices are being equipped with PCs, networks and minicomputers. To save on communications costs, Amax recently replaced older modems and multiplexers with new technology from AT&T, Rosio says.

Winkler is a free-lance writer based in Seattle.

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AT Model 099	$650	$975	$500
AT Model 239	$775	$1,025	$700
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,100	$1,300	$1,025
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,000	$3,500	$2,500
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,450	$1,000
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Portable 386	$2,500	$3,000	$2,200
LTE 286	$2,300	$2,500	$2,000
Deskpro 286	$800	$1,000	$700
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Apple Macintosh Plus	$750	$975	$700
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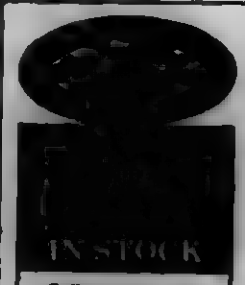
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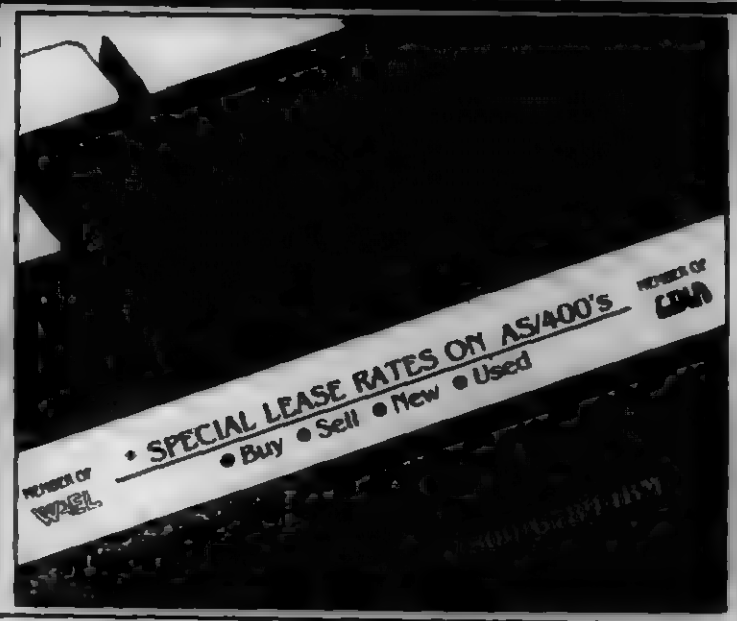
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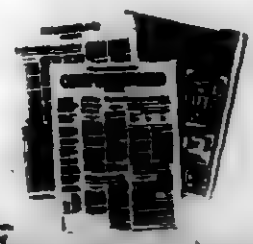
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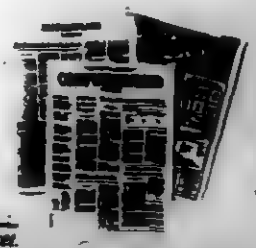
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Winning the fight over budget restrictions

Second in a two-part series

BY ALICE LAPLANTE
SPECIAL TO CW

When it comes to training end users, many information systems managers have a problem: justifying or somehow quantifying the effect of money spent on classroom, interactive video or computer-based training.

However, some IS trainers and managers have successfully answered the demand for cost justification. While these problem solvers say there are no cut-and-dried methods to measure the effectiveness of training, they use several tactics to get around this:

- Developing partnerships with managers and end users.
- Using surveys and evaluation forms to assess training effectiveness.
- Pointing out ways that training can save the company money.
- Implementing certification programs and measuring user performance in jobs after the training period has ended.

For Michael Mazen, manager of professional training and development at Policy Management Systems Corp., a Columbia, S.C., insurance software systems maker, justifying training is more difficult than for most managers. His company classifies training in two categories: strategic and tactical — so he has *two groups* in which to justify the costs of training.

Strategic training at Mazen's firm comprises those classes that corporate senior management deem essential for the long-range survival of the firm: introduction to insurance industry concepts, a customer-relations skills class and a quality-control management course. Tactical training, however, is made up of those courses that focus on goals relating to the day-to-day systems tasks of end users.



Because the firm's training department operates as a profit center, all training is provided on a charge-back basis, Mazen says. Strategic training is paid for by the corporation; tactical training is funded by the individual departments. Mazen has watched strategic training dollars go from 95% of his total budget to only 50%. And he expects that will decrease even further in coming years. This shift in funding means more than half of the funds his department receives are voluntary expenditures, and to continue getting those funds, he must make sure the training is cost-effective.

The best way to go about that task, he says, is through a partnership approach: contacting the trainee's manager and asking for feedback on the courses.

"I spend a lot of time with both the sponsoring managers and the end users, asking them how our core curriculum could be improved," Mazen says.

One of the problems he encounters with this approach, though, is little time and lean resources: "With current staffing, I only have so many hours in a day," Mazen says.

Other trainers have run into the same problem, and the condition of the economy isn't helping matters. "We don't have the resources to do a lot of quantitative testing," says David Stanfield, manager of the MIS education center at Glaxo, Inc., a pharmaceutical manufacturer located in Durham, N.C. His staff is very small, and he relies on independent contractors to deliver much of the coursework.

Because of a shortage of funds to collect quantitative data, many training managers find themselves increasingly dependent on surveys and evaluation forms from employees.

Another way to justify the cost of educating end users is by showing the cost of *not* training, says David Podeszwa, manager of the education department at Johnson Controls, Inc. in Milwaukee.

"I tell them to try and estimate the lost sales that occur when employees mishandle customers," says Podeszwa, who trains employees and customers of Johnson Controls, which develops computer-based management systems.

While concrete measurements are difficult to develop, some trainers still try to quantify the value of training. For example, Linda Starkey, the information center director for North Carolina's Wake County, recommends certification programs that rank employees based on their ability to operate at different levels of computer expertise. "For example, the level 1 office support curriculum would include an introduction to word processing and spreadsheets; level 2 could be the preliminary spreadsheet curriculum and so on," she says.

According to Starkey, certification has two purposes: It gives users a concrete idea of exactly what their skill level is in a given area, and it looks impressive in a management report. For example, a training or IS manager can summarize data for the month or the year to show management inroads in teaching end users valuable computing skills.

The end results

The single best evaluator of training is whether you can measure a difference in how people perform their daily tasks. Can a secretary produce more letters with fewer mistakes? Can a clerk process more orders? Can a salesperson sell more?

"Some people measure how effective computerized sales training is by the number of sales calls made or prospect letters mailed," says Kenneth Kousky, chairman at Wave Technologies Training, Inc. in St. Louis, a training consulting firm. "But the true measure is this: Are they selling more? Or, conversely, are their costs lower? Those are really the only measures you should be concerned about."

However, while several techniques are available and appear to be at least somewhat successful in justifying training, it's not yet a perfect world. Without the involvement of business managers, evaluation of end-user training will continue to be difficult.

"This is a partnership," Kousky says. "It cannot be driven by the technology side alone."

LaPlante is a free-lance writer based in Palo Alto, Calif.

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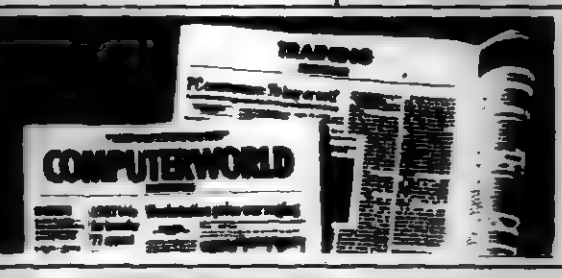
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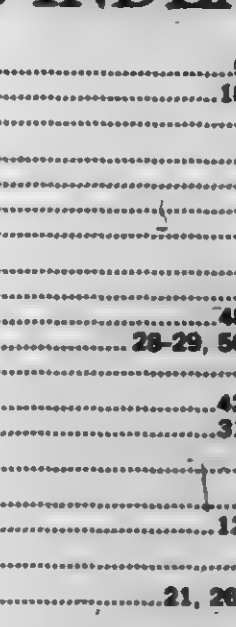
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

UPGRADED FROM UNATTRACTIVE TO NEUTRAL: Lotus Development Corp. (by Donaldson, Lufkin & Jenrette, Inc.). Reason: Although it missed the initial Microsoft Corp. Windows surge, Lotus will challenge Microsoft in the long run.

DOWNGRADED FROM BUY TO HOLD: Microsoft (by Prudential-Bache Securities, Inc.). Reason: Stock price has gained almost 25% since mid-November; current price/earnings ratio is too high.

DOWNGRADED FROM ATTRACTIVE TO NEUTRAL: AST Research, Inc. (by Paine Webber, Inc.). Reason: Competitor Advanced Logic Research, Inc. is now a better short-term investment value; AST shares have more than doubled since March 1990.

DOWNGRADED FROM BUY TO ATTRACTIVE: Advanced Logic Research (by Paine Webber). Reason: Aggressively priced notebook and personal computers are expected to sell well, but stock is overvalued.

GUEST SPEAKER

Erik James, Robertson, Stephens & Co., San Francisco:

"Cypress Semiconductor Corp. supplies all the core pieces of Scalable Processor Architecture (Sparc)-based microcomputers. Its Sparc business went through the roof in December, as its earnings indicated last week. Cypress will grow very strongly in the next two quarters."

"Texas Instruments, Inc. might compete for future Sparc business, but it's struggling now. The market demands specialty companies that make niche products, such as Dallas Semiconductor Corp., which invents product areas that never existed before. It created a market for the components that go into the clock function in a microcomputer, and now it dominates that area."

ANALYSIS IN BRIEF

Computer hardware stocks have recovered from the slide begun in June 1990, but current negative secular and seasonal forces will worsen the industry's three-year revenue slowdown. Take advantage of the recent rally by selling technology stocks now.

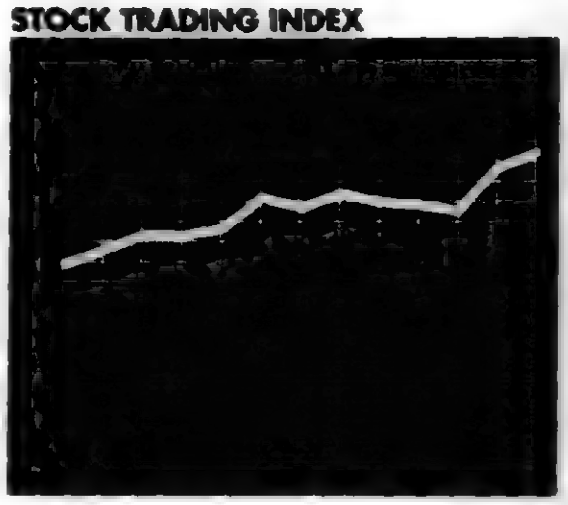
For the long term, IBM is a good buy because of its market-share gains and expense controls. Teradata Corp. is a higher risk but worth a look because of its relationships with AT&T and NCR Corp. AT&T is Teradata's biggest customer, while NCR owns nearly a 10% stake in the company. — *Computers: Danger Ahead, UBS Securities, Inc., Jan. 10, 1991.*

Hold PC and midrange hardware stocks, as we are shaving earnings estimates for the current period. Expect further reductions if the U.S. economy continues to weaken. Most firms should show positive currency translations from foreign sales but not as favorable as those gleaned this time last year.

The only company in this sector rated an outright "sell" is Unisys Corp., which will likely show a big loss for the fourth quarter of 1990. — *Computers: Earnings Preview, Prudential-Bache, Jan. 16, 1991.*

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Technology stocks continued to surge last week as news of quarterly earnings spread. Data General Corp. jumped 4 points, closing Thursday at 8¼ after posting a surprisingly profitable first quarter.
- Microsoft Corp. also gained on news of bigger profits, adding 5¼ points to 90½, a new high. Borland International, Inc. topped its recent high, reaching 43¾ Thursday, up 5⅛ points.
- Although Alex. Brown & Sons, Inc. downgraded Oracle Systems Corp. to "Market Underperformer," citing uncertain near-term cash flow, Oracle advanced 1½ points to 6¾.
- AT&T's fourth quarter profits slipped, and its stock fell ½ of a point to close at 30⅛. MCI Communications Corp., which recently hit a new low, inched up ⅝ of a point to 20⅝.
- While Amdahl Corp.'s quarterly earnings were up, its share price was not, dropping to 14, down ⅛ of a point.

Computerworld Stock Trading Summary

CLOSING PRICES JAN. 24, 1991

TOP PERCENT GAINERS

Computer Auto. Inc.	125.00
Data General Corp.	88.57
Inacstat Inc.	55.56
Corporate Software	50.00
Ariel Comm. Corp.	46.46

TOP PERCENT LOSERS

Network Equipment Tech.	-39.68
Iomega Corp.	-39.46
Micron Systems Corp.	-19.70
Telecterm Inc.	-18.18
Comshare Inc.	-17.19

TOP DOLLAR GAINERS

Microsoft Corp.	5.50
Digital Equipment	5.00
IPL Systems Inc.	5.75
IBM	5.25
Motorola Inc.	5.00

TOP DOLLAR LOSERS

Software Publishing Corp.	-4.13
Bell Atlantic Corp.	-4.13
3M Corp	-4.00
Pacific Telesis Group	-3.13
Computer Sciences	-3.13

Exch	52-Week High	52-Week Range		Jan. 24 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Up 1.20
OTC	19.00	5.38	3COM Corp.	7.63	1.63	27.66
NYS	69.75	52.50	American Info Techs Corp.	64.13	-1.75	-2.65
NYS	44.13	28.00	AT&T	30.88	-0.38	-1.20
OTC	9.63	0.88	Ariel Communication Corp.	2.00	0.69	46.46
NYS	58.25	39.50	Bell Atlantic Corp.	48.13	-4.13	-7.89
NYS	57.63	49.00	Bellsouth Corp.	52.00	-1.38	-2.58
OTC	16.38	8.25	Compression Labs Inc.	13.00	1.13	9.47
NYS	36.75	33.38	Comsat Corp.	34.75	-1.38	-3.81
OTC	4.38	1.75	Data Switch Corp.	4.13	0.13	3.13
NYS	26.75	8.88	Digital Comm. Assoc.	13.00	0.00	0.00
OTC	20.50	12.25	Dynatech Corp.	19.38	0.13	0.65
OTC	12.88	5.88	FiServe Int'l Inc.	8.00	0.38	4.92
OTC	4.00	1.75	Gandalf Technologies Inc.	2.88	0.19	7.52
NYS	4.75	1.63	General Datacomm Inds.	2.13	-0.13	-5.56
NYS	24.13	23.50	GTE Corp.	28.13	-1.50	-5.06
OTC	7.00	0.81	Micron Systems Corp.	0.81	-0.19	-18.78
NYS	80.88	40.25	ITT Corp.	50.00	1.75	3.63
OTC	44.13	17.88	MCI Communications Corp.	20.63	0.75	3.77
OTC	21.00	2.75	Microcom Inc.	3.50	-0.25	-6.67
NYS	34.38	4.00	Network Equipment Tech.	4.00	-1.69	-29.68
OTC	14.63	4.00	Network General	10.00	1.50	17.65
OTC	15.25	8.00	Network Systems Corp.	13.13	0.50	0.00
NYS	29.63	22.13	Northern Telecom Ltd.	26.63	-1.00	-3.62
OTC	30.25	14.25	Novell Inc.	30.38	0.88	1.32
NYS	69.50	47.13	Nynex Corp.	62.50	-1.50	-2.14
NYS	47.88	36.25	Pacific Telesis Group	39.88	-3.13	-7.27
ASE	10.13	4.75	Penril Corp.	10.13	1.25	14.08
NYS	29.13	8.88	Scientific Atlantic Inc.	12.88	0.50	4.04
NYS	69.50	47.25	Southwestern Bell Corp.	51.00	-2.38	-4.46
NYS	46.38	29.63	United Telecom	32.25	-0.13	-0.56
NYS	40.88	32.38	US West Inc.	38.13	-0.75	-2.00
Computer Systems						Up 2.75
OTC	8.75	0.88	Allard Computer Sys.	1.00	0.00	0.00
ASE	16.88	10.00	Amdahl Corp.	14.00	-0.25	-1.75
OTC	82.75	24.25	Apple Computer Inc.	32.13	0.88	1.71
OTC	13.88	4.25	Archive Corp.	5.63	0.13	1.58
NYS	8.63	3.88	Bolt, Beranek & Newman	8.25	1.25	25.00
NYS	13.63	4.50	Commodore Int'l	13.63	2.25	21.11
NYS	97.88	35.50	Compaq Computer Corp.	81.50	-1.75	-2.77
OTC	4.25	0.13	Computer Automation Inc.	1.13	0.63	125.00
NYS	21.63	8.75	Control Data Corp.	9.38	0.63	7.14
NYS	20.88	8.38	Convex Computer	13.00	1.25	10.64
NYS	51.25	20.00	Cray Research Inc.	37.50	2.25	6.38
NYS	13.25	3.50	Data General Corp.	8.25	3.88	88.57
NYS	3.88	0.75	Datapoint Corp.	1.88	0.25	15.38
OTC	22.63	4.63	Dell Computer Corp.	22.63	2.25	11.04
NYS	85.13	45.50	Digital Equipment Corp.	67.88	6.00	9.70
NYS	26.13	13.75	Harris Corp.	21.00	0.75	3.70
NYS	80.38	34.88	Hewlett Packard Co.	38.50	1.00	2.66
NYS	123.13	86.50	IBM	121.00	5.38	4.64
OTC	14.00	7.75	Information Int'l	7.75	-0.25	-3.13
OTC	23.50	10.38	Intergraph	18.50	1.50	10.00
NYS	3.88	0.88	MAI Basic Four Inc.	1.50	0.00	0.00
NYS	180.88	114.00	Matsushita Electronics	124.63	-1.38	-1.48
OTC	26.00	9.00	Mentor Graphics Corp.	15.75	1.75	12.50
NYS	62.88	44.00	NCR Corp.	58.13	1.00	1.73
OTC	35.50	11.00	Pyramid Technology	16.75	2.88	20.72
OTC	34.00	9.75	Sequent Computer Sys.	13.75	1.75	14.58
NYS	40.88	18.00	Silicon Graphics	29.13	2.00	7.37
NYS	29.00	14.63	Stratus Computer Inc.	25.00	1.50	6.38
OTC	37.25	15.00	Sun Microsystems Inc.	27.88	1.88	8.19
NYS	30.13	8.88	Tandem Computers Inc.	12.38	1.75	16.47
NYS	38.50	23.50	Tandy Corp.	27.75	-0.38	-1.33
OTC	35.50	8.75	Teradata	13.75	1.50	12.24
NYS	9.50	1.38	Ultimate Corp.	1.88	-0.13	-4.55
NYS	17.13	1.75	Unisys Corp.	2.88	-0.13	-4.55
ASE	6.88	2.00	Wang Labs Inc. (b)	2.88	0.38	16.00
Software & DP Services						Up 7.31
OTC	80.75	17.50	Adobe Systems Inc.	35.88	2.38	7.09
OTC	39.50	16.50	Aldus Corp.	25.25	2.25	9.82
OTC	19.88	10.50	American Mgmt. Systems	10.88	1.63	8.60
OTC	18.25	7.38	American Software Inc.	14.75	0.25	1.72
NYS	4.50	1.38	Analogic Inc.	2.13	0.00	0.00
OTC	23.50	10.00	Analysts Int'l	13.38	0.00	0.00
OTC	15.13	4.88	Ashton Tate	5.63	-0.25	-4.26
OTC	10.25	4.00	ASK Computer Sys.	6.25	0.50	10.53
NYS	60.38	46.38	Auto Data Processing	58.75	2.38	4.13

Exch	52-Week High	52-Week Range		Jan. 24 Close	Wk Net Change	Wk Pct Change
OTC	60.25	32.00	Autodesk Inc.	52.00	2.13	4.28
OTC	25.50	12.00	BGS Systems Inc.	21.50	1.00	4.88
OTC	39.00	17.75	BMC Software Inc.	36.00	2.13	6.27
OTC	21.50	11.00	Boole & Babbage Inc.	14.00	2.00	16.67
OTC	43.25	10.63	Borland Int'l	43.25	4.13	10.54
NYS	11.88	0.88	Businessland Inc.	1.00	0.00	0.00
OTC	11.00	4.25	Cognos Inc.	11.00	2.00	22.22
NYS	16.88	4.38	Computer Associates	7.88	0.38	5.00
OTC	17.25	7.75	Computer Horizons	16.38	-0.50	-1.67
NYS	53.25	36.75	Computer Sciences	48.13	-3.13	-6.96
NYS	12.25	5.63	Computer Task Group	7.88	-0.38	-4.55
OTC	25.25	13.25	Comshare Inc.	13.25	-2.75	-17.19
OTC	16.00	3.75	Corporate Software	8.75	3.25	59.09
NYS	43.00	34.38	General Motors (cls)	41.50	0.00	0.00
OTC	18.25	7.25	Gist Systems Int'l	14.25	2.00	16.33
OTC	4.75	1.88	Hogan Systems Inc.	2.88	0.38	15.56
OTC	9.75	5.50	Index Technology	7.25	-0.50	-6.45
OTC	16.63	7.75	Information Resources	11.88	1.38	13.10
OTC	17.50	2.88	Informix Corp.	3.38	-0.88	-1.90
OTC	7.88	1.38	Intelicorp Inc.	2.19	0.31	17.21
OTC	8.00	2.88	Ivex Ind Inc.	5.25	1.88	55.88
OTC	27.50	10.00	Knowledgeware Inc.	24.13	0.13	0.52
OTC	34.50	16.75	Legent Corp.	34.38	4.38	14.05
OTC	28.25	12.50	Lotus Development	16.13	-0.25	-1.38
OTC	28.25	13.63	Microgrids	21.50	-2.50	-10.42
OTC	91.00	46.00	Microsoft Corp.	90.50	5.50	7.74
NYS	10.13	4.00	On Line Software Int'l	6.50	0.75	13.04
OTC	28.38	4.88	Oracle Systems	6.75	1.13	20.00
NYS	17.88	7.00	Parasitic Systems	9.88	0.75	8.22
OTC	5.38	1.38	Phoenix Technologies	4.50	0.88	24.14
NYS	43.75	20.75	Policy Management Sys.	43.75	2.25	5.42
NYS	23.50	11.50	Reynolds & Reynolds	16.88	0.00	0.00
OTC	16.13	6.88	Sapiro Software Inc.	7.75	0.50	6.90
OTC	22.25	14.50	SEI Corp.	18.50	0.00	0.00
OTC	18.25	12.00	Shared Medical Systems	15.13	-0.38	-2.42
OTC	28.00	12.50	Software Publishing Corp.	20.75	-4.13	-16.86
NYS	11.00	8.50	Sterling Software	9.25	1.25	15.63
OTC	38.00	8.50	Sungard Data Sys.	11.88	0.63	5.56
OTC	35.25	16.25	Symantec Corp	34.75	2.38	6.92
NYS	24.88	4.50	System Center Inc.	5.25	0.25	5.00
OTC	30.75	12.75	System Software Assoc.	30.75	3.50	12.84
OTC	27.38	4.75	Vitek	11.50	2.38	27.54
Semiconductors						Up 7.11
NYS	25.88	17.88	Advanced Micro Devices	20.50	0.50	2.50
NYS	8.63	5.50	Analog Devices Inc.	7.75	0.63	8.77
OTC	23.50	5.25	Chips & Technologies	8.00	0.75	9.09
OTC	52.00	28.00	Intel Corp.	43.75	1.75	4.17
NYS	13.00	5.13	LSI Logic Corp.	8.75	0.25	2.86
NYS	14.38	6.75	Micron Technology	11.13	-0.25	-2.20
NYS	66.38	46.75	Motorola Inc.	60.88	5.00	10.50
NYS	6.88	3.00	National Semiconductor	5.50	0.50	10.00
NYS	44.00	22.50	Texas Instruments	37.88	-2.88	-6.82
OTC	12.25	3.00	VLSI Technology	7.13	1.25	21.28
ASE	14.88	4.00	Western Digital Corp.	5.88	0.75	14.67
Peripherals & Subsystems						Up 3.05
OTC	2.50	0.09	Alloy Computer Prod.	0.31	0.00	0.00
OTC	2.50	0.88	Apertus Technologies	1.44	0.06	0.00
OTC	41.25	12.38	ASYT Research Inc.	40.38	0.38	0.94
OTC	24.00	7.50	Stanctec Inc.	8.13	-0.13	-1.52
ASE	7.63	3.13	Chyphtronics Corp.	7.13	0.13	1.79
NYS	21.25	12.38	Conner Peripherals	24.25	-0.25	-4.40
ASE	22.00	7.00	Distortion Corp.	8.50	-0.13	-1.45
NYS	10.50	4.13	EMC Corp.	10.38	0.38	3.75
NYS	49.88	38.75	Eastman Kodak Co.	48.13	0.38	0.84
OTC	8.50	4.38	Emulex Corp.	8.88	1.25	22.22
OTC	24.50	14.00	Evans & Sutherland	19.00	-0.38	-1.30
OTC	6.25	2.13	Iomega Corp.	4.38	-1.13	-20.46
OTC	21.00	8.00	IPL Systems Inc.	21.00	5.75	37.70
OTC	2.88	0.13	Maxtor Systems	0.47	0.09	7.08
OTC	17.50	2.88	Maxtor Corp.	3.50	-0.13	-3.45
OTC	10.75	3.88	Micropolis Corp.	10.88	1.00	10.87
NYS	91.38	73.88	3M Corp	81.13	-4.00	-4.70
OTC	14.50	6.00	Prestolite Inc.	7.50	0.38	5.45
NYS	21.38	8.50	QMS Inc.	18.00	-0.50	-2.70
OTC	28.75	9.88	Quantum Corp.	17.50	-3.00	-14.58
NYS	6.88	4.38	Recognition Equipment	8.25	0.13	2.44
OTC	8.88	4.00	Reton Inc.	8.88	1.00	17.86
OTC	19.75	6.88	Seagate Technology	12.75	-0.25	-1.92
NYS	35.38	11.50	Storage Technology	25.50	2.00	8.51
OTC	4.00	0.88	Tandon Corp.	2.19	0.25	12.50
NYS	19.50	11.88	Tektronix Inc.	19.25	0.38	1.99
OTC	0.88	0.19	Televideo Systems	0.22	0.00	0.00
NYS	60.75	39.50	Xerox Corp.	49.88	1.00	2.05
Leasing Companies						Off 2.24
OTC	10.50	8.88	Amplicon Inc.	8.50	-0.38	-6.85
OTC	4.38	0.31	Capital Associates	0.47	0.09	7.08
NYS	28.50	14.63	Comdisco Inc.	24.50	1.88	8.32
OTC	16.38	9.38	LDI Corporation	11.88	-0.13	-1.06
OTC	8.88	2.88	Telecterm Inc.	6.88	-0.88	-18.18

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digital
In Transition

Continued from page 1

transition to a software, networking and services company, although he said he believes this will take up to four years.

"We are trying to make a wide range of products, from PCs to mainframes, with all the components," Olsen said last week. "That is a massive job."

The move to open systems is believed to be a sincere, if somewhat belated, move in the right direction, according to *Computerworld* interviews with dozens of customers and industry analysts in recent weeks.

"Open systems means, to us, conformance to a specified set of standard interfaces," said David Stone, the DEC vice president who was recently appointed to a restructured software organization encompassing everything but the VMS operating system.

"DEC is certainly well ahead of IBM as a network integrator," said Kevin Obermann, network manager for the engineering department at Lawrence Livermore National Laboratories in Livermore, Calif.

"I think DEC has decided its future is not in selling boxes but in controlling the network," said Ken Krallman, MIS director at Carleton Technologies, Inc. in Orchard Park, N.Y. "But I look at DEC as the perfect example of tremendous products and lousy marketing."

Although many customers retain their loyalty and confidence in the vendor, they have raised sharp questions not only about DEC's marketing weakness but about the abilities of its sales force to adapt to a complex, increasingly varied product line (see story below).

"We fell down in educating [our sales force] in our products," Olsen conceded last week, adding that the company's products have become increasingly complex.

Customers also said they are concerned about the quality and pricing of DEC software.

"DEC is releasing so many software products, it seems to me that in their frenzy to get to market, the testing is not as thorough anymore," said Robert Forster, DEC project leader for the information management department at Sikorsky Aircraft Corp. in Stratford, Conn. "Out of 45 to 50 layered products we run here, I'm running at least a third of them on [software] patches right now."

Peter Coriaco, vice president of technological strategic planning at Bankers Trust Co. in New York, agreed that DEC needs to improve the quality of VMS and its layered products. "I'm not talking about fancy features. It runs, and then it breaks," he said.

These problems are acknowledged at the highest levels within DEC. The VAX systems and VMS division, for example, established more rigorous integration testing for VMS and its layered products three months ago.

"Our software is not degrading in quality," Stone insisted. Instead, he said, the expanding interoperability and complexity of DEC and third-party vendor software at large customer sites is forcing DEC to work on unfamiliar ground with larger networks than ever before.

Users interviewed by *Computerworld* also seemed universally opposed to DEC's intention to "unbundle" some of the features in VMS, which will strip the operating system down to a cheaper basic version and a bevy of more expensive versions with additional features, such as those enabling distributed computing.

The lack of corporatewide licensing is another prickly issue with DEC users, particularly those with global businesses. DEC is now reworking its software pricing and licensing fee structure with an eye toward changing the company's method of charging fees based on processor size. A charging system based on number of users will likely take its place, DEC said.

Despite the formidable challenges facing the company on both the technical and managerial fronts, confidence that they can pull it all off seems to run high at DEC.

"We have a love/hate relationship with some of our customers," said Jack Smith, senior vice president of operations at DEC. "I was visiting a customer recently who beat up on me for 15 minutes about software problems. Then after all that, he says 'The only saving grace you have is that nobody else can do it.' "

Love/hate relations with DEC reps

As variable as the weather from coast to coast, the field sales representatives from DEC invoke every reaction from admiration to despair in their customers.

It is these perceptions about quality and integrity in the field that shape the customer's view of the vendor — much more so than tumbling stock prices, pessimistic analysts or internal squabbles at the home office.



Carleton's *Krallman*

At best, customers said the quality of DEC service and support varies widely in terms of location and length of service on their accounts.

"You meet young salespeople all the time, but they don't stay salespeople," said Ken Krallman, MIS director at Carleton Technologies.

DEC officials acknowledged the uneven quality of their sales representatives and account managers, but they stressed that training and education for those groups are top priorities.

Some customers said their representatives do understand their businesses' needs, while others constantly have to educate their account managers on DEC's own products.

"I'm usually telling the DEC salesmen what they should be pushing," said George Reid, MIS director at Sanford C. Bernstein & Co. in New York. "I tend to know as much about what DEC is doing as the salesman."

A worst-case scenario with the sales force unfolded recently at the Health and Tennis Corporation of America in Los Angeles. Systems support supervisor Michael Artukovich became entangled in DEC's recent crackdown on the used-equipment market when he purchased used CPU boards from a third-party broker to upgrade his VAX 8330s to 8350s. At one point, the DEC sales representative threatened the company with legal action in a dispute over a licensing fee that was eventually settled out of court.

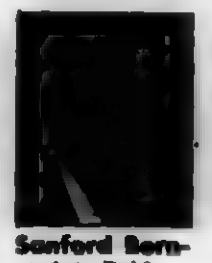
DEC's downsizing: 'No problem'

DEC may no longer be the darling of Wall Street — with its stock prices plummeting more than 50% in the last two years — but customers find comfort in the company's cost-cutting drive and restructuring.

"They must get costs in line with sales," ITT Hartford's John T. Crawford said.

Crawford and other users said customers have a hard time understanding the significance of DEC's reorganizing frenzy and as yet detect little change in how the firm is run.

"I get what I pay for, and I'm not concerned about their financial viability," said John E. Nack, processing network division manager at Caterpillar Tractor Co. in Peoria, Ill.



Sanford Bernstein's *Reid*

"It is to be expected that they will have turbulence when they are downsizing and trying to reduce their overhead," added Michael Artukovich, systems support supervisor at the Health and Tennis Corporation of America in Los Angeles.

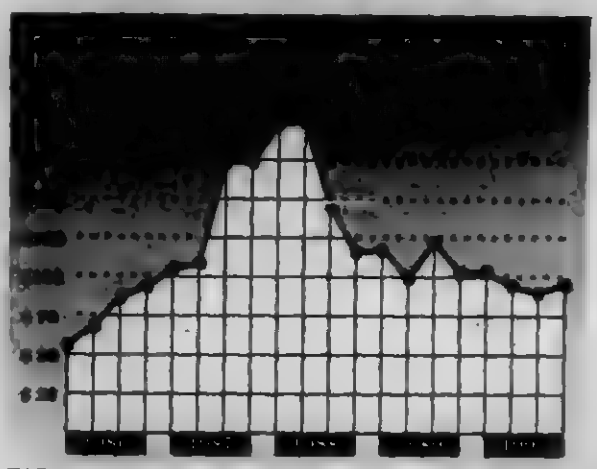
DeWitt Howard, engineering system manager at Interstate Electronics Corp. in Anaheim, Calif., considers DEC to be in stable financial health.

"They still have liquid cash, which is amazing at this time, and that is holding them together and letting them do engineering for new products," Howard said.

George Reid, MIS director at Sanford C. Bernstein & Co. in New York, also feels secure with DEC.

"There was a big to-do because they had a quarter where they didn't make money, but that's a far cry from [other minicomputer vendors], which are all hemorrhaging," he said.

Tossin' and turnin', turnin' and tossin'



CW Charts: Marie Haines

Tightening up

DEC's employee population is on the decline, having peaked in 1989

	Employee population (in thousands)
'84	86
'85	89
'86	95
'87	111
'88	122
'89	126
'90	123.5
end of June '91*	117.5

*Estimated

The ups and downs of DEC

From the dizzying heights of $200-per-share stock prices and 126,000 employees worldwide in 1987 to 1989, DEC's plunging fortunes in the past two years dramatically highlight its need to cut costs and personnel. DEC is restructuring through early retirements, layoffs, management changes and facilities consolidation. Customers and analysts approve, saying DEC is making the right moves to align itself with the economic realities of the 1990s.



COMMENTARY

Gary H. Anthes

Electronic heroes



If combat awards went to nonhumans, computers might win a Medal of Honor for action in the Persian Gulf so far. That was not the case the last time the U.S. fought a real war. Twenty years ago, there was a handful of computers in Vietnam, and they weren't flying.

I was in charge of the U.S. Navy Supply Corps' aging IBM 1401 in Da Nang. The computers weren't doing such razzle-dazzle things as shooting down Scud missiles; the primary application on the 1401 was inventory control. But there was a lot of inventory to control — 105,000 line items, from bullets to frozen lobster to penicillin. The poor 1401 ran flat-out three shifts per day, seven days per week.

My job had its good points, relatively speaking. Because my office adjoined the computer room, I was among the few people in the country who always had air-conditioning.

But there were drawbacks. Because most supplies came by ship across the Pacific, a bug that shifted a decimal place might mean weeks without some vital part or supply.

Downtime was intolerable. Two IBM engineers who lived off base refused to come in at night without an escort, and more than once I found myself riding shotgun — actually my .45-caliber pistol and M-16 rifle were almost solely for show — to bring them back.

One night my world came crashing down. An enemy rocket landed on a stack of 6,000 antitank mines. The shock flattened the building in which I worked. No one was seriously hurt, and the computer escaped relatively unscathed.

But it sat idle for several days while a new air-conditioned facility was built for it. In the meantime, we were able to get some processing done using the punch card accounting machines. Now the wizards weren't the programmers, but the elite few who could wire the big square patch panels that "programmed" the machines.

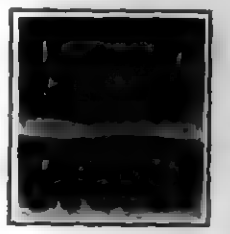
They don't teach that skill to military recruits anymore. Nowadays a sailor is more likely to learn about embedded systems, artificial intelligence and target-recognition algorithms.

Computers play vital role in war

Continued from page 1

and match planes to targets and even to try some simulations to assess the likely effectiveness" of a particular battle plan, said Paul B. Stares, a senior fellow at Brookings Institution in Washington, D.C.

The not-so-simple idea is to match military assets to enemy targets and provide the sequencing for the operation. "The ultimate aim of command-and-control is to apply all of the combat forces you have at the right place, at the right time and in the right amounts," explained Andrew Hesser, a command-and-control expert at Battelle-Pacific Northwest Laboratories in Richland, Wash.



The daily ATO is produced by Air Force-developed software running on a small mainframe computer housed in a shelter outside the Tactical Air Control Center in Riyadh, Saudi Arabia, according to Brig. Gen. Bruce Bohn, head of information systems for the Tactical Air Command headquarters at Langley Air Force Base in Virginia.

Relevant portions of the common ATO are sent down the chain of command via satellite to the numerous bases and units with small-aperture satellite terminals, analysts said.

Besides the command center, the indispensible part of the battle-management architecture is the airborne warning and control system plane with its funny-looking radar dome, which can detect and track all aircraft within 300 miles, direct fighters to their targets and handle air-traffic control as well.

When enemy aircraft is spotted, controllers relay data about the general location to the fighters, which use their own radar to pinpoint the target.

Likewise, two still-developmental Joint Surveillance and Target Attack Radar Systems radar planes scan enemy territory for signs of tanks or Scud missile launchers and relay targeting information to ground or air forces.

The multinational air assault worked so well, "because we all fly off a common tasking order" that is generated by computer at U.S. Central Command in Riyadh, Horner told reporters at a Jan. 18 briefing.

"It's an enormous effort. Of course, now we have a lot of computers, and you can bring together the tens of thousands of minute details," Horner said.

Furthermore, elaborate radar networks for air-traffic control and battle management — integrated and controlled by computers — have enabled U.S. commanders to mount much more complex attacks than in the past.

One congressman said the airspace was so crowded that it made air-traffic control at Chicago's O'Hare airport look simple. Computer-aided jamming equipment befuddled Iraqi radar and cleared a path for incoming fighter bombers.

However, Pentagon officials warned against the impression that this war is just one big video game. Humans are in command, in the line of fire and in captivity. In fact, the noted success of the high-tech cruise missiles may be linked to the legendary temper of the top U.S. commander, Gen. Norman Schwarzkopf.

According to *Newsweek*, Schwarzkopf was "incredulous" in early August when he learned that the digital maps needed to guide the missiles did not exist, so he "used his considerable temper to get them made."

Despite all the computers, coordinating a multinational force — with its conglomeration of dissimilar weapons, equipment and languages — is never easy, analysts said.

"It's no accident that people use artistic terms like orchestrate and choreograph when they talk about coordinating multinational operations," Stares said.

MISSILE GUIDANCE



Missiles and smart bombs get their intelligence from computers at three levels. Detailed targeting instructions come from mainframe computers at U.S. Central Command. Launch and control information comes from local, weapon-specific computers on the ground, in a plane or on a ship. Finally, the missile or smart bomb finds its target by navigating under control of on-board computers.

The low-flying U.S. Navy Tomahawk cruise missile, which reportedly hit 51 of its first 52 targets, uses an inertial guidance system to orient the ship-launched missile to a reference area on the coastline. An on-board computer guides it on a flight path based on coordinates entered before its launch.

Computers in the missile make course corrections by comparing key features in the terrain with terrain altitude checkpoints stored in an on-board database. Finally, the surface-hugging missile scans the target area optically and compares the target image with an on-board digitized "map."

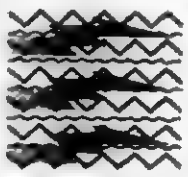
The Tomahawk actually uses a customized imaging coprocessor that can compare 1 billion pixel pairs/sec., said Gerald Miller, deputy program manager for the U.S. Navy Cruise Missiles Project.

The U.S. Army's Patriot antimissile missile uses a ground-based radar beam to spotlight and follow its target. The Patriot missile is launched manually or under software control and then picks up radar reflections off the target and relays its view of the target to a ground station. There, a computer compares the reflected radar as seen by the Patriot to that reflected directly to the ground, calculates the trajectories and speeds of both the target and the Patriot and then issues course corrections back to the missile.

Smart bombs use cooperating computers in the aircraft and in the bomb. The pilot aims at a television picture of the target by adjusting cross hairs on the display, then locks a laser onto the target. The pilot can veer away, letting laser reflections guide the bomb.

GARY H. ANTHES

ELECTRONIC COUNTERMEASURES



Turn on a power drill next to your television set and you may get the same kind of electronic interference that can really mess up enemy radar.

That is the whole point of the military's "electronic countermeasures" equipment. Before each air strike over Iraq, U.S. and British jamming planes use on-board computers to identify the signature of an enemy radar and then blind it with "white noise," thus creating a temporary safe pathway through Iraqi air defenses.

"They see their [radar] screen as being whited out [with] large strobes coming across it. By that time, they know that something is coming at them, but they don't know at what altitude or direction it is coming from," said Navy Lt. Fred Drummond, an electronic warfare specialist in an interview by pool reporters in Saudi Arabia.

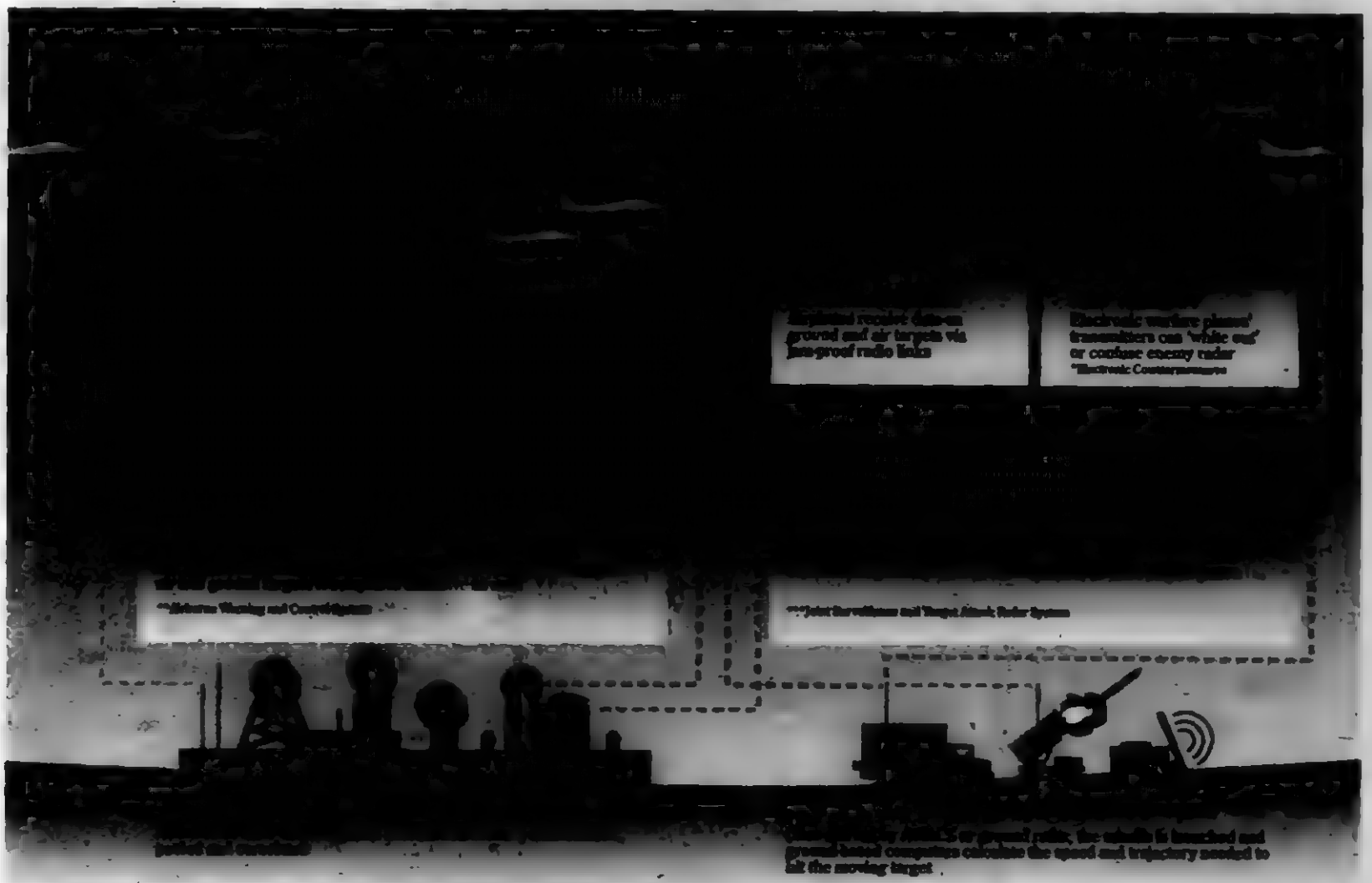
On the U.S. Air Force's EF-111A Raven, the jamming functions are managed by an electronic warfare officer using an on-board computer, which enables the officer to handle a tactical work load that used to require several operators. For example, preflight programming of the computer with known radar signals enables the operator to concentrate on unanticipated radar threats, according to the prime contractor, Grumman Corp. in Bethpage, N.Y.

Electronic jamming equipment sends out signals that crimp enemy radar, for example, by cramming the airspace with high-powered signals on the enemy's precise wavelength.

Likewise, the U.S. Navy's jamming aircraft, the EA-6B Prowler, detects radar and feeds that information into an on-board computer, which processes the signals for cockpit display and recording, a Grumman spokesman said.

Aircraft with missiles designed to knock out the radar stations and other Iraqi air-defense targets scooted through the corridor created by these radar-jamming planes. Next in line were the allied bombers, which were able to fly nearly unscathed to targets in Iraq and Kuwait, thanks to the electronic warfare that preceded them.

MITCH BETTS



Graphics: Tom Monahan

RECONNAISSANCE AND SURVEILLANCE



The first line of defense for the forces of Operation Desert Storm orbits hundreds of miles above the earth, where supersensitive spy satellites can eavesdrop on Iraqi military communications, detect an enemy rocket launch and give pilots the information needed to deliver devastatingly accurate strikes.

The workhorses of the group are signal intelligence (Sigint) satellites, which give an advance peek at the Iraqi electronic defenses from about 400 miles away from Earth. Sigints are equipped with antennas and an array of signal processors that detect the location and capabilities of radar stations, navigation aids, communications transmitters and telephone lines.

Also circling the earth are several KH-11 and KH-12 observation satellites that transmit high-quality television signals, which are in turn translated into photographic images.

The information gathered by the satellites is digitally transmitted to ground receiving stations and processed at interpretation centers.

In addition, the U.S. Air Force's Defense Support Program is a network of satellites orbiting more than 20,000 miles high that use infrared telescopes to detect the hot fumes of incoming aircraft or ballistic missiles.

Closer to the ground, the chief surveillance method is the E-3 Sentry Airborne Warning and Control System (AWACS) planes, which are modified Boeing 707s with a saucer-shaped rotordome with banks of computers and radar screens. An AWACS plane flying over Saudi Arabia at 29,000 feet can track aircraft taxiing on runways north of Baghdad, then direct allied aircraft to intercept the incoming raid.

Additionally, the new Joint Surveillance and Target Attack Radar System (J-STARS) is a radar-loaded Boeing 707 that flies high over Saudi Arabia and tracks targets up to 125 miles behind enemy lines. Information is sent to field commanders, who can order air assaults. However, critics charge that the J-STARS cannot distinguish between, for example, a tank or a school bus.

JAMES DALY

AIRCRAFT AND NAVIGATION



Behind Operation Desert Storm's air attack is a computer-driven score that is designed to inflict maximum damage with minimal casualties.

The more than 10,000 sorties flown in the first week of the war were organized into discrete "force packages," which are symbiotic groups of planes, each bearing specialized capabilities. Leading the pack and flying flank guard for the fighter planes are EF-111A Raven defense-suppression aircraft, which jam long-range Iraqi radar. F-4G Wild Weasels also send jamming signals that create a path for the fighters to fly through. Additionally, the planes can carry antiradiation missiles, which home in on air defense radar emitting electromagnetic waves.

Leading the aircraft strikes is the F-117A Stealth fighter, along with F-15E Eagles and F-16 Fighting Falcons equipped with "smart bombs," which their admirers said limit destruction, spare civilian lives and quicken results. The operator brings the target into the cross hairs on a cockpit video display, then locks the bomb's imaging infrared camera onto it. Accuracy is said to be within 30 feet.

Some of the F-15s and F-16s use an advanced navigation and targeting system called Low Altitude Navigation and Targeting (Lantirn), which consists of a pair of pods slung under the wings that incorporates the information gleaned from satellites to deliver bombs with great precision.

Detailed targeting information — containing everything from roads leading to the bombing site to what the buildings look like from above — is preprogrammed and preinstalled into Lantirn before the jet leaves the ground. Once over the target, the pilots perform rudimentary scene-matching functions before letting their bombs fly.

"When these guys were dropping bombs down ventilator shafts, it wasn't because they were winging it when they got there — the location of each shaft had been programmed for a long time," said the Federation of American Scientists' senior analyst John Pike.

JAMES DALY

High-tech triage

For the first time in a war situation, surgeons in Operation Desert Storm have access to the U.S. Army's most advanced automated medical system from the mobile medical units 10 to 15 miles behind the front lines.

Doctors will be able to use the Theater Army Medical Management Information System to quickly pull up patients' medical records, administer preliminary care and send computer messages to the next appropriate hospital or medical unit for soldiers who need intensive care. The system is also connected to the central command computer center in Germany by radio transmission and telephone lines.

The system, based on Intel Corp. 80386-based Unisys Corp. workstations running CTOS, should be able to send patient records to and from the field units in seconds, said Col. William Pulver, a program executive officer at the Pentagon's Standard Army Management IS Department.

Tests have been conducted, said Noel Goyette, chief of the IS operations branch at the U.S. Army IS Command headquarters. "I'm not saying that we won't have problems, but we do the best we can."

MAURA J. HARRINGTON

Due to a lack of photographic contrast, this page did not reproduce well.

NEWS SHORTS

Profit slip for AT&T

AT&T rang in last week with fourth quarter revenue up 7% to $9.96 billion, but quarterly profits slid to $668 million, down 1% from $706 million one year earlier. For the full fiscal year, however, the telecommunications giant reported that net income increased 1.4% to $2.57 billion, on revenue up 3.1% to $37.29 billion. In light of "a deteriorating economy," the company said, "we are pleased with these results."

Ecker cuts all Ashton-Tate ties

Edward M. Ecker Jr. severed his last ties with Ashton-Tate Corp. last week when he resigned from the board of the Torrance, Calif., database application maker. Ecker had served as the company's chairman and chief executive officer for five years before resigning last May amidst a string of product foul-ups and quarterly losses. Ashton-Tate officials said they do not intend to replace him on the board.

Oracle shines to Windows

Oracle Systems Corp. last week introduced Oracle Card, a database client for both Microsoft Corp. Windows 3.0 and Apple Computer, Inc.'s Macintosh environments. The company said the product, its first for the Windows market, enables users to build front-end applications for Oracle systems that will run unmodified under the point-and-click interfaces offered by Microsoft and Apple. The company said the product will be priced at $299 and will be available in the second quarter.

CA updates PC tool kit

Computer Associates International, Inc. said last week that it is shipping its long-promised personal computer version of the Datacom/DB mainframe database, CA-Datacom/PC. CA also said it is shipping a beta-test version of CA-IDMS/PC Release 2.4, a product intended for cooperative processing and downsizing of mainframe applications. The IDMS/PC release, priced at $10,500, boosts system memory from 640K to 16M bytes and includes a computer-aided software engineering system that allows PCs to double as development workstations and database servers.

Network General profits up

Network General Corp. announced third quarter revenue of $12 million — a 50% jump over the $8 million reported for the comparable period last fiscal year. Net income for the Menlo Park, Calif.-based company rose to $2.1 million, 26% above the $1.7 million recorded in the previous third quarter.

Multivendor structure set

Nippon Telegraph and Telephone Corp. (NTT) introduced its Multivendor Integration Architecture last week. The set of software standards developed through a consortium comprised of NTT Data Communications Systems Corp., IBM Japan Ltd., Digital Equipment Corp., NEC Corp., Hitachi Ltd. and Fujitsu Ltd. will allow applications from each vendor to interoperate on NTT's network. "This is very significant because it simply says 'here are the standards, and any supplier who follows these rules, NTT will buy from them,' " DEC President Kenneth H. Olsen said last week.

Prime pumps up MIPS

Prime Computer, Inc. announced reduced instruction-set computing-based Unix machines last week. The EXL 7363 departmental system is targeted for commercial applications and can support as many as 300 users. With a 33 million of instructions per second rating, the system offers 32M to 256M bytes of main memory and 1G to 20G bytes of disk storage. It is priced from approximately $75,000. The EXL 7660 is a compact, less expensive version of the company's EXL 7680, and it provides from 32M to 128M bytes of memory, with prices beginning at $190,000. Both units are scheduled for delivery in March.

Wang in red, DG back to black, and Conner shines

BY NELL MARGOLIS
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. blamed the gathering forces of war and recession last week for the halt in what analysts had hailed as a heroic march toward profitability.

However, some industry observers said the economic factors that have helped push Wang back into the red could buy the firm precious time in which to complete a critical product line turnaround.

For the quarter ended Dec. 31, Wang posted a net loss of $24.7 million on revenue of $551.5 million, down 15% from revenue for last year's comparable quarter. The loss was expected, several analysts said.

Wang Chief Executive Officer Richard Miller noted the havoc wreaked on Wang's turnaround by economic crises that have taken a toll on banking, government and insurance — all traditional Wang bastions.

The global economic woes that have temporarily derailed Wang's recovery could end up actually aiding the firm, said Chris Christiansen, an analyst at Westport, Conn.-based market research firm Meta Group, Inc.

"Customers are realizing how costly conversion can be," he noted. "Some who might otherwise have changed systems and vendors are bound to reassess and to stick with Wang longer than they'd planned."

Analysts agreed last week that the disappointing earnings report is a probable indication of more job cuts to come. "I think Wang is going to survive," said Mary Rhodes, an analyst at Southport, Conn.-based New Science Associates, Inc., "but certainly as a much smaller, niche-oriented company."

Elsewhere in the industry

Meanwhile, a recent flurry of worry over Sunnyvale, Calif.-based Amdahl Corp.'s health appeared to be contradicted by the mainframe contender's fourth quarter financials. Amdahl posted quarterly net income up 47% to $61.3 million on revenue up 3% to $644.4 million.

Software player Computer Associates International, Inc. saw fourth quarter revenue rise 10% to $381.4 million, while profits fell by the same amount to $63.5 million. Both figures agreed with Wall Street expectations, analysts said.

Long-beleaguered Data General Corp. reported revenue up 7.2% to $311.7 million and a $12.4 million profit, in contrast to a $20.5 million net loss in last year's comparable period. The company credited cost-reduction efforts and increased sales of its Aviion workstations.

San Jose, Calif.-based disk-drive player Conner Peripherals, Inc. — one of Wall Street's darlings last year — announced that its year-end revenue increases of 90% to $1.34 billion and a 1990 profit of $130.1 million was a 213% leap. For the quarter closed Dec. 31, Conner posted net income of $47.4 million, up 225%, on revenue increased 85% to $418.4 million.

Stock firms may merge back offices

BY CLINTON WILDER
CW STAFF

NEW YORK — Recession-plagued Wall Street is hoping to cut costs by teaming up on back-office operations, but analysts warned of major technology barriers to such mergers.

Prudential-Bache Securities, Inc. confirmed last week that it is discussing with Shearson Lehman Brothers, Inc. the idea of combining their back offices, which are hampered by unused capacity because of low trading volume. An agreement could reportedly be signed within a month and could include other brokerage firms as well.

Like most big brokerage firms, Prudential-Bache and Shearson significantly increased their trade processing capabilities in the late 1980s as trading volumes soared. Now, with all of Wall Street in a cost-cutting mode, they said they believe they can realize significant economies of scale by merging operations.

However, that is easier said than done, according to securities processing experts. First and foremost, bringing back-office operations together would not work as a merger of equals, said Scott Smith, senior manager at the New York office of information systems consultancy Nolan, Norton & Co.

"Most back-office systems on [Wall] Street are not very modular," he said. "One firm will have to be the prime contractor and, in effect, subcontract processing services to the other firm."

The communications bridge between the back-office trade processing systems and the front-office systems used by brokers will be the biggest technology challenge, Smith said. "If I'm the subcontracted company and I need the relational copy of the [trading] data, where will it be located? It will be interesting to see how they organize it."

Merging operations would also create "a single point of exposure" for two companies to natural disaster or computer crime, according to Howard Mannella, director of Nolan, Norton's annual study of Wall Street trade processing costs.

Copy crusade

CONTINUED FROM PAGE 1

be required to destroy more than 100 illegal copies of Wordperfect Corp.'s Wordperfect package and Lotus Development Corp.'s 1-2-3 spreadsheet.

Ted Tetzlaff, Kemper's attorney, said the case was actually settled within a week of the SPA's raid. Tetzlaff said that low-level employees who wanted access to software were responsible for the copying and that the "person responsible" for allowing this had left the firm by the time the SPA raided it.

The SPA told *Computerworld* that it is also near a settlement with Davy-McKee Corp., whose Chicago office was the other target in a Nov. 19 raid. The settlement with Davy-McKee could be the largest in SPA history, but Ken Wasch, executive director of the SPA, refused to give details, pending the outcome of the case. According to sources, the settlement against Davy-McKee is expected to be smaller than it might have been because the company agreed it was in error and has agreed to self-audit its other offices around the country. One source estimated that nearly 1,000 illegally made copies of software were found in the Chicago office alone.

Davy-McKee's attorney refused to comment on the case until it is complete.

"Davy-McKee reflects a fairly typical business — it's an honest, upstanding, honorable company that lost sight of their PC management," Wasch said. "Everybody has the problem — even [the SPA]. What we're trying to do is help them to bring it under control."

In discussing the upcoming raids, Wasch said he expects that the SPA will pursue such cases more aggressively this year than it has in the past. He predicted that the organization will conduct more than 100 audits on corporations, as opposed to 80 in the 1½ years since it began its audit program.

FTC probe of OSF said to focus on tech pricing

BY JOHANNA AMBROSIO
CW STAFF

CAMBRIDGE, Mass. — The Federal Trade Commission (FTC) is investigating the Open Software Foundation (OSF) for unfair trade practices and anti-trust violations, industry sources confirmed last week.

At issue is the process by which the OSF selects the technology included in its products, how it prices its products and how it pays for technology.

A spokesman for the FTC's Competition Litigation Division would neither confirm nor deny reports of an investigation, saying such information is not made public unless the government files a lawsuit. No formal legal action has been taken, he said.

An OSF spokeswoman said the OSF had not been contacted by the FTC.

However, executives at two independent software vendors confirmed a report in the industry newsletter "Unigram-X" that the investigation appears to be entering a more serious phase. One executive has met and the other will soon be meeting with FTC lawyers.

The OSF's best-known sponsor, IBM, is treating the matter as "rumor," said Dale Harris, a manager at IBM's Open Systems Group in Austin, Texas.

Harris claimed that the OSF's rival groups, including Sun Microsystems, Inc. and AT&T, might be behind the allegations. "Some groups are becoming very nervous about the OSF's success," he said. Executives of Unix System Laboratories, Sun and Unix International have denied the charge.

"This is not between OSF and us; it's between OSF and the independent software vendor community," countered Roel Pieper, vice president of sales and marketing at Unix System Laboratories in Morristown, N.J. "This is a very serious matter that has been discussed in the industry for quite some time."

Although the OSF does not sell directly to users, it licenses its software for a fee to vendors. The crux of the dilemma is that unlike other industry consortia, the OSF functions as both a standards-setting organization and a vendor.

The OSF's products include the Motif graphical user interface and the OSF/1 operating system. The Distributed Computing Environment is scheduled to ship in June.

Misery loves company

One of the executives meeting with the FTC said he knew of several other vendors that will be doing the same. He added that the FTC had initially approached him earlier this month for some preliminary information but is now looking to take formal statements.

Independent software vendors took their complaints directly to the OSF in March 1990. At that point, they asked the OSF for "a formal set of guidelines about their pricing models and business practices relative to independent software vendors," said Larry Lytle, director of strategic relations at Netwise, Inc. in Boulder, Colo. The formal guidelines have "never materialized," he said.

The problem, Lytle said, is that the OSF offers extremely low prices for the technology it uses in its software and can thus keep its license fees low.

"OSF is a not-for-profit corporation and can afford to price its products low. But independent software vendors can't afford to give away their technology," Lytle said.

Jonathan Gossels, OSF business area manager, said his group pays "fair market prices" for the technology it uses. "We recognize that the independent software vendors are entitled to be compensated fairly."

Gossels said that of the OSF's 10 or so technology agreements, four are with independent software vendors. "Most of the noise is coming from independent software vendors that were not selected for our requests for technology and that have no knowledge of how we negotiate or do business."

Fujitsu product first of its kind

The DS/90 line of systems was announced at last week's Uniforum

BY CAROL SLIWA
CW STAFF

DALLAS — On the hardware side of Uniforum, Fujitsu Ltd. moved to boost its presence in the U.S. midrange systems market when it unveiled the first product based on research by UK-based International Computers Ltd. PLC, a recent acquisition. The DS/90 line is a series of Unix-based midrange systems using Scalable Processor Architecture (Sparc) technology.

"It's interesting in that it's the first — or one of the first — Sparc clone systems from a major manufacturer," said Jonathan Blau, a senior analyst at New Science Associates, Inc., a research company in Southport, Conn.

The systems, which are expected to use Sparc processors from Cypress Semiconductor Corp., start at $50,000 for a 25-MHz model with 16M bytes of random-access memory and range to $200,000 at the high end for a 33-MHz system with 32M bytes of RAM.

Other happenings

Other Uniforum highlights included the following:

- Motorola, Inc. added three new models and several enhancements to its Delta Series 8000 group of Unix systems based on Motorola's 8800 reduced instruction set computing (RISC) processor.

The series is bracketed with new additions at both ends — the Model 8440 at the low end and the Model 8840 on the high-performance side. The Model 8640 is positioned as a midrange model.

Enhancements to the line include increased processor memory, more disk capacity and a new small computer systems interface (SCSI) controller. Prices range from $21,355 to $58,275.

- Sequent Computer Systems, Inc. introduced the Symmetry 2000 family of computers based on the firm's symmetrical processing architecture. The company showcased the S2000/70, an open systems mainframe ranging in price from $190,000 to $2.5 million.
- Waltham, Mass.-based Cambex Corp. announced the porting of Certi-Stream, its tape backup product, to AIX, IBM's Unix offering, for use on the RISC System/6000 platform. Available for all RS/6000 units running AIX Version 3.0 or higher, a single machine license costs $500.
- Cambex also showcased the Certainty 6200 series, a family of SCSI disk drives for the RS/6000. The drives connect to the RS/6000 SCSI attachment cards and range in price from $5,100 to $9,750.

Uniforum addresses user demand for Unix systems

BY JOHANNA AMBROSIO
CW STAFF

DALLAS — Users' longstanding complaints about the dearth of commercial Unix applications are starting to be addressed. At last week's Uniforum show — a forum that in previous years was dominated by basic business applications — vendors unveiled imaging systems, multimedia software and a bevy of connectivity packages.

Sun Microsystems, Inc. introduced a video capture system that allows users to freeze-frame a video from various sources, manipulate the image, store it and share it on a network. Videopix is based on a Sun Sparcstation and costs $895.

In a similar vein, Motorola, Inc. announced the Multipersonal Image Exchange System, an imaging system that includes scanning, editing, facsimile transmission and optical storage. Pricing for a single-user system, which does not include the personal computer engine needed to power it, starts at under $17,000.

A developer's tool kit to write Unix-based imaging applications is now available from Kofax Image Products, Inc. in Irvine, Calif. Available for $695, it allows users to write document imaging software for Kofax's KF-8200 Document Processor.

CD-ROMs a big hit

Compact disc/read-only memory (CD-ROM) is also making inroads in the Unix market. Highland Software, Inc. in Palo Alto, Calif., will distribute Unix applications from multiple software vendors on CD-ROM discs. Three CD-ROM versions will be issued for Hewlett-Packard Co., Digital Equipment Corp. and Sun workstations.

Even hardware vendors were showcasing software. Sunnyvale, Calif.-based Mips Computer Systems, Inc. announced five applications portfolios containing software for specific uses. These include portfolios for computer-aided software engineering, office automation and networking.

Announcements at the show included the following:

- Mountain View, Calif.-based Clarity Software, Inc. introduced Rapport, multimedia software that includes a compound document editor, spreadsheet, graphics and electronic mail. It also supports audio messaging and facsimiles. Rapport runs under the Open Software Foundation's Motif and Sun's Open Look graphical user interfaces on a variety of workstations from Sun, HP, IBM and DEC. It will sell for $895 per copy.
- Lynx Real-Time Systems, Inc. in Los Gatos, Calif., unveiled a Unix multiprocessing operating system it claimed is portable across a wide variety of hardware platforms. Until now, the company said, multiprocessing software had to be closely tied to the specific computer, making the various implementations incompatible.
- Mt. Xinu, Inc. in Berkeley, Calif., introduced a version of the Mach operating system for Intel Corp. 80386-based computers.
- Oracle Systems Corp. announced that its relational database management system will support AT&T's Unix System V, Release 4.
- At the same time, Oracle said that it will support the OSF's Motif graphical user interface in both its SQL*Forms and its SQL*Menu report-writing products.
- The Santa Cruz Operation in Santa Cruz, Calif., announced its version of Microsoft Corp.'s LAN Manager for Unix, along with an updated version of its Open Desktop graphical interface package.

Senior West Coast Editor Jean Bozman contributed to this report.

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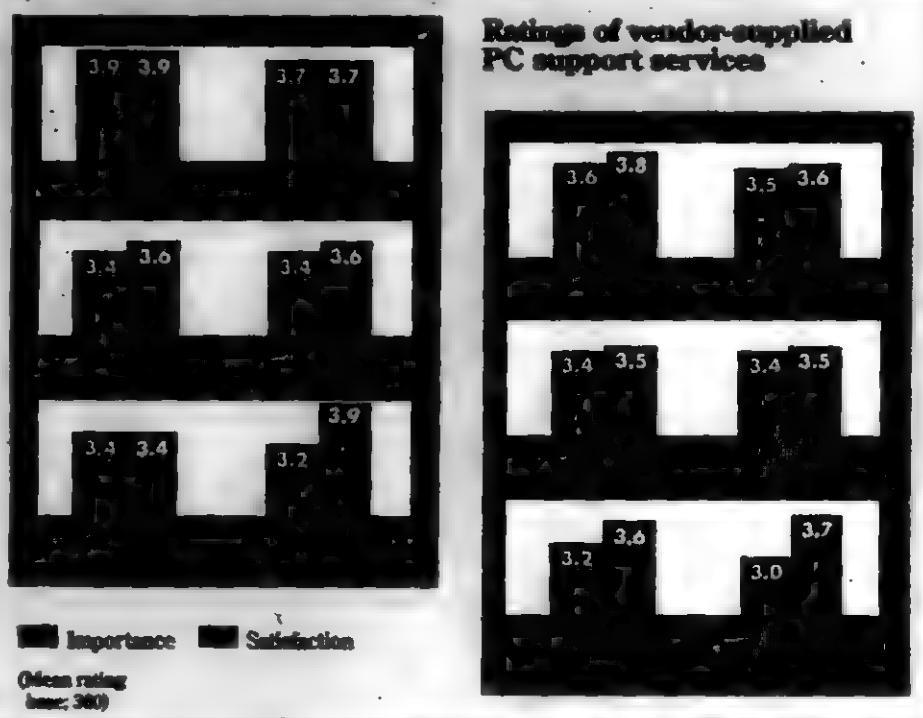
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TRENDS

Personal Computers Service and Support

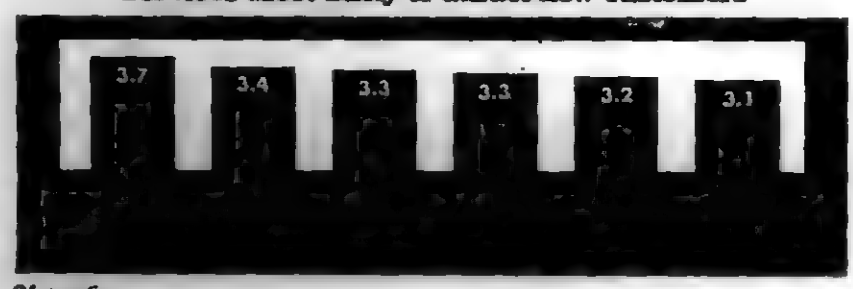
PC users are most annoyed with hardware installation and trouble service, but would be nice to have a single point of contact for both hardware and software problems.

Ratings of vendor-supplied PC support services



Ocean rating
base: 360)

Services most likely to attract new customers



(Mean rating
base: 520)
Ratings based on a 5-point scale: 1 = not important, 5 = very important

Source: The Ledgeway Group, Lexington, Mass.

CW Chart: Doreen St. John

INSIDE LINES

Deere pulls in horns

Deere Technology Services has ended its aggressive move into the business of providing IS services to other firms, general manager Bill Rankin said. The firm is working exclusively for its parent company, tractor maker John Deere & Co.

Putting things in perspective

Ex-Mellon Bank IS chief George DiNardo reports he has already received word of very strong interest from two "major" firms. While he mulls it over, DiNardo has plenty else on his mind: He has one son commanding a U.S. Marine tank in Saudi Arabia and another in a recently called-up Marine Reserve unit. "We get an hour of sleep at a time and then go back to CNN," he said. "We're scared silly."

Serving to the backhand

"It's an awkward moment in time." That's all an IBM spokesman had to say when asked why the company's Token-Ring 16/4 bus-master server adapter A supports competitors' networking software rather than IBM's. The card supports Novell's Netware and Banyan Systems' Virtual Networking Software but not OS/2 Extended Edition or LAN Server. The demos of the card on LAN Server are apparently unreliable.

Classified protection

Facing potential terrorist attacks at airports and on airplanes, many Silicon Valley companies are instituting travel restrictions, but it's unclear whether they are more interested in protecting their knowledge pool or their employees. For instance, Sun's travel policy suggests that no more than three officers or five employees be on one flight at the same time. A Sun employee said that at the department level, however, it was even more restrictive: No more than one engineer from a particular group may travel on a plane.

Chilled-out disk-drive plans

Hitachi Data Systems has left some customers cooling their jetts, as deliveries of the new HDS 7390 disk drives have slowed to a trickle. The reason, HDS admits, is a ramp-up problem both at the Odawara Works in Japan and at HDS' factory in Norman, Okla. HDS "stopped production of the 3380-compatible disk while there was still demand for it — and then it hit a manufacturing problem," said Mark Hess, head of Gartner Group's large-computer strategies group.

What's in their Poqet?

Poqet Computer has canceled advertising space and trade show appearances and stopped production of its current palmtop PC to focus on a new, slightly larger portable, sources close to the firm said. Furthermore, one source claimed, Poqet will eventually recall all of its palmtops and replace them with a redesigned palmtop. A spokesman denied canceling ads and trade show appearances but said the firm has temporarily halted production to make a routine engineering change.

A case of the acquisitives

Ernst & Young is expected to announce today that it is acquiring CASE Research Corp. in Bellevue, Wash., industry sources said. CASE Research principals Vaughan Merlyn and Greg Boone will join Ernst & Young's Center for Technology and Strategy, a Boston-based applied research facility. CASE Research is probably best known for its *Annual Report on CASE* and its Annual CASE Users Conference.

Filling up his Uniforum meeting calendar, the news editor agreed to meet with Intergraph, which said it was introducing a new workstation incorporating image functions. Moments before the meeting, he read a 'scoop' about the product in the Uniforum show's daily newspaper. Come the meeting, Intergraph said it had decided not to introduce the product and would instead target it for some specialized trade show we've never heard of. Hmmmm, what's really going on at the company, we wonder? If you know, fill News Editor Pete Bartolik in on what he missed by calling (800) 343-6474 or faxing the skinny to (508) 875-8931. You can also contact him electronically on MCI Mail, COMPUTERWORLD; Compuserve, 76537,2413; or Prodigy, MRTS78A.

NEXT WEEK

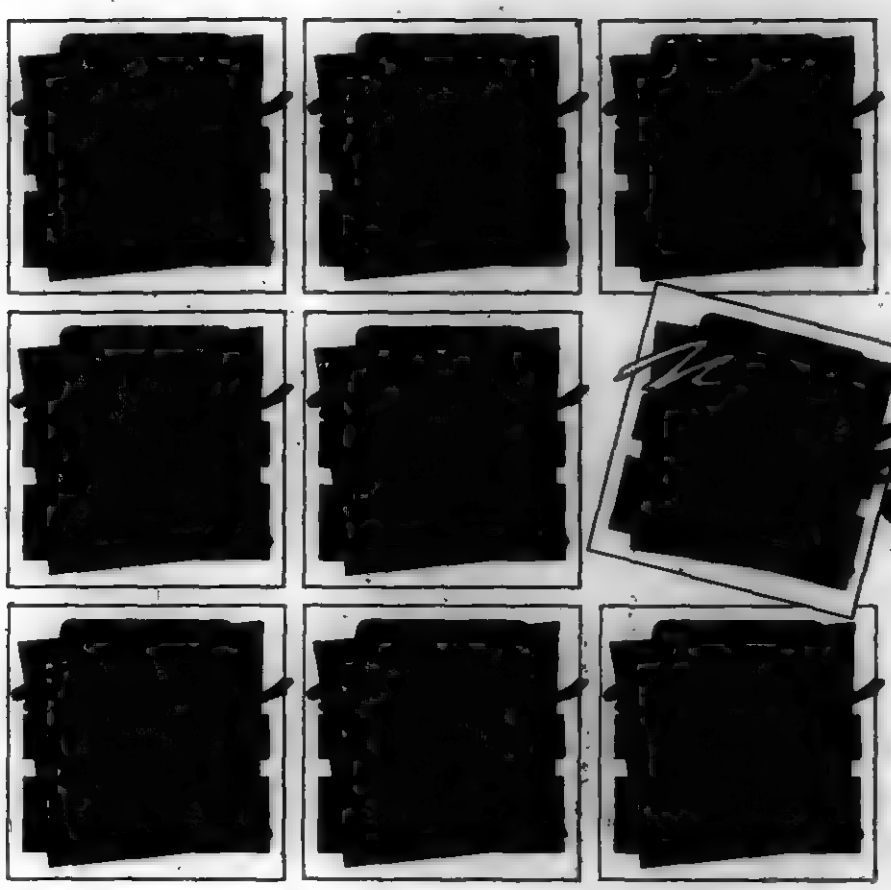
When **Larry Liss**, senior vice president of operations and technology at Meritor Savings Bank of Philadelphia, entered a facilities management deal in 1989, he never imagined the level of systems integration that would result — or the effects it would have on the bank. Find out in Integration Strategies how Meritor continues to benefit.



Eli Allabarg

When it comes time to replace your current generation of personal computers, don't just think power. What organizations need is to make a revolutionary leap to a new breed of corporate workstation that enhances the way business users work. To see a rundown of the features that this machine is expected to have, read In Depth.

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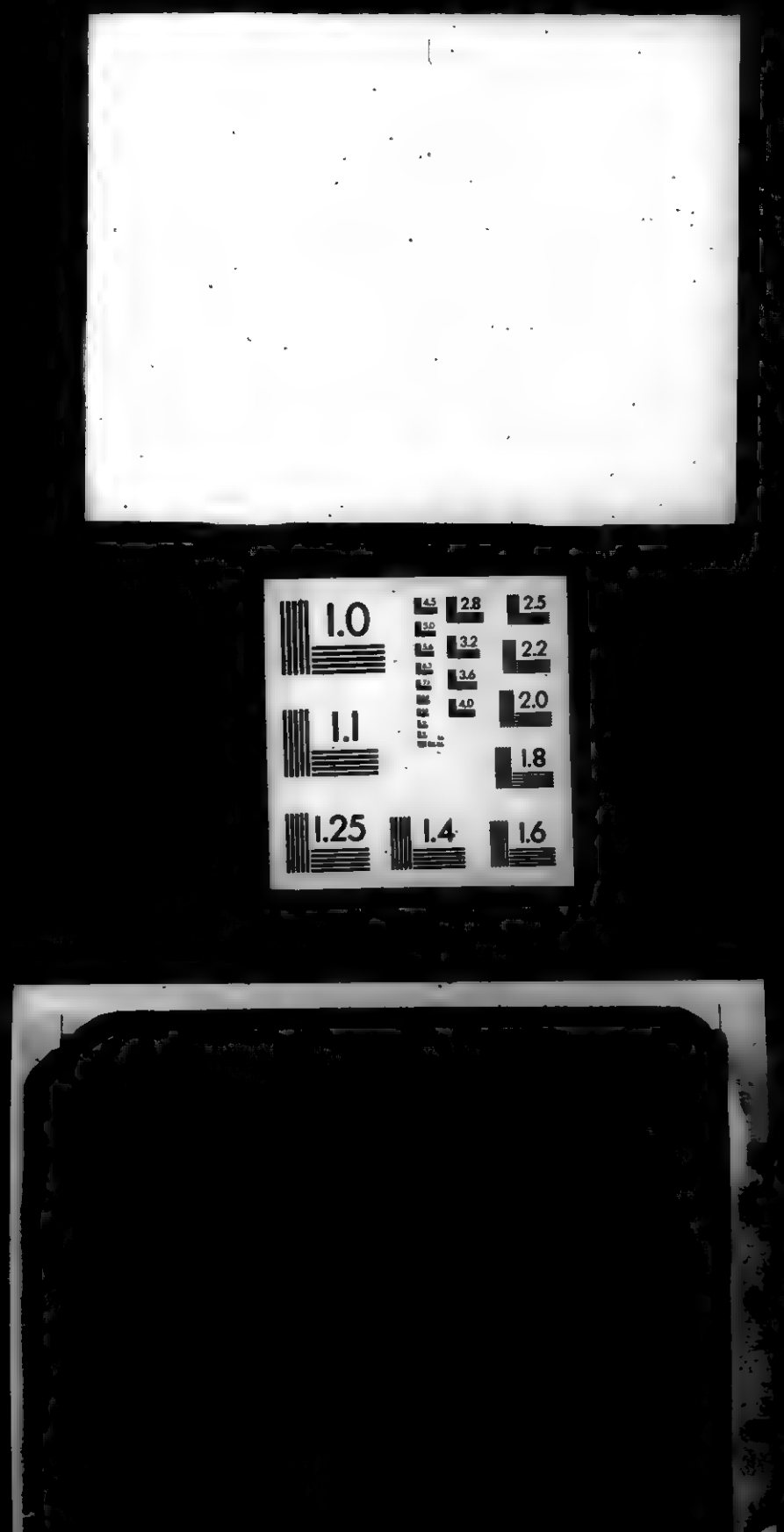
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COMPUTERWORLD

Novell lining up links to outside world

BY JIM NASH
CW STAFF

Novell, Inc. is preparing to introduce Netware Version 3.11 and link up with IBM's Netview network management system, according to analysts briefed by the company.

Sources, who requested anonymity, said the Provo, Utah-based company will announce Netware 3.11 — a successor to Version 3.1 — at the Networld '91 conference next week in Boston and plans to ship the software next month.

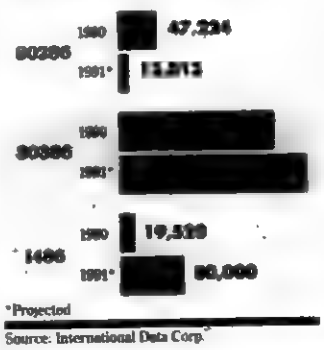
They also said Version 3.11 will be followed in April by delivery of connectivity applications for Apple Computer, Inc.'s Macintosh, Sun Microsystems, Inc.'s Network File System and Open Systems Interconnect's file transfer access and management protocol. All three applications will be Netware Loadable Modules and were originally touted as scheduled features of Version 3.1 when it was announced last year.

Bernard Harguindeguy, product line manager at Novell's Communication Services in Sunnyvale, Calif., confirmed last week that the company will announce availability for the three

Continued on page 4

Fast track

The 80386 is still the clear platform of choice for LAN servers



Source: International Data Corp.

Microsoft, IBM diverge on OS/2 direction

32-bit system to move to multiple platforms

BY JAMES DALY
CW STAFF

REDMOND, Wash. — OS/2 may be many things, but there is one thing it is not: dead.

Microsoft Corp. officials last week vigorously denied a published report that it will abandon the struggling operating system and rolled out a product strategy blueprint that includes a high-end cross-platform version of OS/2 as well as plans to refresh DOS and Windows.

"OS/2 is not dropped, scrapped or dead," said Steve Ballmer, senior vice president of systems software, during an all-day strategy seminar. "Windows is our target operating system, but Windows alone — even future advanced versions — will never be able to satisfy all the needs of power users."

Ballmer said he believes there will always be a need for at least two separate operating systems: OS/2 for the high end and a DOS- and Windows-based product for low-end and midrange users. Microsoft hopes to satisfy computationally demanding users with OS/2 Version 3, which will offer DOS, Windows, Posix and OS/2

Continued on page 93

TWO VIEWS OF THE WORLD

- Windows is Microsoft's 'target operating system,' but the firm will support OS/2 for high-end use.
- IBM reaffirms its Presentation Manager commitment.
- Microsoft says OS/2 Version 3 will be compatible with Windows, Presentation Manager, DOS and Posix.
- IBM says 32-bit Presentation Manager and OS/2 will be released before 32-bit Windows.

IBM vows to stick with Presentation Manager

BY PATRICIA KEEFE
CW STAFF

Confronted by user anguish over the future of OS/2, IBM vowed last week to deliver "a critical mass of volume" in OS/2 products and installations and to do a better job of publicizing its view of the world.

"We are trying to counteract some of the confusion that has been created," said Leland Reiswig, assistant general manager for IBM's Programming Systems, on Friday. "We are going to have to be more vocal about our view of the world independent from Microsoft."

User unease, which resulted from months of mixed messages over the future direction of Microsoft Corp.'s Windows, reached an apex last week after published reports said Microsoft would scrap OS/2 in favor of [redacted].

That story, which Microsoft denied the next day, resulted in panic calls from some corporate executives to information systems managers.

Users interviewed last week were unanimous on one point:

Continued on page 93

DEC faces rocky road in service shift

Part 2 of a three-part series researched and reported by Computerworld's Maryfran Johnson, Alan J. Ryan and Sally Cusack

Dan Snyder was optimistic last year when his company hired Digital Equipment Corp. to handle a major systems integration and conversion job at Tyson Foods, Inc. What he learned along the way was that DEC was "suffering from growing pains" as a systems integrator.

Tyson's migration from Unisys Corp. mainframes to a cross-country network of DEC VAXs "bogged down," Snyder said recently. Plans to buy packaged software from third-party vendors and to have DEC integrate it all on the new systems went astray, partly because of disputes with a software vendor and DEC's inability to help resolve them.

"We need people that understand business issues, who can organize and recommend ways to do our conversion and set up this network," said Snyder, who called DEC a "first rate" firm but said its technical personnel did not impress him.

For its part, DEC appears more than willing to change. In its own version of *Back to the Future*, the Maynard, Mass.-based company is rebuilding the management structure that carried it successfully from the 1960s into the early '80s.

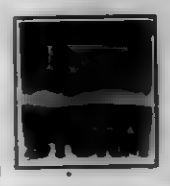


"The product line strategy worked very well, but it grew enormously and, in time, started to deteriorate," DEC President Kenneth H. Olsen said in a recent interview with *Computerworld*.

By creating 18 profit-and-loss business units within the company — each dedicated to particular markets such as Unix systems or systems integration — DEC has put back in place the kind of bottom-line accountability Wall Street applauds

Continued on page 92

INSIDE



Iraq's communications have proved to be surprisingly resilient under assault, but U.S. military commanders say it won't last. Page 6.

LATE NEWS: Late Friday IBM Credit Corp. announced it filed suits against storage product vendors Cambex Corp. and EMC Corp. to "stop the conversion and misuse of computer products owned by IBM Credit." That was the same charge leveled a week earlier against independent leasing company Comdisco, which last week cried foul in a letter to customers; see story page 4.

CA users fume over new fees

BY JOHANNA AMBROSIO
CW STAFF

Computer Associates International, Inc. gleefully greeted IBM's upgrade of the long neglected VSE operating system last year with an advertisement stating, "We'd like to welcome IBM back to VSE." CA customers say they are just now finding out why.

Customers said last week that CA is imposing charges of up to several thousand dollars for users upgrading from VSE to VSE/ESA Version 1.1.

Users claim CA is demanding unreasonable "ESA option" upgrade charges ranging from $1,400 to $11,500 per package to obtain upgrades for their VSE applications. One CA executive said the price tags are justified because of the amount of work the company did to prepare the new software releases and added that less than 20% of VSE applications titles are affected.

However, users are not biting. "[CA's] Dynam/T is a tape operating system — what does that have to do with ESA? Not much," said Ed McLoud, president of Systronics, Inc. in Lenexa, Kan. "They want to charge me an extra $3,400 for it."

McLoud said CA has demanded a total of $22,100 for him to upgrade five CA packages to ESA 1.1 versions. "I told them I'm not going to pay it," he said, "but I don't know exactly what I am going to do yet."

CA Senior Vice President Sanjay Kumar defended the

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6 Unisys' near-term future looks gloomy, after fiscal 1990 losses proved to be worse than Wall Street's expectations.

7 Shearson's information services group is forming a separate entity under parent American Express to provide data processing to all securities firms.

8 Amtrak is thundering into competition with airlines, with plans to install the world's first automated yield management system for passenger railroads.

10 Students are getting away with loan abuse because of poor database information verification by the U.S. Department of Education.

12 A Russian Economic Reform Council delegation met in the Silicon Valley to request U.S. aid in forming a free-market economy.

91 IBM fills in its customers on the state of Advanced Peer-to-Peer Networking at Comnet '91.

93 Intel may only muddy the PC chip waters if rumors of several pending I486 chips about to hit the market this year are true.

Quotable

"I guess one can always find a silver lining in a big black cloud. It gets easier to say 'no' to anything that costs money."

GREG FARMAN
DG USERS GROUP

On IS in a recession. See story page 6.

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INTEGRATION STRATEGIES

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IN DEPTH

67 Out with the old PC, in with the **new corporate workstation.** By Conrad Blickenstorfer.

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The 5th Wave



"OOPS - HERE'S THE PROBLEM. SOMETHING'S CAUSING SHORTS IN THE MAINFRAME."

EXECUTIVE BRIEFING

■ **The recession appears to be slowing users' plans** to move to more open systems environments or change vendors. Purchasing a new computing architecture is viewed as a risk, and today's economic climate encourages anything but risk taking. However, there is another factor dampening enthusiasm for open systems: a lack of Unix software availability on many platforms. **Page 6.**

■ **Microsoft flatly denied reports that it plans to scrap OS/2,** but information systems executives remain confused about the future directions of OS/2, Windows, Presentation Manager and LAN Manager. Some called on IBM and Microsoft to deliver a consistent message about their strategies, but the current situation has raised observers' doubts about the companies' 10-year relationship. **Stories, page 1.**

■ **Shearson Lehman Brothers spun off its IS group** into a separate unit to be run by corporate parent American Express. Shearson said no jobs were cut and that the move is not related to its possible merging of back-office operations with Prudential-Bache. **Page 7.**

■ **Some Computer Associates users are angry** about new VSE pricing policies, saying upgrade charges between $1,400 and $11,500 are unreasonable for users migrating CA packages from older VSE versions to IBM's new ESA 1.1 version. CA defended its pricing, saying the new versions of its products required significant retooling. **Page 1.**

■ **Amtrak will become the world's first passenger railroad** to use automated yield management with a DB2-based system to be completed this summer. The national rail system is working with American Airlines' Decision Technologies to develop the system. **Page 8.**

■ **Comdisco defended its subleasing practices,** telling customers that subleasing and reconfiguring create more choices and lower rates for lessees. The lessor said IBM's suit threatens the entire third-party leasing industry, but IBM strongly denied the charge. **Page 4.**

■ **The top IS executive at EMI Music,** R. Anne Payne, resigned late last month after less than one year in the position. EMI is running IS by a committee of three executives until a replacement is named. **Page 7.**

■ **The practice of using subcontractors,** long popular in government systems integration projects, is becoming popular in the commercial market. Users, however, need to pay careful attention to complicated contracts that are required. **Page 57.**

■ **A New Orleans offshore drilling firm** had some anxious moments recently when its outsourcing vendor decided to exit the business. But the firm was able to work things out and find a new vendor. **Page 51.**

■ **Commercial OSI standards are lagging,** so some users are opting for current network management offerings that promise future OSI compatibility. At Comnet '91, Marine Midland Bank and the UK's National Westminster Bank revealed such plans. **Page 91.**

■ **Automating a sales force** can hold its own special challenges. A General Foods trainer found that sales managers need technical training, too, while trainers don't necessarily have a tougher time training older salespeople. **Page 88.**

■ **On-site this week:** Something special's in the air at American Airlines' computer operations in Fort Worth, Texas: an ambitious project to convert the mainframe-based scheduling system to Unix-based client/server architecture. The first phase of the project has been completed, allowing Mips workstation users running an Oracle database to upload scheduling data to an IBM 3090. **Page 27.**

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Comdisco answers IBM charges

Firm appeals to customers, saying IBM Credit Corp. restricts freedom

BY NELL MARGOLIS
CW STAFF

ROSEMONT, Ill. — One week after IBM Credit Corp. (ICC) hauled archrival Comdisco, Inc. into court on a series of charges stemming from Comdisco's alleged subleasing and reconfiguring practices, the named defendant filed its first reply — not with the court but with its customers.

"We believe that, if successful in its ultimate objective, IBM will restrict the free movement and remarketing of used computers," Comdisco Chairman Kenneth Pontikes said in a letter to the firm's customer base dated Jan. 30.

"Virtually the entire leasing industry considers the ability to sublease an essential right of lessees," Comdisco said. Unfettered subleasing and reconfiguring translates directly into more choices and reduced costs for lessees, the firm noted.

According to Frank Gens, an analyst at Framingham, Mass.-based Technology Investment Strategies Corp., IBM's action threatens more than just lessees' rights to bargain shopping. In the kind of machine-stripping situations detailed in the complaint against Comdisco, Gens said, "the lessee would certainly appear to have the ultimate liability."

Gens, like many other industry observers, characterized ICC's action as open warfare on the third-party market rather than a contained lawsuit against a single vendor.

ICC flatly denied having any hidden agenda. "We've sued Comdisco; that's it," ICC spokeswoman Carol Moore said. "This isn't a subleasing issue. It isn't a 'parts' issue. It's an ownership issue, pure and simple."

"It's a legal issue," said Sidney Diamond, vice president of information systems at Black & Decker, Inc., which leases computers from both ICC and Comdisco. "In time, the courts will clarify the issues, we'll all know the new ground rules, and we'll all play by them."

In the meantime, Diamond said, the suit is bound to raise the caution level in what until now has been a freewheeling leasing industry. "People are going to be a little more careful about who they contract with," he said.

An executive at a large corporate lessee who requested anonymity agreed. One of the lessors about to come in for extra scrutiny, he said, will be ICC.

"ICC has won a lot of leases solely on price," he said. "Now we're faced with the possibility of losing out down the line if third-party subleasing at favorable prices dries up or is shut down." That prospect, he said, converts ICC's dramatic upfront price breaks into loans rather than bargains.

"This will be — or at least it should be — one of the things that lessees consider right up there with price on Day 1," the executive said.

In this corner...

A survey of 100 computer leasing firms shows that they view IBM Credit Corp. and Comdisco as the top competitors

Top five competitors	Number of mentions	Respondents by volume size (in millions)				
	Total number	$1-5	$6-20	$21-100	$101+	NA*
ICC	60	14	13	18	10	5
Comdisco	44	8	11	14	11	
Bell Atlantic	11	4	3	1	3	
El Camino	10	3	5	1	1	
Meridian	8	1	2	1	4	

Source: Gartner Group, Inc./CDLA

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CW Chart: Tom Monahan

IBM releases details on its AD/Cycle model

BY ROSEMARY HAMILTON
CW STAFF

IBM loosened restrictions last week on its Information Model, the blueprint to its AD/Cycle software development strategy, by releasing a technical manual on its contents.

The Information Model manual comes months after IBM stated it would soon provide public documentation on the model. Last year, a company spokesman said that IBM was hashing out a plan that would allow it to put details of the model into the public domain while protecting it as intellectual property.

The manual is a technical overview and is not the Information Model's actual technical specifications.

Until now, it has been nearly impossible for a user to get nuts-and-bolts information on the model. That information had been contained only in Repository Manager, which carries a monthly license fee of up to $4,500.

Furthermore, the software has been under restricted availability since its debut in June 1990 and will only be released to qualified customers.

Along with the document, which goes by the title Repository Manager/MVS Supplied Entity-Relationship Model Definition Version 1, Release 1, IBM will offer workshops to elaborate on its contents.

Mo Rosenbaum, senior project manager for application development research and planning at Allstate Insurance Co., said the document resembles a "parts manual," providing listings of the entities, relationships and policies that the Information Model currently addresses.

> UNTIL NOW, IT has been nearly impossible for a user to get nuts-and-bolts information on the model.

However, Rosenbaum said, the manual would be too technical for a customer not familiar enough with Repository Manger's concepts. He added that those users would likely need the week-long workshops, which are priced at $1,800.

The manual's introduction makes clear it was designed to provide a "general understanding" of the model and is "not intended to provide information about using the model in repository-based AD/Cycle tools."

Novell

FROM PAGE 1

module products at Networld, but he refused to comment on shipment dates.

As part of a strategy to establish itself in the network management area, several sources said, Novell will acknowledge that its management tools must work with other vendors' products. They said that under the new strategy, Netware management applications will pass alerts to IBM's management product, Netview.

Harguindeguy said Novell engineers have developed interpretation code for IBM. This will allow Netview consoles to interpret Netware alerts concerning servers and server file systems, eliminating the need for cumbersome gateways.

The new code, he said, will be part of Netview Version 2, Release 2, which IBM has stated will ship in June.

Integration begins

Mark Freund, president and chief executive officer of Interconnect Network Consulting Group, Inc., said Novell will begin "integrating cohesive management tools with existing Netware products as well as IBM's Netview and Systems Network Architecture."

Other sources said they had been told separately that Novell would deliver on a promise to integrate Netware with IBM's Systems Application Architecture (SAA) by June. Last year, Novell said it would offer as many as 1,000 concurrent IBM 3270 host sessions on each Netware 386 network. A source at Novell said the company will not announce delivery of the SAA product at Networld as had been rumored.

Analysts said they had been told Novell is also planning shortly to outline a management strategy incorporating Microsoft Corp.'s Windows 3.0 in most, if not all, future network management products. Harguindeguy said formal strategy statements on management will wait until just after Networld.

Windows 3.0 will be one of the standard interfaces on all Netware management tools, said Harguindeguy, who would not say what other interfaces would accompany Windows as a standard feature.

CORRECTIONS

Installed base numbers for Wang Laboratories, Inc. VS system installations should have read 18,655 installations in the U.S. rather than worldwide, as was incorrectly reported in the Jan. 21 edition of *Computerworld*.

"IBM bids to build on Japan clone market" [CW, Jan. 7] should have said U.S. *Intel Corp.-based* PC shipments will grow by only 3%, according to International Data Corp.

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Users hold off on open systems

Recession, lack of software compatibility prevent users from taking risks

BY SALLY CUSACK
CW STAFF

Proprietary systems users feeling pressure to move quickly to open systems platforms may be getting a reprieve in the form of the current economic crisis.

"I guess one can always find a silver lining in a big black cloud," said Greg Farman, executive director at the North American Data General Users Group. "As a user, it gets easier to say 'no' to anything that costs money in light of budgetary constraints."

One Bull HN Information Systems, Inc. DPS 6 user who wished to remain anonymous stated that financial considerations were indeed putting a temporary hold on company plans to buy into another computing environment. As soon as the dollar crunch loosens up, the food processing firm will definitely be purchasing from another vendor, he said.

Analysts cautioned, however, that the national recession is probably not the only cause of a slight slowdown in open systems-related purchases.

"The recession is having less of an impact than other factors, such as software availability on both Unix and personal computing platforms," said Carolyn Griffin, an analyst at International Data Corp., a Framingham, Mass.-based market research firm.

Griffin noted that buyers are not as open to taking risks in today's financial climate, and purchasing a new computing architecture certainly falls into the risk-taking category.

Wayne Kernochan, an analyst at The Yankee Group, a Boston-based research and consulting company, suggested that while users may see Unix as something of a risk, the economy is pushing more people toward downsizing as a potential money saver. "We see a lot of tire kicking out there and more of a push toward PC local-area networks than Unix."

While much is dependent on individual corporate needs and general software availability, cost cutting is evident everywhere. Research from Computer Intelligence, a La Jolla, Calif.-based market research and consulting firm, shows that the planned purchases of both IBM and Digital Equipment Corp. midrange systems have indeed fallen off in the past year.

"People are cutting back everywhere," observed Catherine Van Orman, president of the National Prime User Group, adding that the current purchase delays go beyond actual monetary considerations. "People are also waiting to see how both the industry and the open systems concept shake out."

Systems diet

Michael O'Rear, director of operations at the University of Southern California (USC) in Los Angeles, commented that systems personnel at the university are "tightening belts and squeezing hardware." USC is currently using a combination of Prime Computer, Inc. proprietary and Unix-based systems.

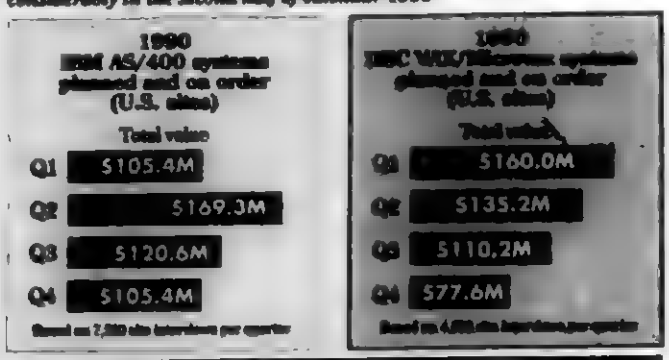
Some companies are going ahead with previously established plans, although perhaps at a slower rate than originally anticipated.

According to Matthew J. Gillman, manager of office automation at Blue Cross and Blue Shield Association in Chicago, the company is getting the go-ahead to proceed with pilot testing projects and product evaluations in an effort to be ready to roll when the money is again available. Blue Cross is in the process of integrating Wang Laboratories, Inc. VS computing platforms with personal computer-based LAN technology.

"We can't abandon VS," Gillman said. "We have too much invested in the software."

Economic retreat?

Purchases of DEC VAXs and IBM AS/400s appear to trail off considerably in the second half of calendar 1990



Source: Computer Intelligence — CW Chart: Paul Mock

Unisys 1990 losses exceed Wall St. fears

BY NELL MARGOLIS
CW STAFF

BLUE BELL, Pa. — Unisys Corp. last week posted net losses of $88.5 million for the fourth quarter and $137 million for the year ended Dec. 31, 1990, signaling that the firm's long and painful turnaround ordeal is far from over.

"This is a company with some real problems," said John B. Jones Jr., an analyst at Montgomery Securities. The company has a staggering debt load that is not being paid off quickly enough, he said.

"Asset sales are a key factor for Unisys," said David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago. "These sales have to happen; otherwise, we're going to continue to see a company swamped with interest payments and preferred dividends," Schofield added.

The firm's continued existence, Jones said, is not in serious question. "They've got a lot of metal out there — a huge installed base they can milk for a long time," he noted.

Unisys reported fourth-quarter revenue of $2.93 billion, down slightly from $2.97 billion posted for last year's comparable period. Annual revenue was posted at $10.11 billion, up slightly from $10.10 billion in 1989.

Chief Executive Officer James Unruh blamed fourth-quarter results principally on "generally weakening economic conditions." "These factors will continue to exist during 1991," Unruh warned, forecasting a first-quarter loss.

Seperately, Unisys announced that Vice Chairman Curtis A. Hessler resigned to return to California.

Lotus lowdown

Despite a 24% hike in revenue to $186 million, the cost of acquiring Atlanta-based Samna Corp. threw Cambridge, Mass.-based Lotus Development Corp.'s fourth quarter $32 million into the red.

Analysts said they expected the loss, which came as the result of a onetime charge against earnings for approximately 75% of Samna's $65 million price tag. Lotus reported an operating profit of $21.4 million for the quarter ended Dec. 31.

While the loss sounded no alarm on Wall Street, other elements of Lotus' earnings did, according to Paine Webber, Inc. analyst Robert Therrien.

"It's obvious that their expenses are way out of control," Therrien said. Moreover, he added, Lotus' continued reliance on its flagship 1-2-3 spreadsheet line is particularly disconcerting in light of aggressive competitor Borland International, Inc.'s success with 1-2-3-like Quattro Pro, over which a Lotus lawsuit is pending. "Lotus' franchise is in trouble if Borland has created the perception that the spreadsheet is a commodity."

HIGH-TECH BATTLEFIELD



Despite the constant pummeling of Iraqi command-and-control facilities by the air forces involved in Operation Desert Storm, Iraqi leader Saddam Hussein is apparently still able to communicate with his troops. Military commanders and analysts attributed the surprising resilience of Iraq's military communications network to a combination of stealth and redundancy.

Hussein has a sophisticated network of command posts — many in underground concrete bunkers — linked by communications cables buried in the sand. As a backup, messages can be relayed among the command posts by transmitting satellite signals horizontally across the land to small receiving dishes, according to military analyst Jeffrey Shaffer at the Center for Strategic and International Studies.

Gen. Norman Schwarzkopf, the U.S. commander of Operation Desert Storm, said in a briefing last week that one-third of Iraq's command, control and communications facilities have been destroyed or disabled, forcing Iraqi reliance on backup systems, which "are far less effective and more easily targeted."

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An electronic poll last week on Prodigy found 81% of respondents saying war was the only option for U.S. and coalition forces — up from 60% on Jan. 15. Sixteen percent said more time should have been allowed for sanctions and diplomacy to work. Regarding military censorship of press reports, 85% said it was justified. Some 27,000 members of the on-line service participated in the poll; weekly polls generally top out at 5,000.

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The guidance computer on the highly accurate Tomahawk cruise missile is an aging, 16-bit processor running at a turtlelike 300,000 instructions per second. The real magic is in a specialized coprocessor, a customized chip that compares, pixel by pixel, the target as seen through the missile's fish-eye lens with digitised photos of targets. The chip processes 1 billion pixel pairs per second.

Gerald Miller, deputy program manager for the U.S. Navy Cruise Missiles Project, said the key to the missile's success lies in the preparation of the stored digital photographs. The targets have to be stable so that their appearance does not change over time.

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The British Airports Authority has tightened security, which will impact portable computer users. "If you must take a portable computer on your flight, be aware that you must declare it — as well as other electrical items — to both the [airline] carrier and to airport security staff," an authority spokeswoman said. "Not only will you need to prove that it works — by turning it on — but it may well be taken apart."

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Three U.S. weather satellites continue to transmit weather imagery of the Middle East to Iraq, even though that data could be useful to the Iraqi military — if Iraqi receiving stations are still capable of receiving transmissions. The National Oceanic and Atmospheric Administration (NOAA) has not been asked to turn the satellites off, perhaps because allies such as Israel also use the weather data, a NOAA spokesman said.

Shearson spins off service group

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Shearson Lehman Brothers, Inc. has spun off its information services group into a separate division operated by Shearson's corporate parent, American Express Co.

The move was announced to Shearson information services staff members on Jan. 25 and positions the group to provide data processing services to all securities firms, although Shearson will remain a "client," one company insider said. The information services unit, renamed the Securities Information Group (SIG), is now a division of American Express' Information Systems Corp. (ISC).

For the time being, the SIG's 1,000 information services employees will remain intact at Shearson's headquarters in New York. The company is still working out specifics about how SIG will operate; a meeting of senior executives is planned for Friday to discuss these issues.

No cuts expected

No information services personnel cuts are planned. "We look forward to growing, and we will offer services to the securities market," an ISC spokesman said.

According to a Shearson spokesman, this announcement is not related to his company's ongoing discussions with Prudential-Bache Securities, Inc. to form a joint unit [CW, Jan. 28]. The Shearson/Prudential-Bache deal, if consummated, would create a group for so-called back-office processing, which includes setting up and processing trades.

"We've always kept the two groups — DP and back office — separate," the Shearson spokesman said. "SIG concerns only the DP side, and it makes sense in and of itself."

Still, the two may turn out to be more closely related if the Prudential-Bache deal falls through. If that happens, the back-office trading group could also be brought into the ISC unit, company insiders said.

ISC was formed in April 1989 primarily to provide database services to a wide range of industries. It provides telemarketing services and supplies software and services to the health care industry.

Ernst & Young buys out CASE firm

NEW YORK — Last week's merger of CASE Research, Inc. into Ernst & Young provides the accounting firm with a boost of technology that has become a competitive necessity.

Ernst & Young's Navigator line of computer-aided software engineering (CASE) products, training and consulting services competes with Andersen Consulting's Method One suite and similar offerings from Price Waterhouse's CASE arm, Price Waterhouse Technology.

The work of CASE Research co-founders and top executives Vaughan Merlyn and Greg Boone, now Ernst & Young partners, will complement efforts afoot at the Las Catinas, Texas-based Navigator Division, said Alan Stanford, Ernst & Young's national director of information systems consulting.

However, Merlyn and Boone will be stationed at the firm's Boston-based Center for Technology Research, a 2-month-old think tank/consulting group focused on the relationship between information technology and business strategy.

"Vaughan and Greg have been moving in this direction for years," Stanford said. Their firm, he added, was instrumental in moving the CASE dialogue to the recent emphasis on multistage implementation.

NELL MARGOLIS

EMI's IS chief allegedly ousted

NEW YORK — Another information systems executive is out of a job. R. Anne Payne, senior vice president of information technology at EMI Music Worldwide, resigned from her position on Jan. 23.

Payne, a veteran IS consultant, joined the music and entertainment company less than one year ago in April 1990. She had previously worked with EMI as a consultant.

Payne's resignation was not voluntary. Stefan Gladyszewski, senior director of systems and development and one of her direct subordinates, said that he was not surprised by her departure: "We were not bonding with the business," he explained.

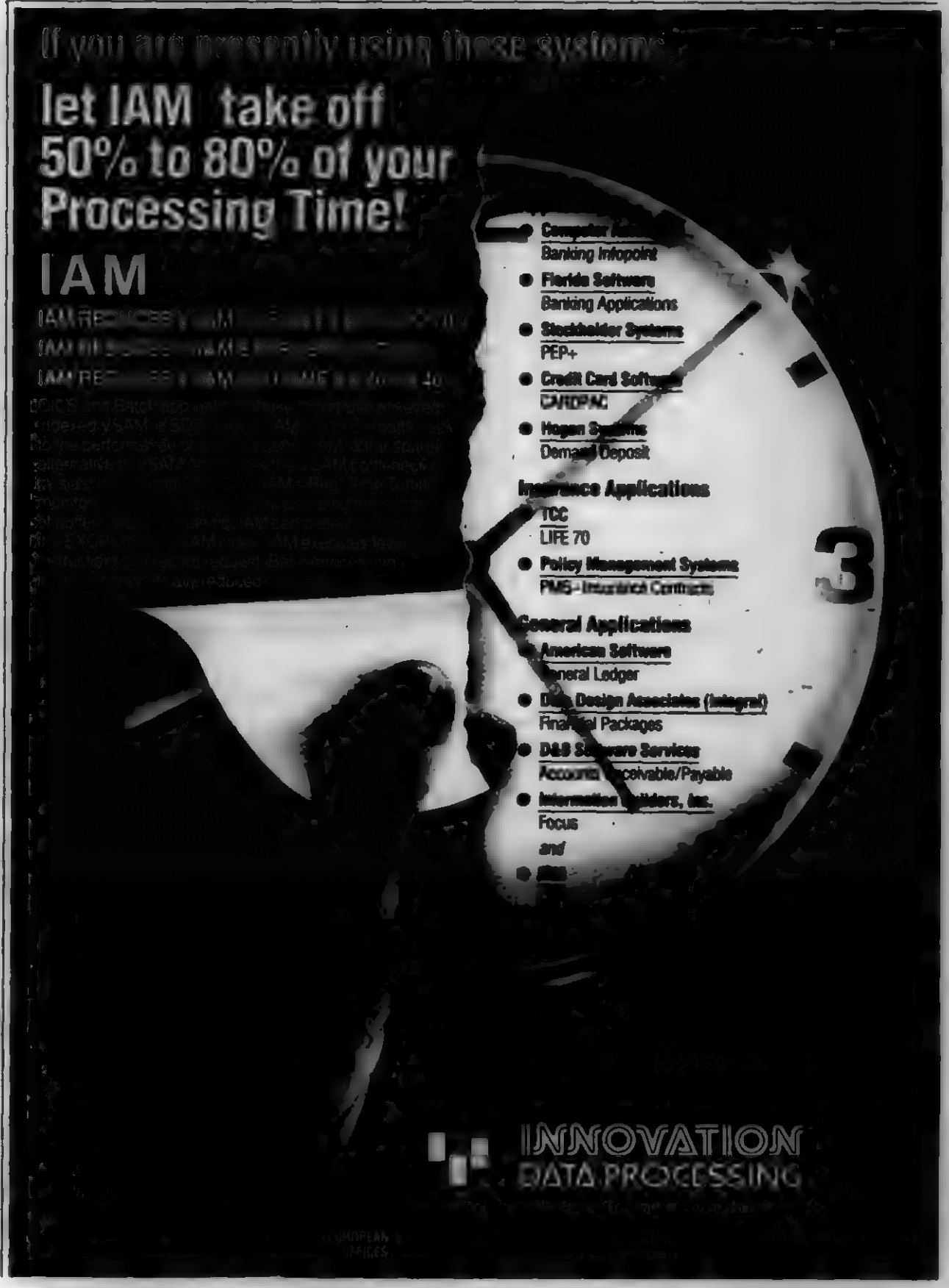
Payne has left the company and could not be reached for comment.

Running the show

Gladyszewski, who left the top IS job at General Signal Corp. last October to join EMI, is one of three executives now running the IS department until a replacement for Payne is found.

It is not yet clear whether the replacement will be an internal or external hire, Gladyszewski said. He shares IS responsibility with Wayne Guymon, senior director of planning and control, and Laurie Antonell, director of information technology services.

Both EMI Music and Capitol Records are part of the British conglomerate Thorn-EMI PLC.



NEWS SHORTS

Erasing "Syntax Error"

Tired of getting such puzzling error messages as "Offending Command," "Unsolicited Interrupt" and "User Aborted"? The American National Standards Institute's X3 committee last week formed a panel to standardize fault and error codes in hardware and software. "We hope to make computers more maintainable and to remove some of the confusion of computer use," said NCR Corp.'s Paul Fessler, who proposed the group and will convene its first meeting Feb. 26 in Washington, D.C.

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3Com adds OSI support

3Com Corp. will implement Open Systems Interconnect's intermediate system-to-intermediate system routing protocol in its Netbuilder brouter Version 2.0. The company announced last week that the new $750 version is in beta testing at a Novell, Inc. office. There is no word about when it will ship to end users. 3Com — no longer developing its own electronic-mail product line — also signed a marketing agreement with CC:Mail, Inc., under which CC:Mail will build gateways to 3Com's 3+ and 3+Open E-mail applications.

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In search of a better world

The Johns Hopkins University Applied Physics Laboratory in Laurel, Md., last week kicked off a year-long search for innovative computer devices and software that will improve the lives of people with disabilities. The project, co-sponsored by the National Science Foundation and MCI Communications Corp., will culminate in a $10,000 prize for the best invention.

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Lawyers parry over NCR

AT&T's effort to take over NCR followed a legal tack last week as the two firms' lawyers exchanged letters that centered on NCR's efforts to rebuff a special meeting of its shareholders. In addition, NCR asked for a stay, pending appeal, on the recent federal court order that NCR give its shareholder list to AT&T. A decision is expected tomorrow. In the meantime, NCR set March 1 as the record date for its regular and special shareholders meeting. The regular annual meeting is expected to be April 17; the special meeting must be held within 90 days of the record date — the date when shareholders of record are eligible for shareholder meetings.

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AT&T wins academic network pact

Cicnet, Inc., the midwest academic network consortium, has taken its network operations business away from Merit Computer Network of Ann Arbor, Mich., and awarded it to AT&T and Ohio State University. Merit also operates and manages the National Science Foundation Network in concert with IBM and MCI Communications Corp. Cicnet decided to put its contract with Merit up for open bid last spring primarily because of cost/performance issues, according to the the academic consortium's interim executive director, John Hankin. Ohio State will operate Cicnet, while AT&T will generate network performance and traffic reports.

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Apple eyes the airwaves

Apple Computer, Inc. has asked the Federal Communications Commission to allocate a part of the radio spectrum so that all computer manufacturers can use radio waves for wireless computing. Apple said it seeks to establish a class of data communications called Data Personal Communications Services that will let computers transmit information over radio waves.

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Mobius answers SEA suit

Mobius Management Systems, Inc. last week dismissed as "without merit" a suit filed against it by Software Engineering of America (SEA) in late January. The SEA suit charges Mobius with making false remarks about SEA products. Mobius President Mitchell Gross called the charges "bizarre" and said he plans to contest the suit. "Our sales practices will be vindicated when this suit reaches court," he said. The two companies compete in the mainframe report management market.

More news shorts on page 91

Amtrak follows airline route

BY CLINTON WILDER
CW STAFF

WASHINGTON, D.C. — Amtrak wants to compete with the airlines for passengers and will soon be using one of the airlines' favorite automation weapons in the effort.

Amtrak, officially known as National Railroad Passenger Corp., plans to go live this summer with the world's first automated yield management system for a passenger railroad. Amtrak is developing the system with assistance from American Airlines Decision Technologies (ADT) in Fort Worth, Texas, whose parent airline pioneered the use of yield management in the travel business.

Profitable idea

The yield management concept, now embraced by the hospitality industry as well as the transportation business, involves analyzing historical sales data to plan the most profitable combination of fares offered on a given route and day. Amtrak's yield management system will be its first application using IBM's DB2, which runs on an IBM 3090 Model 400 mainframe at its data center here.

"We will do the same thing the airlines have been doing," said Amtrak's assistant vice president of information processing, Donald Gentry, at last week's Profit-Oriented Systems



Planning Program winter meeting in Los Angeles. "But in our case, it's complicated by the fact that each of our routes has an average of 22 stops."

Amtrak currently has about 10 employees who do yield management manually. The new system, which the railroad and ADT have been working on for three years, will update historical ridership data every night and automatically highlight important patterns or anomalies.

The system — which Gentry said he expects will pay for itself in one year — will allow Amtrak to adopt the airline practice of overbooking. Based on past patterns of no-shows on particular routes, the railroad may sell more reserved tickets than the number of reserved seats on the train. "We don't want empty seats," Gentry said.

The other main purposes of the system, he said, will be more profitable allocation of discounted fares and more effective limits on sales of shorter rides. For example, Amtrak would limit sales of reserved seats from Washington, D.C., to Philadelphia if the system predicted, based on past ridership, that the railroad could fill those seats with riders traveling all the way to New York.

Technology goals

The yield management system is part of Amtrak's overall strategy of using technology to help it turn a profit and end its federal government subsidies by the year 2000. Other projects include upgrading Honeywell, Inc. reservations terminals to AT&T workstations and overhauling several operations applications.

"We feel we've come a long way from the days of acronym-spouting, technology-chasing isolationists," Amtrak Executive Vice President William Norman said. "Information technology is our enabler of innovation."

CA users

FROM PAGE 1

policy. "VSE ESA 1.1 is a radically different operating system than the older VSE versions; they're not compatible. A number of the products required significant reworking to run. It's like going from MVS to VSE."

Kumar said CA does not charge MVS customers similar fees when they upgrade from MVS/XA to MVS/ESA because the firm did not have to do as much reworking with those products as with the VSE version.

Spokesmen for other applications vendors said they were not asking customers for additional fees for the upgrades.

"That's why customers pay us maintenance fees," said Steve Sasser, president of Goal System International, Inc.'s Data Center Management Division in Columbus, Ohio. "So we'll upgrade their software."

Kumar said the pricing changes affect only about 18 of CA's approximately 100 VSE packages. Upgrade fees impact only a small number of CA's 50,000 VSE licenses, he said, adding, "Not many of my customers have been asking about upgrades."

However, users said, that is bound to change as IBM continues to try to persuade customers to adopt the new VSE version.

An IBM spokeswoman said that licensing ESA 1.1 on existing processors is less expensive than keeping older VSE versions on the processors. IBM has also announced it will no longer market VSE version 3.0 after July.

Although IBM has not officially announced when it will stop supporting all non-ESA versions, indications are that users will have to move to ESA within about 18 months. Still, last year's VSE upgrade was a welcome relief for users, after years of neglect by IBM in what VSE users believed was a concerted effort to force them over to the MVS operating system.

At the center of the CA dispute are users' claims that VSE ESA 1.1 is only an upgrade to an existing product, while the company says it is a substantially new operating system. Also, users said, CA had not given them any advance notice that this pricing change was in the works.

"It was a surprise deal," said Brett Middleton, director of information systems at the American Polled Hereford Association in Kansas City, Kan. "I found out about this by accident." Kumar said CA sent a letter to customers early last week informing them of the pricing policies.

Still, Middleton said, "I don't think we have much choice at this point. We're really married to the CA products."

Longtime VSE user Pete Clark, a systems programmer at Olan Mills, Inc. in Chattanooga, Tenn., said that he is "no longer a CA user — and this kind of thing is one reason why. But I've heard from between six and 12 CA VSE customers who are very upset about this, and at least two are considering switching to a different vendor because of it."

DEC adds to network line

Digital Equipment Corp. announced at last week's Communication Networks '91 show in Washington, D.C., that it will resell Stratacom IPX fast-packet multiplexers internationally under the IPX label. The move provides fast-packet pioneer Stratacom with a worldwide presence and DEC with technology that the firm said it could not do a better job of building itself.

Also at the show, DEC announced a single-mode fiber attachment to its Fiber Distributed Data Interface (FDDI) concentrator, which — per the FDDI standard — allows the 100M bit/sec. FDDI local-area networking speeds to run between nodes up to 40 km apart. This compares with 2-km distances supported in the FDDI standard for multimode fiber.

DEC also announced a product to manage the exchange of information between AT&T's Definity private-branch exchange and applications running in a DEC VAX environment.

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Panel calls for easing of computer gear exports

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Rapid technological progress and the easing of Cold War tensions have lessened the desirability and feasibility of controlling the export of computer hardware, software and networking products, according to a panel of the National Academies of Sciences and Engineering and the Institute of Medicine.

Calling many of the existing controls counterproductive, wasteful and damaging to U.S. competitiveness, the panel called for the easing of export restrictions on many items and for mechanisms to rapidly and automatically remove controls as technology advances.

The panel urged a presumption of export approval for "dual use" items such as computers and electronic equipment destined for civilian use in the Soviet Union and Eastern Europe. It added that the U.S. should avoid the use of unilateral export controls, which it claimed do more to hurt U.S. industry than help national security.

Setting controls

In a 400-page report released last week, the 22-member panel proposed "sunset" provisions for controlled hardware and software. For example, controls on items that cost more than $1 million might expire in 10 years, while those on items that are priced below $4,000 might vanish in two years. The panel suggested a five-year sunset for controlled but nonclassified software.

"We are pleased that the study's recommendations largely parallel those that U.S. industry has made through ICOTT," said Victoria Hadfield, acting chair of the Industry Coalition on Technology Transfer (ICOTT), a group of 10 trade associations.

The Computer and Business Equipment Manufacturers Association, an ICOTT member, said separately it hoped the study would spur new legislation similar to the Export Facilitation Act of 1990, which would have eased restrictions on the export of high-technology items had it not been pocket vetoed by President Bush in December.

Other options

In addition, a seven-member subpanel on computer technology said the U.S. should do the following:

- Completely decontrol over-the-counter software and high-volume "commodity" items such as Intel Corp. 80286-based personal computers.
- Establish a hierarchy for supercomputers that tailors export restrictions to the risk assessments of individual countries. In addition, replace static performance thresholds with a flexible measure pegged to existing state-of-the-art computers.
- Establish a similar moving threshold for high-speed network products.
- Control the flow of technical data by such means as encryption, rather than by legislative or regulatory actions or restriction of U.S./international network connections.
- Revise federal regulations that restrict the export of encryption products, which have effectively allowed the International Standards Organization to bypass U.S. industry in establishing international encryption schemes.
- Spearhead an effort to bring about worldwide enforcement of software copyright protection.
- Relax export controls to the Soviet Union gradually because of the political instability that exists there now.

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Price entitles user to year of free upgrades	YES	NO	YES
Automatic distribution of product upgrades	YES	NO	NO
Benchmark compile-and-link speed[c]	25 sec. (3 times faster)	1 min. 14 sec.	1 min. 14 sec.
Benchmark execution speed[c]	4 min. 11.4 sec. (4.3 times faster)	18 min. 17.2 sec.	18 min. 17.2 sec.
Benchmark executable file size[c]	104,713 bytes (2.6 times smaller)	282,288 bytes	282,288 bytes
Benchmark source available for review[c]	YES	N/A	N/A
DOS memory extender included	YES	NO	YES
No-charge run-time for DOS memory extender	YES	NO	NO
No-charge support for both EBCDIC and ASCII under CICS and IMS	YES	NO	YES
Dynamic Link Library (.DLL format) support under DOS as well as OS/2	YES	NO	NO
Dialect support for IBM VS COBOL, VS COBOL II, ANSI-74, ANSI-85, etc.	YES	YES	YES

a. Both are Micro Focus products. Company and product names are registered trademarks of their respective holders. Product information was current as of 12/5/90.
b. The COBOL/2 list price is $900. To get the editor, it's necessary to pay a $45 postage and handling charge.
c. This benchmark was created by Realia to test the competing compilers. Different benchmarks can lead to different results; the best benchmark is your own application.

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Loan system out of date, GAO says

WASHINGTON, D.C. — Breaking with its stated intention, the U.S. Department of Education has failed to use a database of guaranteed student loans to prevent loan abuse, according to a report by the U.S. General Accounting Office (GAO).

As a result, students who had defaulted on previous loans were able to secure $109 million in new loans. Moreover, students have received millions of dollars in loans that exceeded the legal loan limits, the GAO said.

The Department of Education "is running a multibillion-dollar commercial-type loan operation with a data system that contains incomplete, inaccurate, unreliable information," said U.S. Sen. Sam Nunn (D-Ga.), chairman of the Senate Permanent Subcommittee on Investigations who requested the GAO report.

The GAO reported that the Department of Education pays a contractor $900,000 per year to maintain the loan database, yet it does not verify the accuracy of the information. The GAO said the Department of Education uses it the database for trend analyses and "did not believe there was a serious problem with defaulters obtaining new loans or students exceeding loan limits."

The GAO estimated that in fiscal year 1990, student loan defaults will cost $2.4 billion — more than 54% of the total program cost.

GARY H. ANTHES

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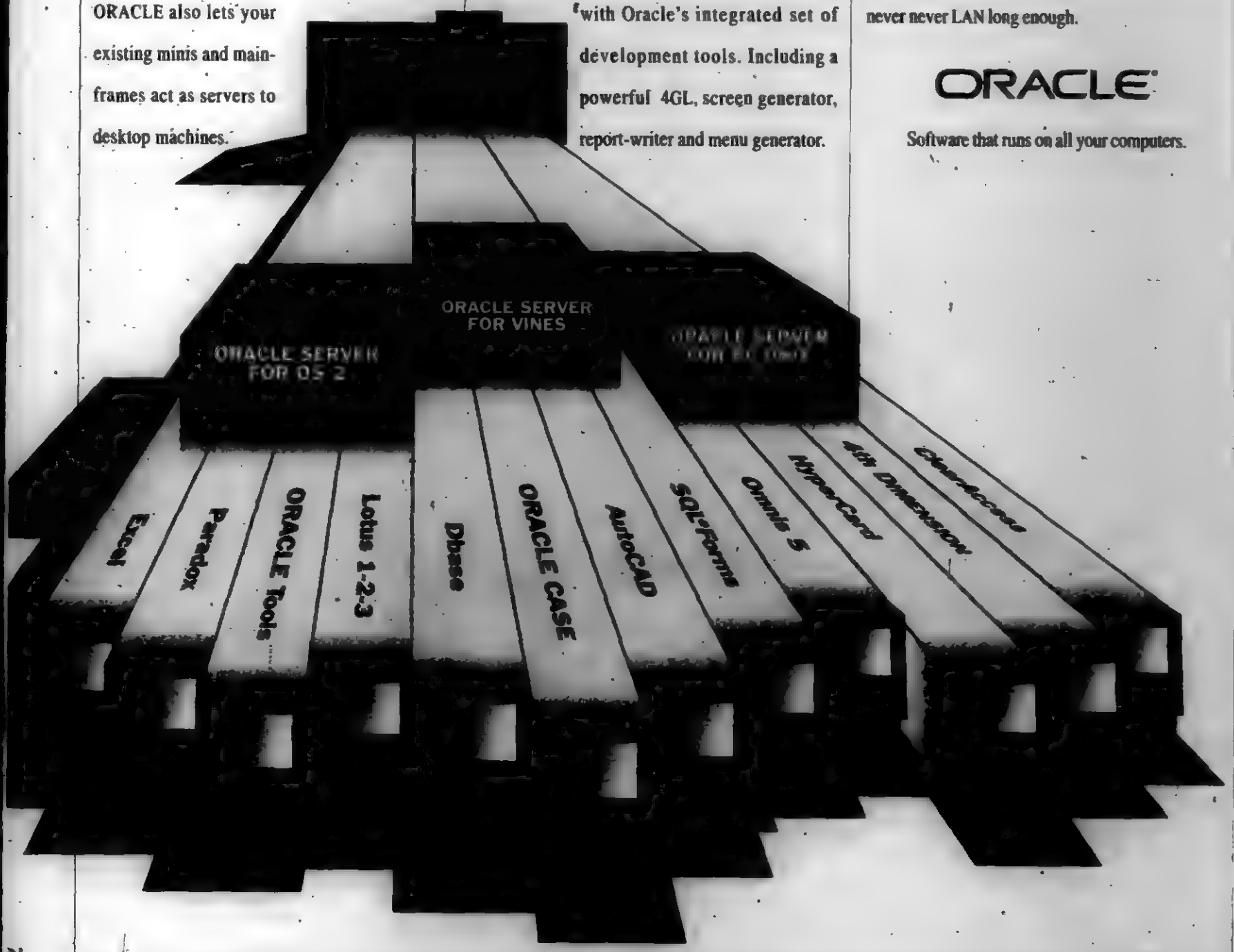
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Soviet delegation seeks U.S. aid for free-market economy

BY MAURA J. HARRINGTON
CW STAFF

MENLO PARK, Calif. — A five-member delegation of Russian business and political leaders came to the Silicon Valley last week at the request of the Russian parliament as part of a worldwide search for "assistance" in moving the Russian Republic to a free-market economy.

The delegation was made up of members of the Economic Reform Council, a private venture consisting of business and political representatives. Boris Yeltsin, president of the Russian Republic, sanctioned the visit to the U.S., which is headed by Mikhail Botcharov, an entrepreneur and member of the Supreme Soviets of both the USSR and the Russian Republic.

The high-technology assistance sought by the private Russian delegation included virtually free computer equipment and professional expertise in return for the opportunity to establish joint or possibly wholly owned U.S. businesses in Russia, according to Tim Bajarin, executive vice president at Creative Strategies Research International, Inc., a consulting firm based in Santa Clara, Calif., that is working with the delegation.

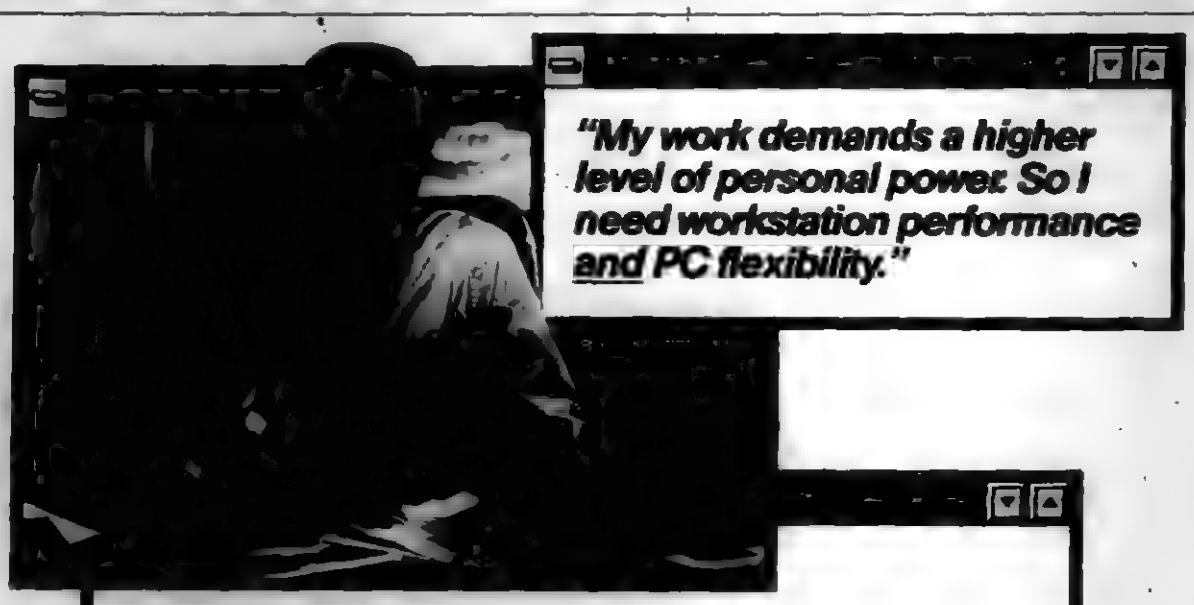
Plea for assistance

The delegation also asked for help installing personal computer-based networks in all businesses, the education system and the developing stock market; bringing manufacturing plants up to date through automation; and establishing and installing a telecommunications system for these systems, Botcharov said.

"We realize it is impossible to transfer to a market economy without first establishing relationships . . . and without completely computerizing all areas of market business," Botcharov said.

While the Supreme Economic Reform Council has been busy establishing a free-market economy for some time, Botcharov added that the Russian Republic has already established business relations and partnerships with some European and Asian countries and has set a goal of two to three years to be computerized and operative in the international market.

This would include the republic's plans to manufacture and market its own PCs, according to delegate member Mikhail Aroutiounov, chief of the Russian Republic's Ministry of Electronics as well as chairman of the Institute of Radio Techniques, a private university with a focus on computers.



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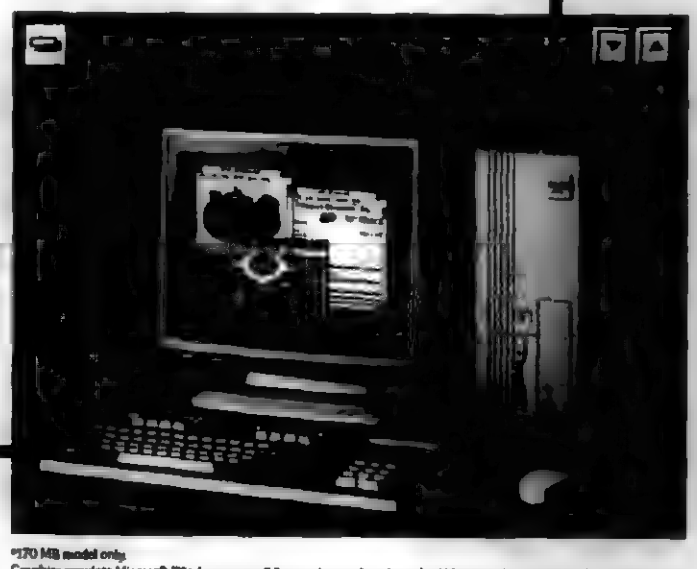
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Mips taking RISC to 64-bit plateau

BY J. A. SAVAGE
CW STAFF

The next reduced instruction set computing (RISC) processor architecture from Mips Computing Systems, Inc. will run between 50 million instructions per second (MIPS) and 150 MIPS but will not be available in systems until the end of the year, said President Chuck Boesenberg.

The processor, called the R4000, has 64-bit architecture for all procedures, such as data paths, addressing and registers, according to Dane Elliot, director of component marketing at the firm. This allows large database applications to run faster, using less I/O, and expedites technical applications that use large data sets, according to the company.

"WE WOULD HAVE been happier if they had done the R4000 in a more prompt manner."

JAMES CLARK
SILICON GRAPHICS

Other RISC processors, such as those by Sun Microsystems, Inc. and Motorola, Inc., are 32-bit devices. Hewlett-Packard Co. uses 64-bit addressing in an otherwise 32-bit chip, and IBM has 32-bit registers and a 32-bit integer arithmetic logic unit, while its floating-point unit is 64 bit and its virtual address space is 52 bit.

Industry analysts and vendors basing their products on Mips' processors have been expecting the CPU since mid-1990. Its design has been slowed by such Mips business partners as Digital Equipment Corp. and Tandem Computers, Inc., which had their own input into Mips' design, according to Boesenberg.

"We would have been happier if they had done the R4000 in a more prompt manner," said James Clark, chairman of Silicon Graphics, Inc., another Mips-based vendor.

While other RISC companies have chosen one of the two Unix operating system camps, Mips will continue to straddle the fence with R4000. It will support functions of both, Elliot said.

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ADVANCED TECHNOLOGY

Games with DVI

■ Data East USA, Inc., a San Jose, Calif., publisher of home video games, recently said it has attained exclusive rights to develop a new generation of arcade video games based on Intel Corp.'s digital video interactive (DVI) technology. DVI technology makes it possible to compress large blocks of animated graphics onto compact disc/ read-only memory (CD-ROM) discs. Data East said the first game will debut this spring.

Promising software

■ Braincel is the first neural network software package that runs in Microsoft Corp. Excel under Microsoft's Windows 3.0, according to Promised Land Technologies, Inc., the program's publisher. The program was designed to be an easy-to-use alternative to statistics and expert systems in such areas as forecasting stock market prices and sales, failure diagnoses and demand forecasting of equipment and personnel, the company said.

On the Go

■ Photonics Corp., based in Campbell, Calif., has introduced what it claims is the first wireless network for portable computers, including pen-based models. The Infrared Transceiver sends data via infrared light at speeds of up to 1M bit/sec., the company said. Go Corp.'s newly introduced notepad portable computer, called Pen Point, will include the wireless network system, according to Photonics.

The Cats Meow

■ Cats Meow is a new multimedia authoring tool aimed at users of Sun Microsystems, Inc. Sparcstations, according to Tiger Media, the Los Angeles software company that developed the authoring system. The interactive audio/visual presentation tool, which is packaged on a CD-ROM disc, is compatible with Sun's Videopix add-in board and software, Tiger Media said.

Packing in the magnetic media

Advances are being made to address the needs and demands for greater disk storage

BY MAURA J. HARRINGTON
CW STAFF



While magnetic media may not have the shimmering appeal of optical discs, there have been several shining new advances that are keeping the tried-and-true technology of magnetic media on the top of the storage heap.

For example, floppy disk drive manufacturer Brier Technology, headquartered in San Jose, Calif., has been marketing a high-density floppy disk drive that accepts standard 3½-in. floppy disks with 1M- to 25M-byte capacity, according to the company. With this added storage capability, analysts said these disks have added longevity to the floppy drive industry. Brier is also expected to come out with a 50M-byte capacity floppy drive soon, a company spokesman said.

Insight Systems, Inc., based in San Jose, manufactures similar high-density floppy drives, according to tape drive analyst Michael Peterson, president of Santa Barbara, Calif.-based Peripheral Strategies, Inc., a market research firm that specializes in the data storage industry.

Opening new doors

Hard disk-drive companies are quickly finding new ways to manufacture 2½-in. drives with more than 300M bytes of storage capacity, a feat not possible for drive makers before the invention of special manufacturing techniques (see story below).

Such improvements in hard disk-drive technology have also made small notebook and laptop computers a more attractive alternative for desktop users, Peterson said.

Milpitas, Calif.-based Komag, Inc., a 7-year-old company that manufactures the metallic disks used in hard drives produced by several vendors, has the technology to make ultra high-density internal disks with capacities of more than 300M bytes for 2½-in. drives and more than 1G byte for 5¼-in. drives, according to T. Hunt Payne, Komag's vice president of marketing.

With higher density disks being made for small form-factor 2½-in. hard drives, manufacturers such as Conner Peripherals, Inc. and Prairietek, Inc. can buy the disks, make the hard drives and sell them to laptop vendors such as Toshiba America Systems, Inc., Zenith Data Systems and NEC Corp., according to Komag.

Finally, magnetic tape has also improved, making tape backup options, such as 8mm magnetic tape, viable alternatives for users on a budget, according to analyst Bob Abraham, president of Freeman Associates, a Santa Barbara, Calif., market research firm that specializes in data storage technology.

"Eight millimeter tape has a very high capacity in a small form-factor. Typically, you can find up to 2.3G bytes in an 8mm video cassette," Abraham said.

Eight millimeter magnetic tape is increasingly becoming an accepted alternative to the standard IBM ½-in. tape at the high-end and midrange storage levels, according to Abraham. It is in the same league as ¼-in. cartridges in terms of price but can store more than four times the capacity of a ¼-in. cartridge, he added.

The only two companies that manufacture 8mm tape drives today, Abraham said, are Exabyte Corp. in Colorado, and Kubota Ltd. in Osaka, Japan.

Peterson said that because of the recent strides made in the magnetic storage area, new life has been breathed into the industry, helping to ward off the threat of optical disc technology moving into the storage market.

"Magnetic media still has a lot of life left in it," Peterson said. Optical disc drive technology — especially erasable optical drives and write-once, read-many drives — are increasingly popular but are still too pricey to become a standard, he said.

Total unit shipments of 5¼-in. hard disk drives reached 26.7 million last year, according to analyst Jim Porter, publisher of "Disk/Trend," a Los Altos, Calif.-based trade publication that focuses on the storage industry. In comparison, unit shipments of erasable optical disc drives are expected to grow to about 319,000 by the end of this year, he said.

Roads to progress

Several new manufacturing processes have been developed to help pack more data onto floppy disks, hard disks and other forms of magnetic media. Some of these techniques are listed below:

• **Sputtering.** This is a process of metal-coating used to boost the magnetic charge in thin-film rigid disks in hard drives. It is similar to the method of magnetizing tape, called metal evaporated technology, and is more accurate than the conventional metal-plating technology, according to analyst Michael Peterson, president of Peripheral Strategies.

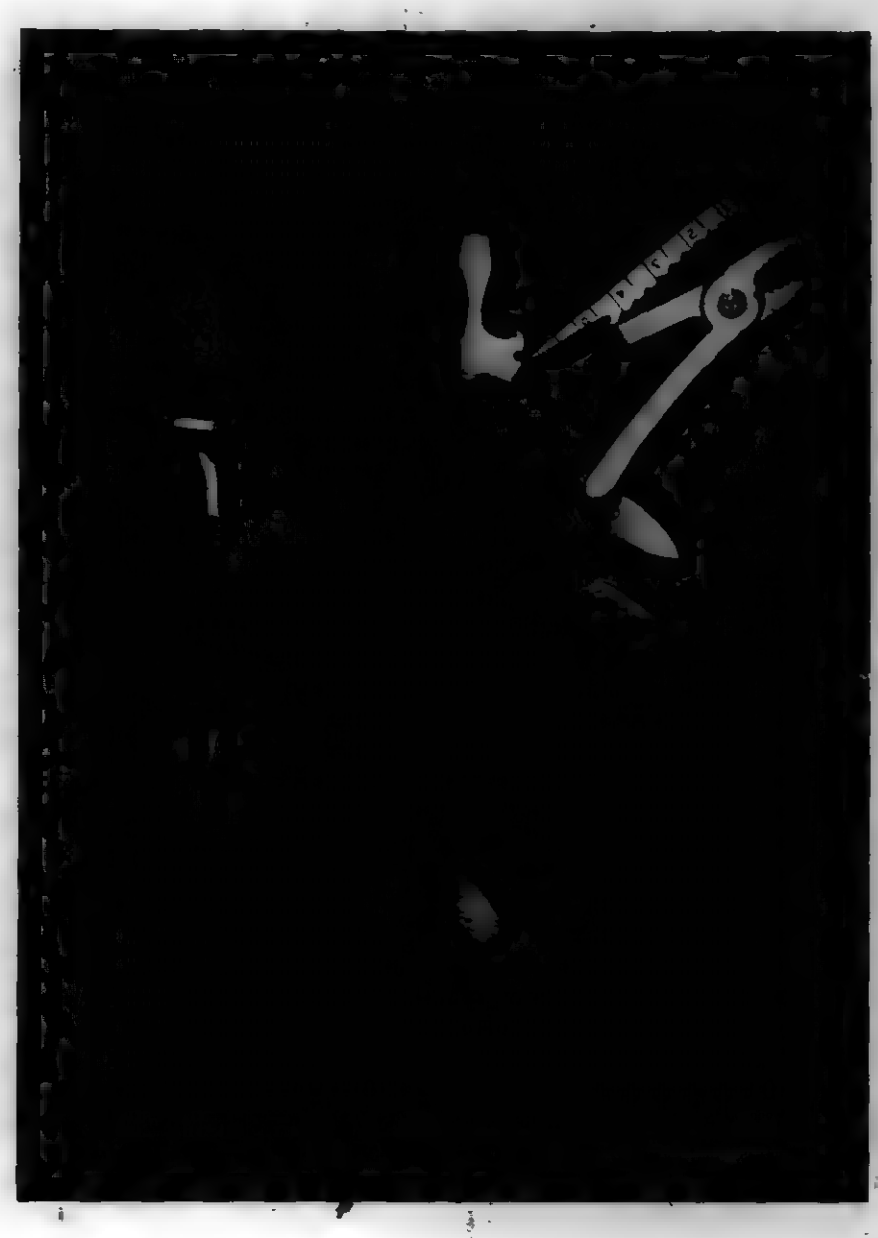
• **Metal evaporated technology.** This is a vacuum evaporation tape-coating technology. It is a dry process that uses an electron beam to irradiate a cobalt alloy-based metal substance, heating it to several thousand degrees in a vast multimillion-dollar evaporation tank. Once the substance is heated, the alloy adheres to the base film or disk surface and is then cooled by a cooling drum to fix the alloy permanently, according to the "Tape Market and Technology Report," published in December by Peripheral Strategies.

• **Twin Tier Tracking.** Brier Technology in San Jose, Calif., has developed a process called "Twin Tier Tracking" that uses the disk media more efficiently by creating two distinct horizontal magnetic layers in the disk, according to a Brier spokesman. This technique uses one layer to store all the data on the disk and another layer to position embedded prerecorded positioning tracks (also called servo tracking) to accurately control the read/write head of the drive, a Brier spokesman said.

MAURA J. HARRINGTON

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EDITORIAL

OS/2 Big Blues

AT SEVERAL CONFERENCE sessions we attended during last week's Communications Networks '91 show in Washington, D.C., the topic of discussion was future systems architectures.

And as the session leaders ran down their views of the future, they stumbled when they came to one key element in many of these architectures — OS/2. Why? Because Microsoft, OS/2's co-developer, last week confirmed what has been pretty obvious for some time: It is Windows, not OS/2, that customers want, and it's Windows they'll get.

The company was quick to point out that it is not going to abandon OS/2. Then again, the zillions of programs to be written for Windows, especially the 32-bit future version, may not be compatible with IBM's OS/2 Presentation Manager graphical user interface, which figures so prominently into Systems Application Architecture and Officevision, among other future systems schemes.

Is it any wonder users are confused?

Also, it is pretty clear that the prodigious investments made by third-party applications developers who followed Microsoft's and IBM's instructions by writing software for the Presentation Manager specifications may not bear much fruit.

Surely there will be plenty of criticism directed toward Microsoft and even accusations that it led developers down a dead-end OS/2 path. This criticism is largely nonsense, as Microsoft is responding to the market, which has scooped up 3 million Windows packages in one year while buying one-tenth as many OS/2 units in four years.

On the other hand, it is now imperative that IBM, the other OS/2 co-developer, step up to the mike and clarify what it intends to do with Presentation Manager and define sooner rather than later how that development will fit with Microsoft's Windows of the future.

As it is, IBM is already in a software pickle. Earlier last month the company said it would provide a status report in the the second quarter of this year on its delayed Officevision project, but it hedged on whether it would provide shipment schedules for the release of Officevision that would provide OS/2 direct-connect capability. Now you know why.

It's one thing for 6,000 software developers to be stuck holding OS/2 developers kits. It is quite another for tens of thousands of customers worldwide to be holding their collective breath while they await clear directions and intentions from key vendors.

IBM and Microsoft have radically different views of the future of computing at heart, and the current rift between them is probably the most blatant manifestation of those differences to date. Customers designing their own future systems can ill afford to ignore these realities.



LETTERS TO THE EDITOR

VDT safety

Regarding "Low-emission VDTs begin to hit U.S. market" [CW, Jan. 7], Wellware tests the effects of actual workplace VDTs on real, live animals. Our laboratory tests show that VDT radiation negatively impacts mortality and development in fruit flies and chicken embryos. A "low-emission" VDT may claim reduced levels of radiation, but are the emissions safe? No one knows for sure.

Although A-Nox bulbs do not vibrate and glow as your article suggests, they employ the quantum physics principles of counterphase and resonance to mitigate VDTs' harmful effects. Thank you for continuing to provide computer users with information on this important issue.

Jana Baumann
Director of Communications
Wellware Corp.
Park City, Utah

Apple accolades

As an MIS manager, I find all the current hoopla over Microsoft's Windows 3.0 and OS/2 Presentation Manager very puzzling.

In our organization, we find that the Apple Macintosh has far greater connectivity, and to more environments, than any other platform.

I work in the Windows, Macintosh and OS/2 Presentation Manager environments. I spend half my time with a group of about 25 people now using Windows 3.0 on IBM Personal System/2 Model 70s. We also have two PS/2 70s running OS/2 1.1

The other half of the time, I work with about 35 people using 15 Mac SEs, 15 Mac IICX's, two Mac IICIs and three Mac IIs.

With the DOS, Windows, OS/2 people, I find that we spend a large portion of time poring over manuals, trying to kludge together installations and struggling with the underlying DOS.

Users still wind up dealing with weird and wonderful file name restrictions and wonderful utilities with instructions such as "Always exit Windows before running CHKDSK with the /F option; never run CHKDSK from within Windows; loss of data may result," or "Run disk compaction utilities directly from MS-DOS, after exiting Windows; damage to the files on your hard disk might result."

With our Macintosh group, we simply discuss the work at hand. Rarely do we talk about or worry over computer installations or support.

Our Mac people produce more than the DOS, Windows, OS/2 people because the technology seems to aid, rather than get in the way of, the work.

Robert Corley
Mississauga, Ont.

Graphic error

Ms. Keyes' Marketplace story about graphics packages [CW, Jan. 7] is far from current.

First, the information box listed a range of graphics products, most of which were substantially out of date. Corel Systems has been shipping Version 2.0 of Corel Draw since Comdex/Fall '90; the common bugs that slipped into the production version are well known already. Computer Support Corp.'s Arts & Letters Graphics Editor is currently shipping version 3.02 (or is it 3.1 — one generation later than my 3.01, and several generations beyond 2.1, in any case). Micrografx Designer is up to 3.02, and beta testing for some silent upgrades is now well in train.

Most of Keyes' opinions are, in fact, on the same order as the list of obsolete products. The simple fact is that most serious graphics users would not use many of the produts she lists in her second paragraph. Simply put, I consider the Keyes story to be misinformation.

Donald Jenner
Donald Jenner Consulting
New York, N.Y.

Turbo C++ fan

I am a programmer, and I work part-time teaching graduate-level C and advanced C classes at a major university. Three months ago, I purchased Borland's Turbo *C++ 1.0* Professional just to see what all the hoopla was about. Since that time, I have been inspired to program like never before. My productivity and creativity have increased exponentially.

The power of the tools that C++ 1.0 has put in the hands of wild-eyed hackers nationwide is wonderful, and in the long run, this will result in better quality, cheaper software. I can see how this would worry some people.

Ralph Crawford
Microcomputer consultant
Washington, D.C.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

So you want to telecommute?

MICHAEL COHN



Telecommuting does not have that much of a chance of catching on in information systems departments.

OK, it's a whale of a concept. It saves energy. It reduces pollution. And I'm all for anything that gets cars off the road, especially the guy in front of me last Tuesday who was trying to make a left turn — probably since last Monday. But I don't think IS managers buy work-at-home. It's too good an idea. It makes life too easy.

Remember, IS managers are supposed to make sure everyone is equally miserable. They've been worrying for decades about ways to keep employees out of the house, and now they fear you're about to waltz into the office and ask if you can stay home every day in your pajamas, keep up with *All My Children* and occasionally tap out a line or two of Cobol.

You really want to telecommute? The best shot you have is to commit to making your home environment exactly like your work environment. Your boss will never approve unless he's convinced you'll be just as bored and uncomfortable at home as you are at work.

Walk into your IS manager's office and present him with the following list of promises. Your chances will improve if you're serious, sincere and, most importantly, haven't taken a shower in over a month.

• **Promise to rearrange the bathroom.** You can't make home feel like the office unless you start here.

First, you'll have to get rid of everything — the *Sports Illustrated*, the soft fluffy towels and especially that bar of Irish Spring. Then stick one of those standard office-restroom, pink liquid-soap containers on the wall, and to make things more realistic, keep it empty most of the time.

Add a few folded paper towels and a roll or two of the cheap, rough toilet paper that you can't use unless you fold it about six times.

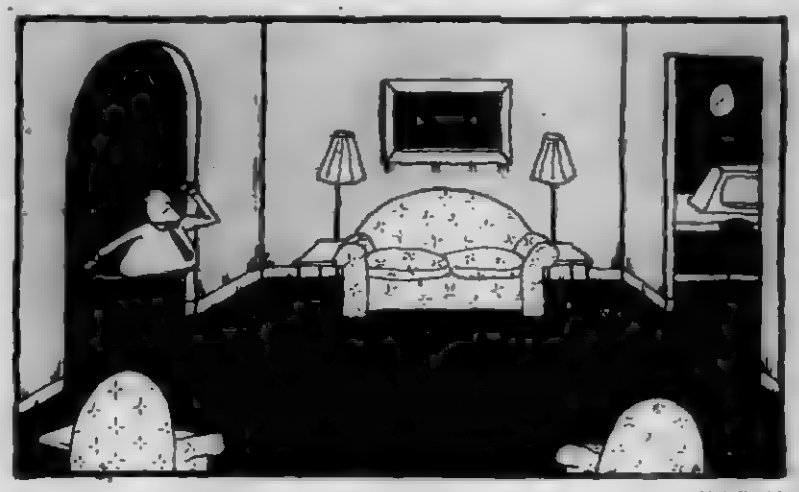
If this isn't enough, promise to throw away your cups and glasses. Agree to suck water right out of the bathroom faucet. This will effectively re-create the ambience of that office fountain, which barely works and won't let you get a drink from it without getting water up your nostrils.

• **Promise to follow a regular business routine.** Be disciplined. No matter what, don't let anyone think you're sleeping late. Your boss would go nuts if he thought you were home asleep at 10:00 a.m. He'd much rather have you asleep at work at 10:00 a.m. like everyone else.

So try to keep your old schedule. Get up at the usual time. Shower and dress just like the old days. Go sit in the car for 45 minutes (an hour if the weather is bad). Around 5:00 p.m., wander around your driveway, pretending you forgot where you parked.

Your manager needs to know you're suffering at least a bit, or he'll call the whole thing off.

• **Promise to keep your home at office temperature.** It would be nice if you could keep your home at computer-room temperature. IS managers make sure that computers are cool and comfortable. However, the people who run the computers must get used to office temperature, which is five to 10 degrees higher than the vinyl interior of a Ford Escort in August with the windows rolled up.



Mark Kaminski

Telecommuters are expected to keep their homes at office temperature year round, which tends to get a little expensive if you live anywhere north of El Paso, Texas.

• **Promise to eat only office food.** It's tempting to keep running to the fridge. If you can finish a sack of Doritos during 30 minutes of *The Cosby Show*, then imagine what eight hours of IMS would do to a week's worth of groceries.

So for the sake of your budget, your waistline and your boss, stock up on gross office food. Fill the cupboards with packs of those cheesy peanut-butter crackers, the kind that always crumble up and fall into the keyboard. Use the same coffee mug day after day, and clean it only once per month (preferably with office-restroom, pink liquid-soap, if there is any).

Lunch gets kind of tricky, since it's pretty stupid to brown-bag it when you're already home. But once in a while go out for lunch — after you've argued with yourself about who should drive.

• **Promise to have lots of meetings.** One or two conference calls per day just won't cut it. You need to have as many dumb meetings as they're having back at the office, even though you'll have to conduct and attend them by yourself.

Come prepared to these meetings, so that you don't waste your own time. Of course, a meeting's not a real meeting unless it starts fashionably late, so be patient and wait for yourself at least 10 minutes. And once in a while, cancel a meeting on short notice, and don't send yourself a mental note.

Cohn is trying to be a computer salesman in Atlanta.

We must take care when computers control war

CHARLES P. LECHT



The current situation in the Persian Gulf makes me wonder what lessons we have learned about the fallibility of computer analysis since Black Friday in 1988.

On that October day, broker computers that were being used to manage investor portfolios inadvertently caused a massive securities sell-off and triggered a meltdown of Western markets.

Doubtless there were other factors that contributed to this calamity, but it soon became clear that uncontrolled computer-assisted trading was substantially at fault.

This realization motivated members of U.S. (and presumably other countries') exchanges to institute new and self-imposed trading rules concerning the use of computers to manage investor portfolios. It also caused governments to install so-called "circuit breakers" in exchanges to suspend trading if the rules didn't work.

Undoubtedly, the current war between Iraq and the U.S.-led United Nations forces is also based, at least in part, on the computer-calculated chances of success. It is likely that, as in the securities business, there are various computer-based models that guide "war or no-war" decision-making processes. These no doubt produce action thresholds that, once reached, compel their users to initiate actions to "buy/hold/sell" war.

Cold comfort

On one hand, we should be comforted by the idea that computers are determining such thresholds. I'd hate to believe these judgments were being made solely on a gut-feeling, seat-of-the-pants basis by mere mortals. But, in view of what we learned from the Black Friday crash about how computers can play a role in escalating calamity, one has to wonder what rules and circuit breakers have been put in place to govern the use of computers to make decisions about war.

The fact that we can rely on computer models for some really critical decisions is well established. For example, in the management of our airspace, we are forced to rely on computer analysis of radar-sighted objects, and we know that, scary as this may be, we do not have any other choice.

The difference is that the kind of modeling used to manage air traffic is based on a more discrete set of facts than those that would apply to a "wage war or not" decision.

As in the securities business, the facts that govern "buy/hold/sell" decisions on war are qualitative as well as quantitative and, as such, are plagued by vagary, if not outright error. Of course, in the securities business, only money is lost when the models yield false results; when war is waged, lives are lost.

The dilemma we are faced with is this: If computers are not used to analyze data in decisions on whether to wage war, the facts are too numerous and amorphous for us to have a ghost of a chance of coming up with anything but a guess (unless we are attacked, of course). But if computers are employed, we are forced to fly blind, using them as a "radar" to guide our actions in an area where I don't think we can feel safe flying blind.

Consider the following scenario. Suppose there were a battery of computers in the Pentagon assessing the threshold of going to war against a proclaimed adversary.

Factored into the equations used to reach this conclusion are thousands of statements, some of which are accurate, but others are only partially correct, if not completely wrong, qualitative information. No matter how or how long the computer models grind away, the same conclusions are reached; war is the best alternative. No matter how the data is massaged, the results are the same. We can expect to lose X lives, and the enemy will lose Y if we go today. If we go tomorrow, X increases, and Y decreases. Extrapolated in time, the results always yield an increase in X and a decrease in Y.

One day, the risks of declaring war appear less than those of not doing so. The ultimate result if we do not go to war seems to be a victory for the enemy; capitulation for ourselves.

To make matters worse, consider the possibility of a domino effect such as the one we saw on Black Friday, with computers in one country after another reaching the same conclusion, based in part on the prior decisions of others.

"An unlikely scenario," you may say. "Surely such computer-assisted decision-making was subjected to scrutiny by someone."

Not so unlikely, I say, especially if each country's Pentagon-equivalent were running the same program, if there were there no "trading" rules, and our pitifully weak United Nations was unable to put circuit breakers in place.

UNDOUBTEDLY, THE CURRENT war between Iraq and the U.S.-led United Nations forces is also based, at least in part, on the computer-calculated chances of success.

Lecht is an IDG News Service correspondent based in Tokyo.



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NTT sets rules for vendors

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

TOKYO — Nippon Telegraph and Telephone Public Corp. (NTT) turned the tables on the computer industry recently with the announcement of its Multivendor Integration Architecture (MIA) — wielding the purchasing power of one of the world's largest user organizations.

With advice and recommendations from IBM, Digital Equipment Corp., NEC Corp., Hitachi Ltd. and Fujitsu Ltd., NTT hammered out its initial list of purchasing specifications for a variety of software standards. Vendors must comply with these standards by October 1992 if they want to sell computer equipment to the telecommunications giant, the company said.

With NTT's yearly spending for information technology running as high as $1.5 billion, industry analysts noted that most vendors are happy to comply with whatever the firm wants.

"NTT is calling the shots, much like our own government or phone companies have done in various areas in the past," said David Moschella, an analyst at International Data Corp. in Framingham, Mass.

The philosophy behind NTT's plan — enabling multivendor network computing without changing the underlying hardware — is similar to DEC's Network Application Support (NAS) strategy.

"The whole point of MIA and NAS is establishing a layer of software above an operating system, which makes the operating system transparent to the application," said Jacqueline Kable, a DEC marketing manager. "As long as a vendor supports these interfaces, users don't have to care what the underlying platform is because it guarantees interoperability."

However, the siren song of this so-called "middleware" software is still a long-distance lament. It will be the mid-1990s at the earliest before any vendor can deliver such complex capabilities for a production environment, several analysts observed.

Still, the resemblance between the two architectures planned by DEC and NTT was cause for rejoicing at the Maynard, Mass.-based vendor last week, heightened by NTT's selection of DEC's Application Control Management System as the transaction processing piece of NTT's architecture.

"We are really ahead of the game," Kable said.

"This is obviously a big deal for DEC, which is not particularly well known in Japan for transaction processing," Moschella said. DEC could also pick up some sorely needed commercial cachet with Japanese customers, he added.

As one of the world's largest companies — with 277,000

Continued on page 29

Interfaces of the future

By mid-month, NTT will publish interface specifications for Version 1 of its Multivendor Integration Architecture. The three sets of interfaces are the following:

- Application Program Interface: programming languages Cobol, Fortran and C and database access language SQL. For distributed transaction processing, NTT specified an interface called Structured Transaction Definition Language.
- System Interconnection Interface: specified for the upper-layer communication protocol for file transfer, mail transfer, distributed transaction processing and network management. For the lower layer protocols, the specs call for Internet and Open Systems Interconnect.
- User Interface: OSF/Motif from the Open Software Foundation, Open Look from Sun Microsystems, Inc. and Common User Access from IBM.

Softbench wins Informix backing for CASE products

BY JEAN S. BOZMAN
CW STAFF

Informix Software, Inc. said recently that it will base its future computer-aided software engineering (CASE) products for Unix on Hewlett-Packard Co.'s Softbench tool kit.

Informix's Opencase environment will combine HP's 1-year-old Softbench with the character-based Informix/4GL as well as third-party CASE products. "HP's Softbench will be at the core of what we're doing with Opencase," said Gilbert Wai, executive director of product marketing at Informix.

The final Informix product, Opencase/Toolbus, will leverage the Softbench design, which allows third-party software modules to be "plugged into" the HP environment, Wai said. "We're leveraging the 200 man-years of development HP has put into Softbench," he added. HP has already licensed Softbench, which supports the Open Software Foundation's OSF/Motif interface, to other companies, including Control Data Corp.

"In a sense, Informix ends up with an instant CASE environment," said Stephen Joseph, a manager at HP's Software Engineering Systems Division in Sunnyvale, Calif. He said HP will support various hardware platforms and already has third-party software firms building on the HP software environment.

The new Informix CASE strategy may do more to stimulate the generation of Informix applications by the firm's 2,000 value-added resellers than giving new capabilities to end users. "It's not a great leap forward," said Darlene Brown, director of software engineering research at the Gartner Group, Inc.'s Santa Clara, Calif., offices. "It hasn't greatly changed the capability of the tools themselves, but it greatly improves the productivity of the developer."

Coming soon

Informix's Opencase/Toolbus is scheduled to be shipped to users of HP Unix workstations and Sun Microsystems, Inc. Sparcstations in late 1991.

While programmers will be able to use Opencase's graphical user interface to design applications, the resulting programs will still be character-based, Wai said. Informix is modifying the Informix/4GL to support graphical user interface applications, even as relational database management system competitors such as Oracle Systems Corp. unveil new graphical user interface front-end products. However, Informix said it prefers to migrate its fourth-generation language code, Wai said, because that will preserve compatibility with older applications.

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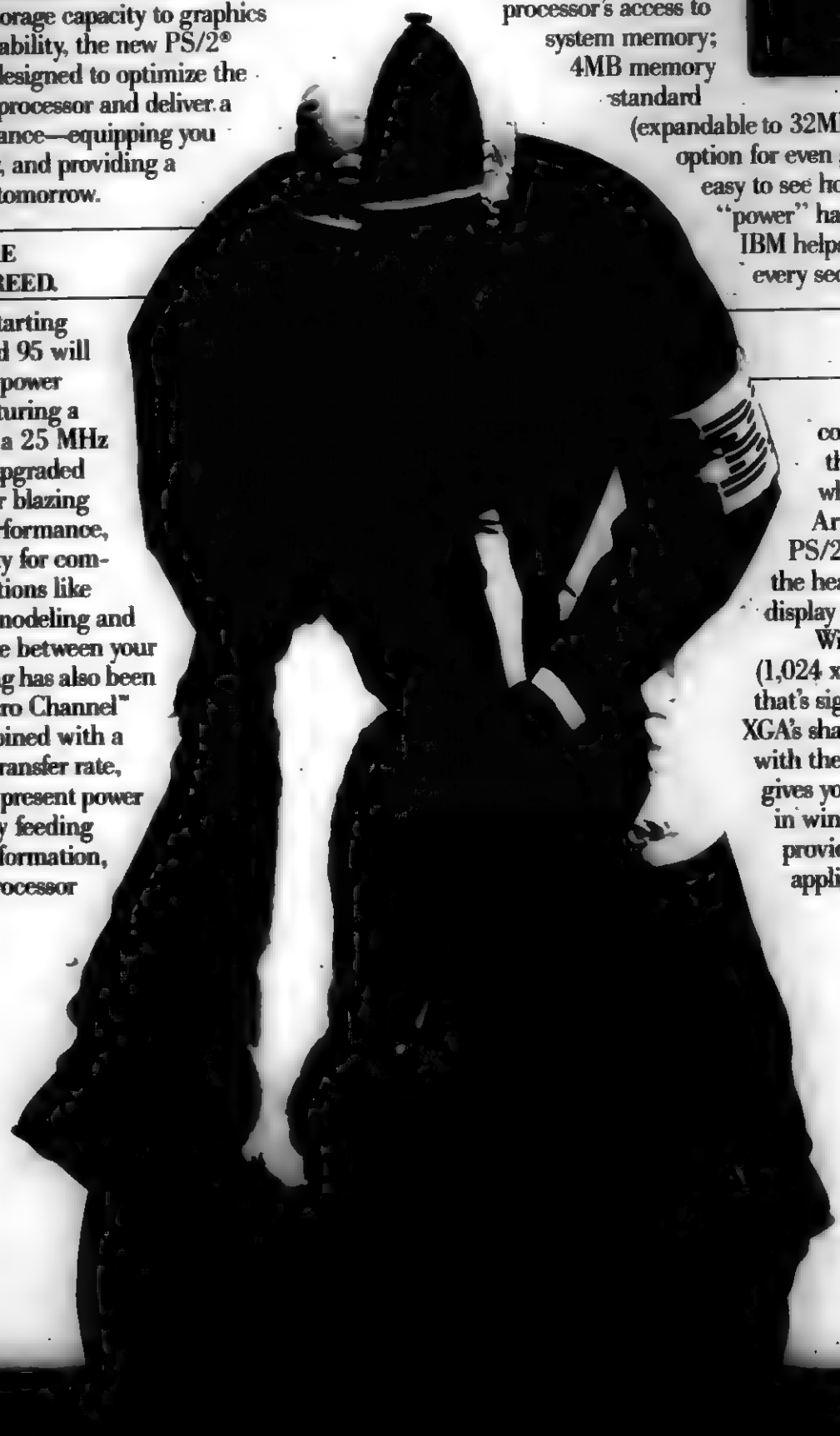
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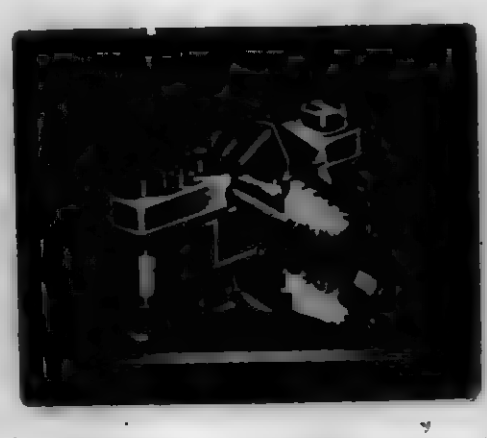
Without the proper venue, dazzling ability often falls short of expectations. That's certainly been the case with the Intel 486™ microprocessor, a processor that hasn't been utilized to its full potential. So that's what IBM set out to do. Just as it takes a seasoned jockey to turn a thoroughbred into a champion, it took IBM to give the 486 processor every opportunity to work its genius. Introducing IBM Personal System/2® Model 90 XP 486 and Model 95 XP 486.

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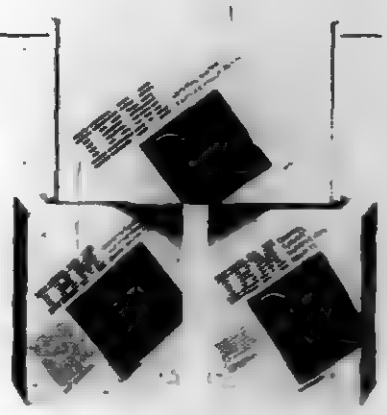
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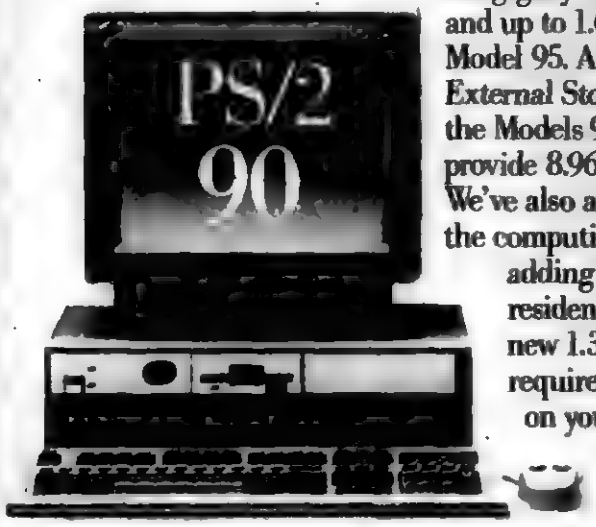
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Features	IBM PS/2 Model 90	IBM PS/2 Model 95
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[illegible]	80486	80486
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Optional upgrade	33 MHz	33 MHz
Memory		
Standard	4MB (70ns)	4MB (70ns)
Maximum	32MB	32MB
Integrated Functions	Extended Graphics Array (XGA) and display port, DMA serial port (dual ports on Model 90), DMA parallel port, pointing device port, keyboard port, diskette controller support for three drives, SCSI Adapter with Cache.	
Fixed Disk Storage		
Standard	80-320MB	160MB-320MB
Display Modes	XGA (includes all VGA modes) 640 x 480 x 256 colors/64 gray shades; 1024 x 768 x 16 colors/gray shades; hardware support for 132 column text mode, 16-bit direct color mode at 640 x 480 x 64K colors	
Available Expansion Slots	three 32-bit	six 32-bit
Bus Architecture		
Data path	MCA 32-bit	MCA 32-bit

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*Gartner Group's *Software Management Strategies*, P-480-866, "LEGENT's ASO Products Take the Lead," 8/29/90.

LEGENT

Scientific space data may not be safe

NASA and other federal agencies hit for failing to archive information

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Scientific data from space, gathered at a cost in the tens of billions of dollars, is not being safeguarded by the federal agencies charged with its storage, according to the U.S. General Accounting Office (GAO).

In recent reports, the GAO criticized the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Department of the Interior's Geological Survey (USGS) for a variety of lapses, including failure to archive irreplaceable data, loss of data from storage and poor storage conditions.



"[NASA] does not archive original data from past missions that may be needed for future research. Further, NASA's archives are largely incomplete for many important missions and contain no data for others," the GAO said. It was the second such criticism of NASA.

A companion study released last March faulted the space agency for its storage of hundreds of thousands of tapes under "deplorable conditions" and for poor management of its data storage.

NASA has data from scientific missions stored on more than 1 million magnetic tapes, yet for 23 of 37 important missions, it has archived less than 60% of the required data, the GAO found. NASA attributed that to a variety of reasons, including a lack of agreement between NASA principal investigators and the agency as to what data to archive, failure to prepare required project data plans and an inadequate budget.

The congressional audit agency said the NOAA and USGS have 230,000 tapes, 370 million film records and 76 million paper records stored under poor conditions and have not adequately managed their archives or performed comprehensive inventories of data holdings.

The GAO said 30,000 tapes associated with the Earth Resources Observation Systems program are in jeopardy. "NOAA officials noted that some early satellite data is lost and that over half of the archived environmental data is suspect, damaged or otherwise at risk," the GAO said.

The problems at these agencies raise troubling questions about how the federal government as a whole saves and protects its data, GAO official Ronald W. Beers said.

Each of the agencies examined acknowledged the problems and are taking steps to correct them, the GAO said. "We're not without fault," said Joe Bredekamp, chief of the information systems branch of NASA's Office of Space Science and Applications. "Back in 1972, it seemed the right thing to do. We've learned from our mistakes."

In earlier NASA missions, scientists and engineers focused mainly on the spacecraft, instrumentation and data capture, Bredekamp said. Now, careful planning and a much higher share of missions' budgets go into data processing, storage and distribution.

That shift in emphasis is absolutely essential as NASA prepares for data-intensive programs such as the Earth Observing System (EOS), part of Mission to Planet Earth, which is scheduled for the late 1990s, Bredekamp said. "Within our archives we have maybe 7T to 10T bytes of data. With EOS we'll take more than 1T byte per day."

Tidal wave of facts

The challenges seen by NASA in storing vast amounts of data are not going to get any easier. Between 1990 and 1996, the space agency plans to launch more than 30 new missions, which will produce an unprecedented tidal wave of data. NASA estimated that by the late 1990s, the annual volume of space science data acquired by its missions will increase by a factor of 5,000, from 60G bytes in 1989 to 312T bytes in the late 1990s.

In less than 10 years, NASA will be handling 29 times more data annually than is stored in the 15 million books held by the Library of Congress. Storing that data using today's technology would require 1.7 million standard reels of magnetic tape or 48,000 optical discs. Fortunately, NASA will not have to rely on old-fashioned magnetic tapes anymore. Joe Bredekamp, chief of the IS branch of NASA's Office of Space Science and Applications, said NASA will move to a suite of new technologies — "a hierarchy based on the volatility of data and the cost of storage and retrieval." He said the hierarchy would include helical-scan digital tape and optical disc systems.

As daunting as the storage problem is, there is an even tougher job, he said. "The real challenge is not so much data storage as it is data management, retrieval and distribution."

GARY H. ANTHES

Airline builds scheduler on client/server model

ON SITE

BY JOHANNA AMBROSIO
CW STAFF

American Airlines, Inc.'s mainframe-based scheduling system is going the way of the propeller plane. The airline is adopting a client/server model based on Unix to help determine where and when planes fly.

"This is the most strategic system at American Airlines," said Thomas R. Cook, president of American Airlines Decision Technologies (ADT), which is jointly developing the client/server model with Sabre Computer Systems, another subsidiary of Dallas-based AMR Corp., the airline's parent company.

The scheduling system, called the Integrated Capacity Planning System, feeds into just about everything else the airline does, from maintenance and reservations to food service. "If you don't know when the planes are flying, or how long the stopovers are, then you can't really do anything else," said Stephen Clampett, an ADT vice president.

American Airlines made the decision to revamp its old scheduling system, which was based on an IBM IMS database, about four years ago. The airline has been phasing in the new system in stages.

The first phase, bringing in Mips Computer Systems, Inc. workstations and file servers running an Oracle Systems Corp. database management system, was recently completed. The workstations upload the completed schedule to the IBM 3090 mainframe in Tulsa, Okla., where the rest of the airline can access it.

"We're just now training the schedulers on how to use the database, so it's a bit early to talk about how successful it's been," Clampett said. Still, he added, the airline expects the system to pay for itself "within days" of when all 72 schedulers are up and running with it. Savings will be realized because of the more efficient way people will be able to access and update data and because the decision-support tools will help the schedulers explore all options, Clampett said.

These decision-support tools, which were originally developed as stand-alone modules under IMS, are being rewritten and integrated into the workstation system. This is scheduled to be completed by July, Clampett said. The tools run the gamut from aircraft routing to figuring out what kinds of planes go to which stops.

In fact, the airline's original reason for revamping its mainframe scheduling system was to add decision-support modules. The client/server model was adopted only one year ago.

"The old system was batch-oriented, with no real decision-support tools. You'd look at the database, make a query, figure something out and batch the changes up to the mainframe," Clampett said. "There was no real interaction."

However, convincing everyone about the merits of Unix was not so straightforward. "We introduced Unix into American Airlines," Cook said. "It wasn't easy."

Breaking the ice

The first widely used Unix system was the Workstation Crew Allocation System, also developed by ADT and implemented last June [CW, June 4, 1990].

"Data processing departments in general resist Unix and distributed processing," Cook said, "but once we broke the ice and users began using it, there were no problems. The graphical user interface really turns their heads and makes them want to use it."

On the other hand, making the business case for Unix "was easy," Cook said. "There's better price/performance, and the user interface makes it easier to use so people can get more information out of the system."

In addition, Cook said, schedulers no longer have to contend for mainframe resources. "Even though the Unix machines run at about a third of the speed of a 3090, it's faster overall because people don't have to wait for their answers," he explained.

Goal unwraps updated version of Runtrac

BY JOHANNA AMBROSIO
CW STAFF

COLUMBUS, Ohio — Goal Systems International, Inc. recently said it is delivering to users a new version of its Runtrac software, which is the restart/rerun component of its Runtrac job-scheduling system.

Separately, Goal announced new integration features on several of its other packages. For example, its Explore for MVS performance management software can now link directly to Goal's OPS/MVS console management system. This allows users, for example, to set performance limits and have OPS/MVS act on those limits automatically, Goal said.

The new Runtrac version replaces the code that had been contested by Computer Associates International, Inc. as infringing on CA-11 and CA-7 software. CA sued Goal in June 1990, alleging copyright infringement, but the two companies settled out of court [CW, July 16, 1990].

New coding

As part of the settlement, a Goal spokeswoman said, all 200 Runtrac users must switch to the new version, which has been certified by CA not to contain any infringing code. Although CA is not being paid royalties on the new version, which is being provided free to current Runtrac users, Goal has paid CA an unspecified amount in damages.

The new and old Runtrac versions are functionally equivalent especially in look and feel, the Goal spokeswoman said, but the new version adds a few things. For example, Runtrac can now rerun and restart jobs both within and outside Jobtrac. "We're getting ready to sell Runtrac as a stand-alone package, although we're not doing that yet," the spokeswoman said.



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Altos offers Unix release

DALLAS — Altos Computer Systems used the recent Uniforum show to introduce a new release of its AT&T Unix System V-based operating system for all of its multiuser computers.

Altos claimed that Altos Unix System V/386, Release 2.0 offers improved I/O and other enhancements, providing up to 35% system throughput improvements.

In addition, the company introduced four systems based on Intel Corp. 80386SX, 80386 and I486 microprocessors. Those systems included two I486-based members of the Altos System 5000 family: the 5820, supporting up to 50 users, and the APS/5000-33, supporting up to 160 users.

The processors will be sold through resellers and end users. Prices are expected to be $14,300 and $28,600, respectively. The new low-end machines, the System 400 and System 700, were designed to support between two and 16 users. The basic System 400 starts at $4,700, while the System 700 starts at $7,600.

Meanwhile, AT&T's Unix System Laboratories and Sequent Computer Systems, Inc. announced a cooperative effort to enhance AT&T's Tuxedo System/T transaction monitor for symmetrical multiprocessing environments. Sequent will provide Unix System Laboratories with a 486-based Sequent system to operate as a platform on which AT&T can enhance Tuxedo System/T.

The following is other Uniforum news:

- The industry's promise of shrink-wrapped applications for Unix-based personal computers and workstations is apparently proceeding apace. Intel in Santa Clara, Calif., said it will provide a final copy of its recently announced Binary Compatibility Standard in May. A review group consisting of representatives from the Open Software Foundation, Unix System Laboratories and others will help develop the specification.
- Another new product is Post from Alfalfa Software, Inc. in Cambridge, Mass. It is an electronic-mail package that supports both the Internet and X.400 protocols. It sells for $395 per copy.
- Version 1.3 of Clockwise, a group-scheduling and calendar package from Woburn, Mass.-based PhaseII Software Corp., is shipping now for a wide variety of Unix workstations. Enhancements include support for the Network File System protocol and better printer support. Prices start at $695.
- Mapinfo, a package that maps data and analyzes it geographically, will soon be available for Unix workstations from Mapping Systems Corp. in Troy, N.Y. It is scheduled to ship by April; prices begin at $1,795.
- Faximum, a facsimile package for Unix workstations, is available from Faximum Software, Inc. in West Vancouver, B.C. Prices start at $995.
- An applications development tool kit to port Sunview and Xview applications to the IBM RISC System/6000 is available from Unipress Software, Inc. in Edison, N.J. Prices start at $2,495.
- Uniplex announced a version of its integrated office applications software to run on The Santa Cruz Operation's Open Desktop.
- An Xserver to allow DOS-based PCs to access Unix applications was announced by Markham, Ont.-based Hummingbird Communications Ltd.

NTT

CONTINUED FROM PAGE 23

employees and annual sales in the neighborhood of $44 billion — the Tokyo-based company is "a major user of computer systems and is launching all kinds of new services now," according to William Ambrose, an analyst at Cambridge, Mass.-based Pyramid Research, Inc. These days, NTT is facing increasing competition in Japan over value-added network services such as electronic data interchange.

The company is also trying to encourage U.S. vendors that may have felt they were at a disadvantage in the Asian market. "They're trying to show an open-mindedness in importing from the U.S.," Ambrose said.

Junichi Nomura, vice president of NTT America in New York, said the chief benefits his company expects from its home-grown architecture are increased application program productivity and "the flexibility to use the appropriate computer where it is needed."

The company's systems integration business, handled by NTT Data Communications Systems Corp., will also get a competitive boost from MIA, according to Nomura.

Trendsetter

Analysts familiar with the NTT plans noted that such a large user can set a trend other big companies may consider.

"We are certainly seeing a trend toward large customers looking for ways to specify — and get the vendors to support — the standards they feel are important," said David Passmore, a partner at the information systems consulting practice of Ernst & Young in Fairfax, Va.

"This is a fundamentally different approach: picking the open system and standard architecture, then, as new applications come along, making *them* fit the technology architecture," he said.

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RENEWALS

Latest Crays on campus

The University of Texas System has launched on Cray Research, Inc.'s door a third time, signing a contract worth approximately $50.6 million for a Cray Y-MP8 supercomputer and accompanying storage devices. The system, which will service research needs at each of the 14 universities in the System, will replace two earlier Cray Research models. The new Cray Research model will be housed at the University of Texas System's Center for High Performance Computing in Austin.

The Texas deal was only one in a string of recent contract wins for Cray Research. In Livermore, Calif., the Department of Energy (DOE)'s Lawrence Livermore National Laboratory dedicated an X-MP supercomputer from Cray Research, which the firm donated for use in its National High School Supercomputer program. The program is part of a national push by DOE laboratories to help advance the state of U.S. high school math and science educational programs. The X-MP will be linked to classrooms nationwide via telephone lines to simulate and solve problems in such areas as math, physics and environmental studies. Cray Research will also pick up half of the annual maintenance costs of the system, according to the company.

The National Institute of Standards and Technology in Gaithersburg, Md., has ordered a supercomputing system from Cray Research worth roughly $5.5 million. The Y-MP2 will be used by the civil agency for research and environmental research by nine affiliated government environmental laboratories and for radio spectrum analysis by the Institute of Telecommunications Sciences.

Cray Research took an order for the first Y-MP2E headed for French soil with the announcement that Peugeot SA will be upgrading from its current X-MP. The system is scheduled for installation in the second quarter of this year. Another French twist came from the French National Organization of Aerospace Research, which ordered a Cray Y-MP system to replace its current X-MP supercomputer.

Cray competitor FPS Computing announced the purchase and installation of a Model 500EA supercomputer by the Canadian government's Networks of Centres of Excellence. The group was formed to fund and help integrate scientific research. The 500EA will be used for theoretical chemistry research at the University of Montreal.

Mips' contract enters Wang into RISC market

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. and Mips Computer Systems, Inc. recently announced an OEM agreement whereby Wang will market computer systems based on Mips' reduced instruction set computing (RISC) technology.

Wang said it hopes this first entry into the RISC marketplace will help it expand its existing Dynamix line of Unix-based products. The existing Dynamix line is based on Intel Corp. 80386 and I486 microprocessors.

Stephen Josselyn, senior analyst at International Data Corp., a market research firm in Framingham, Mass., acknowledged that the contract gives Wang good presence on the RISC platform but questioned whether this might create an overlap with the Intel-based Dynamix products over the long term.

A means to an end

According to Joseph Tucci, executive vice president of operations at Wang, the Mips agreement "marks another step in our server platform strategy within our overall product lineup." He added that the Unix-based systems play an integral role as complementary server choices for Wang's VS midrange and personal computer products.

The first official product rollouts are slated for sometime in the first quarter. No pricing information is available.

In related news, Macsoft, Inc., a Bakersfield, Calif.-based company, released Lightspeed NVS for Unix, a software package specifically designed to allow standard Unix computers and workstations to connect to Wang's proprietary VS minicomputers. The software provides virtual terminal emulation and is reportedly capable of supporting between 32 and 96 active users per gateway. It is slated to be available in June.

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NEW PRODUCTS — SOFTWARE

System software

Legent Corp. has announced a software management architecture designed to enable users to manage software changes across multiple platforms.

Endevor for DOS, Endevor for OS/2 and Endevor for Link can manage distributed development across MVS and personal computer platforms.

Endevor for DOS and Endevor Link are both scheduled to be released this month. Endevor for OS/2 is slated to be available in August.

Corporate licenses are priced between $80,625 and $201,562. Network licenses cost from $5,375 to $26,875. Endevor Link ($15,000) is licensed as a mainframe product.

Legent
114 Turnpike Road
Westboro, Mass. 01581
(508) 870-1900

Jetform Corp. has announced Jetform-Server DEC/VAX VMS, allowing users to print electronic forms in multiuser and network environments.

The software runs on any Digital Equipment Corp. VAX/VMS machine. It includes Jetform Merge, a batch-mode forms and data-merge software package.

Prices ranges from $3,000 to $9,000, depending on the size of the host system.

Jetform
163 Pioneer Drive
Leominster, Mass. 01453
(508) 840-8181

Applications packages

Concepts Dynamic, Inc. (CDI) has announced Version 1 of the Control series, a family of Informix Corp. Informix-based fourth-generation language applications for Unix platforms.

The series includes the Financial Control System, a corporate accounting system designed to meet critical-data demands of firms with multiple profit centers, and the Job Control System, an integrated job-costing system developed to help industrial service firms and custom manufacturing firms manage jobs from the quotation to final invoicing stage.

Prices range from $50,000 to $500,000.

CDI
1821 Walden Office Sq.
Schaumburg, Ill. 60173
(708) 397-1044



Concept Dynamic's *Control series includes accounting and job-costing 4GL applications for Unix platforms*

Systems Union, Inc. has announced Sunbusiness, a multicurrency order-, invoicing- and inventory-management software module for the global marketplace.

The product was designed to operate with Sunaccount, Systems Union's global financial management software package. It allows users to manage multilocation inventory and process sales orders, purchase orders and invoicing in all currencies. Prices range from $2,900 to $50,000, depending on the type of operating system and the number of users.

Systems Union
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NEW PRODUCTS — HARDWARE

Data storage

MDB Systems, Inc. has added a removable subsystem designed for Digital Equipment Corp. Vaxstation 3000 and 5000 systems to its Datashuttle family.

The Datashuttle 500 single-disk subsystem incorporates 3½-in. Winchester disk-drive technology and features up to 400M bytes of mass storage.

The product is scheduled to begin shipping during the first quarter and is priced from $2,100 to $4,995, depending on disk-drive capacity.

MDB Systems
1110 W. Taft Ave.
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Emulex Corp. has announced two 4mm tape subsystems that can reportedly store up to 2G bytes of data on 90-meter, 4mm tape cartridges.

The EH13 single-drive and the EH13D dual-drive subsystems feature compatibility with Emulex's UC line of small computer systems interface (SCSI) host adapters and with external SCSI ports on Digital Equipment Corp. Decstation 3100 and Vaxstation 3100 machines.

Pricing ranges from $4,795 for the EH13 without a host adapter to $9,395 for the EH13D with a UC08-III host adapter.

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COMMENTARY

Patricia Keefe

Tempest on the desktop



There is no question, sources close to both companies say, that the disagreement between IBM and Microsoft over what should reign where on the desktop has reached the boiling point.

It may prove to be little more than a tempest in a teapot, however, since Microsoft reportedly controls 60 million desktops. That makes it the IBM of the desktop. So no matter how much IBM may feel betrayed by its longtime partner, it can't just say no to Microsoft and its view of the world.

Most of the developers and analysts interviewed over the last few weeks described an angry but essentially helpless IBM.

It is expected by these same sources that no matter how deep the rift and no matter what Microsoft said between the lines at its seminar last week, the two vendors will collect themselves long enough to present some semblance (yet their third) of a united front. Win-win for everybody, right?

It may be smiling on the outside, but IBM, we're told, is expected to continue racking up those strategic development alliances with small third-party software companies. The goal,

Continued on page 40

Multiuser DOS: LAN alternative

ANALYSIS

BY JAMES DALY
CW STAFF

While communications companies have long sung the praises of local-area networks, those who have actually fiddled with the sometimes complex and frustrating job of setting up a LAN know the darker side of the equation.

There is, however, what some see as a less taxing way to gain the benefits of work-group computing, bypassing the hassle of installing and maintaining a LAN: multiuser DOS. "It's a much, much simpler way to get around installing a LAN," said Dick McCoy, who runs a multiuser DOS system as senior vice president of administration at the South Trust Bank of Etowah County in Gadsden, Ala. "We have a network up and running in the time it takes to set up one PC."

Multiuser DOS products link dumb terminals and personal computers to a central processor, thus getting LAN benefits at a fraction of the cost and complication of actually installing a LAN. Although the idea is not new, it has gained momentum with the advent of powerful chips such as the Intel Corp. 80386 and I486.

"The available microprocessors just couldn't handle multiple DOS sessions very well, and many people found the idea of sharing a CPU unacceptable," said Mike Seither, communications manager at Theos Software Corp. and a member of the Santa Clara, Calif.-based Multiuser DOS Federation.

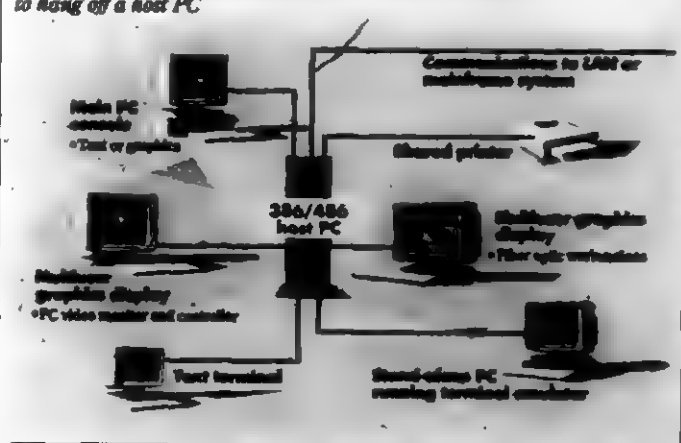
Federation members currently include Marlboro, Mass.-based Alloy Computer Products, Inc.; Bluebird Systems, Inc. in Carlsbad, Calif.; Concurrent Controls, Inc. in South San Francisco; San Jose, Calif.-based IGC; Microdyne Corp. in Ocala, Fla.; S&H Computer Systems, Inc. in Nashville; The Software Link, Inc. in Atlanta; East Lansing, Mich.-based Starpath Systems, Inc. and Theos in Walnut Creek, Calif.

These companies provide multiuser DOS environments to 300,000 domestic users, Seither said. But that still represents only a fraction of the thousands of companies and tens of millions of DOS users spread throughout

Continued on page 37

Making connections

Multiuser DOS is designed to allow various types of devices to hang off a host PC



CW Chart: Paul Mock

Trusted Xenix, blessed by NSA, now available for PCs

BY GARY H. ANTHES
CW STAFF

GLENWOOD, Md. — Trusted Information Systems, Inc. (TIS) said the National Security Agency (NSA) has evaluated and certified its trusted version of the Xenix operating system at a B2 level of trust, the highest level of security yet assigned by the NSA to a personal computer operating system.

Trusted Xenix is a Unix-based operating system derived from Microsoft Corp.'s Xenix for use on IBM and compatible PCs. It enables PC users to have a trusted system for local work while accessing sensitive information on multiple computer systems having files at different degrees of sensitivity or classification. The security guidelines are offered in the U.S. Department of Defense Trusted Computer System Education Criteria, or "Orange Book."

Trusted Xenix is now being used in several secure network systems within the Department of Defense, and it is intended for use in commercial applications as well, TIS said.

TIS is also developing a trusted version of the Unix-like Mach operating system, with help from the Open Software Foundation and funding from the Defense Advanced Research Projects Agency. Trusted Mach (Tmach) has been submitted to the NSA for evaluation at the B3 level of trust, the second highest level in the Orange Book.

TIS announced it has also submitted Tmach to the British and German governments for simultaneous evaluation against the European Community's security evaluation criteria.

Tmach will be available as a product within two to three years and will be widely portable to machines with Unix-like compatibility, TIS said.

TIS added it is developing a family of cryptographic-based trusted products for electronic mail and other transfers of sensitive information. Trusted Mail is software that implements the Internet community's new standards for privacy-enhanced mail.

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Jerry Barnes, Chrysler Corporation

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Moving application development to a workstation environment allowed Chrysler to use its mainframe resources more efficiently and speed up development cycles by taking advantage of productivity tools not available in the mainframe programming environment. With this solution, programmer productivity improves greatly without a large investment in additional mainframe resources; an important consideration in uncertain economic times.

"The mind-set here a few years ago was, 'why would anyone want to do anything away from the mainframe.' Now, we have over 200 trained COBOL/2 Workbench users."

With the Micro Focus COBOL/2 Workbench, programmers can develop and maintain full-scale CICS/VS and CICS DL/I applications independent of the mainframe in a fraction of the time.

"We quantified the time spent on typical software development activities. We showed how we could make a code change, compile the program, detect an error, correct the error and recompile the program again in less time than it would take someone to logon to the mainframe and submit the first compile. In many cases, the developer would make the change on the PC in two to three minutes, while it could take close to 20 minutes on the mainframe."

Jerry Barnes made his case for Micro Focus COBOL/2 Workbench based on greatly improved productivity. The Micro Focus edit-check-debug cycle, now an industry standard for PC-based programming made a big impact on throughput and costs.

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Next move up to customers in Amoco's OS/2 plan

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — "We're waiting as fast as we can."

This was the basic message of Amoco Corp.'s architectural coordinator, John A. Chapman, in a recent address given to the Chicago Association of Microcomputer Professionals on Amoco's choice of IBM's OS/2 Extended Edition after a lengthy examination of both that and Microsoft Corp.'s Windows 3.0.

Still, Amoco's Information Services Department waits on, largely for one of its 106 business units to request development projects on the OS/2 Extended Edition platform.

"We haven't had any major requests for OS/2 development as a first-choice platform," Chapman acknowledged, saying that a number of prototype systems have been built using OS/2. "We don't expect that to be permanent, but we have no way of forecasting when" users will ask for OS/2-based applications.

While Chapman praised OS/2 for its power, functionality, sensitivity for developing mission-critical applications and connectivity, Amoco's systems developers are also waiting for IBM to deliver on some pieces of OS/2. Chapman said developers for both IBM and Microsoft have listened to Amoco's requests and have been responsive, but there is still one essential piece of functionality missing from OS/2.

"The single biggest thing I have to have before I can afford to support a nonuser-installable, terribly complex, terribly powerful operating system across all 27 countries [Amoco operates in] is a way to remotely access, service, update, manage, maintain and debug that," he said.

Other smaller problems have made OS/2 Extended a conditionally certified product at Amoco, rather than a completely certified one. For instance, the majority of Amoco's personal computers come from Dell Computer Corp., Toshiba America, Inc. Information Systems and Apple Computer, Inc. — not from IBM. Also, OS/2 Extended does not run out of the box on many of those clones.

Chapman added that the lack of shrink-wrapped applications for OS/2 has limited the cost-effectiveness of moving users off DOS, and those that do exist do not tap the power of OS/2 the way they might.

"They can't get at their data any better than they could under DOS, so why should they move?" Chapman asked.

No so worried

Still, he is not particularly worried about the waiting game.

"It's very clear from the briefings we've had and the direction statements that [IBM vice president and general manager of personal systems James] Cannavino and others have made that Extended Edition is going to be the strategic platform for a lot of the host and cooperative processing products that IBM delivers," Chapman told the group. "We think OS/2 is more Unix competition than DOS competition. It's going to be well past 1995 before we get a majority of OS/2 users."

In the meantime, Amoco is rapidly migrating systems development technology off mainframes onto workstations, and Chapman said this will "bode well" for OS/2 development.

At the same time, Windows 3.0 is not likely to appear on Amoco's certified products list anytime soon, although Chapman said the company is continuing to assess the product.

Chapman said he does think that Windows 3.0 provides better compatibility with DOS applications than does OS/2 and that Windows is an adequate environment for a simple local-area network with one access-interface point or a 3270-coaxial emulation-type connection.

However, Chapman said, "If your connectivity requirements are more complicated than that, or you want to operate LAN-based applications where the server is actually going to do part of the applications, you'd better check because Windows and local-area networks have not learned to hold hands completely yet, in our experience.

"Another issue is LAN compatibility — how many different ways can you connect to a LAN that Windows won't like? The number we've found is greater than one," he added.



Amoco's Chapman *is waiting for the Amoco divisions to fully accept his OS/2 decision*

Chapman added that Amoco will not do any development under Windows until there is a clear path of applications transportability from Windows to OS/2. Chapman noted that Amoco users have shown "very little interest" in Windows.

Amoco has also had difficulty getting Windows to run effectively on Intel Corp. 80286-based machines.

"Microsoft has been fairly loud in saying that you can run Windows successfully on a 2M-byte 286 machine, and that's correct," Chapman said. "Unfortunately, the copy we got of that claim did not in fine print below explain that meant Windows [only]; if you wanted applications, that was extra."

Project manager's users cite Windows edition's speed

BY CAROL HILDEBRAND
CW STAFF

Computer Aided Management, Inc. had the timing down pat.

While Viewpoint, its project management software, was generally well regarded, its graphics capabilities were not exactly up to par. In fact, according to Brian Hedges, assistant division chief at the Fiscal Methods Division of the U.S. Bureau of Labor Statistics in Washington, D.C., "the old graphics package was really a dog."

So the Petaluma, Calif.-based software firm switched to a Microsoft Corp. Windows-based graphics package with Viewpoint Version 4.0 just in time for the advent of Windows 3.0.

With Version 4.1, Computer Aided Management has continued to enhance the graphics package.

"In Version 4.1 vs. 4.0, the main difference is probably the speed," said Harlan Kelly, an engineer for the city and county of San Francisco. Kelly said that to draw a histogram, a scheduling tool that adds up required man-hours in chart form, the speed improvements "are somewhere in the magnitude of where it once took hours, it now takes minutes."

Kelly also said that cutting and clipping between Windows applications was easier.

Charts made easier

Doug Gross, an estimator/scheduler at Gerald Phipps Co., a Denver-based general contractor, pointed to some of the labeling options now available for charts. "The biggest enhancement is vertical lines at intervals," he said. For example, project managers at his firm use a lot of Gantt charts, he said. "Now, you can establish a vertical line on the chart, which makes it easier to read."

Hedges liked the fact that Viewpoint now makes it possible to preselect parts of a project that need graphing. "Windows can only take so much information. It warns you ahead of time when there's going to be too much data and gives you a chance to select parts [of a project] to graph," he said.

Although the company recommends using at least an IBM Personal Computer AT or compatible, at least one user upgraded that threshold to an Intel Corp. 80386-based machine. According to Hedges, some of his co-workers run the package on an AT, but he would not want to. "After using it on a 386, it drives me crazy," he said.

Hedges added Windows 3.0 is necessary for a smooth job. "It was absolutely horrible on Windows 386," he said.

Viewpoint users can upgrade to Version 4.1 for $150, including support, the company said.

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SPF/2 includes 75 ISREDIT commands that interface with REXX and, if you wish, you may write your own commands and assign them to the 48 programmable function keys. Your existing mainframe REXX edit macros may also be downloaded to run with SPF/2.

SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 even displays the same status indicators.

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Lotus decision impact weighed

BY RICHARD PASTORE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp.'s recent decision to scrub its Marketplace consumer demographics database was a victory for privacy-rights advocates and a blow to firms interested in dispensing personal data on CD-ROM software, observers said.

Lotus announced that the "volume and tenor" of protests forced it to cancel the March release of Marketplace: Households. More than 30,000 people registered complaints with the firm and demanded the removal of their names from the compact disc/read-only memory (CD-ROM)-based database on the grounds that they did not give Lotus permission to sell their personal information.

The $695 CD-ROM package for the Apple Computer, Inc. Macintosh was to contain 120 million U.S. consumers' names, addresses, estimated income and buying-habit information.

Off the bandwagon

While Lotus Chief Executive Officer Jim Manzi claimed that the financial impact of the cancellation would be nil, some observers predicted a dampening impact on similar product plans elsewhere.

"Any company developing Marketplace-type software will probably rethink it because they'd have a lot less clout than Lotus does," said Marty Gruhn, an independant industry consultant based in Mesa, Ariz.

CD-ROM vendors also see a narrow impact from the Lotus decision. "This has taught publishers of this type of information that they have to be very careful of what form they offer it in," said Kurt Mueller, president of Dataware Technologies, Inc., an optical disc software and services vendor based here.

However, the Direct Marketing Association downplayed the cancellation's effect on privacy issues and the industry.

"Direct marketers and database developers are already concerned about privacy," a spokesman said. While the Lotus product apparently did not satisfy consumer concerns at this time, "there is nothing to say that such a product won't be useful somewhere down the line."

Champions of privacy rights were chiefly concerned about the scope of the Marketplace database — it included the names of nearly half of the U.S. population — and its manner and medium of distribution.

"There is no product that would have made more detailed personal information available on more people than Marketplace," said Marc Rotenberg, director of the Washington, D.C., office of Computer Professionals for Social Responsibility, which led the protest.

The nature of CD-ROM would have made it difficult to delete names and correct mistakes on a timely basis, added Robert Ellis Smith, publisher of the Providence, R.I.-based "Privacy Journal" newsletter.

Even potential Marketplace users voiced concerns about product misuse. "Every person who buys this can give it to anybody they want," said Tom McGrath, computer operations manager at the New Jersey Symphony Orchestra. "The software piracy on something like that could be incredible."

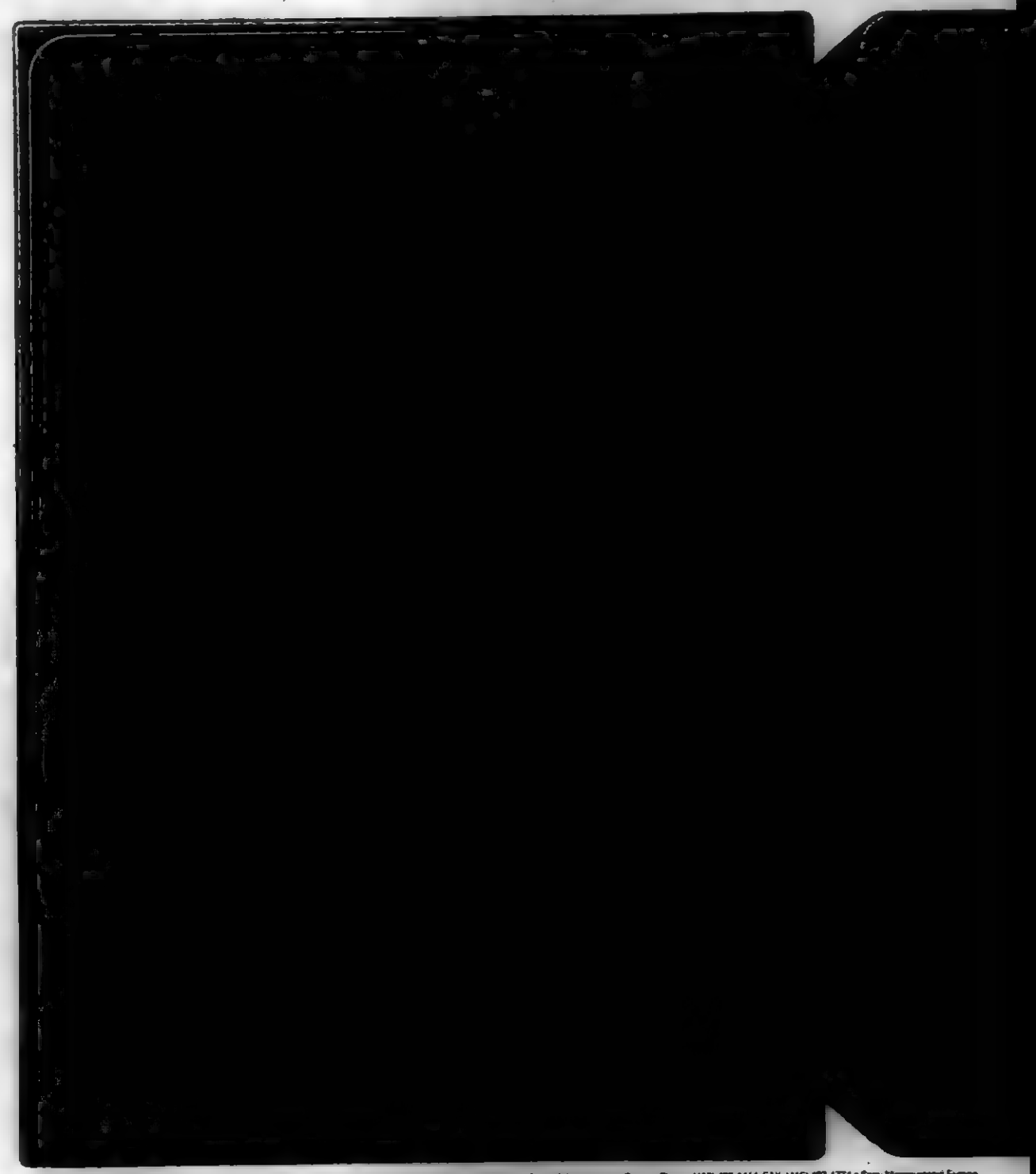
The victors in this contest said they do not hold a grudge against Lotus or CD-ROM technology. Rather than slowing technology development, "I hope our work on Marketplace directs efforts toward [software] that provides greater social benefit and does not undermine privacy," Rotenberg said.

With Marketplace: Households scrubbed, Manzi said he cannot justify costs to further distribute Marketplace: Business, a database of U.S. companies that began shipping last October. Customers of the discontinued product will receive a full refund, he said.

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Multiuser

FROM PAGE 33

the U.S. "Some people still think there are no alternatives to local-area networks," Seither said.

Multiuser DOS advocates said the beauty of the concept is that it preserves investments and allows for future cost savings. Because multiuser DOS systems are really MS-DOS systems — they run DOS software, use DOS commands and follow DOS conventions — information systems managers can continue to use familiar DOS applications and commands. Users can also display applications on low-cost dumb terminals instead of more expensive intelligent PCs.

Advocates also noted that there is no need for a network administrator. In multiuser DOS systems, all file access to the shared disk and file system is done directly on the bus, not across additional layers of network hardware and software. Some users see multiuser DOS as a low-end alternative solution to Unix. "We're heading toward Unix, but we'd like to stick with DOS as long as we can," said Dave Chittum, president of Auto Maintenance System, Inc. in Burbank, Calif. "Fortunately, the ease of support, maintenance and installation with multiuser DOS make it a great Unix option in work groups of less than 50 users."

Another selling point for multiuser DOS is security. Users working on dumb terminals are physically incapable of removing data from the system because the data is stored centrally on the host computer. Multiuser DOS systems offer security that LANs only offer with diskless workstations.

However, multiuser DOS fans said it is not a catchall solution. LANs make sense when individuals need to run processor-intensive applications such as computer-aided engineering or financial modeling. LANs may also be more appropriate when large numbers of users — for example, 50 to 100 — are required to connect to a centralized set of files of peripherals.

Migration plans

Analysts said LANs are also recommended for users who plan to migrate to graphical user interfaces and client/server architectures. Conversely, multiuser DOS systems are best suited for work groups that focus on text-based applications and that require only occasional access to graphics programs.

Multiuser DOS systems also have a number of capabilities that LANs do not. Because multiuser DOS can take advantage of 386 memory management, some multiuser DOS environments can provide users with more memory for individual applications than is often available to users working at PCs equipped with memory-resident LAN drivers.

Unlike network operating systems, multiuser DOS offers multitasking capability, allowing multiple DOS sessions to execute simultaneously while users switch back and forth among several active programs.

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NEW DEALS

Raytheon to buy CAD/CAM

Raytheon Co. has agreed to purchase a minimum of 150 of **Computervision Corp.**'s computer-aided design and manufacturing workstations and software products. Raytheon will use the equipment to design air traffic control, radar and submarine sonar systems.

The **Virginia Department of Health** is installing a $4.6 million statewide **NCR Corp.** computer system with an eye toward improving efficiency, accountability and patient service. The distributed system relies on a network of Unix-based NCR Tower computers to collect and distribute information across multiple vendors' platforms.

Oryx Energy Co. has agreed to purchase more than 500 personal computers in 1991 from **Northgate Computer Systems, Inc.** The contract covers Northgate's Intel Corp. 80386- and I486-based systems.



"My ultimate PC system? Well, for starters, it's got to be compatible with everything I've got already... so you can take a floppy from an old PC, pop it into a new one, and it will work."



"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work... and still connect with all the networks I've already installed."



"We've got plenty of data... the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."



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They wanted a graphical user interface with no compromise in performance. Like Macintosh.

And they wanted all their software to have a single way of working, so training and support costs could be dramatically lower. Like Macintosh.

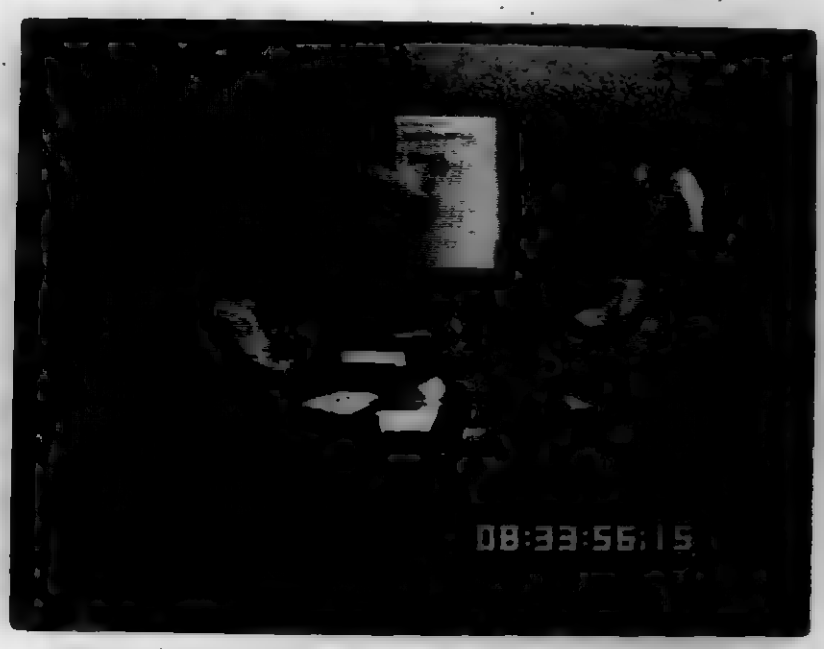
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"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."



"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate the cost of constantly retraining."



"My company's needs go way beyond off-the-shelf software. I need serious development tools my existing programming staff can use to develop custom apps quickly and easily."



"Macintosh? No kidding?"

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CONTINUED FROM PAGE 33

sources said, is to work toward freeing IBM from its long-term partnership with Microsoft — one that appears more and more to be working mostly in Microsoft's favor.

What's unclear is what this means for those users and developers who have invested in OS/2 and, to a lesser extent, Officevision LAN. We're not talking huge numbers, but we are talking some key accounts and some big-name developers. These people wield clout, and they don't want to find out that they've made messy or expensive mistakes.

A developer who is close to Microsoft thinks he has the boys in Bellevue all figured out. "Microsoft owns all the technology for OS/2 and Windows; they are now looking forward from the perspective of applications."

Because Microsoft already owns the desktop operating system market, it's now moving to dominate the applications market. Moreover, it wants to do so through Windows, according to the developer. "The most important thing to [Microsoft Chairman Bill Gates] is the future of his applications, so he wants to make sure Windows is everywhere so those applications have a place to go," he said.

One cynical observer noted that by not providing binary compatibility, unless developers want to run parallel development efforts, Microsoft forces the community to develop for Windows first and then go to OS/2 if they so desire. The reverse migration is not supported, he pointed out.

Even more caustic is the developer who claimed that "OS/2 was part of the biggest con of the decade. Microsoft mugged IBM and a few other big vendors."

Maybe. Maybe not. But it's the Presentation Manager graphical user interface that appears to be the big loser here, not necessarily OS/2. The capabilities that make up the back-end OS/2 kernel will survive, and that is, after all, the functionality that allows users to support downsizing and distributed computing efforts.

Microsoft is not likely to break a sweat over Presentation Manager, but IBM could fill buckets. It has so much money and customer confidence invested in Presentation Manager that most observers said they expect IBM to pledge continued evolution of its interface, no matter what Microsoft does.

More and more, I'm hearing users say they want to standardize on a Microsoft desktop. But many can't until Windows grows up in terms of host connectivity and support for the Intel 80386 and other high-end platforms. Hence, the plans for a 32-bit Windows and a rebuilt portable platform built around the Windows interface. If that means eclipsing, absorbing or replacing OS/2 and Presentation Manager, then so be it.

It has also meant that like it or not, IBM has had to backpedal and promise a Windows client for all those would-be Officevision users who balked at the thought of 8M bytes of OS/2 Extended Edition on every desktop. As one user said last week, "I'm just not going to do that."

IBM is said to be looking for and, some would say, actively building through development relationships, an escape hatch through which it can dump, and potentially, wound, Microsoft. Some developers and analysts have suggested that Microsoft's arrogance has reached new heights.

Of course, developers have little choice but to buckle under and write to the platforms IBM and Microsoft endorse.

So it's the users who hold the real clout here. A user at a major oil company who is working with OS/2 said a significant number of companies, including Microsoft, have written code to the Presentation Manager application programming interface (API).

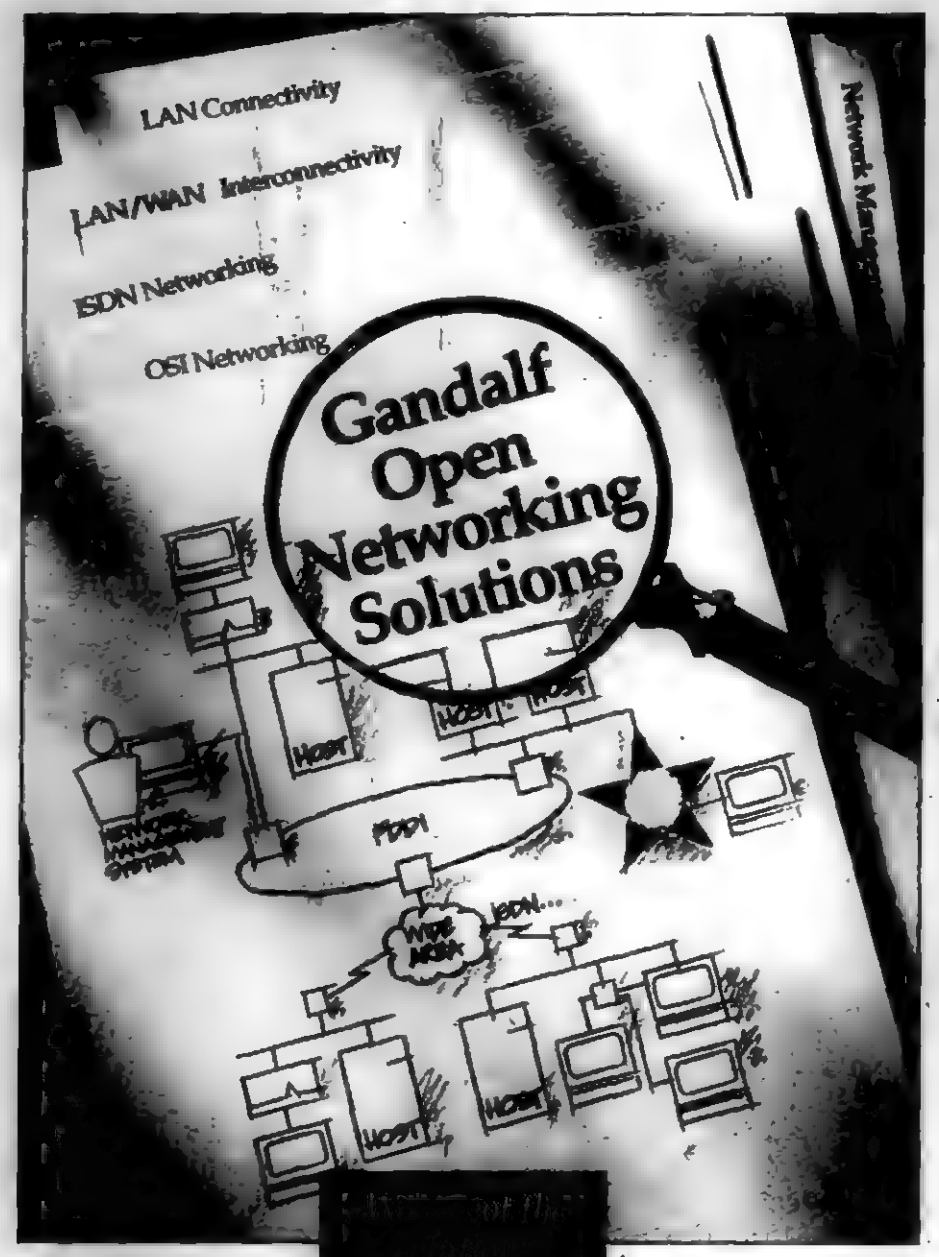
The only way Microsoft's vision can succeed is if API changes are evolutionary, not revolutionary, the user said. Otherwise, "a fair amount of people [will] make noise," he pointed out.

OS/2 is important to users like him precisely for the IBM-sponsored capabilities that others sneer at. He needs access to host graphics, for one. "My mainframes are not going to go away," he explained, no matter how much he may downsize in other areas. Even if Presentation Manager goes away, these features remain.

If Microsoft fails to recognize that and becomes too dictatorial, or if IBM and Microsoft go head-to-head with similar and competing systems, then users still have a trump card. They could say to heck with both and go to Unix, the user said.

IT'S THE PRESENTATION Manager graphical user interface that appears to be the big loser here, not necessarily OS/2. The capabilities that make up the back-end OS/2 kernel will survive.

Keefe is *Computerworld*'s senior editor, PCs and workstations.



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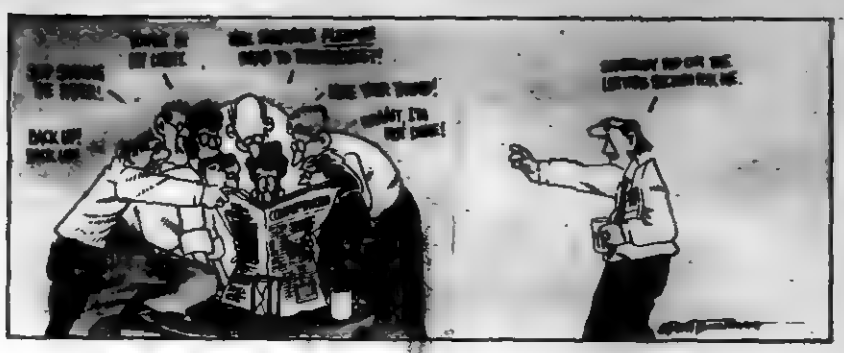
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1-2-3: Strong graphics, but more RAM required

Technology Analysis — a roundup of expert opinion about new products. Summary compiled by free-lance writer Suzanne Weixel.

That venerable granddaddy of spreadsheets, Lotus Development Corp.'s 1-2-3, shows in Release 3.1 that you can teach an old dog new tricks without giving up the traits that made the mutt so comfortable to have around.

The most recent release adds enough new spreadsheet features to thrill power users, and it provides the graphics capabilities everyone has been clamoring for. It also manages to maintain the traditional 1-2-3 menu system and character-based interface while running as a DOS task under Microsoft Corp.'s Windows 3.0.

Unfortunately, as reviewers at PC publications have been quick to point out, the graphics come added-in, not built-in, and 100% Windows 3.0 compatibility is still at least one upgrade away.

Performance: Reviewers found that Release 3.1 is slower than earlier versions in performing many tasks, particularly in the graphics mode. Graphics features are provided by an add-in called Wysiwyg, formerly called Impress and marketed by PC Publishing, Inc.

Release 3.1 requires 1M byte of random-access memory, but *Infoworld* claimed anything less than 2M bytes is sluggish, with 4M bytes being more realistic. New virtual memory capabilities make Release 3.1 compatible with Windows 3.0, but it still cannot take advantage of Windows drivers.

Compatibility: Lotus has always been concerned with backward compatibility, and Release 3.1 is no exception. According to *PC Magazine*, the fact that Release 3.1 is fully compatible with earlier releases is one reason to buy it.

Graphics: Reviewers agreed that the Wysiwyg add-in makes Release 3.1 the strongest spreadsheet publisher available. The catch is that you need a system with a lot of memory and a fast pro-

Database: Release 3.1 offers improved links with some external databases through its Datalens driv-

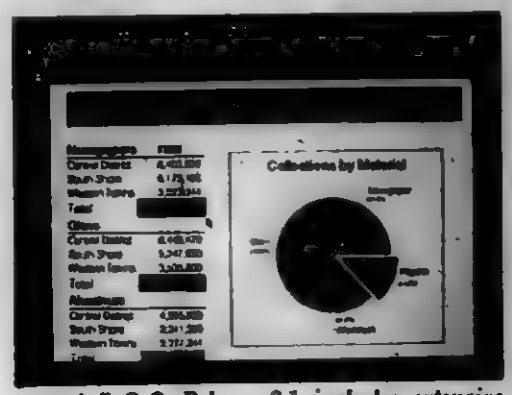
Output: According to reviewers, one of the most substantial improvements in Release 3.1 is the output, which is high quality and professional.

Documentation: The documentation, presented in paperback books, is as thorough as ever.

Ease of use: Reviewers find that navigating two independent menu systems — traditional 1-2-3 and Wysiwyg — can be confusing. Luckily, Wysiwyg supports a mouse, which makes some tasks easier.

Support: Lotus' toll-free support lines are answered 24 hours per day, seven days per week.

Value: For new users, 1-2-3 Release 3.1 costs $595. However, Release 3.0 users can upgrade for a paltry $35.



Lotus' 1-2-3 *Release 3.1 includes extensive graphics facilities*

Reviews Summary

Criteria			
Performance	Good	Still versions for RAM	Improved memory manager
Compatibility			
Graphics	Very good	Impressive power to beautify	Greatly improved
Database			
Output	Very good	Rich options	Enhanced
Documentation			
Ease of use	Satisfactory	Penalty with separate Wysiwyg	Lacks a full-fledged GUI
Support			
Value	Satisfactory	NC	NC
Reviewer's score	4.5		

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

What the experts say

• Users: Paul Anderson, automation analyst, CIBA Corning Diagnostics Corp. (*performance*: 8, *cost*: 7), "I grew up using 1-2-3, and I'm very comfortable with it. I find that the newer versions have more features and fewer problems."

Tim Arnold, mining engineer, J.S. Redpath Group of Companies (8.5, 9).



Stanfield Software's *Goldfarb*

Benjamin Goldfarb, manager of information services, Stanfield Seafood Co., (*performance*: 9, *upgrading cost*: 10, *out-of-the-box cost*: 9), "3.1 is a substantial improvement over 3.0. We really needed the graphics and the presentation-quality output. Other key features are the integrated mouse, which is very helpful as a productivity tool, and the Windows compatibility. The compatibility with our existing systems is a relief. It uses the Lotus commands that I know and love, and it comes with Lotus support, which is always very good."

• Analysts: Amy Wohl, Wohl Associates (*cost*: 10, *performance*: 7), "Although some users find 1-2-3's interface easy to use, I believe strongly in the future of graphical user interfaces. If Lotus would market Improv [its spreadsheet for Next workstations] on DOS systems, it would have a big hit."

David Cearley, program director, Gartner Group, Inc. (*performance*: 6.5, *cost*: 7).

Marshall Moseley, software analyst, Dataquest, Inc. (*performance*: 8, *cost*: 8), "As a pure spreadsheet, Lotus is extremely powerful. It falls short only in its graphics."

• Vendor financials: W. Christopher Mortensen, managing director, Alex. Brown & Sons, Inc. (*overall financial performance of company and product*: 4), "1-2-3 is about two-thirds of the company's business, and it is growing slowly now. Profitability is down due in part to increased spending on research and development and sales and marketing."

David Bayer, software analyst, Montgomery Securities (*overall financial performance of company and product*: 6).

Jim Wall, analyst, Soundview Financial Group (*overall financial performance of firm and product*: 5), "Lotus will feel competitive pressure until they get a Windows product out."

Lotus' 1-2-3 3.1

score:

Points (maximum)	Category
20 (30)	Published reviews
16 (20)	Analysts' ratings
13 (15)	Users' ratings
16 (20)	Cost evaluation
8 (15)	Vendor financials

(Maximum score: 100)

Lotus responds

Comments from Paul McNully, director of marketing for Lotus' 1-2-3:

Performance: Release 3.1's processing speed is as fast as, if not faster than, equivalent products. Also, because of built-in productivity tools such as three-dimensional capabilities, processing may seem slower, but the work gets done faster. The more memory you have, the better the performance.

Graphics: By making Wysiwyg an add-in, we can preserve compatibility with our existing menu structure, existing macros and the keystrokes used in our earlier graphics add-in, Allways. **Database:** 3.1 comes with the Ashton-Tate Corp. Dbase driver built-in, but there are other Datalens drivers available, including Borland International, Inc.'s Paradox, Oracle Systems Corp.'s Oracle and Sybase, Inc.'s Sybase.

Ease of use: Again, the two-menu system guarantees that users of earlier versions will be comfortable using 3.1.

Value: 1-2-3 Release 3.1 is a DOS application that is compatible with Windows. For most users, it is not an interim solution. It takes advantage of the key Windows features such as task switching. Anyone who wants the complete Windows user interface and the base-level technology may decide to wait for 1-2-3 for Windows, which will be out later this year.

Methodology: *Published reviews: average of numeric scores from product reviews published by PC publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of analysts' ratings of vendor financials and ability to support product from financial analysts multiplied by 1.5.*





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DCW11

MCI airs its global strategy

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — MCI Communications Corp. said last week it has established a service to take some of the headaches out of designing and managing international communications networks.

Aimed at U.S. firms with extensive overseas operations, MCI's Global Communications Service (GCS) is intended to offer a single point of contact for the design, provisioning, management and billing of worldwide private networks. MCI said it has reached agreements in principle with 16 foreign carriers to offer the service, which will encompass systems integration, network management and administrative support.

The company said it has signed one GCS customer so far, Visa International, Inc., in a market estimated by MCI to be worth $5 billion per year and growing at more than 20% annually. In a five-year, $87 million deal, MCI will help Visa develop and support a fiber-optic network linking worldwide transaction processing centers.

Jeffrey Ganek, MCI's director of global services, said GCS resulted from a poll of MCI's largest customers. "They all said their business is facing stiff competition on a global scale. They said they need a global communications infrastructure."

Ganek cited a large New York bank that has 130 people in 38 countries managing its data network: "[A bank official] said, 'I can't manage them, and I don't know what they are doing. I should have 30 people working for me.' " The bank is a prospect for GCS, and Ganek claimed the service could trim the bank's telecommunications staff by 75%.

The bank's large staff is necessary to deal with the myriad of telecommunications environments in which it must operate, Ganek said. Each country has a unique suite of regulations, services, approved equipment and equipment specifications.

Paired with Infonet

MCI is partnering with Infonet in the GCS offering. MCI primarily brings voice services and overall management to GCS while Infonet brings value-added data services in 117 countries and customer support staffs based in 37 countries.

GCS is the fourth step in MCI's path to becoming an international telecommunications firm, said Berge Ayvasian, vice president of communications research at The Yankee Group.

The first step was the acquisition of international carriers RCA Global Communications, Inc., Western Union International, Inc. and Overseas Telecommunications, Inc. Second was its purchase of a 25% stake in Infonet. Third is its ongoing international expansion of Vnet, its virtual network service.

MCI has taken one-stop shopping further than its competitors, Ayvasian said. "One-stop shopping is not sufficient. You can't be just a coordinator; you need to have an actual global network in place. You need to provide end-to-end service. That's where Infonet comes in."

Unlike AT&T, which tends to establish bilateral arm's-length arrangements with the European Postal Telephone and Telegraph (PTT) authorities, MCI has "bought into partnerships with the PTTs," Ayvasian said. "MCI is moving to be an international carrier; you're seeing a worldwide MCI."

This past November, AT&T announced a pact with British Telecom, France Telecom and KDD Ltd. in Japan to offer customers a coordinated, "end-to-end view" of their international networks, but it has not yet provided details about the service.

Under GCS, MCI will price the underlying service elements provided by MCI and foreign carriers at standard tariff rates. But because GCS is intended for very large telecommunications users, each with unique needs, MCI will price the overall service on a case-by-case basis.

Consolidated invoices will be prepared by MCI based on invoices and usage data from Infonet and foreign carriers.

U.S. E-mail providers close interconnections

BY ELLIS BOOKER
CW STAFF

In nature, we talk about "the urge to merge." When electronic-mail services are the subject, we politely call it "interconnections through X.400 gateways." In both cases, the process seems quite irresistible.

Last week, the Electronic Mail Association (EMA) reported all major U.S. public electronic mailbox providers have now completed commercial X.400 interconnection agreements.

The Arlington, Va., trade group heralded this as an impressive achievement because it occurred in relatively short order. The genesis for the interconnections came in 1989, when a handful of E-mail providers, with prodding from the Aerospace Industry Association, agreed to an X.400 pilot.

EMA Executive Director Michael F. Cavanagh said of the X.400 interconnections, "Once the standard was adopted, the next important step was the filling of the grid," he said.

That is not to say message transmission across X.400 gateways is now commonplace. This "interenterprise" environment, Cavanagh noted, will take experience on the part of users and their E-mail providers alike.

E-mail analyst Walter E. Ulrich, managing director of Arthur D. Little, Inc.'s Los Angeles office, is not sure how much cross-service messaging is currently going on.

"But I know for a fact that people are always asking me for my E-mail address," said Ulrich, who, like an increasing number of businesspeople, may soon have this information printed on his business cards.

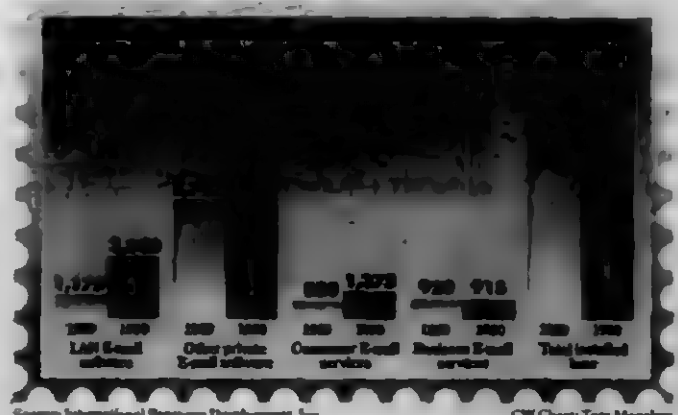
Yet Ulrich observed that aside from the all-important X.400 interconnections, public E-mail systems have changed little since the late 1970s. Indeed, Ulrich said he suspects some savvy E-mail provider will burst on the scene by taking existing technology and repositioning it, similar to what Federal Express Corp. did to the shipping business in the mid-70s.

"I believe users of messaging have matured to the point where they are ready for something like that, for someone to take messaging into the '90s," Ulrich said.

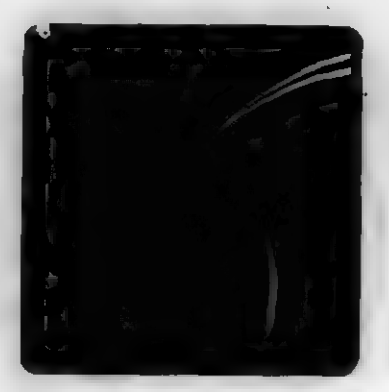
Now that interconnection agreements are largely complete, the EMA said it will press for three more capabilities:

- Establishment of commercial interconnections across national boundaries.
- Large-scale connection and support of private E-mail systems.
- Creation of a complementary directory service to support the global E-mail grid.

In addition, discussions are under way to resolve questions about the billing structure for cross-service messaging, according to Cavanagh. "Pricing issues are being hashed out right now," he said, adding that he is confident these talks will result in cost-effective services. "These services will be provided at a fair price, or nobody will buy them," he said.



Source: International Resource Development, Inc. CW Chart: Tom Monahan



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LANs slow downsizing efforts

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — The move to downsize mainframe applications — and to place them on cost-effective local-area network servers — may have hit a snag with the lack of robust LAN operating systems and development tools.

Representatives of companies such as Chevron Canada Ltd. and Coca-Cola Co.'s Foods Division spoke about start-up problems at Digital Consulting, Inc.'s recently held Downsizing Conference.

Users at Chevron Canada, who are putting a 35-site LAN network into place, spoke of reviewing nine different database management system alternatives before selecting Sybase, Inc.'s SQL Server as the anchor for each LAN. "We needed data security and integrity independent of the applications we would write," said Dave Berry, a software manager at the $1 billion Vancouver, B.C., Chevron division. "Users should be able to get at real corporate data that's up-to-date and secure. But many of the products we looked at didn't support real distributed database functions."

Other speakers said downsizing is accelerating as information systems managers try to trim operations costs and reduce the applications backlog. Yet the quest for graphical user interfaces, user-friendliness and low cost should not compromise traditional IS requirements for security and consistency of data.



Coca-Cola Foods in Houston is shifting the bulk of its day-to-day processing to LANs, leaving just 17 applications on a corporate mainframe in Atlanta. "Database and filing systems aren't really mature, and many people [in the business units] don't know how to use them," said Cheryl Currid, director of end-user computing at Coca Cola Foods.

"You need to bring in the auditors and the security people from Day 1," when LAN applications are being developed, Currid said. She said more tools were needed to manage development of applications under the Microsoft Corp. Windows 3.0 environment, which is on Compaq Computer Corp. Systempro computers at Coca-Cola Foods.

Several industry analysts criticized both Novell, Inc.'s Netware 386 and Microsoft's LAN Manager for lacking sufficient "robustness" as potential replacements for mainframe systems.

Richard Finkelstein, president of Performance Computing, Inc. in Chicago, said even IBM's OS/2 Extended Edition needed modification. "There is no forward recovery on OS/2 Extended," he said. "In the event of disk drive failure, you can't recover all prior transactions." He said IBM was working to fix that problem.

Even vendors acknowledged the need to beef up LAN software with network management and data security features. "If companies are going to bet the farm on information technology, they will demand a quality of product that exceeds anything we've seen before [on PCs and LANs]," said Robert McDowell, Microsoft's vice president of Information Techology Integration Services, a newly formed consulting group for users. "Users are going to demand some protection on the significant investment they're making. Vendors had better be prepared to deliver training and support."

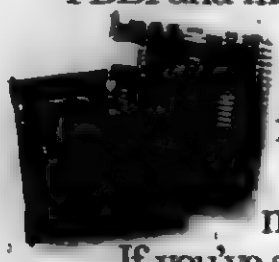


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BIT BLAST

Interop adds show coverage

Interop, Inc. will go bicoastal next year, holding a second interoperability conference in Washington, D.C. The Mountain View, Calif., company will stage its Interop show May 18 to 22. The West Coast Interop show will also move to San Francisco in 1992. The show has been held in San Jose, Calif., since 1987. Both moves, according to the company, are being made to accommodate increasing attendance.

Five leading Japanese computer companies recently became partners in Novell, Inc.'s Tokyo-based joint venture, **Novell K.K.** The partners include **Canon U.S.A., Inc., Fujitsu America, Inc., NEC Technologies, Inc., Sony Corp.** and **Toshiba America, Inc.** The joint venture was formed last April with co-investor Softbank Corp. to market Novell's Netware network operating system in Japan.

Internetworking vendor **Wellfleet Communications, Inc.** said that it will ship software for its routers this month that provides administrators of Novell Netware local-area networks with added levels of security. Wellfleet's router filtering features reportedly allow partitioning of large networks as well as preventing unauthorized client access to restricted servers.

Broadband gear on tap

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — Two rival products displayed at last week's Communications Network '91 show are targeting users who are impatiently waiting for carriers to introduce affordable, broadband switched services.

Teleos Communications, Inc. and Ascend Communications, Inc. presented products that are said to amalgamate switched 56K bit/sec. connections into larger chunks of bandwidth, which can then be allocated to bandwidth-hungry applications on an as-needed basis.

Teleos' IAP6000 Integrated Services Digital Network (ISDN) Access Server was announced in December, and Ascend's Multiband family was introduced last month.

Both boxes reportedly can accept input and dynamically allocate bandwidth among a range of networking devices, including local-area networks, videoconferencing systems and private branch exchanges (PBX) systems.

Different target markets

The two vendors are targeting slightly different segments of the broadband switched service market, however. Teleos' IAP6000 specializes in linking token-ring LANs, according to Rod Randall, director of strategic marketing at the Eatontown, N.J., vendor. The product supports multiple ports, each of which accepts input from a token-ring LAN at speeds of up to 4M bit/sec., he added. The device then takes the LAN input and routes it over a T1 or ISDN Primary Rate Interface link at speeds of up to 2M bit/sec., he said.

Because the IAP6000 performs its own routing, it can dynamically allocate multiple 56K bit/sec. or 64K bit/sec. bandwidth segments to each LAN, according to the ups and downs of user traffic, Randall said. In addition, the device is said to allocate subsets of T1 bandwidth to different remote LAN sites. "It can establish bandwidth between site A and B or site A and C at different amounts, ranging from 64K bit/sec. pipes to 32 sites and one 2M bit/ sec. pipe to one site," Randall said.

The IAP6000 is also said to accept input from a PBX system, so the PBX and LANs can contend for bandwidth on a dynamic, as-needed basis, Randall said. Support of videoconferencing systems and other types of LANs is in the works, he added.

Ascend's Multiband box is built to accept traffic from LAN bridges and routers, PBXs and videoconferencing systems, according to company founder Jay Duncanson. Multiband is said to monitor bandwidth on routers and to increase its clock speed to that device as traffic demands warrant. However, it currently cannot handle multiple-destination traffic from a given LAN site. Ascend is now talking with several major LAN interconnectivity vendors about joint development projects that would provide closer integration, including multipoint routing, Duncanson said.

Both vendors said they have gone through testing to ensure that their boxes will be able to access the major long-distance carriers' respective high-speed switched connections. U.S. Sprint Communications Co. recently announced a service that allows users to merge up to eight switched 56K bit/sec. increments into a single high-speed link. The service requires a box from Digital Access Corp. that Sprint now resells. Sprint demonstrated its service jointly with Ascend boxes last month and is said to be considering whether to resell Multiband in addition to, or even instead of, the Digital Access box.

AT&T is said to be the only carrier whose switches can handle multiple increments of 56K bit/sec., such as 384K bit/sec., as one solid chunk.

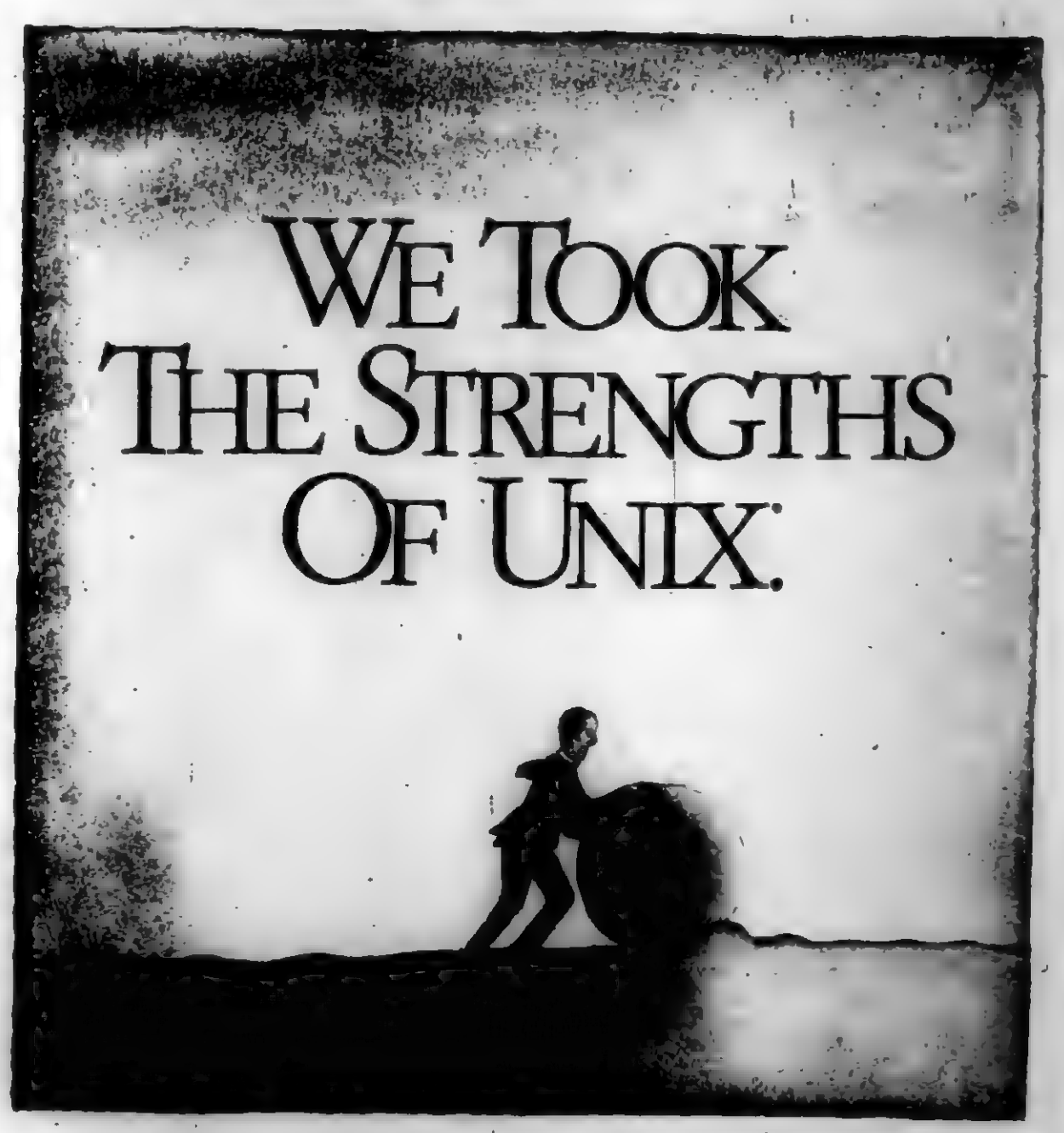
One advantage that Ascend claimed over its rival is the ability to set up multiple 56K bit/sec. connections simultaneously. In contrast, Teleos' product must call up each link serially, taking up to 10 seconds to do so, Randall said.

The above products will come into their own as soon as switched 56K bit/sec. services become widely available "at the cost of a voice call," said Berge Ayvasian, a vice president at Boston-based consulting firm The Yankee Group. While the long-distance carriers have been aggressively introducing broadband switched networking services during the last few months, switched 56K bit/sec. services on the local loop are still scarce and expensive.

Fortunately, the regional Bell operating companies are on the verge of announcing much more extensive switched digital broadband services, including both ISDN and switched 56K bit/sec. offerings [CW, Jan. 28].

While widespread ISDN connections on the local loop are still one or two years away, companies such as US West and Pacific Bell are now looking closely at the role switched 56K bit/sec. will play in their networks as an inexpensive way for users to access both ISDN and other switched broadband long-distance services.

Teleos' IAP6000 is scheduled for first quarter availability, and Ascend's Multiband controllers are scheduled for immediate shipment.



Securities group signs up for Sprint discounts

BY ELLIS BOOKER
CW STAFF

NEW YORK — While the stock market has gone topsy-turvy in recent months, the securities industry has brought a measure of stability to its telecommunications needs, signing a three-year contract valued at more than $100 million with U.S. Sprint Communications Co.

The agreement with the Securities Industry Association (SIA), which represents 600 brokerage and investment firms in the U.S. and Canada, will provide discounts to members for long-distance voice and data services. Members will contract with Sprint to get the SIA discount.

Telecommunications represents a substantial expense for securities firms, which collectively spent an estimated $2 billion to $3 billion on communications last year, SIA officials said.

The agreement includes public- and private-line services, as well as Sprint's software-defined Virtual Private Network and its outbound WATS and inbound 800 services.

This is the second time the SIA has offered its members a volume purchasing agreement for telecommunications services. Two years ago, the SIA inked a deal with New York Telephone Co. for local private lines.

"In the current environment, saving money is very important to our members," said Arthur L. Trager, assistant vice president and director of administration at the SIA and one of two staff advisers for the SIA's information management committee.

Trager could not say, however, how much the 600 SIA members might now expect to save through Sprint because their savings will depend on their current mix of network services and providers.

Acting as a quasi-agent for Sprint, the SIA will receive, in addition to service discounts, a portion of the revenue Sprint makes from sales to SIA members. Sprint said the $100 million figure is a conservative estimate of how much it expects to receive in revenue under the agreement.

Sprint has increasingly employed joint marketing arrangements to reach businesses it deems important.

In 1988, Sprint formed the Intermediaries Marketing Group to explore "affinity marketing" opportunities. Although the SIA deal did not come out of this unit, Sprint inked a comparable three-year, $100 million contract in January with Universal Telecom Access Corp., a national fund-raising group of Jewish nonprofit organizations and colleges based in New York.



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COMMENTARY

Eli S. Lurin

Customer service drives ISDN

Significant advances have been made of late to harness the computer's intelligence and database resources with the intelligent switching and call distribution capabilities of both public and private networks. For a time, such offerings looked to be yet another solution in search of a problem. However, it is becoming increasingly clear that there is at least one strong niche for computer-to-network integration — customer support.

The ability to provide high-quality customer service has become a key competitive differentiator for a variety of industry sectors. Telecommunications technologies such as automatic call distribution systems have already become standard equipment for customer service and support representatives.

A study of the automatic call distribution market I recently worked on for New York research firm Frost & Sullivan found that $837 million was spent on automatic call distribution in 1990, and that this market is growing at a rate of 10% per year. This same study determined that the most important benefit of automatic call distribution systems is improved customer service.

Now, automatic call distribution systems are being linked to advanced technologies such as Integrated Services Digital Network (ISDN) and intelligent networks that can deliver key information such as caller number identification to the customer service call centers. Automatic number identification is used in call centers to connect a customer's file from the corporate database to the agent handling the call. Information can include sales records, order status and maintenance records. This agent delivers better service because the customer's information is immediately available during the call.

However, this type of application only scratches the surface of what can be done if vendors and users integrate some of the more sophisticated computer and telecommunications technologies. What follows are some of the possibilities:

- Artificial intelligence expert systems can provide valuable assistance to agents responsible for providing customer service and support. They need access to a database of information that describes the specific customer's installed equipment. The expert system combines that data with the customer's description of an equipment maintenance problem and then uses a rule base to draw inferences on the source of a given problem and to recommend a solution to the call-center agent.

In many cases, a company will have multiple call centers, an expert system and multiple databases that all reside at different sites throughout the country. Thus the need for an intelligent network that can match the call-center agent to the expert system and database resources needed to tackle a particular customer's specific problem.

- Another application is the use of ISDN to provide data and voice together during a service inquiry. For example, an IS department staff member who is supporting a user at a remote site can carry on a voice conversation with the user while they are both looking at the same workstation screen.

Either ISDN or a high-speed switched-data service supporting 56K bit/sec. or T1 speeds can be used to provide a customer with a large amount of information, such as a long specification, an updated program and an updated data file without paying for dedicated lines. A company's data center can also use such links to download updated software to internal customers.

It is clear that the need for better customer service is a potential driver for many telecommunications services. To realize this potential, however, vendors and carriers must get together with users to determine how existing telecommunications and computing systems can be packaged to meet customer support needs — and how research and development efforts can be focused on meeting this particular market segment's needs in the future.

Lurin is president of Elpan, Inc., a consulting firm in Great Neck, N.Y.



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Netware set-up tools debut

BY JIM NASH
CW STAFF

Unable to find software that would automate the time-consuming process of configuring 14 Novell, Inc. Netware file servers, Preferred Healthcare Ltd. wrote its own application.

Today, Preferred Healthcare's newly formed subsidiary, Preferred Systems, Inc., is marketing what is considered to be the market's first configuration automation software for DOS-based servers.

Preferred Systems introduced Origen and Lanstandard for Novell's Netware product line last week. Origen configures new file servers, and Lanstandard automates the ongoing configuration and reconfiguration tasks for local- and wide-area networks.

Positive results

Matt Ventura, a University of Rhode Island beta-test Origen user, said the software automated the process of giving 200 users access rights to equipment and applications on a single-server network. Ventura is a senior systems analyst for the university's College of Resources Development.

Origen comes with a workbook that administrators fill out before they actually implement the software, he said. The book asks such questions as how many software licenses do you have?; Who are the users?; What subdirectories will hold which applications?

"It forces you to organize your thoughts about how the network will be set up," Ventura said. Much the same information is entered on the server at prompts by Origen. The server, he explained, is formatted in "less than 30 seconds" after activating the application.

Configuration takes less than two hours, said Jack Serfass, president of Preferred Systems. Generating a Netware file server can be done in one hour, he added.

In a class by itself

Mike Heylin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif., said he is unaware of any other DOS-based network management tools like those of Preferred Systems. Heylin said that while both applications are aimed at saving time for administrators of large, growing networks, they simplify the configuration process to the point where less technical personnel can safely bring systems up.

Heylin noted that Origen lacks remote-console capabilities. Therefore, administrators must work from the same server each time a new configuration is needed. Network managers using Lanstandard are able to perform inventories down to the workstation level, Heylin explained.

Serfass said Lanstandard enables administrators to set up a typical configuration on disks and deliver them to sites for consistent configurations in dispersed networks.

"There are all kinds of gotchas" in configuring networks, said Bob Holmes, computer technology research analyst at Southern California Gas Co. in Los Angeles. Standardizing set-ups, which he said can take four hours, would help eliminate errors.

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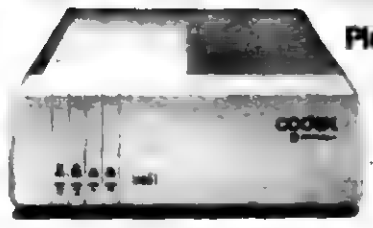
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MANAGER'S JOURNAL

EXECUTIVE TRACK



Gerald H. Sandler has been named president of **Grumman Data Systems**, the systems integration services division of Grumman Corp. in Bethpage, N.Y.

Sandler had been senior vice president of information systems at Grumman since 1985. He replaces Robert J. Myers, who was elected president of the corporation after heading the Data Systems Division since 1986.

A longtime Grumman veteran, Sandler completed the MIT program for senior executives in 1981 and was appointed deputy department head of Grumman Aerospace's engineering department. His positions prior to that included director of the software systems department and assistant to the executive vice president.

Sandler is a graduate of the City University of New York.

.....

W. Richard Howard, former senior IS executive at Northrop Corp., has been named managing vice president of the new information technology practice at **Korn/Ferry International** in Los Angeles.

Howard led IS at Northrop for seven years and served on IBM's IS Customer Advisory Council in 1989-90.

Before joining Northrop, Howard was president and chief executive officer at Continental Airlines' computer services subsidiary. He also worked in the White House as a special assistant to the President and at IBM as a marketing representative.

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Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

A conservative road to success

New England's largest supermarket chain has a no-nonsense way of managing IS

BY ROSEMARY HAMILTON
CW STAFF

Picture grocery shopping with an automated shopping cart, a device now being piloted at some supermarkets. A computer screen attached to the cart can flash sale messages and advertisements to shoppers as they travel through the store.

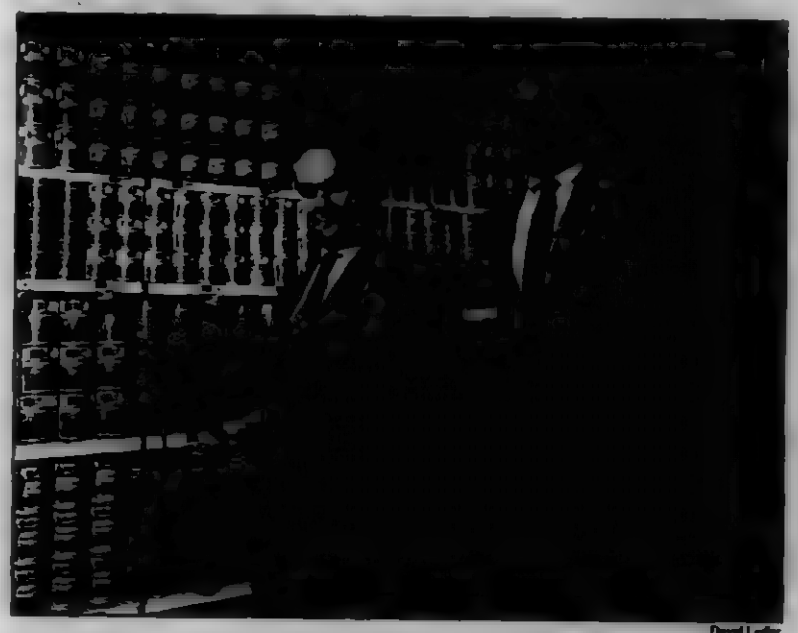
This may be one of the latest devices in retail automation, but information systems executives at The Stop & Shop Companies, based in Braintree, Mass., have their doubts about it. They are waiting for the so-called video cart to prove that it would truly help customers rather than distract them.

This opinion exemplifies the way Stop & Shop's top IS executives do their jobs. They show a practical, no-nonsense approach to managing IS at the largest supermarket chain in New England. The company runs 117 grocery stores as well as 130 Bradlees general merchandise stores. The ultimate aim of IS, addressed by a combination of in-store and back-room automation, is to create a store environment in which customers like to shop, says Robert Manson, vice president of information systems. The goal is to implement systems and devices that make all aspects of shopping, from finding items to having credit authorized, quicker and easier for the customer.

"We look at these things [such as video carts], and we are aware of them," adds Bruce Hannon, vice president of information services. "But we don't experiment on customers."

This conservative philosophy guides not only management of the store but the corporate data center as well. Late last year, the firm completed an $18 million IS rehaul that included a new data center, which runs a partial lights-out operation, and an upgrade of its mainframes. However, the firm did not select IBM's newest generation, the Enterprise System/9000, because a 3090J model suited its purposes. Hannon says he expects the 3090 to handle the job for three years.

Also, the executives are not interested in shifting gears to jump on all the latest IS trends, such as downsizing. Manson says the company has long maintained a balance between centralized and decentralized computing. The main data center handles corporatewide issues such as networking and payroll while individual stores handle support for their specific functions.



David Leifer

Stop & Shop's *Manson (left) and Hannon spearhead the chain's technology efforts which include the use of radio frequency scanners to track inventory*

However, Stop & Shop has also played the innovator. It was one of the first food retailers to implement point-of-sale scanning devices on a chainwide basis in the early 1980s. Since then, it has continued to add in-store devices, from systems managing the pharmacies and video rental centers of its "superstores" to handheld radio frequency devices used to collect inventory data directly from store shelves.

Richard Norris, a senior consultant at Arthur D. Little, Inc. in Cambridge, Mass., says the company keeps a low profile when it comes to retail automation. "They have not been particularly visible in their use of IS to further their business," he says.

Continued on page 55

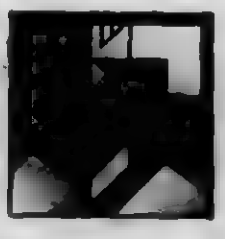
ODECO avoids outsourcing disaster

BY CLINTON WILDER
CW STAFF

Some anxious moments about the fate of IBM-based processing at Ocean Drilling & Exploration Co. (ODECO) ended recently when the company signed a three-year outsourcing contract with Power Computing Co.

ODECO had been notified six months ago by its former outsourcing vendor, Houston-based Summit Computing, that it was exiting the outsourcing business. New Orleans-based ODECO had signed a three-year contract with Summit two years ago to develop and run IBM-based corporate payroll benefits and personnel applications. Much negotiation with Summit followed, but according to Gil Gilreath, assistant vice president of administration at ODECO, there were never any service disruptions.

"We just had to renegotiate what would be done at what price," Gilreath said. "We wanted more of a comfort level; they wanted to cleanse their books. But it worked out all right in the end," he said. "We minimized the cost and there were no disruptions."



Summit parent company Texas Eastern Corp., a gas utility, decided to end its foray into the computer services business after it was acquired by Panhandle Eastern Corp. in 1989. Summit was formed out of Texas Eastern's internal information systems function in 1987. ODECO is a $320 million international offshore drilling firm.

ODECO's 20-employee in-house processing is an all-Unisys Corp. shop with an A 10 mainframe, but the firm decided to outsource payroll processing for all its employees who are paid in U.S. dollars. Summit agreed to develop the IBM mainframe-based application and run it. "I don't think anyone anticipated them getting out of the business," Gilreath said. "It was unfortunate for us that it happened."

Bringing payroll processing back in-house was not an option, Gilreath said. "We would have had to purchase an IBM mainframe, and the cost would have been prohibitive," he said. ODECO chose Dallas-based Power Computing because it already had a close relationship with Power's parent company, energy services firm McDermott International, Inc., according to Gilreath.

CALENDAR

FEB 24 - MARCH 2

Computer Associates International's V32/ESA Educational Workshop. New Orleans, Feb. 24-26 — Contact: George Jamtsis, Computer Associates International, Garden City, N.Y. (516) 227-3360.

IEEE Conference on Artificial Intelligence Applications. Miami Beach, Feb. 24-28 — Contact: IEEE Computer Society, Washington, D.C. (202) 371-1013.

Share 76. San Francisco, Feb. 24-March 1 — Contact: Share Headquarters, Chicago, Ill. (312) 644-6610.

Gartner Group Interenterprise Systems Conference. Lake Buena Vista, Fla., Feb. 25-27 — Contact: Ashley Pearce, Gartner Group, Stamford, Conn. (203) 967-6757.

Communications Connections (Comnexus '91). San Diego, Feb. 25-27 — Contact: Disneplanes, Redwood City, Calif., (415) 591-0183.

Sun Open Systems Expo. Boston, Feb. 25-27 — Contact: Sun Open Systems Expo, (512) 331-7761.

The State of The Practice/The State of the Art CASE Conference. Orlando, Fla., Feb. 25-27 — Contact: Extended Intelligence, Chicago, Ill. (312) 346-7090.

Compcon Spring '91. San Francisco, Feb. 25-March 1 — Contact: Roger Anderson, Livermore, Calif. (415) 422-8572.

SAE International Congress and Exposition. Detroit, Feb. 25-March 1 — Contact: IDI, Ann Arbor, Mich. (313) 995-2040.

EDI and the Law '91. Washington, D.C., Feb. 26-27 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

European Wireless Systems Conference. Munich, Germany, Feb. 26-27 — Contact: Rita A. Tannenbaum, Probe Research, Cedar Knolls, N.J. (201) 285-1500.

Financial Market Data Conference. New York, Feb. 26-27 — Contact: Waters Information Services, Binghamton, N.Y. (607) 772-8006.

Working with Personal Computer Local-Area Networks. Milwaukee, Feb. 26-28 — Contact: John T. Snedeker, University of Wisconsin at Milwaukee, Milwaukee, Wis. (414) 227-3101.

The Restructuring and Outsourcing Conference. Orlando, Fla., Feb. 27-28 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Strategic Planning Systems Conference. Tempe, Ariz., Feb. 27-March 1 — Contact: Pete Ashey, Conference Coordinator, Nardoni Associates, Lebanon, N.J. (201) 730-9444.

MARCH 3 - 9

Seybold Seminars. Boston, March 4-7 — Contact: Seybold Seminars, Malibu, Calif. [illegible]

IS Performance/Capacity Management Conference. Mesa, Ariz., March 4-8 — Contact: Applied Computer Research, Phoenix, Ariz. (602) 995-5029.

Directions '91. New York, March 5 — Contact: International Data Corp., Framingham, Mass. (508) 879-6700.

Point-of-Sale Transactional Networks. Washington, D.C., March 5-6 — Contact: Telestrategies, McLean, Va. (703) 734-7050.

ACM's Computer Science Conference. San Antonio, March 5-7 — Contact: Don Nowak, Association for Computing Machinery, New York, N.Y. (212) 869-7440.

CASE World. Los Angeles, March 5-7 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Fuse '91. Washington, D.C., March 5-7 — Contact: Fuse '91 Registrar, Alexandria, Va. (703) 683-8500.

Techconnect. San Francisco, March 5-7 — Contact: Techconnect, Austin, Texas. (512) 343-9068.

Windows and OS/2 Conference. San Jose, Calif., March 5-7 — Contact: CM Ventures, Emeryville, Calif. (415) 601-5000.

The Networked Economy: Global Communications in the 1990s. Washington, D.C., March 6-7 — Contact: CMP Conference Group, Manhasset, N.Y. (516) 562-5717.

National Computer Service Network. Ft. Lauderdale, Fla., March 6-8 — Contact: NCSN, Atlanta, Ga. (404) 255-1043.

Interex Computing Management Symposium. Reno, Nev., March 6-8 — Contact: Interex-ICMS '91, Sunnyvale, Calif. (408) 738-4848.

Communication Technologies Conference '91. Washington, D.C., March 6-7 — Contact: Jess Seigle, Technology Interchange Group, Clifton, N.J. (201) 478-3606.

Effective Problem Solving Within the IS Organization. Orlando, Fla., March 6-8 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

East Coast Oracle User Resource Conference. Washington, D.C., March 6-8 — Contact: Dale Lowery, Oracle User Resource, Washington, D.C. (202) 254-4864.

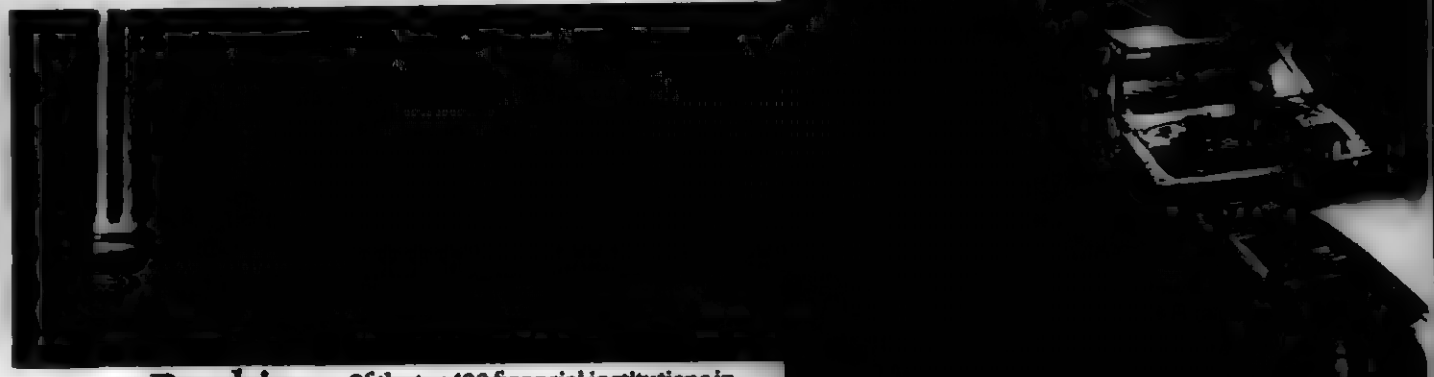
Image Communications Conference. Orlando, Fla., March 6-8 — Contact: BIS CAP International, Norwell, Mass. (617) 982-9500.

Open Systems Explained — The Management Issues. London, March 7 — Contact: Suzy Mayhew, London, England: 071 236 4080.

The Interactive and Information Services Conference. Washington, D.C., March 7-8 — Contact: Telecommunications Report, Washington, D.C. (202) 347-2970.

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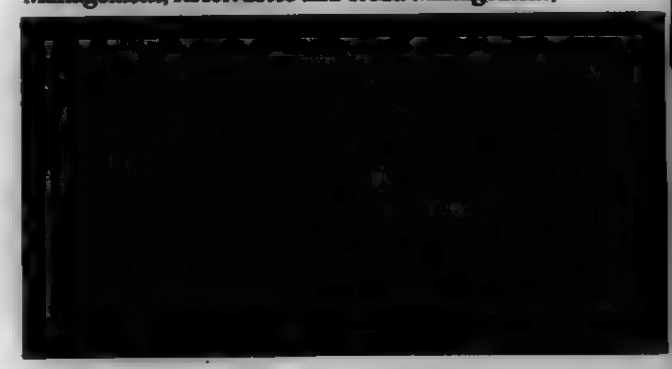
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VDT liability raises questions

BY J. A. SAVAGE
CW STAFF

If electromagnetic fields, which emanate from most VDTs, become linked to health effects in the future, employers will be largely protected from economic liability under current laws.

Still, lawyers warned that employers should not stick their heads in the sand on high-technology health issues, even when the relationships between exposure and human health are difficult to prove.

"It's more dangerous to be inattentive," said Lara Pincus, an assistant professor of business law at De Paul University in Chicago. "An employee can sue for malicious conduct under workers' compensation in most states if the employer knew of dangers and failed to take appropriate steps." However, Pincus added, deliberate inaction may be difficult to prove.

State workers' compensation laws are a sort of "no-fault" insurance that protects employers from civil liability and large payments. Whether an injury is the worker's fault or the employer's fault does not matter in workers' compensation cases.

No-fault workers' compensation, however, was developed in an era of less creeping workplace toxicity and big lawsuits. "Most workers' comp laws were formulated before VDTs, before toxic chemicals," said David Rosen, a Los Angeles attorney. "It was made to deal with specific trauma, like hitting your thumb with a hammer."

Yet employers like the idea of no-fault insurance. "We have protection from workers' comp and [the California Occupational Health Administration]. It's no-fault insurance," said John Cammidge, director of employee relations at Bank of America in San Francisco. "We could be liable if I was negligent, and I don't intend to be."

An AT&T Communications attorney said she was so confident there is no link between VDT exposure and health effects that she did not expect to even have to pay workers' compensation claims, much less malicious conduct claims, in the future.

"I don't think we pay workers' comp very often for hysteria and unjustified fear," said Terry Thompson, senior attorney at AT&T in Basking Ridge, N.J.

Hard to prove

Malicious conduct, negligence or fraudulent concealment of injury could take an employer out of the protection of workers' compensation, according to attorneys, but that is difficult to prove in most states.

In the more notable employer liability case of asbestos poisoning at Johns Manville Corp., there were "smoking memos": clear proof that the employer knew it was exposing its workers to hazardous materials. With the current knowledge of VDT electromagnetic fields, "there's definitely a proof problem," according to Elaine Warren, an attorney for the city of San Francisco.

AT&T and Pacific Bell both claim there is no reason for them to actively change before health effects are proven, and both said they retain their own panel of experts on the subject. "To take any measure without valid scientific evidence would require a lot of thought," a Pacific Bell spokesman said.

Despite the companies' reticence, both AT&T and Pacific Bell have contracts with the Communications Workers of America (CWA) to allow workers to transfer out of VDT jobs during pregnancy, according to David LeGrand, national health and safety director at CWA in Washington, D.C.

Ultimate liability, if there is any, rests with the manufacturer. "Go after the manufacturer — that's the most effective and immediate way [to get results]," Cammidge said.

Midwest Bureau Chief Ellis Booker contributed to this report.

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BOOK REVIEW

Buzzwords, facts and a not-so-surprising conclusion

POWERSHIFT
By Alvin Toffler
Bantam Books, $22.95

During the past 20 years, the best-seller lists have been laden with pop psychology/business texts bearing catchy titles and clever prescriptions for the future. Many who follow such trends believe that futurist Alvin Toffler, a man who never met a buzzword he didn't like, started it all with his best-selling book, *Future Shock*.

In fact, every 10 years, Toffler offers his prognosis for the coming decade. He followed 1970's *Future Shock* with *The Third Wave* in 1980, and late last year he gave us his prescription for the 1990s with *Powershift*, a book he says is "about power at the edge of the 21st century."

Toffler says *Powershift* is the final book of this 20-year-long trilogy.

The author's premise is that we are in the midst of a massive "powershift," which is not merely a transfer of power but a transformation of power. Power, Toffler says, involves the use of violence, wealth and knowledge to make people perform in a certain way. "Out of this massive restructuring of power relationships, like the shifting and grinding of tectonic plates in advance of an earthquake, will come one of the rarest events in human history: a revolution in the very nature of power," he writes.

These kinds of dramatic overstatements pop up throughout *Powershift* and detract from what otherwise might be a fascinating collection of concepts and pre-

Sifting for nuggets

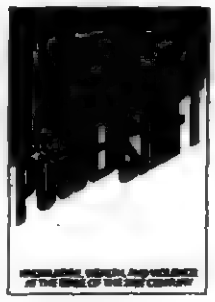
Although *Powershift* as a total package is lacking, information systems professionals may still want to read sections of the book. "Part Three: The Information Wars" and "Part Four: Power in the Flex-Firm" are filled with Toffler's views on the impact of IS and computers on the corporate world.

In these chapters, Toffler comes across as a strong proponent of information as power, going so far as to predict, "Power, in the business of tomorrow, will flow to those who have the best information about the limits of information. But before it does, the info wars now intensifying will alter the very shape of business."

In fact, he devotes an entire chapter (titled "The Executive Thought Police") to the chief information officer. CIOs, Toffler says, are in the "hotcenter of the infowars." Though they often complain about a lack of power, CIOs are far from powerless; controlling often enormous budgets and, even more crucial, the flow of information within the corporation.

Although he regurgitates concepts known to any longtime IS pro, Toffler does provide a few useful and quotable tidbits that a CIO can use at raise time.

For example, Toffler predicts that creativity within the information processing world is crucial, albeit hazardous: "In today's high-turbulence environment, business survival requires a stream of innovative products or services. Creativity requires a kind of corporate *glasnost*," he writes. "The safer and surer a business information system and the better it is protected, predefined, prestructured and policed, the more it will constrain creativity and constipate the organization."



Surely any CIO looking for wider parameters in which to operate can use that quote in his presentation.

Toffler fans will be satisfied with *Powershift*. The book is constructed along the same formulaic lines as his earlier works: a lot of short subchapters running no more than a page and a half; buzzword-laden text — "super-symbolic economy," "meta-tactics" and "info-agenda —" to name a few; and premises built on data lifted from countless books, newspapers, magazines and reports (the notes and bibliography section covers 75 pages).

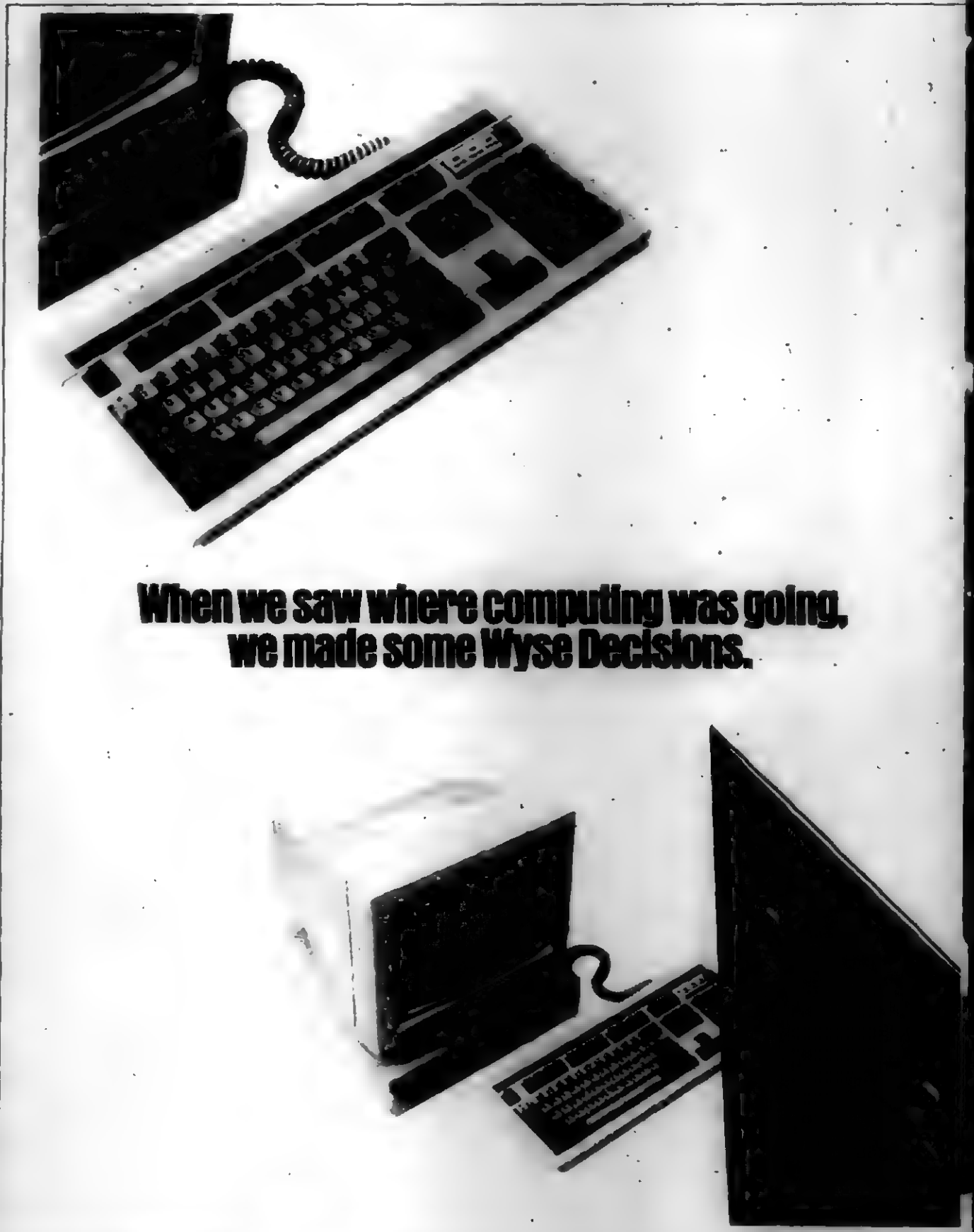
To give him his due, Toffler is a master at synthesizing various news events, societal shifts and technological advances into cultural and business trends. This ability has made him a popular speaker and a regular guest at conferences about the future.

For readers unfamiliar with Toffler's work, however, *Powershift* is an often interesting but ultimately disappointing collection of facts and ideas that leave the reader more confused than enlightened. Nor is it a particularly fun read — more of a plow-through than a fly-through tome.

The book suffers from metageneralization (sorry Alvin, I couldn't resist), the same fate as most books of this genre. Toffler leaves us — after nearly 500 pages of information stew, with this pearl of wisdom: "For it is now indisputable that knowledge, the source of the highest quality power of all, is gaining importance with every fleeting nanosecond." One might have hoped for a more startling, less obvious conclusion.

GLENN RIFKIN

Rifkin is a free-lance writer and a former *Computerworld* features editor.



MANAGEMENT BRIEFS

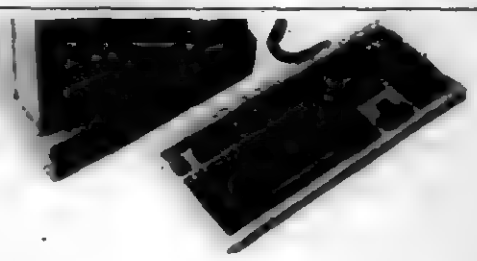
AT&T software lets telecommuters answer calls

A company's customer service calls can be answered by employees who telecommute, according to the promise of software introduced last week by **AT&T**. Called *The Home Agent*, the software routes incoming calls to telecommuting employees. **The Travelers Corp.**, based in Hartford, Conn., has already ordered the product to allow more telecommuting by service representatives in its 60 customer service centers. The software, for use with AT&T's System 85 or System 75 private branch exchanges, is slated to be available in the second quarter and is priced at $30,000.

John W. Lainhart IV, Assistant Inspector General for Policy, Planning and Resources at the U.S. Department of Transportation, has been awarded the **Paul R. Boucher Award** for outstanding public service from the **EDP Auditors Association**. Lainhart directed five major audits resulting in significant improvements at 10 federal computer centers.

Among the improvements were the discovery of serious operating system and environmental security software control deficiencies. Lainhart's Computer Systems Integrity project also identified an estimated $17 million in underutilized disk storage capacity.

The Association for Information and Image Management (AIIM) has issued a call for papers for its 1992 conference to be held June 22-25 in Anaheim, Calif. AIIM is seeking papers on document- and image-management case studies enabling technologies and applications. Interested speakers should request an abstract submission kit from AIIM, Education Department, Suite 1100, 1100 Wayne Ave., Silver Spring, Md. 20910 (301) 587-8202. The deadline for submissions is June 7, 1991.



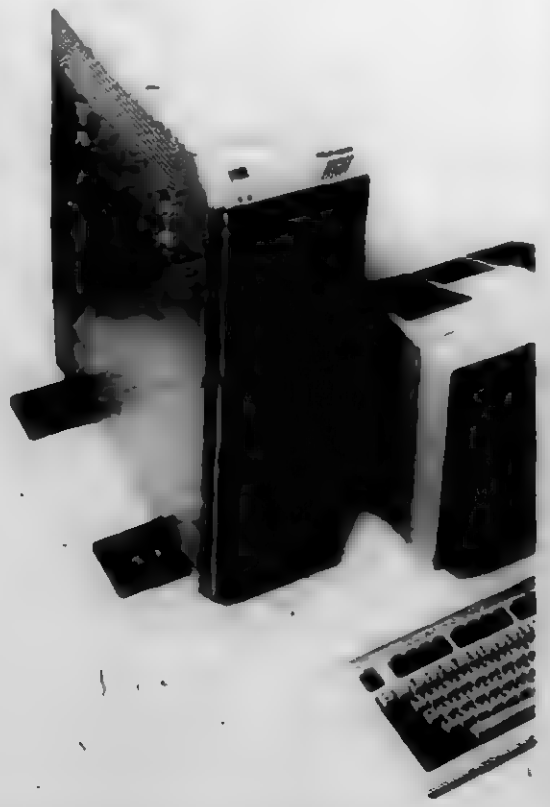
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Supermarket

CONTINUED FROM PAGE 51

The IS approach may also be reflective of the corporate personality. "It's one of the few major corporations that is still run very much like a family," said Stephen Griffin, president of Griffin Publishing Co., which publishes *The Griffin Report Of Food Marketing*, a monthly newspaper tracking grocers in New England. "They are solid and dedicated people, and a company run as well as they are is in many instances careful about what they say and do."

This approach has apparently paid off. While it is difficult to measure the exact impact IS has had on the health of the company, it has long maintained a clear market lead in New England.

The privately held firm does not release financial data, but *The Griffin Report Of Food Marketing* estimates the firm brought in close to $3.3 billion in supermarket revenue in 1990. Griffin said Stop & Shop holds about 17% of the market, while its closest competitor has just under 8%.

The IS executives say the goal is to use technology where it makes sense. One of the company's devices is a customer IS console installed at its superstores — supermarkets with in-store pharmacies, video rentals, general merchandise and expanded grocery selections.

The customer information system, used with a touch-screen monitor, can assist shoppers in finding an item in the store. It also provides information for first-time shoppers on what each department offers. IS executives consider this effective because it is a nonintrusive device. The information is there if and when the customer wants it.

"We want to build customer loyalty," Manson said. "You do that by catering to their requirements to make [shopping] pleasant."

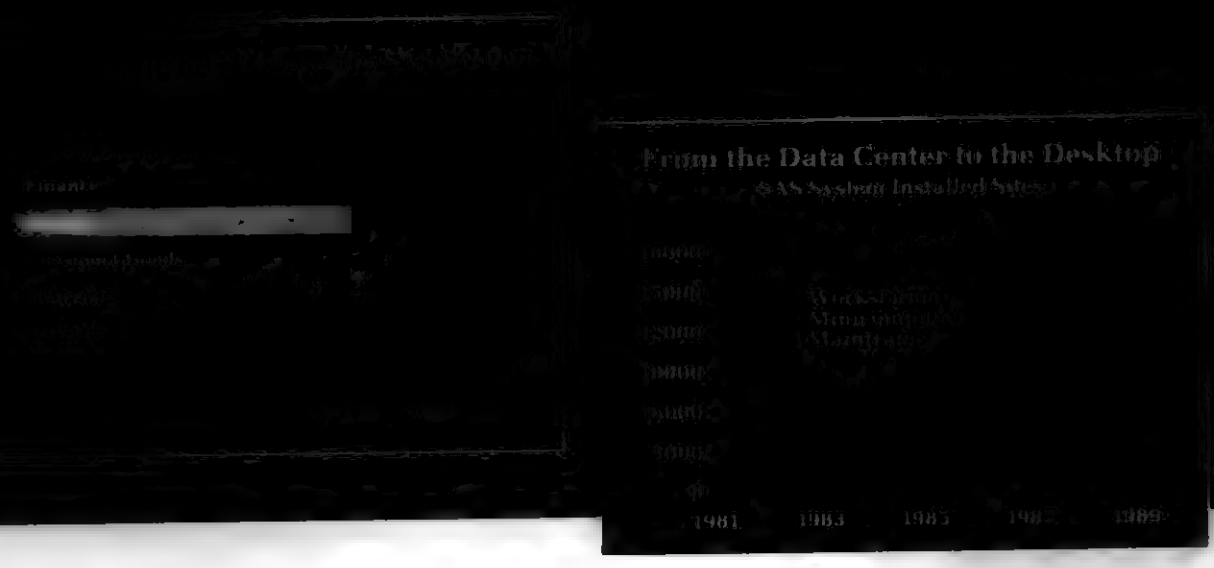
No room for mistakes

Stop & Shop may face tougher times ahead in the gloomy New England economy, but analysts say it will not take a real beating.

The food retail industry tends to ride through recession periods better than other retail segments because consumers with fewer dollars tend to cut back on restaurant spending and buy more food for cooking at home, analysts say.

"This business just isn't quite as sensitive to market fluctuations," says Stephen Griffin, president of *The Griffin Report Of Food Marketing*. "But you do see some trading down, with consumers buying less peripheral items, like snacks."

For Stop & Shop's IS department, the recession translates to more pressure to perform at maximum efficiency, says Robert Manson, vice president of information systems. "In today's environment, you have little room for mistakes," he says.



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Using subcontractors: Outside help is in

BY ALAN RADDING
SPECIAL TO CW

When the Los Angeles Fire Department needed a new computer-aided dispatch system, city officials knew the job was too big for a single systems integrator. "We had no illusion that one company could do it all," Assistant Chief Merlin Rudd says.

The city eventually chose SHL Systemhouse, Inc. to create the key part of its new $57 million fire command and control system. The department hired the Ottawa-based integrator and five other firms to assist in handling mobile terminals, mapping systems, personal computers, token-ring networks, training and other exotic technologies.

The practice of employing subcontractors — long commonplace on government projects — has gained widespread popularity in the private sector. Among commercial systems integrators these days, farming it out is in.

According to consultants, users and integrators, there is nothing Machiavellian about using "subs."

The federal government has long used a lead or primary contractor along with other providers on systems integration projects, according to Jeff Kaplan, director at The Ledgeway Group, a Lexington, Mass., consulting firm.

What is new, according to Kaplan and others, is how widely the government model is now being used in the private sector.

In fact, many integration customers now just assume there will be subcontractors, says Dudley Cooke, president of The Executive Insight Group, a consultancy in Bryn Mawr, Pa. "Nobody sees it as a big deal."



Paul Fusco

Poses serious questions

The widespread and growing popularity of subcontracting, however, raises several questions for information systems managers, especially in companies that possess limited experience using commercial integrators.

The big problem, users and vendors agree, is that the use of subcontractors can make already complex systems integration contracts even more complicated.

"The contract negotiation presents the greatest difficulty as you try to figure out who's responsible for what and what the recourses are," says Lawrence Pietras, manager of information resources at the Ontario Ministry of Tourism and Recreation in Toronto.

To ensure control in linking 450 PCs, the ministry specified that integrator subcontractors be identified in

Continued on page 60

USING COMMERCIAL INTEGRATORS

Meritor Savings Bank

Meritor opens the integration door

Nation's oldest thrift banks on its deepening relationship with EDS

BY KATIE CRANE
SPECIAL TO CW

Like human relationships, dealings with commercial systems integrators can change and grow as the months pass, sometimes in unexpected ways. Just ask Meritor Savings Bank in Philadelphia.

In March 1989, Meritor — the nation's oldest savings bank and seventh largest thrift — signed a 10-year facilities management contract with Dallas-based Electronic Data Systems Corp. (EDS). At the time, Meritor wasn't looking for a systems integrator.

Instead, the 175-year-old bank — known as the Philadelphia Savings Fund Society — wanted a third party to handle all of its systems development and maintenance, including check processing, back-office automation and voice and data communications.

Two years later, Meritor has not only outsourced those functions, but as part of the original plan with EDS, it has also moved its Philadelphia data center to a regional EDS site. It is also considering converting its banking systems to EDS' Integrated Financial System.

What's more, EDS also helped facilitate Meritor's $5 billion sale of 54 branches to Pittsburgh-based Mellon Bank Corp. in what was the largest sale of its kind.

Meritor's case illustrates the expansive nature of commercial systems integration today. With more vendors offering more services, buyers of commercial integration services can find themselves involved in deals for professional services, consulting, training, outsourcing and other areas.

"Even though we could see the strategic advantages of integrating back then, it was not our primary motive," says Larry Linn, senior vice president of Meritor's Operations and Technology Division. Of bigger concern was trimming costs and boosting capital assets and profitability, he explains.



Ed Alcalay

Meritor's Linn: *Starting with outsourcing, moving on to integration*

Yet the expanded partnership with a commercial integrator seems to have helped Meritor; thrift officials say outsourcing has saved nearly $9 million in two years, aiding the climb back to greater profitability.

Meritor has shown some remarkable improvement, especially during the second half of 1990, agrees James Marks, a publisher/analyst at SNL Securities, a bank and thrift research and publishing firm in Charlottesville, Va.

"For several years, it looked as if [Meritor] wasn't going to survive," Marks says. "They've been fighting for their life, and so far, they're putting up a good fight."

The thrift, he continues, "has taken the right steps to keep its chances alive," including selling the branches to Mellon and improving the bank's equity-to-asset ratio. Marks is less sure of how much the turnaround can be credited to the Meritor/EDS liaison, adding, "They're not out of the woods yet."

While recession is slowing growth, Linn says, thrift managers remain optimistic that outsourcing has helped it improve stability and build a stronger capital position.

Three years ago, Meritor was in dangerously rough waters. The bank had 83 branches in and around Philadelphia, $21 billion in assets and $10 billion in deposits.

However, its capital position was poor — well below the federal regulatory requirement of 6.5%. That meant Meritor faced the possibility of running aground like many other savings and loans.

Today, capital stands at more than 9.5%, which is well above federal requirements. Meritor has scaled back to only 29 branches in Philadelphia,

Continued on page 64



Doubt has an office. Anxiety has a key to the Ambition and a lunch date with Paranoia. And me, our PBX works as consistently as the tides. And just as who just happens to be passing by my office at this That ring is a chorus of thousands of AT&T workers was a peerless decision...." And as the phone rings residual value in the industry. It's ready to grow like maintenance program unequaled...." But Blame looking for some other doorway to darken. Just as asking me if I had lunch plans.

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Continued from page 57

the initial response to the request for proposals. Digital Equipment Corp. won the contract and assumed total responsibility, Pietras says, including software licensing for a fourth-generation language development tool from subcontractor Cognos Corp.

Pietras jokes: "The contract ended up being as thick as the request for proposals."

On the surface, the trend seems to make sense. Many integration projects are simply too big and too complicated for one firm to handle.

A typical distributed system integration, for instance, may require as many as 100 different products and services, according to Barry Sullivan, director of corporate marketing at Dallas-based Electronic Data Systems Corp.

No integrator has all those capabilities in-house, according to Sullivan.

Expertise required

Projects may also require highly specialized knowledge about a particular industry.

For example, SHL was recently teamed with five marine specialists on a $4.2 million contract to provide computer systems and integration services for a new marine terminal being built in San Francisco, says Peter Sandiford, president of SHL.

Subcontracting helps integrators save money. "It's economics," says David Herter, vice president of technical services at Bull HN Information Systems, Inc. in Billerica, Mass. "All the jobs are different, and you can't staff for every possible job. So, you bring people on-board as you need them."

Shouldering the burden

There's no hard and fast rule, but experts say prime contractors generally assume legal and other responsibilities for their subcontractors, whose fees are paid directly by the prime contractor.

"Ideally, the client wants the primary integrator to take all responsibility for all the subcontractors," notes Julian Millstein, a partner at Brown, Raysman & Millstein, a New York law firm specializing in high-technology law.

In addition, clients generally reserve the right to approve all subcontractors and to remove any individuals or companies from the project. And clients can always dictate who actually works on their premises, Millstein says.

In Los Angeles, for example, Rudd even had the right to pick the project's team leader.

Under ideal circumstances, clients will know the identity of major subcontractors *before* the contract is issued and will probably have screened them during the evaluation process, says Bob Russell, vice president of Enterprise Integration Services at DEC. "The sooner you get the subcontractors lined up, the better it is all around."

Often, that's not a problem because subcontractors can play an active role in winning the contract and pitching the project as a team along with the primary integrator. In one case, for instance, DEC went so far as to reimburse Consilium, Inc., a factory management software vendor, for an employee who participates in DEC sales calls, says John Golovin, Consilium's chairman.

While the systems integrator usually picks the subcontractors, Russell makes sure that he clears his choices with the client: "You don't want to bring in a sub where there has been bad history with the client."

Although Millstein says it is generally a good idea to identify subcontractors up front, doing so is not always feasible. In some cases, the need for a particular subcontractor may not become apparent until the exact configuration of the system is known, he says.

Another exception is when the subcontractor plays a minor role and has no direct contact with the client. According to Russell, "you might bring in a software boutique at the eleventh hour" to write a piece of particularly tricky code. •

Rudding is a free-lance writer based in Newton, Mass.

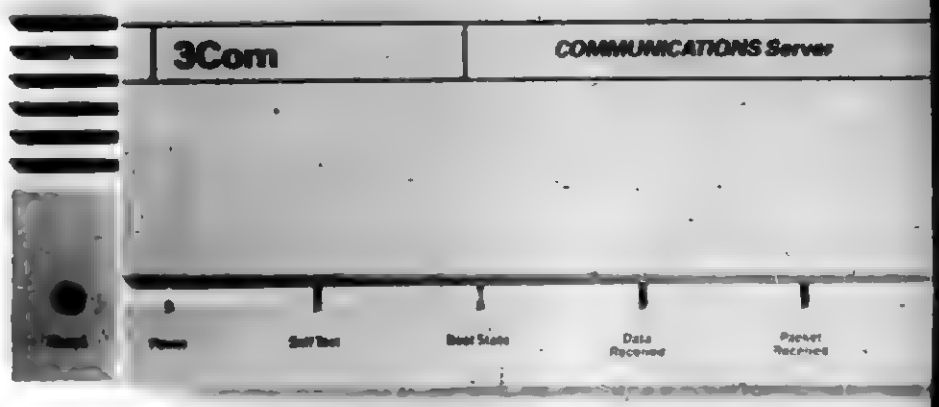
Ground rules

In integration contracts, almost everything is negotiable — relationships between primary contractors and subcontractors as well as those between primary contractors and their clients. Many dealings with commercial integrators and subcontractors follow certain conventions:

- **Payment.** In most cases, the user pays only the primary contractor, who then pays the subcontractors. Only in unusual circumstances would a subcontractor bill the user directly.
- **Prices.** The primary contractor negotiates a fixed price with the subcontractor during the bidding process. Subcontractor prices are then usually marked up to cover the primary contractor's overhead and responsibilities. The total price paid by the client is established at the outset and kept in line through competitive bidding. When the client is a government agency, all costs and markups may have to be identified individually.
- **Who works on the project?** The client usually has the final say regarding subcontractors — including project leaders. But get it in writing.
- **Legal responsibility.** The primary contractor usually assumes full legal responsibility for work being delivered acceptably and on time. But that, too, can be negotiated between primary and sub. The primary is responsible for security, even when the sub is investigated and approved by the client.

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Subcontracts that work well

Users say that a good legal pact can be a firm's best friend during projects

Good contracts can be invaluable in case integration projects go wrong, says Larry Murphy, director of court information systems for the state of Iowa.

Murphy was relieved to have a strong pact with Bull HN Information Systems, Inc. when a subcontractor failed to deliver on a key part of a new integrated court management system. The company didn't provide the promised personnel and missed delivery dates, Murphy says.

"We had a clause in the contract that we could remove any person or sub at any point," Murphy says. "We complained to Bull and told them that either they do the job or get someone who could." Four months into the project, Bull fired the subcontractor and finished the job itself. The project is slated to be completed on schedule this year.

Genstar Stone Products in Baltimore, hired IBM as the systems integrator for installation of its new mainframe, including construction and wiring of a new computer facility incorporating the latest halon fire protection and environmental controls.

"We expected that IBM would use subcontractors," says Paul Veltre, director of information resources. He wasn't concerned about the subcontracting because IBM assumed responsibility: "The only number I was going to call was IBM."

IBM was responsible for everything, down to the insurance certificates and bonding to cover the subcontractors. Subcontractors were directed by the IBM project manager. In fact, Veltre was never even introduced to the subcontractors and says he didn't need to be as long as IBM was managing the project.

Of course, the subcontractors were working on-site, so Veltre saw them daily and spoke with them about the project. But all formal communication about the work was with IBM.

The Society of Manufacturing Engineers in Dearborn, Mich., arranged a shotgun marriage between integrator and subcontractor when it awarded its $4 million management system contract to Oracle Complex Systems in Arlington, Va., a division of database vendor, Oracle Systems Corp.

The society wanted the association management software from Orange Systems, Inc. in Gaithersburg, Md. Oracle responded to the society's request for proposals with hardware from Digital Equipment Corp. and Sun Microsystems, Inc., both of which included the Orange Systems software.

In the end, the society opted for the Sun hardware, with Oracle as the system integrator, says Jack Gurney, project manager at the society.

In certain cases, the integration subcontractor can even act as an OEM. That was the case when San Diego-based Science Applications International Corp. (SAIC) was hired by the **Baltic International Maritime Council (Bimco)** in Copenhagen to develop an international telecommunications network. As primary contractor, SAIC hired Datamedia Corp. to provide network workstations.

Datamedia was not involved when SAIC won the contract, and Bimco hadn't met Datamedia when SAIC selected it. Only later did Bimco inspect and approve the Datamedia facility, says Matt Lundberg, director of marketing at Datamedia.

Besides supplying workstations, Datamedia provided a continuous staging area for loading software, burning in and testing the units for network-ready shipments to 3,000 Bimco members worldwide, Lundberg says.

The arrangement has worked well, and Bimco has since asked Datamedia to take a larger role in its efforts to popularize workstations among its members.

The new arrangement is outside the SAIC contract, but Datamedia keeps SAIC informed: "We don't do anything [with Bimco] unless SAIC is in the loop," Lundberg says. ■

ALAN RADDING

The Big Ten

The big-name companies that dominate the top spots in the commercial systems integration industry are among the most likely users of subcontractors. These 10 vendors accounted for more than half of all worldwide integration revenue in 1990

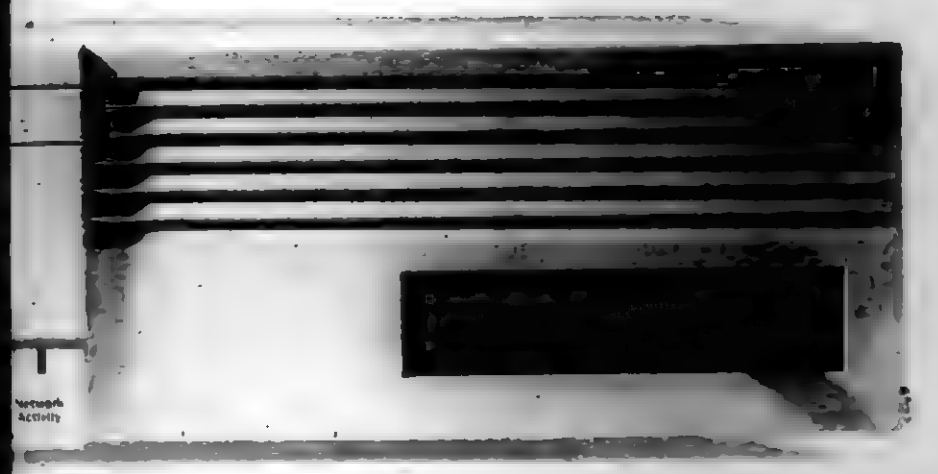
Worldwide systems integration revenue (in millions)

Rank	Vendor	1989	1990*	Growth
1	Electronic Data Systems	$1,647	$2,042	24%
2	IBM	$1,238	$1,548	25%
3	Andersen Consulting	$1,045	[illegible]	[illegible]
4	Digital Equipment Corp.	$715	[illegible]	25%
5	Unisys Corp.	$523	$638	22%
6	Computer Sciences Corp.	$510	$612	20%
7	Boeing Computer Services Div.	$360	$396	10%
8	Science Applications Int'l. Corp.	$261	$274	5%
9	Lockheed Corp.	$230	[illegible]	18%
10	Martin Marietta Corp.	$210	[illegible]	14%
	Revenue: Top 10 SI vendors	$6,790	[illegible]	23%
	Total revenue: All SI vendors	$12,640	$15,617	24%

*Estimated

Source: International Data Corp. CW Chart: Doreen St. John

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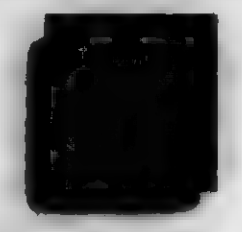
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Continued from page 57

$7 billion in assets and $3 billion in core deposits.

In 1989, Meritor's 300-employee, in-house information systems operation was already lean, Liss says, and few additional cuts could be made in the IS budget. With the help of Andersen Consulting, Meritor concluded that the option to stay in-house did not look as promising as outsourcing. Meritor hoped not only to save $4 million to $5 million in annual operating expenses but also to sell its computer assets.

After a comprehensive bidding process, EDS beat out three other finalists: Fiserve, Inc. in Milwaukee; Mellon Bank Corp. in Pittsburgh; and Systematics, Inc. in Little Rock, Ark. Andersen was not a contender because at the time, it did not offer the services Meritor was seeking, Liss explains.

EDS clinched the pact on the strength of its "excellent" financial proposal and integrated banking software, Liss says. Another plus was that EDS did not plan to lay off existing Meritor IS employees.

Close-up

Organization: Meritor Savings Bank.
Goals: Trim costs, boost capital assets and profits.
Strategy: Outsource all IS operations, sell and integrate 54 branches.
Payoff: $9 million savings in operations costs, stronger future positions.

The original contract was worth "hundreds of millions," says Bobby Grisham, president of EDS' Large Financial Institutions Division, declining to cite a specific figure. It would, he says, yield projected savings of as much as $50 million during the life of the 10-year agreement, plus the value of equipment sold to EDS.

Now, two years later, Liss claims he has reviewed the figures carefully and says that Meritor saved close to $4 million in the first year, even with all the up-front costs. In 1990, the bank expects $5 million in savings. Furthermore, the IS chief concedes, IS performance levels are as good as or better than ever.

A ripe Mellon

That could be the end of the story, with Meritor and EDS sailing off into the sunset together, but it's not. The first rocking of the boat came in early 1990, when Meritor decided to sell 54 of its branches to Mellon. Although EDS had been aware of Meritor's strategy to downsize, a divestment of this magnitude had never been contemplated in the agreement.

According to Grisham, the deal touched every operation at Meritor. "It had a major impact on [Meritor's] business, and in turn, a major impact on our operation, which was structured to serve one large organization."

The Mellon sale created the need for EDS to convert systems in less than six months — in essence, clone Meritor's operations for Mellon — and support two separate, smaller operations without any interruption in service to the customers of either bank.

"It was an important early test of the relationship between Meritor and EDS," Grisham says. "The worst thing we could have done is force Meritor to follow through with the original plan and tell them, 'That's what you bought.'"

Instead, EDS modified the plan, postponing for several months the targeted move of Meritor's data center to one of EDS' regional data centers, along with the deadline for investigating the integrated financial system. More than two dozen systems engineers were reassigned to the conversion project.

More importantly, Liss says, he believes EDS support gave Meritor a level of flexibility that helped clinch the deal with Mellon. "We told Mellon what we would have told any prospective buyer," Liss explains. "EDS is there. They are supporting us. They can support you."

With the cutover done, the partners took up where they'd left off. Last fall, Meritor's data center operations were moved to an EDS facility in Camp Hill, Pa.

To convert or not to convert

Now they are evaluating whether to convert Meritor's current, mostly proprietary systems to EDS' Integrated Financial System — a 15-month project that would integrate Meritor's strategic systems, including all deposit and loan systems and Meritor's customer information file and loan files, as well as back-office accounting functions with the general ledger. A decision is expected next month.

While direct project costs are spelled out in Meritor's contract with EDS, Liss still worries about the indirect costs, especially the hundreds of thousands of dollars worth of hours required for bank employees to be trained to adapt to the new software, to write new procedures, to change forms, etc.

Unlike before, Meritor cannot quantify any direct financial benefit. The major advantages, Liss says, are strategic. "It's hard to put a price tag on that."

Now, two years into their partnership, the relationship between Meritor and EDS is stronger than at the beginning, Grisham says, because they have weathered big changes. With at least eight years to go, both firms predict there will be other unexpected developments in their relationship. Grisham explains, "There's no such thing as smooth sailing, in their business or ours." ●

Crane is a free-lance writer based in Norwich, Vt.



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INSIDE EDGE

Objectivity: Is it a farce?

With more hardware and software vendors getting into the fast growing commercial integration market, can a buyer really expect to get anything other than that vendor's solution? With more consultants and integrators forming partnerships with those same vendors, what chances exist that the user will get the best solution?

Computerworld recently asked several commercial systems integrators if users could — and should — expect even a pretense of objectivity.

BARRY SULLIVAN
Vice President and Director of Marketing
Business Development Unit
Electronic Data Systems Corp. (EDS)
Dallas

No one is objective. Even the best judge in the world brings some set of biases with him. It isn't as much an individual choice or a relationship with the vendor as it is a knowledge of technology. Most people base their choice of systems on what has worked successfully in the past. The best we can do is minimize our biases.

To achieve that goal, EDS has an acquisitions organization consisting of 600 employees who track and assess hardware and software. Through this process, EDS has established contractual relationships with more than 7,000 vendors.

JOHN E. OLTMAN
Worldwide Managing Partner
Integration Services
Andersen Consulting
Chicago

Yes, systems integrators can be objective — but only if they think of themselves as solutions providers with access to a variety of software and hardware vendors. However, when a systems integrator has its own value-added software, it's hard to be objective, but it is still possible to provide the customer with the most beneficial solution for the best price.

MEL BERNSTEIN
Senior Vice President
Systems Integration
Computer Sciences Corp. (CSC)
El Segundo, Calif.

One theory is that objectivity isn't as important as client delivery. Therefore, the theory goes, anything that can enhance delivery should be done, making objectivity less important. This theory is based on the view that systems integrators having long-standing vendor relationships can offer price advantages.

Computer Sciences Corp. believes that objectivity is possible. Our relationships with vendors are at arm's length, but we can still establish price breaks and act as a single channel for all vendors without any diminution of delivery.

In the future, objectivity may be threatened if vendors restrict access to only those systems integrators with strong ties to them. For example, if IBM refused to have a relationship with CSC, it might force us to have a stronger relationship with them. But so far, I don't see that happening.

BOB RUSSELL
Vice President
Enterprise Integration Services
Digital Equipment Corp.
New York

Digital Equipment Corp. has ties to 850 vendors with 8,000 products, and we provide solutions that don't necessarily include DEC products. To ensure additional objectivity for the customer, DEC has formal alliances with other systems integrators, including Price Waterhouse and Andersen Consulting.

This association with third parties allows DEC to use a wide set of partners to ensure that the end user is given the widest number of options.

AL BEEDE
President and Chief Executive Officer
TSC
Chicago

It's more than likely that the systems integrator will recommend a system based on its own technology because it will be more profitable. The systems integrator with integrity, however, will have a commitment to giving the customer the best solution, regardless of where it comes from.

F. MARK KUHLMANN
President
McDonnell Douglas Computer Systems Co.
Systems Integration Co.
Hazelwood, Mo.

Objectivity runs on a spectrum: The only way to be 100% objective is to have absolutely no past experience at all. Companies bring their past experience to bear on the new end user's situation.

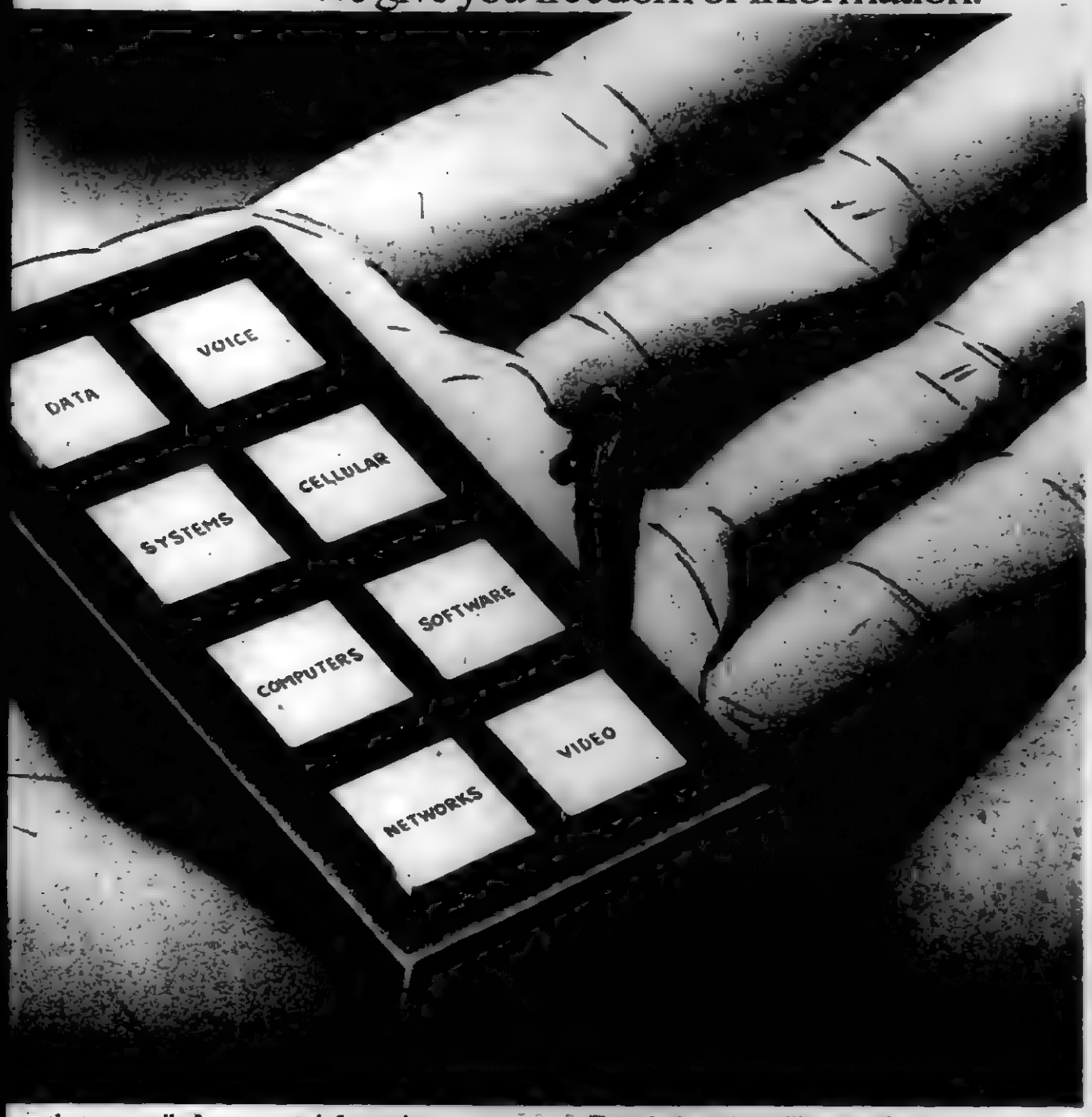
Possession of a proprietary product doesn't taint objectivity. Instead, it gives the systems integrator the needed expertise to provide prudent advice and counsel. A systems integrator with a proprietary product is more likely to be an expert in that product category than one without the product.

Even independent consultants with no proprietary software and no formal association with vendors aren't objective. A good independent consultant will recommend a product from a given vendor over and over again. ●

JANET MASON

Mason is a free-lance writer based in Philadelphia.

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Nesbit earns gold for Olympic setup

BY SUSAN R. NYKAMP
CW STAFF

CBS Sports talked to all the giants when it was searching for a systems integrator for its coverage of the 1992 Winter Olympic Games in Albertville, France, but in the end, it picked a smaller, lesser known specialist instead.

Nesbit Systems, Inc., a small, privately owned software developer and systems integrator in Princeton, N.J., won the open-ended contract. Terms were not disclosed.

"We looked at quite a few vendors, and we had the greatest confidence in Nesbit," says Rick Cusworth, CBS manager of computer systems for the Olympics. He says Nesbit competed against some "major players," although he declined to name them. The pact is worth "hundreds of thousands of dollars," Cusworth adds.

A 15-employee firm, with more than $1 million in annual sales, Nesbit specialises in managing projects on microcomputer networks in real-time environments, says President Irene Nesbit. Other clients have included ESPN and Turner Broadcasting System, Inc., as well as the USA Network, she says.

Under the new pact, Nesbit will integrate all CBS systems and communications on a Novell, Inc. local-area network, linking Intel Corp. 80386-based personal computers from Northgate Computer Systems, Inc. to IBM Personal System/2s. The system will be used by CBS Olympic staff for a wide range of information processing and tracking, covering everything from word processing to budgeting to communicating between France and New York.

Nesbit will also provide CBS with a videotape library management system, a logistics database that will track the whereabouts of CBS staff, an equipment-tracking program and custom user utilities. The firm is also acting as a systems consultant for all Olympics project operations.

Nesbit is no stranger to the Olympics: It managed systems setup for NBC at the 1988 Summer Olympic Games in Seoul, South Korea.

Cusworth says Nesbit's experience with the Olympics and its existing base of broadcasting applications helped clinch the deal. The company began working on the project at CBS's New York headquarters in September 1990, with a deadline of December 1991. •

Nykamp is *Computerworld*'s associate editor, features.



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F.Y.I.

Information systems at the U.S. Department of Housing and Urban Development (HUD) will get a $525.9 million renovation from **Martin Marietta Corp.** in Bethesda, Md. The plan is to consolidate all networks into a single link from HUD offices to Martin Marietta's data center.

Canada's SHL Systemhouse, Inc. won a $32.5 million integration contract from New York-based Spectrum Healthcare Solutions. SHL's task: to bring a financial information system on-line for six Los Angeles hospitals.

Eight U.S. Marine Corps facilities will be outfitted with Amdahl Corp. mainframe systems under an eight-year, $29.9 million contract with Lanham, Md.-based **ICF Severn, Inc.**

Syntrex, Inc. won a $2.2 million contract with law firm Heller Ehrman White & McAuliffe in San Francisco. Eatontown, N.J.-based Syntrex will expand Heller Ehrman's Banyan Systems, Inc. Virtual Networking Software-based network to 650 nodes spanning seven locations.

Digital Equipment of Canada Ltd. nailed a two-year, $3 million (U.S.) contract with the Treasury Board of Canada. Digital will design, implement and manage the network linking 800 users in 10 offices.

Under a $10 million contract with Unicor Federal Prison Industries, Reston, Va.-based **Digital Analysis Corp.** will supply Data General Corp. Aviion systems to 54 factory sites at federal U.S. prisons.

Japanese systems integration giant S&I Co. will distribute **Mux Lab, Inc.**'s Token-Ease token-ring hub in Japan under terms of a $2.5 million agreement with Mux Lab, a subsidiary of National Havinfo Communications. S&I is jointly owned by IBM Japan and Sumotomo Electric.

Richard Strauss joined **Eastman Kodak Co.** as director of business development at Kodak's Integration and Systems Products Division.

The new corporate workstation

PCs in the '90s will need to favor people over power. Here are the basics for these intuitive, flexible machines

BY CONRAD BLICKENSTORFER

Countless information systems departments across the country are facing the same unpleasant situation in the early 1990s. Just as they are preparing to replace dozens, hundreds or even thousands of their first- or second-generation personal computers, management is starting to ask tough questions.

Chief executive officers want to know what their PC investments have done for their companies and why they should invest in upgrading PCs.

CEOs don't want to hear that these newer, more expensive machines are faster and can potentially run a powerful new operating system, support several users at once and act as file servers on a network. That's the same technological justification they were given back in 1984 for the purchase of the IBM Personal Computer AT. The CEO's position may well be, "Fool me once, shame on you; fool me twice . . ."

It's time to bring a new PC paradigm into the workplace. What IS managers need to justify is a new "corporate workstation" whose functionality doesn't just allow users to work faster but enhances the way users work. They need to get back to the ideal goal of the PC: to help people be more creative and think up new business solutions that were simply not possible before. The basics of that machine exist today.

Justification in the past

Actual benefits were very easy to see when the first PCs came along in the late 1970s. Those machines, though slow and primitive, opened up a new dimension to corporate America in the form of the electronic spreadsheet.

Even in the early and mid-1980s, the technical refinements of PCs could be clearly tied to work improvements. With their hard disks, hierarchical filing structures, highly legible 80-column screens and increased speed, these machines made word processing available to everyone and made everyone more productive.

In the last couple of years, however, justification has been tough. While current state-of-the-art PCs are at least 10 times faster than their predecessors, these advances have been evolutionary rather than revolutionary. Most people still run the same old industry-standard applications under DOS.

The extra speed helps database processing, but PC databases are not the bread and butter of personal computing. Spreadsheets compute faster, but whether a model recomputes in 12 seconds or two doesn't have much impact on the company's bottom line. Furthermore, many of the latest software packages have grown too large, complex and feature-laden for users.

In other words, PCs have become almost as complex and finicky as central multiuser systems. Try battling with current windowing environments, DOS extenders, memory-resident programs, memory mapping, disk-partition extenders, multiple configuration files, program installation procedures and a multitude of incompatible drivers, conventions, standards — or lack thereof.

To make matters worse, the PC industry remains in a state of confusion. At this point, it's still anyone's guess which of the competing operating environments will eventually win — DOS, Unix, OS/2 or Windows 3.0.

To get back on track, companies need a machine that assists and enhances a person's natural intellectual abilities.

Although human thought processes are basically serial in nature, we can nevertheless work on several tasks at once by having different things laid out around us. We jump from one project to the next, as determined by priority, inclination or environmental conditions. We may be interrupted, switch our attention somewhere else and then return to where we left off. We can gather information for two tasks and then use the information as input for a third.

For this to work best, we require a suitable "operating environment." We need proper tools. Everything must be easy to locate. There must be ample room on an uncluttered desktop.

Compare this to how we use a PC today: menus, commands issued from DOS prompts or terminal emulation sessions to perform tasks in one-at-a-time sequences.

Most PC users have accepted this serial mode of operation as the standard way of desktop computing. However, the time and productivity lost by this one-thing-at-a-time, load-process-and-quit type of computing is horrendous.

Multifunctional desktop

Enter the corporate workstation. If reason prevails, the corporate workstation of the 1990s will offer greatly enhanced functionality to all users. It will emulate and enhance the natural rhythm of human work patterns and working environments rather than fight it. It will enable users to do more than one thing at a time and switch between tasks quickly. There will be an intuitive, common

Continued on page 68



Blickenstorfer is chief information officer at the state of New York's Dormitory Authority in Delmar, an agency that handles financing and construction for public buildings.

- **Justifying upgrades used to be easier**
- **Features the new PC must have**
- **Prototypes exist today**

Continued from page 67

interface to all applications. Clever screen design will eliminate clutter and make locating things easy.

During the next few years, most business computing sites will be multivendor environments with a variety of different, optimized processors for increasingly decentralized computing tasks. Users will expect instant, transparent access to information located anywhere on the network. The corporate workstation will enable them to have that access.

Many Wall Street firms have already discovered the benefits of exchanging a number of dumb terminals for a single, large-screen workstation with multiple windows. "Micro-to-mainframe connectivity" will simply become "systems connectivity" as cutting and pasting between applications residing on computers hundreds of miles apart becomes commonplace.

The emphasis is going to shift away from uploading and downloading files because few office workers have the need to transfer large files. Most move a few numbers here, a paragraph of text there and perhaps a few pages of numbers from a mainframe. These tasks can be done better and faster with scrolling, buffered windows and a good set of cut-and-paste tools.

Busy tools

Unlike a terminal, these workstations will have a standard set of local tools for outlining, writing, editing, graphing, analyzing, charting, drawing and publishing. They will have vast data manipulation capabilities so clipping, cropping, pasting, parsing and the handling of different formats becomes simple.

Instead of making the user switch from program to program, they will let the knowledge worker of the 1990s conceive ideas, look up data in various locations, cut and paste from anywhere to anywhere, have access to central repositories and then combine all the elements in a complete project either for output on a page description network printer or for electronic mail distribution to co-workers.

At any given time, users may interrupt what they are doing, pull up something else, perform tasks and have the option to return to the first project. All of this will work smoothly and easily, with a common user interface and common conventions from application to application.

IF REASON PREVAILS, the corporate workstation of the 1990s will offer greatly enhanced functionality to all users.

Prototypes of this new corporate workstation already exist (see stories page 70). They do not rely on any one specific processor or specific system architecture, but there are some basic technological requirements:

- A large, high-resolution screen that can display at least two full letter-size pages at actual size.
- A mouse or other device that permits switching from task to task without the need to use keystroke combinations.
- An internally consistent, intuitive windowing environment.
- An operating system that remains completely behind the [illegible].
- Enough memory to run a reasonable set of applications without having to page to disk.
- Easy access to a high-resolution page description printer.
- A set of completely integrated network access and communications tools.

During the past few years, we have increasingly moved away from the original ideals of personal computing. PCs are in danger of becoming the technological equivalents of 1960s muscle cars: plenty of raw power but little else. The corporate workstation — with its large screen, multiwindow and multisession capabilities, integrated tool sets and transparent connectivity to all other corporate computing resources — is a friendly, useful tool that complements the way the human mind works.

It could restore personal computing to what it should be. ●

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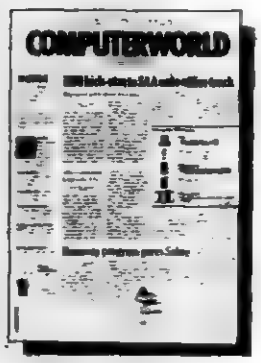
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PC WORLD

A workstation put into practice

Dormitory Authority will build off an Apple Macintosh base

BY CONRAD BLICKENSTORFER

The prototype for our corporate workstation at the New York Dormitory Authority is based on Apple Computer, Inc.'s Macintosh because of its intuitive user interface and consistency from application to application. We also approved of the well-established file formats, such as PICT and Tag Image File Format, the ready availability of large-size screens, Adobe Systems, Inc.'s Postscript output and a variety of tools, such as Aldus Corp.'s Pagemaker page layout software, Informix Corp.'s Wingz spreadsheet and Microsoft Corp.'s Word word-processing software.

This corporate workstation is also well connected. It has ties to a companywide Ethernet network via Etherport II cards. Other Macintoshes operate on local Appletalk strands and connect to the Ethernet via Shiva Corp.'s Fastpath IV bridges.

Central processing is performed on two Prime Computer, Inc. hosts in different cities. A variety of Sun Microsystems, Inc. and Microsoft Xenix-based workstations are also accessible as hosts.

Older Sun machines can act as file servers for all Macintosh corporate workstations. Pacerlink communications software from Pacer, Inc. permits multiple terminal sessions to several hosts at once.

Showing its stuff

That's how our corporate workstation works; here's what it does for the business users using it at the Dormitory Authority:

- An accountant runs several simultaneous payroll system host sessions to see several different views at once. The Macintosh's clipboard may be used to paste numbers or results directly into a spreadsheet for further analysis.
- A lawyer reviews electronic mail in one host session, pastes parts of it directly into a document assembly session in another window and finally sends the whole thing via network facsimile to outside counsel or clients.
- A programmer has two sessions on an engineering workstation, then captures the program output as a PICT format file and, for documentation purposes, drops it directly into Pagemaker software on the Macintosh. Supporting data is received from a colleague via E-mail on a Prime session and pasted into Pagemaker as well. The programmer then uses Pagemaker's layout and font capabilities to produce near-typeset documentation quickly.
- A project manager monitors two different construction projects in two different sessions on a host computer located hundreds of miles away in another city, while occasionally screening E-mail sessions on Unix and working on a chart in Innovative Design, Inc.'s Macdraft.
- An architect reviews computer-aided design drawings in a host-session window, captures a screen and pastes it into a Macintosh drawing program to prepare a client presentation. A shared multiclip file residing on a Sun-based Tops file server from Sitka Corp. supplies a variety of logos and images. The final product is placed in a Tops folder on the Sun machine, where it will be picked up for distribution.
- A secretary monitors E-mail and scheduling calendars in two host sessions. The secretary uses a Pagemaker window to prepare a cover for a report received through E-mail. A remote system host session displays the report, which is then pasted into a spreadsheet on the Macintosh, cleaned up, complemented with additional calculations and pasted into the Pagemaker window. The entire project is then printed on a networked Postscript laser in a different city. ●

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The choice is yours

By following the generic features outlined in the main story, you can create the basis of a corporate workstation.

Although we used the Apple Macintosh as our platform, you don't have to. Options can include:

- An Intel Corp. 80386- or I486-based personal computer with Microsoft's Windows. Make sure there is adequate random-access memory (at least 4M or 8M bytes) and disk space (100M bytes).

Screens should be at least 16 inches diagonally; 19 inches is preferable for fitting a one- or two-page document. Access to a page description laser printer is necessary.

- A Sun workstation or Sun IPC machine with a local disk. Make sure your Sun machine comes with a complement of business software — not its typical education and engineering tools.
- A Next, Inc. machine as is, although it may be rather unfamiliar and exotic for business users.

CONRAD BLICKENSTORFER

NATIONAL BRIEFS

Quality pays

IBM saw the truth of this maxim when the total quality management program undertaken by its Application System/400-making Rochester, N.Y., site doubled — and in some cases tripled — product reliability and added some $257 million to the company's bottom line, according to one executive. The effort also brought home the coveted Malcolm Baldrige award this past fall. Last week, **Larry Osterwise**, who oversaw the effort as site general manager, was named vice president of IBM U.S. market-driven quality assessment. The quality quest continues in Rochester under application business systems director and site general manager **Robert Unterberger**.

Analytic-ally speaking

A recent partnership between **Computer Sciences Corp. (CSC)** and **Equifax, Inc.**, formed in part to pursue investment opportunities for the $1.5 billion CSC, late last month acquired **Analytics, Inc.**, a privately held El Segundo, Calif.-based information security and communications systems provider. Financial terms were not disclosed. The new buy, according to CSC, will work as part of the Systems Engineering Division, providing command/control and communications systems to U.S. military services and agencies.

North by northwest

IBM reached out to Canada and California over the past two weeks to reiterate its faith in two entrepreneurial software companies. An equity investment of an undisclosed amount went to geographic information systems (GIS) provider **Intera Tydac Technologies, Inc.** The Calgary, Alberta-based firm was created in late January by Intera Information Technologies Corp.'s acquisition of Ottawa-based Tydac Technologies, Inc., whose IBM workstation and personal computer-based GIS line made Tydac an IBM business partner in 1989. Only days after the Intera/Tydac deal, IBM paid $2.7 million for a 6% stake in San Jose, Calif.-based **SVG Lithography Systems, Inc.** — formed last spring by wafer processing vendor Silicon Valley Group, Inc., semiconductor consortium Sematech and IBM to buy the optical lithography operations of **Perkin-Elmer Corp.**

Smart hubs owe it all to LANs

Despite economy, LAN boom will ensure continued need for smart hubs

BY JOANIE M. WEXLER
CW STAFF

So-called "smart hubs" may be more than smart: If analysts are right, they may be lucky, too. The local-area networking boom will prevent vendors of smart hubs from becoming casualties of a sagging economy, according to analysts. In fact, revenue opportunities abound for makers of the products — intelligent wiring centers that interconnect dissimilar LANs and bundle in centralized network management and other functions.

Smart hubs are popular because they interconnect various flavors of LANs running over different types of cabling. This heterogeneous scenario is common in large firms where LANs grew up independently and before department managers realized that the networks would eventually need to communicate.

In addition, LAN topologies such as Ethernet's bus or token-ring's ring are configured logically within the smart hub rather than physically throughout a building.

Each node is star-wired back to the wiring center, allowing for centralized network management.

Smart-hub vendors are packaging network management modules with their products, as well as an array of routing, bridging, terminal server and protocol analysis capabilities.

Currently putting heads in the sizzling smart-hub market are Mountain View, Calif.-based Synoptics Communications, Inc. and Cabletron Systems, Inc. in Rochester, N.H. Each company reported revenue in excess of $48 million for its recently ended fiscal third quarter. Synoptics' revenue marked a 131% increase over the comparable period last year; Cabletron showed an 80% increase.

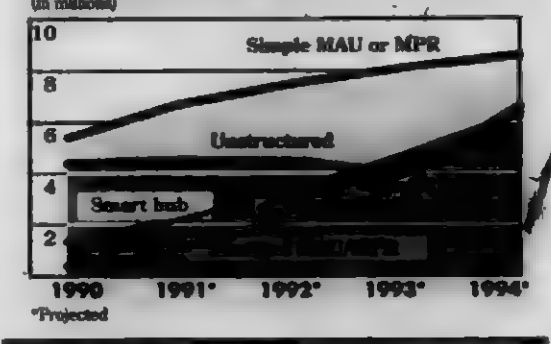
Thomas Erickson, a financial analyst at Minneapolis-based Wessels, Arnold & Henderson, estimated that Synoptics is earning a staggering 68.9% gross margin on its Lattisnet 3000 wiring concentrator, which accounts for nearly 100% of the firm's business. Cabletron, Erickson said, is earning margins of about 60% on Multi Media Access Center, which competes with Lattisnet for smart-hub market share while accounting for 50% of its manufacturer's business.

Erickson predicted that Synoptics' $175 million in 1990 revenue will jump 66% to the $290 million range in 1991 and that Cabletron's $180 million in 1990 will double this year.

Family ties

Smart-hub vendors will likely weather inclement economic conditions as users continue to invest in LAN equipment

Managed multistation access unit (MAU)/multiport repeater (MPR) and smart-hub connections



Source: Forrester Research, Inc. CW Chart: Paul Mock

Competition

The figures are just as impressive for other smart-hub players. For example, comparatively small Chipcom Corp., based in Southboro, Mass., rang up sales of $28 million in 1990 — up from sales of $17 million in 1989 and about $10 million in 1988.

The reasons why these companies and their competitors will continue to thrive in an industry

Continued on page 72

In terms of hubs

What will smart hubs mean to the computer industry? For that matter, what does "smart hub" mean?

Smart hub: An intelligent wiring center supporting multiple access methods and media. Many devices offer bridging, routing and sophisticated network management down to port monitoring on a LAN. These are targeted toward large company headquarters.

Multiport repeater (MPR): A wiring center for Ethernet LANs that generally supports one access method (carrier-sense multiple access with collision detection) but a variety of media (coaxial, twisted-pair and fiber). Aimed at smaller sites connecting into a corporate network, it can be managed or unmanaged.

Multistation access unit: A wiring center for token-ring LANs that supports one access method (token passing) but a variety of media (twisted-pair and fiber). Like the MPR, it is aimed at smaller sites connecting into a corporate network and can be managed or unmanaged.

While Oracle plans offense, time flies and money dries

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Top Oracle Systems Corp executives recently outlined a series of economic moves designed to stave off a cash shortfall between now and the end of this month, when the $971 million software firm can once again borrow from its banking syndicate.

"We burned more than $40 million in cash in the second quarter [ended Nov. 30], and we're trying to break even on cash in the third quarter [ending Feb. 28]," said Oracle Chief Financial Officer Jeffrey Walker. "We can't pinpoint when we'll reach the zero-cash-burn point."

Meanwhile, Oracle's borrowing power is greatly diminished, while a syndicate of 13 banks audits Oracle's accounts receivable for potential cash flow to secure further borrowing [CW, Jan. 21].

The syndicate has limited Oracle's borrowing to $170 million on a $250 million line of credit extended last August, leaving just $5 million untapped by the firm, executives said. Cash reserves of $50 million on hand in November have been eroded by further spending, Walker said.



In fact, Walker confirmed, Oracle would have been in default of its loan covenants in recent months had the bankers not agreed to a renegotiation of terms.

Oracle's attempts to raise cash in the near future include the following:

- The firm has launched a USA Cash Collection program aimed at raking in sums owed by late-paying customers. Oracle executives said that as of Nov. 30, the program had collected approximately $150 million of the $453 million owed.

As of that date, the average delay between orders and payment was about 152 days, according to Oracle.

- Discounts are being given for quick payment. Oracle executives, including Geoffrey Squire, president of Oracle's worldwide sales division, said discounts were being offered on some large deals in return for prompt payment in cash.
- Oracle is writing as much as 85% of its new business with "net-30" terms. This means that payment is due within 30 days of shipment, Squire said. Many other Oracle deals have been written on 365-day terms, he said, delaying repayment until the fourth quarter. At the same time, capital expenditures are frozen, as is hiring, with few exceptions.
- Oracle is no longer supplying "free" consultants to large customers. Until recently, about 80 consultants worldwide were working at no charge, Squire said. "That's a million dollar revenue opportunity at flat cost," he said.

In addition to raising cash, Oracle is lowering expectations. In September, the firm projected 25% growth for fiscal 1991, ending May 31. Late last month, Chief Executive Officer Lawrence Ellison declined to specify a 1991 growth projection.

Smart hubs

CONTINUED FROM PAGE 71

suffering budget cutbacks and slashed operating costs is that the recession has thus far bypassed the LAN market, said Mary Modahl, director of network strategy research at Cambridge, Mass.-based Forrester Research, Inc.

No end in sight

Forrester expects the smart-hub boom to continue for at least the next several years (see chart page 71). "Though companies are buying less, when they buy, they buy LAN-based technologies," Modahl said.

In addition, "smart hubs are very complementary to routers, which are also showing tremendous growth," said Nick Lippis, principal consultant at Northeast Consulting Resources, Inc. in Boston. "With routers being bundled into the devices, the hubs serve as another distribution channel for router vendors."

While the smart-hub market is relatively new, not all of the companies contending for it are. The big-name computer players are providing competition for the niche players by offering slimmed-down versions of the hubs that interconnect several networks of the same type.

For example, AT&T rolled out a managed multiport repeater that supports up to 12 Ethernet LANs, and IBM introduced its Controlled Access Unit, a managed multistation access unit for Token-Ring networks.

Digital Equipment Corp., however, has indicated plans for a full-fledged smart hub, acknowledging that it cannot ignore competition from vendors bundling terminal-server support into their wiring centers.

> "THOUGH COMPANIES ARE buying less, when they buy, they buy LAN-based technologies."
>
> MARY MODAHL
> FORRESTER RESEARCH

Terminal servers, which connect multiple dumb terminals or other devices to a LAN, account for about 50% of DEC's networking business [CW, Jan. 14]. Smart-hub vendors currently offering modular terminal server support include Cabletron Systems, Inc., Racal Interlan and Tandem Computers, Inc. subsidiary Ungermann-Bass, Inc.

The boom notwithstanding, smart-hub vendors will face many challenges during the next several years, Erickson said. For instance, he said, although vendors insist they have barely broken ground with their products, the risk of commoditization already looms on the horizon.

William A. Lanfri, vice president of business development at Synoptics, maintains that the risk is slight. "Manageability is key, and there is constant pressure to improve throughput for high-speed data networking," he said. "It's only been in the last year that this has been discussed in terms of smart hubs."

In addition, Synoptics has been a leader in pushing the industry toward a standard for running the 100M bit/sec. data rates of Fiber Distributed Data Interface LANs over twisted-pair wiring — another technology that could eventually be supported by the company's Lattisnet 3000, Lanfri said.

Humble beginnings

How does a company go from selling cabling out of a garage in 1983 to winning kudos as the New York Stock Exchange's top performer in 1990, with stock skyrocketing 204% during the year?

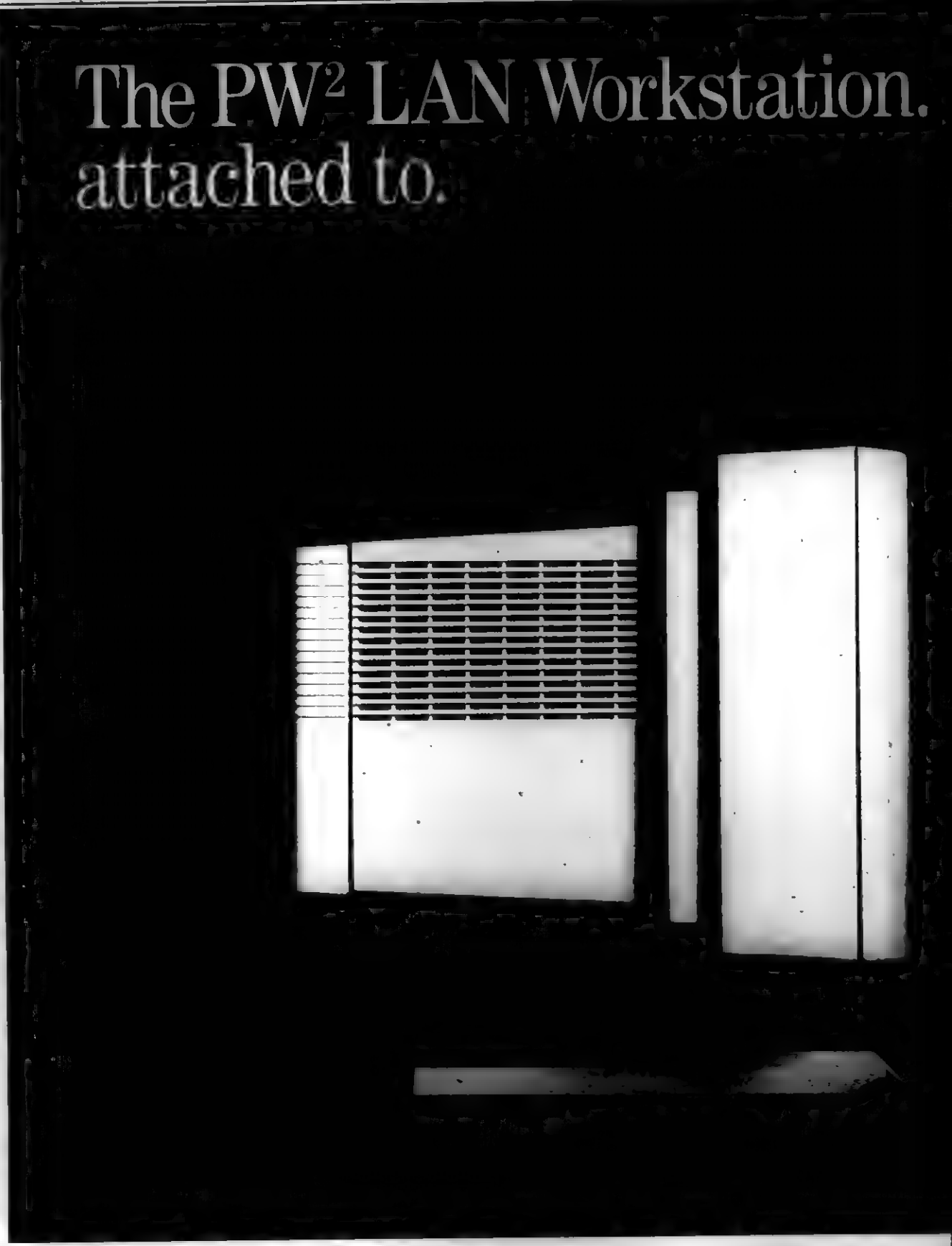
"Remember your roots," advised Craig Benson, chairman and chief operating officer at the now-$200 million Cabletron Systems, Inc. The Rochester, N.H.-based firm manufactures intelligent wiring centers, network adapter cards and network management systems.

"Everyone has a corporate philosophy," Benson said. "Ours wound up being customer service because we started as a cable company, and there was simply no other way for us to differentiate ourselves. We have found that as long as you show people you're willing to work with them and not abandon them — whether what you're solving is [actually] your problem or not — they'll stick with you," Benson added.

Benson also attributes the success of his company, which he and President Robert Levine co-founded in 1983, to quick decision-making.

"Our biggest enemy in this business is time," he said. "If we make a decision and it's wrong, we can fix it quickly. And if we're right — well, we're that much ahead." However, he added, "You can't have people believing that just because you're bigger, it takes you longer to react. If you do, you open the door for smaller companies to intrude."

JOANIE M. WEXLER



Are you a smart-hub candidate?

While the benefits of smart hubs are obvious, they aren't for everyone.

The appeal of smart hubs diminishes when office or plant layout is widely dispersed or when networks are sparsely distributed in the workplace. Electrical or magnetic interference can also obviate the star-wired topology typical of smart-hub environments.

Under these circumstances, stand-alone routers or bridges, discrete multiport repeaters or multistation access units (see story page 71) make more sense.

Before considering a modular smart-hub approach, be sure you need enough modules in one place to beat the overhead costs of the chassis. The chassis is the basic building block for a smart hub and can cost more than $1,500. The modules cost from 10% to 25% less than you would pay for a stand-alone product because they do not require an enclosure or separate power supply.

Swavely's sudden departure prompts changes at Compaq

BY RICHARD PASTORE
CW STAFF

The recent surprise departure of Compaq Computer Corp. North America President Michael Swavely and last week's announcement of another slow quarter for North American sales has some analysts questioning whether pricing and marketing strategy concerns simmering at the No. 3 personal computer maker have finally come to a boil.

Swavely's abrupt decision to take at least a six-month leave of absence for personal reasons prompted the company to reorganize its leadership structure, Compaq stated publicly last week.

In announcing overall sales growth of 27% for the quarter ended Dec. 31, 1990, Compaq noted that domestic revenue grew only 5% over the like quarter in 1989. This concludes one year of North American growth that never surpassed 5% in any quarter. In contrast, international revenue grew 49% this quarter and an average of 50% for the year. Overall, Compaq profits this past quarter jumped 70% to $135 million on sales of $1 billion.

Weaknesses in Compaq's domestic pricing and marketing strategies may be at least indirectly responsible for slow domestic growth and Swavely's departure, according to analysts. They further questioned whether these policies will be more open to change under Swavely's counterpart in Compaq's international operations, Eckhard Pfeiffer, who was named to the new position of chief operating officer.



Swavely takes leave of absence from Compaq

"Swavely has stubbornly refused to react to the [market] threat of the second-tier vendors," said Jim Poyner, an analyst at William K. Woodruff & Co. in Dallas. With the change in leadership, "Compaq is finally recognizing its market share is at risk domestically" from low-priced competitors.

Despite some modest price cuts last year, Compaq has kept its prices relatively high, while the company has consistently maintained that its core customers are more concerned with quality than price.

"That's baloney," Poyner said. "For most desktop applications, one 386SX is as good as another."

Many users concurred. "In side-by-side comparisons, I don't see enough of a difference between Compaq and some of the others to justify the premium," said a PC buyer for a major state agency who asked not to be identified.

Increasing pressure

In 1991, for the first time, Compaq will also face serious pricing pressure in the notebook computer market it once dominated. AST Research, Inc.'s $3,000 Intel Corp. 80386SX-based notebook and a similarly priced model expected from Dell Computer Corp. this week will "embarrass" Compaq in 1991, one analyst said.

If Compaq does not restructure its pricing on existing and new portable products, it will lose considerable market share to competitors later in the year, analysts agreed.

Compaq downgraded Swavely's vacated post to the level of vice president and filled it with former distribution chief Ross Cooley. Swavely's return is not certain, nor is the position he might fill, Compaq spokesmen said. Swavely could not be reached for comment.

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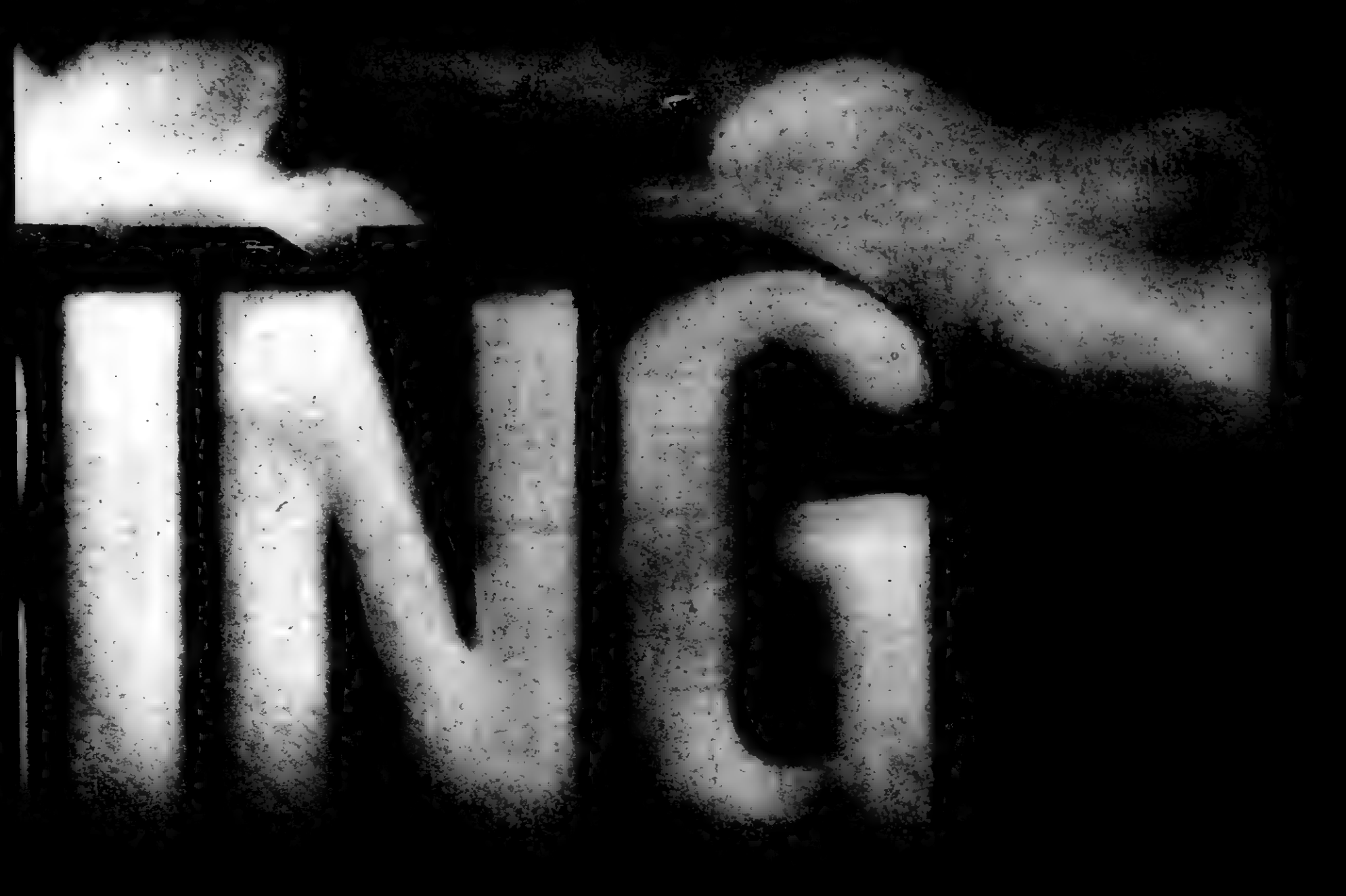
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Contract to rescue Concurrent

Bondholder pact may keep computer firm out of bankruptcy

BY NELL MARGOLIS
CW STAFF

TINTON FALLS, N.J. — The book is far from closed on Concurrent Computer Corp., but it now appears less likely to end with bankruptcy.

Late last month, the embattled real-time systems vendor signed a debt restructuring pact with the bondholder consortium that threw Concurrent into an involuntary bankruptcy proceeding under Chapter 11 of the federal bankruptcy laws in December. Under the agreement, approximately $111 million of bond debt will be exchanged for $55 million of new senior subordinated notes and 70% of voting equity in the recapitalized Concurrent.

Awaiting bank approval

If the group of banks that currently holds some $52.9 million of Concurrent debt blesses the vendor's agreement with its bondholders, the bondholders will move to dismiss the involuntary bankruptcy petition filed on Dec. 31, according to Concurrent.

Jeffrey Werbalowsky, managing director of the Financial Restructuring Group at Houlihan, Lokey, Howard & Zukin Capital, the bondholders' financial advisers, said he expects the bankers' decision is imminent.

Werbalowsky added that he anticipates a green light from the bank group. The bond debt restructuring offers a substantial boon to all Concurrent creditors and customers, he said.

The swap of approximately half of Concurrent's bond debt for equity that will go to the bondholders allows the firm potential bond interest savings of some $45 million over the next three years, he said. Sums thus saved will be available to help finance the company's comeback move into the real-time Unix market, he noted.

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INTERNATIONAL BRIEFS

Welcome Back

Leaders from government, business and academic communities turned out in **Prague** late last month for an official ceremony marking the formation of **IBM CSFR** (Czechoslovak Federal Republic), an IBM subsidiary to be staffed with about 70 local workers. IBM has had a market presence in the country since 1969 and is currently selling most of its wares to customers in 40 cities. However, IBM CSFR will be the first IBM company based in Czechoslovakia since the 1948 nationalization of a then 16-year-old subsidiary. Big Blue marked its return on a graceful note: It donated two Personal System/2s to a foundation that aids the disabled, named in honor of Czechoslovakia's first lady, Olga Havlova.

Growing, not going

A **Digital Equipment Corp.** spokesman in Hong Kong recently said DEC's announced plan to lay off 3,500 personnel during the first half of 1991 "will not be applied to [the Asian] region," according to a recent report in the Hong Kong business press. Not only will there be no layoffs in Asia, the spokesman said, there will be no personnel cuts through attrition. To the contrary, he said, DEC's regional headquarters in Hong Kong is actively recruiting.

Breaking in

Forget pizza, pasta and mozzarella — **Italy** is bidding fair to become known for its computer industry. According to Italian market research firm **Assinform**, the country's overall information technology market grew 14.5% in 1989, with the personal computer sector alone increasing 45%. However, another growth figure is less encouraging: Losses caused by software piracy in Italy amounted to $768 million in 1989, making Italy the second most pirated country in Europe, according to the Business Software Association (BSA). Germany, according to the BSA, still holds the dubious distinction of topping Europe's software piracy chart.

Gone South

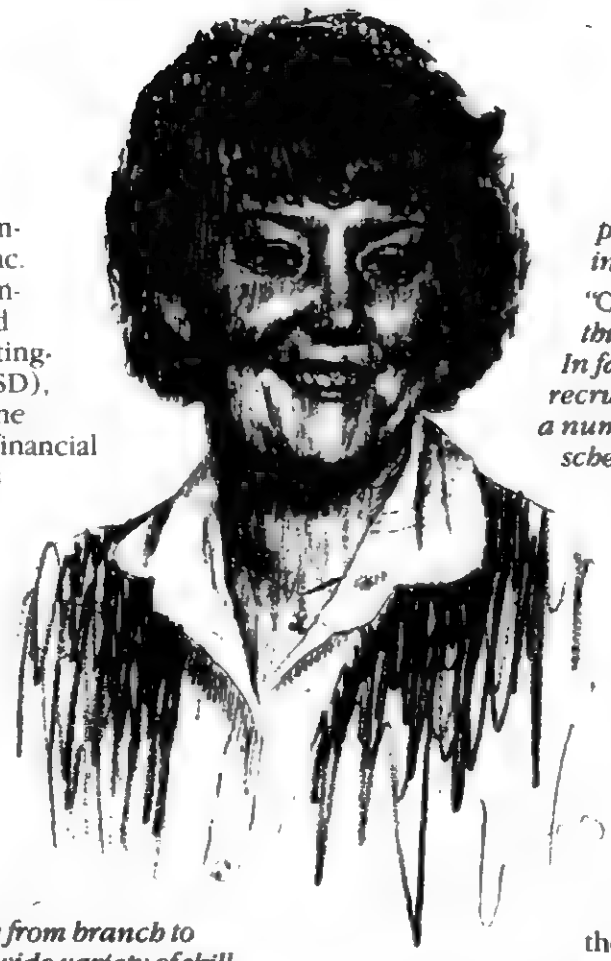
Computer Associates International, Inc. has opened a branch in the Philippines. According to Cristy Gomez, head of the new branch, recent deregulation of the country's banking industry "and a more modern look at computing in general has allowed for a boom of unprecedented [proportions]." CA said it hopes to leverage its current 40 user sites in the Philippines to take advantage of the sudden change in computing climate.

A rude awakening

European PC manufacturers who have enjoyed relatively inexpensive Japanese dynamic random-access memory chips over the last year may be in for a period of belt-tightening. According to market research firm **Dataquest, Inc.**, a 10% to 15% price hike is expected in Japan's DRAM market during the course of this year. The cost of Japanese DRAMs is controlled by a complex pricing structure related to individual prices from the country's 11 major chip producers.

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COMPUTER CAREERS

Making a move painless and inexpensive

BY KATIE CRANE

Virtually every company, large or small, has comprehensive relocation policies covering domestic and international moves for new hires and transferees. But the challenge for most organizations is how to make the moves smooth and with as little out-of-pocket expense as possible for those moving.

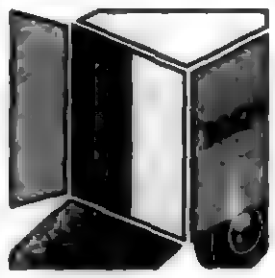
Two current avenues that companies take include offering their own comprehensive preparation service as part of their relocation package and farming the task out to a relocation services company. No matter who provides them, relocation preparation services were designed to help employees deal with more than just the logistics of a move.

"It doesn't matter where the employees are moving to or from," says Anne Perreyclear, manager of recruitment services at Resources International, Inc. in Atlanta. "When the doors on the back of the moving truck close, and they're left standing there with only a suitcase, they feel like they have no control over their destiny." Her advice to clients? Try to laugh a lot.

These services also provide information about the area the employee is moving to so that expectations will not be higher than they should be.

Robert Baillie, chief executive officer of Hestair Computer Group, which places technical talent in temporary assignments all over the world, puts it bluntly: When people are relocated to a job that is different from what they've been led to believe or to an area someone in the family doesn't like, the resulting pressures will affect job performance.

However, just providing handout information about a region isn't enough. It's also up to the relocating company or preparation services provider to be forthright about the drawbacks of the region. For example, Baillie moved 18 experienced programmers from Canberra, Australia, to Fort Wayne, Ind., a few years ago. "When we 'sold' them on the area, we certainly hit the highlights, but we had to acknowledge the drawbacks," he says.



Step-by-step help

Most relocaters say they go to great lengths to provide volumes of information: everything from videos and bulky newcomers' kits to appointments with bankers and step-by-step procedures for dealing with the department of motor vehicles.

Even if the information sought by the relocating employee is trivial, the preparation services providers take it seriously: "If a person wants to know where the Society for Underwater Basket Weaving meets, I'll find out," says Leba Harrington, manager of US West Relocation Services.

Probably the most difficult move that even a serene relocation veteran can make is an international one. In addition to the obvious logistics of customs declarations and currency exchange rates, relocation experts may often find themselves coaching those moving on everything from language (one foreign family thought a hot dog was an overheated pup) to driving on the "wrong" side of the road.

Rick Swaak, vice president of human resources at the National Foreign Trade Council in New York, gets calls daily from member companies around the world seeking information on such things as housing, education, per diem allowances, perks and danger pay for volatile areas such as the Middle East and Eastern Europe.

Aside from the basic relocation allocations, which can be either a flat fee or some percentage of a person's annual salary (5% to 7% is common), companies include several relocation perks to help ease transitions. These may include: one or more expense-paid trips for house or apartment hunting, transportation of household goods and variable allowances for travel expenses, temporary living and the myriad of miscellaneous expenses, such as utility deposits, that crop up in the process. Many also include some optional services such as job-hunting advice for spouses.

Smaller perk package

However, with nationwide budget cutbacks, even relocation packages are less attractive now than they were a few years ago. There was a time, Perreyclear says, when "a company would fly you and your family to the new location as often as necessary to find a new house, buy your house at the going rate, pay all the closing costs and commissions on the new house, pack the boxes, move the goods and give you a per diem expense account while in transit," she explains.

Now, Perreyclear says, companies are trimming relocation costs as much as possible, but most are trying to trim areas that won't place undue burden on the individual or family moving.

Debby Paris, whose family moved from Teaneck, N.J., to Atlanta when her husband accepted a technical consulting job at Resources International, says she has seen how relocation packages and services have slacked off in recent years.

"We had to sell our house in a soft market with no promise of assistance," she says, adding that two neighbors faced the same dilemma; one house, on the market for eight months, has yet to sell.

A full-time programmer with a three-year-old son in day care, Paris rushed home during her lunch hours to coordinate the logistics of the move. She had only been settled in Atlanta for two months — and was not yet reemployed — when she recalled the stresses associated with relocating.

"We received tons of help from Resources," Paris acknowledges, "but they couldn't provide the emotional support to help us cope with the separation from families and friends and the adjustment to this place we'd only visited for a few days on vacation." While she admits that this kind of support is not necessarily the company's job, that is what makes moving so stressful, Paris says.

Relocating is never an easy project, whether it be across the state border, across the country or overseas. If an employer is offering these services to new hires or to transferees, they should take advantage of them. After all, Harrington says, "Moving is No. 3 on the stress meter after death and divorce."

Crane is a free-lance writer based in Norwich, Vt.

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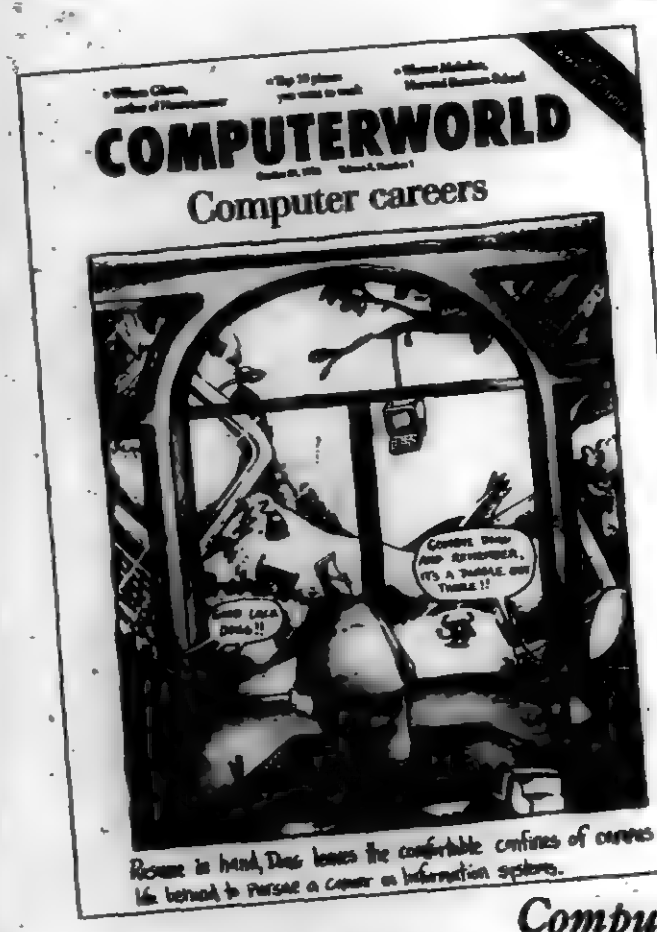
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Issue Date: October 31, 1991
Close: September 27, 1991


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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Prospects for minorities in computing.
- Merits of an Electrical Engineering degree for a computer career.
- Information Systems salaries from Computerworld's annual survey with the Data Processing Management Association.

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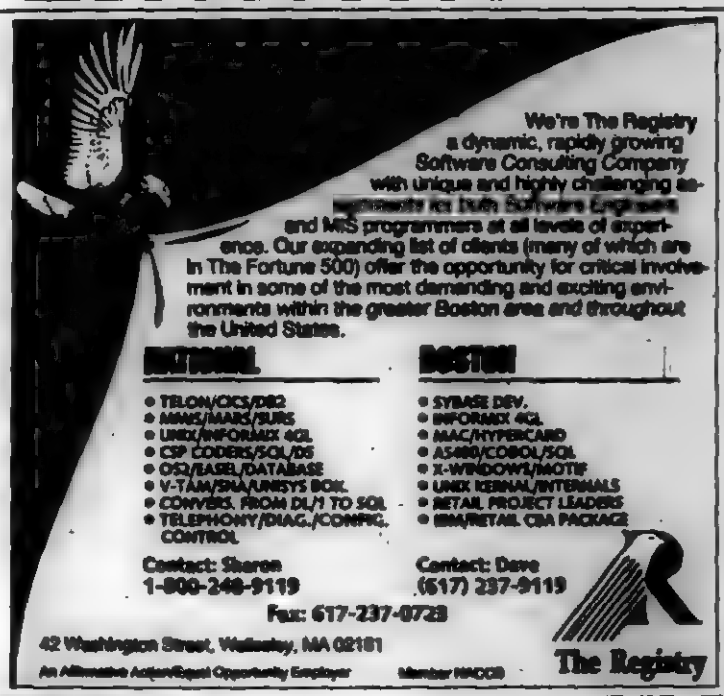
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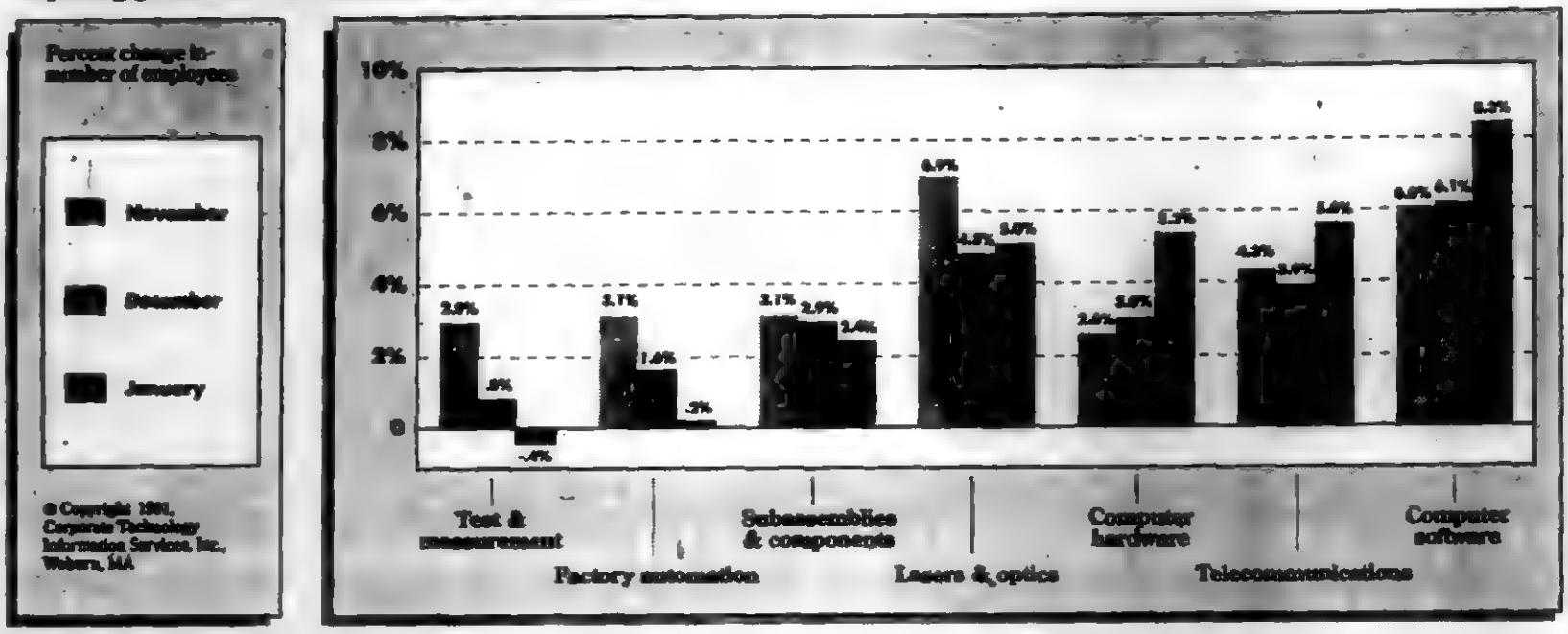
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Computerworld/CorpTech Career Index

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Mark Linder, Manufacturers Hanover Trust Co.'s vice president of strategic technology and research, recently solved one of the most difficult problems in any information systems organization: Senior management suspected programmers were not performing productively, and they wanted to know why.

Linder developed a "quick strike" management strategy based on Howard Rubin Associates' RA-Metrics, a productivity management package, to analyze what was happening.

In one department, the reason for the declining productivity became clear immediately: The development team was constantly responding to requests for end-user support. This drained the workers' time, making it difficult for them to focus on mission-critical applications development. "Once we realized where our resources were going, we were able to reconcile the right order of priority," Linder says.

Indeed, as cost pressure continues, many IS managers are turning to personal computer-based packages that attempt to make productivity measurement easier and more reliable.

The packages are not cheap, ranging from $15,000 to more than $100,000, but managers who use them say they can be well worth the money — analyzing one project can mean a 50% to 60% increase in productivity, Linder says.

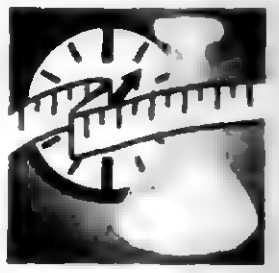
Most packages offer the following features:

- A large mix of soft and hard measurements: size of project, lines of code, staff experience and how clearly project specifications are stated.
- Industry-specific benchmarks to compare any given in-house project with similar projects at other firms.
- The ability to use data from previous projects to track productivity improvements.
- "What-if" capabilities that allow managers to see how changing variables can affect the cost or time frame of a project.

Productivity improvement software has only recently begun to appear on the market, and packages are usually the result of decades of field experience and research by a consultant or group of consultants. Thus, each package offers its own approach to productivity problems.

"These approaches involve more of a process than a package because of the inherent difficulties involved in measuring productivity," says Jessica Keyes, president of New Art, Inc., a New York-based consulting firm.

Keyes and other industry experts identified four of the top productivity packages available: RA-Metrics is $45,000 for an unlimited site license; Quantitative Software Management's Production Analysis Productivity System (PADS) costs $15,000 for an annual license; Software Productivity Research's Checkpoint is priced at $20,000 for a single copy, with site licenses and volume discounts available; and Computer Power Group's Metrica Analysis costs from $35,000 to $110,000, depending on consulting/training fees.



For many organizations, the payoff from using these packages comes when an IS manager is able to apply the results of one productivity analysis to subsequent development projects.

This was the case at GTE Data Services, according to Craig Scates, the administrator for systems planning.

Hoping to reduce costs and increase customer satisfaction, GTE wanted to implement a new "phased" approach to systems development and used Quantitative Software's PADS to determine if this would increase worker productivity. GTE chose a massive capital management system project that was to cover a wide range of plant management functions as the pilot test; the project had six releases and took four years to complete.

PADS measured and tracked the productivity of the programmers in each phase of each project release. At the end of the project, GTE was able to take all this data, compare it with past, nonphased GTE projects as well as industry-specific benchmarks and determine the overall productivity of the phased project.

"We learned a lot from this," Scates says. "Productivity shot up in the second release because the programmers were more accustomed to the new fourth-generation language they were using; but then it dropped down again as integrating new sections into an increasingly large system grew more complicated."

For some firms, accurately assessing software developer productivity is more than a luxury — it's essential for survival.

For CACI, a Rosalind, Va., software development consultancy, the problem was one of accurately assessing development costs and using that knowledge to allocate resources.

CACI first used Software Productivity's Checkpoint 1½ years ago to more closely estimate the real cost of manufacturing and distribution projects it was bidding on, says Dave Garmus, CACI's development manager.

Keeping in check

Checkpoint estimated the cost of prospective software projects and at the same time measured the quality and productivity of projects in progress. "In one project, we calculated we would actually save money by assigning five to 10 more programmers to a task to get one phase of it done faster," Garmus says.

Although there are currently only a handful of software packages on the market that measure the productivity of corporate development efforts, experts say they expect that to change. And this trend will only intensify if the economy remains sluggish, Scates and others say.

LaPlante is a free-lance writer based in Palo Alto, Calif.

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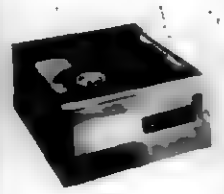
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Refuting sales training myths

***Head of the Class** is a monthly column exploring innovative training approaches throughout corporate America.*

BY KATHLEEN C. PORTER
SPECIAL TO CW

As corporations provide their sales forces with information systems tools, they are finding that some of the old myths about training salespeople to use technology no longer apply.

Through my work in providing systems support for sales forces at Kraft General Foods, a division of General Foods USA, I have identified common misconceptions made by systems managers, sales managers and even trainers, who should know better.

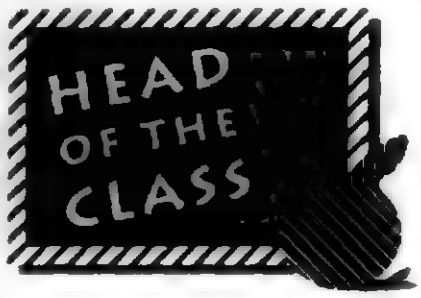
• Myth No. 1 — Computer training for salespeople should be serious business.

Computer training *is* serious business. But that doesn't mean it can't be fun and that trainers can't capitalize on some of the very strengths that make good salespeople.

Salespeople are different to train than the usual end user. They're competitive and independent, and they aren't used to sitting in one place for very long. They're motivated by incentives and rewards.

Trainers can take advantage of these characteristics to make technical training more interesting and to generate active participation.

For example, at the end of each initial training class, General Foods holds a mock graduation ceremony in which the salespeople print out their own diplomas using the graphics software on their computers. Each person is called to the front of the class to accept his signed diploma, a small token "graduation" gift and a handshake from the instructor, who welcomes him officially to the General Foods Laptop Team.



While this approach is fun and reinforces the use of software taught during training, it also serves to end the training on a positive note.

• Myth No. 2 — Train all salespeople together, no matter what their computer experience may be.

The inherent assumption in this particular myth is that everyone *should* be at the same level, just as if it were a theoretical course in management. There is also the assumption that being a "beginner" equates to "remedial," a stigma that will somehow show up on a year's end job performance evaluation.

In fact, most salespeople prefer to be in a group with people who are at the same level of experience. Learning how to use a computer is a skill. Think about it: If you've never played tennis before, would you sign up for the advanced class? It's far more embarrassing to be the dummy in the wrong class than it is to be called a beginner.

One last caveat on this subject: Don't mix salespeople in the same classes as their bosses. For a first-time user, learning how to use a computer is hard enough without the added pressure of thinking, "If I ask this question, my boss will think I'm stupid." It can be equally difficult for the bosses, who won't want to show any weakness in front of the group.

Trying to teach a group of salespeople who have different levels of previous experience is frustrating for the learners, exhausting for the instructor and not very successful for the time and money involved.

• Myth No. 3 — Older salespeople have a hard time learning how to use a computer.

It's a big mistake to assume that competency or potential performance is based on age. While it's true that younger salespeople usually gain some computer experience in school and may already be familiar with such concepts as saving a file, what they have is more experience, not necessarily more competence.

Unfortunately, the myth of age-related competency persists even among users. One long-term company salesman showed his colleague a comprehensive sales presentation for a new product, which he had prepared on the computer. The presentation was professional, concise and persuasive. The colleague, a younger salesman with a reputation as a "computer jock," said only half-jokingly, "Who did you get to do that for you?"

One project manager from a large Midwest insurance firm, who has been training salespeople to use computers for the past six years, put this issue into perspective: Some people are open to learning their whole life, while others have never been. Resistance to change is something we all have to deal with; how we handle it and adjust has more to do with individual personality than it does age.

• Myth No. 4 — Sales managers don't need computer training because their secretaries will probably do the work anyway.

Sales managers don't need the same kind of training as their salespeople, but they need training. Providing the sales force with IS tools revolutionizes the way it does business.

In any change of this magnitude, successful results mean a show of support and commitment from the top down. Sales managers are asked to lead the way in this show of commitment, but it's hard for them to demonstrate support if they don't understand what benefits IS will give.

Trainers can approach training for sales managers in several ways: Offer several introductory courses on the hardware and software aimed only at managers. Design the courses around the ways managers would use the tools, and show them how they can get the information they need faster for more timely and profitable decision-making. Most importantly, outline the benefits to the sales managers. People pay closer attention when there is something in it for them.

Porter is a systems specialist at General Foods USA in White Plains, N.Y., and has spent the last three years teaching and developing laptop training for the field sales force.

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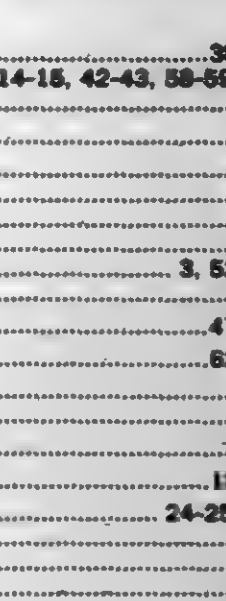
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

UPGRADED FROM UNDERPERFORMER TO NEUTRAL: Oracle Systems Corp. (Alex. Brown & Sons, Inc.). Reason: Increased confidence in cash-flow status after conference with company bigwigs.

UPGRADED FROM HOLD TO BUY: Digital Equipment Corp. (Prudential-Bache Securities, Inc.). Reason: Stock has hit bottom; projected profit improvements should spark rise in share price.

INSIDER ACTION

BOUGHT: Alex Sandison, a controller at Santa Clara, Calif.-based **Rasterops Corp.**, exercised his option to buy into the computer monitor firm, picking up 10,000 shares in mid-December, which is now his total holding. Rasterops went public nine months ago.

SOLD: Scott Mercer, **LSI Logic Corp.**'s former chief financial officer, sold 1,500 — or 10% — of his shares in LSI in early December, approximately one month before he and two other executives left the company [CW, Jan. 28].

GUEST SPEAKER: POINT

Andrew Neff, Bear, Stearns & Co.:

"One of the reasons to buy **Apple Computer, Inc.** now is the success of **Microsoft Corp.**'s Windows 3.0. Windows may have brought the graphical user interface to the DOS world, but it hasn't made inroads into the Macintosh environment. In fact, Windows may have made the Mac approach more acceptable [in business], evidenced by Apple's recent market share gains."

"The Mac has significant advantages over Windows, such as more uniform applications, a broader array of software, and it requires less hardware overhead."

"Apple is criticized for its proprietary, closed architecture, but the market doesn't care about that. Microsoft, **Intel Corp.** and **IBM** have proprietary products that are widely successful."

GUEST SPEAKER: COUNTERPOINT

Stephen Smith, Paine Webber, Inc.:

"Apple is an unattractive stock right now. Although it has increased its unit volumes shipped, it underestimates the effect on its growth of competition from Microsoft. The good earnings report Apple recently posted was buoyed by strong currency conversions from overseas."

"Microsoft aims to convert half the 70 million DOS users to Windows within a couple years. Unless Apple continues to price its products extremely aggressively, it will quickly lose market share wars. Apple hopes that its newfound unit growth, due largely to the success of its Macintosh Classic, will maintain current profit levels. The Classic is selling, but Microsoft's challenge still threatens. Software developers dropped everything to jump on Windows when it came out last May.

"People who say that the Mac approach is better miss a key point: Windows 3.0 is not going to stand still. With the large installed base — both realized and potential — limitations of Windows will soon be addressed. Apple, meanwhile, has been late with System 7, and I wouldn't be at all surprised if it's late with future products."

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- After posting its quarterly earnings loss last week, Lotus Development Corp. stumbled 1⅜ points by Thursday to close at 16¾.
- Borland International, Inc. hit another new high Thursday, closing at 50, up 6¼ points. Novell, Inc. also topped its high mark, jumping 4⅜ points to 43.
- Still riding high after recently reporting a 70% profit increase for its fourth quarter, Compaq Computer Corp. soared 8¼ points to 69¾, a new high.
- Peripherals makers Storage Technology Corp. and Quantum Corp. each gained 3¼ points last week, closing at 28¾ and 20¾, respectively. Meanwhile, Seagate Technology, Inc. lost ¾ of a point, dropping to 13½.
- Motorola, Inc. won big among semiconductor firms, picking up 3⅜ points to close at 54¾.
- Autodesk, Inc. continued the slide begun after it warned investors to expect lower fourth quarter financials, dipping to 45½, down 6½ points.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, JAN. 31, 1991

TOP PERCENT GAINERS

Grid Datacomm Indls	35.53
Oracle Systems	33.33
Antel Comm. Corp.	31.50
Intersys Sys. Corp.	30.38
Tandon Corp.	28.43

TOP PERCENT LOSERS

Alloy Computer Prod.	-68.47
Intellicorp Inc.	-17.65
Autodesk Inc.	-12.50
Computer Automation Inc.	-11.11
Boole & Babbage Inc.	-8.99

TOP DOLLAR GAINERS

Compaq Computer	8.50
Microsoft Corp.	7.63
Borland Int'l	6.75
AST Research Inc.	6.63
System Software	6.00

TOP DOLLAR LOSERS

Autodesk Inc.	-6.50
Lotus Development	-1.38
Boole & Babbage Inc.	-1.25
LDI Corporation	-0.88
Sterling Software	-0.75

Exch	52-Week High	52-Week Low		Jan. 31 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**Up 8.86%**
OTC	19.00	5.38	3 COM Corp.	7.38	-0.25	-3.21
NYS	69.75	52.50	American Info Techs Corp.	65.13	1.00	1.57
NYS	44.13	25.00	AT&T	32.75	1.88	6.07
OTC	9.63	0.88	Antel Communication Corp.	2.63	0.63	31.50
NYS	58.25	39.50	Bell Atlantic Corp.	49.50	0.38	0.78
NYS	57.63	49.00	Bellsouth Corp.	52.50	0.50	0.98
OTC	16.38	0.25	Compression Labs Inc.	13.63	0.63	4.85
NYS	38.75	23.38	Contel Corp.	38.00	1.25	3.40
OTC	4.38	1.75	Data Switch Corp.	4.38	0.25	6.19
NYS	36.75	8.88	Digital Comm. Assoc.	13.38	0.38	2.92
OTC	20.75	12.25	Dynatech Corp.	20.75	1.38	7.10
OTC	12.88	5.50	Fibronix Int'l Inc.	7.88	-0.12	-1.56
OTC	4.00	1.75	Gandalf Technologies Inc.	2.88	0.00	0.07
NYS	4.75	1.63	General Datacomm Indls.	2.88	0.75	35.53
NYS	34.13	23.50	GTE Corp.	28.13	1.00	3.57
OTC	7.00	0.81	Intecron Systems Corp.	1.06	0.25	30.38
NYS	60.88	40.25	ITT Corp.	51.88	1.88	3.76
OTC	44.13	17.88	MCI Communications Corp.	24.38	3.75	18.21
OTC	21.00	2.75	Microcom Inc.	4.25	0.75	21.43
NYS	34.38	4.38	Network Equipment Tech.	4.38	0.38	9.50
OTC	14.88	4.00	Network General	11.25	1.25	12.50
OTC	15.25	8.00	Network Systems Corp.	14.88	1.75	13.37
NYS	29.63	22.13	Northern Telecom Ltd.	27.75	1.13	4.23
OTC	43.00	14.25	Novell Inc.	43.00	4.63	12.06
NYS	89.50	67.13	Nynex Corp.	71.00	2.50	3.65
NYS	47.88	38.25	Pacific Telesis Group	41.25	1.38	3.46
ASE	11.00	4.75	Parvi Corp.	11.00	0.88	8.64
NYS	29.13	8.88	Scientific Atlanta Inc.	13.63	0.75	5.84
NYS	59.50	47.25	Southwestern Bell Corp.	52.13	1.13	2.22
NYS	48.38	20.63	United Telecom	24.63	2.38	10.70
NYS	40.50	32.38	US West Inc.	38.25	2.13	5.89
Computer Systems						**Up 6.52%**
OTC	8.75	0.56	Alliant Computer Sys.	1.00	0.00	0.00
ASE	16.88	10.00	Amdahl Corp.	15.88	1.88	13.43
OTC	55.50	24.25	Apple Computer Inc.	55.50	3.38	6.47
OTC	13.88	4.25	Archive Corp.	7.13	0.00	7.62
NYS	6.63	3.88	Bolt, Beranek & Newman	6.38	0.13	2.00
NYS	16.63	4.50	Commodore Int'l	15.63	2.01	14.72
NYS	70.00	35.50	Compaq Computer Corp.	70.00	8.50	13.82
OTC	4.25	0.13	Computer Automation Inc.	1.00	-0.13	-11.11
NYS	21.63	6.75	Control Data Corp.	10.88	1.51	16.05
NYS	20.88	8.38	Convex Computer	15.63	2.82	20.23
NYS	51.25	20.00	Cray Research Inc.	36.75	1.25	3.53
NYS	13.25	3.50	Data General Corp.	9.00	0.76	9.09
NYS	3.88	0.75	Datapoint Corp.	2.00	0.13	6.67
OTC	22.63	4.63	Dell Computer Corp.	22.63	0.00	0.02
NYS	95.13	46.50	Digital Equipment Corp.	71.63	4.13	6.12
NYS	36.13	13.75	Harris Corp.	22.75	1.75	8.33
NYS	50.38	24.88	Hewlett Packard Co.	38.88	2.38	6.52
NYS	126.88	88.50	IBM	125.88	5.88	4.96
OTC	14.00	7.75	Information Int'l	8.00	0.25	3.23
OTC	23.50	10.50	Intergraph	17.75	1.38	7.58
NYS	3.88	0.88	MAI Basic Four Inc.	1.00	0.00	0.00
NYS	180.88	114.00	Matsushita Electronics	127.00	2.38	1.91
OTC	25.00	9.00	Mentor Graphics Corp.	16.00	0.25	1.58
NYS	92.88	44.50	NCR Corp.	87.88	-0.25	-0.28
OTC	35.50	11.00	Pyramid Technology	19.25	1.50	8.46
OTC	24.00	9.75	Sequent Computer Sys.	14.50	0.75	5.45
NYS	40.88	18.00	Silicon Graphics	33.25	4.13	14.18
NYS	29.00	14.63	Stratus Computer Inc.	27.38	2.38	9.52
OTC	37.25	15.00	Sun Microsystems Inc.	28.38	0.50	1.81
NYS	30.13	8.88	Tandem Computers Inc.	13.63	1.26	10.14
NYS	39.50	23.50	Tandy Corp.	30.75	3.00	10.81
OTC	25.50	8.75	Teradata	15.63	1.88	13.67
NYS	9.00	1.38	Ultimate Corp.	2.38	0.50	26.93
NYS	17.13	1.75	Unisys Corp.	2.50	-0.13	-4.76
ASE	6.25	2.00	Wang Labs Inc. (b)	2.76	-0.13	-4.35
Software & DP Services						**Up 7.79%**
OTC	50.75	17.00	Adobe Systems Inc.	38.00	2.13	5.92
OTC	37.50	16.88	Aldus Corp.	37.50	2.38	6.35
OTC	21.25	10.50	American Mgmt. Systems	21.25	1.38	6.92
OTC	18.25	7.50	American Software Inc.	10.75	2.00	13.66
NYS	4.50	1.38	Anacomp Inc.	2.38	0.25	12.00
OTC	23.50	10.00	Analysts Int'l	18.25	3.00	22.64
OTC	15.13	4.88	Ashton Tate	6.88	1.38	22.31
OTC	10.25	4.00	ASK Computer Sys.	6.50	0.75	14.38
NYS	60.25	46.25	Auto-Data Processing	59.75	3.00	5.29
Semiconductors						**Up 5.02%**
NYS	25.88	17.63	Advanced Micro Devices	20.38	-0.12	-0.59
OTC	8.63	5.50	Analog Devices Inc.	7.88	0.13	1.68
OTC	23.50	5.25	Chips & Technologies	10.13	1.13	12.56
OTC	52.00	28.00	Intel Corp.	45.75	2.00	4.57
NYS	13.00	5.13	LSI Logic Corp.	7.50	0.75	11.11
NYS	16.38	6.75	Micron Technology	12.38	1.38	11.28
NYS	58.38	40.75	Motorola Inc.	54.75	3.38	7.62
NYS	8.88	3.00	National Semiconductor	5.00	0.38	8.11
NYS	44.00	22.50	Texas Instruments	37.38	-0.24	-0.65
OTC	12.25	3.00	VLSI Technology	7.00	-0.13	-1.75
ASE	14.88	4.88	Western Digital Corp.	5.38	0.13	2.48
Peripherals & Subsystems						**Up 6.92%**
OTC	2.38	0.09	Alloy Computer Prod.	0.13	-0.19	-58.47
OTC	2.50	0.88	Apertus Technologies	1.78	0.31	21.70
OTC	47.00	12.38	AST Research Inc.	47.00	6.63	16.41
OTC	24.00	7.50	Banctec Inc.	8.50	0.38	4.62
ASE	7.88	3.13	Cognitronics Corp.	7.88	0.75	10.60
NYS	31.25	12.38	Conner Peripherals	28.75	2.50	10.31
ASE	22.00	7.00	Datatram Corp.	10.50	2.00	23.53
NYS	10.50	4.13	EMC Corp.	9.88	-0.49	-4.77
NYS	43.88	33.75	Eastman Kodak Co.	42.63	2.51	6.24
OTC	8.50	4.38	Emulex Corp.	7.25	0.38	5.46
OTC	34.50	14.00	Evans & Sutherland	20.75	1.75	9.21
OTC	6.25	3.13	Iomega Corp.	5.00	0.63	14.29
OTC	21.25	6.00	IPL Systems Inc.	21.25	0.25	1.19
OTC	2.88	0.13	Maxstor Systems	0.50	0.03	6.81
OTC	17.00	2.63	Maxtor Corp.	3.75	0.25	7.14
OTC	11.00	3.88	Micropolis Corp.	11.00	0.75	7.32
NYS	91.38	73.63	3M Corp.	84.88	3.75	4.63
OTC	14.50	6.00	Printronix Inc.	7.75	0.25	3.33
NYS	21.25	8.50	QMS Inc.	16.13	2.13	13.31
OTC	25.75	8.88	Quantum Corp.	20.75	3.25	18.57
NYS	8.88	4.38	Recognition Equipment	5.25	0.00	0.00
OTC	8.88	4.00	Reexon Inc.	8.75	-0.13	-1.82
OTC	19.75	5.88	Seagate Technology	13.50	0.75	5.88
NYS	35.25	11.00	Storage Technology	28.75	3.25	12.75
OTC	4.00	0.63	Tandon Corp.	2.81	0.62	28.43
NYS	19.75	11.63	Tektronix Inc.	19.75	0.50	2.60
OTC	0.63	0.14	Telxon Corp.	0.25	0.03	14.16
NYS	58.75	38.00	Xerox Corp.	46.50	4.63	10.54
Leasing Companies						**Up 0.84%**
OTC	10.50	6.88	Amerilcon Inc.	9.25	0.75	8.82
OTC	4.38	0.31	Capital Associates	0.44	-0.06	-6.19
NYS	28.50	14.63	Comdisco Inc.	24.00	-0.50	-2.04
OTC	16.25	9.25	LDI Corporation	10.75	-0.88	-7.53
OTC	5.88	2.25	Silicon Inc.	2.50	0.25	11.11

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OSI delay forcing firms to seek other options

BY ELISABETH HORWITT
CW STAFF

Tired of waiting for Open Systems Interconnect (OSI) network management standards to go commercial, a number of users are going ahead and purchasing "open" network management platforms that promise OSI-based interoperability at some future date.

"A lot of users we talked to are saying that they have until the end of 1991 to lay down a network management plan for the next five years," said Robert Montgomery, president of the OSI Network Management Forum.

Between 125 and 150 Fortune 1,000 and equivalent companies, based in the U.S. and abroad, have discussed such issues at the Forum's President's Roundtables over the past year, Montgomery said.

At last week's Communications Network '91 show, National Westminster Bank PLC in London and Marine Midland Bank in Buffalo, N.Y., announced that they were implementing Nynex Corp.'s Allink Operations Coordinator. Both companies said they intend to move to OSI-based standards in the future but were satisfied with Nynex's ability to provide management support for their present and future network installations.

Compatibility issues

National Westminster could not go with an all-OSI solution at present because most of the products in its existing network do not comply with the standard, said Ken Clamp, senior manager of network management development at the bank.

"Our strongest reason for buying Allink was its ability to support non-OSI-conformant systems," he added.

In today's uncertain economy, many firms are eager for a management system that will keep networking costs in check.

National Westminster, for example, felt some pressure to wind up a "lengthy evaluation process" because of a project to implement "a major, new, very large information system" this year that is expected to double network traffic, Clamp said. Allink is expected to save National Westminster from having to "increase our staffing proportionate to hardware being installed" by making existing staff members more effective and by handling some management tasks automatically, Clamp added.

Many users have told the OSI Network Management Forum they do not care whether their network management products are OSI-compliant as long as they get the benefits that go with a standardized architecture, Forum Director of Operations Beth Adams said. Top priorities among these are the ability to support their existing mix of network products and the assurance of product stability and longevity, she added.

ICI Americas, Inc. chose AT&T's Accumaster as the right "open-ended system" to handle not only its current mix of computing and networking products but also whatever happens to come on-board with future expansions and acquisitions, said John Duffy, the chemical firm's director of computing and telecommunications services.

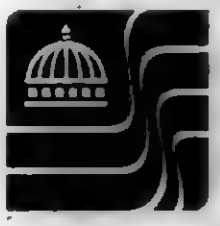
While ICI would like to see an OSI-based "common interface," it has not been pushing AT&T to deliver promised OSI support for Accumaster, Duffy added. "We assume that most network vendors will want to support Accumaster," along with IBM's Netview, Duffy said.

IBM reveals plans to expand APPN

BY JOANIE M. WEXLER
CW STAFF

WASHINGTON, D.C. — IBM entered the state-of-the-union spirit in the nation's capital last week by bringing the networking industry up to date on its strides in Advanced Peer-to-Peer Networking (APPN).

At the Communication Networks '91 show, the company outlined where it stands and where it plans to go with APPN. APPN is IBM's scheme to mesh its inherently hierarchical Systems Network Architecture (SNA) networks with distributed computing and peer-based communications.



Rick McGee, IBM's manager of communications systems architecture, said that by year's end, users will see a common programming interface for the C language (CPI-C) and APPN available on additional platforms.

CPI-C is a Systems Application Architecture (SAA) interface specification for LU6.2 — an SNA protocol that allows applications to communicate peer-to-peer.

McGee said CPI-C will be available for the OS/2 operating system, which runs on personal computers, by year's end. CPI-C for the MVS mainframe operating system was announced in September and is slated to ship by this summer, he said.

APPN functionality — which automates the process of adding network nodes, directory functions and routing — was delivered in 1986 for the System/36 minicomputer and in 1988 for the Application System/400 midrange system.

Ted May, data processing specialist at the Department of Corrections in Jefferson City, Mo., uses several AS/400s and System/36s along with more than 300 PCs. He said he looks forward to the day when APPN capabilities are available for PCs so he can automate the directory function.

"We do a lot of electronic mail and document distribution," he explained. "It's a horrendous problem to define all the users over and over again on all the systems we have, and the maintenance alone requires a full-time person. APPN would give us a centralized directory, which would be great."

Dave Passmore, a vice president in the network strategies group at Ernst & Young in Vienna, Va., said it would be nice if "IBM could start with a clean piece of paper and move all SNA to APPN. APPN is just another routable protocol, like Decnet or Transmission Control Protocol/Internet Protocol."

Currently, no routers on the market can route the complex SNA protocol, though efforts are under way by router market leader Cisco Systems, Inc. to address the SNA environment in its internetworking product line.

APPN builds on IBM's PU2.1, which allows two nodes in an SNA network to connect directly to each other without having to travel through a mainframe. PU2.1 connects nodes point-to-point only; APPN adds a multipoint dimension to the protocol.

McGee explained that the goal with APPN is to "eliminate labor-intensive network coordination in small systems." To accomplish this, APPN will build an "engine" on top of PU2.1 consisting of end nodes (such as an AS/400 and systems running OS/2 or Network Control Program) and network nodes (such as a Personal System/2 or a System/36). End nodes add to PU2.1 nodes such functions as the ability to register resources into the network and the ability to request that a network node do a directory search.

NEWS SHORTS

Laser 'lite' show

Scientists at IBM's Zurich Research Laboratory have developed a way to pack as many as 20,000 tiny lasers on a semiconductor wafer just 2 inches in diameter. The development could lead to practical and economic mass production and testing of semiconductor lasers, which are used to read music in compact disc players and print copy in laser printers, among other uses. IBM scientists said they expect the new method of laser fabrication, called full-wafer technology, to be faster, less expensive and to yield a higher percentage of working lasers per wafer than is now possible.

PC markdown at DEC

Digital Equipment Corp. lowered prices an average of 17% on existing personal computers last week and announced two models based on Intel Corp.'s 20-MHz 80386DX and 80386SX microprocessors. The 320+ will replace a similar model based on the 16-MHz 386SX and will cost $4,010 with 2M bytes of memory and a 40M-byte hard disk. The 320SX will be priced at $3,375 with the same configuration. The 16-MHz 386SX model will still be produced, and its price has been cut from $4,050 to $2,760.

CASE set due from CGI

CGI Systems, Inc. is scheduled to release its first Unix-based set of computer-aided software engineering (CASE) tools today. Paclan/X was designed to work in a local-area network environment with a Unix-based server, the firm said. Initially, it will be offered for the Hewlett-Packard Co. HP 9000 Series 800 systems. CGI sells repository-based, full-lifecycle tool sets in the CASE market. Last year, it branched out from its mainframe business and offered its first LAN product for IBM OS/2 servers. The company is the U.S. subsidiary of CGI-Informatique, a Paris-based software and services company.

MCI stretches its wings

MCI Communications Corp. announced the expansion of its virtual network service, Vnet, with links to Australia, France and the Netherlands. The firm also announced a joint venture to provide Vnet service within Australia and said it may interconnect with virtual networks in Japan and Singapore. MCI is teaming with the Australian Associated Press to introduce the voice, facsimile and data service this year.

Tandem promises RISC upgrade

Tandem Computers, Inc.'s CLX 800 machine, announced last month [CW, Jan. 21], will get new reduced instruction set computing (RISC) technology later this year, Tandem said last week. "Users will be able to upgrade their CLX 800 machines with a one-board swap to RISC," Senior Marketing Vice President Gerald Peterson said. The new version of the CLX machine is being beta tested.

ALR signs national distributor

Advanced Logic Research, Inc. signed an agreement last week to sell its PC line through national distributor Tech Data Corp. The Clearwater, Fla.-based distributor handles a customer base of 25,000, including value-added distributors, through 12 distribution centers in the U.S. and Canada.

Warmenhoven is NET chairman

Two new names were added to Network Equipment Technologies, Inc.'s (NET) board of directors: Daniel Warmenhoven, president and chief executive officer of NET, was appointed chairman; and Walter Gill, vice president and chief scientist at the firm, was given a board seat. Warmenhoven joined NET in 1989 after working at HP and IBM. Gill helped found the firm. NET also demonstrated a high-speed packet engine that will enable its IDNX T1 switches to support frame-relay, LAN routing protocols and ISDN D-channel signaling. The engine will come as a card that can be used to upgrade existing IDNXs, NET said. It is being jointly developed with Cisco Systems, Inc.

Continued from page 1

and customers appreciate.

In the early 1980s, DEC dismantled the straightforward product line approach and replaced it with a broad, mazelike organization of middle managers. Those changes, many observers said, blunted the company's entrepreneurial edge. "You have to make a profit within each individual piece, and we never planned to lose that," Olsen said.

As it recasts its internal management, the company's other transition — from minicomputer vendor to systems integrator/software, services and networking company — is moving at full speed, though not without an occasional roadblock.

"The fundamental shift of resources from hardware vendor to systems integrator is fraught with a long selling cycle, a steep learning curve and performance risks," said Byron Walker, an analyst at Moody's Investors Service, Inc. in New York.

Computer market forces, the current recession and DEC's overly optimistic planning are forcing the firm to shed thousands of employees, while at the same time, it faces a host of technical challenges.

The principal challenges include the following:

- Re-engineering the VAX architecture in the so-called Alpha Project to a reduced instruction set computing (RISC) base. The first machines should hit the market next year, analysts said.
- Opening up the closed VMS operating system by providing support for the Portable Operating System Interface for Unix (Posix) standard. Applications written to the Posix interface will run without changes under any Posix-compatible operating system.
- Firing up DEC's historically lukewarm commitment to Unix systems and software.

When asked about DEC's technical direction, customers seemed universally supportive of plans to open VMS, which should eventually provide interoperability and applications portability on networks of other vendors' machines.

"This statement of direction for VMS is the most important thing they've done in years," said Ken Krallman, MIS director at Carleton Technologies, Inc. in Orchard Park, N.Y. The power and performance of Unix machines make it increasingly difficult for even the most avid VMS fans to ignore Unix, Krallman noted.

Users also lauded the goals of the Alpha Project, which will make the VAX architecture comparable in price/performance to Unix-based machines. "DEC's clear direction is to close that gap," Krallman said. "I may not save a lot of money, but if it gets closer, I can stay in the VMS world."



DEC President *Ken Olsen looks for a profitable future*

The technical hurdles presented by migration to a RISC-based CPU should not be as daunting for DEC as they once proved to be for Hewlett-Packard Co., several analysts said. DEC has already invested years of research on RISC technology and has no fundamental incompatibilities to resolve within its own product line, the analysts noted.

"We know it works," Olsen said succinctly.

For DEC, which still reaps nearly 60% of its revenue from hardware and software sales, VAX pricing and performance are crucial issues.

Calculated RISC

Figures released last week by Computer Intelligence, a market research firm in La Jolla, Calif., showed that many VAX users are considering Unix-based workstations. An estimated 22% of VMS-only sites already have at least one Unix-based system, the company reported.

When DEC unveils its "RISCy VAX" in 1992, customers may notice more than the power of the new machine.

This VAX line will have a markedly slower rollout, with more extensive beta testing before general availability. What is critical to DEC in this rollout — with more than 10,000 VAX/VMS applications out there on 400,000 VAXs — is ensuring that the software porting mechanism in the new release of VMS allows users to recompile and run their old applications on the new systems.

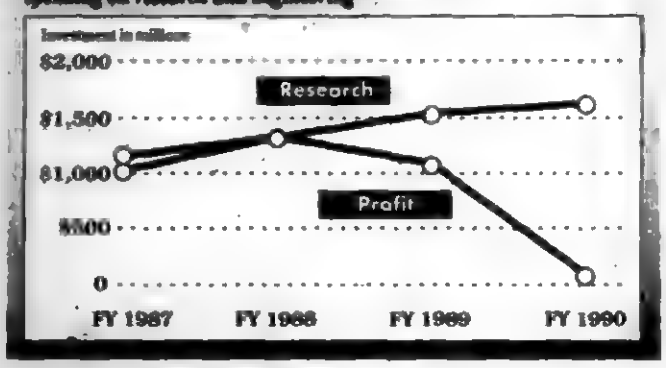
DEC is also intent on changing the poor reputation of its marketing, with particular attention paid this year to the Network Application Support (NAS) program. NAS is the company's software strategy for creating standards-based products that allow multivendor systems to interoperate on a network.

Yet since its 1988 debut, NAS has been lost in the shadows of IBM's Systems Application Architecture, according to John Dunkle, president of Workgroup Technologies, Inc. in Hampton, N.H.

He and other analysts said many DEC customers are using individual components of NAS — such as Decwindows, Decwrite or Decprint — without any idea about the strategic significance of NAS in DEC's future.

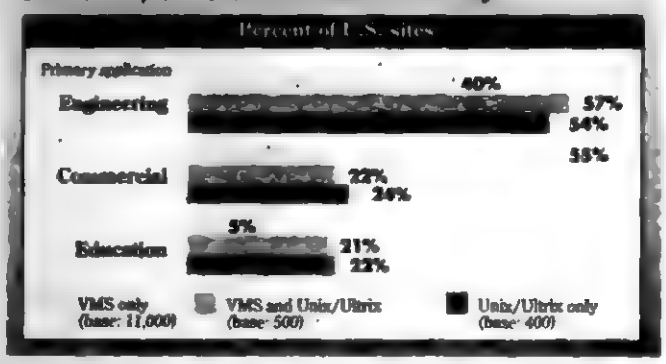
Investing in the future

Despite declining profits, DEC has continued to boost spending on research and engineering



Different worlds

While the bulk of DEC shops running Unix are engineering environments, most commercial IS sites are VMS only



Reputation vs. reality

Despite widespread perception that DEC is lacking in service and support, those activities generated 40.7% of the company's revenue in the first six months of fiscal year 1991



Strengths and weaknesses

Interviews with customers provided the following ratings for DEC:

STRENGTHS:

- Hardware reliability.
- Broad networking offerings with connectivity to other vendors' systems.
- Longevity looks assured and finances seem stable with $1.6 billion in cash reserves.
- Leadership exists in implementing open standards such as Posix.
- Abilities are growing in support of other vendor platforms, particularly those from Sun Microsystems, Inc. and Apple Computer, Inc.
- Technical direction is following industry trends by opening VMS to other platforms and changing VAX architecture to RISC-based CPU.

WEAKNESSES:

- Marketing efforts are disjointed or incompetent.
- Sales-force expertise is inconsistent.
- Rapid-fire product rollouts confuse and annoy [illegible].
- Company stock is undervalued and declining.
- Account-management skills are inadequate for complex customer sites.
- Unix offering (Ultrix) is trailing behind other Unix versions.
- Prices are not competitive compared with third-party offerings in storage and memory.

Where did DEC go wrong? Bell has an answer

From a distance of seven years and some 3,000 miles, the engineer who spearheaded both the PDP and the VAX architectures has watched DEC slide into troubled times.

Gordon Bell, formerly head of DEC engineering and now chief scientist at Stardent Computer, Inc. in Sunnyvale, Calif., has a few ideas about what went wrong at the Maynard, Mass.-based vendor.

In his forthcoming book, *High-Technology Ventures: The Guide for Entrepreneurial Success*, Bell applies a business "diagnostic" tool to DEC and reaches several conclusions:

- DEC missed out on three major market segments: personal computers, workstations and minisupercomputers, all of which "ate into" minicomputer sales.
- The products are good but too numerous, leaving customers and salespeople confused about long-term strategy and direction.



Bell *speculates on DEC's mistakes*

- Marketing lost track of communications between customer application segments (such as insurance and health care) and product planning.
- Financial controls have been poor, and DEC failed at long-range planning, as evidenced by the need to lay off excess employees.
- DEC's healthy cash position will "evaporate quickly" with the expense of severance packages and losses.
- President Kenneth H. Olsen has failed to produce the right products and has a "fundamentally weak" top-level management team.

"Ken has an enormous intellect, but he needs to delegate responsibility and then sit back and let his people manage," Bell said.

"The best sign I see that DEC is shaping up is this return to profit-and-loss centers inside the company," he added.

32-bit system

FROM PAGE 1

application program interface compatibility when it becomes available in the next 18 to 24 months.

At the ground level of Version 3 is a component called the New Technology kernel. The DOS, Posix, OS/2 and Windows subsystems of Version 3 are snapped onto the New Technology foundation. The OS/2 quadrant of Version 3 will also offer Presentation Manager support while the Windows sector will support all 16-bit and future 32-bit versions of Windows applications, said Russ Werner, general manager of systems marketing.

However, analysts said the Version 3 plans indicate a continued dissolution of the decade-old Microsoft and IBM partnership. "Microsoft has stopped paying attention to what IBM is doing and started developing for what they think people want," said Stewart Alsop, editor and publisher of "P.C. Letter."

Microsoft and IBM divided responsibility for OS/2 development last fall, and both companies agreed to cross-license each other's version of the operating system. IBM recently released Version 1.2 of OS/2 and is working on Version 2. Brad Silverberg, Microsoft's vice president of systems, said applications running on IBM's OS/2 will be interoperable with applications running on Microsoft's editions.

Some observers said the operating system options that the New Technology kernel allows will be attractive to users, especially those who may be considering a Unix alternative to OS/2. "New Technology is Microsoft's insurance policy," said David House, president of Intel Corp.'s microcomponents group.

Ballmer added that OS/2 Version 3 will also offer networking capabilities "built into its very core." Several analysts said this puts a cloud over LAN Manager, Microsoft's network operating system. "If Version 3 implements a network operating system, why do we need LAN Manager anymore?" asked Ruthann Quindlen, an analyst at Alex. Brown & Sons, Inc. Ballmer said LAN Manager will remain vital in that it offers administrative tools as well as print- and file-sharing functions.

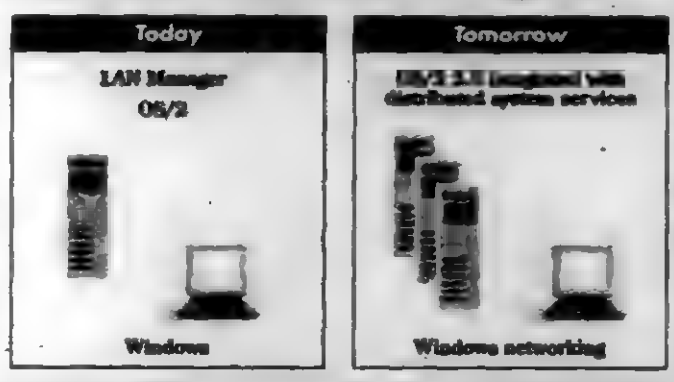
Some users said they would not mind the disappearance of LAN Manager. "If I can get the same features as LAN Manager, I don't mind buying one less product," said Katherine De Bruyn, MIS director at Perkins Coie, a law firm in Seattle.

Microsoft is also moving to develop future versions of both DOS and Windows. Those plans include the following:

- A new release of DOS, Version 5, which is being used at more than 7,000 beta-test sites worldwide and is expected to be released this year. Version 5 will require less memory than Version 4 and offer an enhanced utility set and easier installation, Silverberg said.
- Windows Version 3.1, which Silverberg described as "a refinement" rather than a rewrite, will be introduced later this year and include the Truetype outline fonts as well as extensions for both multimedia applications and pen-based computing.
- Microsoft Chairman Bill Gates also described a "next-generation" object-oriented version of Windows that will include object linking and embedding capabilities as well as an object-oriented shell and extension to the Windows file system.

OS/2 Version 3

Microsoft's strategy hinges on a future version of OS/2 that can provide distributed client/server services for desktop devices running Windows



Source: Microsoft Corp. CW Chart: Marie Haines

IBM vows

FROM PAGE 1

Very little about OS/2 is clear to them. "I have to wonder how strong the resolve will be to continue with OS/2 activity in light of Windows' popularity," said Jerry Weinstein, director of corporate MIS at General Instrument Corp.

"Microsoft has done a good job of confusing people," said Bill Zack, a consultant at Leveraged Technology, Inc. in New York. "I have had more requests from customers recently to come in and explain what is going on," he said.

In most cases, Zack continued, "People aren't changing their minds; they are just getting whiplash [from all this turmoil]." It would be helpful if IBM and Microsoft could manage to come up with a common message, Weinstein added.

George Cheung, vice president of communications systems at Bankamerica Corp., never doubted OS/2's longevity. The issue, he said, is really Windows vs. Presentation Manager. "Will Windows be the dominant user interface in portable OS/2?"

Many users, consultants and developers want one graphical user interface. According to Reiswig, there will continue to be two interfaces simply because both now exist. "If we had to do it over again, we'd have picked one," he said.

Reiswig stated emphatically that IBM remains firmly committed to both Presentation Manager and OS/2. "Presentation Manager is going to survive [into portable OS/2]. Have no doubt about it."

Reiswig said IBM will produce a 32-bit Presentation Manager on top of a 32-bit OS/2 long before Microsoft delivers a 32-bit Windows. OS/2 Version 2.0 will support DOS, 16-bit OS/2-, 32-bit OS/2- and Windows-based applications, he added.

At the very least, the two should look the same, said Ron Adinolfi, a vice president at Swiss Bank Corp. They must also allow him to run his Windows applications. "When [OS/2 Version] 2.0 comes out, we will transition people from Windows to OS/2."

As for Win32, Reiswig echoed the skepticism of some users and developers. "It's very confusing," he said, adding that Microsoft has minimized the changes required. "Will there be a 32-bit DOS? I take [32-bit Windows] as a direction, not a reality."

He conceded that there are not enough off-the-shelf OS/2 applications. "Developers need to know why they should make more of an OS/2 investment."

That is a message with which users concurred. "If I were IBM, I'd give away a million copies. Then it would be a significant force in the market," said Thomas Loane, vice president of computers and communications at Alamo Rent A Car.

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Intel '486SX' may not catch users' attention

BY RICHARD PASTORE
CW STAFF

If Intel Corp. turns current rumor into fact by unveiling one or more 20-MHz "486SX" microprocessors in the second quarter, it may only muddle the microprocessor market rather than clarify user choices.

According to observers, Intel will release as many as three versions of a 20-MHz I486 chip that lacks the math coprocessor built into current 25-MHz and 33-MHz versions. The move is seen as part of Intel's strategy to lure customers away from 80386 clone competition from Advanced Micro Devices, Inc.

An Intel spokeswoman refused to comment other than by saying the 486 microprocessor will "proliferate at the high and low end this year."

At least two personal computer vendors — IBM and Advanced Logic Research, Inc. — are reportedly committed to announcing PCs with the low-priced SX chip versions in the second quarter.

While not confirming reports of the chips, ALR is positioned to have a 486SX machine ready "the day Intel announces the product," said David Kirkey, vice president of marketing at the Irvine, Calif., firm.

However, the new boxes may not capture users' fancy the way the Intel 80386SX has done and they may present a tough choice.

The 386SX fits perfectly in the gap between Intel's 16-bit 80286 processor and the 32-bit 80386DX. However, "there doesn't appear to be a similar need between the 386DX and the 486," said Mark Levitt, an analyst at International Data Corp. in Framingham, Mass.

From an instruction/sec. standpoint, the 486SX would be slightly faster than the 33-MHz 386DX, said Dean McCarron, vice president of technology at Instat, Inc. in Scottsdale, Ariz. However, the 386's faster clock speed could give it an edge in some benchmarks, he said.

Not so sure

Users are already expressing some concern. "There's not a clear delineation of what the [486SX] performance advantage would be," said Stephen Anderson, information systems architect for the state of Washington. But a cheaper 486 would immediately find a home with some state agency users who balked at upgrading 386s to pricey 25-MHz 486s, he noted.

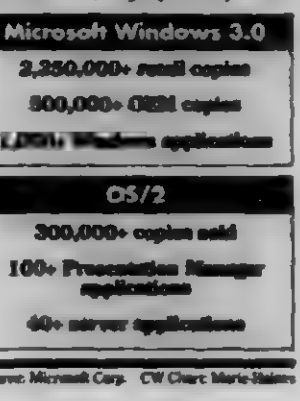
Some dealers, already disappointed by slow 486 sales, do not see cause for optimism with the 486SX. At a Computerland, Inc. store in White Plains, N.Y., only 3% to 5% of sales are 486-based. "I don't see that growing much more than 10% because for most desktop applications, a 486 is overkill," franchise owner Matt Fitzsimmons said.

IBM is well positioned to be among the first to market with the new chip, speculation indicated. The firm lacks a model based on the 33-MHz 386, so a 486SX unit would be a logical move, said Ben Rose, an analyst at Technology Investment Strategies Corp. in Framingham.

Observers estimated that IBM would price a 486SX system at $10,000 or less.

Sibling rivalry

Out of the gate only one year, Windows 3.0 has overshadowed the 3-year-old OS/2 by a factor of nine

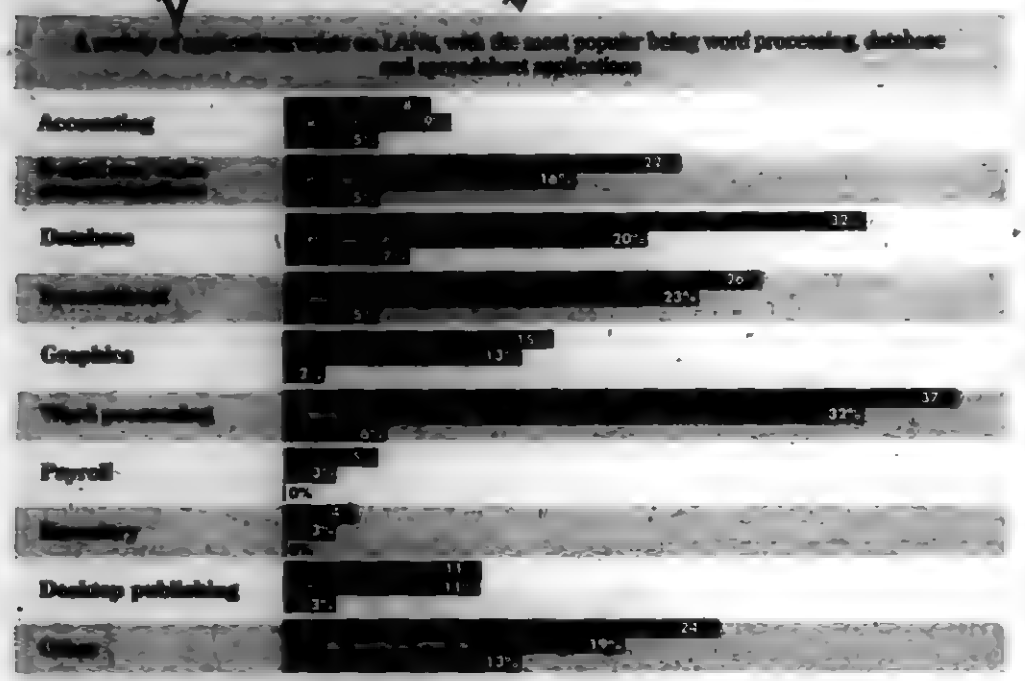


Source: Microsoft Corp. CW Chart: Marie Haines

TRENDS

LAN Applications

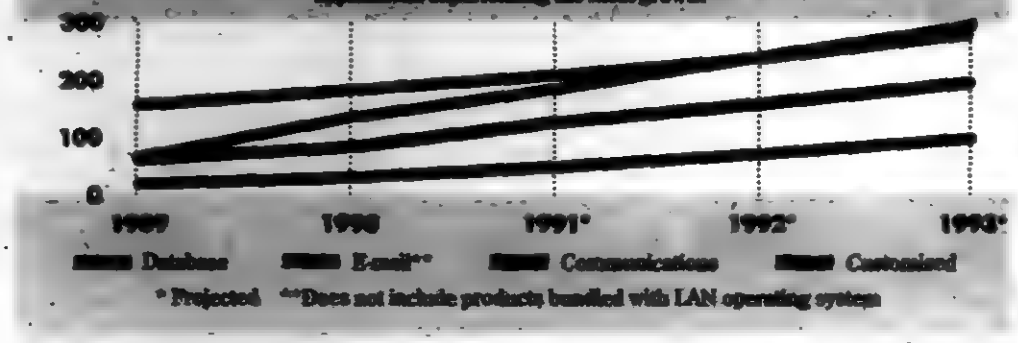
Users are beginning to realize the potential of their local-area networks and are moving beyond basic printer and file-sharing functionality with the addition of multiuser applications



Percent of respondents (base: 243, multiple responses permitted)

Worldwide LAN application package shipments (in thousands)

The demand for sophisticated applications from installations that currently have only file and print services will push up worldwide shipments of network application licenses, with electronic mail applications experiencing the most growth



* Projected **Does not include products bundled with LAN operating system

Source: International Data Corp., Framingham, Mass.

CW Chart: Doreen St. John

NEXT WEEK

Gateway Bank in Newtown, Conn., went against conventional banking wisdom and replaced its microfiche-based document storage system with PC and optical disc technology. **Martin Brennan**, senior vice president of operations, explains how a $12,000 investment is now saving his bank over $100,000 per year in Manager's Journal.



Reinhold Spengler

Half-truths, misconceptions and outright falsehoods have dogged Unix since its inception. It's hard to learn. It's not secure. And on and on. According to John Ozsvath, McDonald's Corp. systems development director and Uniforum president, it is time to debunk these and other Unix myths. He undertakes this task in In Depth.

INSIDE LINES

Netware, anywhere

At Networld next week, IBM will announce a formal alliance with Novell that will include distributing Netware through IBM's field sales force, sources close to both firms say. IBM and Novell will also announce plans to port Portable Netware to IBM's 3172 Interconnect Controller and Application System/400. IBM apparently commissioned a huge study of corporate accounts and found that while Netware has 60% to 65% of the installed base, LAN Manager has barely 1%.

Delivering a message?

Although giving no details, Wang has confirmed that a high-end VS system will be announced by year's end. Industry sources claim that the new processor — code-named VS Mercury — will be based on bipolar CMOS chip technology, will include 256K bytes of cache memory and is targeted to replace the top-of-the-line VS 10000.

Muxing up the T1 market

The overburdened T1 multiplexer market got yet another player last week: Codex. The vendor is "going after Newbridge Networks' business" and is beefing up to become an all-around network systems integrator by announcing a low-end T1 product at Comnet '91, a Codex spokesman said. This will be its first internally developed multiplexer.

Next to nothing at Ashton-Tate

Ashton-Tate has canceled work on Powerstep, its spreadsheet for the Next product line. Insiders say the code base for Powerstep, which Ashton-Tate announced with a flourish last September, will be retargeted toward the Windows platform. No plans have yet been made for the nearly two dozen researchers who were assigned to the project.

No dealers need attend

Compaq is having a busy month. Following up its recent executive restructuring, the Houston PC maker will brief analysts today about changes in its support structure. Observers expect the firm to offer direct support for its Systempro multiprocessor system. One week later, Compaq is expected to announce new storage upgrades for the Systempro that will vault disk capacity into the multiple gigabyte range.

Power-up on the go

Dell Computer will enter the notebook PC market this week with what some observers say will be one of the first portables with a nickle-hydride battery. The battery technology offers up to 50% more life than typical three-hour nickle-cadmium power cells. The 20-MHz Intel 80386SX-based unit will likely be priced in the $3,000 ballpark.

Take Notes

Lotus will roll out Notes 2.0 next week during an evening soiree at the Boston Museum of Science. This second release of Notes will feature improved remote access as well as improved color and a better graphical user interface.

Possibilities are endless

Intel will outline plans for the 1992 introduction of a 100-MHz 1486 chip at a technical conference later this month, according to David House, president of Intel's microcomponents group. Also reportedly on the agenda is the next-generation 80586 chip, a 64-bit reduced instruction set computing microprocessor that runs at 66 MHz and goes by the code name of P5.

The troubled IBM Officevision project may be tardy, but it is apparently coming down to reality. Tony Mondelo, IBM vice president of office systems development, said IBM changed its tune by planning to include DOS computers in Officevision because "3270 and DOS 640K customers will be the largest volume of end users for the next five years. They may move around, but they aren't going away." We're not going away either; you can funnel news tips through News Editor Pete Bartolik by calling (800) 343-6474 or faxing (508) 875-8931. You can also reach him via MCI Mail, COMPUTERWORLD; Compuserve, 76537,2413; or Prodigy, MHTS78A.

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COMPUTERWORLD

Retail pinch sparing IS investments

Stores take long-range view on technology cost

BY MICHAEL FITZGERALD
CW STAFF

Retailers are turning to information technology to battle the first nationwide recession to hit the U.S. in seven years.

An Index Group, Inc. survey of 20 top retail and wholesale information systems executives concluded that overall spending on IS will rise 6.1% in 1991, compared with a 5.3% average increase in all industries.

Despite that spending pattern, however, many retail IS directors are sounding decidedly thrifty these days.

"We will spend less in 1991 than we did in 1990, and that's saying something," said Dave Evans, vice president of IS at J. C. Penney Co. in Dallas. Evans said the recession has slowed spending and is prompting J. C. Penney to "expedite" cost-saving projects such as the previously planned closing of two of its six data centers. He also said IS is not hiring these days. "It's definitely not business as usual," he added.

Spending will also be down at

Continued on page 8

Idle registers

Growth in retail sales slowed markedly in 1990



Source: U.S. Department of Commerce
CW Chart: Marie Haines

IBM widens parts stripping fight

BY NELL MARGOLIS
CW STAFF

STAMFORD, Conn. — IBM's widening bid to stamp out "illegal" trafficking in used IBM parts last week seemed on the verge of tilting its often uneasy alliance with third-party dealers into a cold war. Leasing industry executives predicted a lengthy dispute that could limit mainframe reconfiguration options.

Just one week after bringing suit against Comdisco, Inc., the largest independent computer leasing firm, the IBM Credit Corp. subsidiary filed suits Feb. 1 against Cambex Corp. and EMC Corp., which sell memory devices for IBM systems. IBM charged that the companies illegally stripped IBM equipment from computers leased by ICC.

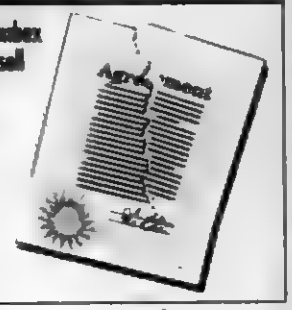
The practice of subleasing and remarketing computer parts is a linchpin of the leasing industry, industry observers said. The practice attained prominence by satisfying user needs for flexibility at competitive prices.

Industry estimates vary as to how widespread the practices under ICC's investigation are.

Continued on page 4

POINTS OF CONTENTION

- IBM charges that Comdisco, EMC and Cambex illegally strip leased IBM equipment and resell parts.
- Industry execs claim resale practice is common, dates back to the '60s.
- IBM victory could limit user options, price breaks.
- Uncertainty to cloud leasing market until issues are resolved.



DEC finds software makes the sale

Last in a three-part series researched and reported by Computerworld's Maryfran Johnson, Alan J. Ryan and Sally Cusack

One sells insurance, another produces soy proteins and the third deals in Wall Street trading systems.

Yet all three of these Digital Equipment Corp. customers exemplify a future in which DEC's proprietary hardware no longer wins the sale. What matters to these users is the vendor's abilities in networking, software development, services and systems integration.



At Phoenix Mutual Life Insurance Co.'s headquarters in Hartford, Conn., for example, DEC is co-developing a new approach to managing systems software that could significantly reduce code maintenance.

"What we've created together is analogous to an airport traffic controller, only it manages the interaction of software," said Robert Fiondella, president and chief operating officer at Phoenix Mutual. "DEC wants to get into software development, and we would like to create much greater capability in that area."

Halfway across the country in St. Louis, DEC has carved out a piece of IBM and Amdahl Corp. territory by becoming the primary supplier at Protein Technologies, Inc., a division of Ralston Purina Co.

"DEC had just as much to lose or gain as we did in starting up this company," MIS Director John Brauckseicker said of the 3-year-old Protein Technologies, which manufactures soy proteins and other products for food industries.

It was the number of process industry applications running on VAXs, not the hardware itself, that made that platform a compelling choice.

Continued on page 91

Hacker probe bogged down

Operation Sundevil case 'going nowhere'

BY MICHAEL ALEXANDER
CW STAFF

WASHINGTON, D.C. — Operation Sundevil, a crackdown on computer crime by federal and state law enforcers started last year, has come under renewed attack by two advocacy groups amid concerns that the investigation has stalled after nine months.

The Computer Professionals for Social Responsibility, a Palo Alto, Calif.-based advocacy group, filed suit against the U.S. Secret Service last week in a bid to force the agency to reveal details of the investigation.

Last May, more than 150 Secret Service agents teamed with local and state law enforcement agencies to execute 27 search warrants in cities across the U.S. The law enforcers seized 40 computers and 23,000 disks.

Facing a brick wall

The investigation is "going nowhere," according to a law enforcement source familiar with the case who asked not to be named. A second law enforcement source, who also asked not to be identified, said the case was "mired" and labeled it a "boondoggle." There have been no arrests, and none are imminent, the two sources said.

Robert Snow, a spokesman for the Secret Service in Washington, D.C., said Operation

Continued on page 92

Windows close on New Wave

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. bought into Microsoft Corp.'s Windows long before the latest version became an overnight success. However, HP has been having a tough time selling its Windows-based New Wave concept, and time may be running out.

New Wave, introduced four years ago and upgraded to support Windows Version 3.0 last May, works on top of Microsoft's graphical user interface to provide an object-oriented approach to data manipulation while hiding the complexity of the process from the user.

Several vendors, including NCR Corp. and AT&T, signed up early to incorporate New Wave into their platforms, but the market is in such an early stage that few New Wave applications have actually been shipped, according to analyst Michael Goulde at Open System Advisors, Inc. in Boston. Furthermore, early enthusiasm may be waning, analysts observed.

Microsoft is pledging a highly object-oriented Windows Version 4.0, which is expected to be released sometime in 1993. However, the company has already begun to implement its object linking and embedding concept, which promises to include some New Wave-like capabilities. This has some users in a wait-and-see mode.

Howard Woodard, information systems manager at Federal

Continued on page 93

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Borland readies visual end-user programming tool for Windows. Page 10.

Systems Center develops integrated, centralized management across IBM's major systems platforms. Page 6.

IBM retooling plans for a SQL link to its IMS database. Page 93.

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Quotable

"If I didn't make my purchase last year, it would be very difficult to buy this year."

DENNIS MEEH
MCCURDY & CO.

On running an IS shop in a troubled retail sector. See story page 1.

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The 5th Wave



"BETTER SEND SOMEONE UP—WE'VE GOT ANOTHER BEAR TANGLED UP IN THE WIRING."

EXECUTIVE BRIEFING

■ ***In a time when malls seem hauntingly bare of shoppers,*** the information systems groups in the retail sector may be called on to carry their companies through the recession. It is no secret that retail chains are suffering. However, they may end up spending more on information technology than other sectors will, hoping that new systems will strengthen them for the future. **Page 1.**

■ **So far, it has been the price war to which nobody has come.** Industry observers have been predicting major price cuts in the laptop industry for at least three months, but the cuts haven't appeared. That should change in the next few months, however, as more name brands hit the shelves and pent-up demand abates. **Page 6.**

■ **Appropriating other people's good ideas** isn't stealing when it comes to quality assurance. Just ask IBM, which makes no secret of the fact that it learned from the success of others when it came to setting up its Application System/400 production facility in Rochester, Minn. The result was the U.S. Commerce Department's Malcolm Baldrige award for quality. **Page 71.**

■ **The fight is turning nasty** as IBM knocks heads with lessors and mainframe parts dealers. IBM's lawsuits claim its rivals are stealing IBM Credit Corp. parts. The rivals and some industry observers say ICC is trying to intimidate the opposition and could hurt users. **Page 1.**

■ **AT&T's Tariff 12 lives,** but AT&T competitors still wish the big-customer bulk-buying communications offering would fade into the woodwork. Most observers are betting that despite the industry opposition and a court order calling for refinements, Tariff 12 will survive pretty much the way it is now structured. **Page 43.**

■ **Saab Cars USA, Inc. figures to save $5 million over the next five years** by shifting from Unisys Corp. mainframes to IBM AS/400 minicomputers. This move comes on the heels of an outsourcing decision at Saab's parent company in Sweden. **Page 8.**

■ **Speaking of savings,** Blue Cross expects that it can chop $5 million per year off of its communications budget by building a national network. In addition, the Unified Network strategy is expected to smooth communications among the 73 Blue Cross plans spread throughout the U.S. **Page 12.**

■ **A new version of the Specmark** test may make it easier to test the performance of high-end workstations and multiuser systems. **Page 35.**

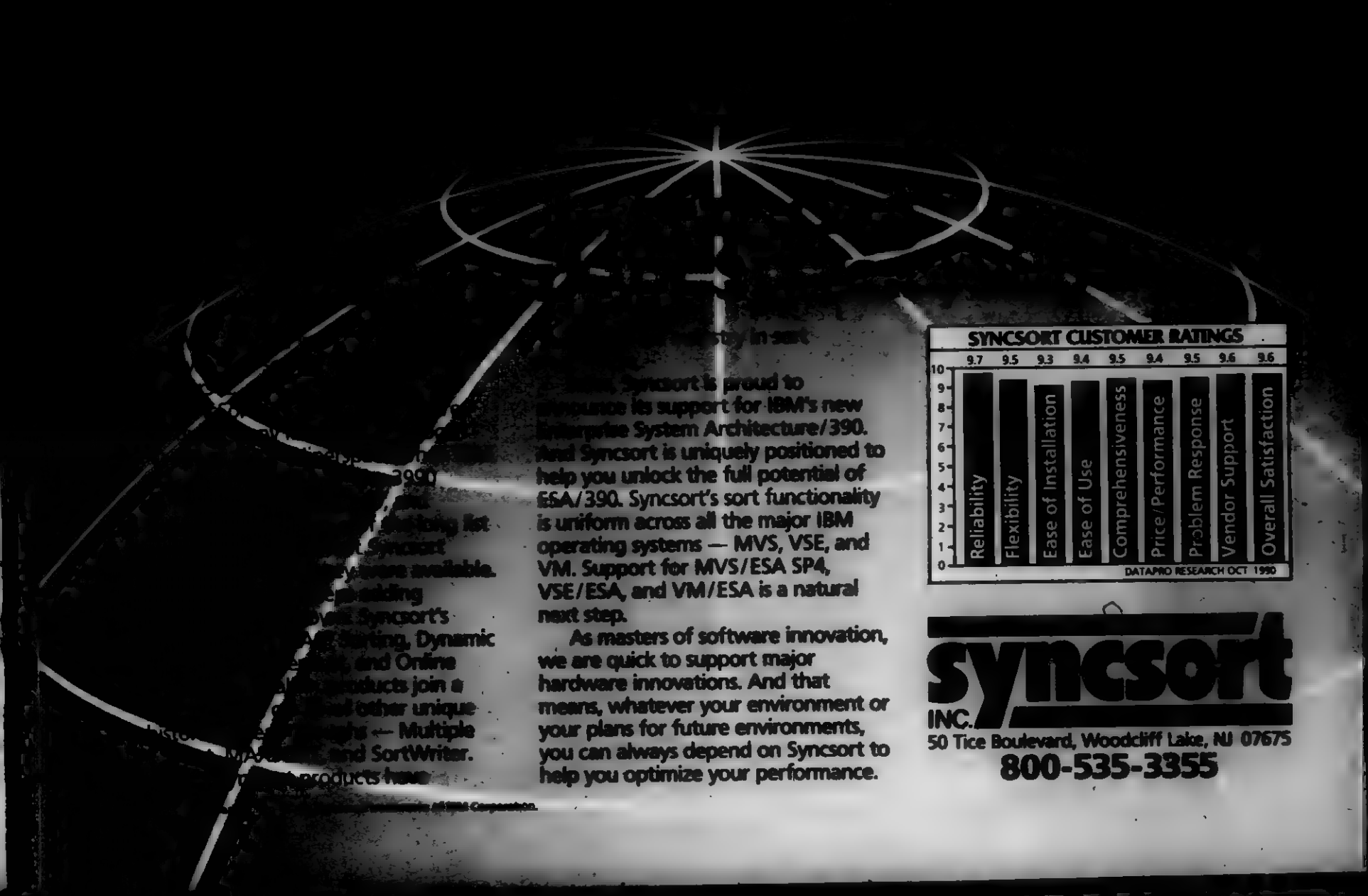
■ **Can age play against an IS professional** in a job search? Don't look for that to be the problem. Rather, open up your options, market yourself better, and don't back yourself into corners. **Page 75.**

■ **Manufacturers that need to respond better to customer demand** and produce wider varieties within a product line are starting at the factory floor and building up. 'Flexible manufacturing' applications start at the machine level but appear at all levels of the company, including operations and corporate. **Page 59.**

■ **On-site this week:** Spending $12,000 once to save $130,000 per year isn't such a bad deal, as Norwalk, Conn.-based Gateway Bank discovered when it switched from microfiche to optical storage. **Page 51.** There are some new elements showing up in Federal Express' Cosmos' package tracking system — peer-to-peer networking and Unix. **Page 29.** It was a natural evolution for Arkansas' food supplement agency when it opted to automate a benefits program by adding Wang minicomputers rather than Unix systems or personal computers. **Page 32.** Seeking to cope in a coffee market that is as volatile as the stock market, Nestle/Hills Brothers Coffee has turned to PCs for use by its analysts and coffee buyers. **Page 37.**

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Compaq ready to offer direct support

Most observers happy with plan, but pricing plan may discourage users

BY RICHARD PASTORE
CW STAFF

HOUSTON — Compaq Computer Corp. is scheduled to announce its first direct technical support service for customers today. Observers said they see the move as an incentive to boost system sales, but they disagreed on its relative worth to users.

Beginning March 4, $3,000 will buy users 10 solutions per year via telephone on technical subjects such as system compatibility, installation and configuration questions and problem isolation. The service applies to any Compaq platform and supported operating system.

Support contracts, which can be purchased from dealers, include a subscription to Compaq's Quickfind Support Reference Library on compact disc but do not cover on-site service.

Compaq, which has no direct sales force and is reliant on dealers, may risk alienating some by going direct. But some resellers familiar with the plan were appreciative.

"I think it will be a help to us," said Ed Michelson, a partner at a Computerland Corp. franchise in San Diego. "For those customers that feel more comfortable with the manufacturer, the mere fact that we would offer [the direct support option] would help in selling Compaq products."

Platform complexity and dealer shortcomings appear to have forced Compaq's hand. "It became clear that we needed a combination of our authorized dealers and Compaq to address the kinds of inquiries [users] were making," explained Ross Cooley, Compaq's North America vice president.

"The move is overwhelmingly positive for customers because they'll get the support they need at the very high level," said Seymour Merrin, president of Merrin Information Services in Palo Alto, Calif.

Some users agreed. "I think it's a good idea. With more complicated machines, the dealers will need some other way of getting the knowledge out there," said Compaq Systempro user Gerard Nussbaum, MIS director at Premier Hospitals Alliance, Inc. in Westchester, Ill.

Being able to cut out the dealer and go directly to the manufacturer will eliminate "a long daisy chain of problems and timing," added Patrick Farley, network administrator at the New York City Transit Authority.

While some called the support program a bargain for users and a loss leader for Compaq, others said it is too pricey for lip service.

"Three hundred dollars per problem is expensive, and how many problems can really be solved over a phone?" asked Lee Levitt, an analyst at International Data Corp. in Framingham, Mass.

New York Life Insurance Co. pays Businessland, Inc. $30 per solution for multivendor phone support. Compaq's fee structure, which is 10 times higher, "will scare some people away," New York Life Assistant Vice President Robert McLoughlin said.



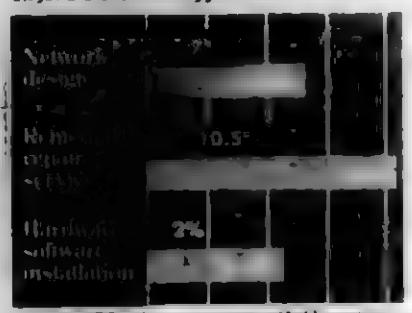
Compaq's *Cooley: Direct service needs 'became clear'*

Cox Cable, Inc. pays $5,600 annually for Systempro support from Intelogic Trace, Inc. The fee covers on-site repair with two-hour guaranteed response time — something Compaq does not include. "I prefer our route because it integrates hardware repair and [phone] support into one package," said Mark Olsen, a systems analyst at Cox.

Beginning March 4, Compaq will also implement a toll-free direct support line for general product questions. In addition, this spring Compaq will designate resellers that have achieved expertise in selected operating systems supporting Compaq CPUs as "Specialized Dealers."

Looking to the source

Systems vendors are increasingly being called on for PC end-user support



Source: Ledgeway/Datapro CW Chart: Doreen St. John

IBM

FROM PAGE 1

"It's not just Comdisco, EMC and Cambex, that's for sure," said Tom Martin, president of Hackensack, N.J.-based Computer Financial, Inc. "But people who say that everybody in the industry is cannibalizing machines are exaggerating greatly. Lessors who take aggressive business stances are doing it — I'd say at most, that's about half of the leasing companies that deal heavily in mainframes."

"I wouldn't say that the kind of upgrades and downgrades that IBM is talking about are widespread practices," industry consultant James Hassett said. "On the other hand, it isn't rare. It's being done."

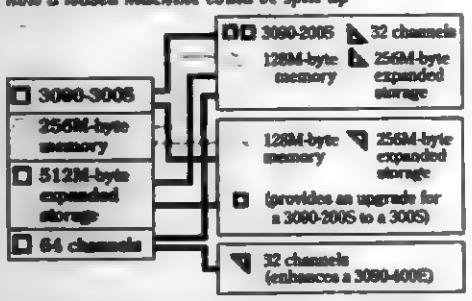
Subleasing has been commonplace since the 1960s with increasing use as IBM mainframe generations have become more modular, EMC Chairman Richard J. Egan said. "Some [firms] do it all the time," he said. "Some do it occasionally. I think everybody's going to get got."

To the contrary, an ICC spokesperson said, ICC is out to stop only those who steal. The suits, the spokesman said, "are not aimed at the third-party market. They are not aimed at subleasing. They are aimed at specific companies' instances of taking property that belongs to us and using it as though it were theirs."

Once a modest sideline, the sublease business boomed when IBM introduced the 3090 family — an increasingly modular generation of machines that enabled inventive third-party competitors with access to a panoply of used parts to "build" mix-and-match mainframes tailored to the customer's requirements.

Market basket

Features in an IBM 3090-300S could end up in three separate systems according to one scenario of how a leased machine could be split up



Source: Technology Investment Strategies Corp. CW Chart: Paul Mock

Some industry insiders said they see the current spate of suits as IBM's new tactic in pursuit of an old strategy.

"This is just a delaying action to confuse the industry," said Paul Shook, senior vice president at Concord Leasing, Inc., a Norwalk, Conn.-based investment banking firm. "The time and resources IBM is causing us to spend on [the subleasing issue] are diverted away from the *real* issue, which is microcode."

The controversy between IBM and the third-party lessors over how IBM restricts access to the instructions underlying its systems has been working its way through the courts since the mid-1980s. The most recent ruling in the series of suits — popularly known as "the AMI case" — was a sweeping victory for IBM on most points. However, the judge's language left open the possibility that IBM's efforts to control microcode could be seen as violating antitrust law.

Industry analysts widely agreed that appeals are likely to come from both sides; few said they expected a resolution of the AMI case in the near future. Meanwhile, the Computer Dealers and Lessors Association (CDLA) hired the New York-based law firm of Weil, Gotshal & Manges last November to study the microcode controversy and advise the third-party companies as to possible legal and administrative strategies. In addition, a CDLA spokesman said, the association personally forwarded a copy of the latest AMI ruling to the U.S. Department of Justice.

Industry executives last week differed on the extent to which the microcode issue and the issues raised in the Comdisco, EMC and Cambex suits are related. None of those interviewed by *Computerworld*, however, said they believed the issues were entirely unrelated.

Meanwhile, Shook said, the speculation and uncertainty surrounding IBM's recent actions are likely to restrict the options of not only the named defendants and every leasing company that begins to be talked about as a probable "next" on IBM's list but also of the customers who are privy to the subleases and reconfigurations from IBM.

While it is unlikely IBM would sue a big customer, Shook said, the uncertainty makes users "much more likely to throw up their hands and say, 'Oh, heck, let's just deal with no one but ICC.'"

COMPUTERWORLD

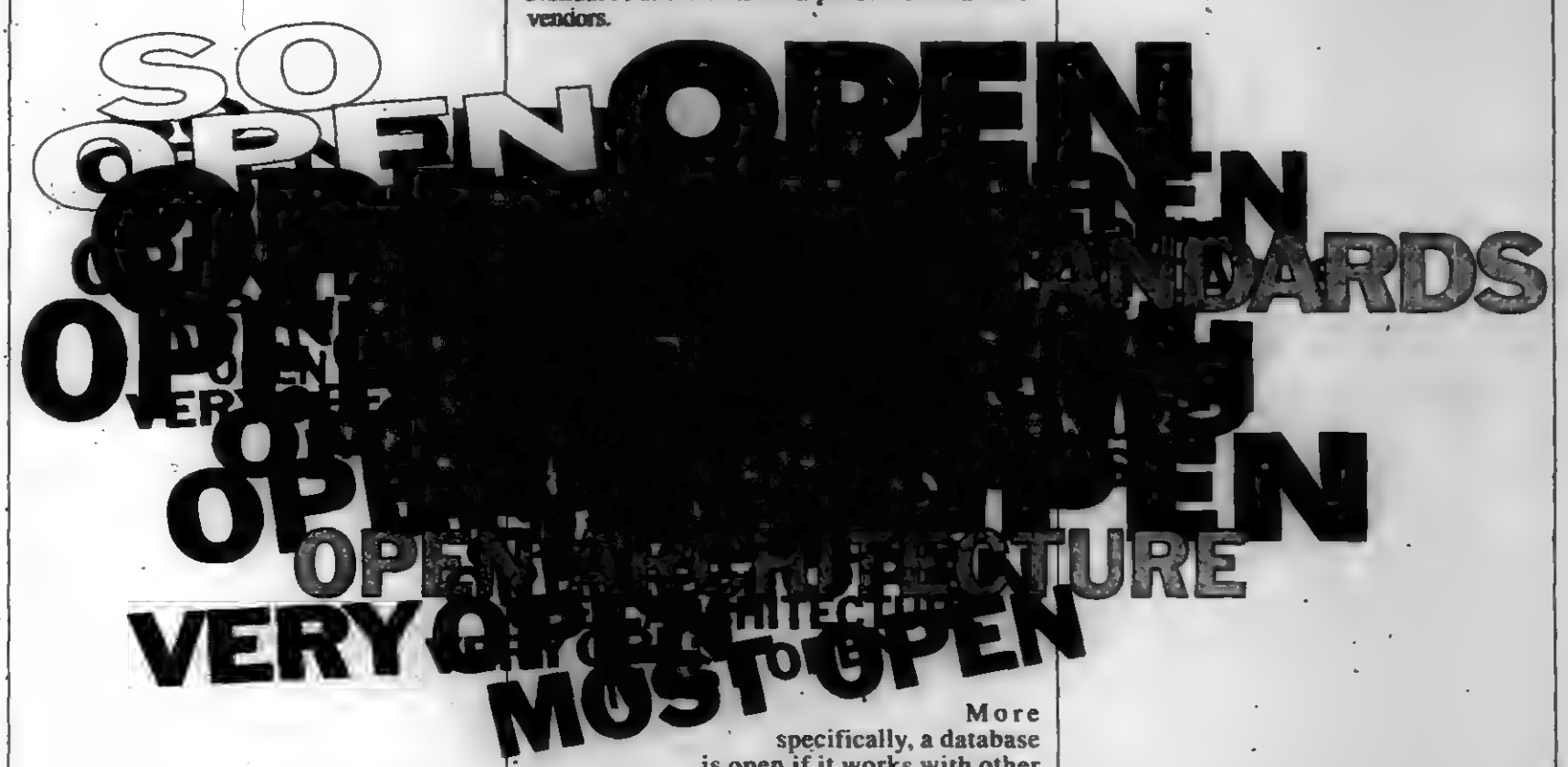
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Closing Arguments

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Notebook PC price war on hold

BY RICHARD PASTORE and MICHAEL FITZGERALD
CW STAFF

Pundits have been predicting a price war since October, as throngs of cut-rate notebook personal computer announcements followed Compaq Computer Corp.'s LTE introduction last fall. So far, pent-up demand and no-show competition have kept the battlefield relatively quiet, but that may change as major brands finally hit the shelves over the next eight weeks.

Larger portable PCs have taken a price beating since last year, "but notebooks — and particularly Compaq — have not," observed Richard Nelson, quality and cost department manager at US West in Denver.

"Compaq has the Compaq mystique," explained Will Fastie, editor of "The Fastie Report" in Baltimore. "As long as that's the case, their prices will remain premium prices." Compaq's Intel Corp. 80386SX-based LTE lists for $6,500 to $6,999.

What's in a name?

IBM is also expected to leverage its name when it unveils a 386SX notebook later this spring. Industry observers said the IBM product will be priced from $5,000 to $5,500.

However, these lofty price tags may finally come under fire as other respected brands begin shipping machines costing thousands of dollars less.

For example, Dell Computer Corp., which has earned kudos for quality and support, announced a $3,399 LTE lookalike last week that is expected to ship by the end of next month.

Dell's 320N notebook includes 1M byte of memory, an internal floppy drive, a 30M- or 60M-byte hard disk and an IBM Video Graphics Array-compatible display. The system weighs 6.4 pounds — one pound less than the LTE — and uses a Ni-cad battery rated at 3½ hours. Dell also announced an Intel 80286-based notebook with a similar configuration starting at $2,399.

"I think Dell could really hit the market hard at that mark," Nelson said. "We'd probably get a couple just to see how they do."

Another player expected to stir up the action soon is AST Research, Inc., with its $2,995 Premium Exec 386SX/20.

"One of the big swingers in the whole [pricing] equation is the issue of AST and when they are going to be delivering in quantity," said Jerry Rycaj, marketing and communications manager at Texas Instruments, Inc. in Temple, Texas. Like many other firms that announced products late last year, AST has been hampered by component constraints and missed its original January shipping date.

Rycaj said AST's price point has earned it "a lot of recognition" and said that when its boxes hit the market, other name vendors may drop prices. AST claimed it will ship in volume by mid-February.

There have already been scattered instances of pricing movement, an omen of things to come perhaps. Everex Systems, Inc., one of the first companies to actually ship an SX notebook, has cut prices from $3,499 to $2,999. Samsung Information Systems America also dropped prices across its product line, including its just-shipping 386SX-based notebook.

Despite the scarcity of low-priced units, some users are already picking sides in the cost conflict. "Compaq is just too pricey," said Enrique Crespo Jr., manager for end-user computing at Torrington Co. in Torrington, Conn. The firm is reluctant to spend more than $3,000 for a notebook right now, he said.

"I'd look for notebook street prices of $2,500 to $3,500," added Frank Nestor, MIS director at Summit Consulting, Inc. in Lakeland, Fla. Nestor said he could not justify paying Compaq's LTE prices.

Market dissection

386SX-based notebook PCs have already spawned several tiers of pricing points



Base price

[illegible]

$3,000 - $4,000 • Twinhead, Samsung, Dell, Epson, Astarte

[illegible]

$5,000 - $6,000 • Texas Instruments, IBM*

[illegible]

*Industry observers expect an IBM announcement in this price range

CW Chart: Tom Monahan

Systems Center won't wait for IBM platform

BY ELISABETH HORWITT
CW STAFF

RESTON, Va. — Systems Center, Inc. is developing a platform to provide integrated, centralized management across all of IBM's major systems platforms — well ahead of IBM's projected rollout of its Systemview architecture.

Systems Center plans to support key Systemview elements, such as the data engine, user interface and applications programming interface, according to Application System/400 development manager Malcolm Marais. However, Systems Center is not waiting for IBM to firm up those specifications before it begins development, he added.

Neither vendor would provide a definite time frame for moving from the architectural to the commercial phase of its systems management platform.

IBM has announced plans to release Systemview user interface and data structure specifications this year. However, "Systemview is not yet a viewgraph, let alone a product," said David Passmore, a principal at Ernst & Young.

Systems Center is now working to integrate its existing Unix and IBM VM, MVS and AS/400 system management products into a common "enterprise management solution" that will include a data repository, a user interface and integrated applications, Marais said.

The first element of that platform, AS/Hub, was introduced last week. The product is said to provide centralized monitoring, maintenance, backup and software distribution for a network of AS/400s. The product also includes an object-oriented data repository, Marais said.

US Air is one IBM shop that would consider a third-party product that provided "a common data repository and central point to look at everything," said Randy Bucknell, a senior systems programmer at the airline. However, the product would have to come out significantly earlier than Systemview, Bucknell said.

Original intentions

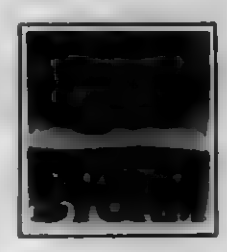
At the Systemview announcement, IBM said it would release specifications by which third parties could support its data repository structure by third-quarter 1991 and its user interface by the end of this quarter.

Most IBM customers will wait for Systemview rather than take a flyer on a third-party vendor, Passmore said. While Systems Center promises eventual Systemview compliance, the company is buying a thorny migration path for its customers and independent software supporters by refusing to wait for Systemview specifications, Passmore said.

On the other hand, Systems Center's offering is likely to find a niche among companies with a mixture of IBM and non-IBM computers, Passmore said.

The AS/Hub product fills a need among users who "don't want to buy an IBM mainframe with Netview just to have centralized AS/400 management," he added.

HIGH-TECH BATTLEFIELD



One reason the U.S. Air Force can fly so many sorties per day in Operation Desert Storm is that computers have dramatically cut the time it takes pilots to plan missions — reportedly from about eight hours to 30 minutes. Fighter pilots use a ground-based computer system called the Mission Support System II (MSS II) to rehearse and select the best routes for an attack.

The system takes the latest intelligence and mapping data to produce three-dimensional views of the fighter's route to the target, according to Brian Cooper, an official at Fairchild Defense Co. in Germantown, Md. He said MSS II software runs on Dynatech Corp.'s Cromemco CS-250 microcomputer, with a Digital Equipment Corp. Microvax II running in parallel to handle the color graphics.

Cooper said the system produces "radar predictions" that give the pilot a preview of what the landmarks and the target will look like on radar at night.

The Air Force Space Command has begun to link data from its Defense Support Program missile-warning satellites to the U.S. Army troops firing Patriot missiles, according to *Aviation Week & Space Technology* magazine. The satellite links provide the missile crews with nearly real-time information on the launch of Iraqi Scud missiles, increasing the chances for successful Patriot intercepts, the report said.

In addition, "improved communications" are enabling the satellites to provide five minutes' warning of a Scud impact, compared with about two minutes when the conflict began, the magazine said.

.....

Telecom Australia International is keeping a 106-member team of advisers in Saudi Arabia amid the Gulf hostilities, according to *Computerworld Australia*. Telecom Australia is maintaining Saudi Arabia's telecommunications network under a 1988 contract.

Peter Thomas, Telecom Australia's director of corporate communications, said Telecom Australia has contingency plans in place should the need arise to move its people quickly from danger areas.

Keith Barnes, Telecom Australia's senior adviser, said most exchanges would be able to cope with the heavier transmission demands being made.

.....

Some press reports have expressed concern that many U.S. high-technology weapons depend on Japanese chips. Not so, said Gregory Sheppard, a military semiconductor analyst at Dataquest, Inc. in San Jose, Calif. Most of the avionics chips used for Operation Desert Storm are made by U.S. companies under military specifications, he said. Sheppard said the confusion may stem from the fact that the ceramic packages protecting the chips are made by Japan's Kyocera Corp.

.....

Intel Corp. is making provisions in case its manufacturing plant in Haifa, Israel, becomes embroiled in the Gulf war, said David House, president of Intel's microcomponents group. "Because of the volatile situation, we have installed in an existing factory in Albuquerque all the equipment needed to make 80386s and I486s. I think we're in pretty good shape there."

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A slim majority (53%) of business economists said they feel business prospects for 1991 have worsened as a result of the Gulf war, according to the National Association of Business Economists. The pessimists predicted the war will reduce sales volume.

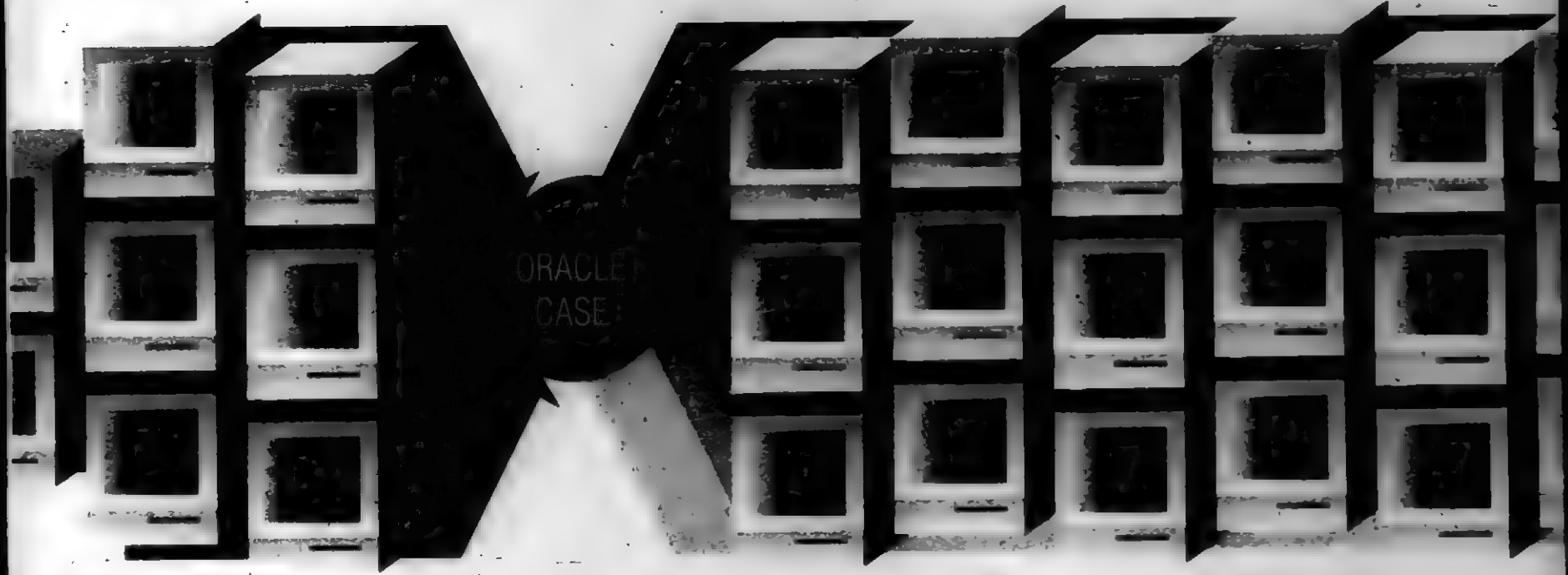
Compiled by National Correspondent Mitch Betts.

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NEWS SHORTS

Postal service signs pact

Trying to be more competitive in the overnight delivery business, the U.S. Postal Service signed a $129 million contract with Systemhouse Federal Systems, Inc. in Arlington, Va., last week for a system to track and trace Express Mail items. Customers will be able to call a toll-free number to check the status of scanned items, which will be tracked by IBM mainframes at the Systemhouse data center in Houston. Subcontractors include Unisys Corp.; IBM for the data communications network; and Symbol Technologies, Inc. in Bohemia, N.Y., for the scanners. The five-year contract could be extended to 11 years, totaling $270 million (see story page 29).

The cow did it

With memories of Mrs. O'Leary's cow, a dead cow was blamed for a four-hour interruption in AT&T's telephone service to parts of Birmingham, Ala., and Nashville last week. It seems a farmer attempted to bury a deceased bovine above an AT&T fiber-optic cable running between Birmingham and Farmington, Tenn., utterly destroying the cable. An AT&T spokesman said phone traffic in the area was quickly steered around the break by AT&T's Network Management Operational Support System.

J. C. Penney tries ISDN

J. C. Penney Co. said last week that it is three months into an Integrated Services Digital Network (ISDN) trial that involves transmitting high-resolution still images from one device on a corporate local-area network to a file server on another remote LAN. The company said the test could lead to eventually using increments of ISDN's dial-up, 1.5M bit/sec. bandwidth to send the still images between stores and corporate buyers to facilitate the final selection of merchandise styles and colors.

Intel sets up Noyce fellowships

Intel Corp. has established the Robert Noyce Memorial Fellowship Fund in honor of the late Robert Noyce, Intel cofounder and inventor of the microchip. The fund, which Intel started with a $500,000 grant, honors Noyce's commitment to the computer industry by supporting graduate students with technical backgrounds whose goals are to improve U.S. industrial competitiveness in the world economy, according to Gordon Moore, Intel's chairman. Intel said that so far the fund has acquired $1.2 million and has been endowed at four universities: University of California at Berkeley; University of Texas at Austin; MIT; and Grinnell College in Grinnell, Iowa.

Oracle ports CASE tools

Oracle Systems Corp. said last week that it has ported its computer-aided software engineering (CASE) tools to IBM's MVS, VM and AIX operating system environments. The CASE tools include a repository, an application generator and a CASE graphical tool kit for data modeling. The same suite of CASE tools was announced in November for the desktop OS/2 and MS-DOS operating systems, for the Unix environment and for Digital Equipment Corp.'s VMS. Prices for the suite of CASE products range from $20,000 to $200,000, depending on the target machine.

Dell trims prices, adds PCs

Besides its first notebook personal computers (see story page 6), Dell Computer Corp. announced across-the-board price cuts and three high-end desktop models last week. The Dell Systems 325P and 333P are low-profile boxes based on the 25-MHz and 33-MHz Intel 80386DX chips. Base prices are $2,249 and $2,649, respectively. Each can be upgraded with a user-installable Intel 33-MHz I486 upgrade card, which costs $2,399. Dell also announced a low-profile 486-based unit for $4,999. Dell's price cuts, which are effective immediately, range from $100 to $900.

More news shorts on page 92

Saab Cars shifts gears to IBM

BY MARYFRAN JOHNSON
CW STAFF

ORANGE, Conn. — Driving toward a savings of $5 million over the next five years, Saab Cars USA, Inc. recently shifted from mainframe computing to a distributed system of IBM midrange machines and workstations.



Saab's Ioli *drives toward IBM equipment for savings*

As the largest of nine Saab importers worldwide, Saab Cars USA is a subsidiary of Saab Automobile AB in Trollhattan, Sweden. The parent company outsourced its entire corporate information systems division last month to Electronic Data Systems Corp. in a 10-year, full-service takeover.

The outsourcing deal, however, has no direct impact on the Saab importers, which have all chosen the IBM Application System/400 platform to anchor their new distributed computing environments. Saab Cars USA will move off of its Unisys Corp. 1100/2200 mainframe by early 1993 while the European importers leave behind their Nixdorf Computer AG mainframes.

"The key reason we chose the AS/400 was the immediate availability of applications packages," said Nicholas L. Ioli Jr., director of IS at Saab Cars USA.

Cost reduction, technology upgrade and the inclusion of the AS/400 in IBM's Systems Application Architecture plans also figured into the decision, he added.

For the company whose slogan is "We don't make compromises. We make Saabs," the aging mainframe technology was indeed compromising the firm's ability to respond to the slump hitting the car industry and luxury car companies in particular.

"With the competition these days, you have to be extremely agile," Ioli said. One example is Saab's new six-year, 80,000-mile warranty for 1991 cars, for which the IS department must maintain records in a specially designed application.

A 20-year IS veteran with experience at Timex Corp. and Comdec Corp., Ioli joined Saab last year with a mandate from the board of directors to increase competitive advantage, develop more effective business functions and deal with the applications development backlog.

The IS staff — reduced by 25% from a companywide layoff and the downsizing project — is now evaluating packaged software in three of its four main application areas: car sales and distribution; sales of parts and accessories; and finance and accounting. For services and warranties, the company will build its own applications, Ioli said.

By May, it is expected that the company's 400 users will be trained on IBM's Officevision/400 for all office automation, word processing and electronic mail.

Over the next two years, Saab Cars USA will set up full IBM Token-Ring connectivity between its headquarters and distribution and parts centers in Union City, Calif., and Meriden, Conn. The network will be anchored by three AS/400s and a dozen IBM Personal System/2 workstations, with 400 personal computers and some Sun Microsystems, Inc. workstations.

Retail pinch

FROM PAGE 1

McCurdy & Co., a local privately held retailer based in Rochester, N.Y. McCurdy's runs nine full-line department stores and 12 B. Foreman & Co. specialty stores.

Dennis Meeh, vice president of IS at McCurdy's, cited economic conditions and the end of several lease-to-own equipment agreements as reasons for reduced spending. He said that the company bought an Application System/400 in 1990, adding, "If I didn't make my purchase last year, it would be very difficult to buy this year."

Overall, retailers will increase IS spending slightly in 1991, although spending will not increase as a percentage of sales, several consultants said.

"I see spending on all fronts for hardware and increasing spending on software," said Stephanie Shern, national director of retail services at Ernst & Young.

At 123-year-old, Philadelphia-based Strawbridge & Clothier, a $1 billion regional retail chain with an upscale department store chain and a Clover Stores discount division, sales are down, but technology expenditures remain on track according to a long-term plan. "Because information systems technology is an integral part of our corporate strategy, you have to stay on game plan," said Tom Rittenhouse, corporate vice president and controller.

Sears, Roebuck & Co. has seen its merchandise group become bogged down in recent years. This year, Sears will finish a four-year game of technological catch-up. On the platter is a back-office system for its stores that is now being rolled out and will allow Sears to cut 21,000 employees, with direct savings of some $250 million.

"During a tough economy, a tough business outlook, I've seen business heads just get up and say, 'We've gotta have it,'" said Robert Ferkenhoff, vice president of MIS for all of Sears' retail operations.

Shern said that retailers will be spending on technology to do "all kinds of customer marketing and merchandising information that retailers don't have today" and that they will spend heavily on expert systems as well as basic technology improvements, such as new point-of-sale (POS) terminals. Ernst & Young's data showed that 54% of retailers have POS systems that are more than six years old.

"None of these retailers can do all of these things in any one year," Shern said.

Senior Editor Clinton Wilder contributed to this report.

To have or have not

Even within narrow segments of the retail industry, the recession has left some information systems organizations in contrasting have/have not situations.

At Toys 'R Us, spending cutbacks are unlikely, despite a poorer-than-expected fourth quarter.

"We've been growing at roughly 20% a year. We've never had that downturn [in sales]," said Dennis Healey, the firm's vice president of MIS. "If it does turn down, my guess is that the IS budget will go up because we will probably try to automate [more tasks]."

By contrast, Child World, Inc. has been badly hit by the recession and is in a severe cash-flow crunch.

"It affects us dramatically because money is very tight," said Hy Waxman, vice president of MIS at the Avon, Mass.-based toy seller. "Projects and systems and equipment we implement have to be justified through hard savings."

Waxman said that the IS department will be spending less this year than last. He said fewer than 10 employees had been laid off, bringing the department total to less than 50.

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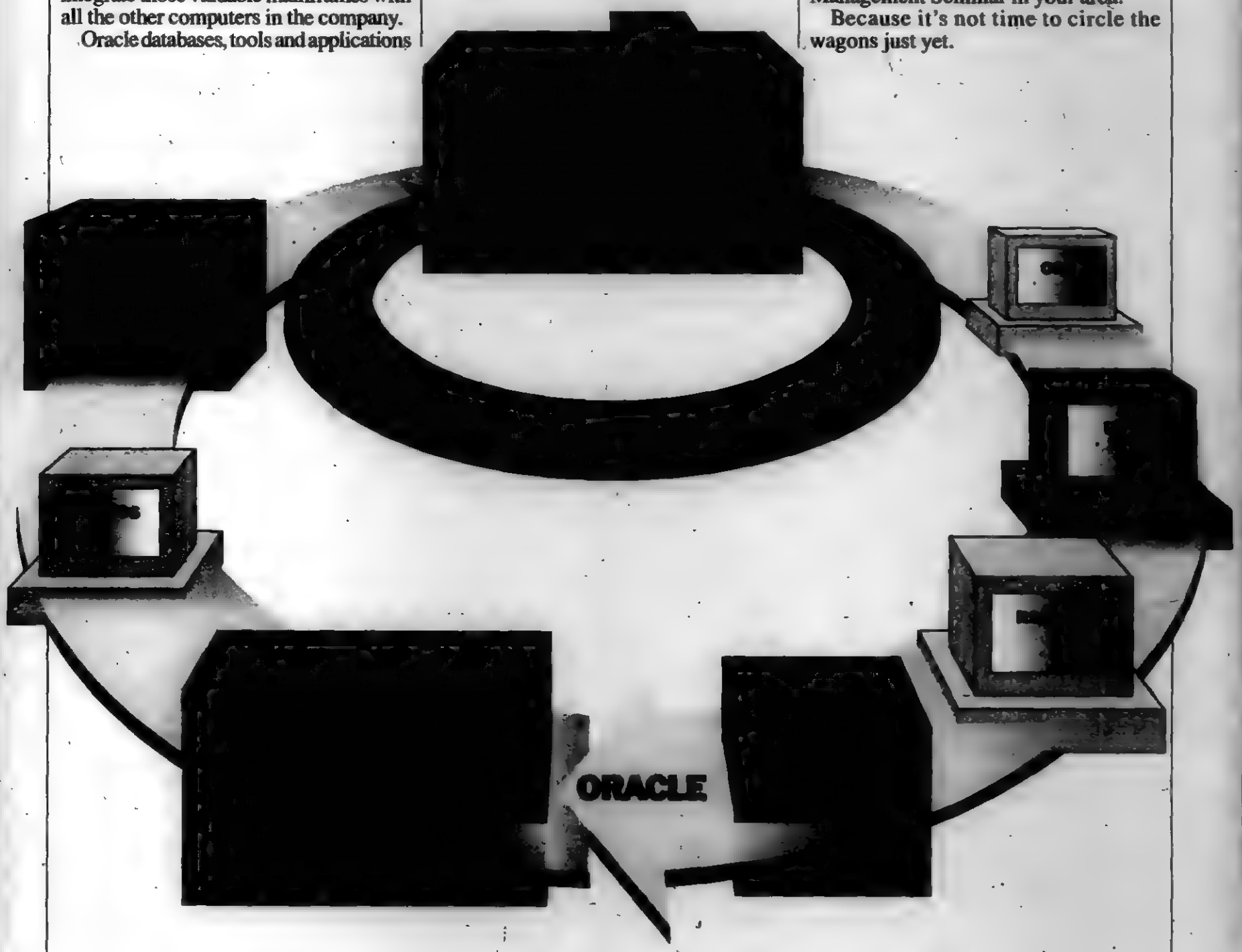
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Borland readies Windows programming tool

BY JAMES DALY
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. will introduce its first end-user product for Microsoft Corp.'s Windows tomorrow when it announces Objectvision, an application builder that uses visual programming techniques to help users create applications without the hassle of learning a programming language.

Objectvision is a highly graphical package that employs an on-screen form design as a tool to create Windows applications, according to early users. The application foregoes typical programming methods such as relational database structures, files, cards and books.

With Objectvision, a user builds applications by drawing a screen interface and then attaching properties to the objects in the form. Decision trees — pictorial descriptions of available alternatives — are included in fields on the form, and the fields are linked either to local or networked external data files.

Objectvision exploits the same type of declarative nonprocedural logic found in spreadsheets, which defines the answer or expression and the circumstances under which such an expression occurs. Most application creation tools use procedural logic in which the programmer defines the steps to be taken to determine an answer.

Not alone in the market

Some analysts said Borland could face competition from Mountain View, Calif.-based Software Publishing Corp., which offers point-and-click application development with its Infoalliance data integrator. However, Borland insiders said the price of Objectvision will be significantly lower than Infoalliance, which starts at $8,500 for 10 users.

While early users said Objectvision wins points for ease of use, they disagreed with Borland's use of a new nonstandard graphical user interface.

"Our users see the graphical user interface as a rallying point where we go for consistency, not for something different," said William Conley, manager of information technology service at Loral Aerospace Corp. in Newport Beach, Calif. "The Objectvision graphical approach may be revolutionary, but we don't need another revolution."

Objectvision can also access data from multiple database sources on a network as well as applications that support Windows' Dynamic Data Exchange. SQL links are reportedly in the works.

Pricing and availability details for Objectvision were not available.

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HP venture could fuel repository

BY J. A. SAVAGE
CW STAFF

An equity stake in Informix Software, Inc. by Hewlett-Packard Co. that was announced last week could result in an IBM AD/Cycle-type repository product for Unix-based systems.

"We're looking at a repository like IBM's for the Unix environment," said Phil White, chief executive officer at Informix.

Late last month, Informix announced that it was combining HP's Softbench computer-aided software engineering (CASE) environment with its fourth-generation language tools.

A repository is the core of the software engineering process and can be best thought of as a higher level or more advanced database. It goes beyond a traditional database by storing and managing information about the data and processes related to software engineering.

"I'm not sure just another repository is a solution," said Darlene Brown, an analyst at Gartner Group, Inc. in Santa Clara, Calif. She said the only open standard for repositories, called Portable Common Tool Environment, comes from Europe. HP has adopted it for its CASE strategy, but White would not say whether a repository product from Informix would use that standard.

HP became the second business to invest in Informix during the last three months. Informix said HP may buy as much as 15% of the company. The first investment from HP will be a 5% stake, valued at $3.5 million. The next 5% purchase is to be completed by April 1992, with the third 5% investment still open. ASCII Corp., a Japanese firm that announced its investment in Informix in November 1990, has the same 15% option.

Analysts said Informix could use the money. Revenue has been gaining, but profits have been flat for the last year, a spokeswoman said. HP also has a stake in another database product line, Ingres, through Ask Computer Systems, Inc. HP owns 10% of Ask, and Ask owns Ingres.

HP does not see a conflict with the two database companies, according to Bernard Guidon, general manager of HP's Unix systems. "The customer will look at which database is the best fit. If you like Ingres, we have it. If you like Informix, we have it as well," he said.

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Blue Cross unifies nets

BY ELISABETH HORWITT
CW STAFF

CHICAGO — Blue Cross and Blue Shield Association is replacing a "spaghetti bowl" of communications lines with a hybrid public/private network that is expected to save the company $5 million annually.

The association announced last week that its Unified Network strategy will provide crucial coordination and information sharing among its 73 organizations throughout the U.S.

Improving communications among the health insurance organizations was the "primary driver" behind the network plan, said Robert Schultz, senior consultant for the project.

Because each member group is an independent business entity, Schultz said, "it was a real challenge to bring them together" so they could go over and support national accounts more effectively.

The new system was designed to allow plans to transmit more than 20 billion characters of information among the member organizations each month.

Blue Cross chose four "quasi-business partners," according to Schultz. AT&T will provide leased lines for the private network; Timeplex, Inc. will supply the T1 multiplexers; IBM's Information Network will provide value-added network connections to customers and smaller sites; and Systems Center, Inc.'s Network Data Mover software will handle batch transfer of customer files between IBM hosts for claims processing at various plan locations. About half of the network's traffic is batch and half is interactive, Schultz added.

Two years in the making

Technical and business members from all of the major plans spent two years designing a hybrid network that "met our very specific business requirements," Schultz said.

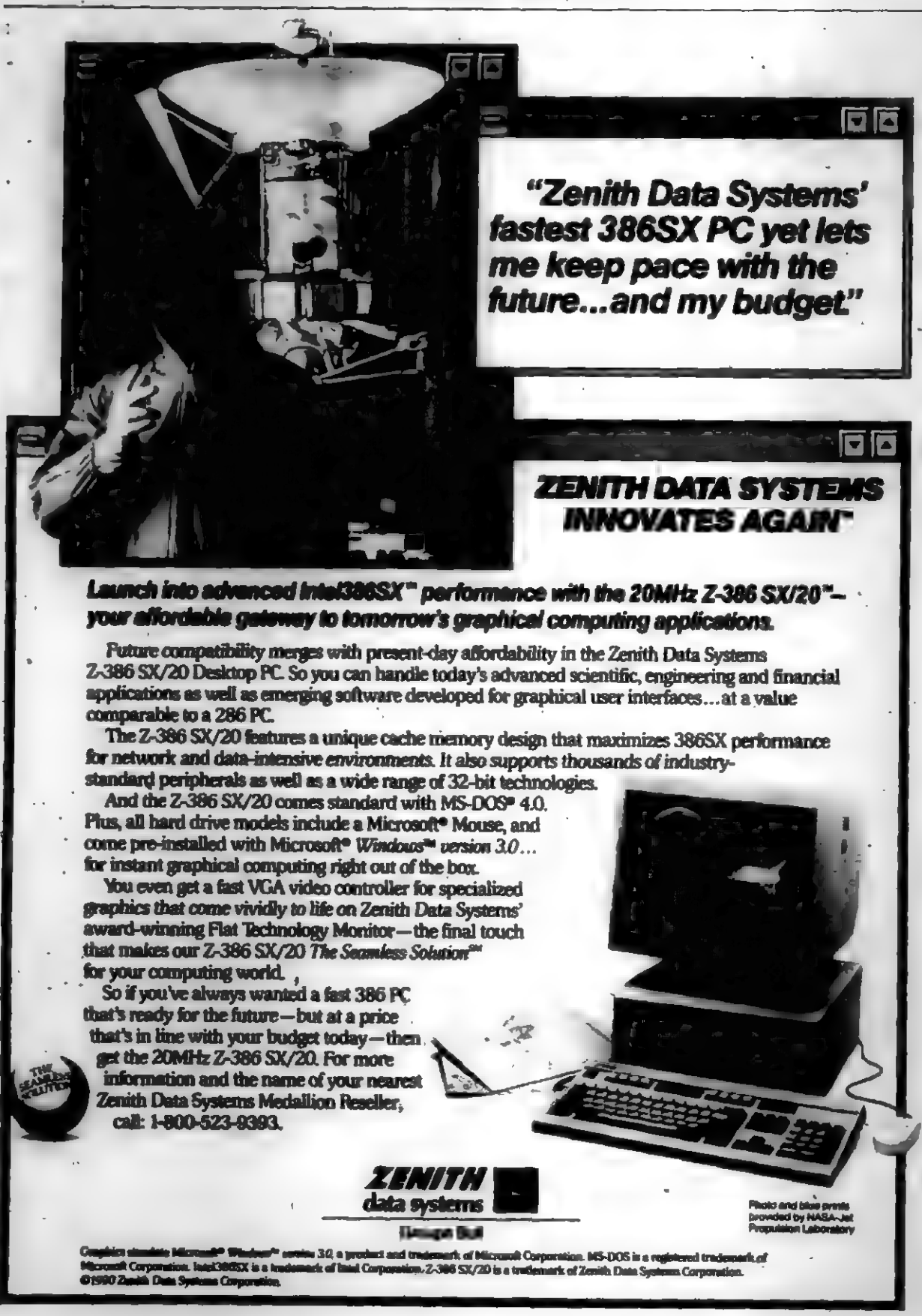
A high-speed dedicated backbone supports the high-traffic requirements of certain plan locations, while a value-added network service links other plan locations and will eventually extend to participating health-care providers, government partners, suppliers and major customers.

Blue Cross will initially limit its Unified Network to IBM Systems Network Architecture (SNA) transmissions because "virtually all 73 plans have IBM or IBM-equivalent mainframes," Schultz said.

However, the company plans to provide support for other popular network protocols to facilitate access for non-SNA users outside the company, according to Schultz.

Earlier this month, the IBM Information Network was serving about 75% of its projected user base, with the rest scheduled to go on-line by early July, Schultz said. The private network backbone should be fully operational a couple of months after that, he added.

Blue Cross' Washington, D.C., plan office will act as a network management center and help desk using IBM's Netview and Timeplex's Timeview to administer the private side of the network, Schultz said. IBM Information Network will manage its own circuits.



Legal fees set Ashton-Tate back

BY JAMES DALY
CW STAFF

TORRANCE, Calif. — Ashton-Tate Corp.'s continuing legal battles got the better of its finances in the quarter ended Dec. 31, when litigation expenses negated a slim profit and resulted in a $5.6 million loss for the software maker.

The firm posted $500,000 in operating profit but then set aside an $8.5 million provision for future legal expenses. This legal reserve, combined with income taxes, resulted in the $5.6 million — or 22 cents per share — loss.

Ashton-Tate reported a net loss of $1 million, or 4 cents per share, for the comparable period last year. Net revenue for the quarter was $65.1 million, a 5% increase over the $62.1 million reported in the fourth quarter of last year.

For the year, the company reported a loss of $18.1 million, or 69 cents per share, compared with a loss of $28.6 million, or $1.09 per share, one year earlier. Net revenue fell 13% from $265.3 million to $230.5 million.

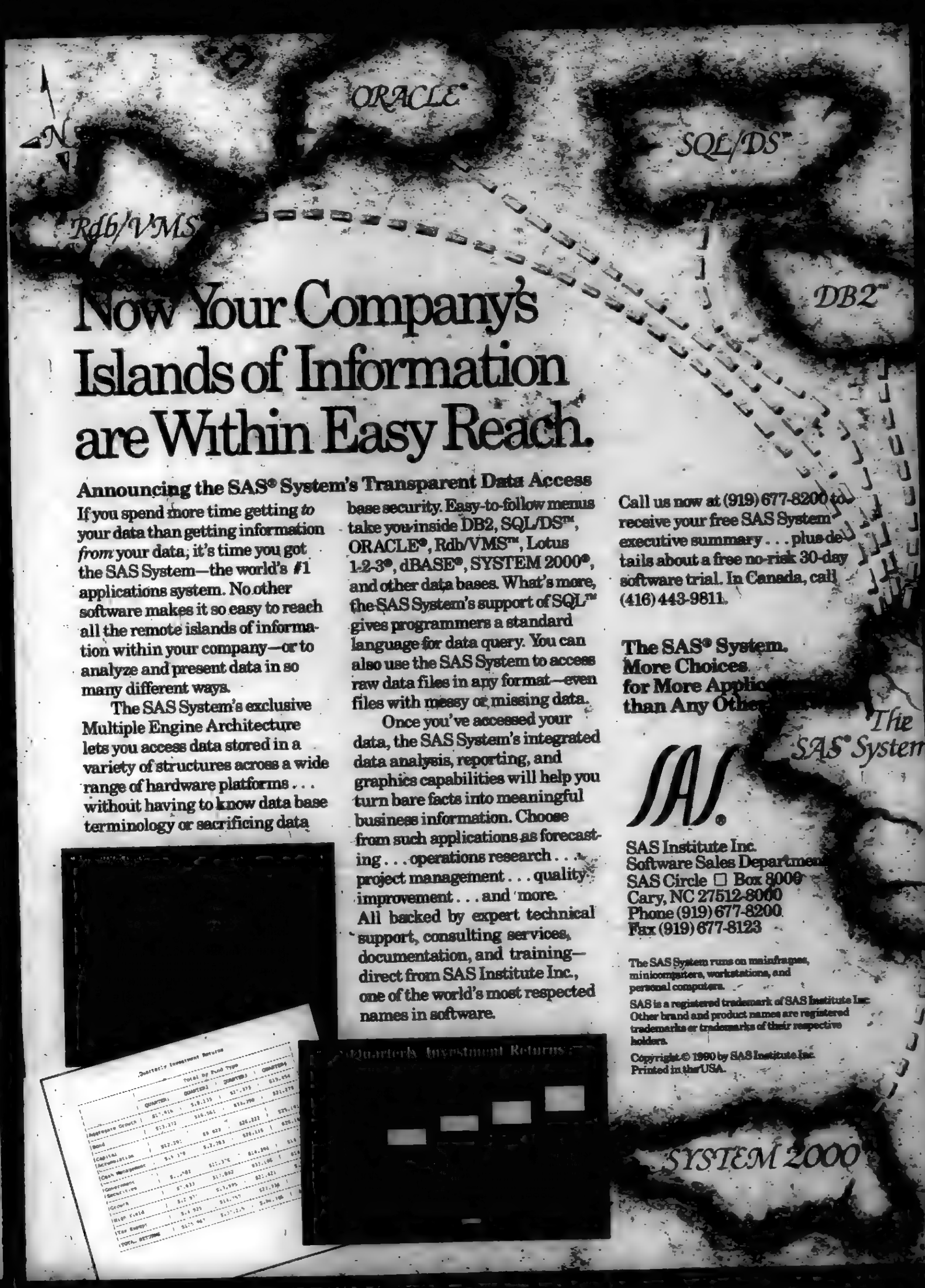
Alleged securities violation

The legal action that caused the $8.5 million set-aside stemmed from a June 1989 shareholder class-action suit that accused the firm of violating federal and state securities laws in its disclosure of financial results.

A spokeswoman said the litigation was still pending and declined to speculate whether a settlement was likely to be reached soon.

Despite the setback, President Bill Lyons remained optimistic, citing a 12% increase in sales of its Dbase IV database program over third-quarter figures.

However, Lyons added that "we remain cautious for the future due to the war in the Persian Gulf and uncertain economic conditions in many countries."



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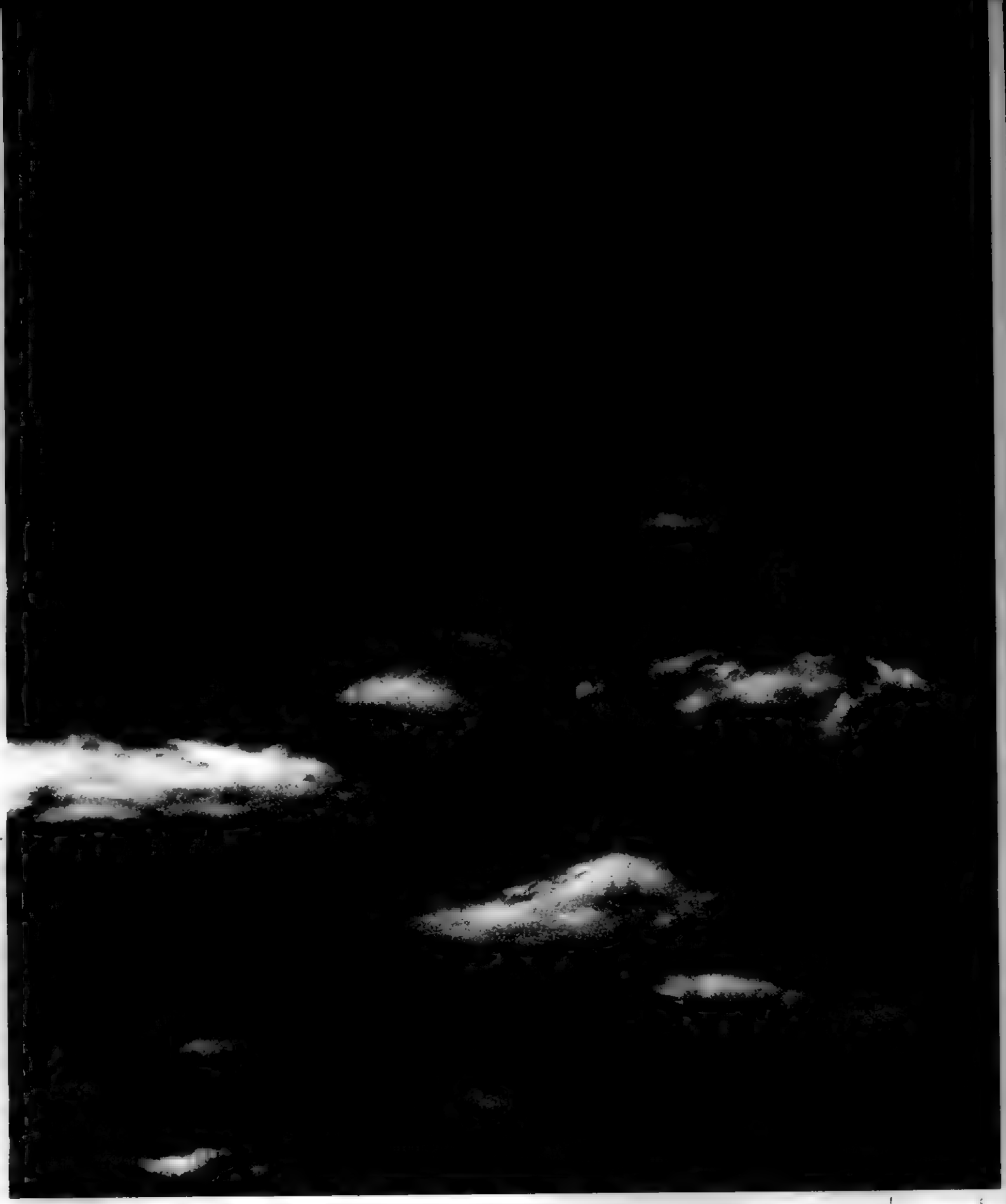
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MCI discount aimed at FTS-2000 plan

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — MCI Communications Corp., the losing bidder for the federal government's private voice/data network, tried to lure agencies away from prime contractors AT&T and U.S. Sprint Communications Co. last week with the promise of discounts of up to 40%.

However, the U.S. Congress has required federal agencies to use the Federal Telecommunications System 2000 (FTS-2000) contract, and waivers are tough to get. The real effect of MCI's new government tariff may be to put more pressure on the incumbent vendors to lower their prices, said federal market consultant Warren H. Suss in Jenkintown, Pa.

MCI is apparently trying to capitalize on reports that some federal agencies believe the FTS-2000 dedicated transmission and data services are overpriced. According to a recent study by Information Strategies Group in Vienna, Va., agency network managers would like to send the message to Congress that either "FTS-2000 services should be the cheapest, or they shouldn't be mandatory."

AT&T and U.S. Sprint characterized the MCI tariff as the last-ditch ploy of a disappointed bidder to get some federal business. Furthermore, they said, MCI's tariff is not really cheaper than FTS-2000 rates, and it includes fewer services. The U.S. General Services Administration, which administers the FTS-2000 contract, is studying the MCI tariff and had no immediate comment, a spokesman said.



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Crash blamed on old system

BY J. A. SAVAGE
CW STAFF

LOS ANGELES — Los Angeles International Airport (LAX), the site of a recent fatal runway crash, is scheduled to install a new computerized ground radar system in April. Air traffic controllers on duty when the US Air and Skywest planes collided Feb. 1 were relying on an almost 20-year-old system that was unusable that night.

"It's easier to count how many times the radar works on one hand than how many times it's out," said Karl Grundmann, safety committee chairman for the National Air Traffic Controllers Association Western Pacific Region.

Grundmann said the LAX radar antenna was working at the time of the crash, but the information on the airplanes was not getting to controllers because the scope was out.

This is despite claims by a Federal Aviation Administration (FAA) spokesman that it has been working constantly since 1972.

Unusual system

According to an FAA spokesman, LAX has an unusual radar system, a "one-of-a-kind" built by Texas Instruments, Inc., which did not manufacture the scope.

Other airports have an Airport Surface Detection Equipment (ASDE) system from Norden Systems United Technology, Inc. in Melville, N.Y.

In its National Airspace Systems plan to upgrade airways technology, the FAA has included a newer version of the surface detection equipment called ASDE 3. This equipment was supposed to be installed at the first site in 1989, according to the U.S. General Accounting Office. However, it is only now being installed at the first site in Pittsburgh.

ASDE 3 is based on an Intel Corp. 80286 CPU that digitizes transmissions from the antenna, processes the information and sends to displays in the control tower, according to Peter Foley, manager of radar and combat systems at Norden.

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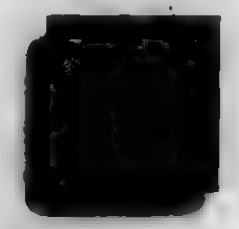
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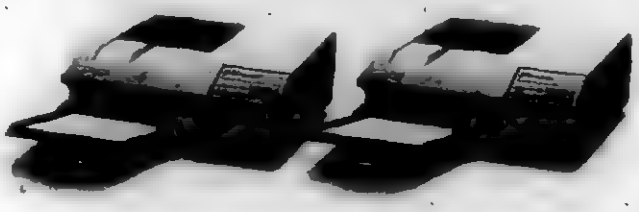
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ADVANCED TECHNOLOGY

TECH TALK

Password protection

■ Baseline Software in Sausalito, Calif., recently declared that it has developed a cure for the security woes plaguing the computer industry. The company said it has developed a software package called Password Conch that prevents unauthorized access to IBM Application System/400 computers. It is the only software on the market that screens passwords selected by users to make sure they are difficult to crack, the company said.

Light work in Iowa

■ Researchers at the University of Iowa in Iowa City have received patents for three devices that could be used as building blocks in an optical computer. Optical computers use light beams instead of electronic components and can operate 100,000 times faster than electronic switches, said Robert Cuykendall, one of the researchers. The patents were awarded for an optical switching device that routes energy impulses, a multiplexing interface to the switch and a device that keeps laser beams from spreading out and becoming too dim. While computer engineers are likely to begin building conventional computers that incorporate some optical components, it will probably be 10 years before the first all-optical computers are introduced, Cuykendall said.

Read up on Unix

■ Highland Software, Inc. in Palo Alto, Calif., said it plans to market a "software store" on compact disc/read-only memory (CD-ROM) discs that contain collections of Unix application software packages and demonstration programs. The CD-ROMs run on Digital Equipment Corp., Sun Microsystems, Inc. and Hewlett-Packard Co. workstations and are sent to users who request them. Programs on the CD-ROMs can be evaluated and purchased after receiving a password from a participating independent software vendor.

Pentagon funds peacetime projects

San Diego firm uses military funds for projects that will benefit nonwar uses

BY MICHAEL ALEXANDER
CW STAFF

Since the war in the Persian Gulf started, many news reports have focused on the computerized weaponry that is being used to wage this "high-tech war."

Television news viewers watch videos taken from the nose cones of "smart bombs" homing in on strategic sites and hear from experts about how tanks use "smart weapon" systems to lock in on distant targets, even as the tanks are rolling over undulating terrain.

Is that all the U.S. has to show for its technological ability — high-tech weaponry that is designed to be more lethal than ever before? Not by a long shot, fortunately. These days, much of the research that is being funded by the Pentagon can also be used for peaceful purposes.

For example, HNC, Inc., a neural networking applications developer based in San Diego, Calif., is working on three military-funded projects: a target-recognition system, a speaker-independent continuous speech recognition system and an analog neural network controller chip.

"The target recognition system is really something much more useful than just that," said David Shlager, vice president of sales and marketing at HNC. "It is as important for commercial airlines. The training of the neural network is for identification of a military target, but it could just as easily be a DC-10 or 747." The identical technology is already being used by a Japanese firm to sort good and bad apples, Shlager said.

The company was launched with and continues to operate largely on government funding, but "we have never done a project unless there is a commercial backside to it," Shlager added. "The military market is limited because it is very specialized."

Military not emphasized

The Strategic Computing Program, probably the most significant Defense Advanced Research Projects Agency (DARPA)-sponsored computer research project, is tied to military applications, but the majority of the program's technology base is basic research in fundamental computer science. Only 20% of the program's budget is slated for military-related technical applications, such as the autonomous land vehicles and smart weapons, according to the Project on Funding Policy in Computer Science, part of the Association for Computing Machinery's Special Interest Group on Automata and Computability Theory.

David Sarnoff Research Center, Sun Microsystems, Inc. and Texas Instruments, Inc. are developing a multimedia workstation that will allow the display of multiple video, static image, computer graphics and text windows on one high-resolution screen under a $7.7 million contract from DARPA.

The workstations are destined to be used as platforms for communications command and control and intelligence analysis. They will also be used to develop algorithms and techniques for smart weapons and night vision.



Cindy Patrick

The workstations will also be useful for such commercial applications as desktop teleconferencing, electronic video mail, medical imaging and broadcasting, researchers said.

Scientists at Calspan-UB Research Center, a joint effort involving the State University of New York at Buffalo and Calspan Corp., developed an "intelligent multimedia interface" under a $500,000 contract from DARPA.

The goal of the project was to develop an interface that would make communications between humans and computers easier and more natural, using speech, gestures, graphics, text, tables and maps, said Stuart Shapiro, chairman of the University of Buffalo department of computer science and one of the project's two principal scientists.

A military strategist would use such a system to plan missions and assess the counteroffensive abilities of an opponent, Shapiro said. By verbally querying the computer and simply pointing at a map, the strategist could delve into a database to retrieve information about missile sites, for example.

The same system could also be used by a city planner exploring various options for redistricting, Shapiro said. "He could talk to the screen the same way he might talk to a person with a map in front of you — you point at the map to highlight things, and the map talks back."

U.S. Air Force researchers at the Biocommunications Laboratories at Wright-Patterson Air Force Base outside Dayton, Ohio, are working on a three-dimensional sound system for fighter pilots. In conventional stereo audio equipment, the sound appears to emanate from the right and left or somewhere in between. The 3-D sound system would enable a listener to localize a sound behind, above or elsewhere in a space while wearing a pair of headphones.

"There are two areas that a 3-D sound system would help pilots," said Mark Ericson, an electronics engineer who pioneered the concept along with Rich McKinley, a senior engineer. "One is target recognition when trying to avoid an incoming missile or to aim a missile," Ericson said. "The pilot wouldn't have to look at a display — he could hear the missile coming. The other is to separate communications in space. Right now, all communications channels are coming through a single headset. If more than one channel comes in at a time, it garbles the sound."

A 3-D sound system would enable a pilot to localize the channels so that communications from a wing man flying behind and to the right would appear to be coming from that direction inside the headphones, Ericson explained.

The same technology could be used by commercial pilots. Less obvious is the idea that 3-D sound technology could be used in a unique navigation system that would assist the visually impaired in traversing city streets. A series of beeps would guide a person from one location to another, Ericson said. The system could also be used to make home audio systems sound more realistic.

Sixty percent of the $21 billion spent by the nation's top federal laboratories is for defense applications; the rest is for basic research, according to the Office of Technology Assessment. Much of the work being carried out by national labs has civilian applications, according to Gerold Yonas, director of laboratory development at Sandia National Laboratories.

For example, more than 300 companies, including computer and automobile manufacturers, are using software for 3-D structural analysis that was developed at Lawrence Livermore National Laboratory for weapons systems research.

Some experts are skeptical that technology developed for military applications is filtering through to the civilian side, however. There have been few notable successes that have come from military technology, they said.

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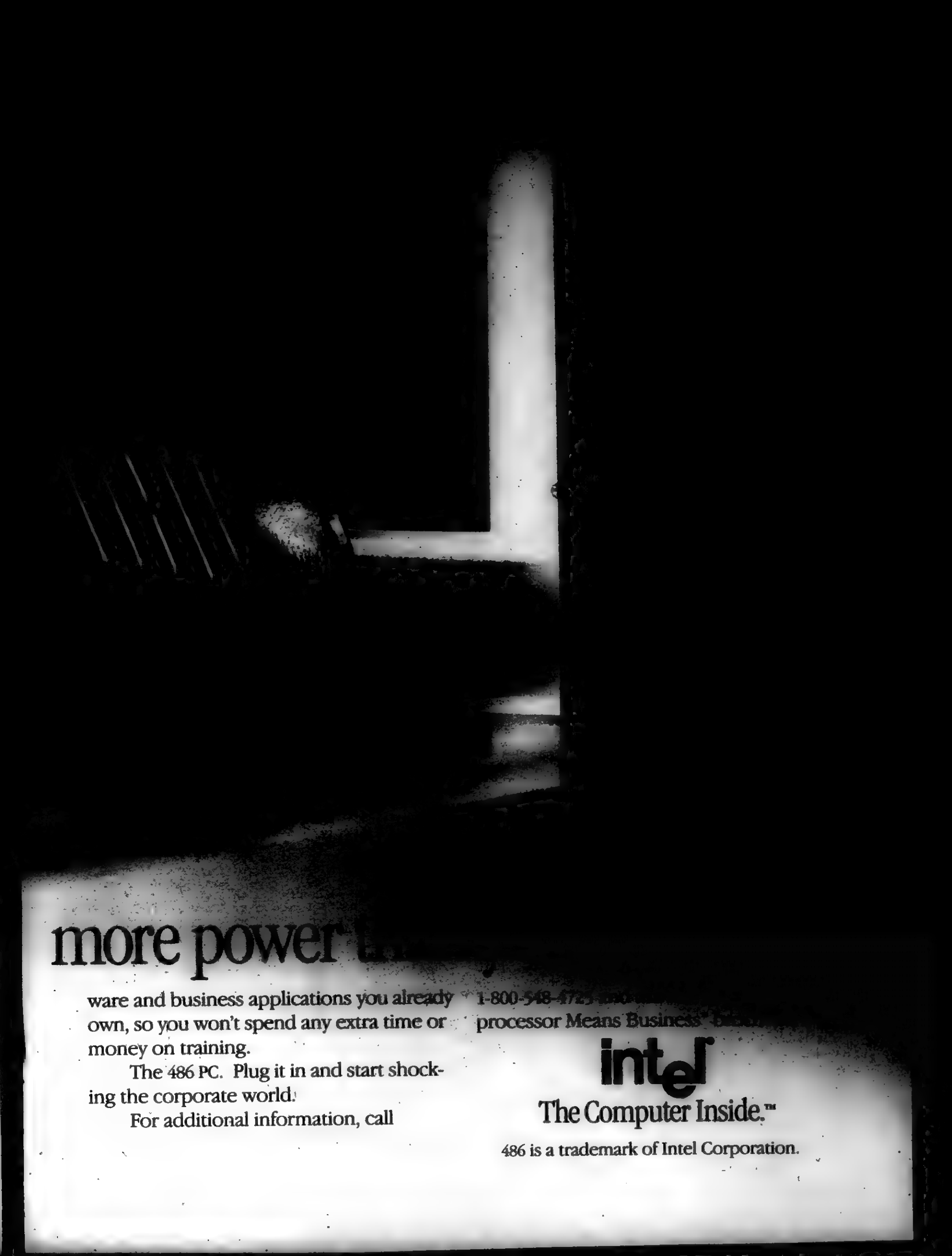
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EDITORIAL

Losing the lease

FOR SEVERAL YEARS there existed a rather uneasy truce between IBM and its largest (collective) mainframe customer — the computer dealers and lessors. The lessors were basically content with the arrangement, especially when IBM began to deemphasize writing its own mainframe leases in the early 1980s in the favor of outright sales. And sales to the lessors still counted as sales for IBM.

Then the elephant began to roll over just a bit and created its own leasing entity, IBM Credit Corp. (ICC), a subsidiary that buys big boxes from the parent company and then arranges great leasing deals. Being very well capitalized, ICC has seldom had trouble competing with the lessors, many of which have fallen on hard times.

In fact, last year the court-appointed trustee of one bankrupt lessor accused (but did not name names) some lessors of generally unethical practices. Many observers felt lessors were being driven to such practices because of the competitive heat radiating from ICC.

Now ICC has sued Comdisco, the second largest lessor, for allegedly doing "chop-shop" work on ICC's computers. IBM says it wants the courts to clarify the terms of ownership of the computers it leases. The lessors, as well as many who follow the multibillion dollar leasing industry, call it war on lessors.

So much for an uneasy truce.

The odds are IBM will get a favorable judgment. It picks its legal battles carefully and sparingly. Can you recall a case initiated by IBM that it lost? We can't either. The lessors know this, and that's why they are not sleeping well these days.

The ramifications for customers are potentially great. An active third-party leasing industry is not only a viable means of price control via competition: It also represents an entity other than IBM to control the stockable mainframes. If this control is not dispersed, it could be a weapon in the hands of IBM when it seeks to push a new generation of mainframes, and that's not necessarily good for you.

This is the worst-case scenario envisioned by ICC critics and one that is unlikely to occur if for no reason other than the lessors do represent a sort of extension of the IBM sales force.

But any blow to a struggling third party, particularly when IBM takes aim at the biggest independent lessor, can be powerful in times of recession and in times of flat mainframe sales in the U.S.

For its part, IBM's credit unit insists there is no hidden agenda; it simply doesn't want the people reconfiguring its machines. It added more punch to that line when it sued two mainframe storage makers 10 days ago with similar chop-shop charges.

Nonetheless, customers need to be wary of these developments. Any blows to competition are ultimately blows to them as well.



LETTERS TO THE EDITOR

Fighting spirit

Praise and accolades to Mr. T. J. Rodgers at Cypress Semiconductor on his perceptive and well-written viewpoint [CW, Jan. 14].

As president of a tiny, entrepreneurial firm, I too am engaged in frivolous "patent" litigation, which was brought against my firm solely to prevent competition and innovation.

Indeed, when the courts start imposing sanctions and actually start punishing these corporations and individuals, then and only then can the U.S. expect to begin to regain the edge over the international competition that only the American entrepreneurial spirit can provide.

When will the U.S. wake up and once again support the basic element of our democracy and economy — the entrepreneurial spirit? How long must the large megacorporations be the driving elements of the U.S. economy, business attitudes and, ultimately, our way of life, especially in light of the situations we are all seeing.

Charles F. V. Rogers
President
CFR Associates, Inc.
Haverhill, Mass.

Big Blue bully

As a 36-year veteran service technican, 21 of those years with IBM and the remaining being a competitor of that company, I was shocked but not surprised at the legal attack on Comdisco by IBM [CW, Jan. 28]

How can IBM demand the return of a system as leased with all original parts as leased? They sell features and take all the removed parts when they install the feature. The maintenance philosophy calls for the replacement of up to five major parts when a malfunction occurs. IBM will even replace entire frames or systems to correct a failure. (So will competitive service companies.)

Does IBM intend to demand that these third-party service companies replace all service-replaced parts with the original ones and then still pass the operational requirements?

Will IBM comply with this rule themselves? IBM will do everything it can to disparage competition because no one has enough money to fight them in court, not even Uncle Sam.

This is just another legal attack on a competitor by our local Big Bully.

Every leased box returned to IBM must pass IBM's inspection and operational verification, in most cases, at additional expense to the lessor or third-party service company.

Remember, IBM does not want all the business in the world, just yours and mine. They only want 100% profit, also.

James E. Beistle
St. Joe, Ark.

Power struggle

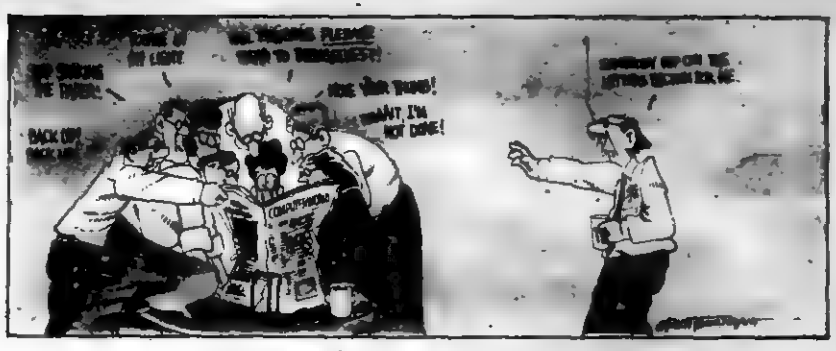
Vicki McConnell and Karl Koch's "Misuse of Power" [CW, Jan. 28] states that new technology implementations often fail because executives have mismanaged the relationship between technology and the business users. This is half the problem. The other half of the problem is the need for information systems professionals to be more forward-thinking in applying the correct technology to their companies. There is no such thing as a bad technology; there are only bad technological fits within companies.

Many of the market and operational achievements in business over the last 10 years were made possible through technological advances. But in order to continue this trend, IS managers need to look where "correct fitting" technology will be and not where it is. Interestingly, when hockey great Wayne Gretzky was asked what made him a better player than others, his response was, "I go to where the puck will be and not where it is."

For companies to stay competitive in the future, IS managers and corporate executives need to keep an eye out for innovations in technology that could revolutionize some part — however small — of the business. It is a task that the entire organization needs to understand and address. New technology implementations in corporations have been filled with problems and leaps of progress. Nonetheless, "correct fitting" technology continues to reshape business. Companies that refuse appropriate new technology may find themselves left behind by their competitors in the future.

Eric D. Goldfarb
Manager of Information Systems
Lintas:Ceco Communications
Warren, Mich.

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Purging information overload

The time has arrived for a new form of conservation: data ecology

MARK HALL



We no longer have information access but rather information excess and a massive pollution problem in the making. The landfills of our minds are brimming beyond capacity. If something is not done soon, we will need a Superfund of the intellect to clean up the muck in each of our heads.

Every other major industry is responding to environmental concerns. The soft drink industry has joined in efforts to recycle plastic bottles. Fast-food providers are eliminating the egregious use of offensive packaging. The painful exception to this spreading awareness of the need for conservation is the information industry.

Information is manufactured at dizzying rates in all corners of the globe. There are no controls on it. No restrictions. Oh, some might say that information is restricted in China or South Africa. Not so. Information is plentiful in those countries. It's truth that is in short supply. Propaganda contributes to the information glut as much as a 350-page printout for accounts payable.

There is no escaping the intrusion of information in our lives. The *New York Times*, *USA Today* and *The Wall Street Journal* are now delivered, along with the local paper, to doorsteps in Dubuque, Iowa.

And that's not the worst of it. *Time* magazine's recent cover story on junk mail observed that the billions of tons of unrequested gaudy paper Americans receive each year is considered information by some misguided individuals.

It's everywhere

Of course, if "a picture is worth a thousand words," television is the googolplex of information pollution. As our globe-trotting former president, Jimmy Carter, recently noted with questionable pride, no mattter what remote Third World locale he wanders in, no matter how poor or how distant, his fellow Georgian, Ted Turner, beams down 24-hour-per-day information through CNN.

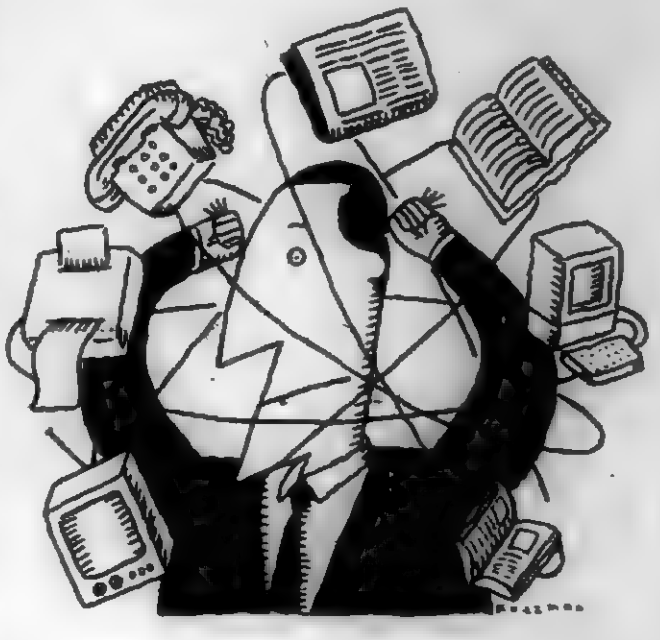
George Bush promised to be our "environmental president." On the information issue, however, he has failed miserably. For a time he held firm, recycling one phrase — "read my lips" — over and over. When pressed on the issue of taxes while jogging, he altered only one letter: "Read my hips." This restraint nobly showed his information environmentalism. And while he held to it, he had the support of his party and electorate. But when he went on television and tried to explain at length why he had changed his mind, his support collapsed.

Information pollution can not only damage politicians, but it can also wreck the economy. The savings and loan fiasco has been around for years. Suddenly, we know about it, and it's a crisis that will not go away.

To avert a catastrophic information-overload crisis, voluntary restraint is necessary. Otherwise, just as the public suddenly came to demand less pollution in its air, water and earth, there will be a draconian backlash against the information rubbish that is dumped into our lives.

Information systems managers are clearly not the only, or even necessarily the worst, culprits, but they will suffer much of the backlash. IS departments are likely to become battlegrounds for the new age of information ecology. Why? Because the very term "data processing" reeks of information excess: reports, forms, input and output.

It is inevitable that IS managers will be portrayed as information wastrels who are unable to hold back the flow of data muck. Clarion calls for a new cabinet-level information secretary will be heard.



James Kaiserman

To get ahead of this reactionary wave, the information industry must take the road of self-restraint.

This will have to be a many-pronged effort. In book publishing, for example, thick volumes of questionable and redundant information ought to be foresworn. Instead of producing twenty-odd competing dictionaries, maybe Random House, Webster's, Oxford and American Heritage could put their heads together and produce one book that does the job right.

Like publishers, IS professionals must unearth new ways to bury data. Eliminating report redundancy is a good start, but eliminating whole reports would be even better. (You've always doubted whether your clients actually read them anyway.)

If self-control isn't enough to do the whole job, federal funding can be earmarked to help IS professionals relinquish their information dependency. Like some farmers, programmers can be paid to let their code go fallow. And people who request new reports can be quietly whisked into rehabilitation clinics for info addicts.

It behooves the information industry to act now. Before the boycotts. Before the marches and the protests. Before "ignorance is bliss" becomes a major political issue.

Hall is an executive editor at Springer-Verlag, a technical publisher in Santa Barbara, Calif., and co-author of Sunburst, a book on Sun Microsystems, Inc. published by Contemporary Books.

Technology offers disabled a chance to make their mark

GLENN RIFKIN



The disabled have long suffered from a handicap much more disabling than their physical difficulties. Discrimination, both in and out of the workplace, has been so rampant that last summer, President Bush signed into law the Americans With Disabilities Act, the first civil rights legislation since 1964, which makes it illegal to discriminate against the disabled.

It is sad but not surprising that legislation had to be passed to change stupid, archaic practices and hopefully some attitudes along the way. Because the fact is that something dramatic is happening for people with disabilities that is making many forms of physical impairment irrelevant.

That something is technology. Computers, along with amazing software and other adaptive high-technology devices, are allowing the disabled to change their lives. Technology is effectively erasing many handicaps, such as visual or speech impairment, motor dysfunction and even certain mental disabilities.

Researchers at IBM, Digital Equipment Corp., Kurzweil Applied Intelligence and dozens of other companies continue to make breakthroughs in adaptive technology. Centers around the country, such as the Trace Research and Development Center in Wisconsin and the Communications Enhancement Center at Children's Hospital in Boston, have brought users together with developers to shape and direct the work.

Dr. Howard Shane, director of the Communications Enhancement Center at Children's Hospital, a longtime prime mover in the field of adaptive technology, says these efforts are starting to bear fruit. "People who haven't worked in 10 or 15 years are suddenly finding that they can now work because of technology advances," he says.

Filling a need

The people who have pioneered this technology should certainly be lauded for their noble contributions, but the net effect of such efforts goes far beyond altruism. The plain numeric fact is that our work force is shrinking as the baby boom blip moves along toward age 40 and beyond. There are simply not going to be enough workers to handle all the necessary jobs. That issue may seem distant in the midst of the current recession, but economic cycles change relatively quickly — demographics don't.

Think about it this way: 43 million Americans suffer from a physical or mental disability — 43 million! That is about one out of every six people in this country. That makes people with disabilities the largest minority in the U.S.

Then think about this: According to the U.S. Census Bureau, only 28% of working-age people with disabilities hold full- or part-time jobs. According to Erica Jones, acting director of public affairs for the President's Committee on Employment of People with Disabilities, a vast majority of the remaining 72% "are ready and willing to work if given access to the work force."

This is where technology comes in. Technology provides access. Technology is the great equalizer, helping to neutralize the disability and allowing the person to participate. Alex Lome is a perfect example.

A truck accident eight years ago left Lome with a degenerative nerve condition in his hands. Lome, a Chicago-based writer, faced the possibility of never working again. In April of last year, he discovered, after much research, a voice-recognition system created by Dragon Systems in Newton, Mass. The innovative technology allows a user to read into a microphone and have the words appear instantly on a computer screen.

With the help of some grant money, Lome was able to get set up with the Dragon system and a personal computer. "I can blast along at 60 words per minute with 95% accuracy," he says. "This technology gave my life back to me."

With the advent of the information age, white-collar knowledge workers are and will be in demand. And someone with access to a computer, a telephone and a modem can perform an ever-widening array of jobs. Suddenly, people with disabilities become a very attractive and vast resource pool from which to draw talent. Corporations, rather than being forced by legislation, should be embracing this resource now so that the issue quickly becomes a nonissue.

It costs relatively little for an employer to provide adaptive technology to a worker with a disability — the President's Committee on Employment of People with Disabilities estimates the average cost of accommodating such an employee to be less than $1,000. Even if it is ten times that amount, the net result is more than worth the cost: It takes someone off relief and gives them a productive life, and it gives the employer a dedicated, loyal employee. This is a trade-off that should spur faster and better development of affordable adaptive tools. There's really no choice anymore.

Rifkin is a free-lance writer and a former Computerworld features editor.



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More change needed at D&B

VAX users say customer service at the firm still leaves much to be desired

ANALYSIS

BY SALLY CUSACK
CW STAFF

FRAMINGHAM, Mass. — When McCormack & Dodge announced its first Millennium accounting product for the Digital Equipment Corp. VAX environment in the summer of 1988, users had no forewarning that the vendor was heading for major changes: a merger, a name change and several divisional restructurings.

Rechristened Dun & Bradstreet Software last year, after being merged with Management Science America, Inc., the company is still aligning products and services. A year and a half after the fallout, the products themselves are getting good marks; however, users have raised questions about customer service under D&B Software.

Keith Mcleod, a senior systems analyst at Perrier Group of America, Inc., uses the Millennium, general-ledger and fixed-assets packages on a DEC VAX/VMS 6340 system that supports approximately 100 users. The company is in the process of bringing up the accounts-payable system.

All in all, Mcleod said, the products are good. He is especially pleased with the general ledger on-line query functions and the report capabilities.

However, Mcleod added, service and support from the software vendor have gone from "good to less than good" since the merger. Seldom does he get to speak to someone on the first call, Mcleod said — something that never happened under the McCormack & Dodge flag.

Pleased with performance

Rick Banning, a business analyst at Maryland Bank National Accounts America (MBNA) in Newark, Del., has been using the general-ledger, fixed-assets and accounts-payable Millennium packages on a DEC VAX 6310 and is basically pleased with the software's performance. Banning described the installation process as "smooth." MBNA brought in consultants for the installation process, and the company has customized several of the D&B Software utilities.

While Banning said the actual vendor merger was virtually transparent to him, he concurred with Mcleod that D&B Software's service and support could use some fine-tuning, observing that the department seems understaffed.

According to John B. Koles, vice president of the Digital Business Unit at D&B Software, customers may still be adjusting to D&B Software's new automated service system, installed approximately four months ago, which logs and prioritizes every call.

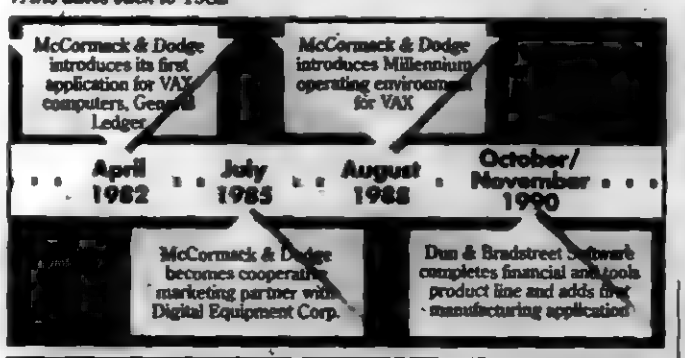
"The intent is to increase the personal touch by guaranteeing that we don't lose a call," Koles said, adding that the company has doubled staff numbers for DEC customers in the central support area alone during the past year.

Some users reported that they have been getting better service since the merger. Doyle

Continued on page 33

VAX timeline

Dun & Bradstreet Software's product line for Digital Equipment Corp. VAXs dates back to 1982



Source: Dun & Bradstreet Software — CW Chart: Paul Mock

Levi's multiprocessor upgrade a snap

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — Jeans maker Levi Strauss & Co. buttoned up the slot as the first user of a Hewlett-Packard Co. multiprocessor minicomputer. The firm is currently using the system for software development at its headquarters but will ship it in six months to its CPU-strapped operations in Brussels.

"We thought going into it that we were taking a bit of a risk," said Stephen Levandowski, vice president of information resources. "But it was pretty easy." The dual-processor machine, an HP 3000 Series 980, was installed in late December.

Levandowski was able to upgrade to the multiprocessor system on the fly, leaving his contingency plans on the drawing board. The computer, based on HP's proprietary operating system, took a two-hour, two-board swap. "In a worst-case scenario, it would have been out for two days," he said.

Zipping along in Europe

The scalability of HP's minicomputer line is expected to work well for the company's European operations. Unlike the U.S. market, which has "maxed out" on jeans, a Levi's spokeswoman said, the European market is "blossoming." Basic blue jeans in Eastern Europe sell for the equivalent of $100.

During the six-month break-in period before the new multiprocessor is shipped to Brussels, Levis will use it for software development for projects such as the company's private Advanced Business Systems, which includes sales and distribution, production, planning, financial management and customer service. The software developed for the HP platform is used only in non-U.S. markets.

U.S. operations will remain on Levi's IBM mainframes, Levandowski said. An HP 3000 Series 960 now residing in Brussels will be shipped to San Francisco for continued software development.

Firm ships reusable code software for CASE market

BY ROSEMARY HAMILTON
CW STAFF

ARLINGTON, Va. — Software Architecture and Engineering, Inc. recently began shipping a reusable code package for the computer-aided software engineering market.

The company is targeting its template, which consists of 225,000 lines of C code, at Unix workstation environments. Called the Strategic Networked Application Platform, the product was designed for networked applications.

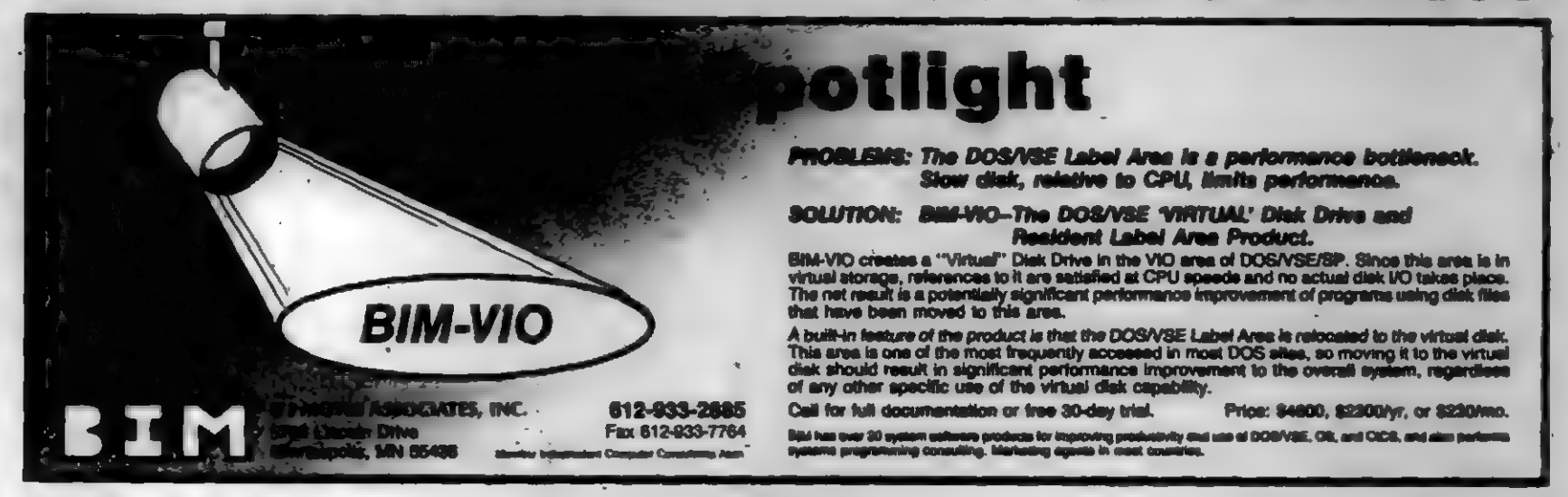
"I think they are on the right track in that reusability is going to be a real kick for users," said Ed Acly, an analyst at Technology Investment Strategies Corp., a market research firm based in Framingham, Mass. "They seem to be targeting it more for real-time [applications] rather than typical MIS."

Ahead of the game

The idea is to provide users with a jump start at programming, the firm said. The template, which carries an entry-level license fee of $28,000, consists of five generic modules required for typical workstation applications.

These modules include links to networks, links to relational database management systems, a graphical user interface, an expert system shell and an object-oriented data model.

A user is required to tailor the template to the specific application. The company claimed that this process accounts for approximately 10% of the total application's code.



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Cognos extends AS/400 support for Powerhouse

BY MARYFRAN JOHNSON
CW STAFF

BURLINGTON, Mass. — Seeking a foothold on unfamiliar terrain, Cognos, Inc. extended its suite of Powerhouse application development tools on the IBM Application System/400 platform last week.

This is the second phase of Cognos' rollout of fourth-generation language (4GL) tools for the AS/400. Powerhouse is well-established on midrange computers from Digital Equipment Corp., Hewlett-Packard Co. and Data General Corp., analysts noted, and it runs on MS-DOS and IBM OS/2 platforms.

"Nobody's really heard of them in the midrange," said Teresa Elms, president of Elms Technical Communications, a market research firm for the IBM midrange. "But bringing another major player in is always good for end users."

The major hurdle Cognos will face with AS/400 users is that Powerhouse is a 4GL based on the C language, which has a reputation for poor performance on the AS/400. The company will also face stiff competition from Synon, Inc., System Software Associates, Inc. and Aspect, Inc., which dominate the IBM midrange with third-generation language code generators and computer-aided software engineering (CASE) tools.

Andre Boisvert, Cognos' vice president of IBM operations, said the Powerhouse products will ease the job of coding and maintenance, which helps reduce costs for information systems shops. Multivendor shops already familiar with Cognos are most likely to give Powerhouse its initial welcome, analysts said.

One of those first users is Norbert Tauchner, director of corporate information systems at Dominion Textile, Inc. in Montreal. The world's largest producer of denim, Dominion has a mix of IBM and DEC midrange machines at 32 locations worldwide plus other systems from Wang Laboratories, Inc., HP and DG.

"We are looking for something to unify the strategy for those 32 locations, so we've tried to pick a hardware platform and applications environment we could live with across all those sites," Tauchner said.

The ability to generate 4GL code was the chief attraction of Powerhouse over competitors such as Synon, which generates 3GL code for RPG or Cobol. "Generating third-generation code is kind of a belt and suspenders approach," Tauchner said.

Different direction

The direction the textile manufacturer is taking instead is toward a client/server computing architecture based on DEC and IBM with applications developed in Powerhouse 4GL.

"Powerhouse makes us almost hardware independent because if the best machine to use is a PC, we can develop applications on that with Powerhouse," Tauchner said. "The real issue is whether the Cognos product will be as good on the AS/400 as it has been on its other platforms."

Cognos released the first phase of Powerhouse for the AS/400 last May with a report writer, dictionary and conversion utility. This second phase fills in several missing 4GL pieces, including a full data dictionary and a conversion utility from the IBM System/36 RPG code to Powerhouse. It is priced from $11,000 to $76,000 for a development license and is available immediately.

Still missing are CASE, documentation and maintenance tools, which Cognos officials said will be added later this year.

Cognos officials stressed that all Powerhouse tools on the AS/400 will be fully compliant with IBM's AD/Cycle and Systems Application Architecture.

Cosmos²: Fedex's next generation

ON SITE

BY JOANIE M. WEXLER
CW STAFF

MEMPHIS — To keep the upper hand in absolutely, positively delivering packages overnight, Federal Express Corp. is taking its Cosmos II tracking system into the world of Unix, distributed computing and relational database management systems.

Cosmos², the next generation of the courier's worldwide tracking system, is a 3½-year project that represents a 100-person effort to build a new infrastructure for the industry-revered system.

"Most people say we have the finest tracking system in the world," commented Ron Ponder, Fedex's chief information officer. "But we want to continually add value to the customer — particularly as competitors catch up to our current-generation technology."

The pioneer in on-call, overnight delivery service said it now processes 14 million on-line transactions per day. The transactions are tracked by an IBM IMS database running on IBM and Amdahl Corp. equipment in communication with a Tandem Computers, Inc. system in the firm's Memphis headquarters. Digital Equipment Corp. minicomputers in dispatch stations and Fedex's own Supertracker handheld scanners and Digital Access Dispatch System computers in delivery vans.

The firm is aiming for systems integration "that brings us into three arenas: totally relational databases, very distributed computing and technology to automate our routing and sorting process," Ponder said.

That infrastructure will include adding a relational database component to the firm's technology mix.

RDBMSs allow dynamic views of relationships between data rather than confining users to preset relationships. The IMS database will remain in place for transaction processing and backup because its nonrelational nature gives it a leg up on performance.

In addition, mainframe software development is under way to allow the company to increase the throughput between communicating systems and the system processing time fourfold to fivefold. "This will ensure that as we handle greater volumes of transactions, the systems won't falter," Ponder said.

New additions

Technology changes at Fedex will also include the addition of a distributed, peer-to-peer computing environment with the installation of Unix-based platforms in the dispatch stations. Ponder said he is running two Unix prototypes on different vendors' hardware. The aim is to offload some of the transaction processing from the mainframes and to place more information closer to the station personnel. Currently, the stations' minicomputers are used only for dispatching.

"It makes for more sensible operations if you push out to each dispatch station the data it needs to manage and allow the stations to access just the data they need," as opposed to locating data only in central mainframe-based repositories, Ponder said.

The purported openness of the Unix operating system is also important to Fedex "so we can take advantage of different vendors' breakthroughs in cost-performance over the next several years," Ponder said.

One Cosmos² component will kick off this summer with the installation of Courier Printers in every Fedex van. The printers were designed in-house to issue a "very smart" label for each package.

The labels will link with another Cosmos² component — software dubbed Astra — that will reside in the Supertracker to help route and sort packages "so not one of them ever goes astray," Ponder said.

He added that when Astra is in place and sorters scan a package with a smart label on it, the Supertracker will beep if a package is placed in a wrong container.

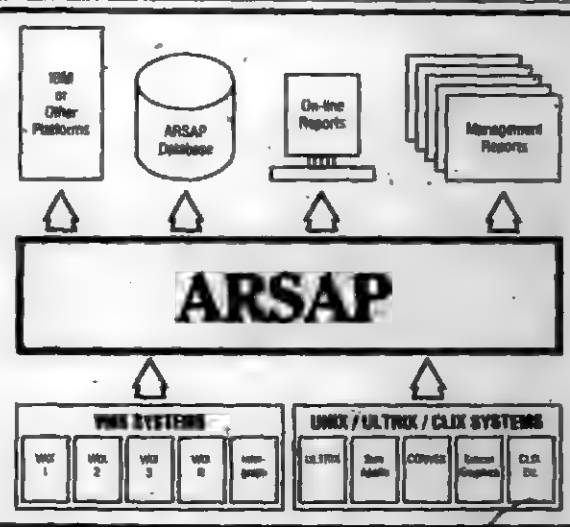
"Cosmos² will allow us to anticipate problems before they happen," Ponder said.

Cosmos II — which won a 1990 *Computerworld* Smithsonian Award for innovative technology [CW, July 2, 1990] — outmoded its "reactive" Cosmos predecessor in 1985 by becoming a real-time system. This happened with the firm's invention of the menu-driven Supertracker bar-code scanner.



Federal Express' Ponder *heads up 'the finest tracking system in the world'*

Worldwide, there are currently 60,000 Supertrackers scanning packages every time a shipment changes hands. The Supertrackers relay data back to the minicomputers in the dispatch station through a coupler on the Digital Access Dispatch System in each van. At the end of each business day, the Supertracker is stored in a mechanical cradle in the dispatch station where its information is downloaded to the mainframe, allowing the database to be updated automatically during the night.



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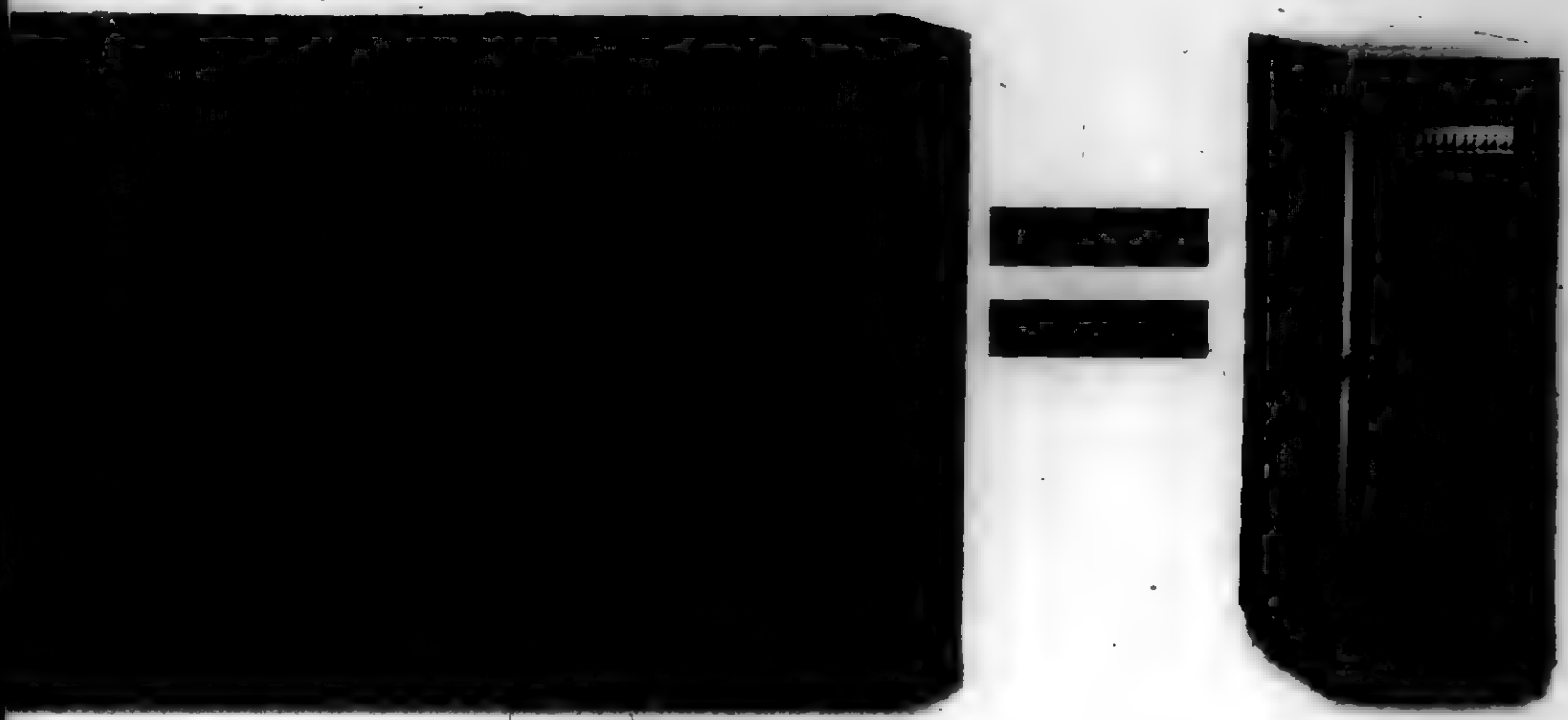
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EMC²

State program chooses minis over PCs

ON SITE

BY SALLY CUSACK
CW STAFF

LITTLE ROCK, Ark. — Good food equals good health, and the federal government's Special Supplemental Food Program for Women, Infants and Children (WIC) hopes to ensure the good health of the four million people it currently serves.

WIC provides nutritional food to pregnant women, nursing mothers and children up to age five. The Arkansas Department of Health decided to automate its statewide WIC program in 1989 and chose a Wang Laboratories, Inc. VS minicomputer environment to link its 111 clinics.

Jerry Perkins, director of data processing at the state's Department of Health, gave several reasons for choosing a proprietary distributed mini-environment over the increasingly popular personal computer-based local-area network and Unix platforms.

"We have been a Wang shop since 1983, so it was somewhat of a natural evolution to use it in the field," Perkins said. "However, we also develop all software applications in-house, so the way I see it, we really have no need for Unix. If we have to modify software, we do it one time only from headquarters, giving us centralized control of software upgrades and subsequently less room for errors."

The software, which was developed in Cobol 85 and executes queries in a Wang Pace database environment, monitors applicants, recipients and vendor participants — in this case, individual grocers — in the WIC program.

Multiple uses

All data resides centrally on a Wang VS 10000, which currently has 288 active ports. According to Perkins, the 10000 also supports software for several other applications, including state immunization records, word processing functions and emergency medical services.

The Arkansas Department of Health also has a second VS 10000, originally purchased to add imaging technology to the Vital Records Division. The department has put a temporary hold on the imaging project for financial reasons, Perkins said, but it is using the second system in the interim for health statistics, geographic information systems, health laboratory data and vital record processing.

The state agency has a VS 7310 serving as a network controller using 56K bit/sec. lines to communicate with six VS 5000 systems scattered across Arkansas. The VS 5000s, in turn, are connected to more than 100 Wang asynchronous workstations.

Perkins noted that the data processing department considered using Zenith Data Systems PCs in the field (the state of Arkansas also has a contract with Zenith), but it elected to go with the Wang 2110A asynchronous workstations based on both price considerations and ease of use.

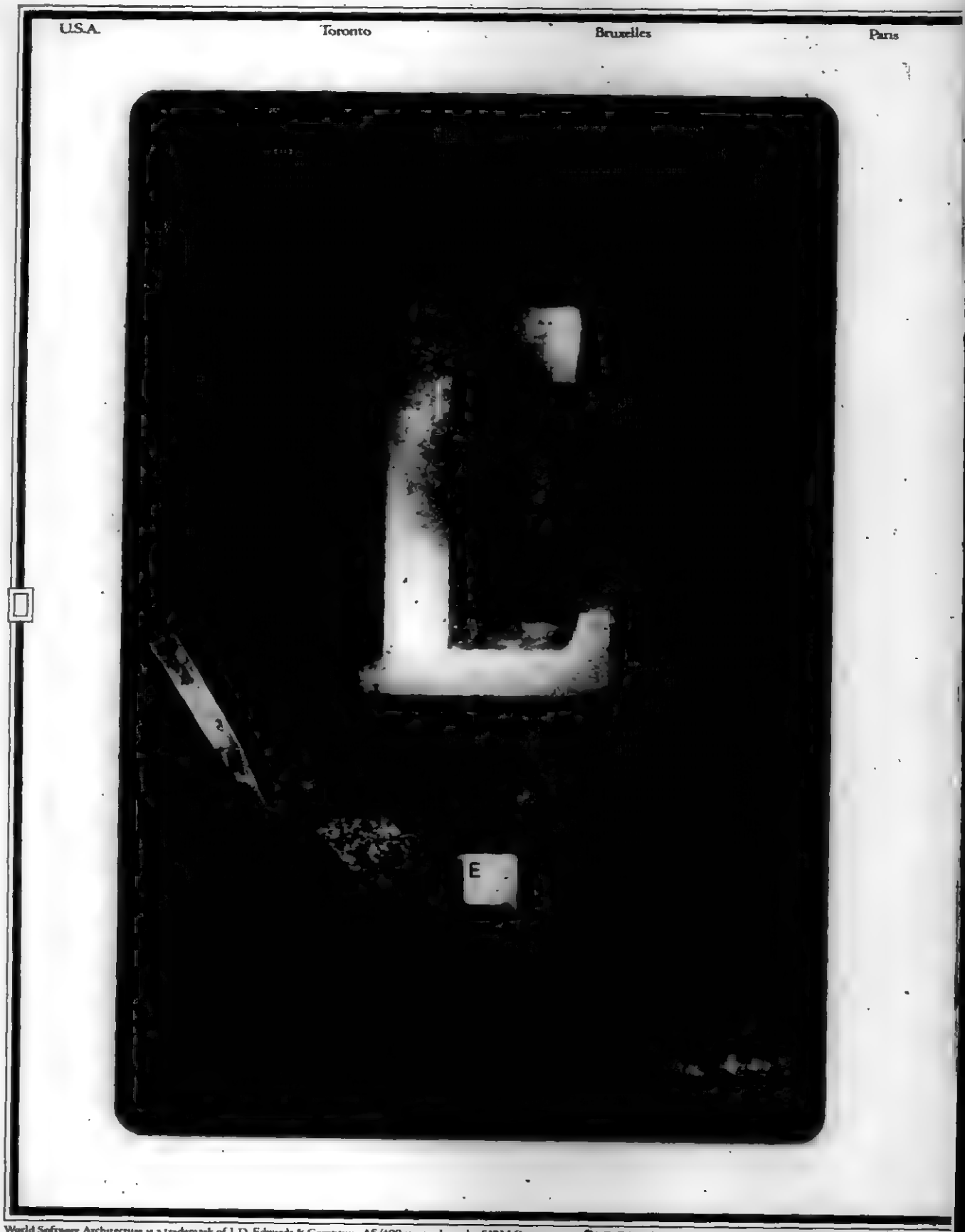
The department has a very mobile staff, Perkins said, and it is easier to train clerks and other personnel on a single keyboard configuration. Using the Wang 2110As throughout the network gives employees a consistent hardware interface with the computer system.

Wide range

"There are 75 counties in Arkansas and roughly 100 health units," Perkins said, adding that each health unit has one WIC terminal. There are sometimes even two or three in the larger clinics, he said.

On the financial side, evaluations revealed that even with a substantial discount, purchasing PCs would have cost $1,200 to $1,300 per unit, while the Wang terminals average $730 each.

The Wang-based system has automated a traditionally paper-



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oriented process for the WIC program. In the past, WIC enrollment forms were filled out in local offices and mailed to Little Rock for data entry into the department's computer. Once eligibility was established, food vouchers were mailed to clients.

Client record information is entered directly onto the system by the field health professional, and the data is automatically updated on the central computer database. This reduces the enrollment process to about five minutes and reduces the chances of producing duplicate vouchers. Food vouchers are printed and issued at the clinic.

Mac Heird, WIC's director at Little Rock, said the WIC budget constitutes approximately 40% of Arkansas' overall health budget, which is estimated to be $40 million in 1991.

According to Heird, WIC serves almost 60,000 Arkansas women and children per month. Clients must re-establish eligibility requirements every six months by meeting income qualifications and other requirements. The typical food voucher provides supplemental items including milk, cheese, eggs, dry beans, orange juice and cereal.

Sequent beefs up power

BY J. A. SAVAGE
CW STAFF

BEAVERTON, Ore. — Sequent Computer Systems, Inc.'s Symmetry 2000 parallel processing computers, which were announced recently, will run up to 30 Intel Corp. I486 processors with a maximum performance of 354 trans./sec., the vendor claimed.

The systems, which run Unix, are aimed at the commercial marketplace. "We're going after applications reserved for big [IBM] 3090s and DEC VAXs," a spokesman said.

Analyst Tom Willmott at Aberdeen Group in Boston said Sequent might have a shot at the Unix commercial marketplace with the new systems.

Sequent's parallel processing computers use applications that break up a program to run over all available processors in order to speed processing time.

The drawback to parallelization remains the lack of software available, although Sequent has been building its portfolio. For instance, Willmott noted, a transaction monitor is needed for transaction processing, but that product has yet to hit the market.

Because Sequent has sided with Unix International for its future operating system, the company expects to use AT&T's Tuxedo monitoring product.

The new series ranges in price from $23,500 to more than $2.5 million and supports 64 to 1,000 users.

Sequent's earlier Symmetry systems, introduced in 1987, are based on Intel's 80386 microprocessors and also have a maximum configuration of 30 processors.

London Milano Sydney

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D&B

FROM PAGE 27

Thompson, controller at the Texas A&M University Development Foundation, said he receives more correspondence and on-line maintenance updates than he did in the past. Thompson is running general ledger, accounts payable and D&B Software's PC Link products on a DEC VAX 6310 and characterized both the software and services as "great."

Carol Frake-Fawcett, project manager at Western Digital Corp. in Irvine, Calif., is running the financial packages in a DEC VAX clustered environment linked to international sales offices.

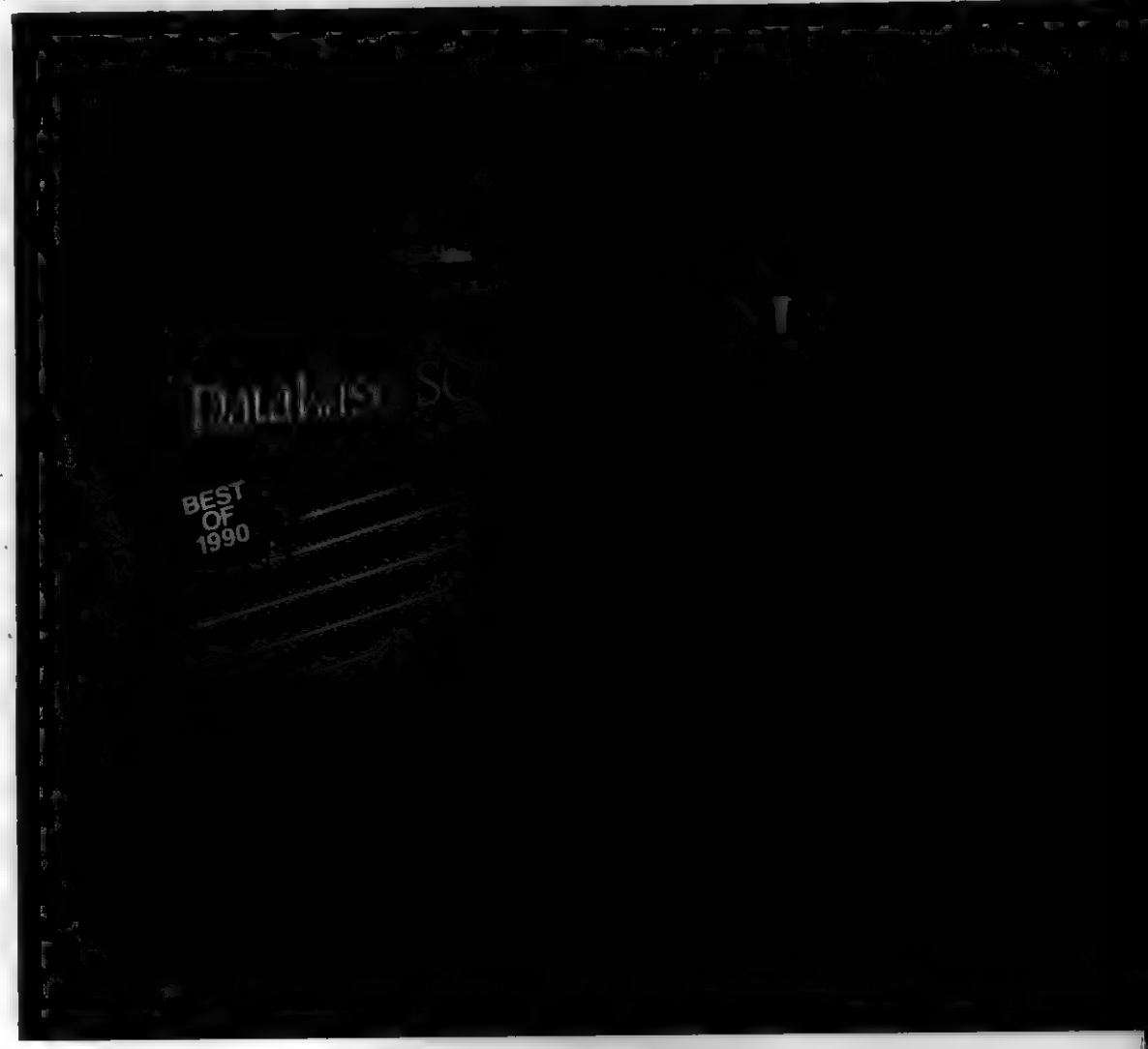
Frake-Fawcett said she is satisfied with D&B Software's product support and added that Western Digital is extremely pleased with the software package's ability to support multiple structures of accounts and to convert from international to U.S. currency.

According to Larry McGachey, national chairman of the D&B Software DEC Vax User Group, there are between 250 and 300 active members spanning a variety of DEC platforms.

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Second Specmark suite aimed at the high end

ANALYSIS

BY J. A. SAVAGE
CW STAFF

Workstation buyers may have noticed in the past year that vendors are marking the speed of their technical systems with a rating called Specmarks and increasingly excluding the traditional millions of instructions per second (MIPS) benchmark.

However, there are problems with Systems Performance Evaluation Cooperative Marks, or Specmarks, and they are acknowledged by everyone from users to the 23 companies within the Spec consortium. The suite of 10 applications in a Specmark was designed for single-user machines, relatively slow CPUs and architectures with small caches.

This month, Spec members began reviewing a second set of benchmark applications aimed at gauging multiuser throughput and the speed of machines in limited commercial applications. The consortium aims to have the new benchmarks out in May, according to Sivaram Chelluri, Spec project manager for the new suite and district manager for performance analysis at AT&T Data Systems in Lisle, Ill.

The current Specmark suite, called Release 1, is used primarily to measure the strength of the CPU. "It's more for when people are trying to create their 'short list' of workstations to consider," said David Chadwick, manager of benchmarking services for third-party evaluator Performance Awareness Corp. in Naperville, Ill. "The Specmark suite is quite large. It is made of applications that affect the system differently so it gives you a higher confidence level as opposed to Dhrystone MIPS — an extremely small code that fits into most caches."

After releasing the first suite of Specmarks last year, consortium members found certain strengths and weaknesses in the release, particularly its bias in favor of floating-point processing and its lack of usefulness for multiuser systems, said Kaivalya Dixit, president of Spec and an engineering program manager at Sun Microsystems, Inc.

Rapid runtime

Additionally, the newest workstations have such large caches and fast CPUs that they run Release 1 too fast, leaving users without a good look at overall system throughput. "With IBM's RISC System/6000 and Mips [Computer Systems, Inc.'s] R6000, the benchmark runs in subminutes," said Bob Novak, former Spec chairman and performance group product manager at Mips. Such a fast runtime "significantly" increases the possibility of errors, he said.

The new benchmarks, called Release 2, took up to eight hours to run on the dozens of lower end workstations set up by as many vendors in a Spec "benchathon" early this month at Intel Corp.'s Santa Clara, Calif., facility. The consortium will now run Release 2 evaluations on larger machines.

Release 2 will simulate multitasking, test I/O throughput and throughput for commercial software development, according to Chelluri. Unlike Release 1, it was designed to be scalable to larger computers. "The only numbers that will change is the amount of throughput," he said.

Reinhold Weiker, the man who published the Dhrystone benchmark in 1984, agreed. Weiker, a senior staff engineer at Siemens Nixdorf Information Systems, said that the vast difference between the number of instructions in complex instruction set computing vs. reduced instruction set computing "rules out any meaningful use of MIPS." He said Spec benchmarks are "larger and more realistic" but are still difficult to understand.

Weiker said that some vendors tuned their software compilers to run faster on the single Dhrystone test but that tuning did not provide an indication of actual speed.

In 1988, he published a second Dhrystone benchmark that eliminated the compiler advantage. He suggested that users check which Dhrystone benchmark vendors are using to eliminate such an advantage and warned that some companies, such as IBM with its RS/6000, went back to the original benchmark. "Others are following. They say they can't afford to look worse than IBM."

Graphing tool displays abstract data

BY RICHARD PASTORE
CW STAFF

Try graphing nonnumeric spreadsheet data such as "Utah," "Crystal B" or "medium-high," with most graphics tools and you are likely to get an error message. Not so with Intelligenceware, Inc.'s Database Visualization Tool (DVT). Released last month, the personal computer-based package can automatically turn even abstract concepts into two- or three-dimensional graphics.

"Not only can you visualize nonnumerical figures, but you can define concepts and give them weight," said Ronald Cook, research director at Eltron Research, Inc. in Aurora, Ill.

As part of research into new uses for methane gas, Cook is using a DVT beta-test version to graph metals vs. various catalytic chemical reactions. The goal is to discover previously unrecognized correlations between the metals and reactions from the visual depictions.

To help predict the productivity of new oil wells, nonnumeric attributes such as well location must be combined with numeric data such as well age and depth. Ultimate Resources, Inc., a Houston-based oil industry research firm, once graphed these attributes manually. Now the firm uses DVT.

"DVT doesn't do it all by itself, but it is a tremendous help toward clarifying the information," said Jim Brown, Ultimate Resources' president.

Users said DVT is the only PC product they have seen with such abstract graphing abilities. Spreadsheet graphics tools in

Continued on page 41



Intelligenceware's DVT *is able to graph nonnumeric data*

Investing in Tomorrow's Bottom Line



Jerry Barnes, Chrysler Corporation

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In the fiercely competitive auto industry, programmers at Chrysler Corporation are using Micro Focus PC-based productivity tools to cut program development time and help move products from the drawing board to the showroom floor faster.

"The bottom line is that our business needs change quickly and we want to streamline the software development process as much as possible so Information Systems can be responsive to all of our operating units," said Jerry Barnes, Chrysler's Manager of Systems Engineering Technology.

Moving application development to a workstation environment allowed Chrysler to use its mainframe resources more efficiently and speed up development cycles by taking advantage of productivity tools not available in the mainframe programming environment. With this solution, programmer productivity improves greatly without a large investment in additional mainframe resources: an important consideration in uncertain economic times.

"The mind-set here a few years ago was, 'why would anyone want to do anything away from the mainframe.' Now, we have over 200 trained COBOL/2 Workbench users."

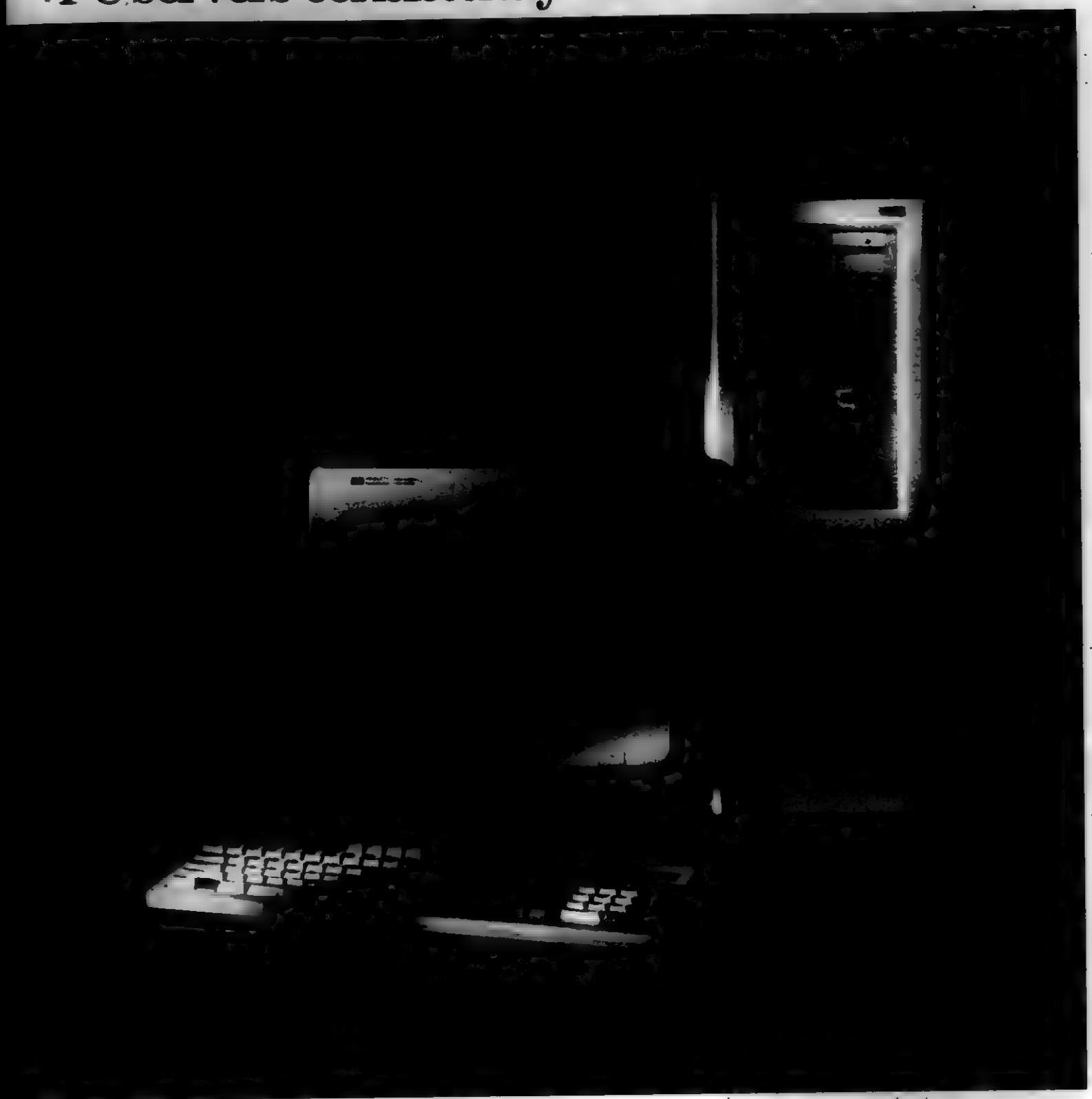
With the Micro Focus COBOL/2 Workbench, programmers can develop and maintain full-scale CICS/VS and CICS DL/I applications independent of the mainframe in a fraction of the time.

"We quantified the time spent on typical software development activities. We showed how we could make a code change, compile the program, detect an error, correct the error and recompile the program again in less time than it would take someone to logon to the mainframe and submit the first compile. In many cases, the developer would make the change on the PC in two to three minutes, while it could take close to 20 minutes on the mainframe."

Jerry Barnes made his case for Micro Focus COBOL/2 Workbench based on greatly improved productivity. The Micro Focus edit-check-debug cycle, now an industry standard for PC-based programming made a big impact on throughput and costs.

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PC Magazine polled 20,000 readers.[1] They put HP personal computers at the very top of the list for reliability. In Computerworld's Buyers' Scorecard, HP Vectra PCs rated highest in overall satisfaction.[2] And the 1990 Dataquest customer satisfaction survey ranked HP #1 among major PC manufacturers.[3]

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[1]PC Magazine, 9/25/90. [2]Computerworld, 11/12/90. [3]Dataquest, 10/29/90. ©1991 Hewlett-Packard Company CPPC012

Windows support service debuts

Corporate Software offers training and migration help — for a price

BY PATRICIA KEEFE
CW STAFF

CANTON, Mass. — If you cannot figure out how to open — never mind install or migrate to — Microsoft Corp. Windows, then reseller Corporate Software, Inc. stands ready to help, provided you have a few bucks.

With blessings from Microsoft Chairman Bill Gates, Corporate Software has launched a package of training, support and migration services targeted at large accounts.

The services will be provided by Corporate Software's service and support organization, as well as through a partnership with Microsoft's consulting arm, Information Technology Integration Services.

According to Corporate Software Chairman Mort Rosenthal, once a decision has been made to migrate to a new platform, users face a "significant challenge" in implementing the new standards over a large installed base.

Pilot program

Together with Microsoft, Corporate Software launched the GUI Pilot Program designed to identify the issues associated with large-scale migrations. The six-month program involved moving more than 200 users from character-based environments to Windows at 14 companies, including Du Pont Co., The Chase Manhattan Bank NA, The Dow Chemical Co., Rockwell International Corp. and Southern California Edison Co.

Quantitative and qualitative data about end-user productivity, internal support efficiency and general acceptance of the new environment was collected. From that, Corporate Software identified key service requirements and migration strategies, the company said.

The software reseller is banking on the premise that large companies would rather contract with third parties to execute migration to Windows, instead of committing additional internal support resources.

Initial user reaction is mixed. Users who took part in the announcement were upbeat about the multifaceted program.

"The migration to Windows requires you to consider a multitude of factors," said Chic Saile, project leader at Rohm and Haas Co., who participated in a pilot test of the program. "Working with a qualified partner can better leverage a company's internal resources during the migration process."

Too expensive

Other users, such as Ron Adinolfi, a microcomputer manager at Swiss Bank Corp. who just moved and migrated 400 users to a new Windows-based office, and David Blumenstein, who heads up the Windows offshoot of the New York Personal Computer Users Group, find the services a bit expensive.

They suggested that many corporations will either rely on internal PC support staff or hire a consultant to do the legwork. Blumenstein also pointed out that there is a lot of free information available about Windows, starting with the Windows manual and "Readme" files.

"Windows has been out long enough so that if you are thinking about it, you should have been able to read enough by now and to have played with it enough to have mastered a lot of these [migration] issues," he said. Still unsure? Blumenstein recommended calling up fellow information systems executives who have installed Windows or dropping in on a local user group. The one case in which Blumenstein saw a potential for migration support is where large networks are involved.

Chris Ward, a technician at Corporate Software, claimed the services are not as expensive as they look. For example, Corporate Software charges $120 per hour, plus travel expenses, for installation services.

For that price, the user receives recommendations on getting machines "Windows-ready," installation of the software, a virus check and a complete post-installation inventory of each system.

IS changes brewing at Nestle/Hills Brothers

ON SITE

BY MAURA J. HARRINGTON
CW STAFF

SAN FRANCISCO — On an average weekday, the American public collectively gulps down 330 million cups of coffee.

America's caffeine habit is what keeps Nestle/Hills Brothers Coffee Co. happy. Hills Brothers, bought by Swiss-owned Nestle SA in 1984, is the third largest coffee maker in a worldwide coffee market that is much like the stock market: unpredictable, according to Craig Collins, Nestle/Hills Brothers' vice president of finance.

While the information systems department has gone through some minor changes since the 93-year-old company was bought by Nestle, the biggest changes are yet to come, according to Collins, who is also Nestle/Hill Brothers' vice president of information services.

One change being made in the IS department is the shift from dumb terminals to personal computers, Collins said.

Prior to running applications on PCs, all companywide applications including Nesnet, an international electronic-mail system that links all Nestle offices in the world via telephone lines, were called up on dumb terminals through IBM's mainframe-based Systems Network Architecture (SNA), Collins said.

While Nesnet and an internal order-processing system are still located on the mainframe, there are some departmentwide Novell, Inc. Netware local-area networks that connect the few hundred Intel Corp. 80286-, 80386- and 1486-based IBM Personal Computers and Personal System/2s used by analysts and coffee buyers in the company, Collins said. These LANs use high-end 386 or 486 IBM PCs as file servers and are hooked up to the SNA backbone, he added.



At Nestle/Hills Brothers, *IS focuses on computers so the rest of the company can focus on coffee*

"We run a tight shop here, with mostly IBM equipment. Because our primary focus is in selling coffee, we don't take many risks in computerization," Collins said. "I care that the system works so my people can get their jobs done without having to worry about their computer."

Grounds for PCs

The switch toward a PC orientation, Collins said, is being made in part because it is more cost-effective to keep information on a PC rather than an "out-of-date minicomputer." It is also in line with a long-term strategy to move toward a companywide network within five years, he added.

For those PC users wanting to access the on-line order-processing system — a 10-year-old internally developed automated order-processing application — they must access it through a PC shell interface, Collins said.

Although there are some important applications developed internally, "where we can, we will use off-the-shelf software applications," Collins said, adding that as Nestle/Hills Brothers moves toward a companywide LAN strategy, these ready-made applications will be more practical.

Because Nestle decided to combine its European coffee operations with its Hills Brothers Coffee division last August, Collins said, it will be more cost-effective in the future for the coffee company eventually to move to a larger, more open system strategy based on a local- and wide-area network architecture.

While it is still more than five years away, such a networking scheme will still be based on an IBM architecture, "probably IBM's Systems Application Architecture," where one user interface will prevail, Collins said.

Computer-aided software engineering tools and a companywide executive information system are also on Collins' wish list for the perfect computer system. However, Collins said, it will be "a few years" before decisions are even made as to which applications would be considered.

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Quattro Pro: Well-rounded and good value

Technology Analysis — A roundup of expert opinion on new products. Summaries written by Computerworld copy editor Christopher Lindquist.

Competing for a stronger foothold in the spreadsheet market, Borland International, Inc.'s Quattro Pro Release 2.0 is a complete package for even the most complex uses, according to reviewers at personal computer publications. For example, Quattro Pro's ability to access external databases gives the spreadsheet power in distributed computing situations. Also, Borland's virtual real-time object-oriented memory management, or VROOMM, memory-handling method permits Quattro Pro to work with very large spreadsheets.

Performance: Reviewers said the package is better than average in terms of speed. However, *PC Week* found Quattro Pro's disk access speed to be slow. Unlike Lotus Development Corp.'s 1-2-3, Release 3.0, Quattro Pro does not support three-dimensional spreadsheets. As a substitute, it offers the capability to link several spreadsheets and save them as a single "workspace."

Compatibility: Read/write compatibility with previous releases of Quattro, Dbase, 1-2-3, Paradox, Reflex and ASCII files is reportedly very high. Quattro Pro does not directly support Microsoft Corp.'s Excel files.

Graphics: Reviewers found Quattro Pro's integrated graphics to be very serviceable, although perhaps somewhat limited.

Output: Reviewers liked Proshow Power Pack, an internal collection of presentation graphics, fonts, macros and coupons for 35mm slide production.

Documentation: Three books as well as a quick reference guide and a context-sensitive on-line Help feature are included.

Ease of learning: Users have a choice of menus. users of 1-2-3 can employ the Lotus-compatible menus, but *Infoworld* reported that Quattro Pro's IBM Common User Access-compatible interface was easier to use, once it was learned.

Ease of use: Menus can be accessed with either the keyboard or a mouse. Alt- and Ctrl-key shortcuts are available for some operations.

Support: Support is available through Compuserve and a toll number between 8 a.m. and 5 p.m. Users who purchase more than 100 units receive an enhanced support package, including a toll-free number and free on-site training.

Value: The product retails for $495 and, at that price, was considered a very good value by reviewers. However, it is not always necessary to pay full retail price. Many users can either upgrade old versions of Quattro ($79.95) or take advantage of Borland's competitive upgrade policy ($99.95) by upgrading from any other high-end spreadsheet such as 1-2-3 or Excel.



Borland's Quattro Pro *Release 2.0 is a complete package — even for the most complex uses*

Reviews Summary

Criteria			
Performance	Very good	Good	Speed and small memory needs
Compatibility			
Graphics	Excellent	Satisfactory	Superior graphics and publishing
Output			
Documentation	Excellent	NC	NC
Ease of learning	Excellent		
Ease of use	Very good	NC	Efficient menus
Support	Very good		
Value	Excellent	NC	Fundamentally a better deal
Reviewer's score	8.5		

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

What the experts say



Hudson Foods' *Poland*

• Users: Christopher Poland, Hudson Foods (*performance:* 9, *cost:* 10); Mitch Miller, Super Travel Data Services (9, 8.5); Mark Levitt, International Data Corp. (9, 6); Bob Rhodes, Yavapai County, Ariz. (9, 8); Cliff Cuellar, Washington State Department of Natural Resources (7, 5); Duane Phelps, Maxtor Corp. (9, 8.5)

"Quattro Pro 2 with the SQL Link it allows interoperability between Quattro Pro 2 and Paradox. This facilitates users being able to get access to SQL databases that are located remotely — making it easy to get information from your database to the spreadsheet and from your spreadsheet to your database," Phelps said.

• Analysts: Marshall Moseley, Dataquest, Inc. (*performance:* 8.5, *cost:* 8); Earl Rich, Faulkner Technical Reports (8.5, 9); David Cearley, Gartner Group, Inc. (8, 9)

"It's extremely quick. It has processor and display support, which really makes it a strong choice in an environment where you have everything from old [IBM Personal Computer] XTs to powerhouse 386s. But I'd like to see it use extended memory, I'd also like true three-dimensionality, and I'd like to have a Windows version. Given the competitive upgrade scheme that Borland has offered and continues to offer, it's possible for many people under many circumstances to get the product for a very low amount of money," Moseley said.

• Financials: Alfred Tobia, Mabon Nugent & Co. (*overall rating:* 9); Charlotte Walker, Labe Simpson (9); W. Chistopher Mortenson, Alex. Brown & Sons, Inc. (9); David Bayer, Montgomery Securities, Inc. (8); Jim Wiel, Soundview Financial Group (7)

"They have a very debt-free balance sheet. The only negative in the whole Borland story is that they've sort of locked themselves into selling this product as a $99 upgrade, and the task remains to raise the price of the product to its full retail price. That's going to be difficult after Lotus ships its Windows product and Borland ships its Windows product. You can only sell $99 software for so long. The company financially is as healthy as can be," Tobia said.

Quattro Pro 2.0

score:

Points (maximum)	Category
25 (30)	Published reviews
16 (20)	Analysts' ratings
13 (15)	Users' ratings
16 (20)	Cost evaluation
13 (15)	Vendor financials

(Maximum score: 100)

Borland responds

Comments from Jack Oswald, product manager for BOS spreadsheets:

Performance: Regarding concerns about disk access, there is some degradation of performance for spreadsheets that take up 95% of memory. In those instances, VROOMM will kick in and frequently access the disk in order to bring in the next function you're asking for. The trade-off is now you're working with a bigger spreadsheet than you could have used before.

Compatibility: [A Windows product is] not a long way off — it's going to be sometime this year. We're actively developing for future DOS versions.

Value: In the last year and a half, we've shifted significantly toward selling the full price unit. We're still selling more units at the competitive upgrade price, but we're generating more revenue from sales of full-price units.

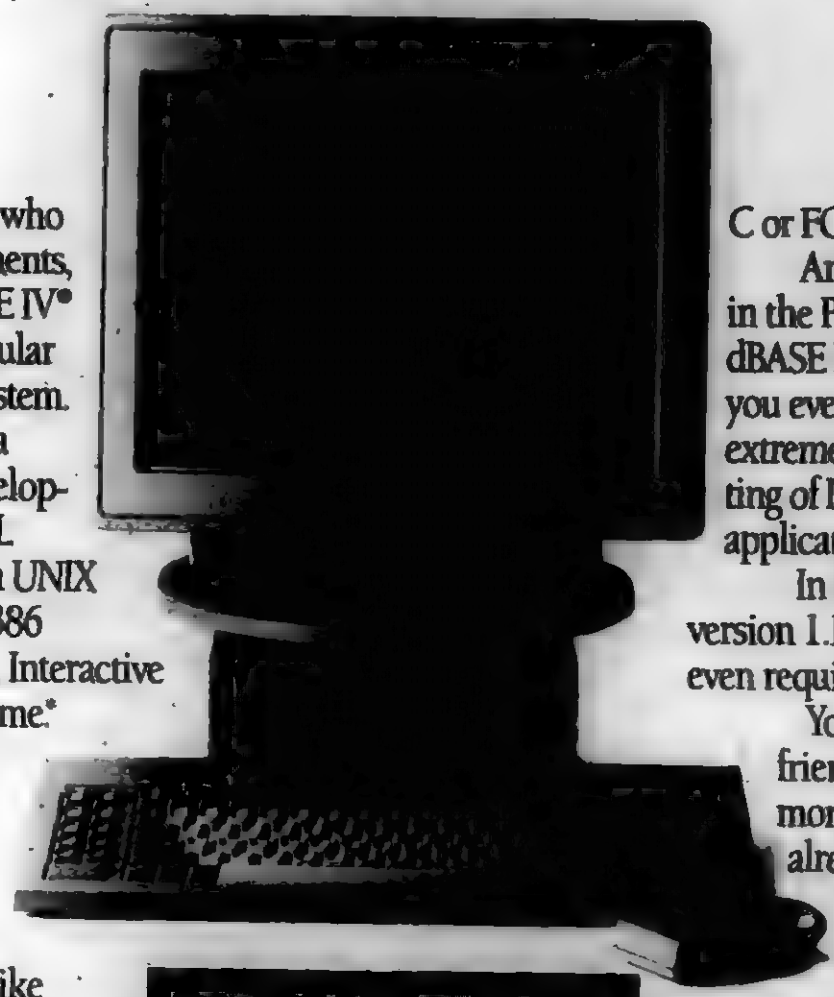
As long as there are people using competitive spreadsheets who have a reason to want to buy a competitive upgrade from us, we'll continue to offer that. But that segment of the market is becoming less and less significant.

NEXT WEEK

▶ Informix Software, Inc.'s Wingz is noted as the best graphics spreadsheet but the least compatible.

Methodology: *Published reviews: average of numeric scores from product reviews published by PC publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of analysts' ratings of vendor financials and ability to support product from financial analysts multiplied by 1.5.*

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Which means that you can now get the job done faster than with languages like COBOL, C or FORTRAN.

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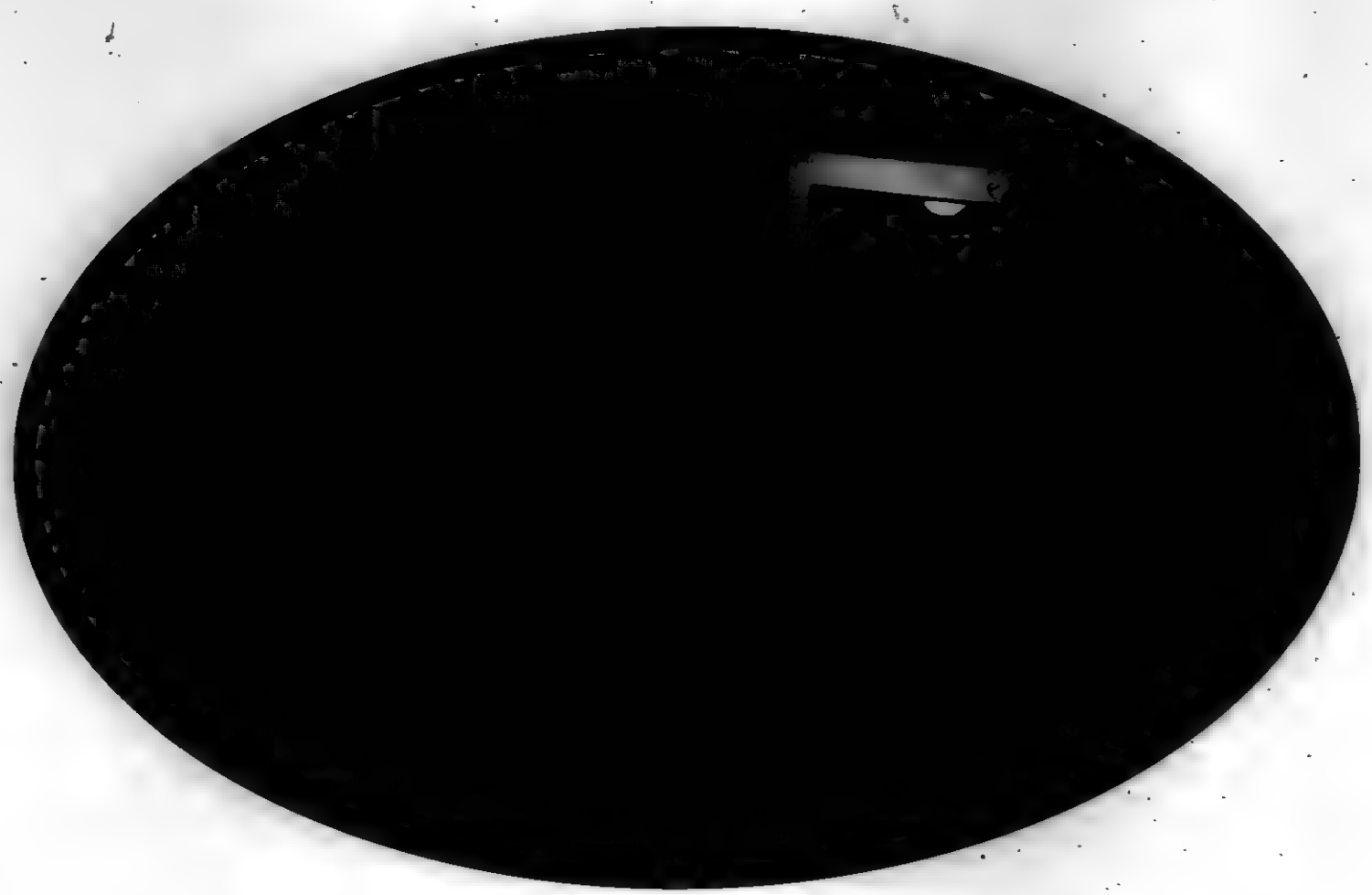
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Wang introduces PC-based tool

LOWELL, Mass. — Wang Laboratories, Inc. recently unveiled a personal computer-based document image processing software package that was designed to electronically manage paper-based information.

Called Seaview, the package combines Wang's Open/Image-Windows — which integrates imaging onto PC and PC local-area network applications within Microsoft Corp.'s Windows 3.0 environment — with a SQL relational database from Gupta Technologies, Inc.

The product electronically duplicates paper documents as images, which are then stored within the database for retrieval. End users may create queries for search-and-retrieve functions and can use the program to send and receive facsimiles and display or print images from the desktop.

Jointly developed by Wang and Science Engineering Associates, Inc. in Albuquerque, N.M., the software runs on Intel Corp. 80286-, 80386- and I486-based platforms that support XT/AT bus, Micro Channel Architecture, Extended Industry Standard Architecture and Netbios.

Seaview Administrator Station ($2,450) allows customers to create, modify and delete image cabinets in both stand-alone PC and PC LAN configurations. The Seaview Client Station ($1,450) is targeted specifically for LAN environments, while the Seaview LAN Pack ($5,850) offers licenses for Administrator and Client Station.

Graphing tool

CONTINUED FROM PAGE 35

Lotus Development Corp.'s 1-2-3 and Borland International, Inc.'s Quattro, for instance, "are not particularly good because they only plot numerical information," Cook said.

DVT, which runs on IBM-compatible personal computers, reads data from ASCII files as well as 1-2-3 and Ashton-Tate Corp.'s Dbase file formats. The program is menu-driven and can present multiple graphs in user-manipulated windows.

According to beta testers, the software is easy to use. However, "people who have a good understanding of relational databases will get the most power out of it," Cook said.

At $490, the software is overkill for those users who simply want a visual rendering of their data, the beta-test users said. "It's more a tool for people who are very much interested in pulling information out of the data," Cook noted.

The software reportedly runs well, except for slowness when it comes to removing or swapping elements in graphs already drawn.

"I like to try one thing and then try something else," said Brown, who runs the package on an Intel Corp. 80386DX-based IBM compatible. "The facility should be in there so you could do that almost instantaneously."

"It's kind of awkward to go through that process," said Cook, who added that Intelligenceware said it intended to work on improvements.

Sidekick gets windowing feature

BY JAMES DALY

SCOTTS VALLEY, Calif. — Borland International, Inc. has announced an update to Sidekick, a software hub for users of personal and business organizers.

Sidekick 2.0 was designed to coordinate data within groups using a variety of laptop and notebook computers, palmtop organizers, local-area networks, pen-based organizers and pagers.

The refreshed application uses a windowing interface to integrate a time planner that maintains calendars and appointments, an address book that offers a speed-dial feature, a note pad for writing quick memos, a calculator and a communications application used for data calls to on-line services.

"I don't use a day planner anymore; I just carry a disk," said Bruce O'Blander, a financial consultant at the Bank of America National Trust & Savings Association in San Francisco.

Sidekick also offers a reconciliation feature that notes when a schedule conflict occurs — for instance, the feature will recognize when a user has one schedule on a portable system and another on an office personal computer.

It also supports Novell, Inc., 3Com Corp., IBM Token-Ring/Extended Edition, Banyan Systems, Inc. and other networks that are compatible with DOS 3.1 or higher. Automatic record locking allows users to access the same file simultaneously. An auto screen refresh updates all screens automatically when a common file is changed, allowing the user to view the most current information.

The time planner, address book and communications applications use Borland's Paradox engine and standard Paradox file formats. These formats support data exchange with Paradox and Quattro Pro and enable third-party developers to provide access to the Sidekick applications. Sidekick 2.0 will be priced at $99.95 but is being offered for a limited time at an introductory price of $69.95.



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Multisided Tariff 12 debates not over yet

ANALYSIS

BY GARY H. ANTHES
CW STAFF

This is a pop quiz: AT&T's Tariff 12 offerings are (choose all that apply): 1) anticompetitive, ultimately leading to higher prices and less innovation; 2) free-market enterprise at its best, bringing users lower prices, better service and simplified networking; 3) a secret price list that allows AT&T to illegally skirt the tariff process; 4) affirmed as legal by the courts, needing only a few details to be sorted out by the Federal Communications Commission; 5) something MCI Communications Corp. and U.S. Sprint Communications Co. do that they don't want AT&T to do.

All of these views and more are argued passionately by the players in a six-sided tariff tiff involving AT&T, its competitors, the FCC, the courts, customers and third parties who have wrangled nonstop since the FCC began approving Tariff 12 deals more than three years ago.

Tariff 12 provides large users with customized packages of voice and data services at large discounts off standard component prices, generally for periods of three to five years.

AT&T said competition at the high end of the business market — Tariff 12's primary target — is now vigorously competitive. Therefore, the ties that bind AT&T can be loosened, the argument goes. The interests of users as well as basic rules of fair play say AT&T should have the same right as MCI and Sprint to offer custom, discounted services, AT&T contended.

Besides, Tariff 12 buyers do not need any help from Uncle Sam, AT&T executive William Catucci recently told an audience at the Communication Networks '91 trade show. "Large business users don't need regulations to help them negotiate with suppliers. They do that all the time — and quite well," he said.

Still too big

AT&T's competitors, although they own 40% of the $5 billion annual market for Tariff 12-like services, said AT&T is still the dominant player, with 65% of the long-distance market — five times that of No. 2 provider, MCI. Therefore, they contended, AT&T should not be deregulated further at this time.

The FCC sided with AT&T on the issue and has approved 76 Tariff 12 options for more than 100 customers.

However, the commission was dealt a setback last October when a federal appeals court found fault with the way the FCC found Tariff 12 to be legal. The court said tariffs based on tailored packages of services for single customers were not inherently illegal, but it ordered the FCC to reconsider its decision, saying the FCC would have to show that Tariff 12 packages are functionally different from their separate components, not simply different on a cost basis, as it had done earlier.

Although users are not completely happy with Tariff 12 (see story at right), they welcome the additional options offered by AT&T's presence in the market. "Competition is the best way to ensure the best services at the best prices," said Henry D. Levine, a Washington, D.C.-based attorney who represents large [illegible]

AT&T and most FCC watchers said they are betting the FCC will get its act together and find a way to preserve Tariff 12 more or less in its present form. "The prevailing view [at the FCC] is to be rather tolerant of Tariff 12," FCC Commissioner Ervin S. Duggan said at Comnet.

Also weighing in against Tariff 12 are third parties that view giant AT&T as an impediment to their getting a piece of the action. Noncarrier systems integrators said they are handicapped by their inability to price out alternate circuit configurations because they do not have access to carriers' discounted price structures.

Equipment manufacturers also said that AT&T may overtly or covertly pressure customers to buy AT&T equipment as part of a Tariff 12 deal. "AT&T is the only carrier that has an integrated equipment division," said Robert W. Stearns, a Codex Corp. executive and a director of the Independent Data Communications Manufacturers Association. "This . . . could lead users to think, incorrectly, that they must also buy AT&T [equipment] out of fear of losing the large discounts."

No matter what the FCC does now, a final resolution of the legality issue is a year or so away, industry watchers said. For now, the FCC is likely to keep approving Tariff 12 deals.

It pays to be prepared

When it comes to entering into Tariff 12 deals, users said three things are important: preparation, preparation and preparation.

"I like the general idea of [Tariff 12], but you have to be a tariff lawyer to understand what's being offered," said John Macri, a Bankamerica Corp. vice president. "You have to do a lot of analysis up front."

Horror stories about Tariff 12 invoices abound. Susan Morrow, communications manager at Kemper Financial Cos., said her invoices have been plagued by "major delays, major errors, changes without notice and considerable manual intervention required."

But Kathy Mock, communications manager at Caterpillar, Inc., said she has had no problem with her Tariff 12 invoices, something she attributes to "very careful homework" when working with AT&T to set up the service.

"Know your network up front," said Paul Singer, manager of communications planning at US Air. "[Implementation] is a tedious process."

James Blaszak, the Washington, D.C.-based counsel for the Ad Hoc Telecommunications Users' Committee, said extra caution is in order until the legality of Tariff 12 is firmly established. "Attempt to negotiate safeguards," he said. For example, he said, it might be possible to negotiate a refund provision for one-time installation charges in case the FCC or the court pulls the rug out after Tariff 12 service begins.

GARY H. ANTHES

Network programming requires new attitudes

BY JOANIE M. WEXLER
CW STAFF

Companies needing customized local-area network applications may find themselves shorthanded in programming expertise. The reason, some industry observers said, is that LANs are a relatively new technology and require a skill shift for veteran mainframe programmers.

Vic Novasad, a senior applications consultant at G&A Systems Associates in Oklahoma City, for example, has been a tried-and-true mainframe developer since 1970. In December, however, he discovered a graphics-based tool from Austin, Texas-based Syscorp International, Inc. that automates applications development for Novell, Inc. Netware and IBM Personal Computer network LANs.

"I started testing the tool the first week in December with 64 specifications to meet," Novasad said. "By the 14th of the month, we had incorporated user changes, brought the application up on our Novell network, and everything was working."

As the programmer "paints" an application on the screen, Syscorp's Microstep Version 1.5 software — officially rolled out last month — automatically generates C source code.

"The product fills an important gap: a full life-cycle [computer-aided software engineering] tool that is married to the PC LAN platform," said Frank Michnoff, a program director at Westport, Conn.-based Meta Group, Inc.

"Other vendors, such as Texas Instruments, Inc. and Andersen Consulting, may eventually target the client/server architecture. But the fact that this company has this product today suggests that smaller, more nimble vendors could be a major force in the LAN market."

According to Michnoff, many of his clients "have 150 Cobol programmers who are totally resistant to new technologies." New engineering graduates, he noted, may have up-to-date programming skills but not the business savvy of a 15-year veteran developer.

The shift in gears for developers reorienting their thinking from mainframe- to PC- and LAN-based applications is that "with a mainframe, you try to think like the computer and do what the computer will accept," said Peter M. Storer, manager of information systems at The Acord Corp., a White Plains, N.Y.-based nonprofit insurance association. "In the microcomputer world, I decide what I want to do, then figure out how to make the computer do it."

Acord recommends technology to its insurance company and agent members. Storer said the nature of a program such as Microstep "lets you concentrate on business applications instead of worrying about the intricacies of the source code."

Kevin van Noppen was responsible for KPMG Peat Marwick's rapid applications development methodology when he benchmark-tested the original stand-alone PC version of Microstep two years ago.

"Microstep is a graphical language more than a CASE tool," van Noppen observed. "It develops the application in front of you and lets you change it as you go. Companies using other tools must often throw away seven or eight application prototypes."

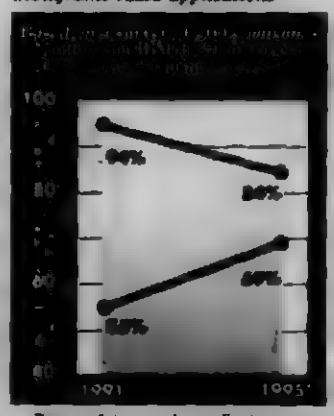
Van Noppen said that in the master/slave environment of the mainframe world, development rules are well-defined. In the distributed environment, he said, it is much more difficult to define how to manage data.

"For example," van Noppen asked, "if two people grab data simultaneously and one user changes it, what happens?"

Novasad acknowledged that Microstep is not yet as fast as Nantucket Corp.'s Clipper language. "However, Clipper isn't standard," he said. "You need the same person available if you need to change it; with Microstep, anyone can make changes."

Net gain

The next five years will see LAN-based applications close the gap on mainframe-based applications



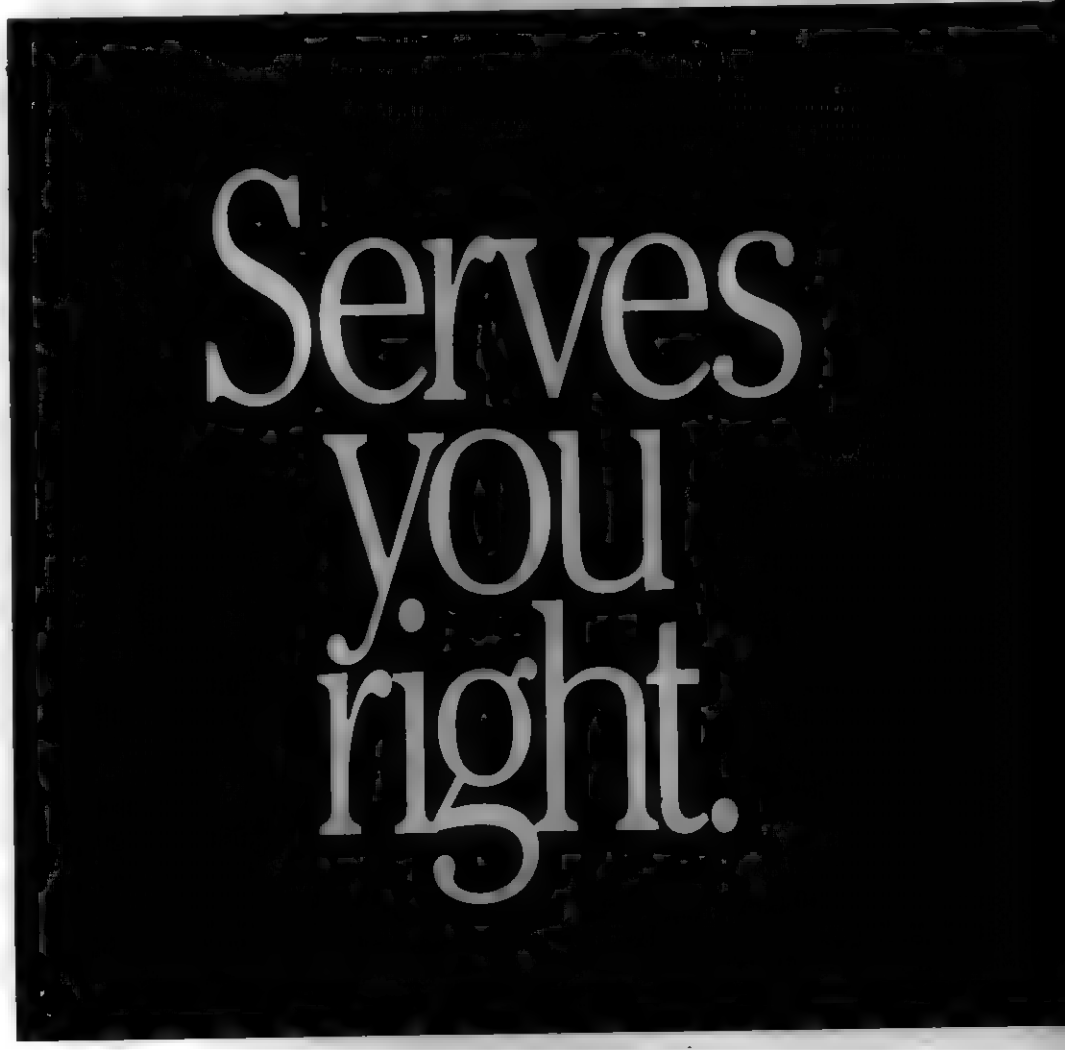
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Firms announce plans for future services

AT&T and British Telecom unveil long-term E-mail and ISDN service plans at Comnet '91

BY ELISABETH HORWITT
CW STAFF

WASHINGTON D.C. — Two value-added network vendors revealed long-term service strategies at the recent Communication Networks '91 show.

AT&T officially launched its Easylink Service, which will merge its former AT&T mail service with the electronic-mail service that it recently acquired from Western Union Corp. British Telecom PLC subsidiary BT Tymnet, Inc. also announced a multiyear migration path to broadband Integrated Services Digital Network (ISDN) services.



AT&T is concentrating on setting up a global messaging service that will handle multimedia messages "and provide all the hooks so that you can access voice mail via E-mail, for example," said Berge Ayvasian, a vice president at The Yankee Group in Boston.

AT&T's recent acquisition of Western Union's Easylink provides a strong overseas presence because Western Union had aggressively installed E-mail connections overseas to take advantage of users' migration from telex to personal computer messaging, he added.

Steven Graham, Easylink's vice president of marketing, outlined the following key strategic directions that AT&T's 1,500-person business unit will pursue during the next few years:

- Support of multimedia transmissions through AT&T's message-content architecture. This will allow such capabilities as cutting and pasting bulletin board information or directory information into a document.
- The provision of image databases.
- The introduction of new features such as alternate addressing and routing of messages, message status reports and media conversion to electronic data interchange.

AT&T will also aggressively expand the global reach of its messaging services, Graham said. While the company now serves 160 countries and "key centers," it has operations and facilities in only 20 countries, he added.

Former users of AT&T's mail system and Western Union's Easylink can now access both services via the same mailbox, Graham said.

AT&T's present concentration on messaging services puts it at odds with value-added network vendors such as BT Tymnet, which are aggressively introducing fast-packet services, Ayvasian said. However, AT&T will probably announce frame-relay services later this year, he added.

Migration ahead

BT Tymnet announced plans to migrate its users to broadband ISDN during the next few years.

In the second quarter, Tymnet plans to support frame relay-based connections of up to 256K bit/sec., as well as its existing X.25 packet-switching services. The vendor plans to target local-area network interconnectivity applications and is now working with such router vendors as Advanced Computer Communications, a company spokesman said.

Sometime in 1992, BT Tymnet plans to implement a full frame-relay backbone that will provide features such as dynamic routing and Switched Virtual Circuit connections at speeds of up to 2M bit/sec. In 1994, the vendor plans to provide frame-relay connections over broadband links of 45M bit/sec. Sometime after 1995, BT Tymnet will provide frame relay over broadband ISDN backbones, a spokesman said.

Network management gaps targeted

Users who have stopped kicking tires and are now seriously shopping for an integrated network management platform saw plenty to catch their eye at the recent Communications Network '91 show.

Announcements targeted two items at the top of users' wish lists: broad support of networking systems and protocols and fault isolation and analysis.

Nynex Corp. announced Version 2.0 of its Allink Operation Coordinator, which is said to use expert system technology to filter, consolidate and correlate information provided by various element management systems. The software is said to track and graphically display the relationship between various devices and systems on a network.

Systems Center, Inc. in Reston, Va., released Net*Insight, a software package that is said to isolate faults and analyze performance IBM Systems Network Architecture (SNA) networks. The software can take user-defined samples of network utilization, response times and IBM Network Control Program statistics. It can also analyze network problems by tracing multiple communications lines and collecting network data flow and VTAM trace data, the vendor said.

The software package is priced from $13,000 to $23,000 and is available immediately.

British Telecom PLC announced that its Concert platform will manage Timeplex, Inc.'s T1 multiplexer networks, as well as systems that support Simple Network Management Protocol (SNMP), beginning in June.

British Telecom is also working with IBM on an interface that will allow Concert to manage IBM SNA networks via an Open Systems Interconnect interface, a British Telecom spokesman said.

AT&T announced that it has released a document that allows network vendors to build systems to convert SNMP messages to the Accumaster Integrator Alarm Interface specification.

Boole & Babbage, Inc.'s Network Systems division, formerly Avant Garde Computing, announced an interface between its Net/Command system and AT&T's Accumaster.

ELISABETH HORWITT

HIT BLAST

Sprint splits circuits

U.S. Sprint Communications Co. is divvying up its customers' T1 circuits to allow them access to the Sprint Meeting Channel, the carrier's worldwide videoconferencing network. The capability builds on Sprint's Integrated T1 Access Partitioning service.

A relationship between token-ring vendor **Madge Networks, Inc.** and **Synoptics, Inc.** is intended to beef up Synoptics' smart-hub functionality. The two firms recently announced that Madge's throughput-maximising Fastmac software and bridge management software will be rolled into Synoptics' Lattisnet intelligent wiring center.

International Computers Ltd. and **Fujitsu Ltd.** have signed an agreement under which Fujitsu will sell ICL's reduced instruction set computing-based Unix servers and mid-range systems and Officepower integrated office system.

An alliance between Omaha-based interexchange carrier **Midamerican Communications** and **US West Communications** will result in US West's disaster recovery network scheme being deployed in two of Midamerican's major markets: Denver and Minneapolis.

Modem prices are dropping: Last month, **UDS** announced across-the-board reductions of 17% to 31% on its CCITT V.32-compliant modems. Meanwhile, **Uunet Technologies, Inc.** announced that it is offering Telebit modems at reduced prices. Uunet said it is offering a 9.6K bit/sec. V.32 modem for $545; UDS' reduced-price Telebit counterpart is $795.

IBM, router vendors wield SNA swords

BY JOANIE M. WEXLER
CW STAFF

IBM is probably finding inspiration from at least two router vendors to supply the missing pieces of its Advanced Peer-to-Peer Networking scheme.

Cisco Systems, Inc. and Wellfleet Communications, Inc. seem to be trying to beat IBM to the punch in blending IBM's inherently hierarchical Systems Network Architecture (SNA) with distributed computing and peer communications. Last month, both router vendors announced support in their products for IBM's Synchronous Data Link Control protocol, which is used for communications among remote IBM SNA devices.

The product enhancements allow disparate networks to merge over the same serial data backbone, possibly eliminating a communications line, by encapsulating SNA packets inside other "routable" protocol packets.

Some large IBM shops run an SNA network and multiprotocol internetwork in parallel, which can require the redundant leasing of dedicated wide-area links. Firms undertake this costly endeavor because SNA, IBM's network architecture for communications between IBM devices or between IBM and non-IBM devices, is proprietary and complex, leaving it unsupported in existing multiprotocol routers.

However, at the Communication Networks '91 show in Washington, D.C. last month, Cisco announced that it has found a way to blend SNA with the other networking protocols that flow through its router.

New deal on the horizon

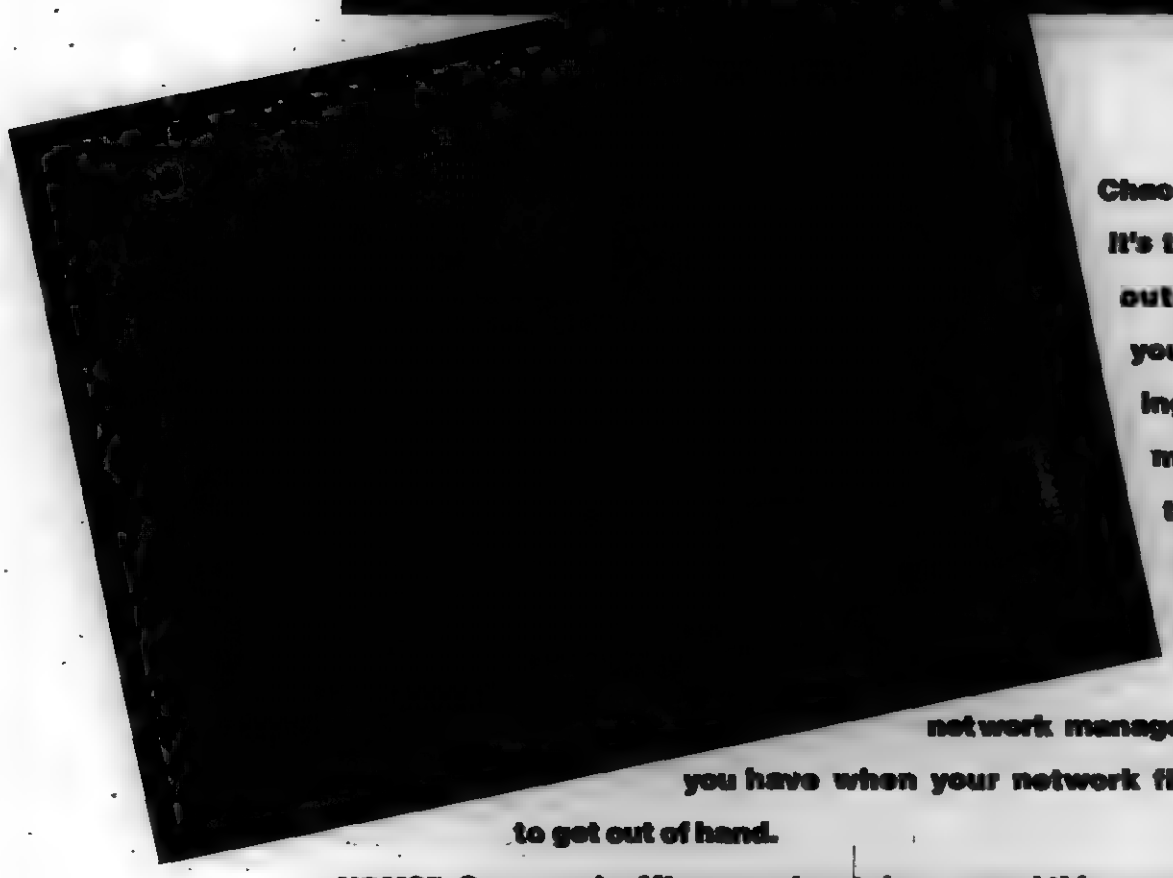
The firm said it has inked a multiyear agreement with start-up firm Brixton Systems, Inc. in Cambridge, Mass., for source code that will allow its product line to route SNA protocols within the year. Cisco also said it will acquire Brixton code that interfaces its routers to IBM's Netview enterprisewide network management system.

"Local-area networks are pervading the 'corporate' network, where IBM has traditionally been king," said Robin Layland, an engineering consultant at The Travelers Corp., a large IBM user. "IBM is trying to figure out how to hold its position in the shadow of competition from these router vendors."

Layland remarked that a key issue in networking is that "you don't want separate boxes for each protocol." Indeed, some users place both a multiprotocol router and an IBM front-end processor next to their wide-area switch, which passes SNA data to the front-end processor and other traffic to the router.

Another approach is to hook SNA nodes to a token-ring network and link LANs with IBM's proprietary source-route bridging scheme. Unlike routers, bridges ignore communications protocols and simply broadcast each transmission to all nodes. The trade-off is that broadcasting can saturate the network and inhibit security by not allowing network partitioning.

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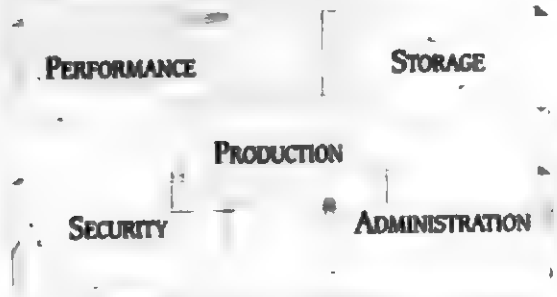
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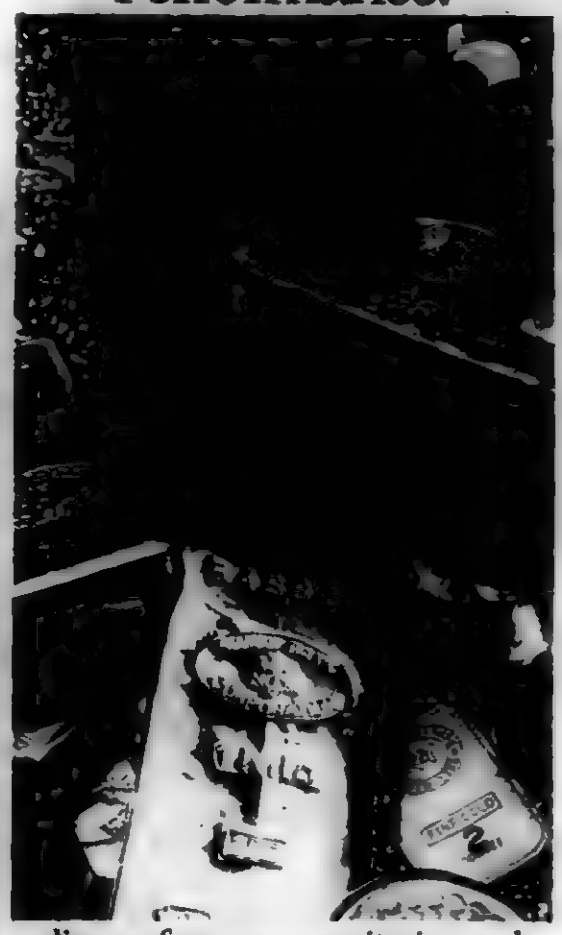
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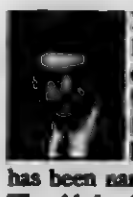
EXECUTIVE TRACK



Patrick L. Kelley has been named vice president of information services at **Air Canada** in Montreal.

He is responsible for overall systems strategy at Canada's largest airline.

Kelley was most recently managing partner of the information technology practice at Peat Marwick Stevenson & Kellogg. His 20 years of experience in information systems management and consulting include the job of senior vice president of strategic development at Molson Breweries of Canada Ltd.



Donald V. Earle, formerly director of IS at University Health Center in Burlington, Vt., has been named president of **The Alpha Group**, a healthcare industry IS consulting firm in Williston, Vt.

Before joining University Health Center, Earle, 35, was coordinator of computer systems at Massachusetts General Hospital in Boston. He holds a bachelor's degree from Bates College in Lewiston, Maine, and an MBA from Boston University.

James A. Hazlett has been promoted to director of information resources at **Central Washington University** in Ellensburg, Wash.

He joined the university in 1988 as director of computer services. He was previously in IS management at Indiana University in Bloomington, Ind.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Gateway puts pennies in its bank

Bank realizes savings of more than $100,000 per year using PC-based optical discs

BY MICHAEL ALEXANDER
CW STAFF

The vendors and value-added resellers who trooped through Martin Brennan's office in 1987 pitching document imaging systems simply did not get the picture.

"I kept asking them, 'What are we saving?' " recalls the senior vice president of operations at Norwalk, Conn.-based Gateway Bank.

What Brennan needed was not a way to store documents but a substitute for microfiche. Gateway, a medium-size bank with $1.3 billion in assets, was spending $130,000 per year to have tapes from the bank's IBM 4341 copied to microfiche.

None of those who came to pitch their document storage solutions were interested in solving the bank's microfiche problem, Brennan says. "In 1987, they told me that it couldn't be done, and that didn't make sense to me," says the veteran of more than 25 years in bank information systems management.

That was the prelude to Brennan convincing Gateway to spend $12,000 for then-unproven personal computer-based optical-disc technology. That is not a lot of money for many businesses, but banks have a cautious attitude toward capital expenditures, says David DiVincenzo, president of Integrated Financial Systems, Inc. (IFS), the value-added reseller in New Haven, Conn., that developed the system.

"This is a case where [Gateway] went out on the edge a little bit and realized a benefit starting in 1988, while everyone else sat on the sidelines," DiVincenzo says.

Brennan says he had to get approval from the bank's chairman for the $12,000 needed to attempt the project. "He said, 'Go ahead and try it,' " Brennan recalls. "At worst, we would have bought a PC."

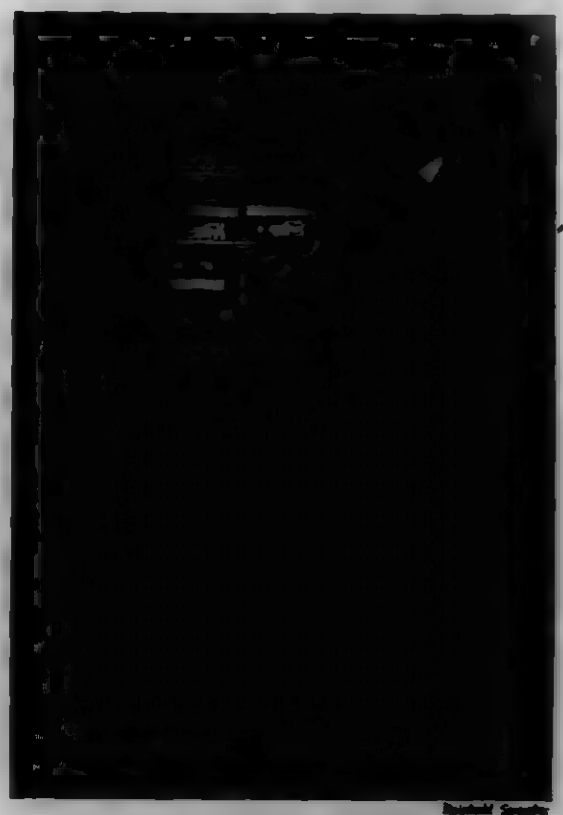
The initial system, installed at the operations division in Newtown, Conn., included a no-frills IBM Personal Computer AT, a 5¼-in. write-once read-many (WORM) optical disc drive, a tape station and a printer. All of the equipment was from IBM.

"This is an all-IBM shop, and they wanted to be able to get the equipment fixed easily if there was a problem," DiVincenzo says.

IFS developed the software needed to archive and retrieve the reports easily once they had been stored on optical discs.

"In the first month, we saved $2,000 on microfiche," Brennan says. "From there, it got to be a snowball."

Following its early success, the bank shifted all of its applications to optical disc, completing the job in 1988. Now there are 14 banking applications stored on discs. They include customer and commercial checking and savings accounts, installment loans and mortgages — all of the banking reports that the bank generates.



Gateway's Brennan was able to save hundreds of thousands of dollars by investing $12,000

The system has undergone refinement almost from the first day. Gateway now uses three PCs equipped with optical disc drives, and a fourth PC is slated to be added this year. A mirror image of the setup in operations has been installed at bank headquarters. All of the PCs are IBM PC AT-compatible clones.

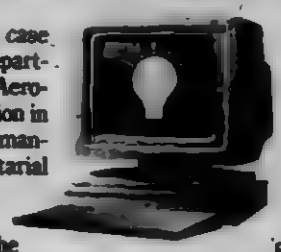
Unlike in days past, few of the

Continued on page 52

LTV Aerospace and the Last Crusade

BY CLINTON WILDER
CW STAFF

Empowerment of employees with information technology is like the Holy Grail: Many have spent a lot of money searching for it, but the goal remains elusive.



That is no longer the case in the office services department at LTV Corp.'s Aerospace and Defense Division in Dallas. The department managed to cut annual secretarial expenses by 40%, eliminate nine of 18 secretarial jobs and retrain the displaced employees for other positions.

However, it was not easy, and technology had very little to do with it. In fact, LTV accomplished these goals with the office technology that was already in place.

Bobby Harper, director of information services at LTV Aerospace, established a task force in which both secretaries and managers participated. The committee analyzed work flow and work loads, how much of the workday was spent performing what tasks and what was done on paper vs. what was done electronically.

The committee confronted managerial fiefdoms, secretaries' fear of change and technologists' fear of working with secretaries to solve technology problems. However, Harper, who was the self-designated change agent, continued to believe that the eventual benefits would be worthwhile.

"We always talk about the paradigm shift — of IS changing the way work is done," Harper said at the recent Profit-Oriented Systems Planning Program conference in Los Angeles. "Well, if you want to shift that paradigm, you're going to have to push."

The task force identified a host of clerical, paper-intensive tasks that could be done by the managers themselves on LTV's IBM Professional Office System electronic mail package. These included weekly status reports, meeting announcements, agendas and memos. "The memos are faster, too. They're not fancy, but the information is there," Harper said.

The improvements are now a model for other LTV Aerospace departments looking to cut costs. For example, a companywide 40% cut in secretarial costs would save $7.2 million per year, according to Harper.

Gateway

FROM PAGE 51

reports are ever printed on paper. When the auditors want to look at the general ledger, for example, they no longer have to leaf through a 900-page report on computer paper. They merely pop a pocket-size disc into a drive and enter a few simple keystrokes to retrieve data.

"One month into the project, the general ledger was off by nine cents," Brennan recalls. "Tell a banker that the general ledger is off nine cents, [and] you might as well say it was off by $1 million." The error was uncovered in a few minutes instead of a few hours, Brennan says.

The WORM drives used at Gateway are capable of packing 200M bytes of data onto a disc. Newer versions can store 940M bytes on the same size disc. A single disc can store one month's worth of information per application. More information could be crammed onto a disc, but "the size fits nicely," Brennan says.

Gateway's savings have amounted to more than $100,000 per year for the past three years, according to Brennan. Gateway now spends about $21,000 per year for discs instead of the $130,000 per year it once paid to a service bureau to transfer tapes to microfiche.

The tapes are transferred on site rather than being sent out to the service bureau. This has compressed turnaround time from three days to four hours. The system has also produced savings in personnel and has improved customer service.

Clerks no longer have to spend several hours checking microfiche returned from the service bureau for quality and completeness. Nor do they have to maintain a log or track records and microfiche that must be returned for reprocessing when faulty. The ease and speed with which infomation can be stored and retrieved has improved customer service by cutting response time on customer account inquiries.

"Before, we had to manually retrieve the microfiche, and that took about 28 minutes," Brennan says. "Now, it takes three to five seconds to find the same information." The bank can now react to a customer's request for a statement virtually overnight, he says. Furthermore, two fewer clerks are now needed to process statements and other banking records.

The system has also helped the bank get out from behind an ongoing five-week backlog of requests for copies of customer statements and reports from the Internal Revenue Service.

GATEWAY'S SAVINGS have amounted to more than $100,000 per year for the past three years.

Gateway's success has rubbed off on IFS: The company now markets what it calls the Optical Disc Information Network to other banks seeking to replace their microfiche systems. The company has sold 15 of the systems, which are now available in stand-alone and networked versions, according to DiVincenzo.

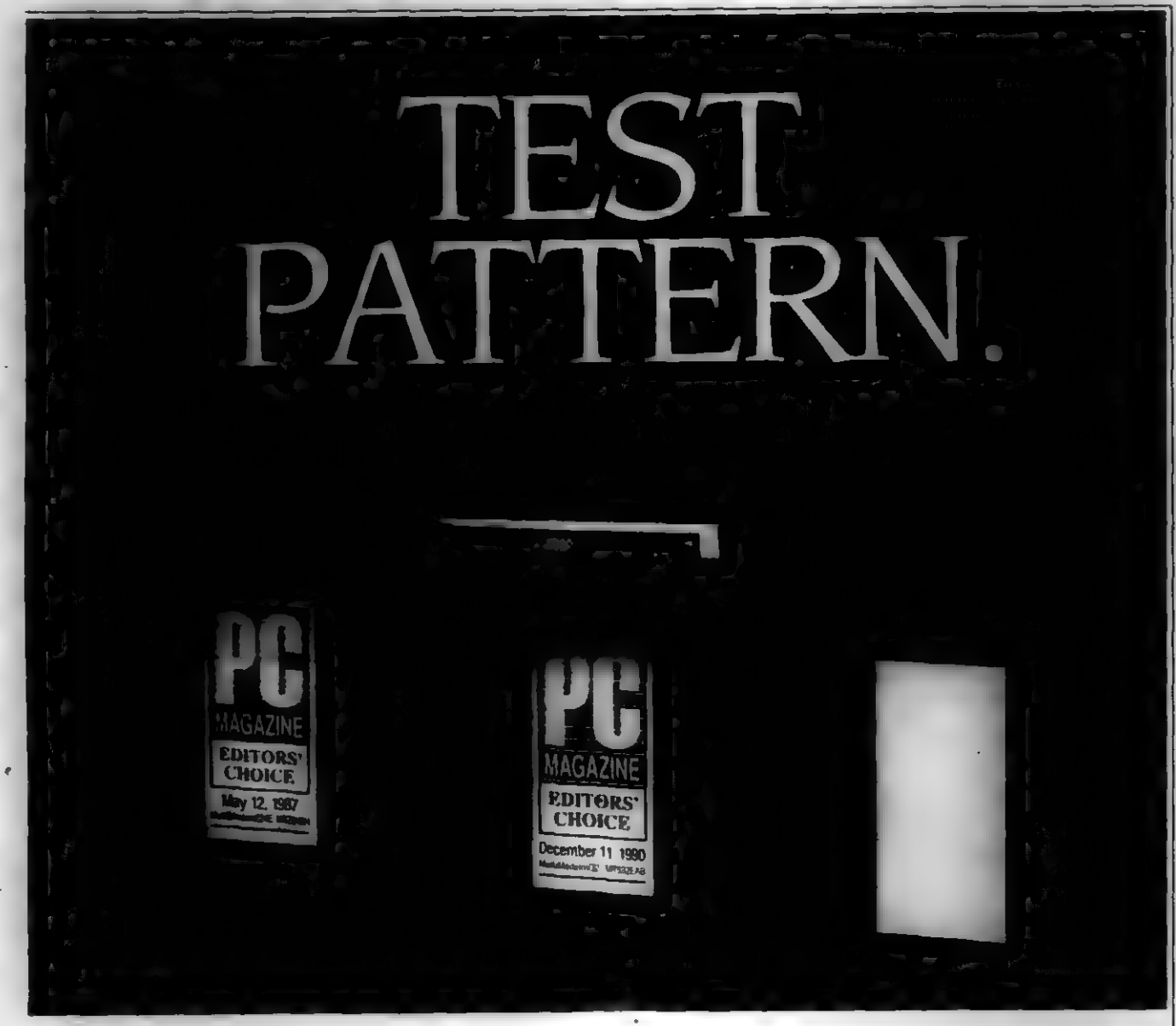
Brennan is now more receptive to image documenting systems than he was three years ago. He is currently researching what it would take to move images of checks on rolls of photographic film onto optical discs.

The current system records only the information on the magnetic ink character recognition line at the bottom of checks. When a complete image of the actual check is required, the bank's clerks must retrieve it from film and have it processed into hard copy, which is time-consuming.

"Ninety percent of the look-ups are for checks," Brennan explains. What Brennan needs now is a document imaging system for checks, but he says he cannot get what he wants just yet.

"IBM, Unisys Corp. and NCR Corp. are catering to the large banks," he says. "Five years from now, they may have it for guys like us."

If the past is any indication, Brennan may not wait that long.



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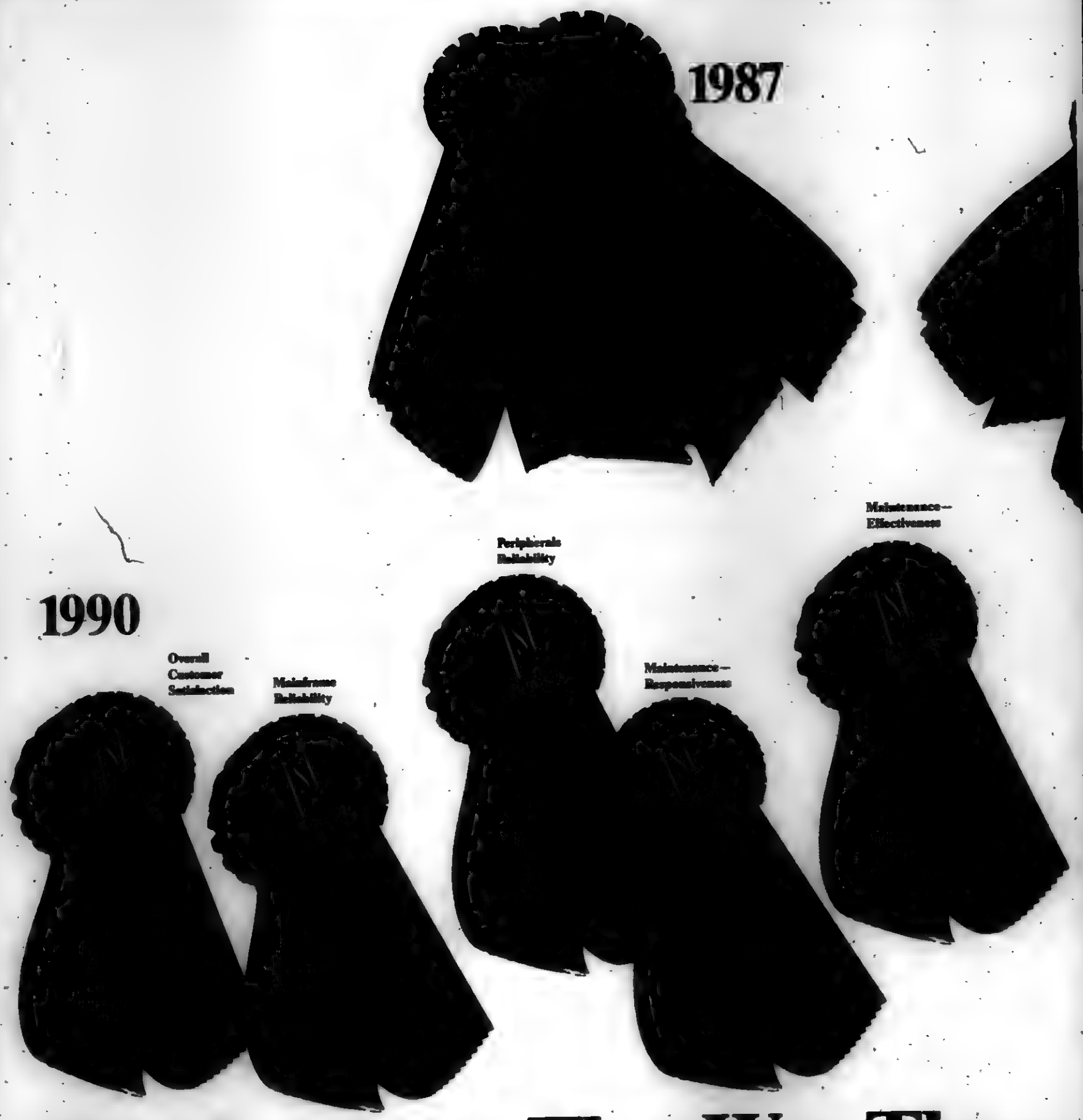
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BOOK REVIEW

Armageddon, oxymorons — and feeling fine about it

THE AGE OF UNREASON
By Charles Handy
Harvard Business School Press, $18.95

When you sit down to read Charles Handy's *The Age of Unreason* — and I hope that you do — don't let the book's compact size and anecdotal style lull you into thinking you're going to be done before dinner. Be sure to factor in extra time for the moments when you may need to snap the book shut, beat your head against the nearest hard surface and say "Arrgh!"

The premise and philosophy of Handy's jolly apocalyptical treatise is summed up by rock group R.E.M.'s jolly apocalyptical refrain: "It's the end of the world as we know it, and I feel fine."

Indeed, that oxymoronic twist is the value that Handy, a British management consultant, professor and author, adds to what might otherwise be an old debate. Yes, the world has changed vastly, irrevocably and quickly. But Handy takes a quantum leap beyond and suggests that the end of the world as we know it is a pretty exciting turn of events, if only we choose to see it that way.

From one point of view, *The Age of Unreason* is a seductive invitation into an exhilarating concept. "Discontinuous change" — the breakneck, sweeping, relentless phenomenon that change has become — could usher in not only the end of the world as we know it, but also the start of the world as we wish it. If we greet this new kind of change with "upside-down thinking" — the ability to "consider the unlikely if not the absurd" — then we can harness the otherwise daunting convergence of social, biological, technological and cosmic mutation to energize the maturing of mankind. Not Armageddon — rather armed to get on.

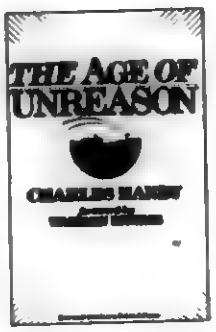
Armed with the ability to think upside-down, Handy suggests, we will recreate the world and redefine the work world. He foresees the dinosaurlike demise of the large, paternalistic top-down firms. In their place, he sees "shamrocks" and "doughnuts."

According to Handy, a shamrock is a company made up of three groups: die-hards, whose careers may span as few as 10 to 15 years but who will devote virtually their entire lives to their jobs during that time; outside contractors (in other words, outsourcing in the extreme); and a flexible work force consisting of off-site, largely telecommuting workers with discrete abilities and/or unconventional time constraints — mothers of young children, for instance.

The doughnut works on a similar premise, with the career-oriented core in the middle and subcontractors and telecommuters in the surrounding ring.

In the world of the shamrocks and the doughnuts, offices become clubs in which workers who need the common facilities or collegial comaraderie can gather as need dictates. Work becomes defined by the abilities and work style preferences of the workers. Pay — which includes, but is not limited to, money — is awarded unfailingly for a specific job well done.

However, there are two catches that underlie and, to some extent, undermine Handy's argument. The first (which, to give him his due, Handy recognizes) is that the new, upside-down world doesn't take into account a lot of the baggage that is bound to be carried over from the old world. For example, we are already finding that the bottom-line drive of today's corporations is creating a huge number of unemployed that no one knows what to do with. Handy's pragmatically driven shamrocks and doughnuts, however intellectually appealing, would compound the problem.



Yet Handy reminds us, revolutionary innovation never has been, and arguably never should be, held back by consideration of the havoc it might wreak. Point: Handy. Game? Not so fast.

The second limitation is that several thousand years of history have produced and reproduced the very kind of control-hungry business leaders that would make Handy's new order an impossibility.

"If control is left to one person," he writes, these intelligence-driven organizations do not work. The "postheroic" leader he posits as evolving under his scenario "lives vicariously, getting kicks out of other people's successes — as old-fashioned teachers have always done." Right. This concept was floated in ancient Greece. It sank then and hasn't had much better success since.

Don't let that stop you from reading *The Age of Unreason*, though. At the very least, the book abounds with provocative, good ideas. At best, some of Handy's ideas might catch on. After all, at the end of the world as we know it, wouldn't you prefer to feel fine? With so many moronic management ideas and future scenarios being bandied about, oxymoronic seems well ahead of the game.

NELL MARGOLIS

Margolis is Computerworld's senior editor, industry.

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COMMENTARY

Thomas Lodahl

Just say career rotation

Two years ago, I met the newly minted chief information officer of a major bank. The position had just been created, and he had four direct reports, but the bank's data processing operations (900 strong) were still controlled by the hard-as-nails vice president of data processing.

The CIO had no experience in information systems. So why was the position created? Business management at the bank couldn't get the attention of IS, felt ignored and couldn't get things done. Ergo, appoint a CIO to translate business problems into IS action!

We've seen this scenario many times. What's wrong with this picture? The bank's CIO had the power of office, but he had not yet earned credibility. You achieve credibility by getting things done. He had no means to get things changed in IS. Eighteen months later, the office of the CIO was "reorganized," and the vice president of data processing took over.

Not a pretty picture? It's a pretty common way to develop a senior IS executive: Throw him in and see if he can swim. Here it's a case of "Simonise the humanist" — a phrase I owe to Howard Johnson, late of MIT — by putting him in the rock polisher.

Those who survive — and there are some — can become extremely valued members of senior corporate management. But the attrition rate and cost is high. There must be a better way.

How about reversing the process? Let's humanize the vice president of data processing. Send him off for executive development, give him an office in "Mahogany Row," put him on the executive committee.

The problem with this method is that our candidate came up through the IS ranks, where he was promoted mainly for technical management skills. He may not know beans about marketing or finance. And at first, he feels and acts like a fish out of water, which he is.

However, give him a year and some lunch, and he's got a chance to make it — at least a better chance than our ex-banker CIO in the rock polisher. He'll get credibility because he can get things done — he knows how IS works.

The problem with developing senior IS executives is that the requirements have changed. When IS was a back-room function, we wanted a competent technologist who could manage other techies. Now that it's a front-line function, we need someone who can focus IS power on adapting the business to rapidly changing markets, competition and ownership patterns. This means understanding and having credibility in IS and business.

Today, the ones who can do that were created by accident, by being thrust into new roles and coping. It's called "career rotation," which sometimes means "twisting in the wind."

In research on IS dispersion for the Society for Information Management, I have found that the best firms *systematically* rotate people in and out of the IS function (along with marketing, finance and so on) on their way up the managerial ladder. These firms home-grow their IS managers just like all their other managers, so there's no magic here. It just takes a long time. You have to hire generalists, train them and hope they don't leave just when they're getting good.

It works best if it is a systematic program supported by educational and career management programs. Moving our banker into IS didn't work because it was a one-off effort with no real institutional support.

What kind of educational development is appropriate for an IS manager who may be a candidate for the top job?

Conversations with CIOs in companies and organizations with more than $500 million in revenue revealed these conclusions:

- Their senior IS managers need specialized training, combining business and IS issues. Each organization has anywhere from five to 30 people who could benefit. Some have MBAs; most of them don't.
- They don't want technical training. They get enough of that from vendors and consultants.
- They want updates on the latest concepts on the business side: finance, marketing, strategic planning and organizational behavior.
- On the IS side, they want ideas on managing IS issues: future technology environments, the latest in cost-benefit analysis, IS organization and staffing issues and managing high-performance teams.
- To sharpen management skills, they want training in leadership, motivation, negotiating contracts, listening and consulting.
- They can spare people for one week at a time, no longer.

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Lodahl is Adjunct Professor at Polytechnic University in New York and chairman of Cognitech Services Corp. in Easton, Conn.

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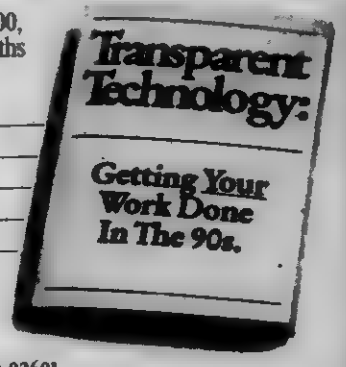
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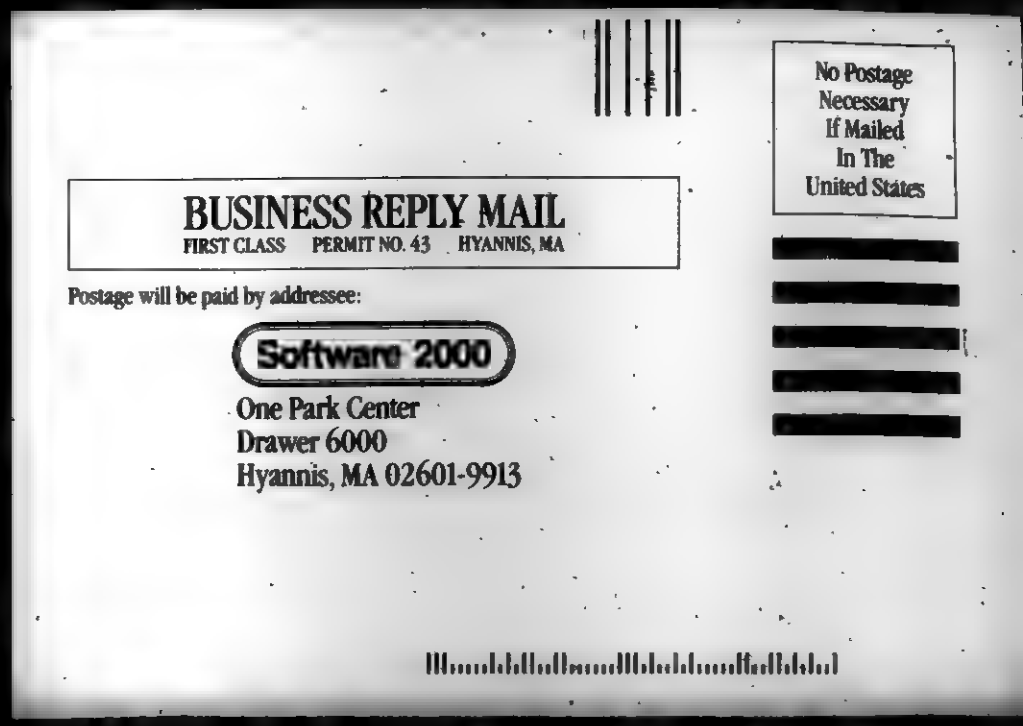
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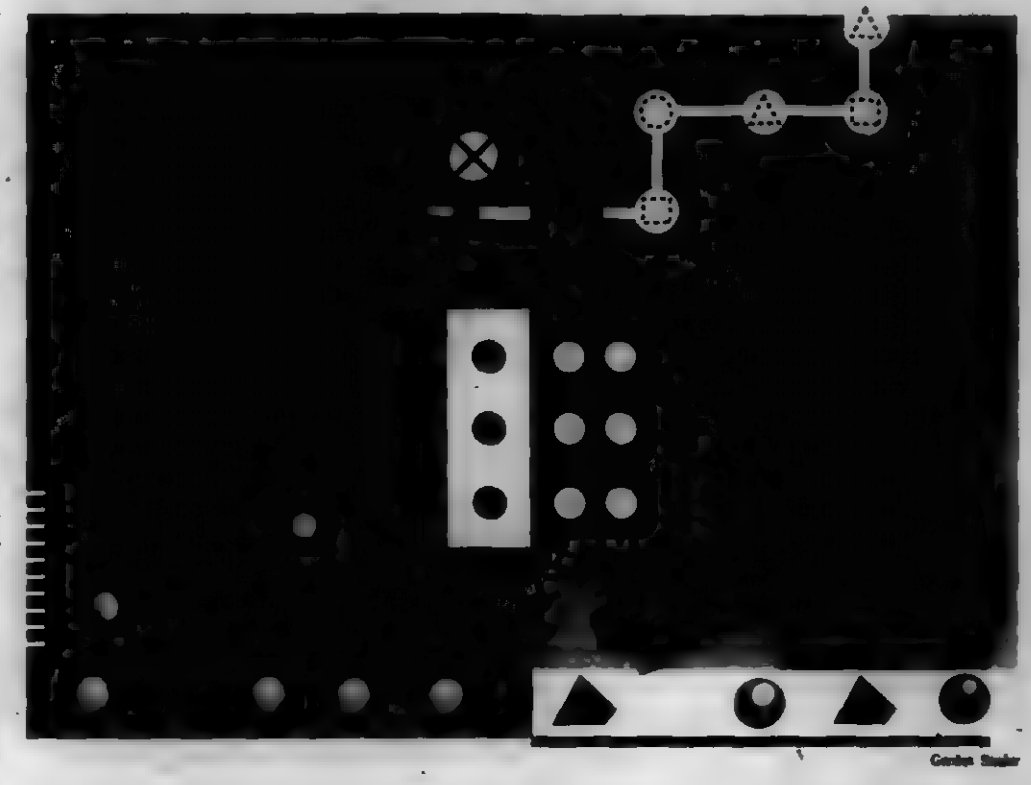
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FLEXIBLE MANUFACTURING

It's gotten easier to change on demand

BY TONY BAER



Gordon Studer

Manufacturers in the U.S. know from experience that one size absolutely does not fit all. They learned that lesson the hard way during the early '80s as the Japanese flooded the market with goods that not only were cheaper and better but also had more variations.

Flexibility — the ability to quickly produce wide varieties of products using the same equipment — has since become a prime watchword in the U.S. industry. A compact disc player featuring a strap handle today could easily have a plastic retractable handle tomorrow.

However, flexible manufacturing systems today are a far cry from the machines first installed in the 1980s. Those were highly complex, fully automated systems that people found difficult to operate and maintain.

Today's flexible manufacturing systems are usually made up of "cells," or clusters of simpler, less automated machines dedicated to a specific purpose. More importantly, they offer not only variation in actual manufacturing processes but also *flexible control*, or the ability to quickly adapt to changes in manpower levels, raw material characteristics, machine availability and, of course, customer demand.

Rather than appealing only to manufacturers with variable product lines, flexible manufacturing systems have become just as important to manufacturers with only one product line.

For example, a photosensor manufacturer on the West Coast that produced a wide variety of products regrouped its machines, which were scattered, into flexible production cells according to product family.

The company also reduced the number of its suppliers, adopted just-in-time methods to cut inventory and provided plant floor personnel with more information about the product they were assembling.

With all the changes, the plant cut its lead time from eight weeks to one, and switching gears between product orders was simplified.

At the other extreme, a Pennsylvania pet food plant with one major product found itself facing a sudden outburst of demand. It was able to keep pace by replacing its manual procedures for controlling individual processes with an integrated supervisory control system.

The control system eliminated the guesswork that occurred between each production step, thereby reducing scrap by 30% and boosting plant output. The new control system also made it easier to spin off variations of its product line.

Not all industries have the same flexibility requirements, however. For instance, a turbulent market demands that consumer product manufacturers be highly flexible. According to the industry publication *New Product News*, one out of every six items on supermarket shelves was introduced within the last 12 months. On the other hand, construction materials show less of a need for change.

Formula for flexibility

Virtually any computer-integrated manufacturing application — from manufacturing resource planning (MRP II) to computer-aided design, process optimization and statistical quality control — can play a part in making the plant more flexible.

In addition, there is no standard recipe for flexible manufacturing. But there are three products that make up the core of a flexible manufacturing system. The linchpin is the supervisory program, which runs on a personal computer, workstation or minicomputer. These are known as "cell control systems" in the discrete manufacturing world (where solid parts are fabricated, built or assembled) and "supervisory control systems" in the process manufacturing sector (where ingredients are blended, boiled, cooked, distilled, fermented or chemically reacted).

Depending on the plant or process type, supervisory programs are available off-the-shelf from independent software vendors, machine tool vendors or controller suppliers. Otherwise, they can be custom written by systems integrators.

As their names imply, supervisory and cell control programs

Continued on page 60

Baer is a senior contributor at *Managing Automation* and president of Business and Technology Communications in New York.

INSIDE

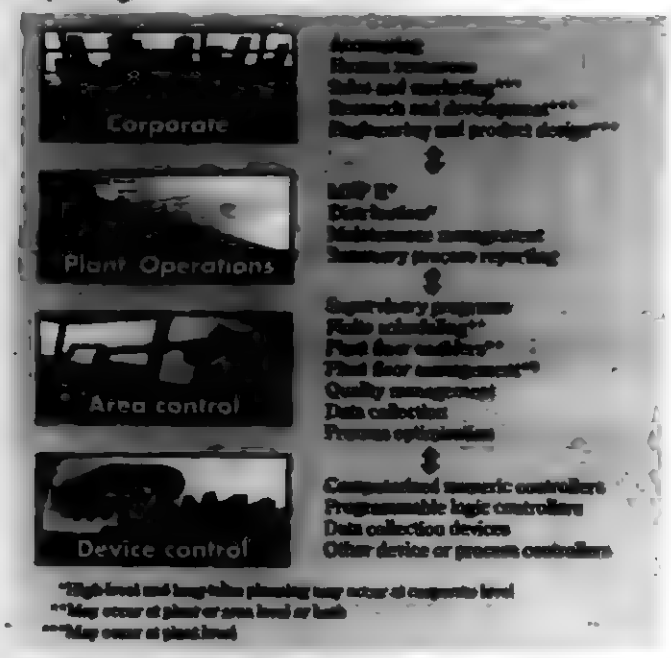
Check the Price Tag
Flexibility doesn't usually come cheap. Page 60.

Scheduling Chaos
Finite schedulers are filling in where MRP II cannot. Page 61.

Product Guide
A comprehensive listing of plant management software. Page 64.

Corporate flexibility

No two corporations are alike, but a likely flexible structure might include the following:



Source: Business and Technology Communications CW Chart: Paul Mock

Continued from page 59

provide overviews and coordinate the activities of the plant or a portion thereof. Their job is to collect data on work in progress, prepare trend analyses and summary reports for managers and machine operators and transmit high-level supervisory instructions to local controllers that govern such things as machines, robots, cookers, blenders, reactor tanks and distillation columns.

These controllers translate the instructions into the digital or analog codes needed to operate the device or machine. Because many controllers are proprietary, they can pose integration problems.

The final component of the flexible manufacturing system is the factory floor network. These high-speed networks operate in real time to transmit data from the supervisory program to the machine itself. On a regular local-area network such as Ethernet, there is no guarantee that the instruction will reach its destination before the device or process fails. These networks are generally provided by the controller supplier.

There are numerous other applications that can play a supporting role in this threesome and many different ways to decide at which level of the organization or computing system each application is to be run (see diagram at left).

For instance, a relatively new type of software called a finite scheduler can adjust production schedules according to current demand and operating conditions. This can be valuable for companies faced with tight delivery and production schedules, many machines to choose from, many possible ways to order their sequence and a large number of staff deployments (see story page 61).

Complex capabilities

Another new category of software is plant floor management programs, which retrieve job instructions or complex machining instructions and track how well they were executed. Such functions are traditionally handled by MRP II packages, which store the instructions, and supervisory programs, which download the instructions to controllers on the plant floor. What plant floor management programs add to the picture is the ability to handle complex instructions in better detail (see story page 63).

An option that process manufacturers may want to consider is a distributed control system, which helps the supervisory program communicate more rapidly with the machines on the plant floor. Distributed control systems originated in refineries and large petrochemical complexes and are required at sites where hundreds or thousands of controllers are used to regulate fragile processes and where extremely fast, millisecond responses are necessary. These systems provide redundancy and millisecond real-time control capabilities not available from general-purpose computers running supervisory control programs.

In recent years, miniaturized versions of these systems have become available to serve smaller process plants producing differing products by the batch.

Smaller plants have other options as well. If your site does not need millisecond control, you can get by with real-time coprocessors plugged into the back of the supervisory computer.

One last category of tools may help bring down the last major hurdle to flexible manufacturing: the difficulty of integrating many third-party applications in areas such as quality control, data collection and process optimization. Traditionally, it has been up to the information systems staff or a systems integrator to write customer interfaces; more recently, several vendors have developed enabling tools that make these diverse programs compatible.

Such enabling tools have been developed by Digital Equipment Corp., Hewlett-Packard Co. and IBM. Mainstream Software Corp. — a cell control vendor — has developed similar enablers that work on platforms in the Unix environment.

Once flexibility is achieved in the plant, it can ultimately reach all the way to the corporate suite, where many organizations are also striving to be more adaptable to market conditions and customer demand. Through standard SQL links, different departments throughout the organization can begin pooling data on product development, pricing, delivery, customer service and market research. ●

A checklist of key qualities defines the ideal supervisor

BY TONY BAER

When choosing a supervisory program, be sure to consider the following requirements:

• **Graphics displays.** Displays must be readable and easy to create, since neither the supervisor nor operator has time to translate a confusing layout.

• **Interfaces to specific controllers.** Every brand of controller uses a unique binary control language, so supervisory programs must include drivers for the major brands.

That's easier said than done, however; there is a wide variety of modular and proprietary controller hardware used on the plant floor.

In discrete processing, most machines use proprietary controllers, although programmable logic controllers (PLC) — digital controllers that turn machines on or off, regulate speeds and set positioning — have made major inroads. Most cell control programs include drivers for the most popular controller brands.

The situation is brighter on the process side, where PLCs and standard proportional-integral-derivative controllers — analog controllers that regulate temperature, flow or pressure — have staked a dominant beachhead.

Most supervisory packages contain drivers for the most popular PLCs and proportional-integral-derivatives.

• **Standard libraries of control functions or tools for creating them.** Control functions — or generic steps, such as lifting, assembling, cutting, cooking, blending and drying — are more easily defined in the process industries.

On the discrete side, even similar operations have significant variations. For instance, the control functions necessary for assembling windshields hardly resemble those for piecing together circuit boards. Some supervisory programs rely on custom programming, especially where highly customized machinery is used, while others feature high-level languages for object-oriented programming using graphical flow charts.

• **Robust databases that keep track of operating status.** In the process world, where events such as complex chemical reactions may happen in milliseconds, data is generally kept on memory-resident databases that refresh data only when it changes. Some systems update at regular intervals, an approach that may tax the system if the installation is large.

The requirements are looser in the discrete world, where it may take seconds or minutes to cut a piece of metal or assemble a door panel. If something goes wrong, two or three seconds' notice should suffice.

Therefore, many cell controllers are built around industry-standard relational databases.

• **Reporting capabilities.** Supervisory programs should contain a menu of standard reports and tools to prepare custom ones.

• **Alarm displays.** When a process is about to fail, the program must prominently flash a message pinpointing where the problem is occurring.

• **Multitasking capabilities.** Especially in the process industry — where events can happen in fractions of a second — the supervisory program may have to juggle alarm notification, reporting and dispatching of control instructions while also displaying current operating status. ●

Count costs of flexible manufacturing

The paybacks of flexibility are great, but the price of implementation is high. The software itself is only the tip of the iceberg, and even that does not come cheaply.

The prime variables affecting software cost include the following:

• Whether you use the software only for data acquisition and monitoring or also for control.

• The number of peripheral applications you install, such as statistical quality control, process optimization and material tracking.

• The level of integration with a plant or corporate manufacturing resource planning system.

• The number of machines or processes covered by the system.

• The complexity of the operations covered.

• The degree to which drivers must be customized.

In discrete manufacturing cells, the cost of purchasing and installing supervisory programs may range from $10,000 to more than $1 million, depending on the degree of functionality, customization and product sophistication.

On the low end, Lotus Development Corp.'s manufacturing consulting service can install its 1-2-3 spreadsheet, complete with its @Factory module, and provide training and custom installation for less than $15,000. A maker of low-end PLCs can add a rudimentary supervisory control program for another $2,500.

On the high end, Andersen Consulting and Cimcorp, Inc. provide software and systems integration for sophisticated production cells comprising five to 10 machines, automated or semiautomated material handling systems, data collection systems and interfaces to finite scheduling and MRP II systems. Costs range from $500,000 to $2 million.

Costs vary similarly in the process world. Popular personal computer-based supervisory control packages such as Intellution, Inc.'s The Fix and U.S. Data Corp.'s Factory Link may begin at $3,000 to $8,000 for stand-alone systems. Networked versions for five or six users begin at $15,000 to $20,000. Multiuser Unix- and minicomputer-based systems begin at $40,000 to $50,000, with large installations reaching $250,000.

Distributed control systems, necessary for complex or high-speed processes, can add another $100,000 to $1 million to the picture.

TONY BAER

How to schedule in unexpected events

Employee absences, machine downtime and material delivery delays are usually considered outside the realm of manufacturing resource planning (MRP II) systems, which have historically been strong in long-range planning but ill-equipped for the idiosyncracies of everyday plant life.

Finite scheduling programs, on the other hand, dare to bring to the scheduling chaos not only order but also optimization.

Some of the newer systems can figure out how to best juggle work orders to minimize the setup procedure to readjust machines between production runs. Others can determine the most profitable job sequences to ensure that jobs are produced in order of priority.

In the last few years, roughly a dozen vendors have produced finite scheduling programs, some of which are stand-alone products and some that are modules to MRP II packages. Some cell and supervisory control suppliers, such as Cincorp, Inc.'s Cimcell, are beginning to incorporate third-party finite scheduling products into their packages.

For such a young field, there are a lot of product variations. Some programs concentrate on scheduling individual production lines, while others operate at the plant level.

Other distinctions are based on the method of analysis.

Despite their capabilities, finite scheduling programs can't solve everything. "We don't shoot for an optimal solution, because we know that things are going to change, probably within the time that the computer is running," says Bill Schaeffer, vice president at finite scheduling vendor Pritsker Corp.

The costs of finite schedulers range from $10,000 for a module included with MRP II to more than $250,000 for the latest state-of-the-art package. ●

TERRY HAAK

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Finite scheduling



Cell control



Supervisory control



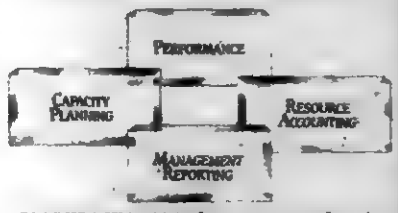
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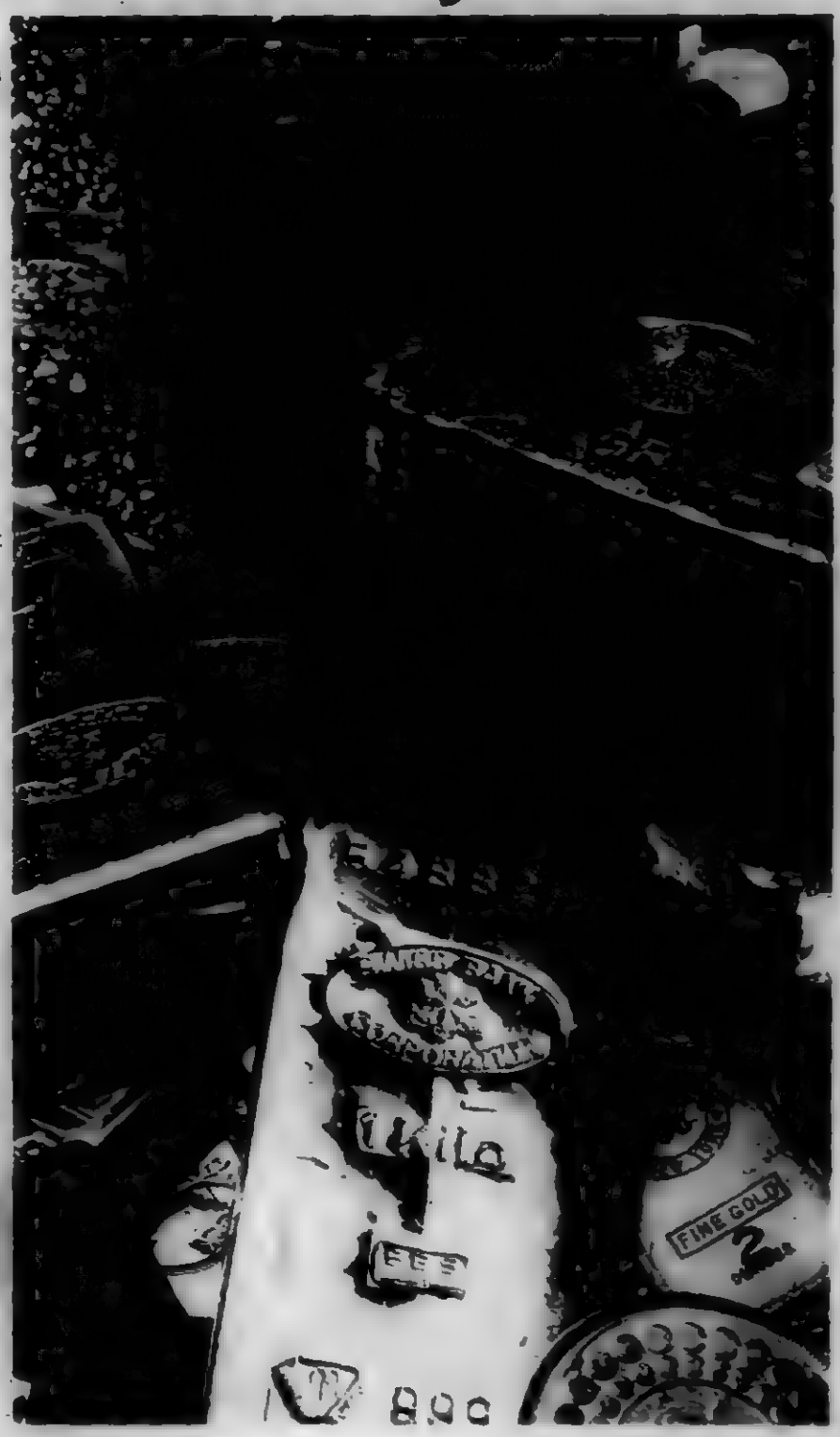
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Plant management systems use many aliases

BY BRUCE RICHARDSON

It's a lot easier to say "plant management system" than it is to define one. Even terminology differs: Vendors call it an area management system, factory control and management system, factory management and control system, factory floor management system and plant operations management system.

The basic function of plant management systems — which Advanced Manufacturing Research, Inc. (AMR) in Cambridge, Mass., terms "manufacturing execution systems" — is to link a corporation's planning and control layers, which roughly correspond to the operations and device-control levels, respectively, in the diagram (see page 61).

By linking these two levels, plant management software forms a new layer, the execution layer, giving operators and managers a current view of all manufacturing resources.

These systems can cut manufacturing costs by 45% to 55%, with payback periods of only three to 12 months. They don't come cheaply, however: Products in this market range from $10,000 to more than $1 million.

The plant management market is less well-defined than its planning and control counterparts. Manufacturing resource planning (MRP II) vendors such as Dun & Bradstreet Software, SAP America, Inc. and Ask Computer Systems, Inc. cover the planning function, while vendors such as AEG Corp., Allen-Bradley Co., Asea Brown Boveri Ltd., Honeywell, Inc., Mitsubishi Corp., Siemens AG and Yokogawa Corp. dominate the control function.

Consequently, a host of software suppliers have rushed into that space with "integrated plant management packages," which usually consist of four modules (see story below and chart page 64).

A variegated lot

However, there are at least a dozen other strategies for implementing a plant management system. Some users are working top-down by extending the reach of their MRP II systems by buying additional modules. They see the execution layer as an extension of planning.

Others are working bottom-up by building on top of their installed base of programmable logic controllers or process control systems. These users tend to be concerned with implementing a real-time information management system.

Still others are implementing just a piece of the plant management function, such as finite scheduling.

Another option is to build your own plant management software. If you don't want to start from scratch, you can build from one component.

As baffling as this product category is to define, it is proving itself popular. Plant management systems are the fastest growing segment of the computer-integrated manufacturing software market.

AMR estimates show these systems to be installed at nearly 2,000 sites, yielding a market of $350 million in 1990. The firm said it expects this market to grow by 25% to 30% in the next two years. •

Richardson is vice president of research at Advanced Manufacturing Research, Inc. in Cambridge, Mass.

Must haves

In an integrated plant management package, there are four critical modules:

• **Planning and scheduling.** This module includes scheduling, planning and dispatching of all resources. Planning data is usually gathered from an MRP II system.

One of the most desirable features is support for finite capacity scheduling. Whereas MRP II typically assumes infinite resources, finite scheduling is designed to provide the optimal schedule, given existing constraints in machine capacity, materials, labor and time.

• **Tracking, monitoring and control.** This component extends the reach of the plant management system. It tracks all plant resources, particularly work in progress, labor and equipment.

• **Quality management.** This includes quality data collection and display. Some systems also provide work instructions in compound document format for operators.

These work instructions guide the operator through the required steps and can also provide an audit trail to ensure that all of the steps and procedures were followed. This validation is particularly important in the pharmaceutical and aerospace/defense industries.

• **Computer-integrated manufacturing interface.** This module provides interfaces to other applications such as supervisory programs, maintenance management and decision-support tools, databases, computers, control systems and other plant devices, including bar-code systems and sensors.

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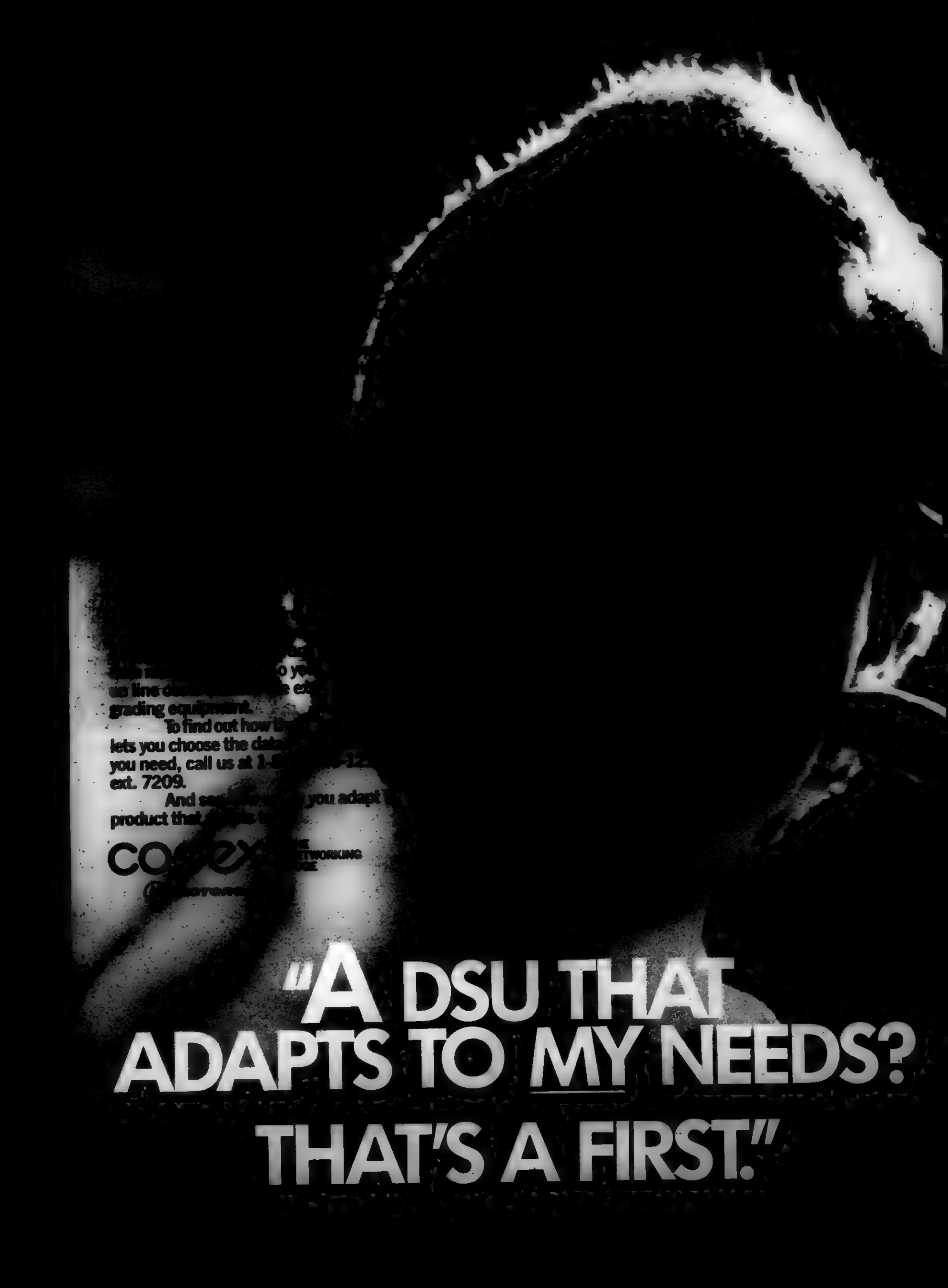
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	TQM (Real-time Quality Management System)	DEC, HP, IBM PC/AT, Sun/VMS, HP-UX, Interactive Unix, Sun OS	Aerospace, commercial electronics, automotive, pharmaceuticals, consumer goods	NP	Application dependent/ 16M	None, but will interface with other application software	Interfaces to PLCs and process control systems, cell control and supervisory control support, machine utilization support; interfaces to bar code and factory data collection, process monitoring, data acquisition, alarm management, exception reporting	Supports off-line SPC/SQC	Motif	All	TCP/IP	Available on request	Available on request/No
Battelle[3] and Hewlett-Packard Co. (614) 424-6212	Open CIM Factory Control System	HP's 9000 Series 300, 400, 800/HP-UX	Aerospace and defense, automotive, electronics	10/1989	Application dependent/ 10M	Via Pritsker Corp.'s Factor, interfaces to MRP, CAD; finite capacity scheduling, simulation, includes DMS by Sherpa Corp., CAPP; Intellicapp by Cimtelligence	Via ICC's Shop Floor Data Manager, interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection; displays electronic work instructions; includes Impression by Eyring Research Institute	Via IRQM by ATA, supports real-time SPC/SQC; via RS/Series by BBN, supports lab information management system	Motif	Ingres, Informix, Oracle	TCP/IP	Available on request	$200,000+/ Yes
IBM Software Products (617) 873-3000	MAPfusion	DEC, HP, Sun, IBM PCs/VMS, Unix, Ultrix	All manufacturing and R&D, focus on semiconductor and pharmaceuticals	10 - 20,000/ 1989	8M/ 20M (workstation)	Statistical analysis SQC, design of experiments	Interfaces to PLCs and process control systems, cell control and supervisory control support, interfaces to bar code and factory data collection	Supports real-time SPC/SQC and lab information management system, design of experiments, multiple regression, data analysis	Menu driven	Oracle, Rdb, Ingres, RMS files	TCP/IP, Decnet	$2,000 - $100,000+	Platform dependent/No
Bradley Ward, Inc. (404) 394-4292	PMIS[4] (Process Management and Information System)	HP's 9000 Series 300, 400, 800/HP-UX	Food and beverage, pharmaceuticals, pulp and paper, specialty chemicals, electronics	120/ 1985	16M/ 400M	Interfaces to MRP, CAD; finite capacity scheduling	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support; interfaces to bar code and factory data collection; displays electronic work instructions	Supports real-time SPC/SQC and lab information management system	Motif	Informix, Ingres, Oracle, Sybase	TCP/IP	Platform dependent	$15,000 - $80,000; $35,000 (average)/No
Clearing Factory Controls, Inc. (708) 851-2280	Clearview Shop Floor Management	DEC's VAX, RISC/VMS, Ultrix	Discrete manufacturing	NP/ 1991	32M/ 300M	Via Pritsker's Factor, interfaces to MRP, CAD; embedded finite capacity scheduling	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection; displays electronic work functions	Statistical quality control	Discoverview, Vi Corp.'s Dataviews	Ingres	TCP/IP, Decnet	Available on request	Available on request
Cimflex Teknowledge Corp. (415) 787-3900	Data Factory Management and Control Systems	HP's 9000 Series 800/HP-UX	Discrete, repetitive manufacturing	12/1987	32M/ 1G	Interfaces to MRP, CAD; work order management, changeover control	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, machine utilization support; interfaces to bar code and factory data collection, work in progress tracking, failure reporting and tracking, component traceability	Supports real-time SPC/SQC	JYACC's Parameter	Oracle	TCP/IP	Available on request	$380,000/No
Computer Database International, Inc. (213) 207-6200	Microshop	IBM, HP, Prime/AIX, Unix, Xenix	NP	100/ 1977	16M/ 300M	Interfaces to CAD; finite capacity scheduling, backward and forward loading	Inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection; displays electronic work instructions, fully integrated to purchasing and financial	None	X Windows, Multiview	Basic	TCP/IP	$1,500 - $8,000	$60,000 - $100,000/ Yes
Consilium, Inc. (415) 691-6100	Workstream	DEC/VMS	Aerospace and defense, electronics, specialty chemicals	180/ 1983	32M/ 1.5G	Interfaces to MRP, CAD; finite capacity scheduling, simulation	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection; displays electronic work instructions	Supports real-time SPC/SQC	Motif	None	Decnet	$3,000 - $90,000 (Microvax II), $13,750 - $412,500 (Vax 8978)	$100,000 (Microvax II)/No
Duo & Realtime Software (408) 255-6000	Factory Control and Management System	Tandem/Guardian 90	Electronics, aerospace and defense, automotive, heavy machinery, pharmaceuticals, consumer durables, packaged goods	6/1989	NA	Interfaces to MRP, CAD	Interfaces to PLCs and process control systems, inventory tracking, labor tracking, interfaces to bar code and factory data collection; displays electronic work instructions	Supports real-time SPC/SQC	Integrated with various graphics presentation packages	Tandem's Non-Stop SQL	TCP/IP, Decnet	NA	$200,000/No
Effective Management Systems, Inc. (508) 261-0480, (414) 289-9888	EMS Manufacturing System, EMS-SFIS (Shop Floor Information System)	DEC/VMS	All discrete manufacturing, hard goods in process manufacturing	600 - 700/ 1978	2M/ 400M	Interfaces to MRP, CAD; finite capacity scheduling; simulation, forecasting, rough cut capacity	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection; displays electronic work instruction, real-time E-mail notification of problems	Interfaces with application software to support real-time SPC/SQC	EMS Worksheets, Cognos' PowerHouse, Powerplay	Rdb, RMS files	All DEC protocols	Priced by concurrent number of users: $3,000 - $6,000	$35,000 - $400,000/ $100,000 - $500,000 (SFIS)/No

[1]PLC — programmable logic controller. [2]Battelle is the Open CIM System Integrator. [3]PMIS is part of the FCS/9000 Factory Control System architecture from Hewlett-Packard Co.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors. DOS-based products have not been included in this chart.

Product Spotlight

VENDOR	PRODUCT	PLATFORMS SUPPORTED (HARDWARE/OPERATING SYSTEM)	VERTICAL MARKETS	NUMBER OF INSTALLATIONS/ DATE OF FIRST SHIPMENT	MEMORY REQUIREMENTS/DISK REQUIREMENTS (IN BYTES)	PLANNING AND SCHEDULING CAPABILITIES	TRACKING, MONITORING, CONTROL CAPABILITIES	QUALITY MANAGEMENT	GRAPHICAL USER INTERFACES	RELATIONAL DATABASES INTERFACED WITH	NETWORK PROTOCOLS SUPPORTED	PRICE PER MODULE	AVERAGE SYSTEM PRICE/ HARDWARE INCLUDED
Part, Inc. (330) 758-3900	The Factory System	IBM PCs and compatibles/Unix	Discrete parts manufacturing	30/1989	2M/ 80M	Interfaces to MRP; finite capacity scheduling	Interfaces to PLCs and process control systems, inventory tracking, labor tracking, machine utilization support; interfaces to bar code and factory data collection; displays electronic work instructions, work order tracking, manages resource utilization	Supports real-time SPC/SQC	Proprietary Windows, pull-down menus	Quantum Software Systems' Zim	Arcnet	$1,000 - $10,000	$150,000/ Yes
Factorial Systems, Inc. (512) 345-1192	The Paperless Factory System	IBM DAE, Tandem/Guardian, OS/2	Discrete manufacturing and assembly	9/1985	12M/ 60M	Interfaces to MRP; limited finite capacity scheduling	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection; displays electronic work instructions	Interfaces to stand-alone package	Interfaces to DOS graphics	None	Token-ring, Tandem	$50,000 - $100,000	$300,000 - $1M/Yes
Gherlation, Inc. (916) 368-6696	Gherpac	DEC's VAX, IBM AS/400 and PCs/VMS, OS/400, CDOS, OS/2	Process control and manufacturing	5,000/ 1983	8M/ 100M	Interfaces to MRP; simulation	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, interfaces to bar code and factory data collection	Supports real-time SPC/SQC	Decision-down, Presentation Manager	None	TCP/IP, Decnet, Token-ring, Ethernet	$3,995+	$15,000/No
Hilco Technologies, Inc. (314) 298-0100	Monitrol/UX	HP's 9000 Series/Unix	Automotive, food and beverage, petrochemical, consumer products	497/ 1985	16M/ 336M	Interfaces to MRP; finite capacity scheduling, customer-specified	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection, data acquisition, lot performance production tracking, process optimization	Supports real-time SPC/SQC and lab information management system	Motif	Oracle, Allbase, Informix, Ingres	TCP/IP	$20,000 (base product)	$25,000 (software only)/ $80,000 (includes hardware)
IDEA Corp. (214) 907-9475	Ibex Version 4.0, Integrated Financial, Manufacturing Distribution Software	Any platform supported by Informix	Distribution, discrete and discrete repetitive manufacturing	10/ 1989	4M/ 150M	Interfaces to MRP; CAD; simulation of material planning	Inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support, interfaces to bar code and factory data collection; displays electronic work instructions	None	Motif	Informix SE or Online	TCP/IP, OSI	$2,000 + (price varies)	$50,000 - $250,000/No
IBM Contact local IBM sales office	POMS (Process Operations Management System)	IBM distributed architecture, featuring PS/2 and industrial computer/OS/2 Extended Edition	Chemicals, pharmaceuticals, pulp and paper, consumer goods	NP/ 1990	NP	Electronically links MRP, planning, and other business systems with process control and process operations	Interfaces to PLCs and process controls systems	None	Presentation Manager	None	NP	$6,300 per workstation (includes first-year maintenance)	YP/YNo
Intellication, Inc. (617) 780-0878	Fix DMACS for VMS	DEC's VAX, IBM PCs/VMS, OS/2, DAE	Food processing, metal processing	NP/ 1990	12M/ 9,500 - 19,000 blocks	Interfaces to MRP	Interfaces to PLCs and process control systems, cell control and supervisory control support	Supports real-time SPC/SQC	Decision-down, Presentation Manager	Oracle, Rdb. data can be exported to Ingres	Decnet	Available on request	Available on request/No
Intercim Corp. (612) 894-9010	Factory Net I/S	IBM PCs and compatibles/OS/2	Discrete parts manufacturing and batch manufacturing or assembly	100+/ 1988	2M - 6M/ 100M	Interfaces to MRP, CAD; electronic traveler, routing instructions	Cell control and supervisory control support, machine utilization support; interfaces to bar code and factory data collection; displays electronic work instructions, distributed numerical control, machine monitoring; interfaces to NC/CNC machines and robots	None	Windowing development package	SQLbase, IBM DB Manager	Network. IBM LAN Manager, DAL, PC LAN, DEC's PCSA, Banyan, 3Com	$2,000 - $15,000	$160,000/No
John A. Keane & Associates (908) 934-7304	QMS Programs	DEC's VAX, IBM 370/VMS, VM/CMS	All manufacturing	72/1987	NP	Interfaces to MRP, CAD; simulation	Interfaces to PLCs and process control systems, cell control and supervisory control support; interfaces to bar coode and factory data collection; displays electronic work instructions	Supports real-time SPC/SQC and lab information management system, supplier quality management, calibration, defect analysis, MIL-STD compliance	None	Proprietary, Rdb	None	$20,000 - $180,000 (DEC platforms), $20,000 - $400,000 (IBM platforms)	$75,000/No
Mpact Systems, Inc. (414) 792-3900	Inter Act	Tandem/Guardian	All manufacturing and distribution	NP/ 1987	NP	Via D&B Software's AMAPS, interfaces to MRP; via Boeing's PPDM, interfaces to CAD, finite capacity scheduling, simulation	Inventory tracking, cell control and supervisory control support, labor tracking; interfaces to bar code and factory data collection, displays electronic work instructions	Supports lab information management system	Boeing's PPDM	Tandem's Non-Stop SQL	TCP/IP Ethernet	Each module priced separately	$300,000 - $400,000/No
Peripheral Software Concepts, Inc. (310) 883-7900	Striped Lightning, Shop Floor Management System	DEC's VAX, HP's 9000/VMS, (data collection); HP/Apollo, IBM RS/6000 (finite scheduling)	Discrete manufacturing	75/1983	NA	Interfaces to MRP; finite capacity scheduling	Inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection; interfaces to payroll and SQC systems	None	Motif	None	TCP/IP, Decnet	$12,000	$75,000/No
Promis Systems Corp. (415) 960-0960	Promis (Process Manufacturing Integration System)	DEC's VAX, IBM/VMS, VM	Batch processing industry, semiconductor, electronics, pharmaceuticals	100+/ 1981	32M/ 4G	Interfaces to MRP; simulation, priority scheduling, line balancing	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, partial labor tracking, machine utilization support; interfaces to bar code and factory data collection, displays electronic work instructions, bill of materials	Supports real-time SPC/SQC and lab information management system via interface, calculations, data edit, lot size reconciliation	Proprietary, Macintosh	None	Decnet	$12,000 $230,000	$400,000/No
Saberus Manufacturing Systems, Inc. (313) 641-0660	SPM+/Statistical Process Monitoring Software	DEC's VAX/VMS	Discrete and process manufacturing	60/1988	8M/ 70M	Interfaces with DEC's Rmaster application integration platform	Interfaces to PLCs and process control systems, cell control and supervisory control support; interfaces to bar code and factory data collection; displays electronic work instructions	Supports real-time SPC/SQC	None	Rdb/VMS	Decnet	NA	$50,000 (includes maintenance)/No
Setpoint, Inc. (713) 584-1000	Setclen	DEC's VAX, HP's 9000 Series 800/VMS, HP-UX	Food and beverage, automotive, metals, electronics, discrete manufacturing	50/1986	10M/ 10M	None	Interfaces to PLCs and process control systems, cell control and supervisory control support, machine utilization support; interfaces to bar code and factory data collection, real-time graphic system, history of process operation	Supports real-time SPC/SQC	Decision-down	Rdb, Oracle	TCP/IP, Decnet	$25,000 (Microvax ID plus $2,000 per screen	$60,000/No
Synaic Computer Systems, Inc., (614) 866-0720	Synaic	Over 200 platforms supported/Unix, Xenix, VMS	All manufacturing	900/ 1988	4M/ Varies	Interfaces to MRP; finite capacity scheduling, simulation, what-if, forward, backward and infinite scheduling, capacity planning, work center control	Inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection; displays electronic work instructions	None	None	Progress	TCP/IP, Decnet	Available on request	Available on request/No
U.S. Data Corp. (216) 696-9700	Factorylink	DEC's VAX, Decstation, HP's 9000 Series 300, 400, 800 IBM RS/6000, PCs and compatibles/VMS, Unix, OS/2, Deqnxw	Process control, SCADA	7,500+/ 1985	2M/ 5M	Interfaces to MRP, CAD; simulation	Interfaces to PLCs and process control systems, inventory tracking, cell control and supervisory control support, labor tracking, machine utilization support; interfaces to bar code and factory data collection; displays electronic work instructions	Supports real-time SPC/SQC and lab information management system	Decision-down, Presentation Manager, Motif	Oracle, Rdb, IBM Database Manager	TCP/IP, Decnet, OSI, Net-ware, Net-bios	Available on request	Available on request/No


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David Perkins

When weighing Unix's pros and cons, it helps to have all the facts

BY JOHN OZSVATH

Unix is gaining mythical stature as the golden system in which code never dies and computers get less expensive every day. It also looms large in the imagination as a demon of complexity.

There's a shred of truth in almost every myth. But for the most part, commonly held beliefs about Unix and its open systems status are false. These falsehoods need to be exposed so that information systems managers contemplating the Unix option can make a judgment based on the real pluses and minuses of the operating system. Unix deserves better than the half-truths that have caused some IS shops to avoid it.



Vendors set the standards, so you should wait to see whether Unix International or the Open Software Foundation wins the struggle to provide the "standard" Unix operating system before investing.

Reality: Vendors make products, not standards. Users make de facto standards by voting with their dollars. Waiting until one vendor establishes dominance before making any operating system choices does not make sense. In fact, a move to open systems may free your IS operation from dependence on a vendor's timetable; that's something we've experienced at McDonald's Corp. since we began using Unix.

When users — specifically private corporations and government agencies — adopt formal standards, there is pressure on vendors to adopt these standards in place of proprietary options. The government put such pressure on vendors when it mandated Posix compliance for certain specified volume purchase agreements. One way to protect your IS interests and influence the outcome is by joining a standards committee or user group (see story page 69).



Unix is so hard to learn that you have to be a rocket scientist to use it.

Reality: How true this myth is depends on who is saying it. A beginning programmer may say Unix is hard to learn. I would agree that when you take away some of the recent layers of programs that shield end users from the complexities of Unix, it can be somewhat intimidating. However, the fact that scientists were the original users of Unix says more about AT&T's licensing policy than about the required IQ level.

From a commercial user's standpoint, I don't know any large IS department that is afraid of learning Unix. It takes work and time to learn it — or any other operating system, for that matter. At McDonald's, we experienced a typical learning cycle with Unix. We began by teaching ourselves, then took a vendor's training program. Members of our project team became competent users in about one year.

For an end user, using Unix through graphical user interfaces and other available tools is like running DOS under Microsoft Corp.'s Windows. At McDonald's, we don't tell end users they are using Unix, and they don't complain about it.



Unix software is completely portable.

Reality: My systems development group says, "Unix is huggable not portable."

Unix applications are portable when they conform to industry standards that are common to all platforms, such as Posix. The key is understanding the portability requirements thoroughly and avoiding the use of any superset of the system (however attractive) that restricts you to a particular vendor's version of Unix.

In the past, there have been differences in tools that made seemingly portable ones behave a little differently on each platform. As a result, the application interface needed to be tweaked on each platform. Database management system tools, which are often highly optimized for performance, have had particular problems with portability under different implementations of Unix.



Unix programmers are flaky, scarce and expensive.

Reality: Stereotypes aside, we all know that any group of people has some flakes. But scarce? If you're near a large city or a large university, it is substantially easier to find Unix-capable IS people. If you're not, it is more difficult.

However, that is usually the case with any IS hire, not just a Unix hire.

In some remote places, you can expect to pay more for Unix/C professionals than for Cobol professionals. However, I believe that this pay differential is more than balanced by the savings realized by developing applications under Unix on supermicrocomputers. Such applications development is, in most cases, significantly less expensive than it is when working on a mainframe. How much less depends on the application being developed.

With the fourth-generation development tools available under Unix, applications can be developed faster as well. At McDonald's, we have had good results with fourth-

Continued on page 69

Ozsvath is director of systems development at McDonald's Corp. in Oak Brook, Ill., and the 1990-91 president of Uniforum, the international association of Unix and open systems users.

- **Seven myths debunked**
- **The Ballantine Beer approach to integration**
- **How you can have a say in Unix issues**



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Continued from page 67

generation languages (4GL). The level of productivity improvements from them depends on how compatible the application is with the 4GL selected.

You can therefore afford to spend more on staffing because Unix platforms and open systems help control your hardware costs. Moreover, developing for open systems encourages staffs to think in terms of modular design and reusable routines (a trick that mainframe developers are relearning from personal computer programmers). If your programmer isn't spending time writing redundant code, you save the cost of doing it over.



With an open systems environment, you don't have any clout with a vendor.

Reality: Nothing could be further from the truth. Designing an open systems environment gives you leverage and clout with vendors. There are now a number of comparable alternatives from which to choose. Because of this variety, each vendor must differentiate itself through price/performance.

Moreover, vendors must especially demonstrate how attentive they are to your needs, how they will follow up and how they will deliver. That, in my mind, becomes the new bottom line in the relationship.



With open systems, you can plug anything into anything.

Reality: Not yet. Universal connectivity may be the goal sometime in the future — but without open systems standards, there is not a prayer of it ever happening. There are too many variables (see story below).



Unix is not a secure system.

Reality: There is more truth in this than in the other myths. The slow move toward standards in the security area is a major obstacle for commercial users. Maybe it's an oxymoron — you can't have open systems and security at the same time.

In cases in which it's unwieldy, security can actually be a problem, however. The lack of interoperability among security systems is one of the biggest deterrents to distributing applications in a multivendor environment. It's frustrating for users to sign off and on or change passwords to move from an application on one platform to an application on another.

Having said that, I want to underscore that Unix is further along in offering transparent security to users who need to access both local and remote applications than many proprietary operating systems are. It is definitely ahead where multivendor solutions are required.

For example, Unix security's layer approach uses the system's machine and file-level access codes. Specific applications can offer additional security implementations. This setup provides greater flexibility in implementing data security.

Proprietary operating system security, on the other hand, may be different from machine to machine, with specific users controlling access to files.

McDonald's has a corporate goal of allowing anyone in the company to access any data for which he is authorized, regardless of where it is located. Achievement of this goal cries out for open systems standards.

.....

The myths I've sought to debunk here are at the root of many misconceptions about Unix. The next five years, however, will see the eradication of these myths as development moves off the mainframe and into distributed environments.

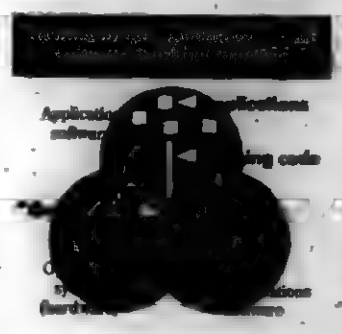
When you distribute applications and databases, there is an obvious benefit to having them all function under the same operating system. Unix increases this benefit by running the same way on a desktop system as it does on a processor that supports 100 users.

The move to Unix is already happening on the desktop. According to Dataquest, Inc., in 1986, business, government and schools around the world each spent less than $1 billion on Unix applications software. Projections are that by 1992, businesses will spend about $7 billion, government more than $5 billion and schools about $3 billion. And that's no myth. •

The place where 'goodness' resides

One way to grasp the difference between trying to integrate business systems in a proprietary environment and attempting the same thing with open systems is to draw a picture. The image I like to use is a three-circle design (see diagram below) that I call the Ballantine Beer approach because I borrowed it from the brewer's logo.

Our job as information systems managers is to make the three business software circles — application software and packages, data communications software and operating systems software — work together. (The latter area includes hardware, except in the case of Unix, because of the dependency between machines and the operating systems they run.)



We want our companies to be at the intersection of the three circles because that's where the "goodness" resides. Goodness is the ability of applications to fit seamlessly, without IS having to do any work or rework to get them that way.

Change any one of the circles, and the cost of integration comes into play. When the business requires an application that is not compatible with the operating system or data communications software, IS has to spend the money to bridge the distance between the circles and bring this software into the intersection.

Ongoing maintenance adds to that cost, because if anything changes in any one of the three circles to affect the bridging code, IS must accommodate that change.

Proprietary vs. open

Integration is simple in a proprietary environment: The vendor makes sure all three circles work together.

However, if the business needs a software package that runs on another hardware platform, IS has a problem. It must either wait until the proprietary vendor makes that particular application available or find someone (possibly itself) to make it work.

With open systems, the intersection of the three circles is governed by standard interfaces and protocols and not by the hardware.

For example, if Unix is running in the application software circle, Transmission Control Protocol/Internet Protocol (TCP/IP) occupies the overlap between the data communications and operating system areas.

If a Unix application that requires TCP/IP satisfies portability requirements, then all three domains will work smoothly together. IS can change the hardware or distribute the processing differently without changing a single line of code.

However, even in an open environment, if one more variable comes into play, then IS faces integration work, although I would argue that it is less drastic than on proprietary platforms.

Take, for example, a business that needs a DOS application running under Microsoft Corp.'s Windows. Some vendors enable DOS to run under Unix, so the operating system and application circles intersect smoothly. But Windows doesn't run as smoothly under TCP/IP, so the data communications circle is out of sync.

There are basically three choices for IS in this situation: Rewrite the code to make it run better, run it on personal computers and find another way to hook it up through gateways or forego the opportunity.

Scattered

Today at McDonald's, we're all over those circles. Some programs were written using the open systems standards in place at the time. Others are way out at the edge of the application circle and take a lot of maintenance.

Our goal over the next five to 10 years is to bring them all into the goodness center.

We're willing to write bridging code over the short run, if necessary, because there still are not open systems standards for every occasion and need. As open systems standards mature, the necessity for bridging codes fades.

JOHN OZSVATH

Would-be Unix movers

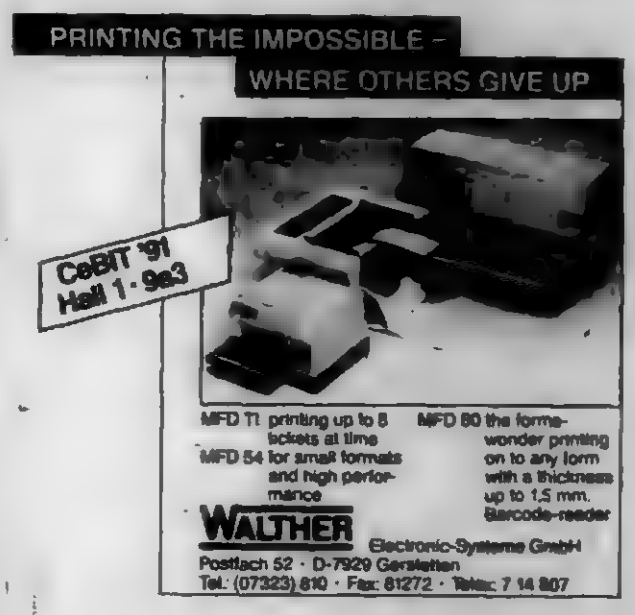
There are a number of routes available to Unix users who want to influence the pace and direction of standards development. These include the Uniforum users group, X/Open Consortium Ltd., Unix International and the Open Software Foundation.

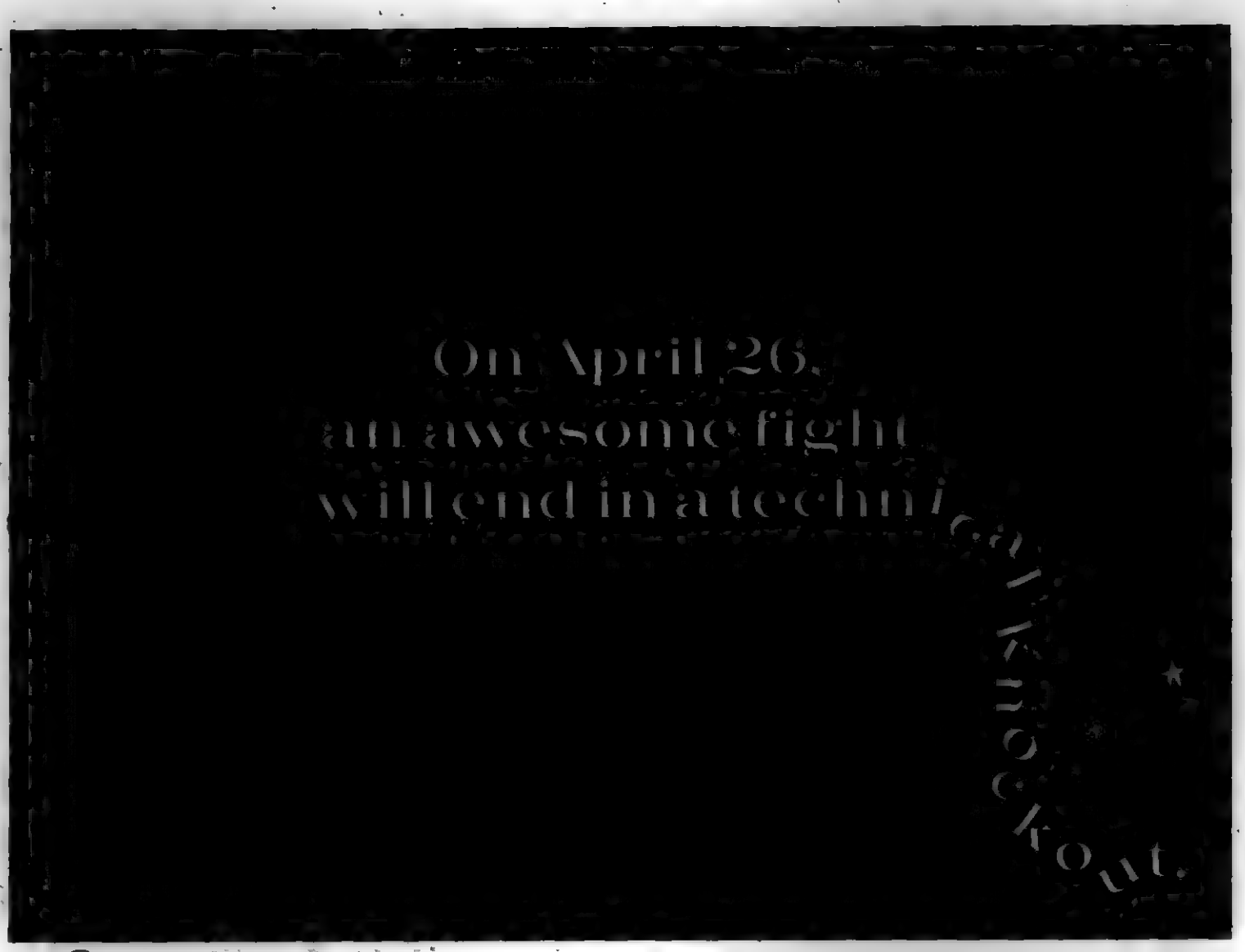
The Uniforum Technical Committee, for example, proposes specifications to the Institute of Electrical and Electronics Engineers, Inc. in a number of emerging Unix and Posix areas. It has several technical subcommittees, as follows:

- Internationalization, which coordinates work on the different linguistic and cultural requirements of portable operating systems in other countries.
- Security, which has worked mostly as an educational body since its proposed standards for the U.S. Department of Defense and commercial environments sparked the formation of the Posix.6 Working Group.
- Performance Measurement, which serves as an advisory group on benchmarking and provides input to standards bodies.
- Realtime, which jointly operates with the Posix.4 Working Group to explore and evaluate real-time extensions to the Posix standard.
- C++, which discusses object-oriented programming issues related to the C++ language.

To join one of these subcommittees or receive further information about the other Unix-related organizations mentioned above, contact Ralph Barker, Uniforum director of technical services, at (408) 986-8840.

JOHN OZSVATH





Okay, so it won't exactly be Tyson-Holyfield, but The Computer Museum's 3rd Annual Computer Bowl still promises to be one of the most exciting quiz games you'll ever witness. Join us ringside for round after round of mind-boggling action as the finest minds in the East and West go head to head. See who ends up on the ropes first. See who beats whom to the punch. But, most important, see who's left standing when all is said and done. The place: The San Jose Convention Center, San Jose, CA. With live broadcast via satellite to The Computer Museum in Boston. Don King, eat your heart out.

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James E. Clark
AT&T Computer Systems

Samuel H. Fuller
Digital Equipment Corporation

John Markoff
The New York Times

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Intel Corporation

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Radio Shack

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The Computer Bowl is a project to benefit the educational programs of The Computer Museum, 300 Congress Street, Boston, MA 02210.

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NATIONAL BRIEFS

Two-time Nobelist dies

▶ **John Bardeen**, who won the 1956 Nobel Prize in physics for his co-invention of the transistor and shared the signal honor a second time in 1972 for his research into superconductivity, died of a heart attack Jan. 30 at the age of 82. Bardeen came from an academic family and devoted much of his life to teaching engineering and physics at the university level. He also won such honors as the Presidential Medal of Freedom and the Soviet Academy of Science's Lomonosovcq Prize for his work, which revolutionized technology.

Out of the Blue

▶ Berkeley, Calif.-based **TRW Financial Systems, Inc.**, purveyor of image-processing systems to paper-intensive corporations, late last month backed away from a co-development alliance with **IBM** that had been announced this time last year. Instead of developing image-based lockbox and remittance products for IBM platforms and Personal System/2-based banking software, TRW Financial Systems, a subsidiary of TRW, Inc., intends to target custom image-based systems at organizations with specialized processing requirements.

Market player

▶ Milwaukee-based **Fiserv, Inc.** advanced its campaign for player status last week in the large commercial bank outsourcing market with the pending acquisition of the principal financial data processing business units of Stamford, Conn.-based **Citicorp Information Resources, Inc.** The move gains Fiserv in-house processing and software systems tailored to the needs of commercial banks and credit unions.

I want my HDTV

▶ The industrial and academic worlds are joining forces to provide the **Federal Communications Commission** (FCC) with a sweeping array of high-definition television (HDTV) technology. Through a joint venture to be known as the American Television Alliance, San Diego, Calif.-based **General Instrument Corp.** and **MIT** will develop all-digital, simulcast HDTV systems to be submitted to the FCC for possible selection as the U.S. standard.

Quality: Take it to the limit

At IBM Rochester, improving product quality is a matter of give and take

BY MICHAEL FITZGERALD
CW STAFF

ROCHESTER, Minn. — Steal shamelessly when it comes to quality.

This is a guiding principal throughout IBM, the company says, but nowhere is it better demonstrated than at IBM's Rochester site, home of the Application System/400 and also a major manufacturer of IBM storage devices. In fact, according to the U.S. Department of Commerce, IBM Rochester's adherence to this maxim and its skill in implementing the good ideas it appropriates were critical in winning it the coveted Malcolm Baldrige National Quality Award this past fall.

Take what you can get

"The policy is to share successful strategies among companies — 'steal shamelessly' is a phrase a lot of people use," said Curt Reimann, the National Institute of Standards and Technology's associate director for quality programs, who oversees the Baldrige competition. "The companies all have great ideas, and they each have ways of taking ideas and converting them for their own environment. It is a central purpose [of the Baldrige awards] to foster that and to create a climate for doing that."

IBM Rochester implements the ideas it finds both within IBM and elsewhere at places such as Motorola, Inc., Xerox Corp. and Milliken & Co.

Now, following what has become a Baldrige winner tradition in the four years since the award's establishment, others will come to Rochester to see what they can "steal" from IBM.

Ironically, IBM Rochester almost skipped the Baldrige competition in what turned out to be its winning year. Only one year ago, the plant's top managers gathered here to make what would be their biggest decision for 1990: whether to reapply for the Baldrige award after being eliminated in the final round the year before.

"There were a lot of dissenting opinions," said Larry Osterwise, who was then general manager at IBM Rochester, the largest IBM plant under one roof. Osterwise, who last month was named vice president of IBM's U.S. market-driven quality and assessment group and was succeeded at Rochester by general manager Robert Unterberger, said the site's managers agreed that the Baldrige application process had been worthwhile. However, he said, they were worried about what it might do to morale if they tried and lost again.

"We finally all said, 'Look, we're going to have to become a little mature about this,' " Osterwise said. "We're doing this because we'd like to win an award, but the primary reason is because we want to learn about ourselves. So if we lose again, we'll get over the disappointment. We'll just be that much better."



Stepping up the quest for quality

In search of "undisputed leadership in customer satisfaction" and guided by the qualification requirements for the Malcolm Baldrige National Quality Award, IBM's Rochester, Minn., site – the home of the AS/400 – shifted from technology-driven to quality-driven corporate culture. Last fall, the site also brought home the Baldrige award

1986 to 1989	IBM Rochester claims a 30% overall productivity improvement and a threefold increase in product reliability
1986 to 1990	An estimated $300 million invested by IBM in improved processes and information systems yields a 75% decline in capital spending on defect detection equipment and a 55% drop in write-offs as a proportion of manufacturing output
1989	As a direct consequence of IBM Rochester's investment of some 5% of its payroll in education and training, about 33% of the site's employees move into new positions, almost half of them promotional
1990	IBM Rochester, having been a runner-up in 1989, becomes the first computer company to win the Baldrige award

Source: IBM — CW Chart: Paul Mauck

Successful quest

So a quest was renewed from within the 3.6 million sq-ft structure that spreads like the northern plains from which it rises in a locale known for the Mayo Clinic and far from the near-hallowed grounds of computing in the U.S. This time, the pursuit was met with success: IBM's Rochester plant received the Baldrige trophy at an official ceremony Dec. 13.

Management writers, including Tom Peters and Robert Waterman, have long ballyhooed IBM's ability to create an atmosphere that allows its employees to behave like entrepreneurs despite its huge size. That reputation suffered during the late 1980s, however, as IBM stumbled financially and was frequently accused of having lost touch with its customer base.

That may explain why Rochester's management demurred when IBM asked them to represent the company in the first Baldrige competition in 1988, but

Continued on page 73

Ask exec outlines new game plan for Ingres

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — Ask Computer Systems, Inc. has an "action plan" to bring its new Ingres database division into step with the approximately $400 million business, top Ask executives said last week.

The plan was designed to change Ingres' former strategy of shadowing large relational database management systems rival Oracle Systems Corp., according to Eric Carlson, Ask's executive vice president of product operations. Carlson, one of three Ask executives reporting directly to Chief Executive Officer Sandra Kurtzig, is in charge of all research, product development and manufacturing at Ask.

"When you're second in a sailboat race, you don't take the same tack as the leader, especially if they're heading into a storm," Carlson explained, referring to Oracle's current financial troubles.

Instead, Ask intends to "grow" Ingres' database market share through a network of business partnerships with major systems vendors, including Hewlett-Packard Co. and Digital Equipment Corp.



Ask's Carlson *puts database plan into action*

Ask is also requesting that some systems vendors, such as Pyramid Technology Corp., help underwrite the cost of "porting" to the Ingres database. This will relieve some pressure on Ingres' 300-person product development team, according to Carlson.

Meanwhile, he said, Ask's Application Product Division will be fashioned into a 200-person "software factory" that turns out ready-to-use software applications for open systems Unix machines and proprietary DEC, HP and IBM Application System/400s.

"We are modeling ourself on Microsoft Corp., which is a company that partners very well, sells much of its product through indirect sales channels and delivers a complete set of tools and applications for its market [of desktop computers]," Carlson said.

Recently, Carlson said, he has spent two days of every week overseeing the Ingres division's business plans and reducing the overall number of commitments to support multiple versions of its DBMS and software tool products. Prior to its October 1990 acquisition by Ask, Ingres had made commitments to maintain 47 different "ports" — a lineup second only to Oracle's 80 hardware platforms.

Open environments

Now, Carlson said, Ask will support nine standard "open systems software environments," which together account for the majority of hardware platforms.

Ask will arrange with systems vendors to share responsibility for supporting platforms not covered by open systems.

No Ingres products will be abruptly discontinued, Carlson said. He added that some will be placed on a "sunset" program for eventual termination, but he declined to cite examples.

Opus picks Sun and Motorola for RISC architecture

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Most reduced instruction set computing (RISC) companies have set up camp in one of five currently competing architectures. However, Opus Systems, an 8-year-old former add-in board company turned systems vendor, is hedging its bets.

Opus has opted for two RISC architectures: Sun Microsystems, Inc.'s and that offered by Motorola, Inc.

In fact, the firm is keeping its options open in more ways than one. In addition to its two-RISC strategy, it has a no-RISC alternative: Opus offers complex instruction set computing (CISC) systems based on Intel Corp.'s CPUs.

Opus' Series 400 Personal Mainframe is based on Motorola's 88000 RISC processor. Its Personal Mainframe 5000 is based on Sun's scalable processor architecture (Sparc). Its Personal Mainframe/8100 and 8200 family uses Intel's 80286 and 80386 processors.

"The [divided allegiance] has its good and bad sides," said Laura Segervall, an analyst at San Jose, Calif., market research firm Dataquest, Inc. "If one or two processors make it in the market, that's good, but it makes you divide your resources."

In marketing its Sparc-based systems, Opus appears to be using a game plan now viewed as traditional in the IBM plug-compatible mainframe market: It is offering its 12.5 million instructions per second workstations at 20% less than Sun's wholesale price.

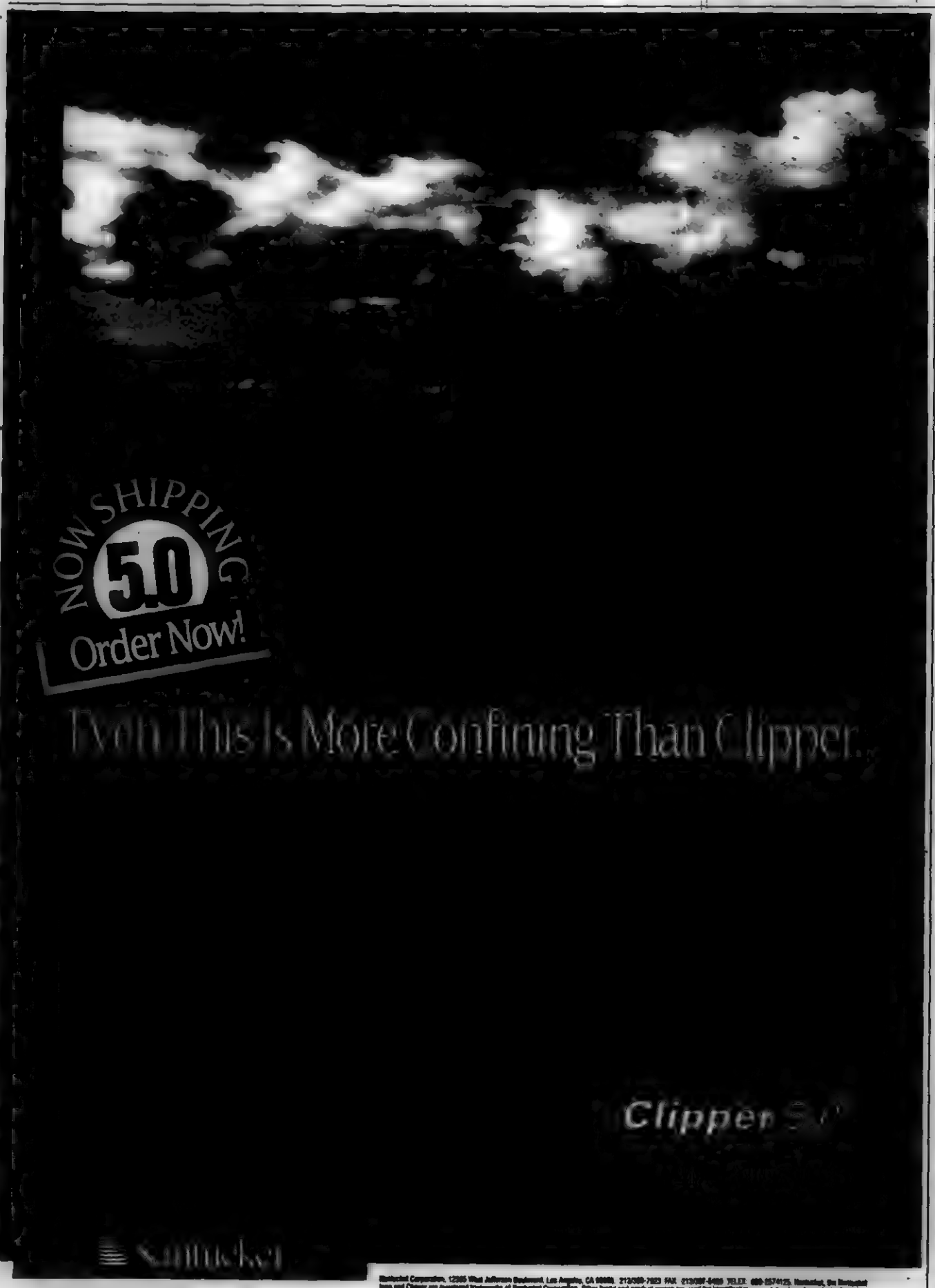
Because Motorola and Intel produce components rather than systems, no such price comparison tactic applies when it comes to selling wares based on their architectures.

Ensuring high volume

In addition to selling Sparc-based systems, one of Opus' side businesses is attempting to ensure that Sparc remains a high-volume RISC architecture. Opus is spreading the availability of Sun's Sparc by providing hardware developer kits through its silicon partner, LSI Logic, Inc., in Milpitas, Calif.

"Twelve of the 15 vendors who unveiled Sparc-based machines at fall's Comdex were based on Sparc kits designed by Opus," said Tom Lacey, vice president of marketing. The kits were developed with LSI Logic as the silicon partner, according to Opus.

Despite its attempts to advance the Sparc market, and conceding that Sun has better volume than Motorola in RISC architecture, Opus will continue to offer the Motorola-based system "because it's a better multiuser chip," Lacey said.



Utility sues NCR, claims system failed

The Cleveland Electric Illuminating Co. has filed a $2 million lawsuit against NCR Corp., charging that NCR's turnkey computer-aided dispatch system was inadequate to meet the public safety needs of Lake County, Ohio.

The county purchased the V8555-based system in the late 1980s but allegedly had many problems with it and later replaced it with one from Digital Equipment Corp. NCR has filed a motion to stay the lawsuit pending arbitration of the dispute.

A similar case occurred in 1988, when a dispute between NCR and the city of Portland, Ore., over the same system was settled out of court at NCR's request. In that case, the computer-aided dispatch system contracted for use was never delivered, and the city had to upgrade its old system.



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32. Programmers, Software Developers
89. Sys. Integrators/VARs/Consulting Mgt.
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INTERNATIONAL BRIEFS

The high price of DRAMs

▶ European personal computer manufacturers that have enjoyed relatively inexpensive Japanese dynamic random-access memory chips during the last year may be in for a period of belt-tightening. According to market research firm **Dataquest, Inc.**, a 10% to 15% price hike is expected in Japan's DRAM market during the course of this year. The cost of Japanese DRAMs is controlled by a complex pricing structure related to individual prices from the country's 11 major chip producers. The 1991 increase is not dramatic in itself, Dataquest analyst James Eastlake told *PC Business World* in London, but it looms large in relation to last year's bargains.

Software en Espanol

▶ **Andersen Consulting** is at work on the design for a building that it hopes will house the first software factory in Spain. Andersen executive **Pablo Navarro** told the Spanish business press that his firm wants the factory to introduce "the concept of manufacturing activity in the development of information technology products." He added that Andersen will rely on computer-aided software engineering tools and software to help it achieve its goal.

Vive la HDTV

▶ In a deal reportedly worth about $16 million in subsidies, Netherlands-based **Philips Telecommunications N.V.** has announced it will set up Europe's first major high-definition television (HDTV) tube-making center in Dreux, France, at a site that reportedly was in danger of being shut down. France will invest some $10 million in the Philips Components manufacturing unit's research and development efforts. Because this amount will be subsidized by regional administrations, Philips is looking at commitments in the $16 million neighborhood.

The chosen few

▶ The **Swedish Agency for Administrative Development**, currently evaluating PCs for networking applications, will soon announce the five firms it has chosen to recommend as "authorized" PC vendors to the Swedish government. When the list comes out, however, **IBM**'s name will be among the missing. According to sources within IBM Sweden, the agency decided to eliminate Big Blue from the testing because of the price involved.

When opportunity knocks . . .

▶ French state-owned **Thomson Consumer Electronics** is taking advantage of the promised post-1992 deregulation of the European Community telecommunications equipment markets with a plan aimed at giving the firm a 10% share of the European telephone terminal market by 1995, according to a report in the British financial press last week. The report said Thomson will kick off its European campaign in the summer of 1992 and will place a $30 million development budget at the project's service during the next three years.

Quality

CONTINUED FROM PAGE 71

management says that the complexity of shifting from System 36 and System 38 production to AS/400 production was the key factor, along with what Robert LaBant, vice president and general manager of Application Business Systems at IBM, called an inability to "appropriately answer some questions."

LaBant acknowledged that seeking the Baldrige award "has changed us." Going through the qualification process, he said, introduced an increased emphasis on benchmarking of department results against those of similar departments at competing firms.

The race for the award also inspired IBM Rochester's closed-loop, in-house communications process, which allows for more efficient and effective interaction between the site's market planners and customer service staff, LaBant said.

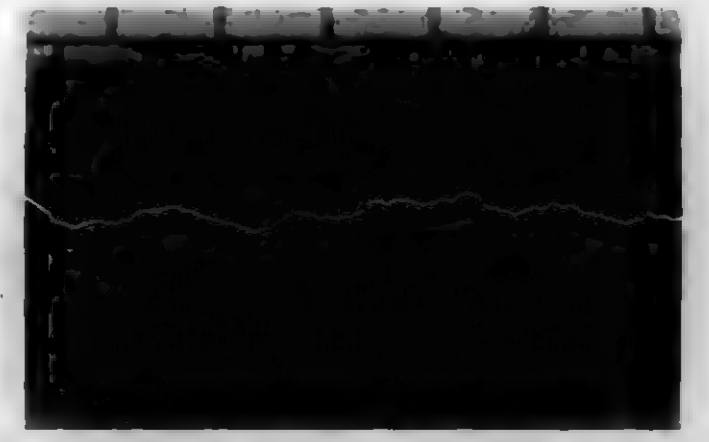
Building from the top down

IBM Rochester's drive for quality, as measured by customer satisfaction, is a top-down effort, LaBant said. After reading a newsweekly's account of complaints from a less-than-ecstatic AS/400 user, he said, he called the user to discuss the issues — and then called Rochester to find out how the paper knew about a user problem of which he was not aware.

One of the things the Baldrige judges noted about IBM in 1989, the year it missed winning the award, was a tendency to reward individuals for their own performances rather than that of their team, Osterwise said. The IBM Rochester crew took the teamwork observation to heart. LaBant told his top managers that they would receive bonuses as a team according to how satisfied customers were with the AS/400. This policy of rewarding the team as well as individuals spread throughout the Rochester plant.

"The real benefit for us is the intense and grueling self-assessments that resulted in changing our jobs," LaBant said.

Improving quality and keeping the customer satisfied have become the buzzwords for all employees at IBM Rochester, and they seem to be developments that are paying off for IBM.



EDUCATION DEVELOPMENT FOUNDATION

The East-West Education Development Foundation, a not-for-profit foundation, is seeking donations of surplus personal computers and peripherals for placement in educational institutions in the USSR and Eastern Europe. The goal of the Foundation is to introduce information technology into the educational system of those countries evolving toward a democratic, free market society. By educating the students on the power of information technology, they will be better equipped to compete in the global market of tomorrow.

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*Under IRS Section 170(e)(3), corporations which donate their inventory (property sold in the normal course of business) to certain charitable educational organizations, receive an additional tax benefit. The deduction will be the total of (a) the donor's tax basis in the donated inventory, plus (b) one-half of the difference between the inventory's tax basis and its fair market value, (c) any incidental costs associated with donating the inventory, such as shipping, postage or warehousing.

Firm cashes in on winning ways

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Banking on a strategy of selling its products before they are developed paid off for Conner Peripherals, Inc. last month when the firm reported record sales for its fiscal year that ended Dec. 31, 1990.

Conner, an OEM of software-driven 2½- and 3½-in. hard disk drives, has operated at a profit at all times in its four-year history, Chief Financial Officer Carl Neun said.

Reported sales for 1990 totaled $1.34 billion, up 90% from $704.9 million in 1989. Net income for the year was $130.1 million, up 213% from $41.5 million one year ago, Neun said.

"I think the increase in sales and income is a continued measure of our basic strategy, which is to sell the product to our customer first and then design it and finally, to build it last," Neun said.

Conner's rapid growth rate earned the company a spot on the New York Stock Exchange last October, and its continued growth has proven it can handle the market, analysts said.

However, Neun acknowledged, "You can't double forever. Clearly, we'd like to continue to grow the company as fast as we can, but we are subject to the cyclical trend of our customers."

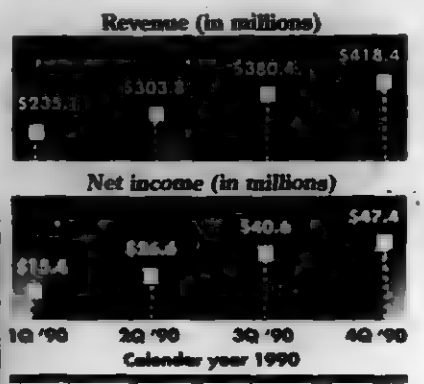
While the company's goal is to reach the "$2 billion range" in total sales by the end of 1991, Conner will be extra cautious during these recessionary times, Neun said.

Widespread caution may already be showing up indirectly in Conner's financials, Neun noted. Sales to Compaq Computer Corp., Conner's biggest customer, accounted for 18% of total sales during the recently closed fourth quarter, down from 20% in fourth-quarter 1989. In 1990, sales to Compaq were down 10% from 1989, he said.

"I think everyone is trying to run their business very prudently under the circumstances," Neun said. Compaq's Wayne Collins, vice president of materials operations, said Compaq has always had a good working relationship with Conner. A Compaq spokesman confirmed that Compaq was one of Conner's initial investors in 1986.

Conner Peripherals, Inc.

Its sell first, build last strategy fueled the disk drive player through yet another boom year



Source: Infocorp CW Chart: Doreen St. John

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IBM Business Partner

AT&T systems work goes on

BY MICHAEL FITZGERALD
CW STAFF

Maligned, excoriated and all but written off since AT&T began its $6.12 billion attempt to "give" its computer operations to NCR Corp. in late December, AT&T's Computer Systems Division is attempting a "business as usual" facade.

So far in 1991, the Computer Systems Division has announced two sales to corporations, a reseller's agreement with Milwaukee-based computer reseller Computer Bay, a franchise of Computers Unlimited of Wisconsin, Inc., several product enhancements and three strategic agreements with other vendors. This is a high level of activity for the Computer Systems Division, according to company executives, and it is not at all the behavior one would expect from an operation that all sides said is about to be dismembered.

Bill O'Shea, the division's vice president of systems marketing and development, acknowledged that the current spate of activity is motivated in part by the desire to keep AT&T employees occupied. However, he added, it will also function to keep them fresh for service in the newly merged organization.

"When you're a company contemplating a takeover, you don't put the business on hold and let things stagnate, even though things may change vastly after the fact," said Robert Kidd, midrange analyst at Dataquest, Inc. in San Jose, Calif.

Yet O'Shea said that the move by AT&T to acquire NCR has employees "certainly more aware of what's available outside of the Computer Systems Division" than they were before. However, there is not a mass exodus under way, he said.

AT&T has said that most of NCR's top management will stay with the company if the merger is completed, according to spokesmen. Also, AT&T told Computer Systems Division employees who are not retained that it will find places within AT&T for as many of them as possible.

Don't blow age issue out of proportion

'Fast track' is a monthly column dedicated to answering questions on career directions.

BY NORM SANDERS
SPECIAL TO CW

Q: I am a computer professional with 23 years of experience, 10 in management. I am female, 52 years old, hold a Ph.D. and am currently unemployed (although I do consulting on a casual basis).

Because I cannot relocate, I apply only for local jobs. I choose only management positions that match my qualifications fairly well. There are at best three such openings per year. Generally, I don't get any response to my letters of inquiry.

It has been suggested that my age is the problem. Employers assume that they will have to pay a higher salary for a more experienced person. Further, the older employee wreaks havoc with the group health insurance policy. Finally, no one wants a subordinate who is older than they are.

Is any of this true?

A: Assuming that you have a fine management record, I don't think the problem is your age. By setting the parameters of location and job level as tightly as you have, it appears to me that you're not giving yourself much opportunity for success.

Simply, you're just going to have to market yourself better and let more opportunities come to you. Have you thought about speaking at local events, writing or getting involved in local community activities in which other business leaders are involved? What do you have to lose by applying for jobs advertised even if you view yourself as overqualified? People might adjust their thinking in organizational structures to suit you if they know a person of your qualifications is available.

My opinion is that the age issue is overblown. If you are looking for it to be a problem and believe it is a problem, it probably will be.

Q: I am looking forward to an early retirement within the next two or three years. I am wondering if there are any opportunities for part-time consulting. I like information systems work, but I'm getting tired of big-company politics and am ready for a rest.

I have more than 25 years of IS experience, including mainframes and personal computers. I am currently an internal consultant for office systems and office systems hardware. I make evaluations and recommendations at the corporate level.

How do I go about finding part-time consulting work? I hesitate going out on my own because I'm concerned it will develop into a full-time job, and that is not what I want. I would rather contract for a specific job, set a price and some dates, then approach it in a leisurely manner.

A: Many people think that consulting is relaxing and easy work that can be accommodated in one's relaxing schedule.

Nothing is further from the truth. In today's world, there is not much consulting money around for people who want to dabble or do things leisurely. Companies have stringent requirements for energetic consultants who can solve problems rapidly and who can get a specific set of tasks done more efficiently than they could be done internally or by another consultant.

When you retire, do it completely for a while. Get your energy and drive back, and then aggressively pursue part-time employment as a consultant if you choose.

The chance of escaping politics as an employee or a consultant is not very likely. That's why some people think about a fishing career on a secluded island.

Q: I have a master's degree in economics and more than 15 years of IS experience in positions from entry-level programmer to manager of systems and programming. My career has taken me to Europe, Mexico and Saudi Arabia. For the last six years, I have been working for contracting firms in a variety of technical and analytical assignments.

Should I seek out permanent employment in a more traditional environment again? If so, when? The alternative would be to remain in contracting/consulting. If I choose that option, how do I select the type of firm with which to build a career?

A: Your value to a company, particularly at a senior-management level, is a function of your background and experience. Obviously, your international background and experience might be very useful to a company whose needs and problems duplicate those areas in which you have the maximum experience. You are probably well-connected with companies operating in those arenas, and your network of contacts into those firms is possibly your strongest bet for connecting with a company.

As for the "traditional environment," I'm not sure there are many traditional opportunities any more. There are so many people vying for each senior position open today that the chance of your being given the nod over someone who has had virtually identical experience in the "traditional environment" is truly a long shot. That is not to say that it is impossible; I believe your better chance is to have your services engaged by a company in the contracting/consulting area and try to network those jobs into a more permanent relationship.

FAST TRACK
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Sanders is president of Hazlet, N.J.-based Norm Sanders Associates, a se[illegible] level IS [illegible]

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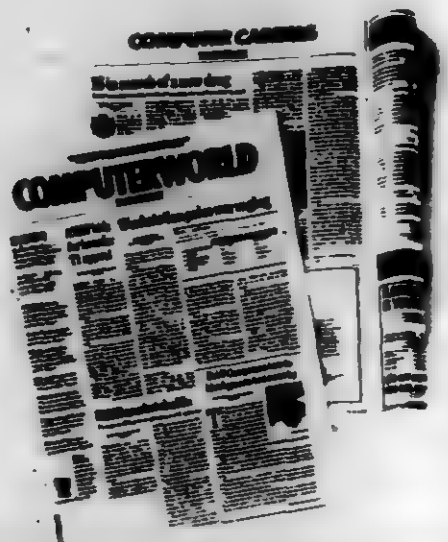
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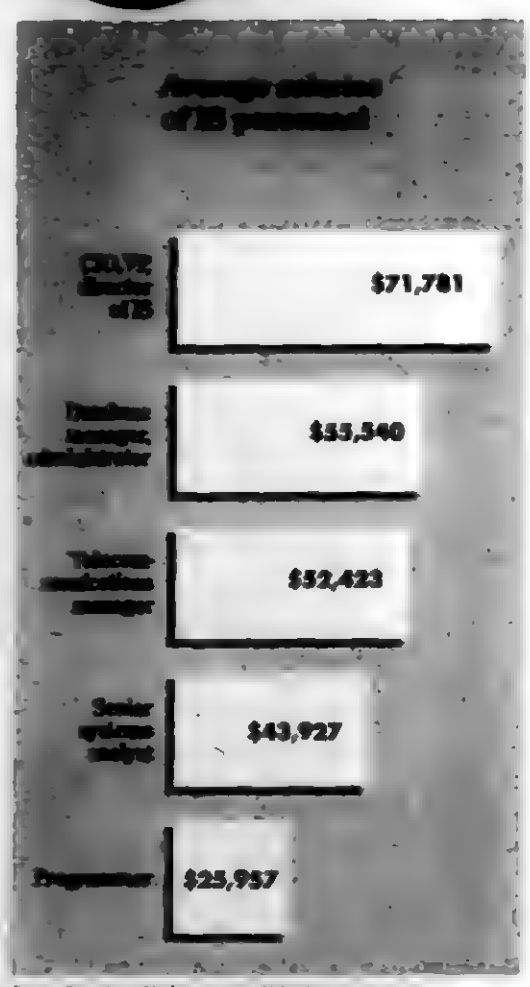


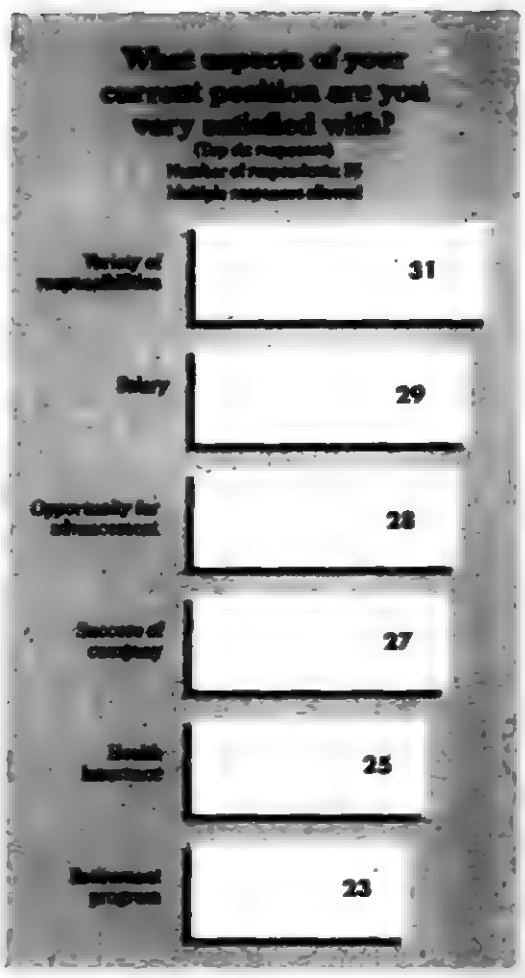
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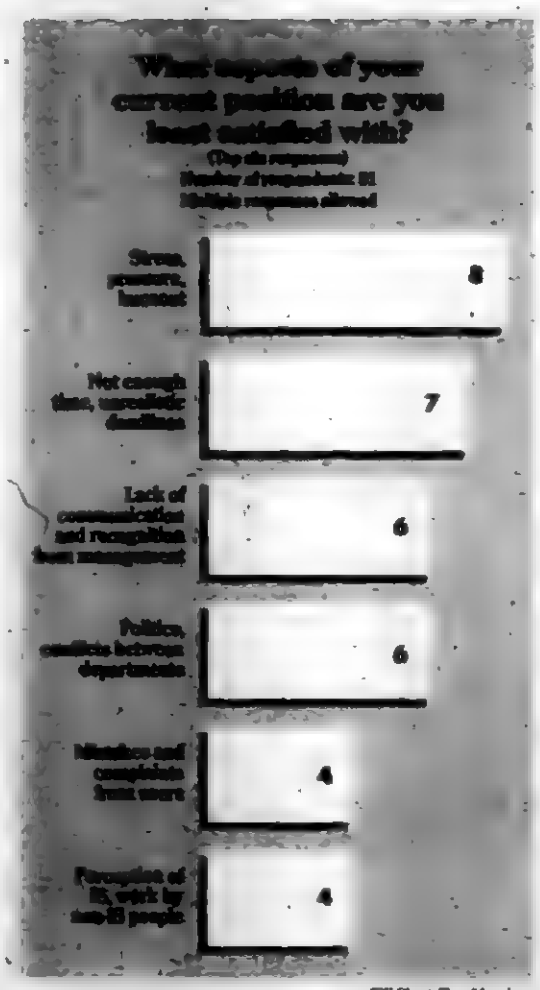
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Source: Computerworld salary survey and job satisfaction survey

CW Chart: Tom Monahan

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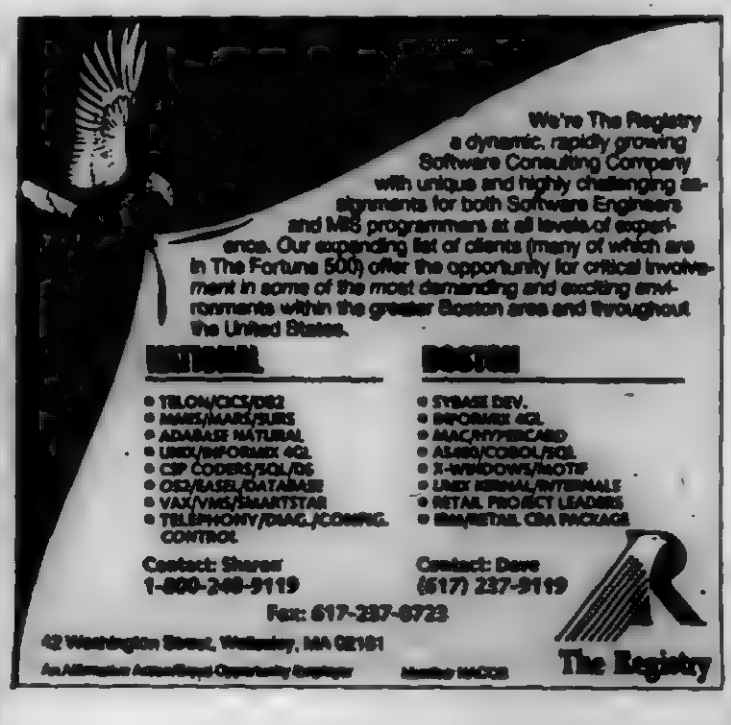
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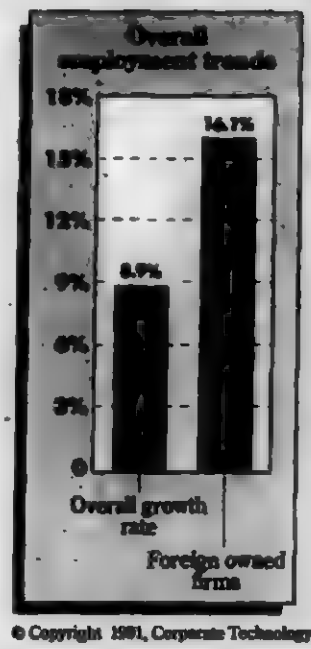
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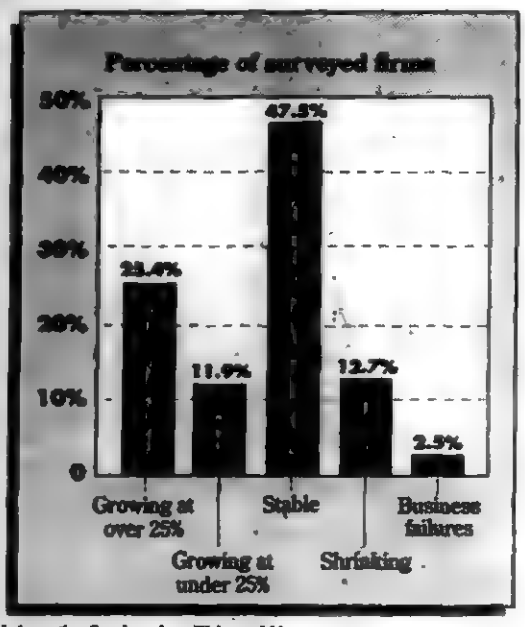
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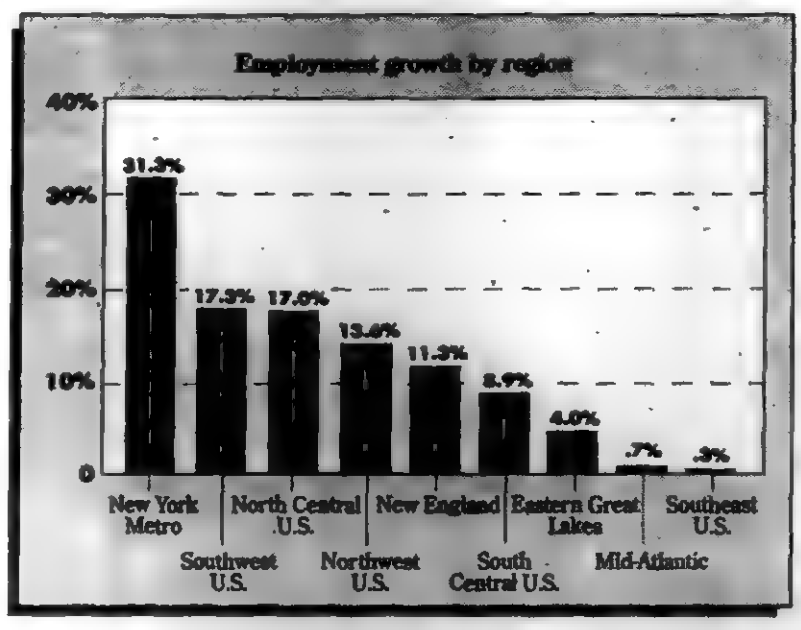
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Challenges created by Windows' popularity

BY JESSICA KEYES
SPECIAL TO CW

The growing popularity of Microsoft Corp.'s Windows 3.0 in many corporations causes unique problems for software developers creating applications in a windowing environment. These problems are gradually being addressed by new development tools being delivered by a number of vendors. However, information systems managers must take care to navigate the differences among these new solutions.

First, IS managers asking their staffs to develop Windows applications should be aware that graphics programming is fundamentally different from text-based programming. For example, just creating a window that displays the word "hello" can take hundreds of lines of code. All of the default characteristics that define how the window behaves on the screen have to be programmed from scratch. Thus, hundreds of lines of code are required to select the standard fonts, handle scrolling and control the use of the mouse.

In addition, applications must be structured quite differently from traditional applications to accommodate a more flexible user interface. Instead of the application program controlling the user interaction, the windowing environment is now in control.

For instance, when the user selects a menu item or clicks the mouse, the windowing system sends a message informing the window of the event that must take place. Windows systems are often called "event-driven" or "message-driven" because of this interaction.

Developing in such a foreign and difficult environment — Windows 3.0 contains more than 450 callable functions that a programmer must learn — coupled with an often unyielding development schedule makes it necessary for IS managers to find a package that gets programmers up to speed as quickly as possible.

Fortunately, there are a number of tools on the market that can turn a Windows novice into a Windows maven in practically no time.

With the wide price range of $395 to $3,500 (with the higher price providing more memory and capabilities), these products unlock the potential of graphical user interface development. However, before buyers jump into making a purchase, they should be aware of some of the windowing tool sets' strengths and weaknesses:

• **Keyboards vs. mice.** There's really no secret to using a mouse rather than a keyboard — it's just another peripheral to the computer. What's different is the context in which the mouse is used for developing applications.

The keyboard is generally used to type character strings or to access any one of a number of function keys. Programming with a mouse necessitates understanding how to program things through Cobol routines such as list boxes, buttons, resizing of windows, highlighting variable character strings and even using the mouse to drag objects from one area of the display to another.



• **Object orientation.** All development tools for windowing environments are object oriented. Object-oriented programming is now widely accepted by many as the best way to manage software complexity — especially the complexity of programming in a windowing environment.

One trait of an object-oriented system is an object's ability to inherit attributes from a parent. In a windowing environment, this enables an easier development of sophisticated windows. A complex window that contains list boxes, scroll bars, menus, dialog boxes and buttons can be mocked up easily because each of them automatically inherits all of the standard windowing behaviors.

• **Multiplatform considerations.** Companies with multiple platforms should choose their tools wisely. Not all tools will work on all platforms. For example, the windowing standard for non-IBM Personal Computer platforms is not Microsoft's Windows. Workstations, minicomputers and even IBM reduced-instruction set computing systems use the X Window System standard.

From the application programmer's perspective, the best tool would be the one that works the same regardless of platform. In other words, let the software take care of the differences between X Window and Microsoft's Windows.

• **Disk and memory requirements.** Most development tools for Windows have high memory requirements. Some of the higher end products require a minimum of 10M bytes of free disk space plus at least 4M bytes of memory. If all you need to do is develop windowing applications and you don't need a robust, full-blown application development environment, stick to the lower end, lower requirement and lower price offerings.

• **Software support.** Because there is such a learning curve in understanding how to use windowing tool sets, the most valuable asset for developers will be their ability to call for assistance.

Windows development software:
- Toolbook by Asymetrix Corp. ($395)
- Knowledgepro/Windows by Knowledge Garden, Inc. ($695)
- Actor by The Whitewater Group, Inc. ($895)
- Smalltalk by Parcplace Systems ($3,500)
- C++/Views by CNS, Inc. ($495)

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

Buy/Sell/Lease

The BoCoEx index on used computers

Closing prices report for the week ending February 1, 1991

	Closing price	Recent high	Recent low
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XT Model 086	$500	$550	$450
XT Model 089	$500	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$795	$1,025	$700
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,000	$1,300	$1,000
PS/2 Model 60	$1,500	$1,900	$1,400
PS/2 Model 70P	$3,000	$3,500	$2,500
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Apple Macintosh Plus	$800	$975	$700
SE	$1,200	$1,450	$1,100
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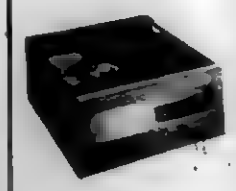
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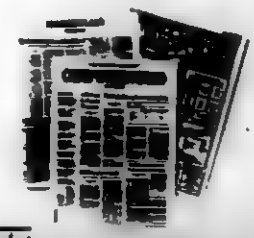
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Business as usual for disabled

BY LISA GUISBOND
SPECIAL TO CW

At first blush, training disabled people to become productive information systems professionals may seem to pose unique challenges. However, IS trainers say that once the system is made accessible to the student, training disabled people is essentially the same as training anyone else.

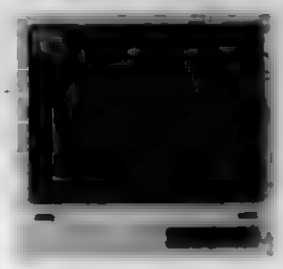
In fact, they say, the greatest obstacle to disabled IS professionals isn't the training environment but the attitudes of potential employers who aren't convinced of the disabled person's capabilities.

Attitudes like this prevent employers from tapping a vast pool of potential IS employees, given the fact that IS positions are often well-suited to a disabled person's capabilities and limitations.

"All across the board, for many disabled people, computers are a fantastic opportunity. It doesn't generally require a tremendous amount of mobility, and it does allow a user to rely on one sense or another," says Gil Mann, chairman of Minneapolis-based Learn-PC, a producer of videotape-based personal computer software training systems.

Jim Vagnoni, executive director of the University of Pennsylvania's Center for Information Resources (CIR), has 15 years of experience with IS training for the disabled. CIR offers a variety of IS training programs for disabled people and provides three-month internships in-IS work environments.

According to Vagnoni, CIR's philosophy is to adapt to the person, not the disability. Before the student begins training, CIR staffers work with the individual to make whatever accommodations are necessary. In many cases, these accommodations are extremely low-tech and low-cost: For example, a cigar box with a felt pad used by a student with muscular dystrophy to rest his wrists on, accommodates the fact that he has movement only in his hands and fingers.



Once the student and staff settle on an assistive device, it belongs to that student and can be taken with him to his job when he is placed. Obviously, Vagnoni says, students with vision impairment require more sophisticated accommodations, such as speech-output software.

While recognizing the tremendous advances that have been made in assistive technology in recent years, Vagnoni says he sees a great opportunity for further research and development. Despite the profusion of devices that have appeared during the past year, many are still in a crude state of development, he says. "I'm a real skeptic about some of the products that are out there. They're just overpriced and unnecessary."

Whatever the assistive device, CIR maintains the philosophy of adapting to the individual. That approach has apparently worked well for the program, which has placed more than 90% of its graduates in full-time IS jobs since the program started in 1976.

One resource developed for training hearing-impaired IS workers has been used successfully by the federal government and Gallaudet University, among others. Learn-PC's video-based software training products come with closed-captioning so that both hearing and hearing-impaired workers have access to the same training.

"Our videos were already done and were proven effective with hearing employees, so all we did was take the same training curriculum and encode closed-captioning within the video," Mann says.

The interest generated by this product has prompted Mann to begin compiling a resource guidebook of assistive technologies and resources that are available free to the public. He says he expects it to be completed soon.

Hot line available

There are several other services that aid in finding assistive technologies. The Job Accommodation Network, a publicly and privately funded resource hot line in Morgantown, W. Va., can help employers find assistive technologies or address compatibility issues free of charge.

IBM offers a service called the National Support Center for Persons with Disabilities, based in Atlanta. While the IBM service cannot prescribe a specific piece of technology, it does provide information on available technology for mobility, hearing, speech, learning and vision impairments.

Another IBM program that focuses on IS training for the disabled looks beyond the use of assistive devices and brings together state vocational rehabilitation agencies, business representatives and training agencies to establish self-sustaining computer training programs for the disabled. Irv Kaplan, manager of IBM's Rehabilitation Training Programs, explains that the goal of the programs is to overcome the barriers for the disabled.

"We're doing networking. We're getting people who are the movers and shakers in the programming business — or whatever business you happen to be training people for — directly involved with the students and the program. We're giving them technical control of the contents of the training," Kaplan says.

Kaplan adds that he doesn't emphasize technical accommodation because it hasn't been a major issue in most cases. "That doesn't mean there isn't somebody here and there [who needs technical accommodation]."

Kaplan and others in IS training for the disabled stress that opportunity and access — not special training techniques per se and certainly not special treatment — are really the issues.

David Castel, vice president of human resources and enterprise at Abilities, Inc. of Florida in Clearwater, is adamant on this point. His company comprises a rehabilitation training group for people with physical disabilities and a group of profit-making businesses that hire some graduates of the training program. "All any person with a disability is asking is: First, make the work location accessible, and second, keep the scorecard the way you would for any employee who's not in a wheelchair or doesn't have a disability. Period."

Guisbond is a free-lance writer based in Cambridge, Mass.

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COMPUTERWORLD

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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

UPGRADED FROM HOLD TO BUY: **Silicon Graphics, Inc.** (Bear Stearns & Co.). Reason: Expanded markets, excellent management, strong balance sheet; demand for workstations greater than expected.

UPGRADED FROM HOLD TO BUY: **Intel Corp.** (Bear Stearns). Reason: Earnings growth to jump because of big demand for 80386SX-based notebook computers; 1486 chip business to pick up as prices on those machines drop.

UPGRADED FROM AVOID TO HOLD: **Seagate Technology, Inc.** (Bear Stearns). Reason: Gained share in 3½-in. disk-drive arena; second-quarter earnings higher than anticipated.

UPGRADED FROM BUY TO STRONG BUY: **Microsoft Corp.** (Alex. Brown & Sons, Inc.). Reason: Windows 3.0 is most powerful product-cycle story in desktop industry; strong international sales expected.

DOWNGRADED FROM BUY TO MODERATELY ATTRACTIVE: **Microsoft** (Donaldson, Lufkin & Jenrette, Inc.). Reason: Stock price has appreciated too much recently; competitive climate in Windows applications world to thicken in near term.

DOWNGRADED FROM BUY TO HOLD: **Autodesk, Inc.** (Prudential-Bache Securities, Inc.). Reason: Last quarter's profits fell short of estimates; delays in key products such as foreign language and Intel 80286-based versions of Autocad Release 11.

DOWNGRADED FROM HOLD TO AVOID: **Tandem Computers, Inc.** (Bear Stearns). Reason: Current cost-cutting measures not enough; new products slated for 1991's second half raise tough product transition and management questions.

DOWNGRADED FROM HOLD TO SELL: **Amdahl Corp.** (Prudential-Bache). Reason: Quarter just ended may be last good quarter until late this year or early 1992; new M-series machines unlikely to be available in enough volume to boost revenue this year.

ANALYSIS IN BRIEF

Planned technology spending in industries such as manufacturing, government and finance dropped this fiscal year to the lowest level in four years. Most of the 465 information systems executives surveyed said they will defer buying big-ticket items, in part because of the Persian Gulf war.

Projected minicomputer spending declined compared with last year, while mainframe budgets remained flat. The survey unearthed encouraging signs for **IBM, Sun Microsystems, Inc.** and Tandem Computers, as respondents indicated overall favorable attitudes toward these suppliers. Prospects for **Hewlett-Packard Co.** look grim, however, as 30% of current HP sites surveyed said they will cut spending with the firm.

Microcomputer spending will grow, but major personal computer vendors may not necessarily benefit. More respondents said they will install new mission-critical software on IBM Personal Computer-compatible clones rather than on machines from either **Compaq Computer Corp.** or **Apple Computer, Inc.** — *Paine Webber, Inc., U.S. Computer Survey, Jan. 22, 1991.*

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Quarterly sales and profits were up at Advanced Logic Research, Inc., but its share price sunk last week. The microcomputer clone maker lost 1¼ points to close Thursday at 12¾.
- Microsoft Corp. and Novell, Inc. outdid themselves as each firm twice topped 52-week highs last week. By Thursday, Microsoft was up 4⅞ points to 103, while Novell climbed 3 points to 46.
- Despite IBM's suit against it, Comdisco, Inc. jumped 1⅛ points, closing at 25⅛. IBM also gained last week, up 1¾ points to 128½.
- Semiconductor stocks fared well during last week's market rally. Texas Instruments, Inc., which had been losing ground of late, rebounded 2⅜ points to 60¼. Meanwhile, Intel Corp. shot up 3½ points to 49¼, and Motorola, Inc. picked up 1⅜ points, closing at 56⅛.
- Network Systems Corp. tumbled 2⅜ points to 12¼, despite posting favorable financials Thursday.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, FEB. 7, 1991

Businessland Inc.		121.24	Televideo Systems		-24.60						
Ultimate Corp.		78.57	Interleaf Inc.		-20.83						
Informix Corp		44.23	Network Systems Corp.		-17.67						
Masstor Systems		37.50	Data Switch Corp.		-17.24						
Phoenix Technologies		31.58	System Software Assoc.		-8.84						
Microsoft Corp.		4.87	System Software Assoc.		-3.25						
Computer Sciences		4.00	Network Systems Corp.		-2.83						
Intel Corp.		3.50	AST Research Inc.		-2.00						
Matsushita Electronics		3.50	Digital Equipment Corp.		-1.63						
Southwestern Bell		3.24	Borland Int'l		-1.63						

Each	52-Week	Range		Feb. 7 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Up 4.19%
OTC	19.00	5.38	3 COM Corp.	9.50	2.12	28.73
NYS	69.75	52.50	American Info Techs Corp.	67.88	2.37	3.64
NYS	44.13	29.00	AT&T	34.13	1.38	4.20
OTC	9.63	0.88	Antel Communication Corp	3.13	0.50	18.82
NYS	56.25	39.50	Bell Atlantic Corp.	49.88	1.38	2.84
NYS	57.63	48.00	Bellsouth Corp.	52.13	-0.38	-0.71
OTC	16.38	8.25	Compression Labs Inc.	14.38	0.74	5.47
NYS	37.50	23.38	Contel Corp.	37.50	1.50	4.17
OTC	4.38	1.75	Data Switch Corp.	3.63	-0.76	-17.24
NYS	28.75	8.88	Digital Comm. Assoc.	16.00	2.62	19.58
OTC	21.00	12.25	Dynatech Corp.	21.00	0.25	1.20
OTC	72.88	5.50	Fibronics Int'l Inc.	8.75	0.87	11.04
OTC	4.00	1.75	Gandalf Technologies Inc.	2.63	-0.69	-2.42
NYS	4.75	1.63	General Datacomm Inds.	2.75	-0.13	-4.51
NYS	34.13	23.50	GTE Corp.	30.38	1.25	4.27
OTC	7.00	0.81	Intecom Systems Corp.	1.00	-0.06	-5.66
NYS	60.88	40.25	ITT Corp.	55.00	3.12	6.01
OTC	44.13	17.88	MCI Communications Corp.	24.00	-0.38	-1.56
OTC	21.00	2.75	Microcom Inc.	4.88	0.63	14.71
NYS	34.38	4.63	Network Equipment Tech.	5.25	0.87	19.86
OTC	14.63	4.00	Network General	10.50	-0.75	-6.67
OTC	15.25	8.00	Network Systems Corp.	12.25	-2.63	-17.67
NYS	29.63	22.13	Northern Telecom Ltd.	28.75	1.00	3.60
OTC	46.00	14.25	Novell Inc.	46.00	3.00	6.98
NYS	69.50	57.13	Nynex Corp.	73.88	2.88	4.05
NYS	47.88	36.25	Pacific Telesis Group	42.88	1.63	3.94
ASE	10.50	4.75	Paradyne Corp.	10.50	-0.50	-4.55
NYS	20.13	8.88	Scientific-Atlanta Inc.	15.88	2.24	16.47
NYS	59.50	47.25	Southwestern Bell Corp.	55.38	3.24	6.22
NYS	46.38	30.63	United Telecom	34.50	-0.13	-0.63
NYS	48.50	32.38	US West Inc.	38.26	0.13	0.33
Computer Systems						Up 5.91%
OTC	8.75	0.56	Alliant Computer Sys.	1.00	0.00	0.00
ASE	18.88	10.00	Amdahl Corp.	16.00	0.12	0.76
OTC	57.75	24.25	Apple Computer Inc.	57.75	2.25	4.06
OTC	13.88	4.25	Archive Corp.	7.00	-0.13	-1.82
OTC	45.00	12.38	AST Research Inc.	45.00	-2.00	-4.26
NYS	6.88	3.88	Bolt, Beranek & Newman	6.13	-0.25	-4.00
NYS	16.25	4.50	Commodore Int'l	16.25	0.82	3.97
NYS	89.50	35.50	Compaq Computer Corp.	89.50	-0.30	-0.71
OTC	4.25	0.13	Computer Automation Inc.	1.25	0.25	25.00
NYS	21.63	6.75	Control Data Corp.	12.75	1.87	17.19
NYS	20.88	8.38	Convex Computer	15.88	0.34	1.57
NYS	51.25	20.00	Cray Research Inc.	38.63	-0.13	-0.32
NYS	13.25	3.50	Data General Corp.	8.50	-0.50	-5.56
NYS	3.88	0.75	Datapoint Corp.	2.25	0.25	12.50
OTC	24.25	4.63	Dell Computer Corp.	24.25	1.62	7.16
NYS	95.13	45.50	Digital Equipment Corp.	70.00	-1.63	-2.28
NYS	38.13	13.75	Harris Corp.	25.88	3.13	13.74
NYS	50.38	24.88	Hewlett-Packard Co.	38.25	-0.63	-1.62
NYS	128.50	95.50	IBM	128.50	1.62	1.28
OTC	14.00	7.75	Information Int'l	9.25	1.25	15.63
OTC	23.50	10.50	Intergraph	18.75	1.69	9.89
NYS	3.88	0.88	MAI Basic Four Inc.	1.00	0.00	0.00
NYS	160.88	114.00	Matsushita Electronics	130.50	3.50	2.76
OTC	28.00	9.00	Mentor Graphics Corp.	15.63	-0.38	-2.34
NYS	92.88	44.50	NCR Corp.	88.25	1.37	1.58
OTC	35.50	11.00	Pyramid Technology	19.50	1.25	6.85
OTC	24.00	9.75	Sequent Computer Sys.	14.00	-0.50	-3.45
NYS	40.88	18.00	Silicon Graphics	38.00	2.75	8.27
NYS	29.00	14.63	Stratus Computer Inc.	27.50	0.12	0.44
OTC	37.25	15.00	Sun Microsystems Inc.	29.50	1.12	3.95
NYS	30.13	8.88	Tandem Computers Inc.	14.50	0.87	6.38
NYS	39.50	29.50	Tandy Corp.	32.25	1.50	4.88
OTC	35.50	6.75	Teradata	15.25	-0.38	-2.43
NYS	9.00	1.38	Ultimate Corp	4.25	1.87	78.57
NYS	17.13	1.75	Unisys Corp.	2.88	0.38	15.00
ASE	6.25	2.00	Wang Labs Inc. (B)	2.88	0.13	4.56
Software & DP Services						Up 6.93%
OTC	50.75	17.00	Adobe Systems Inc.	38.50	1.50	3.95
OTC	40.25	16.50	Ashton Corp.	40.25	2.75	7.33
OTC	22.88	10.50	American Mgmt. Systems	22.88	1.50	7.08
OTC	16.25	7.50	American Software Inc.	16.50	-0.25	-1.49
NYS	4.50	1.38	Analogic Inc.	2.38	0.00	-0.21
OTC	23.50	10.00	Analysts Int'l	16.25	0.00	0.00
OTC	15.13	4.88	Ashton Tate	6.75	-0.13	-1.89
OTC	10.25	4.00	ASK Computer Sys.	6.88	0.88	14.58

Each	52-Week	Range		Feb. 7 Close	Wk Net Change	Wk Pct Change
NYS	62.63	15.25	Auto Data Processing	62.63	2.88	4.81
OTC	60.25	32.00	Autodesk Inc.	46.25	0.75	1.65
OTC	25.50	12.00	BGS Systems Inc.	25.25	0.75	3.06
OTC	38.50	17.75	BMC Software Inc.	38.50	1.62	4.39
OTC	21.50	11.00	Boole & Babbage Inc.	12.25	-0.50	-3.92
OTC	50.00	10.63	Borland Int'l	48.38	-1.63	-3.25
NYS	11.88	0.88	Businessland Inc.	2.50	1.37	121.24
OTC	12.25	4.25	Cognos Inc.	12.25	-0.38	-3.01
NYS	16.88	4.38	Computer Associates	9.50	1.12	13.37
OTC	17.25	7.75	Computer Horizons	15.00	-0.25	-1.64
NYS	56.50	36.75	Computer Sciences	56.50	4.80	7.82
NYS	12.25	5.63	Computer Task Group	9.25	-0.25	-2.63
OTC	25.25	14.00	Comshare Inc.	19.25	0.75	3.17
NYS	16.00	3.75	Corporate Software	9.00	-0.25	-2.70
NYS	45.75	24.38	General Motors (cl e)	45.75	0.75	1.67
OTC	18.25	7.85	Goal Systems Int'l	16.75	2.00	13.56
OTC	4.75	1.88	Hogan Systems Inc	3.75	0.62	19.81
OTC	9.75	5.00	Indsr Technology	8.50	0.87	11.40
OTC	16.62	7.75	Information Resources	14.25	0.62	4.55
OTC	17.50	2.63	Informix Corp	4.88	1.50	44.23
OTC	7.88	1.38	Intellicorp Inc	2.13	0.38	21.43
OTC	8.00	2.50	Interleaf Inc.	4.75	-1.25	-20.83
OTC	31.50	10.00	Knowledgeware Inc.	31.50	2.75	9.57
OTC	35.75	16.75	Legent Corp	36.75	0.12	0.34
OTC	39.25	12.50	Lotus Development	19.50	2.75	16.42
OTC	28.25	13.63	Mentergraphs	25.00	2.50	10.84
OTC	103.00	48.00	Microsoft Corp.	103.00	4.87	4.96
NYS	10.13	4.00	On Line Software Int'l	7.13	-0.38	-5.00
OTC	28.38	4.88	Oracle Systems	10.13	1.13	12.58
NYS	17.88	7.00	Parasophic Systems	11.38	0.88	8.33
OTC	8.75	1.25	Phoenix Technologies	8.75	1.62	31.58
NYS	48.25	30.75	Policy Management Sys.	48.25	1.75	3.89
NYS	23.63	11.50	Reynolds & Reynolds	17.38	-0.13	-0.71
OTC	18.13	6.88	Sage Software Inc.	8.13	1.38	17.74
OTC	22.25	14.50	SEI Corp	22.25	3.00	15.58
OTC	18.38	12.00	Shared Medical Systems	16.38	1.24	8.23
OTC	28.00	12.00	Software Publishing Corp.	24.50	2.25	10.11
NYS	11.00	5.50	Sterling Software	10.13	1.63	19.13
OTC	28.00	9.50	Sungard Data Sys.	14.75	2.37	19.14
OTC	37.50	16.25	Symantec Corp	37.50	0.75	2.04
NYS	24.88	4.50	System Center Inc.	5.25	0.25	5.00
OTC	39.50	12.75	System Software Assoc.	33.50	-3.25	-8.84
OTC	27.38	4.75	Wellfleet	13.00	0.62	5.01
Semiconductors						Up 6.38%
NYS	25.88	17.63	Advanced Micro Devices	22.63	2.25	11.02
NYS	8.75	5.50	Analog Devices Inc.	8.75	0.87	11.04
OTC	23.50	5.25	Chips & Technologies	11.00	0.87	8.59
OTC	52.00	28.00	Intel Corp.	49.25	3.50	7.65
NYS	13.00	5.13	LSI Logic Corp	8.00	0.50	6.67
NYS	16.38	6.75	Micron Technology	11.50	-0.88	-7.11
NYS	58.38	45.75	Motorola Inc.	56.13	1.38	2.51
NYS	8.88	3.00	National Semiconductor	6.25	0.37	6.29
NYS	44.00	22.50	Texas Instruments	60.25	2.87	7.88
OTC	12.25	3.00	VLSI Technology	8.81	-0.19	-2.07
ASE	14.88	4.00	Western Digital Corp.	8.38	1.00	18.48
Peripherals & Subsystems						Up 5.40%
OTC	2.38	0.09	Alloy Computer Prod.	0.13	-0.01	-3.85
OTC	2.00	0.88	Apertus Technologies	2.00	0.25	14.29
OTC	24.00	7.50	Banctec Inc.	10.13	1.62	18.12
ASE	6.13	3.13	Cognitronics Corp.	6.13	0.25	3.11
NYS	31.25	12.38	Conner Peripherals	27.75	1.00	3.74
ASE	22.00	7.00	Data-tem Corp.	10.25	-0.25	-2.38
NYS	10.50	4.13	EMC Corp.	8.25	-0.63	-4.35
NYS	43.88	33.75	Eastman Kodak Co.	43.88	1.24	2.92
OTC	8.50	4.38	Emulex Corp.	8.00	0.76	10.34
OTC	34.50	14.00	Evans & Sutherland	23.50	2.75	13.25
OTC	6.25	3.13	Iomega Corp.	4.94	-0.06	-1.24
OTC	22.50	6.00	IPL Systems Inc.	22.50	1.25	5.88
OTC	2.06	0.13	Magstar Systems	0.69	0.19	37.80
OTC	17.00	2.63	Maxtor Corp.	4.63	0.88	23.33
OTC	11.75	3.88	Micropolis Corp.	11.75	0.75	6.82
NYS	91.38	73.63	3M Corp.	87.25	2.37	2.79
OTC	14.50	6.00	Prestonix Inc.	8.00	0.25	3.23
OTC	21.25	8.50	QMS Inc.	13.50	0.37	2.04
OTC	25.75	8.88	Quantum Corp.	22.50	1.75	8.43
NYS	6.88	4.38	Recognition Equipment	5.75	0.50	9.52
OTC	9.88	4.00	Reton Inc.	7.00	-0.25	-3.70
OTC	19.75	5.63	Seagate Technology	14.25	0.75	5.56
NYS	35.25	11.00	Storage Technology	28.13	-0.63	-2.17
OTC	4.00	0.63	Tandon Corp.	3.06	0.25	9.00
NYS	20.75	11.63	Tokyonics Inc	20.75	1.00	5.06
OTC	0.63	0.16	Televideo Systems	0.19	-0.06	-24.00
NYS	56.75	39.00	Xerox Corp.	48.88	1.13	2.32
Leasing Companies						Up 9.23%
OTC	10.75	6.88	Amplicon Inc.	10.75	1.50	16.22
OTC	4.38	0.31	Capital Associates	0.50	0.06	13.64
NYS	28.50	14.88	Comdisco Inc.	25.13	1.13	4.69
OTC	16.25	9.25	LDI Corporation	12.00	1.25	11.63
OTC	5.88	2.25	Silicon Valley Inc.	2.50	0.00	0.00

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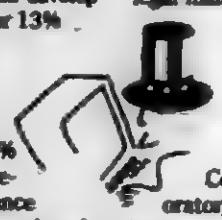
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U.S. budget shines on high-tech

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Despite the financial pressures brought on by war, deficits and troubles in the banking industry, the Bush budget for fiscal 1992 earmarks generous increases for some high-technology programs, including computing and communications.

President Bush asked for $76 billion for research and development, up $8.4 billion or 13% from last year. He also asked for $149 million in new funding — a total of $638 million, up 30% — for a program to develop high-performance computer hardware and software and a gigabits-per-second National Research and Education Network (NREN). It is the first time Bush has sought increased spending for the program, originally proposed by Sen. Albert Gore (D-Tenn.) several years ago.



However, would-be recipients of the largess are not counting their funds until they are hatched. The budget contains spending proposals. Real funds must be appropriated by Congress later this year.

The budget seeks a 19.5% increase for the National Institute of Standards and Technology (NIST), whose computer activities are to get a 26% boost to $15 million. The increase will fund stepped-up work in computer security and a centralized clearinghouse for tracking and responding to computer viruses.

NIST has come under fire for its alleged failure to carry out its legal mandates for civilian computer security and has responded by blaming a lack of funds. James H. Burrows, director of NIST's National Computer Systems Laboratory, said the increased budget will allow the agency to do much more but that an earlier look at its needs suggested it may still be $1 million short.

Part of the extra funds will go to helping NIST coordinate vendors and agencies in the adoption of Integrated Services Digital Network (ISDN) standards, an area Burrows said had been "run on a shoestring." NIST will also work with other agencies in applying ISDN standards to the planned transition of the NREN to commercial operation [CW, Nov. 26]. "We'll look at whether the standards can be used for new things. If not, how do they need to be changed?" he asked.

The White House has requested $2.7 billion — a boost of 17.5% — for the National Science Foundation. The largest increase — 23% to $229 million — is to go to the foundation's programs in computer science and engineering, and an additional $42 million is earmarked for work on the high-performance computing and communications initiative.

Several agencies with big data processing challenges got funds earmarked for systems modernization. For example, the Internal Revenue Service is expected to get $451 million — an increase of $173 million or 62% — for overhauling its aging tax-processing software and for new hardware at regional centers. The IRS is also expected to see its funds for ongoing processing of tax forms and returns rise from $513 million to $606 million, up 18%.

The president repeated a call he made last year for a permanent extension of the R&D tax credit, to which Congress has typically given one-year extensions. The proposed credit has the effect of trimming incremental costs of R&D by 20%, but its perennially uncertain status may inhibit multiyear projects.

Congress has been lukewarm about the tax credit because it reduces federal revenue in the short term. But economists argue that it will ultimately boost tax revenue by allowing companies to expand and become more prosperous.

"[Congress] needs to get it through their heads that the tax credit is a revenue enhancer," a spokeswoman for the Computer and Business Equipment Manufacturers Association said.

In the spotlight

The White House used its budget proposals to spotlight various large-scale computer systems. To list a few of high-priority programs — there are 14 or so deemed to be capable enough of top management's attention — it added the Corporate Information Management program of the U.S. Department of Defense and the Federal Bureau of Investigation's Integrated Automated Fingerprint Identification System (IAFIS).

The Corporate Information Management program is intended to eliminate the redundancy in multiple systems for common administrative functions such as payroll. It will identify uniform information requirements and data formats for use by all the military services and defense agencies.

IAFIS will give 63,000 federal, state and local law-enforcement users access to a network that can transmit fingerprint images and criminal histories.

The Bush administration also added five programs to its list of "high-risk" areas. For example, it said the U.S. Army's property and financial systems are not integrated to give financial control over some $200 billion in property.

It also spotlighted the U.S. Department of Agriculture's (USDA) food stamp program because it said $100 million in stamps are illegally exchanged for cash, drugs and weapons annually. The White House hinted that electronic benefits transfer systems being pilot tested by the USDA may be the answer.

Alliances to be announced at Networld

BY JOANIE M. WEXLER
CW STAFF

BOSTON — Vendors will crowd around the Networld '91 Boston dais this week to announce alliances aimed at filling frustrating local-area network interoperability and network management gaps. However, analysts and users do not expect to see many shrink-wrapped breakthroughs.

What LAN managers will glean from the show, they said, is hope for tangible fruits of some vendor unions by the end of the year, along with the cozy feeling that the right vendors are joining forces.

"Even IBM will be demonstrating [Novell, Inc.] Netware and LAN Server coexistence," said Janet L. Hyland, director of network strategy service at Cambridge, Mass.-based Forrester Research, Inc. "This is not a big deal capabilitywise, but it says a lot about IBM's understanding of the importance of LAN interoperability."

Indeed, IBM is expected to announce that ports of Novell's Netware LAN operating system should be available on IBM's OS/2, RISC System/6000 and Application System/400 platforms by the end of 1991, according to Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C. When it becomes a reality, the move will be a major step in uniting networks made by 57% market-share LAN leader Novell with IBM equipment users.

"IBM has decided that there are certain things you can interoperate with, some you can build bridges to and some that require you to get closer to your enemy," Dzubeck said.

The "strange bedfellows" theme could carry over to the Digital Equipment Corp. environment at Networld, according to Hyland. She said she expects a DEC/Novell announcement that addresses the integration of DEC's Pathworks software with Netware. Pathworks unifies MS-DOS, Apple Computer, Inc.'s Macintosh and OS/2 clients with a DEC VMS or Ultrix server on one network.

"I'm afraid customers will find themselves sorely disappointed with today's level of interoperability," Hyland said. "These moves are big but are still only happening at a fairly simple level."

Marc Dodge, manager of United Parcel Services, Inc.'s LAN support group, who will be attending the show, agreed. "All the LAN interoperability stuff so far is at the first two levels of the [Open Systems Interconnect] model. For example, if you have both Netware and Microsoft Corp. LAN Manager networks, you can grab data off one from the other," he said, "but then you have to write some code of your own to do something useful with it."

State of the LAN

Hyland cited "the awful state of LAN management" as another major area to be addressed at the show. This could be good news for Bill Sheehan, director of MIS at the Commonwealth of Massachusetts' Metropolitan District Commission.

Sheehan runs a Banyan Systems, Inc. Virtual Networking Software (Vines) shop and said that he would like to find an inexpensive network analyzer on the show floor. While he acknowledged that Network General, Inc.'s Sniffer protocol analyzer works under the Vines network operating system, "the last time I looked, it was $2,000 to $3,000, which is too expensive," he said.

The ability of personal computer-based LANs to interact with other corporate resources via Transmission Control Protocol/Internet Protocol (TCP/IP) is apt to be addressed at the show, as well. One analyst predicted that Novell will announce support of TCP/IP on its server, which to date has only supported Novell's proprietary IPX/SPX communications protocols.

Network update to ship in March

Novell confirmed reports last week that a maintenance update for Netware 386 will ship in March, along with several connectivity Netware Loadable Modules (NLM) for the new Version 3.11.

In a preview of its announcement at this week's Networld conference, the company also detailed its anticipated price and package restructuring for the newcomer [CW Jan. 21].

Mark Calkins, Novell's vice president of product marketing, said Version 3.11 will begin shipping next month in 20-, 100- and 250-user versions. Prices will be $3,495, $6,995 and $12,495, respectively. Previously, features were grouped in products according to the likelihood that they would be needed by small, medium or large office needs.

"If it has all the features it's supposed to have, it would address my concerns [with Version 3.1]," said Glenn Fund, principal research specialist at Lockheed Sanders, Inc.

Novell described three new sets of NLMs last week, enabling greater interoperability with Apple Computer, Inc.'s Macintosh, Open Systems Interconnect's file transfer access and management and Sun Microsystems, Inc.'s Network File Systems protocols.

Netware Version 3.11 will also include connectivity NLMs for Transmission Control Protocol/Internet Protocol and IBM's Systems Application Architecture (SAA).

Calkins said he could not comment on the technological aspects of Netware for SAA Version 1.0. Reportedly, it would increase performance over a Systems Network Architecture backbone.

Netware Message Handling System Version 1.5 was introduced last week as part of Netware 3.11. The update includes a fan-out feature that will save dial-up communications costs by sending one message over dial-up lines and distributing it to recipients at the other end.

JIM HASH

digital
In Transition

Continued from page 1

Brauckseicker said.

DEC's acceleration toward open systems also holds a distinct appeal because Ralston Purina operates internationally with other vendors such as Hewlett-Packard Co., he said. "I'd love to be able to transport applications transparently between domestic and international," Brauckseicker added.



Brauckseicker: Just *nothing to lose*

In New York, the Maynard, Mass.-based DEC has forged another sort of customer relationship with Quotron Systems, Inc. to jointly produce an interbank foreign exchange trading system that is called FX/Trader.

"What we are doing with FX/Trader is a grand experiment, and there is a lot at stake. I believe it may help shape the future of what DEC will one day become," said Ken Hines, vice president of Quotron, a wholly owned subsidiary of Citicorp. "DEC has the opportunity here to prove to the world that its reputation is well-founded, that it can do things right."

FX/Trader, which guarantees interbank traders a two-second response time from workstations anywhere in the world, has only been on the market since September. Quotron currently offers it at no charge to financial institutions willing to try it out, Hines said.

The trading product is entering a competitive arena dominated by Reuters' Monitored Dealing System, which essentially speeds up "the electronic handshake" between traders, Hines explained. "Having a vendor like DEC involved in developing this new business helps us spread the financial risk," he said.

What the traders actually see when they use FX/Trader is IBM's Personal System/2 workstation running OS/2. DEC's contribution is all behind-the-scenes, where Microvax 3100s, DEC communications processors and Decnet handle the telecommunications infrastructure that routes trader messages on high-speed international networks.

Networking is widely considered one of DEC's strongest suits as it adjusts to a future dominated by desktop computing, multivendor networks and open architectures.

"Integration technologies is the direction of the '90s to glue all the parts together," and DEC has done a remarkable job over the years in terms of networking software quality, said George Reid, MIS director at Sanford C. Bernstein & Co. in New York.

Kenneth H. Olsen, DEC's president and founder, said he has "no good label" for the company DEC will become. However, in a recent interview, he asserted that DEC is leveraging its networking expertise to achieve the transportable software everyone wanted 10 years ago.

What DEC still must learn, several industry analysts said, is how to pitch its variety of skills to customers more convincingly.

"DEC has a lot of wonderful technology, but I don't know when they're going to get paid for it," said David Wu, a financial analyst at S.G. Warburg & Co. in New York.

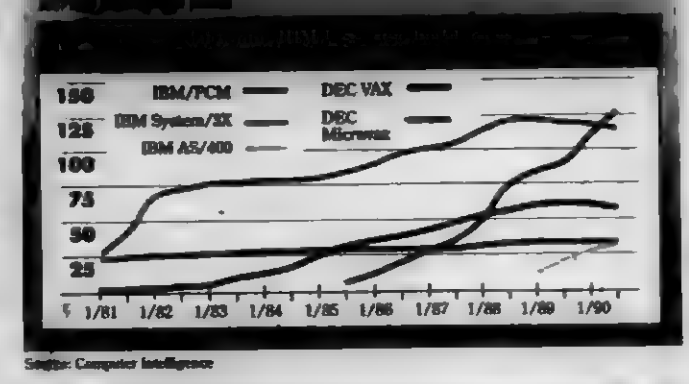
However, Olsen said that in his view, no other firm is better equipped to take the leadership position as a network and systems integrator. "No one else has the money and resources and people to do it," he said.

Fiondella likens the changes under way both at DEC and in the computer industry to a kind of urban renewal.

"You look at the city of the future and determine what you need to get there and then do it in an evolutionary way," Fiondella said. "At the outset, it looks more like the old city. Gradually, the new takes over. Then, in a sudden burst, you get it done."

Mid stride

DEC, with its VAX and Microvax, has overall cut a lead over IBM's midrange lineups



Source: Computer Intelligence

A long way to go

DEC's multiple Unix platforms lag behind the market leaders

Top 5 worldwide Unix market leaders

1990 Vendor	Factory Revenue	Percent of market share	1989 Vendor	Factory Revenue	Percent of market share
HP	$2,171	12.2%	HP	$1,965	14.1%
Sun	$2,142	12.0%	Sun	$1,700	12.2%
DEC	$1,036	5.8%	DEC	$934	6.7%
AT&T	$971	5.4%	Unisys	$906	6.5%
IBM	$868	5.0%	IBM	$892	6.4%
Others	$10,652	59.6%	AT&T	$7,539	54.1%
Total	$17,890		Total	$13,936	

Source: Dataquest, Inc. CW Chart: Paul Mack

Software intentions

Keeping a better handle on the network is foremost on users' minds at DEC sites

Plans of software product groups

Percent of U.S. sites
Base: 712

19%	Network control
16%	DBMS
12%	LAN operating system
11%	Office automation
9%	Resource management
6%	Application development
5%	Design tool
5%	Programming support
5%	Performance measurement
4%	Spreadsheet
8%	Other

Source: Computer Intelligence

Unix: DEC's flavor of the year

Think "Unix," and the name Digital Equipment Corp. hardly leaps to mind, even though the firm sold $1.3 billion worth of Unix-based hardware and software last year.

DEC now hawks several flavors of Unix: its own Ultrix, AT&T's Unix System V for telecommunications customers and The Santa Cruz Operation's SCO Unix to small business users. Two months ago, DEC announced its largest external investment with the acquisition of Digital-Kienzle, a German-based company that sells Unix-based software applications throughout Europe.

"Open systems is DEC's future. Their proprietary sales are faltering," said Rikki Kirzner, a Unix systems analyst at Dataquest, Inc. in San Jose, Calif. "But what they're putting in place now will take several years [to develop]. They're a company in transition."

On one front, DEC is striving to protect its valuable installed base with a strategy to "open" the proprietary VMS operating system and improve VAX price/performance with the shift to a reduced instruction set computing CPU. The second front is its Unix efforts, which customers seem universally convinced are equally crucial to DEC's future.

"Anyone who wants to work with us in the long term has to operate in an open architecture," said Robert Fiondella, president and chief operating officer at Phoenix Mutual Life Insurance Co. in Hartford, Conn. "No one wants to be enslaved to their vendor."

To shore up its scattered open systems efforts inside the company, DEC recently pulled all of its Unix-based systems and software groups into one organization. The company still struggles, however, with the old image problem created by DEC President Kenneth H. Olsen's oft-misquoted crack about Unix and "snake oil."

Ironically, what Olsen said about Unix is still true: The claim that applications written under one flavor of Unix will effortlessly port to any other Unix system is indeed snake oil, several industry analysts noted.

The more serious problem DEC faces is that of a sales force trained to push VAX/VMS but one that is uncomfortable with Unix products.

The Ultrix operating system has also been the target of criticism by users, who find it overweight, buggy and inconsistent from one version to the next.

"We've had a lot of downtime with Ultrix on our network, and there's been patch after patch from DEC for it," said Gerald Siddons, director of scientific computing at the Dana Farber Cancer Institute in Boston.

Still, DEC's commitment to Unix was convincing enough to recently win a $1.4 million contract with Kaiser Engineers Hanford Co. in Richland, Wash. The company is using 60 Unix-based Decstation 3100s and Decstation 5000 workstations for computer-aided design.

Richard Johnston, manager of the information systems department at Kaiser, said DEC ousted Sun Microsystems, Inc. and IBM in the workstation bid through "superior local support" and an aggressive willingness to deal.

Play the right cards

The move into mainframes has been DEC's biggest gamble in years, and the dice are still tumbling for the VAX 9000.

Once customers get their hands on the machines — out the door anywhere from six to 18 months late, depending on who is counting — they tended to rave about both the hardware and the hand-holding from DEC support teams.

When one of the first dual-CPU, dual-vector VAX 9000 Model 410s arrived at the Defence Science and Technology Organisation in Adelaide, Australia, it sailed through stringent benchmark tests and slipped into the laboratory's VAX environment with ease, *Computerworld Australia* reported last week.

What mainframe customers have noticed to be missing are the systems support and performance management tools considered crucial for tuning complex systems. Many also objected to DEC's software pricing based on the size of the CPU — an issue to be addressed with a new pricing scheme in mid-March.

Robert Glorioso, the DEC vice president in charge of the VAX 9000, recently broadened his job description to focus more attention on the overall needs of this new class of mainframe customer. In what would once have been an unusual turnabout for DEC, the engineering is being deemed *less* important than the marketing.

"Our goal is to develop a group that has technical and marketing resources to address this class of customer and provide the current ecosystem working with these customers anything they might need," Glorioso said.

Although there are 100 mainframe VAXs on the market now, [illegible] manufacturing operation and its long selling cycle will delay real profitability until the 1992 to 1995 time frame, industry analysts said. To achieve its [illegible] goals, the VAX mainframe line is going [illegible] "head-to-head" competition with IBM in commercial sales, said Brian Zelaya, an analyst at Gartner Group, Inc. in Stamford, Conn.

NEWS SHORTS

AT&T posts names for NCR board

AT&T announced its candidates to replace NCR Corp.'s board of directors last week. The slate will be offered at NCR's regular board meeting, expected to be held April 17, when AT&T could at most replace the four board members up for re-election — including NCR Chairman and Chief Executive Officer Charles E. Exley Jr. and President Gilbert Williamson. AT&T could also seek to replace them at a special meeting that has yet to be scheduled.

NBI slips into Chapter 11

One year of discussions with creditors, including bondholders and the Internal Revenue Service, ended in an impasse for software vendor NBI, Inc. last week. The Boulder, Colo.-based firm filed for reorganization under Chapter 11 of the federal bankruptcy code. However, NBI CEO Steve Jerritts remained optimistic that this will not be the last chapter in NBI history. A strong cash position and some $73 million in net operating losses that have been carried over to offset future income and avoid problems with the IRS bode well for a successful restructuring and re-emergence as a going concern, Jerritts said.

EMC settles with Cambex

EMC Corp. recently agreed to pay $7 million to rival Cambex Corp. as a settlement in a lawsuit that found EMC guilty of misappropriation of trade secrets late last year. The two companies, which sell memory products in the IBM mainframe market, hashed out settlement details that call for EMC to pay Cambex in $3.5 million installments of cash and stock. EMC had earlier said it was determined to appeal the guilty verdict. Sheldon Schenkler, Cambex's chief financial officer, said both parties decided "they didn't want it to drag on." However, he added, "I guess they realized that they weren't going to win." EMC stands by its claim that it was not involved in any illegal activity. A spokesman said it came down to a "question of how much time, energy and resources are you going to spend arguing about a product that neither one even really sells anymore." The lawsuit concerned memory products for the older [illegible] lines of IBM mainframes.

3+Open surfaces in Japan

3Com Corp.'s beleaguered 3+Open network operating system may yet live. 3+Open, based on Microsoft Corp.'s LAN Manager, is in the process of being phased out in the U.S. in deference to LAN Manager. However, 3Com's country manager in Japan, Robert Freeman, said last week that 3Com's former joint-venture partner, Soliton Systems KK in Tokyo, is considering a new name and added features for the product. A spokesman for Soliton said the company is discussing its options with Microsoft.

Shuttle riders can rent laptop PCs

Business travelers flying the Trump Shuttle will be able to rent laptop computers at Trump airport terminals in New York, Boston and Washington, D.C., according to Laptop Corp., a Boston-based rental firm. The company said many laptop owners do not take their laptops when they travel by air, especially now that there is increased airport security. Rentals begin at approximately $50 per day.

Phillips, ABF to use satellites

A trucking firm and a gas station company said last week they would explore data networking built with very small-aperture terminal (VSAT) satellite technology. Fort Smith, Ark.-based ABF Freight Systems, Inc. announced it would use VSATs from AT&T Tridom to communicate with its 300 remote locations in the U.S. and Canada. The VSAT network will carry electronic mail, bill-of-sale and accounting data between the remote locations and ABF's data center. Also last week, Phillips 66 Co. said it will test a VSAT network for credit-card authorization and point-of-sale applications. Phillips sells fuel through more than 7,800 gasoline and 800 aviation outlets. The trial will be conducted with Sears Payment Systems, Inc.

CA, start-up firm exchange legal fire

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — A start-up company charged last week that Computer Associates International, Inc. illegally obtained a copy of its beta-test software through a dummy corporation. The charge, which came in response to a recent CA suit, also alleges that CA violated antitrust laws regarding unfair competition.

Michael McElroy, CA's attorney, called these allegations "totally and utterly preposterous. CA has done nothing illegal."

The charges came on the heels of a lawsuit CA filed Jan. 18 in federal court in New York. In that suit, CA claimed that the start-up, Application Development Technologies, Inc. (ADT) in Dallas, and its founder, David W. Bryan, misappropriated CA's trade secrets. Bryan worked at CA from 1982 to 1989.

CA's suit claims that ADT's product, AD/TEC-SYS, a project-estimation package, uses proprietary formulas from two CA products, CA-Estimacs and CA-Planmacs. The suit seeks to prohibit ADT from selling its product and asks for damages of up to $4 million.

Bryan denied these charges and said the CA suit is "totally without cause. While at CA, I worked in marketing and sales and not in any technical capacity," he said. He developed a prototype at home of what later became ADT's package while learning a programming language, he said.

ADT's counterclaims charge that CA or an agent of CA set up a company called Vycom, Inc. in Berkeley Heights, N.J., "to fraudulently obtain" a beta-test copy of Release 2.0 of AD/TEC-SYS, which ADT said it plans to ship in March.

Bryan said he planned to appear at a hearing scheduled for last Friday to prove that CA used this knowledge to "radically modify" its Release 7.0 of CA-Estimacs, which has not yet been shipped, to mimic some of the features found in Version 2.0 of ADT's product.

McElroy called these charges "red herrings meant to confuse the real issue, which is that Bryan and ADT ripped off our trade secrets." McElroy acknowledged that CA did "see the product in object form to determine whether it violated any of our trade secrets," but he said CA did nothing illegal in obtaining the ADT product.

Turkstra takes over IS at Arthur Andersen

BY ELLIS BOOKER
CW STAFF

CHICAGO — Bruce Turkstra, formerly the No. 2 man in the information systems department at Merrill Lynch & Co., has joined Arthur Andersen & Co., Andersen confirmed last week.

Turkstra, 49, resigned soon after his boss, DuWayne Peterson, announced his intention to retire [CW, Jan. 7].

Edward Goldberg, a 30-year veteran of Merrill Lynch and currently a senior vice president and director of the Professional Securities Services Group, was named as the successor to Peterson, who will step down in June. Turkstra had been the senior vice president of global information services at Merrill Lynch since 1987.

Turkstra, who was not available for comment, became managing director of IS services at Arthur Andersen effective Feb. 1. He will be responsible for developing and operating the internal IS operations for the global organization, which has headquarters in Chicago, New York and Geneva and is the coordinating entity of the Arthur Andersen Worldwide Organization.

Prior to joining Merrill Lynch, Turkstra had served at First National Bank of Chicago.

Probe

FROM PAGE 1

Sundevil was "still in the prosecution and investigative stages."

The investigation suffered a temporary setback in early January after the Arizona attorney general laid off 13 people, including Gail Thackeray, the assistant attorney general who directed the state's participation in Operation Sundevil. Thackeray masterminded the establishment of a sting bulletin board to ensnare computer hackers suspected of dealing in stolen credit-card numbers, long-distance telephone fraud and other computer-related crimes.



Arizona's investigation continues, said Steve Tseffos, a spokesman for the Arizona attorney general's office. "Gail Thackeray has taken the case with her to the Maricopa County attorney general's office, where she now works," he said. Calls to that office were not returned.

A Freedom of Information Act request filed last year to find out more information about the Sundevil investigation proved fruitless, said Marc Rotenberg, an attorney and director at Computer Professionals for Social Responsibility's Washington office. "They have given us nothing but a couple of press releases and said the reason was that the investigation was an ongoing process," he said.

The Secret Service also sent *Computerworld* two press releases in response to a detailed Freedom of Information Act request for information about the well-publicized hacker dragnet.

Another advocacy group, the Electronic Frontier Foundation (EFF), plans to take legal action in the Sundevil cases, probably within the next two months, said Mike Godwin, in-house counsel for the foundation. He declined to specify which cases the group will pursue.

Civil libertarians have charged that government and state law enforcers have swept up innocent people in their dragnet and, at the same time, have trampled over their First and Fourth Amendment rights by illegally seizing computers used to operate bulletin boards.

Concern for the rights of computer users netted in the raids led to the start-up of the EFF by Mitch Kapor, founder of Lotus Development Corp. and On Technology, Inc., and John Barlow, an author and lyricist. Apple Computer, Inc. co-founder Steve Wozniak and an unnamed Silicon Valley executive have also contributed funds to the venture. The EFF has provided funds and other assistance in the defense of Craig Neidorf, publisher of a computer underground newsletter, and Steve Jackson, publisher of role-playing games.

> CIVIL LIBERTARIANS HAVE charged that government and state law enforcers have swept up innocent people in their dragnet.

In January, a Boston law firm associated with EFF filed a "friend of the court" brief in the case of Len Rose, a Unix consultant from Maryland who was accused of possessing stolen source code and trafficking in password collection programs.

IBM insists IMS interface is alive and well

BY ROSEMARY HAMILTON
CW STAFF

IBM not only denied a report last week that it killed plans for a SQL interface to its IMS database, but it also said the project will likely be bigger than originally planned.

The SQL interface would allow users to access data within the hierarchical IMS with the same procedures they use to get data from the relational DB2. Observers said this is no easy task because of the fundamental differences in the two database environments.

A company spokesman said IBM is evaluating options that could expand the interface to other nonrelational database management systems as well as the idea of bringing in outside help, either by licensing technology or using a third-party developer.

These changes come 10 months after a senior IBM executive said the IMS interface would be announced "soon." However, IBM maintains that the current re-evaluation does not imply there were problems or a lessening in IBM's commitment to the interface.

However, some observers raised questions about the latest move. Since they claimed the SQL interface for IMS is difficult to develop, they wondered why IBM would elect to expand the project.

"If they had abandoned it, it wouldn't have surprised me," said Colin White, president of Database Associates International in Morgan Hills, Calif. "I think producing SQL front ends to nonrelational systems is difficult. It's a tough job to achieve compatibility."

Shaku Atre, a partner at Atre/Computer Assistance, which is a division of Coopers & Lybrand, said she suspects the changes reflect a business decision on IBM's part that the interface would not be a big enough money maker.

Atre claimed that only a small number of users would have use for the product because many users maintain IMS and DB2 as separate worlds.

"They may be figuring out now what to get rid of and what to concentrate on," Atre said.

White said he suspects IBM may be shifting gears from an exclusive IMS focus to a more generic SQL interface that could address other DBMSs and flat files. He suggested IBM could develop a core technology for access to nonrelational data that could then be optimized for specific database environments at a later date.

New Wave

FROM PAGE 1

Way, Wash.-based Weyerhauser Corp., initially committed to New Wave but has deferred the purchase. He said that it does not yet work with several of his applications, including Wordperfect Corp.'s Wordperfect, Lotus Development Corp.'s 1-2-3 and Ashton-Tate Corp.'s Dbase. "I like the interface, but



Howlett-Packard's New Wave: *Microsoft's plan for Windows may hold users back*

in the future, I'm not sure it won't come from Microsoft as a part of Windows or Presentation Manager."

Levi Strauss & Co. in San Francisco has done some evaluation of New Wave. The feelings about it were positive, but the company is biding its time, a spokeswoman said. "There has not been an adequate opportunity to see enough people up and running on it," she said.

Even HP's vendor alliances may be tenuous. When Microsoft has Windows 4.0, NCR will re-evaluate New Wave. "If Microsoft turns out better, we'll go with it," said Darrell Clark, senior vice president of NCR's Integrated Systems Group.

To take advantage of New Wave's automatic updates and tasking capabilities, applications must be ported to New Wave. Nonported applications will work only in building compound documents that include parts from two or more applications. The company claims that more than 100 applications have been ported to New Wave.

In Windows 4.0, applications that run on Windows would be able to use Microsoft's New Wave-like capabilities without porting the software, according to a Microsoft spokesman.

Given that HP is a potential rival as well as a partner to Microsoft — the firms are co-defendants in Apple Computer, Inc.'s pending lawsuit over alleged copyright violations in Windows Version 2.01 — Microsoft has mixed feelings about the relationship, according to Rich Abel, group product manager for Microsoft Windows.

"We're pleased that HP has built extensions on top of Windows, but our approaches are different. Our focus is to implement it at the operating system level," Abel said.

More to offer

Jim McDonnell, HP's marketing manager for New Wave, claimed that New Wave already includes more functions than what is being talked about for Windows 4.0, and two more releases are planned by the end of the year.

"One function will have automatic updates of data across the network as well as within one user's PC," he said. "The second will improve the automatic tasking capability to interact with users — perhaps using limited voice."

One rallying point for New Wave may be HP's embrace of open systems and its plans to apply New Wave technology to the Unix and OS/2 operating systems before Windows 4.0 gets out the door. Microsoft consistently derides any potential business role for Unix.

NCR adopted New Wave to speed time to market for one segment of Cooperation: NCR's 54-module implementation of its new client/server, open systems architecture. "No one can develop everything they need to have; you never have enough resources," Clark said.

Along with NCR, AT&T, Canon, Inc., and Data General Corp. have licensed the New Wave application.

AT&T's Computer Systems Division is licensing New Wave as part of its Rhapsody system client software. AT&T threw its weight behind New Wave to push for an object-oriented standard to "drive independent software vendors" to write to it, according to Marni Ehrlich, a Rhapsody product manager.

Count the New Waves

In the San Francisco Bay Area, there is a family whose 13 sons all bear the same name: Frank Manibusen. New Wave is the Frank Manibusen of HP.

New Wave can denote many different pieces of software at many levels, and it seems that only insiders in the HP family know which is which. At least the Frank Manibusens keep track by calling each other by their middle names. HP officials said they are not interested in making the monikers any more comprehensible.

Most HP users have heard of New Wave, but their scope of knowledge appears to be limited to New Wave, the application. Dennis Brown, programming supervisor at the *Wichita Eagle & Beacon* newspaper, said he has only seen the New Wave personal computer application in passing. "I haven't been hit with a lot of marketing information from HP," he added. Other software also bearing the name New Wave escapes him, he said.

In addition to the discrete New Wave application, the New Wave Computing concept encompasses a host of applications in commercial, industrial and engineering environments as well as segments of the company's Unix operating system:

- New Wave Office is an expanding set of functions (there are currently 21) that includes electronic mail, graphics and document editing.
- Team Computing is similar to New Wave Office but is tailored to an engineering environment.
- Concurrent Manufacturing, also similar to New Wave Office, is tailored to the computer integrated manufacturing environment.

HP is primarily licensing these applications directly to corporate users such as American Airlines. NCR Corp. has discussed licensing parts of New Wave to include in its own software packages but has yet to commit to any, according to Darrell Clark, senior vice president of NCR's Integrated Systems Group.

Arching over the applications is the New Wave Computing strategy, an overall name for all of the above plus application program interfaces and object definitions to integrate applications and parts of the Open Software Foundation (OSF) operating system standards such as Distributed Computing Environment, Motif and network management.

HP is actively trying to get the operating system software accepted as the OSF's Unix standard so HP can license the layers to other vendors.

If HP is successful with its wholesale licensing scheme (see story page 1), as well as marketing to end users, consumers could benefit in the long term with lowered overall software pricing, according to Wim Roelandts, vice president and general manager at HP's Networked Systems Group.

J.A. SAVAGE

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TRENDS

Mainframe Security Software

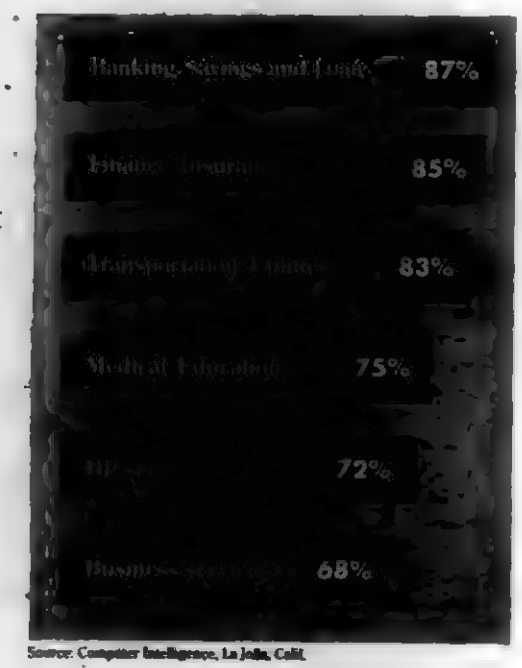
The presence of security software is on the rise at IBM/plug-compatible mainframe sites, as access control to important data continues to be a critical concern



Penetration by industry

Percent of U.S. MVS sites with security software
(Base: 3,686)

Levels of security software use are highest within industries with the most cash at stake. Banking, finance and insurance come in on top with over 80% of their MVS sites having mainframe security software



Market share at MVS sites

Percent of U.S. MVS sites with security software
(Base: 3,686)

During the last five years, Computer Associates International, Inc. has acquired IBM's three principal competitors in the mainframe security software arena, ensuring its lead in total market share

January 1985 ☐ January 1991



Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

The art of "friendly persuasion" has brought sports and entertainment agent Bob Woolf success in representing the likes of basketball superstar Larry Bird and singers New Kids On The Block. Woolf explains why you let the other guy go first, why splitting the difference is a bad idea and other negotiating tips in Executive Report.



Barry Hillard

The best way to clog up the workings of the information systems department is to postpone small application projects and fixes. Before you know it, all those little "unimportant" user requests have turned into a whopping backlog. In Depth will show you how a "quick response" evaluation process can be the key to a productive IS staff and happy users.

INSIDE LINES

Not so fast!

Lawyers for the Kemper Lesnick Organization, a Software Publishers Association target that settled for $75,000 in December 1990, are saying the party responsible for illegally copying software has left the firm. But court documents claim that Kemper Lesnick's then-and-still chief financial officer, Martin Friedman, was clearly aware of the practice and even told employees he would survey other firms to prove that it was "like speeding . . . everyone does it." Friedman's logic may be questionable: Before the raid, he received a memo from his IS manager, who has since left the firm, reporting that at most, it would cost $30,000 to replace the illegal software with the right stuff.

Driving to the top

Fujitsu is expected to announce a 5¼-in. hard disk drive with a 2G-byte unformatted capacity this week. This surpasses the current 1.5G- and 1.7G-byte capacity leaders from Seagate Technology and Micropolis, according to analysts.

Sliding down the slopes

US West has reportedly been waiting for months to receive its order of some 500 Compaq LTE 386S/20 notebook PCs, now promised for the end of this month. The firm's Denver-area suppliers told it that faulty LTE hard drives are causing the delays. US West did get its hands on at least one LTE, which suffered from frozen-drive syndrome. A Compaq spokeswoman acknowledged fulfillment delays but said she knew of no drive troubles.

Now we've got SNA Lite?

When is SNA not SNA? When it has been stripped down and fitted with all kinds of high-octane gear to manage "non-Systems Network Architecture (SNA)-specific" transmissions over a fast-packet network. Such is the case with one of IBM's lesser publicized projects to fit itself for the upcoming era of 1G bit/sec. peer-to-peer networks, according to IBM networking honcho Rick McGee. "In order to exploit high-speed environments like Sonet and fiber, SNA will have to undergo some changes — just like Transmission Control Protocol/Internet Protocol and Open Systems Interconnect will," McGee said. He added that this leaner, meaner SNA will definitely lose link-by-link acknowledgment and recovery mechanisms that currently slow it down.

Apple, take noteski!

The scheduled highlight of the Russian delegation's trip to the Silicon Valley last month was supposed to be a tour of the Apple factory, where the Russians were going to have a go at snapping together a Macintosh in under one minute. But what the comrades really raved about was their trip to The Price Club, a West Coast discount warehouse.

Not ready for Broadway

Claris may have taken over responsibility for Hypercard 2.0; but users are already grumbling about the way the firm is handling its new responsibilities. Some users report that the Hypercard installer script — a vital component for updating to the newer version — is missing from some early 2.0 releases. Additionally, the Hypercard technical support line is not only overcrowded, but it's a toll call to boot.

What's in a Word?

Microsoft engineers are putting together what they call a "workstation-based" office setup that will integrate its Word for Windows application into a work environment, which will include such business-oriented technologies as a facsimile and scanner. It's due this spring.

There are in fact two 's' in the name of Tony Mondello, IBM vice president of office systems development. We only had one in our item here last week. We're in need of a software application into which we can enter info from business cards and then use it to spell check our words. Oh well, we pay News Editor Pete Bartolik to take it on the chin, so when you spot a goof, call him at (800) 343-6474 or fax the red-lined embarrassment to (508) 875-8931. He's also on Compuserve, 76537,2413; Prodigy, MHTS78A; and MCI Mail, 281-6320.



AT&T introduces the biggest thing to hit contact lens sales since shag carpeting.

AT&T Integrated Services Digital Network (ISDN) gave Bausch & Lomb the capability to take 1,000 more orders per week.

Ask most people what AT&T ISDN has to do with the contact lens business and they'll probably tell you it's the first line on the eye chart. But if you ask the people at Bausch & Lomb, they'll tell you about a digital technology so innovative, it lets them answer a lot more calls using the same number of live operators they had before.

Not too long ago, Bausch & Lomb's customer service center was getting a lot more calls than they could handle. Realizing that lost calls can turn into lost customers, they called AT&T for help.

Through AT&T ISDN, Bausch & Lomb got a feature called Automatic Number Identification (ANI). With ANI, their computers can automatically capture each caller's phone number and match it to the customer's record. The end result? Call handling time has been cut by an average of four seconds per call. Which means Bausch & Lomb's customer service representatives can now handle about 1,000 more weekly calls than they could before.

So if you've been looking for a way to boost sales without taking on more overhead, call off the search. AT&T's contact lens solution could be the answer for your business, too.

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COMPUTERWORLD

Competition = bargains for Windows software buyers

BY JAMES DALY
CW STAFF

The success of Microsoft Corp.'s Windows 3.0 has sparked a price war to get users to buy applications tailored to it.

Come and get it
Recent price promotions have made PC software a buyer's market

Product	List price	Promotion price
Borland Objectvision	$495	$99.95
Borland Quattro Pro	$495	$99.95 to Lotus' 1-2-3 users
Lotus Ami Pro	$495	Free with 1-2-3 purchase
Microsoft Excel 3.0	$495	$129
Microsoft Word for Windows	$495	$129

CW Chart: Paul Mock

Microsoft fanned those competitive flames last week with a qualified, limited-time offer that cuts prices on its Excel spreadsheet and Microsoft Word for Windows word processor from $495 to $129. Borland International, Inc. offered a rock-bottom price on a new Windows programming tool last week. Lotus Development Corp. earlier launched a giveaway of a newly acquired word processor.

"The name of the game is getting that huge installed base," said Ryan Rosenberg, a member of the Software Entrepreneurs' Forum and New Wave programs manager at Hewlett-Packard Co.

Analysts said recent newspaper and direct-mail campaigns are effective because they go for users' most vulnerable spot: their wallets. "The beauty of the approach is that it is direct and immediate," said Jeff Tarter, editor of Watertown, Mass.-based "Softletter." "Telling a user up front how much he is going to save is a

Continued on page 101

IBM, Novell in LAN power play

BY JOANIE WEXLER
and JIM NASH
CW STAFF

RESHAPING THE LAN MARKET

IBM
NOVELL

- IBM to resell Novell LAN operating system as "Netware from IBM"
- IBM and Novell to develop Netware for 32-bit OS/2 and RS/6000 by year's end 1992
- Eventual interoperability between OS/2 LAN Server and Netware on OS/2 and RS/6000; Netware hooks to Netview

BOSTON — Making perhaps the strangest vendor bedfellows to date, IBM and Novell, Inc. have formed a relationship that could radically alter the dynamics of the local-area network market.

IBM will immediately begin selling Netware 286 and 386 network operating systems from LAN market leader Novell as "Netware from IBM," the two companies announced last week at the Networld '91 conference here. Novell's product will be sold as an alternative to IBM's LAN operating system, OS/2 LAN Server.

The IBM endorsement of the leading LAN operating system pleased many users. "We are in total shock about this relationship, but it makes our future much brighter," said Francis Paquin, a network computing consultant at Ontario Hydro, a large Canadian utility company that runs a Novell network consisting of 8,000 nodes and 120 servers. Ontario Hydro operates a separate IBM mainframe-based Systems Network Architecture network and other hardware platforms that could be suitable for Netware, Paquin said.

Other users wondered why it took so long for IBM to make the move. "The IBM/Novell relationship is good for the industry,

Continued on page 99

CHANGING ATTITUDES

Liberty Mutual rewrites IBM policy

BY CLINTON WILDER
CW STAFF

BOSTON — Four years ago, Liberty Mutual Insurance Co.'s information systems infrastructure was a sea of IBM hardware. Today, less than half of its processing power wears a Big Blue logo.

Liberty Mutual is at the forefront of a revolution that has loosened IBM's famed account control even among some of its most conservative customers: insurance companies. In Liberty Mutual's case, the multivendor push has been driven by cost savings and an effort to match appropriate technology to applications.

"Three or four years ago, we were 100% IBM for all practical purposes," said Richard Grady, vice president and general manager of IS. "Now, we probably have more non-IBM [millions of instructions per second] than IBM MIPS."

The company currently runs applications on platforms from Digital Equipment Corp., Sun Microsystems, Inc., Apple Computer, Inc. and Teradata Corp. Liberty Mutual, the nation's fifth-largest property and casualty insurer, with assets of $17 billion, is even examining the new workstation from Next, Inc.

Grady estimated that while approximately

Continued on page 100

Credit check goes on the air

Visa says radio link will slash response times

BY GARY H. ANTHES
CW STAFF

SAN FRANCISCO — Visa U.S.A. said last week that it will launch an aggressive campaign to implement on-line, radio-based credit card authorization, spawning cost savings for thousands of merchants and time savings for millions of shoppers.

Visa struck a deal with Vienna, Va.-based Digital Radio Networks L.P. by which DRN will provide merchants with radio transmitters and link its radio tower-based network to Visa's. Transactions from merchants will be sent by radio to one of nearly 100 DRN towers, where they will be relayed over Visanet to a Visa processing center. From there they are relayed to the bank that issued the credit card for purchase authorization.

"We basically replace the local telephone company," DRN executive Stewart Dougherty

Continued on page 4

1-year-old RS/6000 outgrows desktop tag

BY MARYFRAN JOHNSON
CW STAFF

One year ago this week, IBM took a cold plunge into the hot market for Unix-based workstations and servers with its RISC System/6000, making enough of a splash to quadruple its market share and sell 25,000 systems in only six months.

One thing that the RS/6000 has proved is that it is far from a typical workstation. The machine is more often employed in minicomputerlike jobs such as a compute-intensive server or filling in the middle tier between a mainframe and a network of personal computers.

Chips in

- Amdahl signs up for Sun Sparc chip; plans low-cost, large-scale servers for Unix networks. Page 8.

"By and large, the RS/6000 is not sitting on people's desktops. It's too expensive for that," said Steven Eskenazi, an analyst at Alex. Brown & Sons, Inc. in New York. "There has been good acceptance on the customer side but not in large volumes of orders, wins or contracts."

One large customer that may buck that trend is Prudential-Bache Securities, Inc. in New York, which is planning a worldwide network of up to 500 RS/6000s and 10,000 terminals by the end of 1993. The company has seven RS/6000s "progressing successfully" in a pilot project to replace the 8,000 to 9,000 PCs now used in its 350

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INSIDE



Running IS in Hawaii: 'We don't run around wearing hula skirts and living in grass shacks,' an IS exec says. Page 68.

DEC ready for showdown with its old nemesis, the retail PC channel. Page 101.

IBM backs off DB2/IMS link, says project is scrapped but remains committed to the goal. Page 4.

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4 While some microcomputers just can't take the heat, ruggedized versions are well able to withstand the merciless conditions in the Saudi Arabian desert.

6 **CIO** does not necessarily mean 'career is over,' but statistics show the facetious phrase is not entirely off base.

8 In a new effort to take advantage of platforms other than its own, Sun is breaking off two subsidiaries and an R&D division this summer.

10 A host of **Japanese** firms may be dumping flat-panel displays at considerably less than fair market value, the U.S. Commerce Department says.

12 **Imaging** is becoming more of a player in the storage game, but **optical character recognition** is still a worthy contender.

16 By the end of the year, users can expect to see volume shipping of **Intel's** 50-MHz 1486 chip, with a 100-MHz version to follow.

99 *Banyan's* **Vines** is already making a LAN connection with AT&T's Stargroup LAN Manager.

100 **Apple's** upgraded portable, still weighing in at a bouncing 15 pounds, is considered a bit of a drag.

101 **Lotus** rolls out a new release of Notes and announces plans to purchase CC:Mail.

Quotable

"The name of the game is getting that huge installed base, and price, at least in the short run, is no object."

RYAN ROSENBERG
HEWLETT-PACKARD

On PC software discounts. See story page 1.

SYSTEMS & SOFTWARE

27 To hold onto its high-end disk drive customers, **IBM** may soon have to offer discounts as a concession to competing vendors' prices.

PCs & WORKSTATIONS

39 **Computer Associates** plans to make the most of the burgeoning market for project management software afforded by the re-[illegible].

47 Technology Analysis: **Informix Software's Wingz** scores well on graphics but fails reviewers' compatibility tests.

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55 **The OSI Network Management Forum** is opening its doors to a select number of users in order not to close the door on standards interoperability.

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The 5th Wave



EXECUTIVE BRIEFING

■ **Job security continues to be dicey for chief information officers,** according to a Deloitte & Touche survey of 614 top information systems executives in the U.S. and Canada. One-fourth of those surveyed say their predecessors were fired, a percentage up slightly from the previous year's survey. Consultants and executive search experts say many CIOs are still unable to communicate IS benefits in business terms. **Page 6.**

■ **Visa says it will use radio waves instead of telephone lines** for on-line credit authorization. A third-party vendor will connect its radio towers to Visa's global digital network, which Visa says will cut costs and reduce the average authorization time from 25 seconds to six. Visa says it hopes the technology will enable more credit-card use in traditional all-cash businesses, such as fast-food restaurants and supermarkets. **Page 1.**

■ **The business promise of IS has been largely unfulfilled,** according to the results of a six-year research project at MIT's Sloan School. *The Corporation of the 1990s* says organizations must undergo significant changes to tap IS potential. **Page 63.**

■ **A personal computer software price war is serving** up tantalizing discounts to buyers, but vendors say, "Get 'em while they last." The deep discounting is expected to be a temporary grab for market share, particularly with new products, rather than a long-term trend toward lower software pricing structures. **Page 1.**

■ **Liberty Mutual is departing from tradition** in the IBM-dominated insurance industry with a multivendor strategy. The Boston-based insurer says it saves money and can develop more effective business solutions with a variety of platforms from DEC, Apple, Sun, Teradata and others. **Page 1.**

■ **Higher laptop prices could result** from a U.S. Commerce Department finding that Japanese vendors are dumping flat-panel displays into the U.S. market. The preliminary ruling could lead to penalties against Matsushita, Sharp, Toshiba and Hosiden Electronics. **Page 10.**

■ **Good negotiation skills are a must** for IS executives who increasingly deal with demanding users and company executives. Taking a non-adversarial stance and being flexible are key, experienced IS negotiators say. **Page 71.**

■ **A look at the highest and lowest paying** industries for IS professionals finds the IS work to be similar in both. Cultural conditions in the utilities industry at the high end of the scale and the education field at the low end are the reasons for big differences in compensation. **Page 82.**

■ **Companies can curb PC software theft** by educating employees. The Software Publishers Association estimates that for every copy of software in use, there is at least one illegal copy made. **Page 91.**

■ **On-site this week:** The Monterey Bay Aquarium, with steady growth in both marine attractions and visitors, upgrades its 6-year-old HP 3000 minicomputer to an up-to-date Series 932. **Page 27.** A mini upgrade is critical at Women and Infants' Hospital in Providence, R.I., where a Data General MV 40000 replaces two older models to keep pace with expansion at the U.S.' fifth-largest obstetrics hospital. **Page 29.** The Library of Congress will enter the touch-screen world next summer with Access, a network of 18 IBM Personal System/2 Model 70s giving library users a window on the library's huge mainframe databases. **Page 43.** Coors Brewing's area sales managers hawk the right beer now with the help of notebook and laptop computers from Compaq. **Page 46.** San Diego CATV company Cox Cable reaps cost and effectiveness benefits by automating its cost-tracking system with a Novell network and Compaq server. **Page 49.**

"It's dumb.

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IBM cancels SQL project

BY ROSEMARY HAMILTON
CW STAFF

IBM last week confirmed that it has stopped a project to develop a SQL interface to its IMS database, contradicting statements made one week earlier.

However, the company insisted that it still plans to address user requirements that would call for relational front ends to nonrelational environments.

A company spokesman said IBM canceled — and removed programmers from — the specific project that was originally set up to create the relational interface to IMS.

One week earlier, the IBM spokesman had said the SQL interface to IMS project had not been abandoned [CW, Feb. 11]. "This comes down to the meaning of the word project," the spokesman said. "If you mean a project is people writing code, then yes, it was stopped."

The spokesman would not comment on why the project was canceled, but sources last week said IBM determined it was not worth the effort. The product would have served a small slice of the IMS user base and would therefore not have provided a big enough payback for the hard work and money required to complete it.

George Schussell, president of Digital Consulting, Inc., said he was told last fall by a senior IBM executive that the project had been canceled.

"They came to the conclusion that they just couldn't do it," Schussell said in an interview last week. "The product couldn't work. You couldn't predict how long a query would take, and it could take a tremendously long time. The conclusion was: This is not the kind of product IBM would want to ship."

Visa

FROM PAGE 1

said. "This is the first competition they've seen."

According to Visa, replacing telephone with radio can reduce purchase authorization time from an average 25 seconds to six seconds.

This will help the company move into areas such a fast-food restaurants, supermarkets and cinemas, where cash has traditionally been the dominant form of payment.

"We want credit cards to be as fast as or faster than cash," a Visa spokeswoman said.

According to Dougherty, merchants could slash local telephone costs by as much as 60%, especially in metropolitan areas where local message units are expensive.

Even merchants that use toll-free numbers provided by their banks should see cost savings because the bank's cost for the toll-free service is reflected in the fee that the bank charges the merchant for the credit-card service.

> "WE WANT CREDIT cards to be as fast as or faster than cash."
>
> VISA

The Visa spokeswoman said that Visa hopes to have 150,000 merchants using the radio-based service by 1995.

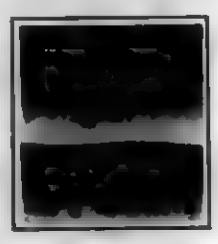
There are currently 3 million merchants in the U.S. that honor Visa cards, she said.

According to Visa, the service is most cost-effective for midsize businesses, typically those with more than 300 trans./month going through dial-up terminals but with insufficient volume to justify leased lines.

Mobile PCs weathering Desert Storm

BY MITCH BETTS
CW STAFF

Some older, commercial-grade personal computers could not take the heat in August, but otherwise, the U.S. military's microcomputers are holding up well in the hot and dusty Saudi Arabian desert, according to military officials and vendors providing support for Operation Desert Storm.



In the first mass deployment of microcomputers to a war zone, the U.S. has fielded a mixture of commercial PCs and "ruggedized" PCs in one of the world's harshest environments. Ruggedized units have such features as shock absorbers, air filters to keep out sand and bigger fans for internal cooling.

Lt. Col. Larry Sims, head of technical services for the U.S. Marine Corps in Quantico, Va., said some of the unmodified Zenith Data Systems Z-248 desktop microcomputers taken to Saudi Arabia could not cope with 120-degree days. They were acquired under a 1986 contract and were never intended for outdoor use.

"During the really hot days in August, they could only be used during the cooler part of the evening. They'd just get too hot and do erratic things," Sims said.

However, some Z-248s were ruggedized before being shipped to the Persian Gulf. In other cases, some resourceful Marines rigged up extra fans to keep the PCs cooler, Sims added.

Considering the fact that most of the Z-248s are not ruggedized, "they are holding up relatively well," a spokesman for Zenith Data in Glenview, Ill., said.

Sims said the Marines' ruggedized PCs had no problem with the heat. The Marines' AN/UYK-83A micros, made by defense contractor C3, Inc. in Herndon, Va., are based on the Intel Corp. 80386 processor.



Unisys TACCS PCs, *such as those pictured above, are among the computer systems used in the Persian Gulf war*

The U.S. Army is using more than 2,000 ruggedized PCs from Unisys Corp. in Saudi Arabia, in applications ranging from command-and-control data to routine personnel information. Called Tactical Army Combat Service Support Computer Systems (TACCS), the units run on the Intel 80186 processor and are known for being tough, extra reliable and slow. Unisys is now working on an enhanced version.

A variety of late-model commercial PCs are being used by soldiers in the Persian Gulf as well, with no reports of widespread service problems. These include Compuadd Corp. desktop micros using the Intel 1486 chip; 386-based PCs from Unisys; and laptop models from Compuadd, Zenith Data and Grid Systems Corp.

If the latest commercial-grade PCs continue to perform well in the war, the military may limit future purchases of the costly ruggedized units to mission-critical systems, predicted Robert Dornan, vice president of Federal Sources, Inc., a consulting firm in Vienna, Va. For administrative tasks, it may be less expensive to use commercial PCs on a disposable basis and have replacement PCs on hand, he said.

Shopping for Saudi

In mid-December, the U.S. Central Command in Riyadh, Saudi Arabia, presented Compuadd with an impressive shopping list topped by more than 1,200 Intel 1486-based desktop computers and a Jan. 14 deadline.

The $21 million order sent the company into a production frenzy, requiring the staff to work through Christmas and New Year's Day, said spokesman John Pope in Austin, Texas.

A series of eight planes ferried the computer equipment to Riyadh, the last one landing Jan. 14, one day before the United Nations deadline for Iraq's withdrawal from Kuwait.

Other items on the list included the following:

- 350 Intel 80386SX-based laptop computers.
- Software packages such as Microsoft Corp.'s Windows, Lotus Development Corp.'s 1-2-3, Ashton-Tate Corp.'s Dbase IV, Wordperfect Corp.'s word processing software and Digital Communications Associates, Inc.'s Crosstalk for Windows.
- Ten local-area networks with Compuadd 333T servers.
- A slew of peripherals, including external compact disc/read-only memory drives, 1,300 Hewlett-Packard Co. Laserjet printers and 1,200 Panasonic Industrial Co. dot matrix printers.

And what about the $21 million tab? It was picked up by Japan's so-called peace fund, which provides cash to the allied war effort in lieu of direct military involvement.

MITCH BETTS

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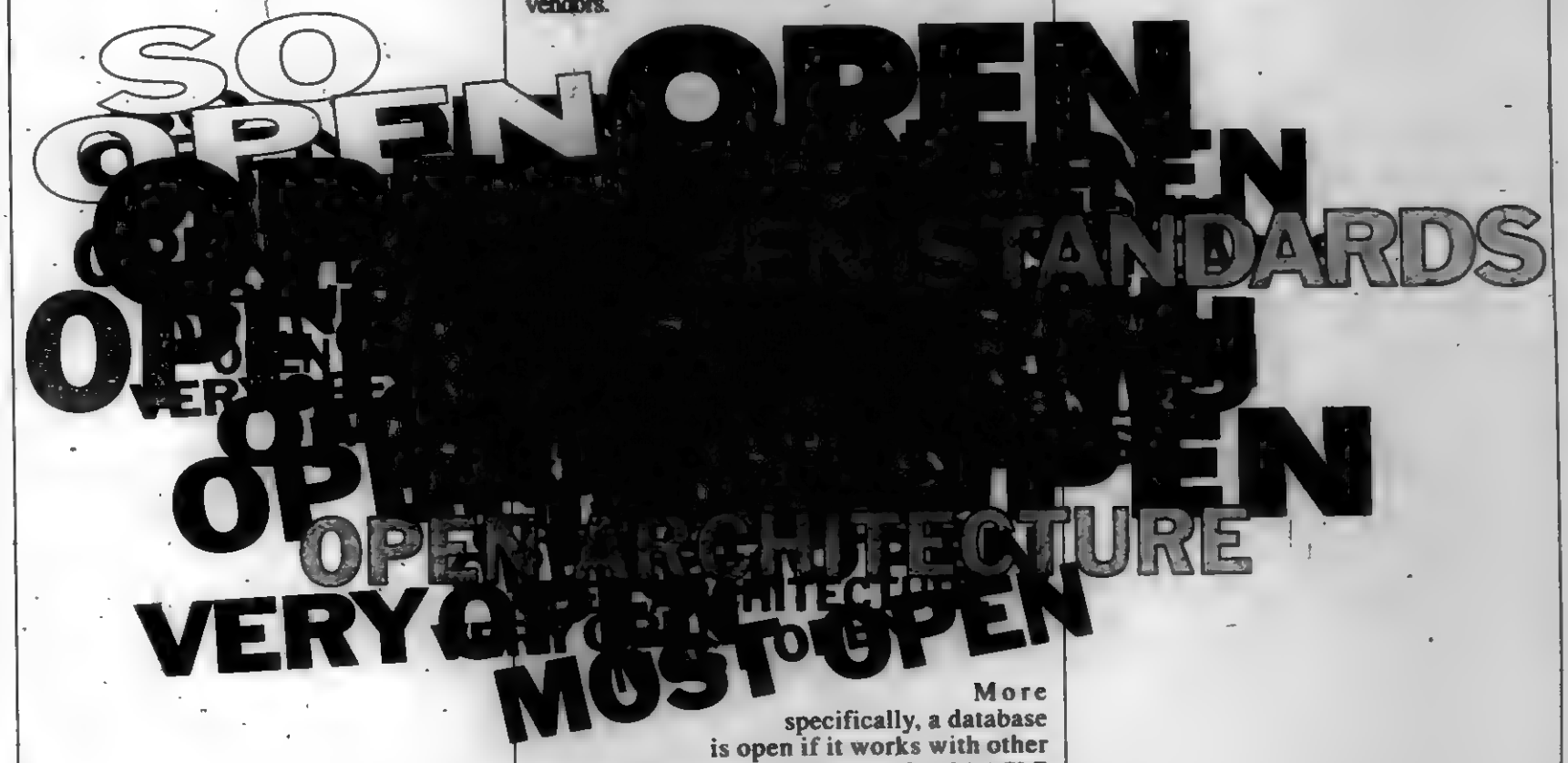
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Closing Arguments

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Today, some software companies claim that their software products are "open." They may even graft the word onto their product names. It is a confusing situation, but a clear definition of "open" is finally emerging.

Software is "open" only if it adheres to industry standards and works with products from other vendors.



More specifically, a database is open if it works with other vendors' databases. For example, ORACLE provides access to IBM's DB2, SQL/DS and DEC's RMS.

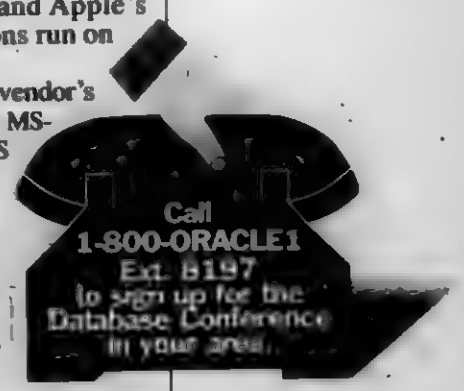
An open database should also work with other vendors' applications. ORACLE works with DEC's All-in-1, DG's CEO, IBI's Focus and SAS. And it supports PC and Mac software like Lotus 1-2-3, WordPerfect, Borland's Paradox and Apple's Hypercard. Even Dbase applications run on ORACLE.

Software is open if it runs on every vendor's operating system. ORACLE runs on MS-DOS, OS/2, Mac OS, UNIX, VMS, MVS and virtually every other operating system on the market.

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NEWS SHORTS

IBM shifts marketing group

IBM "closed the loop" on its Officevision shift last week by moving its marketing group out of the Application Solution Division and into the company's U.S. marketing group, a spokesman said. Last month, the company gave its Programming Systems Division, headed by Earl Wheeler, development responsibility for the troubled office software project. Previously, the Application Solution Division had responsibility for both Officevision development and marketing.

HP to announce Unix systems

Hewlett-Packard Co. said it plans to release a new series of high-end reduced instruction set computing (RISC) multiuser Unix systems running at 50 or more million instructions per second (MIPS) and low-end RISC systems running at more than 12 MIPS by the end of next month. At the high end, the systems will be priced under $20,000, according to a spokesman. A basic low-end system will cost about $5,000.

Belove leaves Lotus

Lotus Development Corp.'s head of corporate research and development, Edward Belove, resigned last week, saying it was time to go. Belove, 40, was involved in the Improv, Agenda and Magellan projects and hinted that the fruits of yet another effort will be introduced in April. Some analysts suggested Belove left because his role had been downsized two years ago. Belove said he wanted to work for a smaller company and had been thinking about resigning for a long time "based on the development I wanted to do and the kind of person I am."

CD-ROM Yellow Pages debuts

Business telephone numbers from the Yellow Pages of every U.S. city and town are now available on a compact disc/read-only memory (CD-ROM) release from Cambridge, Mass.-based Datware Technologies, Inc. Memory-resident and modem options allow speed dial users to access a database of 9.2 million telephone numbers and dial one while another application is booted and running. The $399 disc runs on CD-ROM drives attached to IBM Personal Computers, Personal System/2s and compatibles.

3Com touts host connectivity

3Com Corp. said last week that it is adding Unix host connectivity for a passel of operating systems through two of its Transmission Control Protocol (TCP) products. TCP with Demand Protocol Architecture (DPA) and Netbios will offer host connectivity to Novell, Inc.'s Netware, Microsoft Corp.'s Windows 3.0 and LAN Manager 2.0; and IBM's OS/2 Versions 1.21 and 1.3. TCP with DPA and TCP Netbios, 3Com said, are currently available.

CA cuts workers

Computer Associates International, Inc. last week laid off 20 people from its Microcomputer Products Division (MPD) in San Jose, Calif. The personnel, mostly in administration, represent about 9% of the division's 300-plus employees. A CA spokesman said the layoffs resulted from a reorganization that will "bring MPD more into the corporate fold. It had operated as more of a subsidiary, and there were some redundancies."

Sprint scores NSF win

U.S. Sprint Communications Co. has won a contract to extend the National Science Foundation's (NSF) Nafnet to overseas research and scientific networks, the NSF announced last week. The contract is a coup for Sprint, given that three years ago, IBM and MCI Communications Corp. got the job of implementing Nafnet's high-speed domestic backbone. The initial agreement calls for Sprint to provide 128K bit/sec. links to research networks in France and Sweden, with Cisco Systems, Inc. providing multiprotocol routers and Cornell University providing the network operations center, according to Steve Goldstein, an NSF program director.

More news shorts on page 100

More CIO departures are not done by choice

BY CLINTON WILDER
CW STAFF

CHICAGO — Those who like to proclaim that CIO stands for "career is over" received some supporting evidence from results of a Deloitte & Touche survey of chief information officers that was released earlier this month.

Nearly 25% of the 614 North American CIOs surveyed in 1990 said their predecessors left their jobs because they were fired. A smaller percentage, 19.8%, said their predecessors left voluntarily. By contrast, in the 1989 survey, the percentage of CIOs who were dismissed was the same as those who left voluntarily: 21.1%.

Increasing demands to communicate the bottom-line benefits of information systems is exacerbating such occupational hazards, said W. Richard Howard, head of the IS executive practice at search firm Korn/Ferry International in Los Angeles.

The No. 1 reason for CIO firings is "they simply can't translate what they're doing into terms that the CEO can understand," Howard said. "You see a lot of CIOs doing the right thing, but the key people don't know it."

A telling factor in the Deloitte & Touche survey may be that 38% of the CIOs said they still do not participate in their company's strategic planning process. Furthermore, when asked to rank the most important factors in measuring IS service, respondents rated the company's bottom line — improved overall financial position — only seventh. The No. 1 indicator was the old standby of implementing systems on time and within budget.

"That is a very different focus from the CEO's, which I think the CIOs need to change," said Ray Bolek, director of large-scale systems consulting at Deloitte & Touche.

Turnover at the top

Almost one-third of departed CIOs were ousted or demoted, according to a survey of 614 IS executives in North America

Why did your predecessor leave this position?	
☐ Dismissed	24.8%
☐ Demoted	7.1%
☐ Voluntary leave	19.8%
☐ Promoted	12.5%
☐ Lateral move	11.6%
☐ Retired	10.3%

Source: Deloitte & Touche
CW Chart: Paul Mock

Beware of distribution

The distribution industry was particularly treacherous for senior IS executives. A whopping 60% of CIOs who left distribution companies were fired or demoted; the next worst industry was manufacturing, with 38%.

"Profit margins are so tight in distribution that they can't afford to waste any money," Howard said. However, Bolek pointed out, a high number of mergers among distribution companies may have inflated the number.

At the other end of the spectrum, financial services, transportation and education all had CIO dismissal/demotion rates under 20%.

Employment volatility is also occurring further down in the organization: Turnover rates for systems development professionals increased in the survey for the third straight year. The systems development employee turnover rate in the past two years was 12.2%, up from 11.9% in the previous survey and 9.5% in 1988. Among industries, retail had the highest rate, 13.8%, and energy had the lowest, 8.2%.

Vaxcluster Oracle version on the way

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Systems Corp. said last week it has fixed problems that forced it to exclude Digital Equipment Corp. Vaxclusters from using a version of its database management system software 18 months ago. It expects to introduce the revised product next month.

Oracle 6.2 will replace Version 6.0, which was not withdrawn from the market but which Oracle conceded would not work with Vaxclusters. The features in Oracle 6.2, available at first for Vaxcluster users, will be termed the "parallel server option," and will be included in Version 7.0 for other systems, Oracle spokesmen said last week.

The update will have a rewritten distributed lock manager that solves resource contention problems, Oracle Chief Executive Officer Larry Ellison said last week.

Transaction processing features in Oracle 6.0 had caused excessive I/O messaging and disk resource contention on Vaxclusters, slowing performance. The product reportedly did not experience that problem running on single VAX units.

In Version 6.2, "they fixed the problem the right way," said Donald Feinberg, program director for software management strategies at Gartner Group, Inc. in Stamford, Conn. "They wrote their own distributed lock manager to do their own lock handling instead of letting the DEC Lock Manager do it."

Queries to the Oracle 6.2 database are collected in a "journal" before being transacted, lessening the number of I/O transactions to the Vaxcluster's shared disk memory, Feinberg said. Oracle 6.2 also uses row-level locking instead of page-level locking, allowing multiple users to access the same set of tables without locking one another out.

In contrast, DEC's own RDB relational database manager handles the Vaxcluster challenge by breaking the database into multiple partitions. Each partition is dedicated to a single VAX, explained Vickie Farrell, DEC's marketing manager for database systems. Updates are transferred from partition to partition using two-phase commit procedures. Oracle will not support two-phase commit procedures until Version 7.0, which is expected to be released later this year or early in 1992.

Analysts said they believe the recent improvements in DEC's newest RDB 4.0 DBMS — combined with Oracle's lack of Vaxcluster support — have hurt Oracle's VAX market share. Oracle's VAX revenue slid from $86 million in the fourth quarter of fiscal 1990 to $51 million in the first quarter of fiscal 1991.

Users said the lack of Vaxcluster support has been inconvenient, but they had learned to work around it.

"You can't have five nodes with people trying to update the database at five points," said Michael Corey, the Oracle database administrator at Children's Hospital in Boston, which has a 4-Gbyte Oracle DBMS on one of five VAX 6400 machines. "With the DEC Lock Manager in the middle [of the cluster], performance went down greatly."

Children's Hospital decided to stick with Oracle Version 5.0 to restrict access to the DBMS to just one machine. Pacificorp, a Portland, Ore., power utility, decided to hold off on grouping some of its 50 VAXs into Vaxclusters, awaiting resolution of the Version 6.0 resource-contention problem.

"Oracle 6.2 is a necessary part of our long-term strategy on platforms," said Wayne Horscroft, director of data management at Pacificorp.

Unisys plans hybrid A series midrange system

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. is expected to announce a midrange system today that uses microprocessors from both Unisys and Intel Corp. and that is able to run Unisys' proprietary operating environment as well as Microsoft Corp.'s OS/2 or AT&T's Unix System V concurrently.

The Unisys Cooperative Computing Platform (CCP) will replace the 2-year-old Unisys Micro A, from which it is derived, and could make the A series appealing to a wider audience.

However, analysts said they were skeptical about how much the CCP will extend Unisys' reach beyond the A series installed base or cause a ground swell of software developer activity, given the relatively small Micro A user base.

"With CCP, you have the potential to marry [A series and OS/2, DOS or Unix] applications under a remote procedure call mechanism into a single application," Unisys program marketing manager Mark Feverston said.

For example, he said, the database and on-line transaction processing services could use the Unisys Single Chip A series Mainframe Processor chip, while the graphical user interface could use the Intel 80386 chip. He conceded, however, that for now, applications on the A series and Intel Corp. chips can run concurrently but are quite separate.

David Card, an analyst at International Data Corp. in Framingham, Mass., said Unisys will primarily sell its new machine to its existing base of Micro A users, who may want the option of giving users on a local-area network access to applications resident on the CCP.

Additional compatibility

In addition to OS/2 and Unix, the newest A series can include DOS personal computer services and applications when outfitted with optional Unisys Usernet software. With this configuration, the CCP can function over a Novell, Inc. LAN.

However, Unisys does not appear to be interested in making the CCP a Novell server, according to Card.

Asked if Unisys will use Novell's Portable Netware on the CCP, Feverston said, "Call me back in a few months." Similarly, he said that although Unisys is considering porting the CTOS operating system used in its CTOS networked workstations to the new A series, it was "expedient" to stay with the PC platform and get the system to market quickly.

According to Unisys, the CCP can achieve 12 trans./sec. and ranks in performance between an IBM Application System/400 Model B45 and AS/400 B50.

Existing Micro A customers cannot upgrade to the CCP.

Available immediately, CCP models will range in price from $26,750 to more than $100,000.

Compaq pumps up storage array

BY RICHARD PASTORE
CW STAFF

BOSTON — Systempro users facing potential memory constraints welcomed Compaq Computer Corp.'s announcement last week of a disk expansion unit that pushes current 1.6G-byte storage limits to nearly 20G bytes.

Compaq also announced digital audio tape (DAT) drives for its high-end computers and cut system prices by as much as 21%.

"I'm going to need the space," Systempro user Gerard Nussbaum said. With efforts under way in customized database applications and plans for electronic data interchange, "we're fast approaching the maximum," said Nussbaum, who is director of MIS at Premier Hospitals Alliance, Inc. in Westchester, Ill.

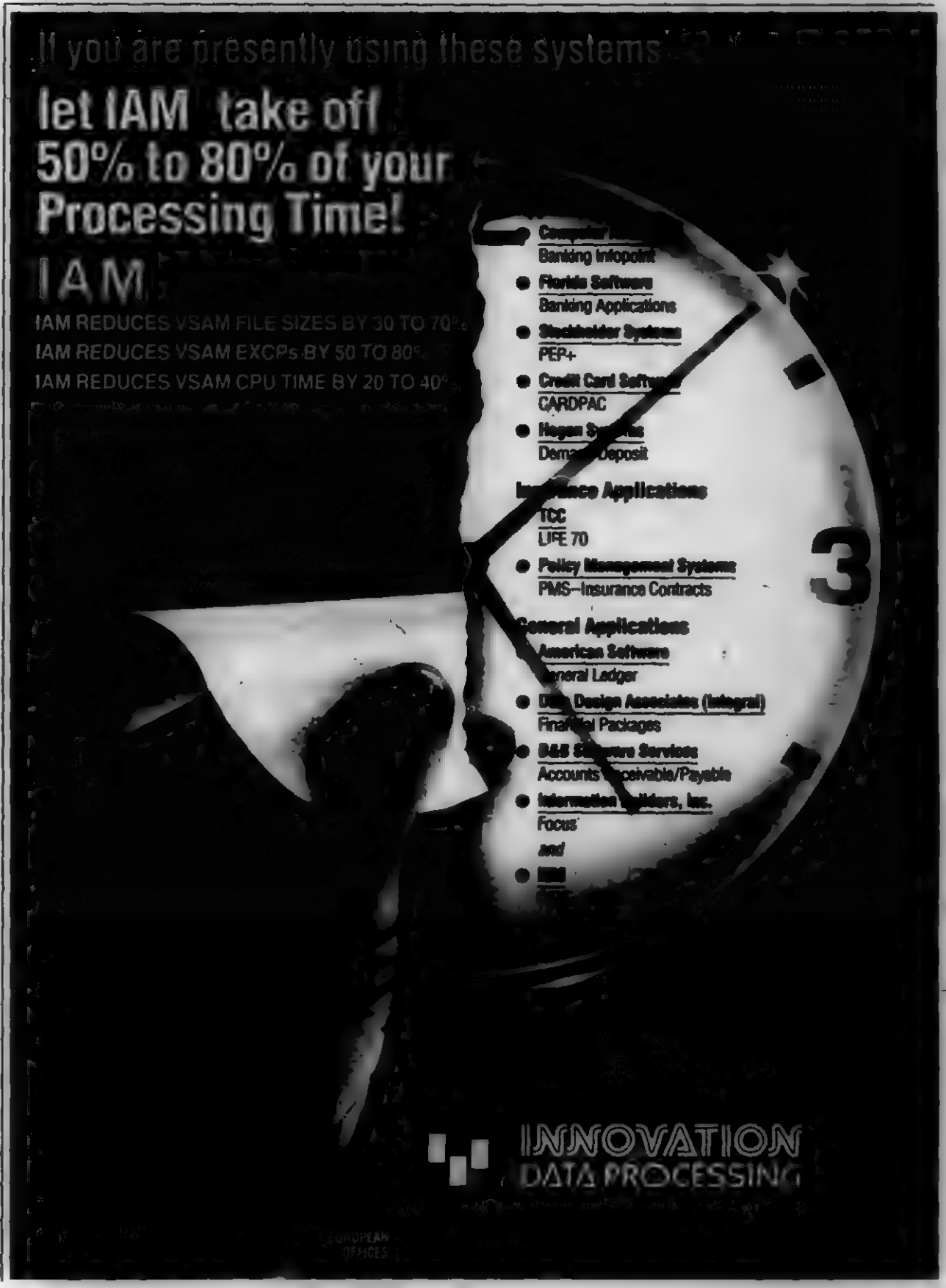
Users can attach up to two free-standing Intelligent Array Expansion Systems, each with a maximum 9.1G-byte capacity, to their Systempros. User-selectable, fault-tolerant features include drive mirroring, an on-line spare drive and controller duplexing.

"It removes the final limitation that I saw on the machine," said Mark Olsen, systems analyst at Cox Cable San Diego, Inc. "New network applications such as imaging have tremendous disk requirements," he noted.

The expansion unit costs $21,999 with two 1.3G-byte drives. Additional drives cost $2,999 each. The systems are expected to ship this quarter.

Up to two of Compaq's new 1.3G/2G-byte DAT drives can be installed in the Systempro and in several other high-end desktop machines. The drives accept standard removable tape cartridges. Shipped with one digital tape, the drive lists for $5,499 and will reportedly be released this month.

To make the systems more competitive, Compaq cut prices by as much as 10% on all Systempro models and boosted standard memory to 8M bytes on Intel Corp. 80386-based Systempros. Deskpro 486/33L and 386/33L systems saw prices drop from 13% to 21%.



RS/6000

FROM PAGE 1

branch offices, according to Chief Information Officer William H. Anderson.

A more typical RS/6000 customer is Gulf States Utilities Co. in Beaumont, Texas, where four RS/6000 Model 320s are taking over a nuclear engineering application that ran on the utility's IBM 3090 mainframe. "Initially, these machines will be used primarily as stand-alone workstations networked over a Token-Ring to the mainframe," said Quentin Whitman, supervisor of application systems.

The nine RS/6000 Powerstations and Powerservers introduced one year ago have been joined by three more, and IBM will introduce low-end workstations in March, company officials confirmed last week. IBM also said it will release a diskless workstation later this year priced well below $10,000.

At an average sale price of $30,000, the RS/6000 accounted for about $750 million of the $1 billion IBM recently reported earning in workstation sales in 1990, according to Alex. Brown. The remaining $250 million were sales of the IBM RT, a workstation widely considered to be an overpriced, underpowered failure.

Sources of money

Despite its popularity, the RS/6000's hefty price tags are forcing some users to cut costs in other ways.

At Deere Technology Services, the information systems division at Deere & Co. in Moline, Ill., there are 15 RS/6000s in use both as servers and desktop machines. The high cost of the hardware, however, led Deere to buy third-party peripherals, memory and disk drives.

The company is pleased with both the performance of the RS/6000s and the ease of integrating the machines into a network of Sun Microsystems, Inc. workstations, said Rosie Barton, a systems analyst at Deere. While the AIX operating system — IBM's version of AT&T's Unix System V — has not proved as "error-free" as Sun's more mature Sun OS Unix, Barton said, AIX has features making it easier to administer.

At Central Hudson Gas & Electric, Inc. in Poughkeepsie, N.Y., a third-party application for electrical load flow analysis prompted the purchase of a single RS/6000 for the engineering department. "What surprised me was that so much software has been written for it, and it's only a year old," said Robert Berger, IS director at the utility company.

Exceeding expectations

Indeed, the RS/6000 overshot IBM's projections for 1,500 applications within the year, instead attracting 2,500 of what IBM calls "best of breed" applications and ports of 7,000 other packages.

"There is no doubt anymore that the RS/6000 has become one of the most important strategic products for IBM in the past year," said Bob Djurdjevic, president of Annex Research in Phoenix.

Not everyone is ready to concede the workstation race to IBM, however.

IBM is "not yet an effective competitor in the workstation business" because its sales force lacks broad experience with Unix, said Mark Stahlman, an analyst at Alex. Brown.

In the running

IBM's RS/6000s are topped only by Motorola's reduced instruction set computing-based systems in AIM price/performance rankings

System	Price (U.S.)	[illegible]	[illegible]
Best price/performers under $50,000 (15 systems total)			
Motorola SYS8440	$29,995	[illegible]	[illegible]
IBM RS/6000 Powerserver 320	$27,205	16.4	$1,659
Decsystem 5100	$39,940	[illegible]	[illegible]
Sun Sparcstation 1	$13,745	5.9	$2,330
AT&T Starserver S	$49,836	[illegible]	[illegible]
Unisys U8000 Model 55	$28,950	8.3	$3,488
Best $50,000-$100,000 price/performers (10 systems total)			
Motorola SYS8640	$77,565	[illegible]	[illegible]
IBM RS/6000 Powerserver 520	$56,890	16.9	$3,366
IBM RS/6000 Powerserver 530	$76,195	[illegible]	[illegible]
IBM RS/6000 Powerserver 540	$93,695	24.9	$3,763

*One AIM approximates the multitasking performance of a DEC VAX 11/780

Source: AIM Technology, Inc. CW Chart: Doreen St. John

RISC alliance draws mixed reviews

BY J. A. SAVAGE and RICHARD PASTORE
CW STAFF

A reputed high-powered alliance led by Compaq Computer Corp. could more quickly shape RISC-based workstations into a general-purpose computing platform, analysts said last week. But Compaq said it has yet to select a reduced instruction set computing (RISC) architecture, and other firms in the alliance remained closed-mouthed about its existence.

Observers said Compaq, which has been studying RISC for some time, will announce adoption of Mips Computer Systems, Inc.'s RISC platform soon. Furthermore, Compaq and Mips will be joined by Microsoft Corp., Digital Equipment Corp. and The Santa Cruz Operation (SCO) in a coalition intent on establishing a new commercial workstation standard, published reports said last week.

Such a coalition would have enough muscle to create another de facto standard in the Unix market — alongside the Open Software Foundation (OSF) and Unix International, according to Tom Kucharvy, an analyst at Summit Strategies, Inc. in Boston.

However, a Compaq spokeswoman said last week that a decision on RISC processor adoption had not yet been made, and none of the companies named as allies would confirm that any such pact existed.

Developing a RISC-based product line — either workstations or servers — capable of running today's suite of business applications would be a good move for Compaq, analysts agreed.

Users would benefit by gaining access to a business-oriented, multitasking system with potentially faster throughput than Intel Corp.-based platforms.

RISC players Sun Microsystems, Inc., Motorola, Inc. and Silicon Graphics, Inc. confirmed talks with Compaq but would not elaborate.

However, Mips is the most likely platform for Compaq to adopt, analysts agreed. If it chose Sun's Scalable Processor Architecture, Compaq would be forced to compete with the market leader using the same technology for the same market, according to Richard Fichera, a Groton, Mass.-based workstation consultant.

Sun currently leads the RISC market with 38.2% of worldwide unit shipments. Sun Chief Executive Officer Scott McNealy lashed out at the potential coalition last week.

"It's just another OSF — Oppose Sun Forever — maneuver," McNealy said, referring to the OSF's efforts to establish an alternative to Sun's Unix implementation.

Some observers claimed a coalition of Compaq, Mips, Microsoft, DEC and SCO would have considerable clout and impact on the RISC market.

Sun subsidiaries to address open systems

BY J. A. SAVAGE
CW STAFF

Sun Microsystems, Inc. reorganized last week, forming two wholly owned subsidiaries to take advantage of business in open systems and make an attempt to streamline the nearly $3 billion company.

As of July 1991, Sunsoft, Inc. will market Sun's systems software, such as its current Unix graphical user interface and future multimedia products, according to a spokesman.

Its first market will be for Sun's Scalable Processor Architecture, its clones and compatibles, but future marketing will be aimed at other Unix-based platforms.

Ed Zander, former vice president of marketing, is slated to be named president of Sunsoft.

At the same time, Suntech Enterprises, Inc. will be formed. It will market products that sit on top of the operating system, such as personal computer network file systems and connectivity software, the spokesman said.

Suntech's president will be Eric Schmidt, former vice president of general systems.

A new division called Sun Laboratories is also being formed for research and development.

"The reorganization is to exploit new opportunities in the marketplace on platforms other than Sun's," the spokesman said.

Amdahl selects Sparc for Unix server/hosts

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif.— Amdahl Corp. last week joined the ranks of systems vendors that are standardizing Unix development on Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) chip.

The $2 billion mainframe maker said it will license the Sparc technology to develop large-scale systems that it plans to sell at lower prices than the IBM-compatible mainframes it manufactures.

Amdahl gave no formal timetable for the delivery of Sparc-based products, but company sources said it may be only one year away.

"We think there's a great need for large, centralized processing within the open systems [and Unix] marketplace," said Dave Anderson, vice president of advanced systems at Amdahl.

Amdahl's UTS 2.1 version of Unix, which complies with AT&T's Unix System V, has Amdahl extensions that support data integrity, enhanced network management and connectivity with IBM-compatible mainframes.

One possible scenario, analysts said, would have Amdahl Sparc machines serving as corporate databases. The Amdahl file servers would also support distributed processing on Unix-based local-area networks, shuttling data between Unix workstations and IBM-compatible mainframes.

An earlier Amdahl attempt at a Unix mainframe, the Amdahl 7300, failed to catch on in the marketplace, said Rick Martin, an analyst at Prudential-Bache Securities, Inc. in New York.

"Their attempt to sell a Fujitsu Ltd.-based machine as a Unix server was a total flop," Martin said. "The machine they were offering was priced at about $1 million, and that's fairly rich for that kind of server." Amdahl said the 7300 ranges in price from $730,000 to $2 million.

Martin said the coming Sparc machine may be less powerful than the 7300 but offer far better price/performance.

Fujitsu, a leading manufacturer of Sparc chips, has also been building workstations on the Sparc standard, Martin said.

Anderson said the Sparc decision was made independently. "Fujitsu has been on Sparc for years," Anderson said. "The fact that we are partners with Fujitsu and that they are also on Sparc is good and a plus, but that's not the reason we made this decision."

In another Sparc-related development, Intergraph Corp. said last week it would buy up to $150 million worth of Sun's hardware over three years, despite its rival relationship in the reduced instruction set computing market.

The deal is a result of Intergraph's purchase of Dazix, an electronic design automation business that runs some of its software on the Sun platform.

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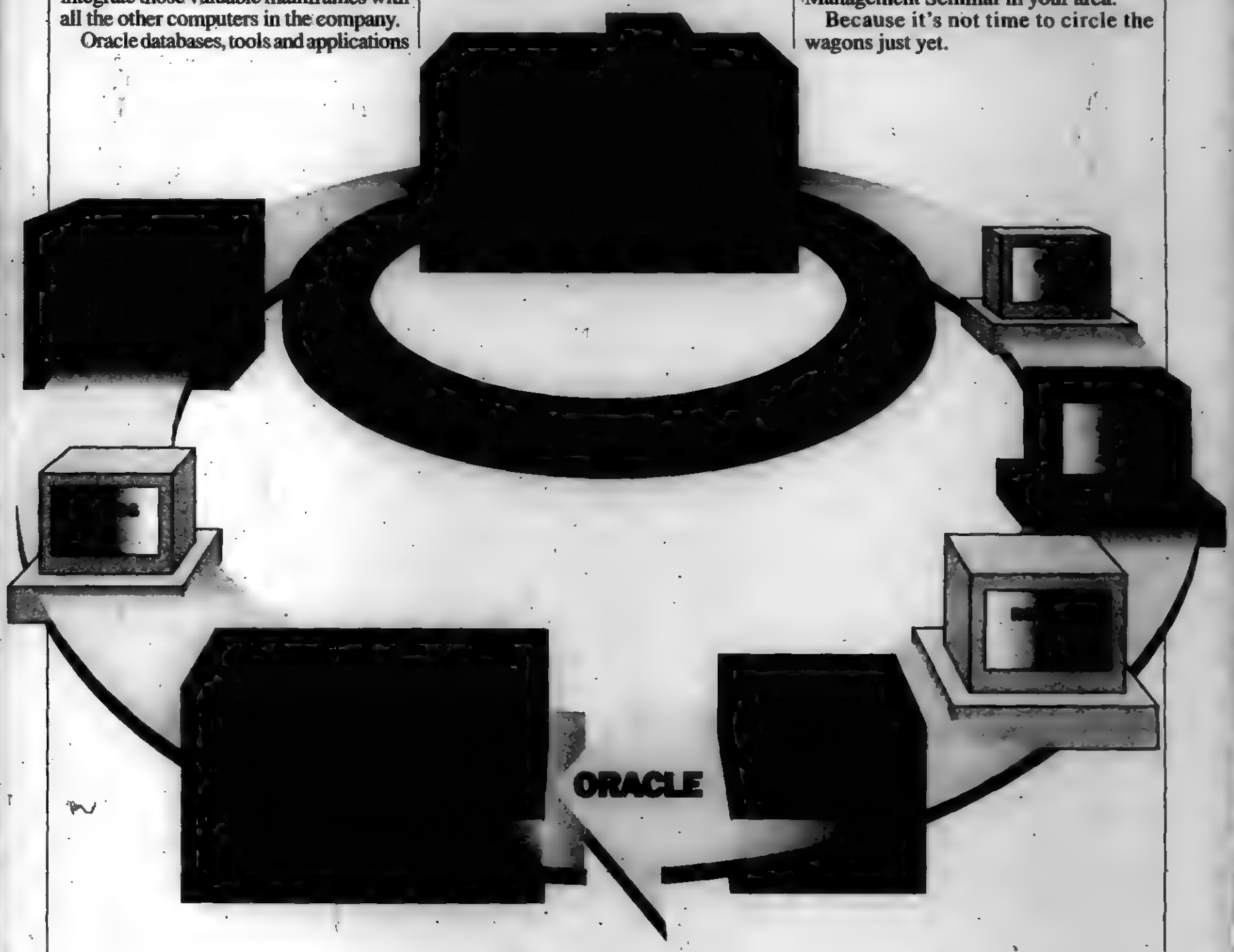
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*1990, Datamation/Cowen & Co. user survey.

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U.S.: Japanese displays underpriced

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — In a ruling that could foreshadow increased costs for laptop computers, the U.S. Department of Commerce announced a preliminary finding last week that Japanese firms are selling flat-panel displays in the U.S. at less than their fair market value.

If confirmed by further study, the finding could lead to the imposition of antidumping penalties against Hosiden Electronics Corp., Matsushita Electric Industrial Co., Sharp Corp., Toshiba Corp. and other Japanese makers of large-area, matrix-addressable displays and subassemblies.

The displays are based on liquid-crystal, plasma and electroluminescence technologies and are used in laptop and notebook computers and other products. They could also have possible future applications in high-definition television.



The Commerce Department found that the companies were dumping the displays in the U.S. at prices as much as 4.6% below fair market value — far less than the discounts that U.S. makers of the devices cited in the complaint that sparked the investigation.

James Burger, an attorney for Apple Computer, Inc., said he was encouraged by the numbers but said flat-panel display manufacturers are certain to vigorously contest them.

Robin Gilbert, a Washington, D.C.-based attorney representing the Advanced Display Manufacturers of America, the group of companies that brought the complaint, said she expects the dumping margins to go much higher when the Commerce Department finishes its investigation.

The preliminary numbers are based mostly on a comparison of prices in the U.S. and Japan, while the final numbers will factor in a comparison of U.S. prices and manufacturers' costs. Gilbert said that could boost the dumping margins from 70% to 300%.

Apple and other computer manufacturers are concerned that antidumping actions will drive up the costs of components they have to buy overseas.

> "THERE ARE INDICATIONS that Apple didn't pick our companies because of price."
>
> ROBIN GILBERT
> ATTORNEY FOR ADVANCED DISPLAY MANUFACTURERS OF AMERICA

Burger said Apple buys its LCDs from Hosiden because no domestic supply exists. For that reason, Apple contends that the antidumping law is misapplied in this case.

However, Gilbert said, "they've been saying that all along, but we do have member companies that could provide the product [to Apple]. There are indications that Apple didn't pick our companies because of price."

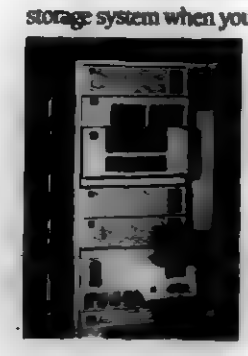
The Commerce Department said it will make a final ruling on the dumping issue by April 29. If the ruling is affirmative, the U.S. International Trade Commission will have to determine within 45 days if the dumping is injuring or threatening to injure U.S. industry — something it found in its own preliminary investigation.

If dumping and injury are found to have occurred, the offending firms will have to pay a penalty thereafter on every item exported to the U.S. The fee will be proportional to the amount by which their U.S. prices were found to fall below fair value.

The penalties will be assessed for at least one year, and then they may be removed, changed or extended.

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Imaging forms data niche

BY CAROL HILDEBRAND
CW STAFF

Imaging is hitting the agenda in more information systems sites, but its potential may be limited until character recognition technologies develop further.

According to a member survey by the Data Entry Management Association in Norwalk, Conn., 33% of respondents saw imaging as the next technology to affect their jobs.

However, one man's imaging may be another man's optical character recognition (OCR), according to Paul Sefjack, director of data entry systems development at Automated Data Processing in Roseland, N.J. "I think a lot of people get those two technologies confused," he said. "Imaging is slow in coming into its own. I can see scanning playing a bigger role in the whole process."

Mary Rhodes, senior analyst at New Science Associates, Inc. in Southport, Conn., predicted that imaging will make more of a splash when used with OCR. "I think a combination of imaging and OCR will make a difference, but there's still a lot of conversion costs that are prohibiting companies from wholeheartedly embracing both technologies," she said.

Sefjack said that in a data entry environment such as his, there is a considerable amount of numerically variable data that must be keyed in by hand. "Quite frankly, I just don't see how [imaging] fits in," he said.

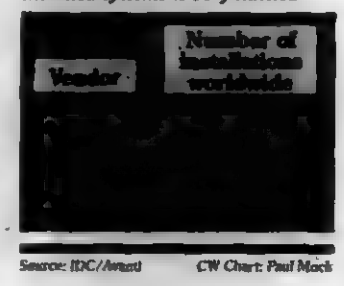
On the other hand, Sefjack said, he was impressed with the accuracy of scanning equipment he had tested and could see mixing that with personal computers in his shops. "Now that pricing is coming down, it's going to be a more attractive alternative," he said.

When imaging does become more prevalent, Rhodes said, she sees it as filling a niche. "It certainly is not going to replace data entry completely," she said. "It's going to complement it and be used for specific kinds of applications. A lot of companies want to maintain their information in electronic ASCII rather than image form."



Small circle

Imaging has been drawing a lot of attention, but the number of installed systems is very limited



Source: IDC/Arnett CW Chart: Paul Mock

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Wang optical drive debuts

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. moved to fortify its presence in the imaging marketplace last week with the announcement of an optical disc drive system.

The drive was designed to allow Wang optical jukeboxes to provide access to 838G bytes of storage at a cost of $236 per gigabyte, the vendor said. It works in conjunction with the Wang Integrated Imaging Systems and Open/Image-CICS product lines and can store 3.2G bytes of information on each side of a double-sided cartridge.

Ajit Kapoor, vice president and director of imaging strategies at Meta Group, Inc., a market research firm in Westport, Conn., noted that the drives were competitively priced and that the product's 90-msec access time was a good average. Wang's primary competitors in the optical storage marketplace are Filenet Corp. and IBM.

Wang said it is obtaining its drives under an OEM agreement with ATG and Gigadisc and that the technology supports 12-in. write-once, read-many (WORM) optical discs.

The stand-alone optical disc drive is priced at $35,000, and as many as five drives can be connected to a single image [illegible].

Also offering jukeboxes

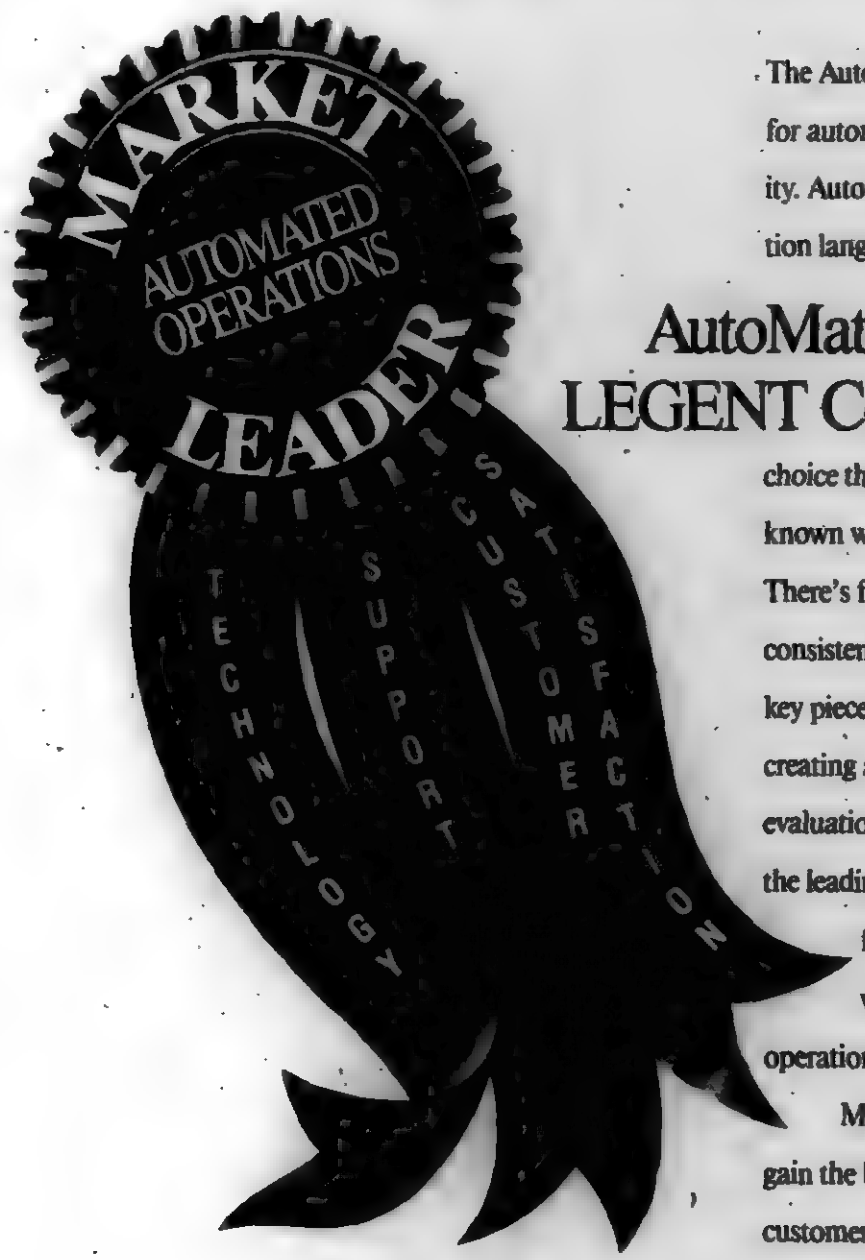
Wang also said it is offering two optical jukeboxes through an OEM agreement with Cygnet Systems, Inc.

Designated the Model 2278V-JA series, one configuration offers one drive and is capable of storing 61 12-in. discs. It is priced at $140,000.

The system is also available with two drives that are capable of storing 131 discs at a price of $198,000. Both jukeboxes can accommodate as many as five drives.

Observing that the optical storage industry is currently in a very dynamic stage of change, Kapoor offered a word of caution regarding the 12-in. form factor: The push is now toward 5¼-in. drives. He also predicted WORMs will soon be a phenomena of the past and will be used primarily in seldom accessed, archival environments.

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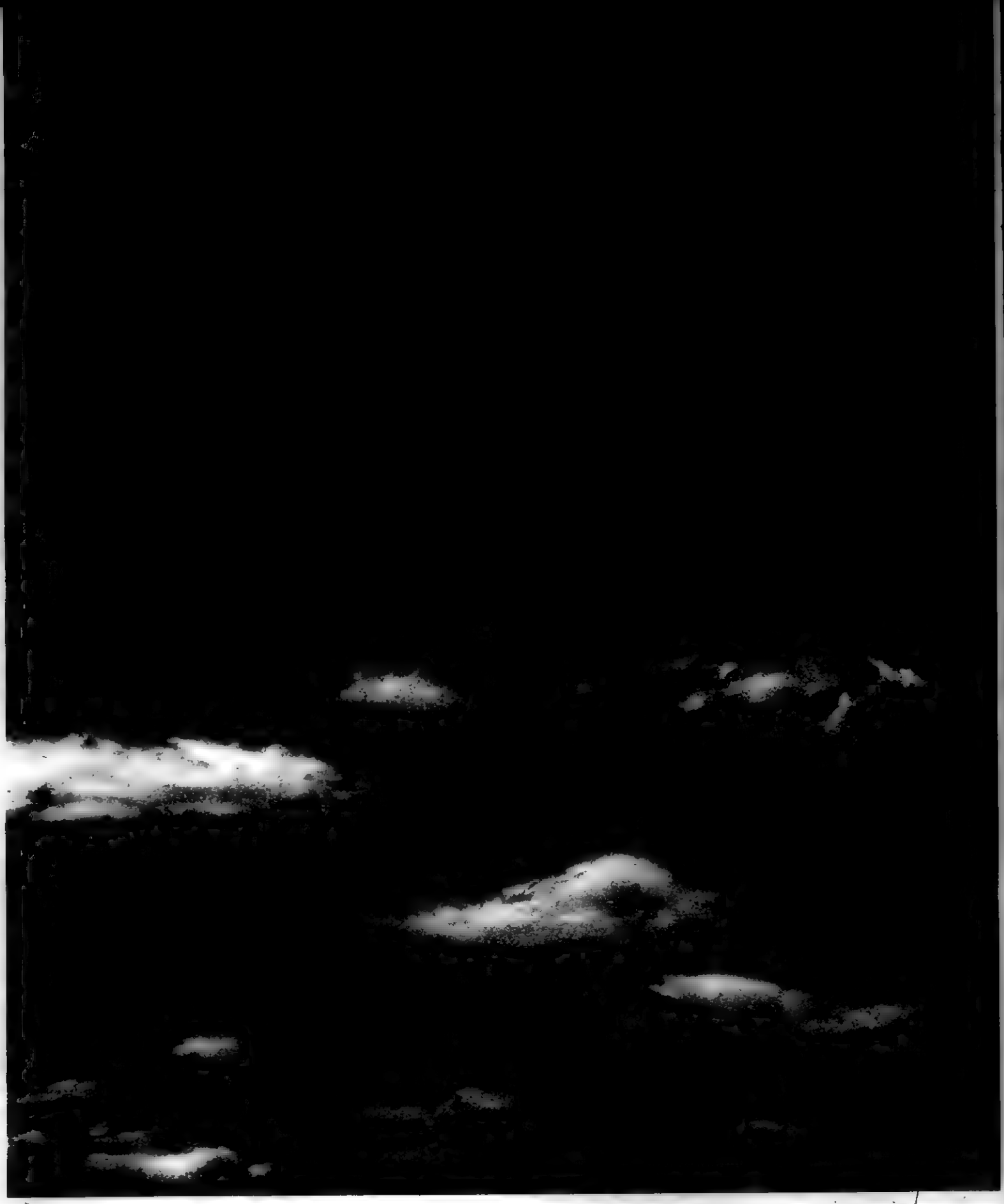
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*Gartner Group's *Software Management Strategies*, P-480-866, "LEGENT's ASO Products Take the Lead," 8/29/90.

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Intel details 486 plans

BY MAURA J. HARRINGTON
CW STAFF

SAN FRANCISCO — Intel Corp. made official last week what industry observers had expected for one month by acknowledging that it has developed a prototype of a 100-MHz 1486 microprocessor and by promising that a 50-MHz 486 will enter volume production by year's end.

Although no schedule was revealed for commercial release of the 100-MHz version, computers incorporating the 50-MHz chip are likely to be available shortly after it goes into production, said Paul Rubin, director of product marketing at Austin, Texas-based Dell Computer Corp.

"I think it's very likely that there will be 50-MHz 486-based PCs on the market almost immediately after Intel ships its first chip," Rubin said.



Joe Schutz, a developer at Intel's Portland, Oregon-based Technology Development Group, declined to say when the 100-MHz chip will enter production.

Analyst Michael Slater, president of Micro Design Resources, Inc., a Sebastopol, Calif.-based market research firm, said he would be "surprised" to see any 100-MHz-based computers on the market before 1993. "I think one of the major points that Intel was making in demonstrating its 100-MHz chip capability is that its [complex instruction set computing-based] products are no longer clock-speed limited, and they can compete with the reduced instruction set computing-based architecture."

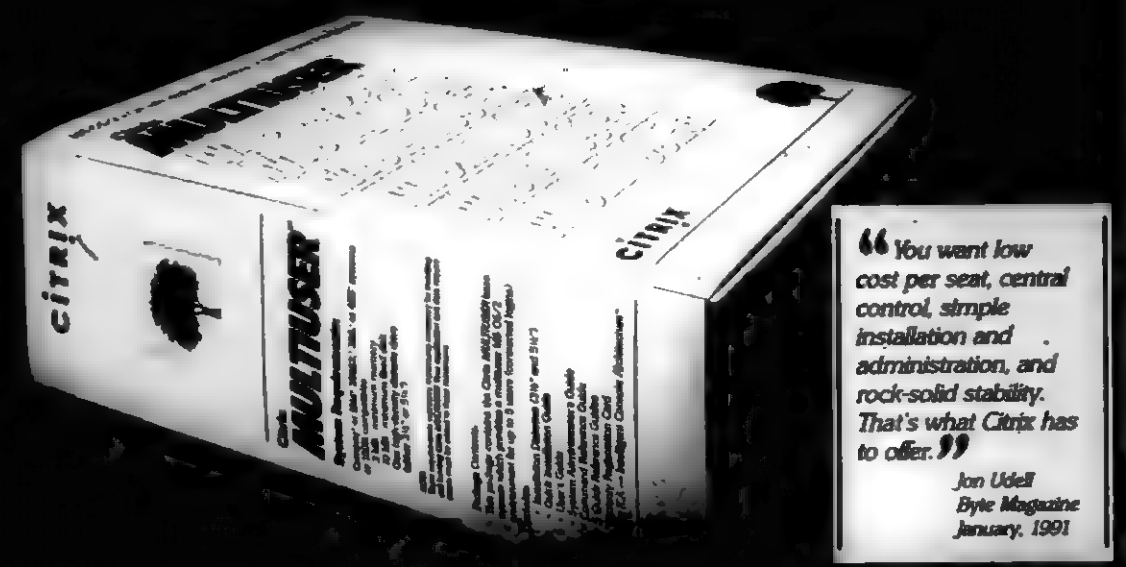
Intel made its announcement at the International Solid-State Circuits Conference here. Other companies at the forum presented theoretical explanations of their latest developments, which could help computer manufacturers make more powerful computers. The following announcements were made:

- IBM said it has an experimental 512K-bit static random-access memory chip that it claimed can send or receive up to 8G bits of information per second.

IBM said the chip's speed is attributed to its patented "pipelining" process, and it has potential for use in IBM supercomputers and workstations.

- Santa Clara, Calif.-based National Semiconductor Corp. introduced an embedded control microprocessor that could boost the output speed of high-end imaging products such as color printers, copy machines and others. The chip has a capacity of up to 100 million instructions per second when running at a 50-MHz clock rate.

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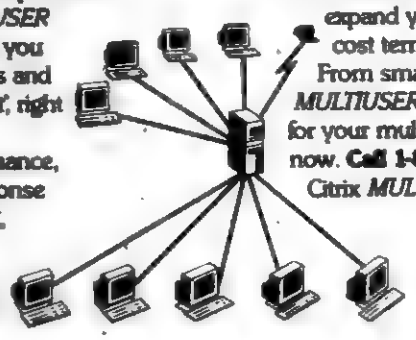


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Byte Magazine
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Borland shipping C++ developer

BY JAMES DALY
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. went on the offensive in the increasingly competitive Windows application development tools market last week with the introduction of Borland C++, a C and C++ programming environment for building both Windows and DOS applications.

The company also formally introduced Objectvision for Windows, an application builder that uses visual programming techniques to help users create applications without the hassle of learning a programming langauge [CW, Feb. 11].

Borland's C++ will butt heads with Microsoft Corp., which recently unveiled an interim Windows development kit when it announced plans to bundle its C Version 6.0 with the Windows Software Development Kit.

The new offering essentially rolls together two compilers: an ANSI C compiler and a C++ compiler. Major features include Turbo Drive, a series of debuggers and a Windows-based tool kit for creating icons, menus and dialogs.

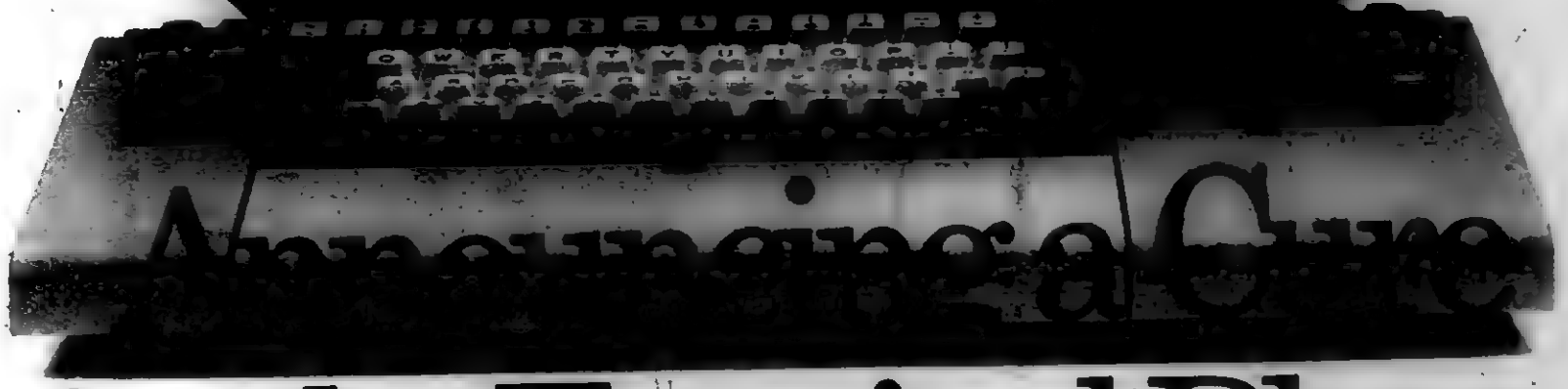
Support for extensions

In continuing its Windows languages thrust, Borland is also readying a Turbo Pascal for Windows that will support Windows extensions and offer a complete development environment, officials said.

Borland C++ replaces Turbo C++ Professional as Borland's high-end programming environment offering, said Gene Wang, vice president and general manager at the languages business unit.

Borland C++ is available now for the IBM family of computers and compatible systems with 640K bytes of random-access memory, a hard disk and DOS Version 3.0 or higher. The package has a suggested retail price of $495. Registered Turbo C and Turbo C++ users may upgrade to Borland C++ for $149.95. Registered owners of Turbo C Professional or Turbo C++ Professional may upgrade for $99.95.

The Objectvision graphical package employs an on-screen form design as a tool to create Windows applications. Although Objectvision carries a suggested retail price of $495, Borland will offer the package at an introductory price of $99.95 through May 31.



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dFacts Are In.

DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
[illegible]			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications *without programming*	Yes	Yes	No
Modern pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
[illegible]			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
[illegible]			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	6	3
[illegible]			
#1 Selling, #1 Rated multiuser database; over 3 million users (1)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 55% of PC database systems sold (3 times nearest competitor) according to the most recent report by the market research firm Ovum & Surveys (Oct. 1990) (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX, and SunOS. Macintosh and other UNIX Platforms are announced.

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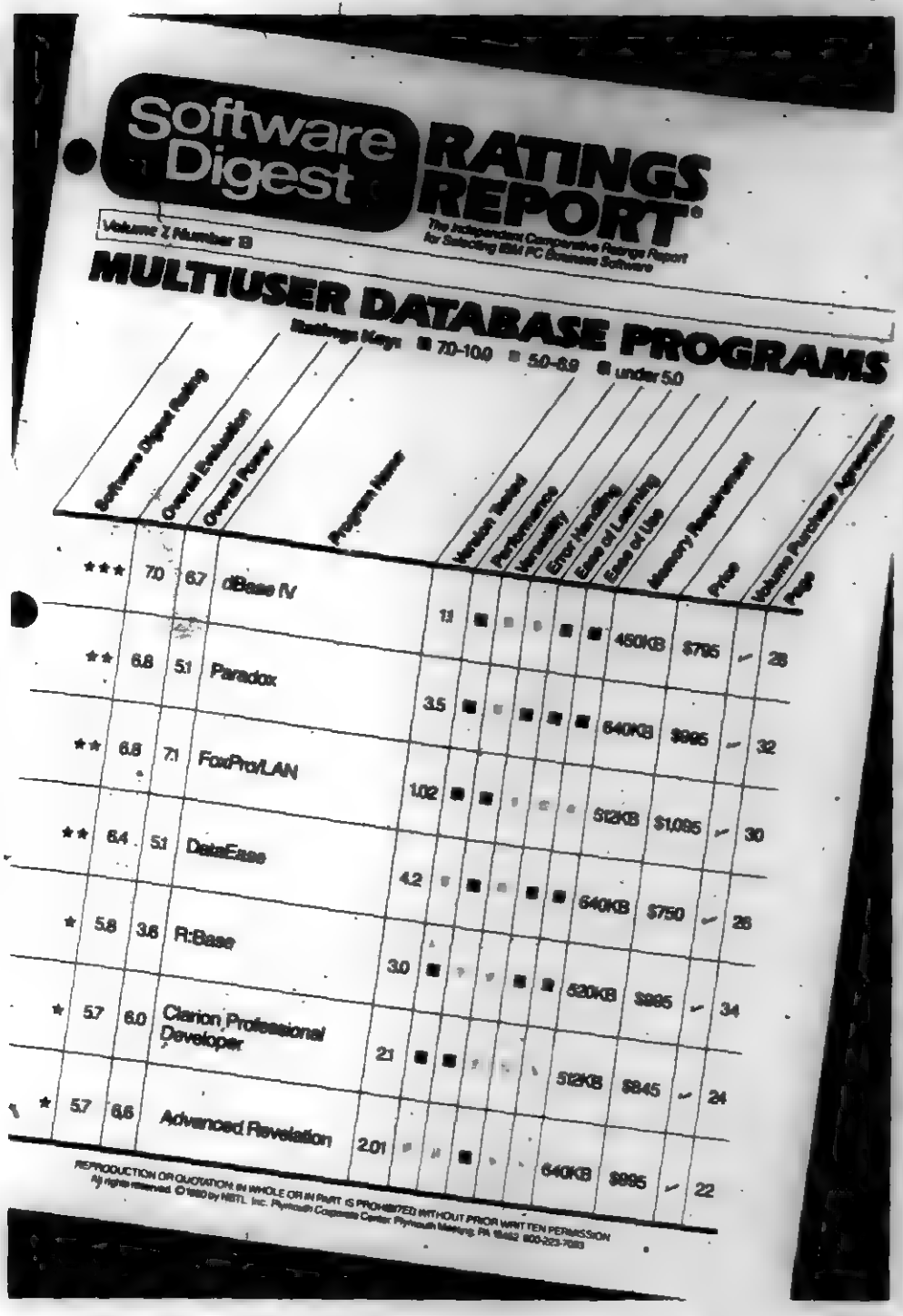
When all the facts are on the table, it's easy to see which database software is best.

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Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

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ADVANCED TECHNOLOGY

TECH TALK

Multilingual multimedia

■ IBM will donate $2 million to fund the creation of a Foreign Language Multimedia Consortium that will enable language teachers to create multimedia lessons. The consortium comprises seven U.S. and Canadian colleges and will focus on the rapid development of multimedia programs to help teach French, Spanish and German. The programs will include the traditional skills of listening, reading, speaking and writing the language as well as cross-cultural understanding, IBM said. The Institute of Academic Technology at the University of North Carolina at Chapel Hill will work with the consortium in the study of teaching techniques based on multimedia technology.

More machine talk

■ ATR International in Kyoto, Japan, plans to develop an automatic voice translating system, the company said. The system will be used to translate between Japanese and English. ATR said it intends to license the technology to other firms for use in such products as telephones and televisions. More than 100 companies as well as the governments of Osaka, Japan, and Kyoto are funding the project. Technical assistance will also be supplied by SRI International, Stanford University, Carnegie Mellon University and Manchester University in Manchester, England.

Really useful media

■ British composer Andrew Lloyd Weber recently acquired a controlling interest in Interactive Instructional Systems, Inc., a Pittsburgh firm specializing in multimedia productions. Weber's company, The Really Useful Group, is apparently interested in Interactive's large multimedia library. A spokesman for The Really Useful Group said Weber's company forecasts a growing demand for training materials based on multimedia technology.

The many tongues of computers

Electronic translation helps firms prepare to enter foreign markets for the first time

BY JIM NASH
CW STAFF

Why would anyone entrust a computer with the task of translating one language — with all its slippery connotations and cultural subtleties — into another?

Proponents claim computers are well-suited to the task of translating the dry, repetitive language often found in product documentation. They said machine translation can cost-effectively help companies that are preparing to enter foreign markets for the first time. However, opponents of computer translation scoff at the idea that computers can translate anything but simple commands reliably.

Their criticism is not new. A 1966 report by the National Academy of Sciences, for example, sneered at the technology for blundering translations such as this: "The spirit is willing, but the flesh is weak," became "The vodka is strong, but the meat is rotten," when translated into Russian. However, the technology has become more sophisticated and accurate thanks to artificial intelligence and other advances.

Logos Corp. in Dedham, Mass., one of the technology's founding fathers, markets services and software based on simulated neural networks capable of categorizing words into 1,000 linguistic pigeonholes beyond the simple classifications of subject, verb and object. For instance, it classifies nouns as proper, human-type and abstract.

The networks impose thousands of rules rather than inflexible algorithms on each full sentence. Logos' translation software can correctly distinguish between "three ways of revolving credit," and "three types of revolving credit," according to Bud Scott, chief scientist and principal at Logos.

Most of the major machine translation applications available use similar approaches, according to Vic Wheatman, an analyst at Gartner Group, Inc. in Santa Clara, Calif.

Several governments are eyeing computer translation systems, said Marjorie Leon, chief of the automated translation program at the Pan American Health Organization. Leon helped develop the organization's Spanish-to-English and English-to-Spanish software. Professional translators can double their work flow — thereby reducing translation costs by 30% — by post-editing documents that have been passed through machine translation, Leon said.



Russell O. Jones

Alan Portella, vice president of marketing for Systran Translation Systems, Inc. in San Diego, said the company's bookings indicated a grudging acceptance of machine translation. Until 1986, Systran's biggest customers were the U.S. government and the European Commission, both seeking to translate technical manuals into English. Today, business is more evenly split between government and commerce, Portella said.

Xerox Corp. in Webster, N.Y., began using a dial-up machine translation service by Systran 11 years ago to hasten the translation of documentation of products destined for international markets, according to Maria Russo, manager of translation services in Xerox's development and manufacturing department.

Autodesk, Inc., a software manufacturer in Sausalito, Calif., is testing a Systran dial-up system. "We use machine translation some now but not as much as we intend to in the future," said Mitch Aoki, Autodesk's system administrator.

Systran MT Systems, as the program is called, is menu-driven. Aoki explained that he chooses "translate" and then keys in his password. The program automatically dials up Systran's mainframe.

When the document is processed, in about one to three minutes per page, it is passed back. "French and German are faster to process because [code for them] is so well-developed," Aoki said. "The shorter the sentences, the faster the translation."

User acceptance continues to be slow despite renewed interest in the technology. Wheatman estimated that out of the $12 billion spent worldwide on all forms of translation, only $10 million will be spent this year in the U.S. on automated translation. He said he expects that to double by mid-decade. Wheatman blamed the bad reputation that the technology earned in the 1960s for much of U.S. businesses' reluctance to use it.

Microchip permits voice storage in analog

BY MAURA J. HARRINGTON
CW STAFF

Information Storage Devices, Inc., a San Jose, Calif.-based start-up company, recently introduced a new microchip technology that could dramatically lower the cost of voice storage technology used in computers and other consumer goods.

The new chip is an analog recording device made from an electrical erasable read-only memory chip capable of storing up to 20 seconds of voice, according to Richard Simco, president of Information Storage Devices and the chip's inventor.

One benefit of storing voice in analog rather than digital form is that it eliminates the need to convert signals from analog to digital, which requires relatively expensive compression and analog-to-digital conversion chips, Simco said. The analog-based chip is nonvolatile and has a shelf life of 10 years, he added.

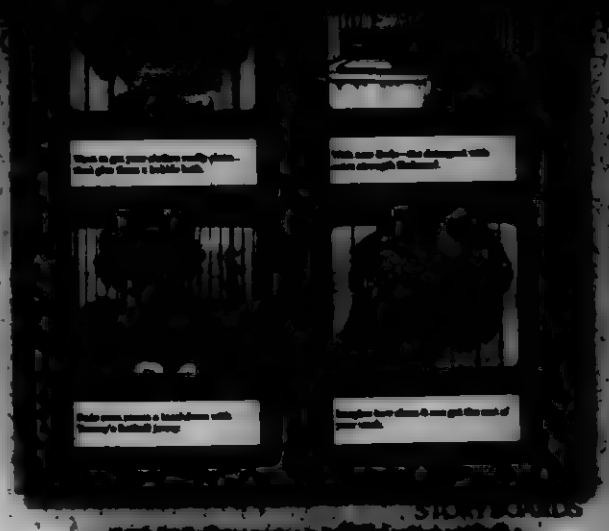
Although digital voice technology is the standard in the electronics industry, it is too costly for some applications, according to one analyst.

Voice technology in consumer products such as car radios, microwave ovens and personal computers requires an analog-to-digital converter, a memory compression chip and several megabytes of memory, according to analyst Will Strauss, president of Forward Concepts, a market research firm in Tempe, Ariz.

"This chip can be used for a number of different types of products. It is very small — eight times more dense than digital memory — and it incorporates digital addresses," Simco added.

Although a 20-second maximum storage capacity for a "tape recorder on a chip" does not appear to be very great, "there are still plenty of uses for a chip with a 16- or 20-second capacity," Simco said.

Multiple chips can be "cascaded" or piggybacked to increase voice storage length, Simco added.



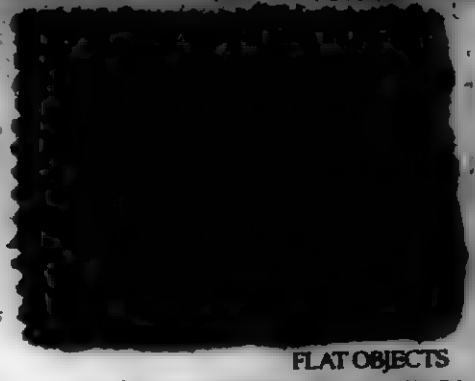
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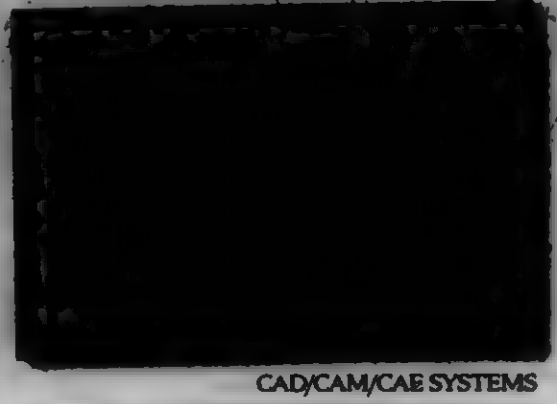
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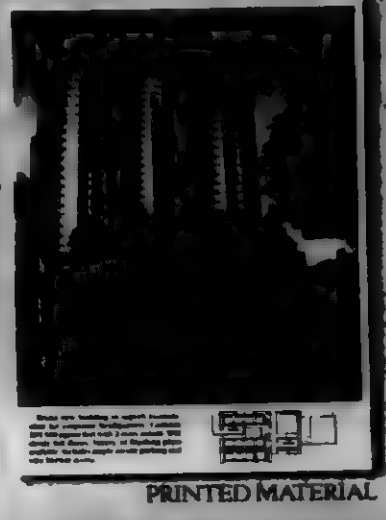
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EDITORIAL

Image vs. reality

IF YOU'RE THINKING of document imaging technology as the "spreadsheet of the 1990s," consider the conclusions of a recent Nolan, Norton & Co. survey of 200 organizations: It found that 35% were using imaging while another 23% were actively investigating its possibilities. "Imaging is generating benefits in every major vertical market," Nolan, Norton's Thornton May concluded.

But there's trouble as well. Despite imaging's rapid acceptance, "Most people aren't succeeding" at their efforts to exploit the technology, May said. In fact, a Nolan, Norton research report found that the vast majority of imaging users are stuck in a rut, unable to expand the technology beyond a pilot project or single department.

How can it be that a technology that has come of age so quickly can be used so badly by so many people? It's because imaging turns out to be much more than a technology; it's a new way of doing business. And users who fail to recognize that are doomed to get stuck in first gear.

Experts say the most common mistake user organizations make with imaging is not looking beyond the potential of the technology to change the business. For example, any business that moves a lot of paper is hamstrung by the fact that only one person can work on a single piece of paper at a time. Imagine the productivity benefits if a whole group of people could get at that piece of paper without having to move it sequentially from desk to desk? That's what imaging provides. In one case cited by Nolan, Norton, an insurance company cut the time it needed to process applications from 24 days to four days by doing just that. Customer service improved, too.

But hold on. That kind of change is scary to large organizations. What about the clerical employees who will be idled? How do you teach 30-year employees to change their sequential approach to managing tasks? How do you retrain an entire work force that has become accustomed to doing things in a rigid, formal way?

When you talk about process redesign, the issues — and the costs — become much bigger than the $25,000 or so that a full-blown imaging system costs per user. In fact, early imaging adopters nearly doubled their imaging-related expenditures between 1989 and 1990, according to the Association for Information and Image Management. And the indirect costs of retraining users and selling the concept to the work force is potentially much greater.

Imaging extends far beyond the information systems department into the very nature of the business. Little wonder that many organizations faced with these choices have opted for the safe route and used imaging as a way to do things a little faster instead of doing them a lot better. That's too bad because for large, paper-oriented businesses, imaging may be a real productivity breakthrough. And it's one in which the IS department can play a leading role. It is up to IS management, however, to understand the potential and the problems of imaging and go into the technology knowing just what a big deal it is.



LETTERS TO THE EDITOR

Innovate to win

In your editorial "Lessons of War" [CW, Jan. 28], you ask why America is capable of producing extraordinary high-tech weapons yet not able to compete with Japanese manufacturing.

It seems clear that America's strong point is brilliant innovation. Consider how many Americans have won the Nobel prize. In light of this, it is hardly surprising that we are able to create unbelievably advanced weaponry or computer products. What America lacks, however, is inexpensive, high-quality labor; something abundant in Asia.

For better or worse, America will probably have to content itself to excel in what it does best and continue to make that unique contribution to the world economy.

Jacob Stein
Monsey, N.Y.

Point of order

Regarding Alice LaPlante's article, "Survival tips for the coming year" [CW, Dec. 24/Jan. 1] the sequence of the 10 survival tips is out of order, at least from a business executive's view. On a point-by-point basis, the advice is good, yet the broader lesson is understanding priority emphasis from the viewpoint of those who demand your services.

- No. 8, get close to the end user, should be No. 1.
- No. 9, know your organization's business goals and objectives, should be No. 2.
- No. 7, work on your communications skills, should be No. 3.
- No. 6, be aggressive in applying technology to your company's business problems, should be No. 4.
- We agree on No. 5, master a broader range of skills.
- No. 4, get downsizing experience, should be No. 6.
- No. 3, become a connectivity expert, should be No. 7.
- No. 2, learn about graphical user interfaces, should be No. 8.
- No. 1, develop strong personal computer skills, would have been No. 1 in 1983: Now it falls into 9th place.
- We agree on No. 10, think constantly of your career path.

Without this reprioritization, the article leads information systems managers down a weak path.

Jim George
Systems Integration Consultant
D. Appleton Co.
Manhattan Beach, Calif.

Get it on tape

After reading the recent article entitled "University erases tape from computer center" [CW, Jan. 21], one is left with the impression that direct-access storage devices or optical-disc devices are being used as alternatives to magnetic tape. In fact, magnetic tape cartridges are still being used; they just happen to be packaged in a different form.

What the article does convey is that an automated tape library provides the solution to efficiently store and retrieve large amounts of data in an unattended manner. It also points out the viability of fiber-optic connectivity to an off-site device to support electronic vaulting — also in an unattended manner.

However, the use of nonstandard magnetic cartridge tapes (IBM 3480-type) preclude the exchange of data to and from other organizations and requires that disaster recovery be dependent on the availability of a proprietary device. This may be fine for a university, but it may not be acceptable to the majority of commercial customers.

Dan L. Costantini
Systems Engineer
Memorex Telex, Inc.
Montreal, Que.

Software abounds

Once again an article, "Users hold off on open systems" [CW, Feb. 4], addresses the issue of software not being available for the Unix environment. I find this hard to believe.

As a consultant and developer in the Pick, Prime Information, Unidata and Vmark industries, I have access to more than 3,000 application packages that run within the Unix environment. These same packages are also available within proprietary operating systems and have been since the 1970s. The choice of hardware and software is limited only by my clients' imaginations.

I am not sure where the lack of software is, as I simply look in one of the software catalogs on my bookshelf.

Richard A. Wilson
R.A.W. Data Systems, Inc.
Smithfield, R.I.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.



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It's shareware, not virusware

Misconceptions about safety prevent many people from using shareware

ROB ROSENBERGER

Shareware gets a bum rap. Pick up any major newspaper or magazine and you'll find experts discussing an epidemic of viruses in shareware programs. "Purchase only retail software," they warn. Many firms and federal agencies take this advice and ban shareware, ignoring the fact that at least 17 firms have included viruses in thousands of copies of shrink-wrapped retail software.

Many stores today accept returns on unopened packages, presenting the threat of viruses in rewrapped packages. An Egghead Discount Software outlet recently gave $750 in gift certificates to a customer whose software was infected after store employees put a returned product back on the shelf. Egghead claimed it has since clarified its policy on software returns, but it doesn't have a monopoly on computer stores. Many virus experts say other stores experience the same problem with rewrapped software.

Comdex and PC Expo conventions have problems with viruses spread by booth personnel who trade floppy disks like baseball cards. Microcom, Inc. the company behind Virex and Virex-PC, scored a publicity coup last year by sending people to inspect computers at PC Expo. They cleansed dozens of infected disks. Microcom Vice President Robert Capon said this parallels his experience at every major convention since 1988: "We've bailed out more companies attending trade shows than you can imagine."

Compare this with the shareware industry's record of spreading viruses. 1990 saw shareware's first recorded case of infected master disks. The author shipped four infected disks; all four recipients detected it and returned or destroyed them. This occurred two years after the first of many similar events involving retail master disks.

Why does shareware have such a great track record compared with the retail industry? The answer lies in bulletin boards and disk vendors, the two major distribution channels for shareware today. Most people who obtain programs this way constantly look over their shoulders, reducing the chance a virus will get into the system.

Disk vendors serve as a clearinghouse for shareware. They often get programs direct from the authors and scan them for viruses before offering them to customers. Retail stores can't check the disks they sell without breaking a shrink-wrap seal in the process.

Bulletin board operators, known as sysops, have successfully dealt with the threat of malicious software for more than a decade. Most bulletin board users double-check the sysop by running virus-detection programs on any software they download.



John Gaeta

Virus expert Rich Levin has watched the shareware industry since the early 1980s and claims "people who use bulletin boards and shareware usually practice better virus safety measures." Indeed, in 1987, the bulletin board community received the first IBM Personal Computer software designed to stop infections at a time when some experts still dismissed viruses as an urban legend.

If we have so many horror stories in retail software and so few in shareware, why does shareware get a bum rap?

- **It seems so plausible.** You can get a virus if you share software. Shareware thrives on people who share software. Bulletin boards carry a lot of shareware. Therefore, people assume they account for a large number of infections.
- **The experts label their assumptions as fact.** Reporters talk to computer security consultants to get the information (and quotes) they need for a story. A recent survey by Empirical Research Systems indicated almost half of these experts formed their opinions on viruses just by reading newspapers. This means the noncomputer press feeds consultants information, which they later regurgitate for other reporters, who write more stories, which other consultants read. This same poll concluded by estimating only one-third of computer security experts have an adequate knowledge of the virus threat.
- **Retail stores tell it to customers.** Software stores make money selling software. If a customer expresses concerns about paying so much for a retail program, a store employee can point to any number of experts, and say, "We don't sell viruses."

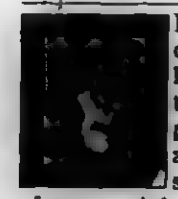
Does this mean managers will greet shareware with open arms? No. Many companies need to control incoming software so they can standardize on specific packages and deter software piracy. In these cases, a wise supervisor will restrict the trial use of shareware without slapping a complete ban on it.

Company policymakers must conquer their fears before they can confront the real virus threat. Ignorance thrives on hysteria, and hysteria has blamed shareware for spreading the majority of viruses.

Rosenberger is proprietor of Barn Owl Software Co., writes shareware phone bill analysis software and serves on the board of directors of the Association of Shareware Professionals.

Information technology: Promises remain unfulfilled

DENNIS E. NOONAN



For the last decade, we've all been awaiting the fulfillment of predictions about the labor-saving potential of sexy new information technologies. There have been a host of them — office automation, desktop computing, expert systems, natural language, artificial intelligence, integrated networks, relational databases — and they've all promised to make a significant impact on the daily lives of business users.

Well, the predictions and promises were partly right. There was an impact. Recent studies have indicated that the work week for the typical white-collar professional is 20% longer than it was ten years ago. Yet during this same period, white-collar productivity has declined. Although most office workers have routine access to a computer terminal or a personal computer, the majority of knowledge workers are working harder today to accomplish less.

What happened to the four-day work week, the paperless office and the electronic cottage? If modern technology was supposed to increase productivity, then how come everyone is more stressed-out and overloaded than ever before? Why are desks cluttered with laser-printed copies of electronic-mail messages? Why is everyone in a meeting when you call them? Why are users still complaining? Is this productivity?

Of course it isn't. Everyone still talks about productivity, but nobody does it anymore.

The productivity gap is clearly the result of rampant technophilia. Technological advances in hardware have created mammoth opportunities for developers to offer seemingly endless software variations and upgrades without actually inventing a new software product.

One result of this endless search for variety is that a lot of business software is designed as an adventure game. Here are the real rules of the game: You must hit the right buttons at the right time and you win; if you strike the wrong key, you lose. Do not attempt to play without reading the READ.ME file or the documentation, which has been shrink-wrapped for your protection, or the assorted inserts that have been included to update the erroneous documentation in the manual.

Somehow along the way, the software development establishment seems to have successfully convinced the buying public and technophiles who write product reviews that software has a right to be defective. "New software always has a few bugs," we are smugly and patronizingly informed. "Software design is a very complex activity."

Most users simply want a no-nonsense product that installs quickly and does the job without blowing up when you hit the wrong key. One PC user laments, "When I install a new revision, I often feel that I'm performing gamma testing."

Technophiles deprecatingly call this type of software "idiot-proofed," but I don't buy that line at all. It's the same kind of attitude U.S. auto makers used to take with American consumers until Japanese and German engineers proved that there was a better way.

To forgive is divine

Users want a system that is "forgiving" when they are in novice mode and sophisticated when they are ready to stretch. Technophiles, on the other hand, tend to view the world as a complex place full of unhappy alternatives. Compromises are necessary, they insist. So you get either a sophisticated system that requires a master's degree in spreadsheet-publishing or a user-friendly system that assumes the user is an imbecile.

The answer isn't in the interface, either. Most users don't really care about a graphical user interface. Techies and game players love high-resolution, animated color graphics because they understand how elegant and hard it is to accomplish. If you asked them, though, most business professionals would gladly trade cute little icons for a product that was easy to install and safe to use.

What professional users do need are PC-based systems that can search through huge distributed databases and come up with answers — with blinding speed. The disk should not need backing up. The system should be as connectable and as easy to use as a stereo system. The user should not have to adjust the way he does a job to the quirks of the machine connected to the keyboard or mouse.

Yet many users today still can't get at the information they need without learning how to write code. Databases can't talk to each other. Response time on local-area networks is getting to be "just like the old days." There are too many technical complexities for most business people to deal with.

The first PC revolution was led by professional users, not by hardware or software system developers or industry experts. The next revolution could be lead by these same folks and, unless some things change, the direction it takes could be toward the PC-less office.

Noonan is a free-lance writer based in Wellesley, Mass.


ven the situati
recovery plan
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IBM 3390 market set to open

Lower prices, alternative products to compete with Big Blue mainframe

BY JEAN S. BOZMAN
CW STAFF

Springtime may bring bigger discounts and stiffer competition in the high-end disk drive market.

Until now, few discounts have been offered to IBM 3390 customers largely because there has been no need for IBM to offer discounts, according to users and analysts.

Now, industry watchers say, IBM mainframe users who are evaluating IBM 3390s can expect to see some alternatives and lower prices sometime this spring, as competing products are shipped in volume and open up the market.

IBM, which announced the high-end 22.7G-byte drives in November 1989, has been shipping them in volume for approximately 15 months.

Last year, IBM shipped about 20,000 IBM 3390 units, according to Fara Yale, an analyst at Dataquest, Inc. in San Jose, Calif., who said that number came from IBM storage executives.

"IBM can get a premium price for the 3390, and the plug-compatible manufacturers [have needed] 18 months to introduce an equivalent product," said Mark Hess, director of the Large Computer Strategies Division at Gartner Group, Inc. in Stamford, Conn. "Once competition sets in, IBM will start countering with discounts," Hess added.

Analysts also said they expect IBM to announce a high-priced 3390 Model 3 later this year.

Hitachi Data Systems, Amdahl Corp., Storage Technology Corp. and Memorex Telex Corp. are all positioning their answers to the 3390, although development of some of those offerings has dragged.

The primary competition for the 3390 is the 5-month-old Hitachi 7390, but availability of that drive has been limited by ramp-up problems, which industry analysts said are connected to quality control problems. The Hitachi drive is expected to ship in volume by April.

Orders have been backlogged because of a slow ramp-up at Hitachi factories in Japan and Oklahoma, said Jack Igoe, Hitachi's new director of disk marketing. "People are ordering more of [the 7390s] than we currently have available," Igoe said.

Yale said many 7390 units are being held in inventory for an unidentified engineering change.

6390 expected soon

By April, Amdahl is also expected to announce its 3390-equivalent, the Amdahl 6390, which is scheduled to begin shipping in the spring, analysts said.

Despite efforts to move quickly, the testing period to ensure full 3390-compatibility has taken longer than expected, Amdahl's Chief Operating Officer Joseph Zemke told financial analysts recently.

"We have to do a better job of shortening the time between IBM's introduction and our own delivery," Zemke said. "Yes, it does give [IBM] an opportunity to sell into their accounts, and I'm not satisfied [with the situation]."

Amdahl gets 16% of its $2.1 billion in revenue from storage products.

As in the past, Amdahl's drives are based on technology from Fujitsu Ltd., which owns 43% of Amdahl.

"It's the same base product as Fujitsu's," confirmed Al Richards, manager of storage systems marketing at Amdahl. "The hardware is basically the same, but we use it differently."

The Fujitsu drive surfaced last year; Amdahl had to write new software that responded to IBM's 3390 microcode instructions and enhanced Systems Managed Storage (SMS) features, Richards said.

There are two other storage systems players yet to be reckoned with, according to analysts. Storage Tek, which plans to ship a noncompatible high-end drive called Iceberg in 1992, and Memorex Telex, which said it will announce a 3390-compatible drive in the third quarter. Both were designed to work in IBM's SMS software environment.

Discounts at large sites

Even without competition, volume discounts for the IBM 3390s have surfaced, but that has been at some of the largest IBM sites, which are installing the greatest number of the $200,000-plus IBM 3390 drives.

However, users at the largest IBM sites continue to buy IBM 3390s on a regular basis, as well as the older IBM 3380s and 3380-compatibles.

Other IBM mainframe users are waiting for the market to become more competitive.

"We're in no hurry here to buy any more IBM 3390s," one Northwestern region IS manager said. "Our company is on a tight budget, and we're trying to use up the capacity we've already got in-house."

New HP mini makes splash at aquarium

ON SITE

BY J. A. SAVAGE
CW STAFF

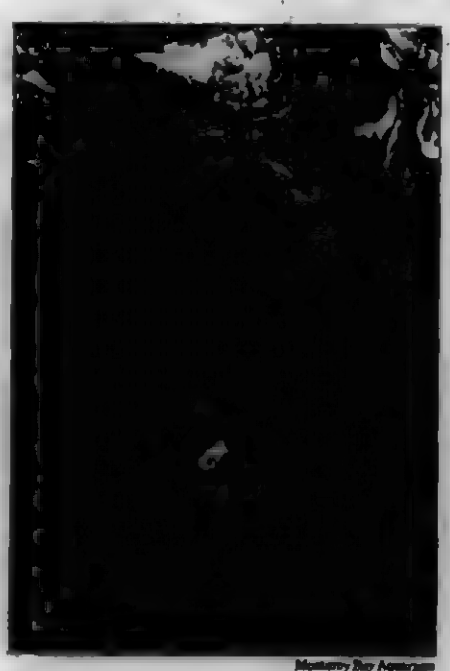
MONTEREY, Calif. — The Monterey Bay Aquarium is perched on the intertidal zone at the edge of Monterey's Cannery Row, made famous through the book of the same name by John Steinbeck.

In Steinbeck's book, Doc Ricketts collected all manner of amphibians, fish and marine mammals from the bay.

Since Ricketts' time, Monterey Bay has been overfished and has suffered from urban development. However, since 1984, when the aquarium opened, visitors have been able to see, behind glass, many live versions of what Ricketts collected, as well as some deadly species that he never stumbled on.

The aquarium has been a hit, but its 1985-vintage minicomputer has paid the price. The aquarium's slimy, warty, cute, scary and sometimes goofy-looking captives entertain and inform as many as 10,000 people per day, and the computer has to deal with them.

Until early February, a Hewlett-Packard Co. 3000 Series 42 minicomputer was chugging along, keeping track of visitors, 600 volunteers and 325 staff members, a growing bookstore, a warehouse and the 3,000 pounds of fish food per month it takes to feed the captive population. An HP 3000 Series 932 is now taking over the job.



Monterey Bay Aquarium

Monterey Bay Aquarium *uses computers to keep track of its fish and their visitors*

The original choice of HP equipment and the decision to continue with the vendor may have something to do with the source of original funds for what Dave Rasco, the aquarium's office automation coordinator, calls "a simple country fish house."

HP Chairman David Packard and his wife, Lucile, donated the $55 million it took to build the showcase. His daughter, Julie Packard, is the aquarium's executive director.

But the organization still has to pay retail price for its HP minicomputer.

"David Packard may have built the aquarium, but we haven't received any support from him since opening," said Michael Pinto, the aquarium's director of finance and administration. He dismissed the choice of vendors by saying that there is no di-

Continued on page 32

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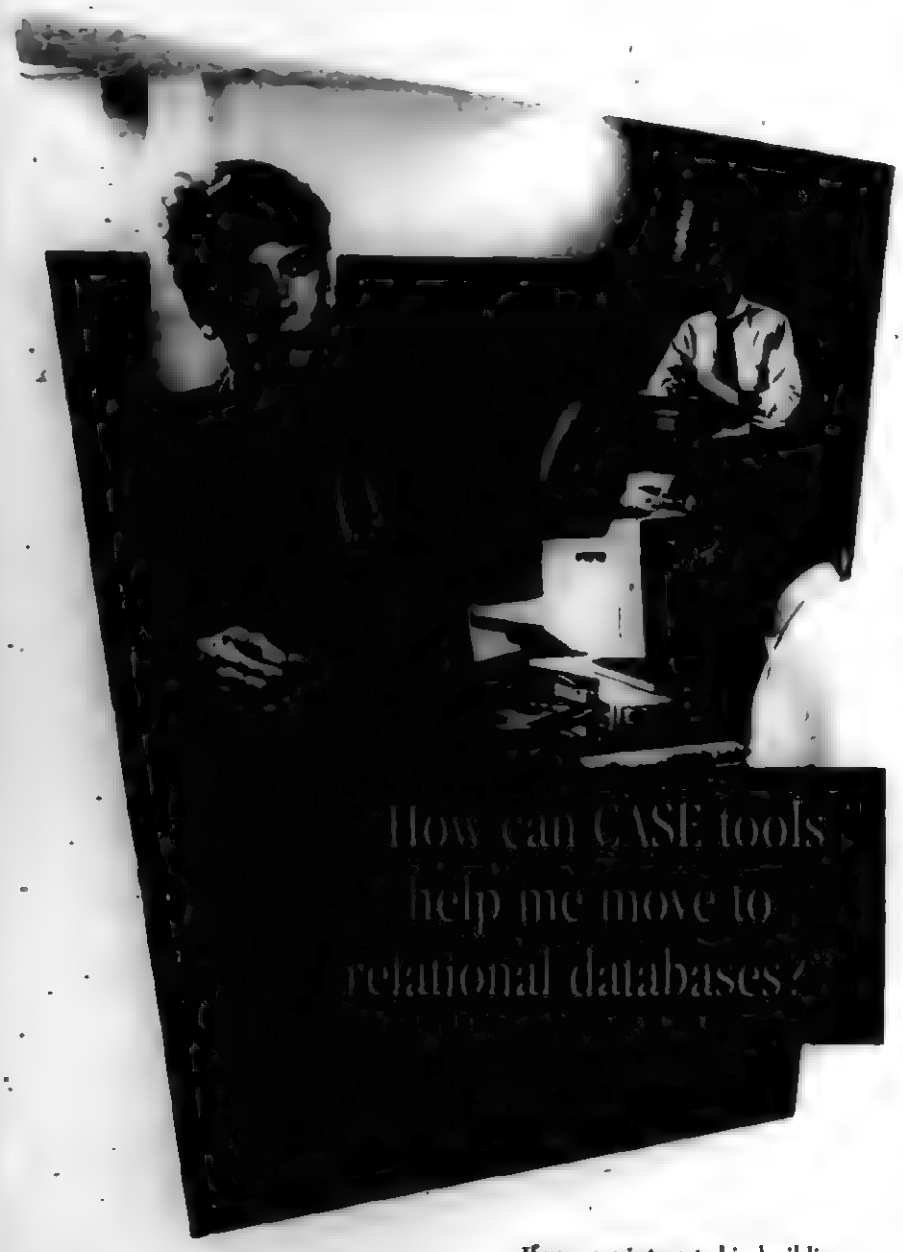
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Smart money managers can avoid cost of DASDs

ANALYSIS

BY JOHANNA AMBROSIO
CW STAFF

When the going gets tough, the tough turn to systems software to help avoid costly hardware add-ons. Users report that with some software tools and upper management's increased willingness to give them personnel and money devoted to the job, they can get more out of existing systems, particularly during troubled economic times.

Navistar International Corp. in Chicago has managed to avoid adding direct-access storage devices (DASD) to its arsenal for the past three years because of an aggressive management program started in 1985. The original idea was to apply Deming's Statistical Process Control theories to the data center, said Mike Watson, manager of productivity and quality improvement.

Over the past few years, Watson said, Navistar has saved millions of dollars with a combination of off-the-shelf and in-house developed software. The company uses Legent Corp.'s MCS software and IBM's Hierarchical Storage Management (HSM) scheme with its own models.

"We have models to evaluate the costs based on the age and size of the data set, the number of times it has been accessed and the statistical probability of its being accessed again after a certain number of days," Watson said. "We can set the parameters that are most cost-effective for us, we can balance things out, and we can economically defend our decisions."

However, "it's not smoke and mirrors," he said. "We've been through two processor upgrades and a memory upgrade since 1985. Our loads are growing — we've just managed them smarter," he added.

At Maryland Casualty Co. in Baltimore, "my charge is to make our new system last for two years, no matter what," said John Melville, manager of systems resource management. "We're not going to spend another $8 million on a mainframe before that."

In December, Maryland Casualty added an IBM Enterprise System/9000 Model 9021-580 as its second mainframe. "Capacity optimization is a big project for us," Melville said. "In the past, it was done as people had time. Now, senior management recognizes it as an important savings. It's become a formalized process, regularly scheduled."

A probing Strobe

Melville said he expects to buy a package that he has piloted sometime this year. Strobe, which was developed by Programart in Cambridge, Mass., identifies which jobs are using excessive resources, Melville said. "Our goal is to run every application through Strobe before it goes into production. Our tests indicate that Strobe allows you to reclaim 10% of your CPU cycles."

Another tool Melville said he expects to buy is called Innovation Access Method from Innovation Data Processing in Little Falls, N.J. "It's a VSAM replacement package," Melville explained. "It not only breaks through VSAM's 4M-byte limitation on data sets, but it also saves about 25% on DASD and improves performance by about 50% over VSAM," he said.

There is another real plus to using this kind of software. Mike Wharrie, supervisor of planning support at Hudson's Bay Co. in Toronto, said his Legent capacity planning software allowed him and his team to bargain better with IBM when it came time to buy a new mainframe.

"We were going to defer the 600J, which we installed last September," Wharrie said, "but then IBM offered us an upgrade from our 400L at no incremental financial cost. The information is leverage, and boy, do we use it."

IBM must have known that was no idle threat. Back in 1985, Hudson's Bay deferred a hardware upgrade for six months, for a savings of $750,000.

"You have to be prepared to make some hard decisions and live with them," Wharrie warned.

According to Melville, "to save capacity, you need a little excess capacity to move around in. You need 10G to 15G bytes of DASD to get HSM rolling. Once you do, it pays you back with even more."

"There are a lot of software tools out there, many very good," he said, "but you need the management commitment, or all the tools in the world won't help you. It has to be understood that this will cause extra work but that there is a benefit."

IS department nurses hospital computing ills

ON SITE

BY SALLY CUSACK
CW STAFF

PROVIDENCE, R.I. — While many companies and business entities have been concentrating on downsizing or outsourcing operations, the information systems department at Women and Infants' Hospital has been busy growing both its IS staff and its IS systems to meet the computing needs of modern medicine.

Bruce Reirden, vice president of information services, recalled that when he arrived at the health-care facility in 1988, six people were responsible for IS in a Data General Corp. MV computing environment.

Today, the fifth-largest obstetrics hospital in the country has doubled its IS staff and employs several part-timers.

In addition to requesting staff increases, Reirden spearheaded a drive to replace an aging DG MV 4000 and MV 10000 with DG's top-of-the-line MV 40000, which supports 220 devices on an Ethernet network, including CRTs, printers and emboasers.

With the system installation completed in October 1989, the hospital moved ahead in December with plans for a much needed software upgrade. Women and Infants' had previously been using Version 6.6 of Professional Health Care Systems' Patient Communication package.

According to Reirden, the change to Version 7.1 was initiated in December 1989 and completed in May 1990. The nature of the upgrade was so great, Reirden said, that it was comparable to changing vendors.

"The typical problem in any hospital is that each employee has his or her own job to do, in addition to learning a new software system," Reirden noted.

Hands-on involvement

In this instance, employees were responsible for helping to define individual screens, reporting requirements and appropriate tables. The heads of all departments were involved in the upgrade and installation, including the training, planning, documentation and testing phases.

The upgrade offers Women and Infants' several significant advantages over the previous version, Reirden said. Among them are automated patient registration functions and increased reporting capabilities.

Perhaps even more importantly, the system now allows information from the admitting process to be passed electronically onto the billing application, which eliminates a tremendous amount of paperwork.

"Before, all health insurance-related information, such as Blue Cross/Blue Shield requirements, had to be captured from the CRT and transferred onto paper to be sent to billing," Reirden said.



Women and Infants' *system upgrade lets doctors give patients more attention*

Along with the shiny new computer and the sophisticated software package, the hospital has replaced its traditional 9.6K bit/sec. lines with a microwave and fiber-optic communications link to transmit data between the computer center and main medical facility.

According to Reirden, DG's Network Services Division designed the network and subcontracted Diversified Communication Technology, Inc. in Abington, Mass., for the actual microwave installation. Reirden said he feels that DG's field service staff is "the best" and added that the network was installed over a period of three weeks.

"Now, we get an instantaneous reponse," Reirden said. "We also looked at laser options and T1 technology. The problem with laser is that it is very susceptible to snow and rain, and the T1 tends to be expensive."

Even with the hardware and software upgrades and the networking installation behind them, Reirden and his staff are not kicking back to rest.

The hospital recently installed a DG Avion 6200 to automate all laboratory testing functions and is evaluating an operating room scheduling package to run on a personal computer-based local-area network.

"We rely heavily on end-user input," Reirden said.

"They have to tell me what they need to run their business. It's my job to tie it into the overall computing strategy."

Laboratory system on its feet without tired soles

The third segment of Women and Infants' troika of projects was the installation of a laboratory information system that has cut down on time, costs and shoe leather wear and tear.

Running software from Medical Information Technology, Inc. on a DG Avion Model 6200, the laboratory system has already partly automated a process that was entirely manual. Bruce Reirden, Women & Infants' vice president of IS, said the system will be completely automated within one year.

When a patient needs laboratory work done, the doctor sends an order to the laboratory. Reirden said he plans to replace the current manual system by having the orders for laboratory work placed at the point of service.

Once the order is entered into the laboratory computer, the test is run and the results are sent from the machine processing the sample directly to the computer via Ethernet, a process that "significantly increases accuracy," Reirden said.



Reirden: *process increases accuracy*

If the work is for patients in the emergency room, the delivery room or the neonatal intensive-care unit, results are sent to printers in those units. The remainder is distributed by foot, but Reirden said that process will also go on-line.

The system, which went live early last month, has run into the inevitable snags. "We had to do a fair amount of scrambling to resolve problems," Reirden said. "The biggest problem is that we got buried with paperwork. We went from a manual system that dealt with one slip of paper to an information explosion."

For example, a report printed in the emergency room would also appear at the main printer, and copies were also generated for the patient's physician and medical records. Reirden said the paper glut has been cut by about two-thirds.

CAROL HILDEBRAND

DG adds to CEO software

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — Moving steadily toward a common user interface on the desktop, Data General Corp. recently announced Version 3.0 of CEO Object Office, its object-oriented, icon-driven graphical user interface for the MS-DOS platform.

The only glitch for would-be users is that they must have a DG MV midrange computer to run the software.

The CEO office automation portion of the program resides on the MV platform, while the object-oriented, graphical user interface is implemented at the personal computer level, running on top of the Microsoft Corp. Windows and Hewlett-Packard Co. New Wave architectures.

The product provides electronic mail, filing and print services; Version 3.0 adds support for Novell, Inc. Netware.

Thomas LaMarche, information systems manager at the Maricopa County Flood Control District in Phoenix, has been beta-testing Version 3.0, and the organization has been using Release 1.0 for six months. "We got into it because we're putting PCs on peoples' desks to do a variety of different things," said LaMarche, adding that all new hires are issued a PC.

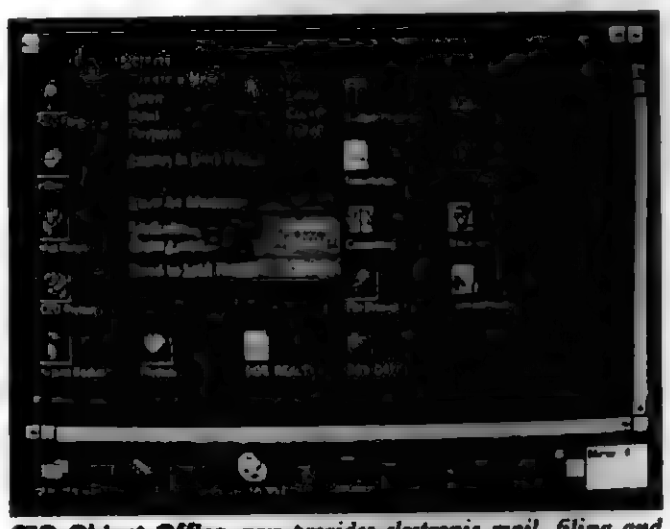
The Flood Control District has been using DG office automation equipment since 1983, and it currently uses the company's high-end MV 40000 for most of its computational needs. LaMarche estimated that 200 users are using the system primarily for office automation applications across DG's proprietary PCI network.

Other components

The organization is also using two MV 2500 machines as well as a DG Aviion 5220 dual processor, Unix-based server. Although the Flood Control District had been running the CEO office automation product for some time, it considered Object Office when end users were reluctant to use PCs. According to LaMarche, they tended to treat their PCs as dumb terminals. "I hate to admit it, but a lot of our users had problems with DOS," he said. "We needed something to get people to use the PCs more, and they seem to take to menu-driven systems like CEO."

The Object Office portion of CEO Object Office allows the organization to use more PC software packages and permits end users to leapfrog the somewhat cumbersome DOS commands.

LaMarche currently has 46 active CEO Object Office users and said he anticipates adding another 24 during the the next several weeks. Most are using either a 25- or 33-MHz Intel Corp. 80386SX-based machine with a minimum of 4M bytes of memory and a 40M- or 100M-byte hard drive. Object Office requires 12M bytes of hard disk space.



CEO Object Office *now provides electronic mail, filing and print services, in addition to supporting Novell Netware*

With some of the users also running Lotus Development Corp.'s Lotus 1-2-3 spreadsheet software and others running engineering applications, LaMarche considered the estimated $3,000 per platform as money well spent. "Buying dumb terminals just didn't seem like a good investment," he said.

LaMarche said he sees several advantages to the CEO Object Office environment, foremost of these being the graphical user interface, which serves to isolate users from the operating system.

"People usually don't need to know the underlying program," he said, "and the point-and-click, mouselike system allows them to bypass this."

Another benefit, according to LaMarche, is that the product allows the creation of shared file systems, and the organization can now keep PC documents for distribution across the network via the CEO filing component residing on the MV 40000.

In addition to the newly added MS Windows 3.0 support, the most current version of Object Office includes an offering called Netware Transport MV.

"Our intention is to deliver Portable Netware on the MV in phases, and the first phase is Portable Netware MV," said Bruce Evans, product line manager for office systems at DG.

In a continuing effort to open up systems, Evans added that DG is also working on a version of the product to run on the Avion Unix-based server platform.

Du Pont employs Expert help to increase database benefits

A DEC offering is helping to maximize database efficiency

BY MARYPAT JOHNSON
CW STAFF

Faced with the job of restructuring an enormous database for Du Pont Co., software engineer Greg Ballance called in some expert help and ended up with 20% better performance.

His helpmate was a bit unusual, however. In a field in which tedious, people-intensive work is required to tune and optimize a complex database, this assistant was a software tool: RDB Expert from Digital Equipment Corp.

The physical database design tool, which began shipping a few weeks ago, is equipped with its own expert system and is targeted at database administrators and developers working with VAX RDB/VMS and VAX database management system databases.

"Most any kind of work with a database has to be done manually, but this takes you a step away from that," said Ballance, who works as an on-site consultant for Du Pont but is employed by Walklett Burns Ltd., a consulting firm in Malvern, Pa.

RDB Expert, which DEC sells at prices ranging from $2,340 to $149,400, tunes and optimizes performance by analyzing the logical design, transaction work load, data volume and system environment of a database. Then it generates executable procedures for creating a new design or restructuring an old one.

Using the product in field test for the past six months, Ballance was able to tune the quality control applications that were straining Du Pont's systems. The company plans to extend its use of RDB Expert as a performance tool, tuning the quality management applications at individual plant sites, the engineer noted.

"This tool really sounds interesting to us," said Joseph Archer, assistant vice president of application development at Colonial Management in Boston. "Our database administrator could use it to check whether we're normalizing our data correctly."

This ability could, in turn, help Colonial cut back its spending on DEC database consultants, Archer said. "We'd have the opportunity to analyze our databases much more often and do the job right from the start," he said. "Anything that can help you get to an optimal situation with RDB as quickly as possible is a benefit."

Hooks included

RDB Expert works in conjunction with Dectrace, a layered software product that collects and reports data and performance information from applications and databases. "The hooks between Dectrace and other DEC products are already there, but you put in the actual calls yourself by changing the application," Ballance said.

Another database consulting firm using the new database design tool in field test is JCC in Granville, Ohio.

"RDB Expert is not a substitute for good design but a supplement," said Jeff Jalbert, president of JCC. His database consultants found that for large, complex applications the tool proved to be a useful guide for reorganizing the database.

"This gives us a snapshot of the database under different load conditions. It can tell which queries are important, then go in and look at those," Jalbert explained.

RDB Expert whirs through the tedium of massive data compilation and analysis in less than an hour or two, while the manual method may take a team of database experts days or weeks.

"We are able to use it as a foil to test our ideas," Jalbert said. "No computer program will replace thoughtful reflection by a human being, but for simpler problems it tended to get to the answer quickly."

RDB EXPERT TUNES and optimizes performance by analyzing the logical design, transaction work load, data volume and system environment of a database.

The debut of RDB Expert marks the first time DEC has made use of expert system technology in a high-volume product, said Vicki Farrell, a marketing manager for DEC's database systems group.

In one customer benchmark, Farrell said, three DEC consultants spent 20 weeks tuning and tweaking the design of the customer's database. Once they finished, they set RDB Expert to the same task. Five days later, the tool produced its own suggested design.

"It was not quite as good as what the experts came up with, but it took one expert only another week to tune it to where the three had gotten to in 20 weeks," Farrell said. "RDB Expert got about ¾ of the job done."

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Users await depreciated prices

BY MARYFRAN JOHNSON
CW STAFF

Like used cars that no longer command a premium price, VMS operating system licenses from Digital Equipment Corp. will be depreciated on older VAX models under a new set of software business practices DEC announced recently.

Although no prices will be revealed until mid-March, DEC officials also backed away from an unpopular policy that charged full price for VMS licenses to customers who upgraded their VAXs with used boards from resellers.

"It sounds like DEC is trying to do something better, but the key factor is pricing and how much they depreciate [the license fees]," said Karlyn Kilroy, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Under DEC's new upgrade practice — called the "from-to license option" — customers who upgrade with used boards will get some credit for the price of their current license toward the cost of an upgraded license, according to Mary Welch, a DEC software business marketing manager.

"In the past, DEC kept the same price for a VMS license over time," Welch explained. "Now, as we introduce new technology in the same cabinet, we will reprice the hardware and software."

Welch acknowledged that announcing a policy change with no pricing information will seem "somewhat empty" to users, but, she said, the complexity of repricing software requires more time.

DEC's review of its licensing charges for upgrade customers was prompted by the Digital Dealers Association in Chelsea, Mich., which raised the objection last month that charging full price for a VMS license upgrade would crush the used equipment market. Now DEC appears willing to give upgrade customers a break, although with the VMS depreciation, it will be based on a license of lesser value.

DEC will not try to collect any additional fees from customers who have already moved their VMS license from older to newer technology, effectively "grandfathering in" whatever deals those customers struck with their DEC representatives, Welch said.

> "AS WE INTRODUCE new technology in the same cabinet, we will reprice the hardware and software."
>
> MARY WELCH
> DEC

Aquarium

CONTINUED FROM PAGE 27

rective to buy HP, but that HP makes perfectly good computers. Rasco indicated that it may be something else. "We don't want Packard coming in here and seeing Sun equipment," he said.

Pinto did not wait six years for the current upgrade because of a lack of money, but by waiting, he said, he felt he got a better deal. "Every year you wait, the performance goes up, and the cost goes down. You get more machine for less money," he said.

The old system was "bogging down" under the cumulative weight of several new applications during the past year, according to Pinto. He had added a new work order application, preventive maintenance scheduling on the physical plant and more reports.

> "EVERY YEAR YOU wait, the performance goes up, and the cost goes down. You get more machine for less money."
>
> MICHAEL PINTO
> MONTEREY BAY AQUARIUM

Despite the system's slowness, "we were able to hang on to it. It was doing its job. The checks kept getting issued every week," Pinto said.

The new computer will allow expanded operation of the bookstore, which is a mainstay of revenue for the nonprofit aquarium. The tiny on-site bookstore will be fed from two off-site warehouses.

The aquarium is updating its inventory software to include multilocation inventory and access to more main data, according to Pinto. It is also slated to handle another dozen personal computers on the system this year.

With the new minicomputer, the aquarium is staying with direct connections rather than a client/server, networked environment.

"Networks are not worth the headache," Rasco said. "There's not a lot of file sharing. Instead we use spooling and print-sharing capability." Rather than relying on electronic mail, aquarium staff members communicate internally by voice mail. "If we were starting new, we would bring in a network," Rasco added. "But we don't want to rock the boat too much."



Brownstone Solutions offers line of 'easier-to-use' CASE products

BY ROSEMARY HAMILTON
CW STAFF

Brownstone Solutions, Inc. recently made available a new release of its data dictionary for computer-aided software engineering (CASE) that has more functions and an easier-to-use front end, a company official said.

The Brownstone data dictionary, which runs on IBM's DB2, has been sold as an alternative to the IBM Repository Manager for CASE environments. With this release, however, the company is shifting gears to provide not only a dictionary, or repository, environment but also more tools and assistance to help users work with IBM AD/Cycle products, including Repository Manager.

"IBM will be at some time fulfilling that role [of repository provider]," said Barry Brown, a Brownstone director. "We knew all along ours was more of a stopgap. We will continue to offer a version of it, but we are now concentrating on the role of integrator. Someone has to be responsible for allowing users to utilize the different components in the AD/Cycle picture."

The new release includes a front end that is compliant with IBM's Common User Access standard. It was designed to allow users to navigate more easily through the Brownstone software and into the AD/Cycle world, Brown said. It has action bars, pull-down menus and pop-up windows to improve productivity.

"We got beat up a little bit in terms of our functionality being delivered in a fairly complex format," Brown said of earlier releases.

Data Dictionary/Solution Release 4.0 also includes easier access to other vendors' software, including IBM's Query Management Facility (QMF), which is used to work within IBM's repository environment. Brown said users can run QMF sessions from the Brownstone environment without getting bogged down by QMF procedures.

The Brownstone software will also provide the ability to incorporate data from IBM's IMS database and Knowledgeware, Inc.'s Information Engineering Workbench. Release 4.0 can be licensed for $60,000.

DB2 utility comes to U.S.

BY ROSEMARY HAMILTON
CW STAFF

Tadiran Information Systems in Tel Aviv is introducing an IBM DB2 utility designed to improve job scheduling for the U.S. market.

DB2 On Schedule is based on three key functions. The company said the product monitors jobs and then provides fixes for problems so users do not have to do complex programming to resolve issues.

First, the software was designed to monitor both batch and DB2 jobs and ensure they are running on schedule. The software calculates when jobs should be completed and then alerts an operator when a job is falling behind the determined time limit.

Second, the software provides a restart facility to address programs that fail. The company said the software will enable users to restart jobs at the time of failure rather than rerun an entire job.

Third, the software offers program abend procedures to get bigger failures back on track. This feature is intended to assist "in times of crisis," a company official said. It enables users to move a failed program into a wait state, fix whatever problems have occurred and then restart the program.

The software, which the company has been selling in Israel, will be available for a license fee of $30,000.

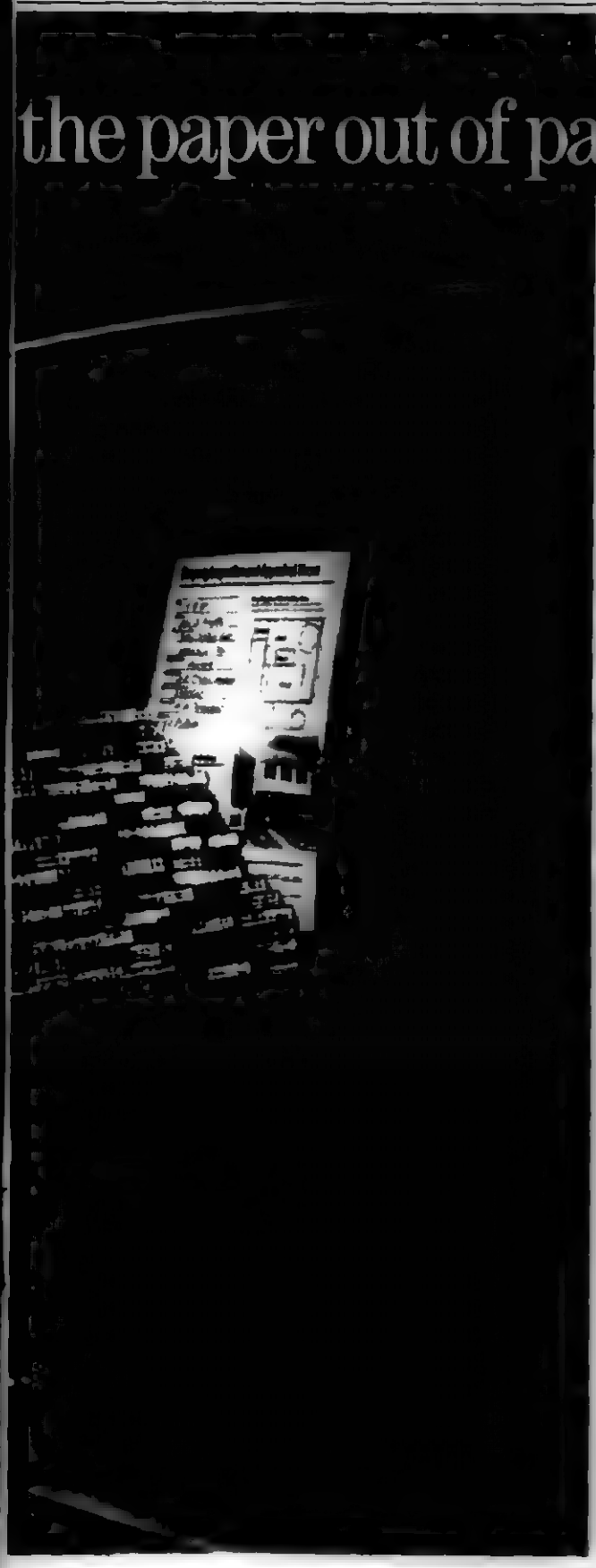
NEW DEALS

Bath Iron Works buys CAD/CAM

Computervision, a Prime Computer, Inc. Company, announced that **Bath Iron Works** in Bath, Maine, purchased 60 computer-aided design and manufacturing systems worth a reported $5.4 million. The company will use the systems for design modifications to the Arleigh Burke-class Aegis guided missile destroyers for the U.S. Navy.

Data Solutions Co., a division of Data General Corp., has signed a five-year data processing service agreement with **Epic Healthcare Group** in Dallas. Under the terms of the contract, Data Solutions will assume responsibility for Epic's data operations. The agreement includes data communications network management and hardware technical and maintenance support. The contract is expected to reach an estimated $10 million.

the paper out of paperwork.



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Unlike CASE tools that make it tough to share or combine information, PACLAN takes full advantage of the client/server architecture of a LAN. Multi-user controls are built into the repository giving each PC workstation continual access to the full set of development information, no matter how big your projects might get.

Call 800-PAC-1866 or 914-735-5030, or write CGI Systems at One Blue Hill Plaza, Pearl River, NY 10965. And discover how PACLAN can help you lose mainframe weight without losing an ounce of muscle.

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NEW PRODUCTS — SOFTWARE

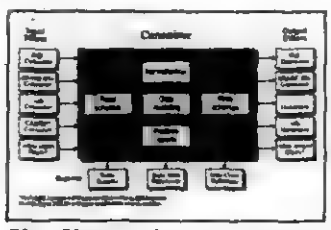
Computer-aided software engineering

Andersen Consulting has announced a computer-aided software engineering (CASE) product for Digital Equipment Corp.'s Cohesion software development environment.

Install/1 for VAX/VMS Version 2.0 — part of Andersen's Foundation life cycle CASE application development environment — generates complete Dectp transaction processing applications using DEC's Application Control Management System. The product supports the Cohesion integration framework, Cohesion standards and Cohesion tools such as Vaxset.

Pricing ranges from $9,000 to $372,000.

Andersen Consulting
69 West Washington
Chicago, Ill. 60602
(312) 580-0069



Six Sigma Case's Canonizer *assists database engineers*

Six Sigma Case, Inc.'s Canonizer, a recently announced computer-aided software engineering tool, features several input and output filters designed to assist database engineers in converting database models from one environment to another.

The product's input filters enable designers to load various data into the Canonizer, model it, normalize or denormalize it and then generate output formats.

The input and output filters have begun shipping and are priced between $145 and $445 apiece. Canonizer is priced between $895 and $2,995, depending on platform.

Six Sigma Case
13456 SE 27th Place
Bellevue, Wash. 98005
(206) 643-6911

Development tools

Microtec Research, Inc. has announced a set of reusable C++ class libraries designed to facilitate objected-oriented application development.

Capsule comprises C++ classes delivered as AT&T Version 2.1 C++ source modules and includes tools for neophyte and experienced object-oriented programmers.

Capsule costs $495 per CPU.

Microtec Research
2350 Mission College Blvd.
Santa Clara, Calif. 95054
(408) 980-1300

Oakland Group, Inc. has released Version 3.2 of its C-scape Interface Management System, a library of C routines for creating professional user interfaces.

The product enables users to write applications that include data entry, text editing, menus, Help, graphics compatibility and mouse support. The product includes a screen designer that allows users to prototype and simulate screens and convert them into C source code that runs under operating systems such as Unix, MS-DOS, VMS and OS/2.

Base pricing ranges from $499 to $2,499, depending on type of operating system.

Oakland Group
675 Massachusetts Ave.
Cambridge, Mass. 02139
(617) 491-7311

Compilers

Promula Development Corp. has announced an enhanced Fortran compiler designed for C-language-based platforms.

Promula.Fortran Version 3.0 can be used to translate Fortran code into portable C code. It allows Fortran applications to be integrated with other C-based applications or C runtime facilities, the vendor said.

Pricing ranges from $995 to $1,495, depending on the type of platform and the number of users.

Promula Development
3620 N. High St.
Columbus, Ohio 43214
(614) 263-5454

UNIX We Stand.

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Computer Associates and Hewlett-Packard have announced a strategic alliance in which they will co-develop software for the HP-UX operating system.

By combining the expertise of the world's leading independent software company with the resources of the world's leading commercial UNIX systems-based vendor, this venture will produce a complete family of superior HP-UX software solutions for systems management, business applications and database management.

And that's just for starters.

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NEW PRODUCTS — HARDWARE

Data storage

Contemporary Cybernetics Group has announced the CY-8200-SX, an 8mm tape backup system that can reportedly store more than 10G bytes of data on a single tape at 60M byte/min.

The product's fast file search feature enables users to search 1G byte of data in 17 seconds.

The company also introduced the CY-8500, an 8mm tape drive that stores up to 25G bytes on one tape. The device features transfer rates of up to 90M byte/min., according to the vendor.

Initial pricing for the CY-8200-SX and CY-8500 is $4,000 and $6,500, respectively.

Contemporary Cybernetics Group
11846 Rock Landing
Newport News, Va. 23606
(804) 873-0900

Intelligent Interfaces, Inc. has introduced the Microram 340, a 4M-byte memory expansion board designed for Hewlett-Packard Co. 340 computers.

The board ($1,995) can be installed in an expansion slot in less than 15 minutes and can be used during Unix, Pascal and Basic applications, the vendor said.

Intelligent Interfaces
P.O. Box 1486
Stone Mountain, Ga. 30086
(404) 381-9891

Decision Data, Inc. recently unveiled an 8mm cartridge tape drive that attaches to IBM Application System/400s via a small computer systems interface.

The Decision Data 7450 ($12,500) uses helical-scan technology to store up to 819 track/in. or 2.5G bytes of data. Features include a 256K-byte data buffer and a 246K byte/sec. data transfer rate. The stand-alone device also features a tape speed of 0.429 in./sec. and a data density of 43,200K byte/in.

Decision Data
One Progress Ave.
Horsham, Pa. 19044
(215) 956-6700

Standard Memories Corp. has announced a 4M-byte double-sided memory module designed for the Digital Equipment Corp. Vaxstation 3100 Model 76 and the Decstation 5100.

The Pincomm 76/51S memory upgrade ($995) fits into a memory socket on the Vaxstation 3100's motherboard. The product can be installed in pairs on a Decstation 5100, 8M bytes at a time. A 16M-byte version is also available.

Standard Memories
9 Whatney
Irvine, Calif. 92718
(714) 583-7500

I/O devices

Idea Courier, Inc. has introduced the Idea 13487 dot matrix printer and the Idea 13412-06 laser printer, both of which can be connected to an IBM System/34, 36 or 38 or an Application System/400 machine.

The Idea 13487 ($4,200) was designed for forms printing, bar coding and general business printing tasks.

The Idea 13412-06 ($3,395) operates at six page/min and enables users to access multiple data sources simultaneously, according to the vendor.

Idea Courier
P.O. Box 29039
Phoenix, Ariz. 85038
(602) 894-7000

Processors

Altos Computer Systems has introduced the Altos System 400 and 700, two Unix-based platforms designed for small and medium-size businesses.

The systems feature industry-standard open architecture and include an XT/AT bus.

System 400 includes a 20-MHz Intel Corp. 80386SX processor and built-in IBM Video Graphics Array support. System 700 is based on the Intel 80386 chip, includes a 32K-byte cache controller and supports up to 18 serial ports.

Pricing begins at $4,700 for the System 400 and at $7,600 for the System 700.

Altos Computer Systems
2641 Orchard Pkwy.
San Jose, Calif. 95134
(408) 946-6700

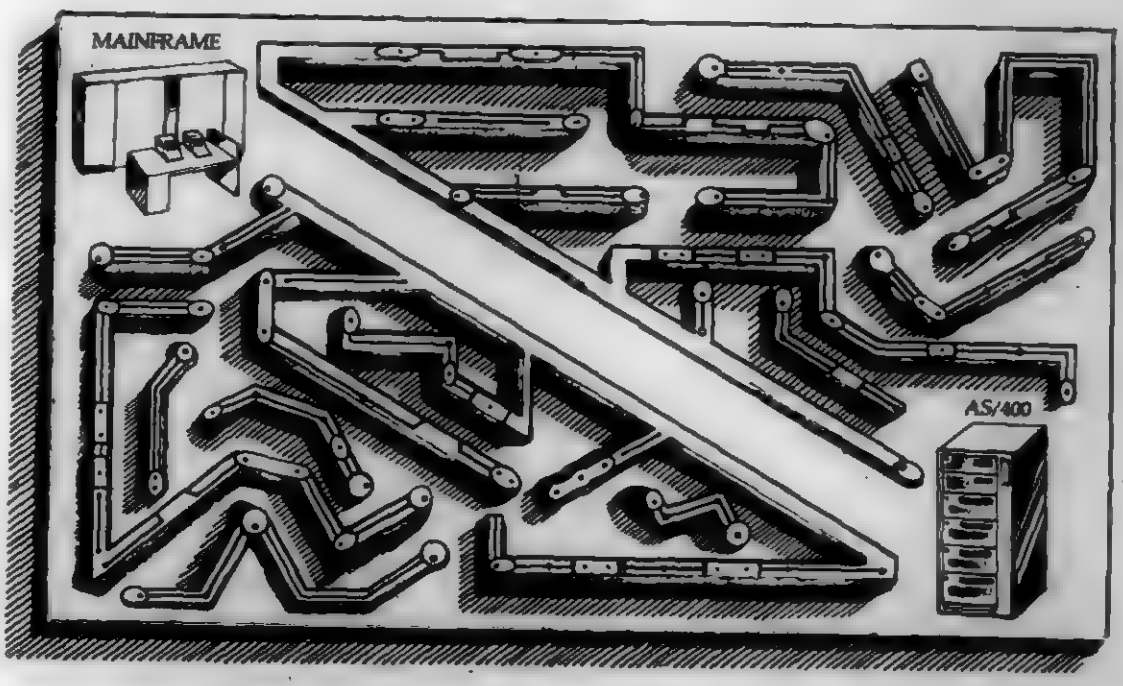
Solbourne Computer, Inc. has announced its Series 5E/800I of network servers that were designed for multiuser and client/server environments.

The deskside configurations support up to four CPUs and incorporate a Cypress Semiconductor Corp. CYC7601 40-MHz microprocessor and a Texas Instruments, Inc. 602A 40-MHz floating-point controller.

The products can be configured with up to 640M bytes of random-access memory and more than 20G bytes of Intelligent Peripheral Interface storage.

The series is scheduled to begin shipping next month. Pricing ranges from $74,900 to $450,590, depending on type of configuration.

Solbourne Computer
1900 Pike Road
Longmont, Colo. 80501
(303) 772-3400



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INTRODUCING KIKS400—THE AUTOMATED MIGRATION UTILITY.

You already know about the many cost benefits and productivity gains of integrating the AS/400 into your mainframe environment.

KIKS400 provides the key: a utility that automatically migrates 370 CICS and batch COBOL applications utilizing VSAM, DL1 or DB2 access methods, to native AS/400 COBOL. It allows you to fully retain your software investment.

Compared with manual conversions or the cost of purchasing new software, if available, KIKS400 is the solution that pays for itself!

The utility's advantages include:

Easy To Use—A single command migrates an entire library of programs, overnight.

No Need To Retrain End Users—Conversions are totally transparent to end users.

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Never before has such a small laser printer offered so much speed and economy — and Adobe® PostScript®, too.

Introducing the 16 ppm microLaser™ XL printer. It's fast, flexible and affordable.

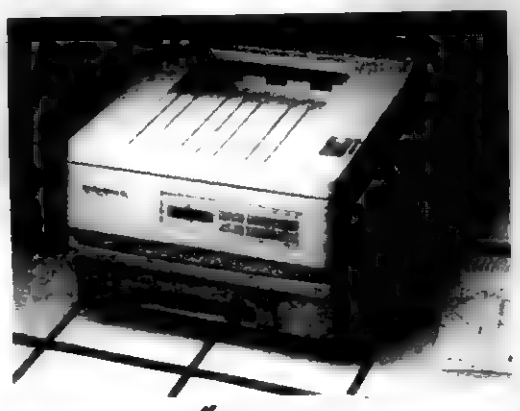
Now you can afford a 16 ppm laser printer at an 8 ppm price. The newest addition to Texas Instruments award-winning microLaser family starts at just $3,449* for the standard model. Or choose from two affordable Adobe PostScript models**, with either 17 or 35 fonts.

For one or many users.

Whether you use Macintosh®‡, IBM® or UNIX® computers — or a combination — microLaser XL can handle the workload for you or your whole department. You can even switch between HP LaserJet® II emulation and PostScript without turning off the printer. At only 15.8" wide and 16.6" deep, microLaser XL is the smallest laser printer in its class. So it's easier to find room for this type of power.

Superior paper handling.

Save time loading paper — microLaser XL's paper drawer holds 250 sheets. You'll save space too, because the drawer slides conveniently inside the printer. An optional, second 500-sheet paper feeder (750 sheets total) and automatic feeder for 70 envelopes are available for your large print jobs and mail-merge applications.



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COMMENTARY

Rebecca Bailin

No one is laughing



What if (as they used to say in Hewlett-Packard ads) you came across a comedian who had written some fabulous stuff — observant and hard-hitting and so funny that just reading it made you laugh out loud? And what if, in great anticipation, you went to see him perform, but he mumbled and looked at the floor and had awful timing and was, in a word, a flop? What's more, what if this comedian was so sure of his talent that he refused to sell the material to someone who could deliver it well?

Is it comedy? Not if the audience isn't laughing.

This brings me to Geoworks' Ensemble and all the weeping and braying going on in the press about what a great product this graphical user interface is and how it's everything that Microsoft's Windows 3.0 should have been, but wasn't and never will be. I will not argue the technical merits of the product; I have no doubt that it is a superlative beast worthy of worship.

What I find irritatingly naive, however, is the implication that technical merit in and of itself constitutes a "good" product, a product of value. This in-

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Project management tries anew

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

Were project management software to label any year its own, you might expect it to be this year, with a recession, a war and a credit crunch that is rapidly spreading across all sectors of society.

Computer Associates International, Inc. sees a window of opportunity in these fiscally tight times for this struggling market niche. Marketing manager Joel Lockwood predicted the spate of hiring freezes and budget cuts might produce a second wave of interest in project management software as, more than ever, users seek tools to better optimize limited resources.

CA is hoping that its revamped CA-Superproject 2.0 for DOS, which was released in November, is just the ticket to further entice users. Prior to its release, Lockwood said, CA undertook a series of surveys to determine why users shunned project management software.

The company came up with a list of five areas in which users found the genre lacking: ease of use, graphics, real-world functionality, multiplatform support and open architecture. CA-Superproject 2.0 is supposed to address these shortcomings.

Users contacted last week seconded CA's list of shortcomings, adding two more: price and network compatibility. However, there was virtually no support for the recession pitch. In fact, as noted by Dave Evans, vice president of information systems at J. C. Penney Co. in Dallas, "when times are really tough, no one is going to take the time to learn how to do anything new. They'll just try to do the old stuff as quickly and cheaply as possible."

As for the concept of project

Continued on page 48

Project leader

Symantec's Timeline holds a more than 3-to-1 lead over the nearest competitor in the personal computer project management software field

Top 6 U.S. PC project management shipments (1990)

Rank	Vendor	Product	Units sold	Market share
1	Symantec	Timeline	38,500	38.4%
2	Applied Business Tech.	Project Workbench	12,750	12.7%
3	Software Publishing	Harvard Project	12,000	12.0%
4	Microsoft	Microsoft Project	8,500	8.5%

Source: International Data Corp. CW Chart: Paul Mock

Lotus' Improv makes its move on the Next platform

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. recently shipped Improv, its spreadsheet for Next, Inc.'s Next computer. Until March 31, Improv will be provided free to buyers of either Next's Motorola, Inc. 68040-based computers or its 68040 upgrade kit.

Improv marks Lotus' first departure from its policy of backward compatibility with 1-2-3 commands. It also provides a break from spreadsheet tradition in that it combines standard metaphors, such as rows and columns, with what Lotus and some users claim are breakthrough features — dynamic spreadsheet views, plain English formulas and presentation graphics that incorporate data, text, images and sound.

Improv enables users to quickly reformat the spreadsheet by creating multiple views of the same spreadsheet without rekeying the information. With Improv's dynamic views feature, data can be arranged to compare and gain greater insight into otherwise hidden data relationships, expanded to show more detail, hidden or grouped for clarity and formatted for presentation needs. Changes made in one view are automatically carried through related views.

Users can also name data cells and formulas using English words instead of letters and numbers.

Boost for Next

Lotus and Next claim that Improv has helped drive customer interest in Next computers. Two early Improv users said that while they went to the Next platform first, Improv has allowed them to continue with, and get more out of, the Next machines.

"I love Improv," said 1-2-3 user Eric Spahr, a vice president at Shearson Lehman Brothers, Inc. He is convinced Lotus has broken new ground. "I need a spreadsheet that allows me to build models for forecasting and accounting, to restructure my data in any way I want. Improv enables me to do this quickly and easily, and the result is a spreadsheet my traders and customers can understand."

Spahr and six traders are in the process of switching to Improv. They have been using the beta-test version, which had some crashing problems, but Spahr said he has confidence the "real" product will work fine.

Spahr said the key to Improv is that it allows him to more easily do things he was reluctant to try before because of the time in-

Continued on page 48

It's Time ...



To Attend the 1991 Micro Focus Users Conference

May 13-16, Orlando, Florida

If you develop applications with Micro Focus COBOL products you can't afford to miss the Third Annual Micro Focus Users Conference. This year's Conference offers a record number of sessions and includes something for everyone:

MIS Managers will learn how PC-based programming can provide additional productivity while leveraging current investments in sessions that examine:

- *Micro Focus Workbench - Making The Financial Case*
- *Strategies for Implementing Programmer Workstations*
- *COBOL in the 90's, including Object Oriented COBOL*

Enterprise Application Programmers will learn how PC-based application development can save time and money in sessions that include:

- *Micro Focus CICS and IMS Options for Workbench*
- *Mainframe Compatibility - Enhancements and Issues*
- *MF 370 Assembler - An Overview*

PC Programmers will be shown the newest Micro Focus tools and technologies in sessions that include:

- *The User Interface Solution*
- *File Handling - The Technical Details*
- *COBOL - The Database Connection*

UNIX Application Developers will see how COBOL and open systems can be an efficient combination in sessions that include:

- *Mixed Language Application Development Under UNIX*
- *Writing Portable Applications*

These are just a few of the 50+ technical sessions scheduled for this year's Conference. But the Micro Focus Users Conference is more than three days of seminars; it's a unique opportunity for developers to meet the Micro Focus technical and support staffs and share solutions with other users through the Conference's Special Interest Groups.

*The Micro Focus Users Conference is **the** forum for Micro Focus COBOL users ... Consider how your company could benefit from attending this year ...*
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For more information or to register, call: 415/856-5617 and ask for the Users Conference Desk.

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Recognizing the full potential of networking is one thing—actually realizing it is another. To truly fulfill that potential, every component of your network needs to turn in a great performance. That's why IBM offers a complete range of leading-edge LAN products in the desktop networking field—giving you the broadest range of solutions available to continually advance your system's possibilities.

Managers That Turn In A Great Performance.

At the heart of IBM networking are the members of the Personal System/2® family that act as high-performance LAN servers. The PS/2® Model 95 XP 486, IBM's sophisticated new 486™ computer, was especially designed to optimize network performance. The Model 95 features an Intel 33 MHz 486 processor or a 25 MHz 486 processor that's easily upgraded to 33 MHz, which quickens the pace of your LAN's operations. For your network's storage, not only are the Model 95's SCSI hard files lightning-quick, but the overall capacity is truly impressive—up to 1.6 gigabytes internally, and up to 8.96GB or more with IBM PS/2 External Enclosures. IBM also offers highly efficient, lower-cost server alternatives with the PS/2 Models 80 386 and 65 SX. All of IBM's PS/2 LAN servers feature the Micro Channel™ architecture, with its 32-bit data path and bus-mastering capabilities. The Micro Channel busmaster adapters allow you to expand your network's capabilities by adding multiple processors—like adding "computers" to your computer. It all amounts to highly reliable and powerful managers that inspire the same kind of performance from the rest of your network.

An Efficient Way To Bridle Your Data.

Whatever your needs may be, IBM has PS/2s that can serve as excellent client stations. And if you want to keep a tight rein on your network's information, IBM offers the PS/2 Model 55 LS, a medialess LAN station version of the best-selling Model 55 SX. A cost-efficient alternative to models with storage drives, the Model 55 LS provides a wide array of effective management controls, including enhanced data security, consistency in software levels, central software maintenance and central file backup. Not only is the Model 55 LS easy to hook up (it comes standard with a Token-Ring Network or Ethernet adapter), but should you need to modify your system, it's easy to upgrade with diskette and file storage devices.



A New Breed Of Software.

Software that hits the ground running—that's our powerful new OS/2® V. 1.3, a high-performance, low-cost software package that supports both DOS and OS/2 clients on either a Token-Ring or Ethernet Network. Both the new OS/2 Extended Edition V. 1.3 and LAN Server V. 1.3 create an environment that delivers improved

to advanced IBM leads the way.

performance, less memory requirements, fewer DASD requirements and support for Adobe Type Manager™ fonts. And with support for 128 DOS requesters, LAN Server V. 1.3 can provide significant cost benefits for DOS network users. Compatibilities between IBM DOS LAN requester and the current version of Windows® 3.0 (LAN Manager 2.0 enhanced) have also been added, capping off the many ways IBM gives you greater flexibility in the LAN environment.



Printing That's The Best In The Field.

For a great finish to any project, IBM offers a full range of printers for client stations, as well as the speedy, large-capacity IBM LaserPrinter, an efficient printing station with immensely attractive LAN benefits. With a high-duty cycle and fewer parts for fewer breakdowns, it offers extremely reliable printing while still boasting a 10-ppm printing speed. The optional paper bins allow for more efficient collation, so there's no need to visit and rearrange the printing station prior to the particular job. You can also easily and inexpensively upgrade to Adobe PostScript.® It all adds up to a range of complete, reliable printing solutions that can handle the kind of workload that any network, large or small, can generate.

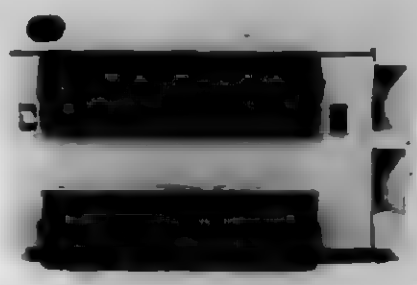
Step Up The Pace With Token-Ring Network.

To optimize the link between your LAN server and client stations, you need a hardware connection that gives you access to departmental and company data, as well as communication with your co-workers—in other words, you need access to a winner's circle; the IBM Token-Ring Network, the winner four years running of the *PC World Magazine* World Class Award. It's a reliable and flexible networking solution, one of the only connections with a data transfer rate of up to 16MB per second.

You can also diagnose, isolate and correct problems in one section of your LAN without affecting the rest of your network. A system you can build on, IBM Token-Ring Network provides a reliable connection that's as strong as your need to keep in constant touch with the people and information around you.

Communicate With Horses Of A Different Color.

Of course, IBM provides you with several ways not only to connect your PS/2 LAN to a multitude of mid-range and mainframe systems, but also to communicate with non-IBM systems as well. To conduct transactions such as hotel reservations, car rental and credit card authorization, an IBM communications adapter such as the IBM ARTIC Portmaster Adapter/A busmaster card, with the proper communciations software, can link your PS/2 with other companies' computers. With an Ethernet adapter, you can also connect to most Ethernet LANs. The integrated communications options of IBM OS/2 Extended Edition software can also allow your PS/2 to send mail, transfer files and access applications on other systems concurrently. So it's easy to benefit from the strengths of an IBM network while still having access to the rest of the computing world.



With the many components that constitute a Local Area Network, it's plain to see why a LAN is only as strong as its weakest link. That's why the IBM total LAN solution—LAN servers, workstations, networking software, printing stations and Token-Ring Network—is simply without peer: because there are no weak links. To find out how IBM can keep your network ahead of the pack, contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438.



How're you going to do it?
PS/2 it!

IBM

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Library users get in touch with Access

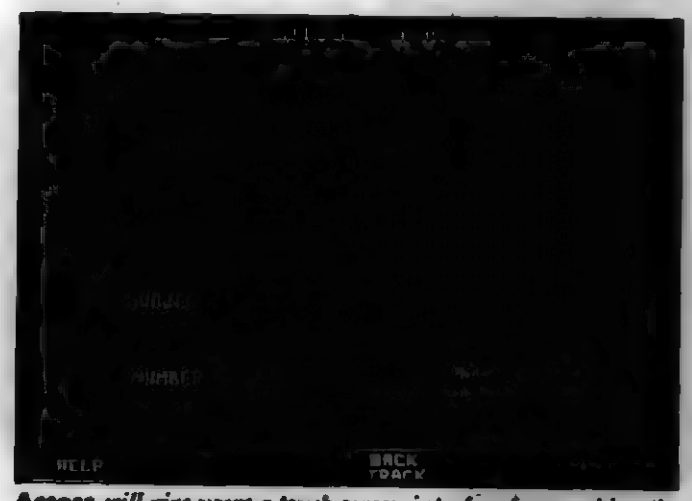
ON SITE

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — This summer, the Library of Congress will provide the American public with an ultrafriendly window into its vast collection of nearly 16 million cataloged books.

James H. Billington and Herbert S. Becker, director of information technology services, to "make computers less of a barrier" to using the library's resources, Becker said.

It now requires considerable training for users to learn the arcane commands needed to search the library's two bibliographic databases, which were designed in the early 1970s.



Access *will give users a touch-screen interface for searching the Library of Congress' mainframe-based card catalog*

The library's information technology staff is busy working on a network of 18 workstations that will give users a touch-screen interface for searching the library's mainframe-based card catalog.

The front-end system, named Access, will be unveiled when renovations to the library's reading rooms are completed, perhaps in June. "We could have come up with some high-tech acronym for the name of this project, but [the word] Access says it all," said Maryle Ashley, head of bibliographic systems in the systems analysis office.

In essence, the Access project resulted from the shared vision of Librarian of Congress

Furthermore, the library has a shortage of reference librarians, who "spend a lot of time explaining the computer system instead of working on more advanced research strategies," Becker said.

However, it will be years before the library can accomplish a complete overhaul of its mainframe databases, which constitute millions of lines of assembler code. So Becker turned to a product called Easel, from Easel Corp. in Woburn, Mass., that provided a software development tool kit for enhancing existing applications with graphical user interfaces.

In this case, when a user touches a box on the screen, the Access software generates data strings that emulate the mainframe keyboard commands to search the two databases. With Access, the only time the user touches a keyboard is to type in the name of the author, title or subject to be searched, Ashley said.

The system will use IBM Personal System/2 Model 70 microcomputers, along with a local-area network and gateway to the mainframes. The information systems staff is now working to improve the response time and reliability of the system before its unveiling, Ashley said.

However, most of the effort has gone into making the user interface as simple as possible to use. Prototypes of the system were developed with the help of experts in human-computer interaction at the University of Maryland and Cognetics Corp. in Princeton Junction, N.J., and have been critiqued by library staffers.

A continuing process

During the last few months, the general public has been able to use three prototype Access terminals in one of the library's reading rooms and then fill out questionnaires evaluating the system.

Throughout this fine-tuning process, Ashley said, the development team has remained focused on the system's "high concept," which is to allow patrons to access files without needing training or assistance from the reference librarians. Fancy features that might jeopardize the simplicity of that mission have been deferred to later phases, she said.

The existing dumb terminals will remain for those expert researchers who know the system's quirks and commands. Initially, there will be 18 Access workstations and about 60 older terminals, but, Becker said, it is possible that the ratio "could go the other way" in the future.

Someday, the Access system could be expanded to cover the library's collections of foreign-language texts, photographs, music, maps and films, as well as allow patrons to actually request an item via a touch screen instead of filling out a call slip.

The experience of developing Access and grappling with the issues of human-computer interaction will also help with other IS projects, including the overhaul of the mainframe databases, Becker said.

Rollouts designed to let PCs, workstations act like Macs

BY JAMES DALY
CW STAFF

The headache of integrating multiple operating systems was lessened recently with the rollout of a series of hardware and software offerings that reportedly give personal computers and workstations the ability to functionally emulate the Apple Computer, Inc. Macintosh.

Cupertino, Calif.-based Hydra Systems, Inc. has announced the Hydra One, which reportedly allows IBM Personal Computers and compatibles to run Macintosh software. The package includes a PC add-in board, proprietary software interface connectors and an RS-422 Appletalk-compatible connector.

Hydra President Wendall Brown said PCs can use Hydra One to provide the Macintosh display. "Primary design consideration focused on allowing the PCs' existing peripherals, such as the floppy, hard disk, modem and mouse, to be directly used by Macintosh software," Brown said.

Installation requires plugging in the PC card and loading the installation software with basic configuration menus. The user adds random-access memory or read-only memory (ROM) separately, Brown added. The $995 Hydra One also includes software that allows file transfer between PC and Macintosh applications and text conversion.

On the workstation side, Dallas-based RDI Computer Corp. recently announced Companion, which emulates the Macintosh operating system on any system using the Scalable Processor Architecture (Sparc) from Sun Microsystems, Inc. The package allows users to migrate to any Sparc-based workstation while maintaining their investment in Macintosh software, RDI President Rick Schrameck said.

Companion runs under the Sun View or Open Windows graphical user interface and emulates the Motorola, Inc. 68000 processor, producing functions similar to a Macintosh SE or Classic. The system requires a Macintosh Classic ROM in a Sparc Sbus, Schrameck added. Beginning this month, Companion will be also available as an add-on for RDI's Brite Lite Sparc-based laptop.

Companion will retail for $1,695 including an Sbus card. A second version without the Sbus card will be available next month for $995.

Nutek Computers, Inc., also based in Cupertino, recently announced a hardware and software strategy that it claimed will allow manufacturers to legally produce PCs that are functionally indistinguishable from the Macintosh.



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SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 even displays the same status indicators.

You will also enjoy features not available on the mainframe. For example, SPF/2 supports 48 PF keys, automatically adapts to the number of lines in the various OS/2 video modes (full-screen or windowed), and scrolls the file as you move the cursor. And, you will appreciate OS/2's virtually instantaneous response time.

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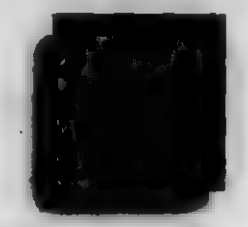
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Coors brews up sales strategy

A laptop project is helping one beer company increase its sales efforts

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

GOLDEN, Colo. — Brewing beer is still based on methods developed only slightly after civilization began.

However, in the viciously competitive U.S. beer market, where total consumption in 1990 was up for the first time in three years, Coors Brewing Co. has turned to thoroughly modern technology to post increases in both sales and market share.

All 170 Coors area sales managers make their calls with Compaq Computer Corp. LTE 286s and SLTs, with Wordperfect Corp.'s Wordperfect Version 5.1, Lotus Development Corp.'s 1-2-3 Version 2.2 and Software Publishing Corp.'s Harvard Graphics Version 2.12 on the hard drives. They also use Coorslink, an internally developed communications package that is used by all 650 Coors distributors nationwide.

Addressing a need

Robert Peterson, director of sales and marketing information systems at Coors, said top management drove the laptop project, which began in March 1990, to reduce the amount of time field representatives were spending pulling together presentations and to improve their communication with headquarters.

"We were in better communication with [our wholesalers] than with our own sales force," said Frances Morgan, manager of sales communications at Coors. "So when laptop technology came out and prices came down, we got into it."

Manager Donna Whitley said the project has been "much more successful than we had anticipated." Whitley said the field representatives, who were largely unfamiliar with computer technology, became aggressive users: "There was a lot of peer pressure to become the best on the computer."



Whitley said fewer than 10% of Coors' field representatives continue to have difficulty with the programs on the machines.

The presentations are a key part of a field representative's job. Whitley said Coors believes its represenatives now "go in with a much more effective presentation than they could two years ago," and the company has saved money on prepared presentations. Coors simply provides its representatives with basic templates and instructs them on what makes a good presentation.

Morgan said a Coors analysis of the portable program showed that after only five months, representatives were each saving 2½ hours per week. Each of the 35 area managers now saves between $800 and $2,000 per year on presentations. The representatives said they saved money in other ways: One said he avoided $300 in Federal Express Corp. charges one week because he was able to get information through his portable.

However, Morgan said, cost savings were icing on the cake, as far as Coors was concerned.

"We never sold it as something that would pay for itself," she said. "It was where we knew we'd have to be in five years, for productivity and use of information."

Coors is brewing up two new directions for its laptop project. On the one hand, it will focus on presentation skills development for all its representatives. In addition, the company is looking to take advantage of the technology involved by creating the ability for its field representatives to do limited queries for information.

Coors' No. 1 project for 1991 is to give its field representatives more access to the data on its IBM 3090 mainframe. Employees in Golden use the IBM/Metaphor data interpretation system base extensively, and Peterson aims to have a project in pilot by the third quarter that will give field representatives an interface to do the same.

Analysts contacted said that this sort of two-way communication was less common than one might expect, and they indicated that Coors may be on the front end of a trend.

Federal program plows IS efforts into snow removal

BY CAROL HILDEBRAND
CW STAFF

Bing Crosby had it all wrong. Winter Wonderland? Tell that to commuters trying to navigate roads corrugated with snow and slush. But according to the National Research Council, cleaning up Jack Frost's revenge could be done more cheaply, quickly and accurately by using the right technological tools.

A three-year project conducted by the council's Strategic Highway Research Program (SHRP) aims to present guidelines to tie together currently available technologies to better predict road maintenance needs through a cohesive system offering instant, real-time data on road and weather conditions. State and local highway maintenance agencies could then consult the report for efficient system configurations and recommendations to set up such a system.

Three specific technologies are being targeted, according to Karen Smith, the program's director of organizational relations. They are the following:

- Atmospheric and pavement sensors that measure surface temperature and weather conditions as well as the presence of snow, water or ice on the road.
- The Nexrad weather monitoring network, which is part of a major revamping project by the National Weather Service.
- "Thermal mapping," which is an infrared scanner attached to a vehicle that can pinpoint warm or cold spots on a road.

The idea is for an agency to feed the data from the three technologies into a CPU, which can then analyze it. When maintenance workers need to know conditions on a stretch of road, they can call them up. "They'll then have real-time information to decide where and when to put the crews out," Smith said.



Arnie Feinberg/The Picture Cube

The National Research Council *is incorporating computer technology to improve snow removal efforts*

Although the costs of setting up a system would be borne by the state, fiscal paybacks would kick in as road crew efficiency increased. A system would cost about $35,000 per site, with each site made up of four sensors, a weather station and a computer.

"We've already seen big paybacks from it. We feel that we've easily recovered our investment in the system," said David Vieth, chief of program and equipment management at Wisconsin's Highway Maintenance Office. Wisconsin has the largest roadway monitoring system in the country. Vieth said his office saves about $75,000 per major storm statewide. With an average of 40 major storms per year, that adds up.

Gordon Bell, maintenance superintendent at the Colorado Department of Highway's Denver Metropolitan District, has had a network of sensors in place for three years. The sensors are connected through remote processing units to an IBM Personal Computer AT.

Field personnel can connect at home via modem to take a look at the data. "For example, you can tell if a chemical has been used on the road surface and how much, so you can tell if someone has been out and treated that road already," Bell said.

Bell said he is hoping to use the study to deploy his sensors more efficiently. "When we first put this stuff in, we didn't know whether the sensors were in the right location — whether they should be in the wheel tracks or the wheel ruts, for example."

The study, although helpful, may be a little too late, Vieth said. Wisconsin is looking to expand its system, but "I'm not sure if we're going to be able to wait for the SHRC to get done with their work," he said. "But we certainly have some mutual interest here."

Bailin

FROM PAGE 39

dustry must wake up to the fact that there is no such thing as value that is purely technical. A "good" product is a product that is technically excellent but is also well-marketed, well-supported, well-documented and brought to market at the proper time. And, I dare add, a "good" product is also from a company with sound financial management, an excellent human resources record and all the facets that make up a quality business. Because — hang on, folks — software is actually a business.

I don't want to detract from the genius of this industry's creative outlaws, but as software (especially PC software) becomes more critical to complex organizations, value becomes more complex as well. Value is not only that the software displays speed and derring-do but also that it can live, breathe and contribute in the customer's long-term, multilevel, business-critical environment.

It's time to get mature and realize that customers care about their needs, not their vendors' needs. Purchasers have lots of reasons for product choices besides technology, and that doesn't make them stupid or inept. An information systems manager of a Fortune 100 company with thousands of PCs may admire the elegant design of Geoworks' product, but she needs an environment that has enough clout to attract leading applications and enough market weight to survive.

Marketing is not a "necessary evil" or "hype." It is part of what constitutes product value. Excellent marketing means coming to market in a timely manner, cutting the right deals, putting forth the right message and making the right alliances. It also means understanding the customer and directing technical development.

In these areas, Windows 3.0 and the Microsoft marketing machine leave most others in the dust. Windows 3.0 has been rightly criticized on a technical basis, but the sale of 2 million units to date indicates that for customers, value is more complex than pure technology.

Instead of bemoaning the fate of an "inept" market that is being fooled into accepting an inferior Windows 3.0 when a technically superior product exists, we should realize that it is the customer who defines value, not the vendor.

It's not just the joke, it's the delivery. If they're not laughing, it's not comedy.

Bailin is a principal at Kovéra Associates, a Redmond, Wash.-based consulting firm specializing in distributed computing.

Wingz trades strong graphics for compatibility

Technology Analysis — A roundup of expert opinion on new products. Summaries written by free-lancer Susanne Weixel.

In porting Wingz 1.1 from Apple Computer, Inc.'s Macintosh, Informix Software, Inc. tries valiantly to answer the call for an object-oriented graphical user interface spreadsheet that runs under DOS, as well as Microsoft Corp.'s Windows 3.0. The result, reviewers at personal computer publications say, is a mixed bag — Wingz offers graphics and charting capability unlike anything seen on the PC before, but it lacks compatibility with basic spreadsheet precedents set by Lotus Development Corp.'s 1-2-3.

Performance: Each spreadsheet can consist of more than 32,000 rows and columns, and users can load multiple worksheets up to the limits of memory. Although slow compared with text-based products, for a graphics-based program, reviewers agree that Wingz is up to speed. It requires 2M bytes of random-access memory, however, reviewers suggests you will do better with at least 3M bytes.

One drawback is that the program pays so much attention to graphics that it sometimes comes up short performing basic spreadsheet tasks. For instance, Wingz can link cells only to an active file.

Compatibility: Wingz can read, but not write, Microsoft's Excel files. It can read and write Lotus' 1-2-3 files but not 1-2-3 macros, and it disregards the 1-2-3 function key assignments. However, it supports Dynamic Data Exchange and can use the Windows clipboard.

Graphics: Wingz offers various types of graphs rarely seen in PC packages, and graphs are customizable with users controlling visual features such as angle and perspective.

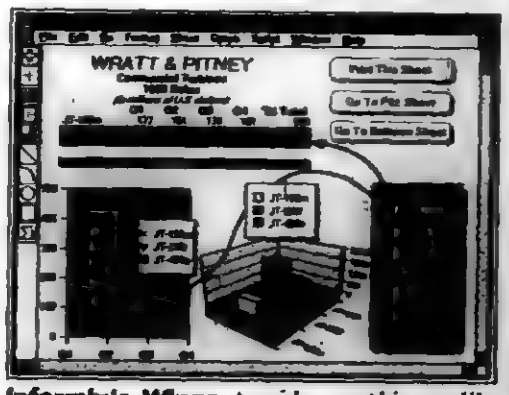
Output: Wingz produces publishing-quality presentations. It offers output options such as color, fill patterns and drop shadows.

Documentation: Wingz comes with three well-written paperback books. However, its on-line Help is not context-sensitive.

Ease of use: Although reviewers find that in some functions Wingz is intuitive, its lack of consistency is frustrating. For instance, *Byte* noted that certain functions, such as specifying links, cannot be performed with a mouse. On the other hand, *Infoworld* complained that several command actions can only be performed with a mouse.

Support: Telephone support is available. However, many of the support staff may be more accustomed to dealing with Macintosh users.

Value: Wingz runs under either Windows 3.0 or OS/2 (both versions come in the same box for the same price). The good news: For $599 you get a graphical, object-oriented package that takes advantage of the Windows environment. The bad news: Its inconsistent design may be frustrating.



Informix's Wingz *provides graphics unlike anything seen on the PC before*

Reviews Summary

Criteria			
Performance	Very good	Good	Perform[illegible]
Compatibility	[illegible]		
Graphics	Very good	Good	Downright fun
Output	[illegible]		
Documentation	Good	NC	NC
Ease of use	[illegible]		
Support	Satisfactory	NC	NC
Value	[illegible]		
Reviewer's score	6.8	The corporate jet of spreadsheets	Promising now but up-front work required

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

What the experts say

• Users: Bob Didner, senior staff consultant, Dun & Bradstreet Corp., Basking Ridge, N.J. (*overall performance of product*: 9.5, *cost*: 9) "We originally chose Wingz for its graphing capabilities, then, we discovered its extraordinary applications development ability. Its object oriented capabilities are outstanding and its speed is very good for a graphics program," Didner said.

Bob Beaman, information center manager, Branch Banking & Trust Financial Corp., Wilson, N.C. (7, 9) ; Steve Jackson, manager of quality assurance, Zenographics, Inc., Irvine, Calif. (8, 7.5)

"Basically, a spreadsheet is a spreadsheet. Wingz has all the features we've come to expect in that capacity, and it is quite a bit more intuitive to use [than Excel], especially when it comes to making charts, when it seems very natural to use. Price-wise, it is in keeping with what you have to spend on a spreadsheet package," Jackson said.

• Analysts: Amy Wohl, Wohl Associates (*overall performance of product*: 8, *cost*: 8); Marshall Moseley, software analyst, Dataquest, Inc. (7, 8); David Cearley, program director, The Gartner Group (6.5, 7)

• Financials: David Bayer, software analyst, Montgomery Securities (*financial performance of company*: 2)

"Informix is a company under fire right now. It is in a tough position. Wingz for DOS is one of the reasons why. Even now that it is shipping, it is showing only modest sales. Although it does well under the company's customers, it has not done much in the way of attracting new customers," Bayer said.

Charles Phillips, analyst, Soundview Financial Group (3)

"They are not in danger of going out of business, but they must turn profitable again," Phillips said.

Alfred Tobia, Mabon Nugent (3)

"Their accounting policies have been very liberal. They have had aggressive revenue recognition policies," Tobia said.

"Certainly Informix is at the edge of the envelope right now. They are looking for ways to generate cash and still be profitable. Most of its growth, however, will come from its database products. Wingz is not really a factor in its financial picture. Wingz is important to Informix as a front end to its database, not as a stand-alone spreadsheet," said Bruce Lupatkin, senior technology analyst at Hambrecht & Quist, Inc.

Wingz 1.1

score:

Points (maximum)	Category
36 (40)	Published reviews
14 (20)	Analysts' ratings
12 (15)	Users' ratings
16 (20)	Cost evaluation
4 (10)	Vendor financials

(Maximum score: 100)

Informix responds

Comments from Rick Lucas, Wingz program marketing manager

Compatibility: It is unrealistic to think you can have a graphics-based product be 100% compatible with a text-based product, and we didn't want to do it less than 100%. We support only SQL database engines. But we support SQL on different platforms [illegible]

Ease of use: From a text-based perspective, there may be ease-of-use problems. We currently have a problem linking spreadsheets. Version 1.5, due out later this year, will feature point-and-click linking. It will also move away from the multitiered pull-down menus toward a top-down, dialog box approach. In Version 1.5, the interface will also be modified to assist users in creating worksheets.

Financials: We have taken steps that we believe are in the best interest of the company over the long term. For instance, we are voluntarily modifying the way we keep our books and report our financial situation. In the short term, such steps mean we may have to take a few hits.

NEXT WEEK

▶Microsoft Corp.'s Excel 3.0 mixes Windows presentation capability with strong analysis functions.

Methodology: *Published reviews: average of numeric scores from product reviews published by PC publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of analysts' ratings of vendor financials and ability to support product from financial analysts multiplied by 1.5.*

Project

CONTINUED FROM PAGE 39

management itself, Mark Jankowski, director of systems development at Frito-Lay, Inc., also in Dallas, was even more blunt. "Project management software is a software product looking for an application."

Stephen Turner, a personal computer technology consultant to Chevron Canada Ltd., has used project management software, but he said he questions its usefulness in a software development shop.

"You can't really say 'this code will take six days to write,'" he said. What it will do is provide an outline to keep track of where things are, but other than that, Turner said, he is not sure it helps much. "I don't know that I put too much of a stake in it."

The only "real practical use" that Jankowski said he can see is if the technology were to come fully embedded in both the front end and the back end of a computer-aided software engineering tool set. However, as a stand-alone application, he likened it to trying to "kill an ant with a computer."

Risk of overkill

Most of the users interviewed cited the overkill factor. They agreed that many project management packages are so complex, they essentially make mountains out of molehills. Vendors have to readjust their sites for a mass market, the users said.

Even those users who come from an engineering background, which is where project management got its start, are not convinced that the current crop of packages meets the needs of business managers.

"I come from an engineering background, where you learn project management and do it on paper. Now, more senior managers are being asked to more effectively manage, and they are looking for a tool to help them do that," said Andrew Roehr, a systems consultant at the Bank of Boston Corp.

For project management to succeed among this class of users, Roehr said, it will have to find a happy medium between functionality and simplicity.

Both Roehr and Fred Winongrad, vice president of distributed systems at Merrill Lynch & Co. in New York, want a networked version. Winongrad wants a server application that is priced per simultaneous user.

"We talk about making sure people get task lists done and coordinated, and for that kind of thing, you need a network version," Winongrad said.

Infrequent users targeted

The situation will change during the course of 1991, said Gladys Francis, an analyst at Dataquest, Inc. Francis said she has seen some upcoming products that will target the manager who looks at the package once per week and who does not want to have to relearn the system each time.

Prices are falling to a more acceptable level, she said. Desktop package list prices run from $595 to $4,800, averaging $2,306 ($1,701 at street prices), according to a report from Framingham, Mass.-based International Data Corp. New offerings are priced in the $300 to $350 range, Francis said.

In addition, not all users are leery about project management software. It provides a measure of discipline that Lithonia Lighting, Inc. did not have before, said Jeffrey Kernan, vice president of information and management service. "Anything is better than where we were before," he noted.

Winongrad said he can "absolutely" tell the difference that project management software makes. "Part of the reason we are looking to manage our whole environment as a single strategy is because there is tremendous pressure to make do with less people," he said.

Improv

CONTINUED FROM PAGE 39

volved. For example, he uses Improv to build very large models that can be changed in any number of ways to satisfy different people.

Improv also makes the reclassification of categories effortless, painless and quick, he said. Another plus is the ability to build up or restrict model expansion or contraction in terms of complexity, Spahr said. "No other spreadsheet allows you to do all this," he added.

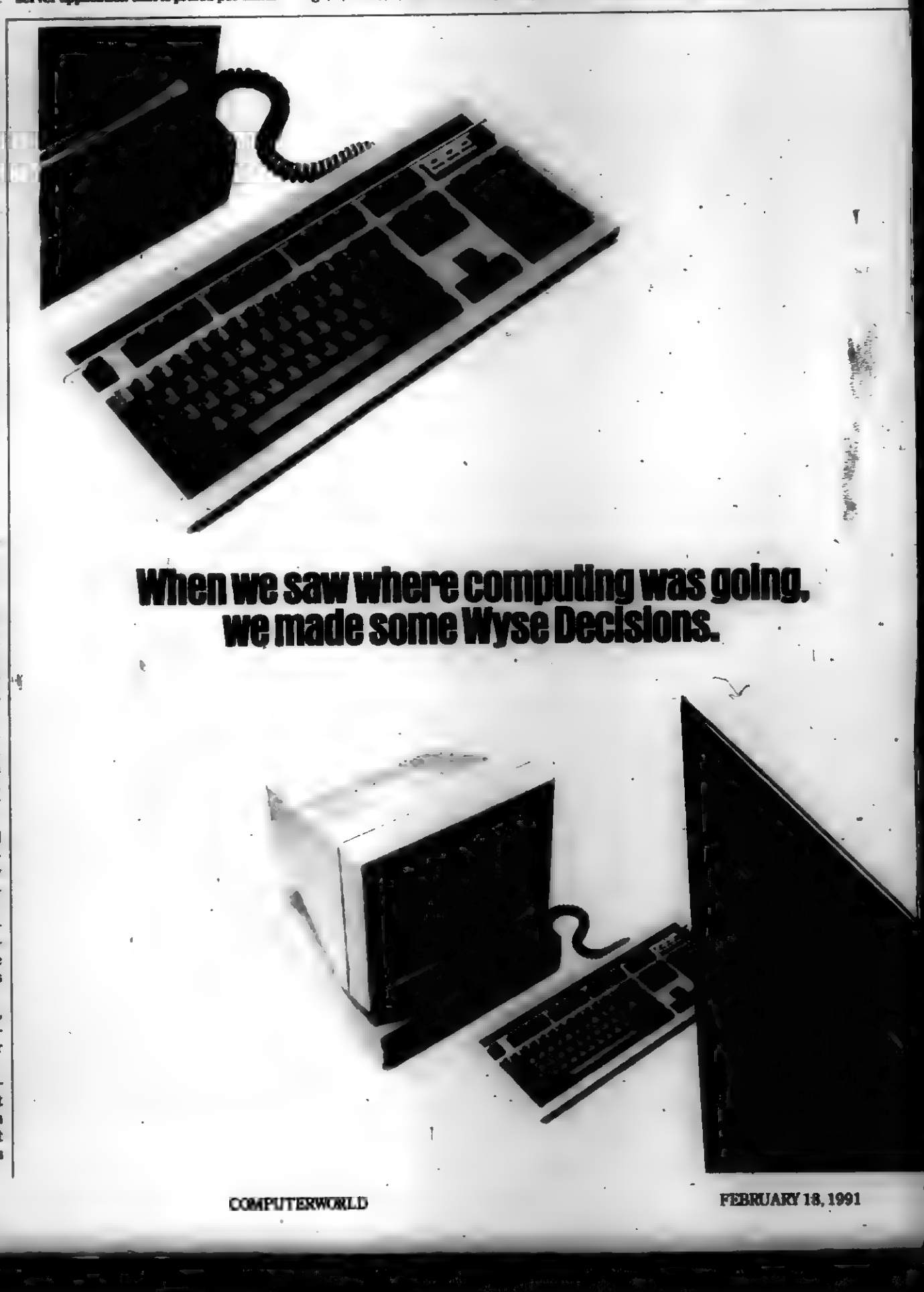
The lack of macros in Improv does not bother Spahr, but Windflower Gilbert, manager of quality assurance at Pencom Software, misses them. "In some cases, the formulas replace them, but in other cases, they don't," she said.

This is not to say Gilbert does not find the formulas helpful — she does, especially a self-correcting mode that not only points out where the error is in the formula but provides suggested solutions.

Gilbert also found that the lack of compatibility with traditional 1-2-3 commands made the move to Improv more difficult, but, she said, the switch was worth it for two reasons.

First, it made the Next computer, which was initially installed as a development system, more accessible to a wider range of users.

Second, she found Improv to be "conceptually much more powerful," in that users can view data in different ways with different categories and concepts. "It really expands on the rows and columns [metaphor]."



Cable firm eyes basics

Systempro helps to automate core functions at Cox Cable

ON SITE

BY RICHARD PASTORE
CW STAFF

SAN DIEGO — CATV is by nature a high-technology animal. State-of-the-art, fault-tolerant systems process picture signals and control customer access to premium services. Yet basic functions such as cable installation and cost tracking are only just beginning to benefit from automation.

Cox Cable San Diego, Inc., the country's third-largest CATV company, began computerizing its own basic operations about one year ago. Its cost-tracking system, which combines custom coding with spreadsheet and database packages, has saved considerable time and improved accuracy over the manual methods it replaced.

The system, an approximately $75,000 investment in hardware and software, resides on an 18-node Novell, Inc. Netware 386 network served by a Compaq Computer Corp. Systempro. The application was part of the justification for buying the $30,000 Systempro, which also runs Microsoft Word for Windows application from Microsoft Corp., said Mark Olsen, systems analyst and designer of the cost-tracking program.

The network is separate from the Tandem Computers, Inc. fault-tolerant TXP superminicomputer that runs the signal processing and customer access functions within Cox's highly decentralized information systems group.

The cost-tracking system allows its 50 users to calculate return on investment and monitor costs and materials associated with cabling new housing developments and upgrading older installations.

For each new cabling project — there are 1,255 currently active — field inspectors visit the housing site and note materials needed for construction: miles of cable, conduits and telephone pole amplifiers.

These and other design elements are entered into the system, which crunches the numbers in a preconfigured Lotus Development Corp. 1-2-3 spreadsheet to determine a return on investment.

Once executives sign off on the project, the system dumps all pertinent project data — dates, materials and costs — into an Informix Software, Inc. Smart Data Manager Version 3.1 database. From there, warehouse staff members use it to print material requisitions and parts lists. Other users track the project's progress on-screen and print status reports as needed.

"It's really streamlined the process," said David Loveland, whose systems development group works with the 1-2-3 aspects of the system. He estimated at least a 50% time savings over manual rate-of-return calculation.

"It also provides more depth and detail of information," Loveland added. Manual calculations took into account only surface costs such as materials and labor. The automated system includes such back-end calculations as amortization based on a 12-year installation life span.

At Cox's warehouse, workers use the system as a guide for requisitioning parts for the construction contractors. Again, the benefits are time savings and improved accuracy.

"We are doing 5,000 transactions a week — a 30% increase — with the same number of people," said Skip Dye, inventory control/fleet manager.

Under the previous method, warehouse workers handwrote part numbers before pulling parts from the shelves. Numbers often got jumbled and incorrect parts were pulled.

"Now when we key in a part number, the system will cross-check it for validity and give us a part description and price," Dye said.

Costs confusion over costs

Real-time inventory reconciliation also reduces the chance for costly discrepancies to slip through. "By more efficient inventory management, we felt there would be very large but difficult-to-quantify savings [in missing material] that would pay back the system investment," Olsen said.

While the menu-based system has proved easy to learn and use even for computer novices, there is room for improvement, users said.

"We need to upgrade our terminals," Dye said. The three dedicated warehouse personal computers are "vintage, and the response time is not what we'd like," he added.

Olsen is also working on a program to allow the cost-tracking system to upload records of parts use to an IBM System/38, which holds the master parts inventory file and performs financial processing.

Currently, warehouse employees have to spend about three hours per day rekeying this data into the System/38. "It's kind of silly, so the next step is to develop an automatic link between the two," Olsen said.



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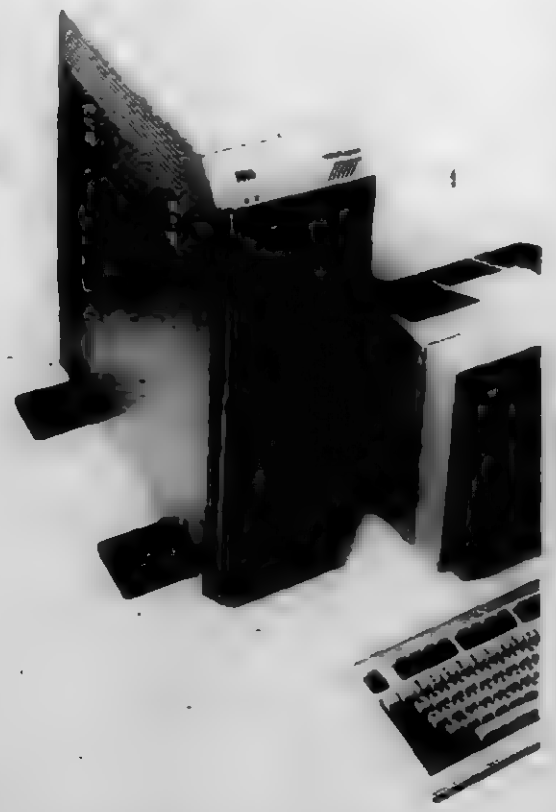
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NEW PRODUCTS

Systems

Tandy Corp.'s Radio Shack Division has introduced an IBM Personal Computer AT-compatible, notebook-size business computer that includes a 16-MHz 80C286 microprocessor and IBM Video Graphics Array graphics.

The 2810 HD features 1M byte of memory that can be expanded to 5M bytes, an internal hard disk drive that features a 23-msec access speed and a 3½-in. 1.44M-byte floppy disk drive.

It is priced at $2,499.

Radio Shack
One Tandy Center
Fort Worth, Texas 76102
(817) 390-3487

Fora, Inc. has introduced a laptop that incorporates an Intel Corp. 80386 chip and features an optional expansion chassis equipped with slots for three (two 16-bit and one 8-bit) IBM Personal Computer AT bus expansion cards.

The 20-MHz LP-386C ($4,995) includes 2M bytes of random-access memory, which can be expanded to 8M bytes; 64K bytes of read-only memory; a 3½-in. 1.44M-byte floppy disk drive; and a 3½-in. 40M-byte hard disk drive. A 120M-byte hard disk version costs $5,495.

Fora
3081 N. First St.
San Jose, Calif. 95134
(408) 944-0393

Peripherals

Mouse Systems Corp. has introduced a three-button mouse designed for Apple Computer, Inc. Macintosh and Apple/Unix environments.

The A³ Mouse ($169.95) incorporates the company's M5 optical technology and features a software package, Power cdev, which allows users to access common command, sequence or function keys by touching a mouse button.

In an Apple/Unix environment, the mouse allows common commands to be performed simultaneously with cursor positioning. The A³ Mouse is scheduled to begin shipping this month.

Mouse Systems
47505 Seabridge Drive
Fremont, Calif. 94538
(415) 656-1117

Logitech, Inc. has announced a family of ergonomically developed, optomechanical input devices designed for IBM Personal Computer XTs, ATs, Personal System/2s or compatibles.

All models feature default resolutions of 400 dot/in. and online ballistics and cursor controls. Prices range from $119 to $199.

Logitech
6505 Kaiser Drive
Fremont, Calif. 94555
(415) 795-8500

Software applications packages

Micro Planning International, Inc. has introduced a high-end DOS-based project management program designed to handle multiproject planning as well as precedence and arrow methods simultaneously.

Micro Planner Professional is a 13,000-activity software program that enables standardised plans to be developed on Apple Computer, Inc. Macintosh, Microsoft Corp. Windows or DOS platforms.



MPI's Micro Planner Professional coordinates multiproject planning on several platforms

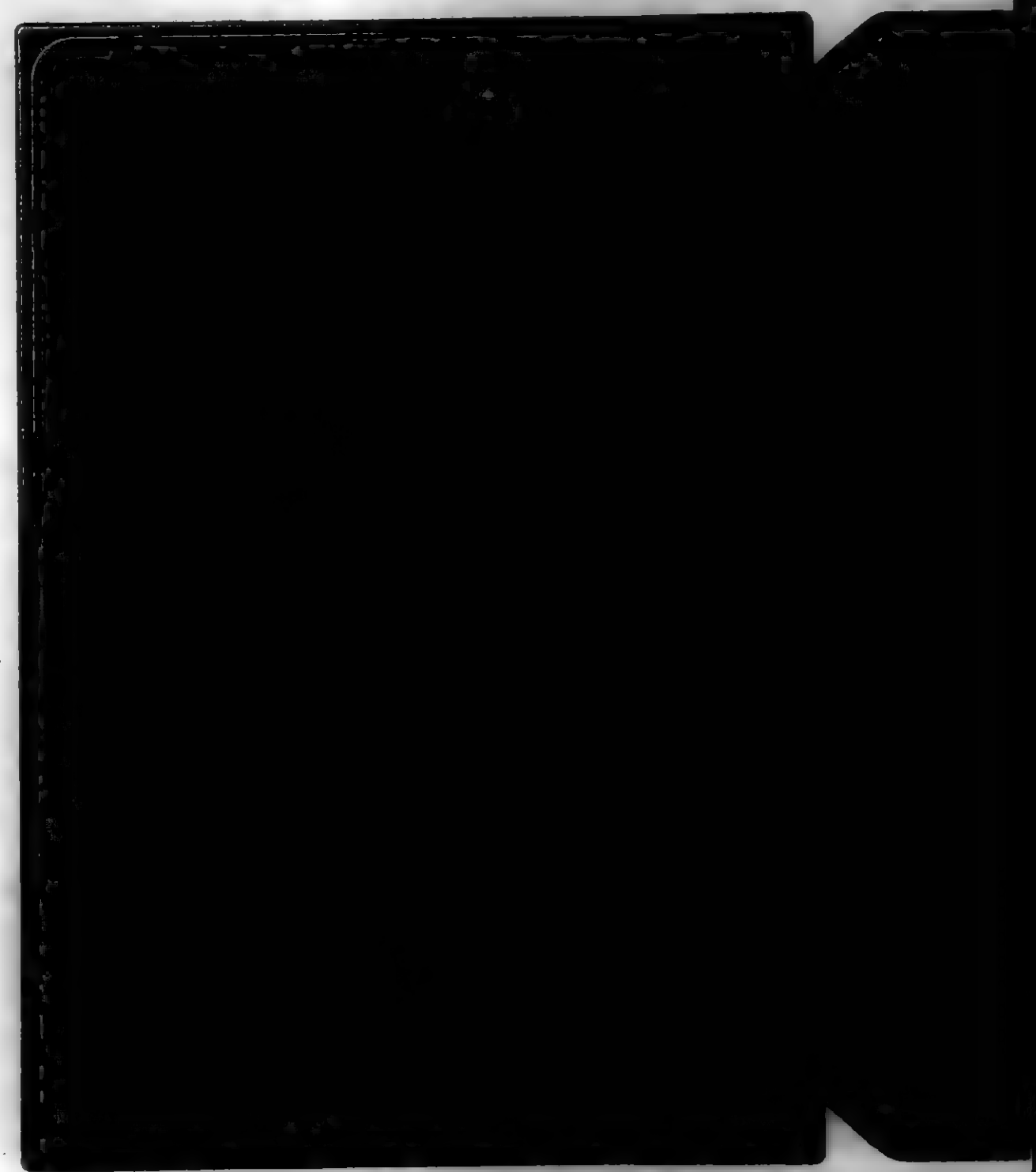
The product requires an IBM Personal Computer XT or compatible with 512K bytes of random-access memory, a 10M-byte hard disk, a monochrome monitor and a nine-pin Epson America, Inc.-compatible dot-matrix printer.

Micro Planner Professional is priced at $1,995.

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Micro Planning International
655 Redwood Highway
Mill Valley, Calif. 94941
(415) 389-1414

Computer Associates International, Inc. has announced enhancements to Accpac Bedford, its entry-level desktop accounting package designed for MS-DOS and Apple Computer, Inc. Macintosh environments.

Accpac Bedford for MS-DOS Version 3.4 and Accpac Bedford for the Macintosh Version 1.2 let users import data from other programs into the product's general journal. A clear-paid invoices function has also been added to the accounts payable and accounts receivable modules.

Prices have been reduced to $199 each, the vendor said.

Computer Associates
711 Stewart Ave.
Garden City, N.Y. 11530
(516) 227-3300

Simplsoft Products, Inc. has released Version 3.0 of Client Manager, an information manager designed for sales tracking, correspondence, mailings and follow-ups on an IBM Personal Computer XT, AT or compatible.

Features include on-line real-time scanning of records based on any criteria and a report capability that permits reading of any ASCII or Aston-Tate Corp. Dbase file using any delimited or standard data field configuration.

The product is priced at $89.

Simplsoft Products
P.O. Box 17116
Boulder, Colo. 80308
(303) 444-8771

Cimlinc, Inc. has released Version 2.0 of Intelligent Documentation, a software package designed to create on-line representations of engineering and manufacturing documents.

The product can reduce the amount of macroprogramming required to generate applications, and it can automate paper-based information such as engineering change orders, the vendor said.

Intelligent Documentation Version 2.0 runs on Unix-based workstations from Sun Microsystems, Inc., Hewlett-Packard Co. and IBM. Prices range from $1,000 for a view-only version to $10,000 for a systems administrator package.

Cimlinc
1222 Hamilton Parkway
Itasca, Ill. 60143
(708) 250-0090

Development tools

Solution Systems, a division of The Software Developers' Co., has announced Charge, The Software Performing Analyst, a tool that enables programmers to view information as bar graphs, statistics, execution [redacted].

The product can reportedly show programmers where code replacements or faster algorithms are needed within an application. Support for six compilers, including Microsoft Corp.'s Microsoft C Version 5.1 and Borland International, Inc.'s Turbo C and C++, is also fea[redacted].

System requirements include an IBM Personal Computer XT, AT or compatible with DOS Version 2.0 or higher and 384K bytes of random-access memory. The product is priced at $99.

Solution Systems
372 Washington St.
Wellesley, Mass. 02181
(617) 237-2313

Microware Systems Corp. has announced a real-time multimedia development environment and user interface that is available for IBM Personal Computer [redacted].

The Real-Time Audio/Video Environment runs on Microware's OS-9000 real-time operating system and was designed for use in real-time industrial applications such as process control and instrumentation.

The product enables designers to combine audio, computer-generated graphics, captured live video and customizable menus in one interface to configure realistic user interfaces and control panels, according to the vendor.

Single-copy pricing is $750.

Microware Systems
1900 N.W. 114th St.
Des Moines, Iowa 50325
(515) 224-1929

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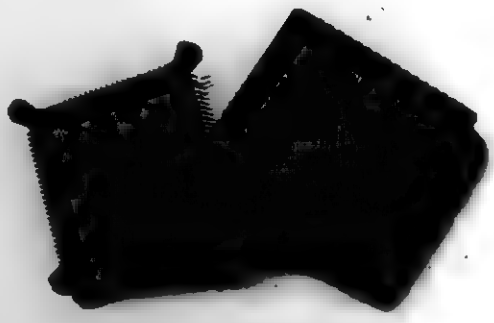
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Users join open systems forum

BY ELISABETH HORWITT
CW STAFF

Historically a vendors-only body, the Open Systems Interconnect (OSI) Network Management Forum has determined that it must open its doors to users if it is to effectively promote standards-based interoperability among different vendors' network management systems, according to the organization's recently appointed president, Robert Montgomery.

The forum's original purpose was to promote the development of common specifications which, when widely implemented by vendors, would provide integrated network management across a broad range of networking systems. With a vendor membership of more than 100 companies, the organization is now looking for 15 to 18 users to meet twice per year as its Users Advisory Council. The council's purpose is to provide the vendor side of the forum with input on its plans and insight on users' network management priorities, Montgomery said.

Ideal candidates for the advisory council are users and companies that are acquainted with "the inefficiencies and problems" associated with multivendor network management, Montgomery said.



Montgomery is *seeking users' advice on open systems*

On the other hand, the forum is not expecting all council members to have a definitive stake in OSI-based management, Montgomery said.

What users do want is what a network management standard can best provide: a set of stable products that have gained widespread industry acceptance and "will not die on the vine," said Elisabeth Adams, forum director of operations.

However, users still see network management standards as a long-term goal, Adams said. In the meantime, they are making do with what is available — and that is often a combination of vendor platforms supplemented by in-house programming.

Securities Industry Automation Corp. (SIAC) is one such company. The stock exchange systems subsidiary is in the process of developing what it has dubbed "Grand Unified Management or GUM: the ideal system where one person at one console can manage all networks and the entire facility, including air-conditioning, power and applications," said Andrew Bach, the firm's director of communications engineering.

Having recently migrated to an OSI-based local-area network platform, SIAC plans to get to OSI-based network management eventually, Bach said. However, right now "it's a choice between proprietary or nothing," he added. "OSI just isn't there yet."

The firm is presently looking at a combination of IBM's Netview, Digital Equipment Corp.'s Enterprise Management Architecture and its own in-house work, Bach said. "Each vendor is talking about providing interfaces to a GUM. As we thread our way and nudge vendors, we hope to come up with a common answer for all of them."

The forum has been working toward common management integration specifications that its members, including IBM and DEC, will eventually support on their products. British Telecom PLC and AT&T are conformance-testing forum network management specifications. Four vendors have finished products based on the specifications and will begin conformance testing soon. Fourteen vendors are actively developing products, and 10 firms are planning to do so, Montgomery said.

Now, the forum wants ongoing user participation as it moves to incorporate more specific tools and functions into its specifications. The organization is already acting on suggestions it has received from users who participated in a recent president's roundtable meeting, Montgomery said. Among the issues identified as top priorities are the following:

- Accounting and inventory applications to keep track of network use.
- Access control and security issues. The forum plans to release specifications for network security later this year.
- A management information base that will enable users to handle a mix of network equipment and protocols.
- The ability to get things up and running fast after a failure.
- Better insight into and control over LANs.

One frequently cited overall user goal, Adams said, was decreasing the number of management workstations needed to handle multivendor network installations "so you don't have to buy a new Sun workstation every time you get a new type of network device."

Electronic meetings increase

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

The videoconferencing market's ducks are all in a row, and user companies are taking aim at a technology that has waited decades for its ship to come in.

Plummeting switched network service and equipment prices, improved technology and slashed travel budgets all add up to rational cost justification for "meeting without being there."

In addition, vendors and carriers reported a dramatic surge in demand for videoconferencing facilities since the onset of war in the Persian Gulf. U.S. Sprint Communications Co., for example, has said that its videoconference network traffic has tripled during the last few weeks.

Aside from security worries over global travel, increasing numbers of firms can afford to furnish rooms on their premises with videoconferencing essentials: a coder/decoder, camera, monitor, microphone and audio system.

The coder/decoder, the heart of the videoconferencing system, compresses video signals so they can be transmitted less expensively. "New codec software is giving us better quality video at lower data rates," remarked Arthur Yee, a systems consultant at New York-based Metropolitan Life Insurance Co. and a user of Peabody, Mass.-based Picturetel Corp.'s V3100 videoconferencing equipment.

Yee said he looks forward to adding on to his nationwide Picturetel network with the vendor's modular V3100-compatible System 4000 that was rolled out last month because of its echo-canceling feature. One central microphone can now pick up

Continued on page 58

Prime time

Plummeting costs, on-demand network services and economic factors will inspire more firms to tune into videoconferencing



*Estimated

Source: The Yankee Group — CW Chart: Paul Mock

FEATURE: PREPARING FOR A NEW EUROPE

EDI booms as global outlook blooms

BY ALICE LAPLANTE
SPECIAL TO CW

At Sea Land Service, Inc., using electronic data interchange (EDI) worldwide is essential for competitive reasons: International customers of Sea Land's cargo services demand the efficiency and timeliness EDI provides, and for the Edison, N.J.-based shipping company to ignore EDI would be to lose valuable business around the globe.

"We are very customer-oriented," says Hans Weiting, an EDI specialist at Sea Land. "We will do whatever it takes to work with them."

Weiting's flexibility underscores an unavoidable conclusion: As Europe moves toward a common market in 1992, EDI has taken on rapid visibility and importance. European governments are pouring millions of dollars into efforts to ensure that intercountry trading of electronic data, as well as more durable goods, goes smoothly for all.

Ovum Ltd., a market research firm in London, forecasts rapid growth in the UK — the largest European EDI market — with estimated 1990 revenue of $47 million from software, training and other services growing to $169 million in 1994. Ovum also expects EDI to take off to a lesser degree in France and Germany.

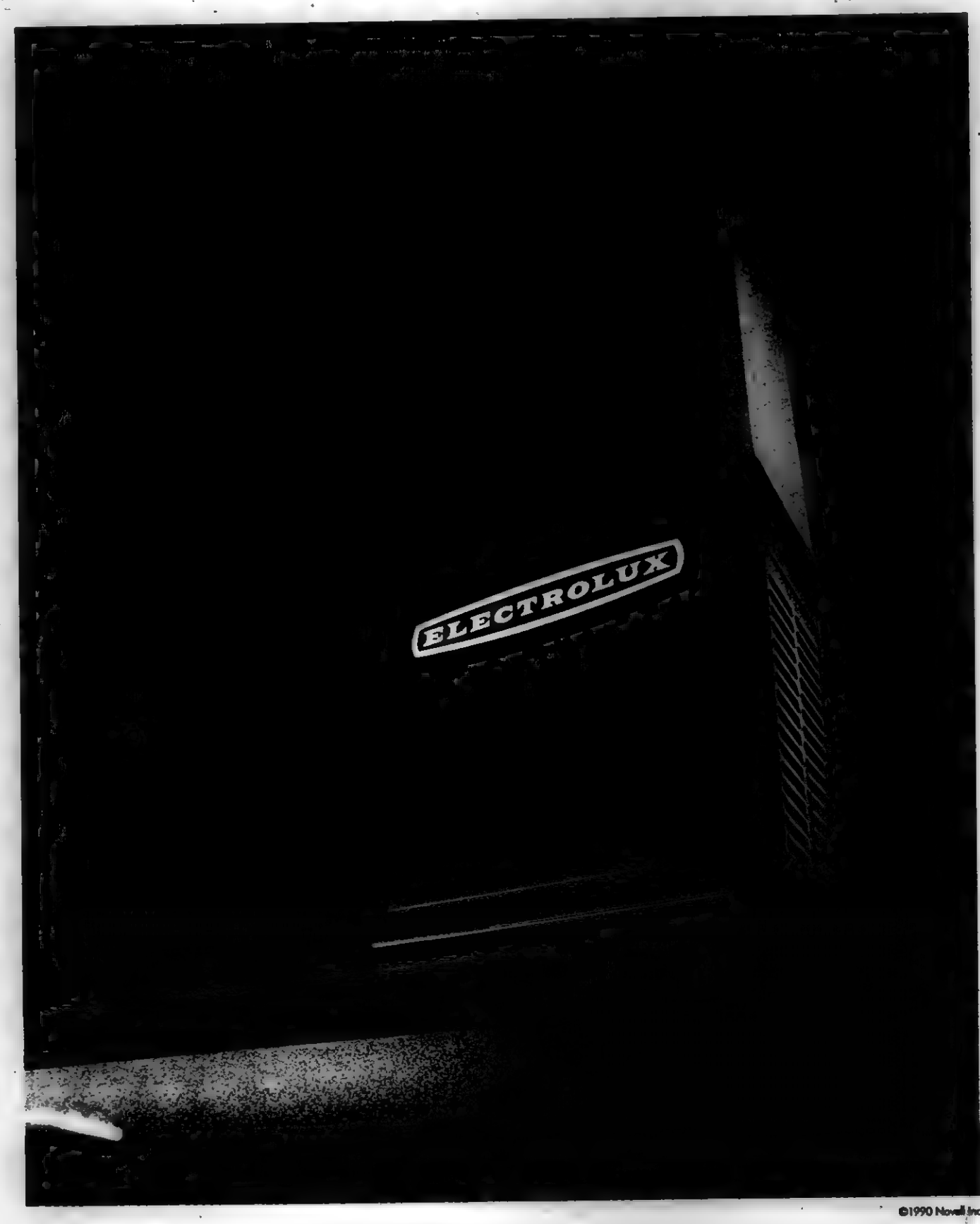
Still, U.S. companies looking to do business in Europe using EDI face considerable challenges. Edifact, the emerging international EDI standard, is incompatible with the ANSI X12 standard that most U.S. firms employ and is far from being completely implemented. The telecommunications infrastructure in some parts of Europe, particularly the southern and eastern countries, is considered primitive by U.S. standards. And there are inevitable language and cultural barriers.



However, EDI is a growing force in U.S./European trade. According to EDI Spread the Word, an EDI consulting group in Dallas, 3,000 to 5,000 European businesses currently use EDI, compared with 12,000 in the U.S. "It is my belief that we will see the European trade bloc surge ahead of North America in EDI use in the

Continued on page 61

ELECTROLUX CHOSE NETWARE TO FROM OPERATING



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When Electrolux corporate management needed to share information with 600 sales offices, they chose the cleanest network solution they could find.

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That's when America's premier floor care company chose NetWare,® the only PC-based network operating system that's in its eighth generation. "We chose NetWare because it's a proven, flexible network solution," recalls Skelton.

In addition to sharing information, NetWare allows Electrolux to share expensive software. In fact, NetWare is compatible with thousands of PC-based applications. And since NetWare is hardware independent, there's no fear of hardware incompatibility or obsolescence.

Skelton puts it this way, "NetWare is the network of choice because compatibility with other products is built in. It gives us an open platform to connect multiple workstations, and the flexibility to choose many routes for network integration."

In just three years, Electrolux has automated from six standalone PCs to an integrated business-wide network with mainframe connectivity, remote access and a workstation on every desktop. And Novell has helped meet its growing MIS needs with solutions and support that only the responsible leader in network innovation can provide.

Call 1-800-LANKIND for your 1990 NetWare Buyer's Guide. And learn more about how NetWare cleared the way for a business-wide network at Electrolux.

NOVELL

The Past, Present, and Future of Network Computing.

Electronic

CONTINUED FROM PAGE 55

the voice of a speaker wandering around the room with no audio degradation.

Some firms with occasional videoconferencing needs are taking advantage of Sprint's worldwide videoconference network, Meeting Channel. Other users are taking a hybrid public/private approach.

Applications to the law

Legal Image Network Communications, Inc. in Dallas, for example, uses a combination of Austin, Texas-based Videotelecom's equipment and Meeting Channel to allow court reporters to take depositions from witnesses. The company has its own facilities in about 20 cities, "but in towns where we have none, we use Sprint's," said David Jackson, the firm's vice president (see story below).

"It is now cost-justifiable to use videoconferencing for a two- to three-hour deposition," Jackson said. "However, it's cheaper to fly for a full day to New York. Transmission costs still need to drop, and the emergence of switched 384K bit/sec. services will probably help that."

A minimum of two 56K bit/sec. channels is required for full-motion video. Jackson's application, however, requires the higher bandwidth because lag time generated by slower speeds causes videoconference participants' voices to overlap, inhibiting verbatim reporting.

Switched 384K bit/sec. services currently rolling out from the long-distance carriers and proliferating Integrated Services Digital Network primary-rate services are contributing to the cost decline.

"Five years ago, you shelled out $100,000 for equipment and $1,000 per hour in coast-to-coast transmission costs over dedicated lines," said Herbert R. Maher, an analyst at Tucker Anthony, Inc., a brokerage firm in Boston. "Now you can get near-television quality for under $50,000 and pay about $15 per hour for switched coast-to-coast service."

Sprint made Meeting Channel more accessible last month by announcing that customers with dedicated T1 (1.5M bit/sec.) circuits could run video over their packet- and circuit-switched data on a channel dedicated to video. In addition, the carrier delivered Meeting Channel access over its VPN virtual private network service. VPN users can dial up bandwidth as needed on Sprint's public-switched network for voice, data or video service.

Neck and neck in the videoconferencing equipment market are Picturetel and industry pioneer Compression Labs, Inc. in San Jose, Calif. Tucker Anthony attributed a 47% market share to Compression Labs and 34% to Picturetel for 1990. However, in terms of shipments, Maher said, the firms are at 41% and 39%, respectively. Videotelecom ranks third with a healthy 10% in both categories.

The Yankee Group, a research firm in Boston, estimated that between 20% and 30% of Fortune 500 companies now have on-site video rooms. However, analyst Mark Lowenstein said, early Yankee Group projections show the video equipment market in 1991 to be nearly triple what it was in 1989 (see chart page 55).

"The videoconferencing business is timely but not enduring," Maher said. He added that vendors are already eyeing ways to expand their expertise, such as using compression for direct broadcast of movies to the home via satellite.

Standard fare

The telecommunications manager at J. C. Penney Co. is skeptical about using videoconferencing because the standard allowing different vendors' equipment to communicate is not yet in place.

"Today's scenario assumes you only want to talk to yourself," said Al Ladwig, who is currently heading up an ISDN pilot program for transmitting still images between local-area networks (see story page 59). "Videoconferencing will really take off when everyone can talk to everyone, as in the fax world."

However, interoperability is being addressed by the Consultative Committee for International Telephony and Telegraphy, which said it hopes to have its PX64 coder/decoder standard in place by midyear.

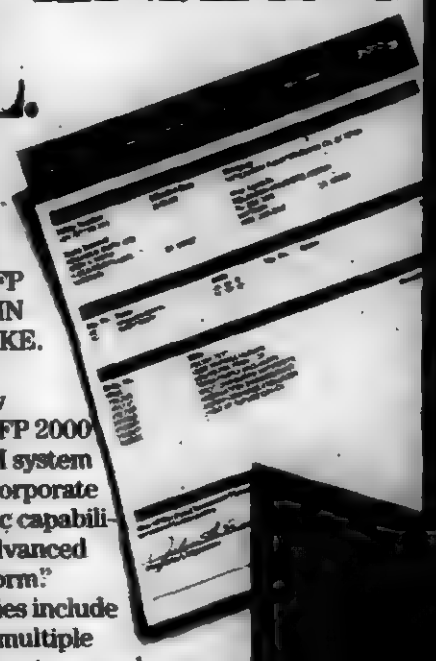
Herbert R. Maher, an analyst at Tucker Anthony, explained that videoconferencing vendors plan to continue to offer proprietary algorithms on their coder/decoders.

"Picture quality is compromised with the standard algorithm," he acknowledged. He explained that because transmission speed standards vary, simply combining the best characteristics of the proprietary systems poses some difficulties.

Sprint's Meeting Channel fills an interoperability gap by providing a gateway service that translates other vendors' coder/decoder algorithms into its own. Firms can then supplement the private videoconferencing networks with Sprint conference rooms in locations where they do not have their own videoconference room. They can also use Sprint as a gateway into other companies running different vendors' equipment.

JOANIE M. WEXLER

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J. C. Penney pleased with results of its ISDN testing

BY JOANIE M. WEXLER
CW STAFF

DALLAS — To experience a true sampling of the Integrated Services Digital Network (ISDN) promise, J. C. Penney Co. would have to find other companies using ISDN service and dial them up on the fly.

In the meantime, the retailer is evaluating the next-best thing. A 3-month-old in-house trial allows J. C. Penney to balance voice and data traffic loads and transmit still images between local-area networks. The pilot program is demonstrating interoperability among ISDN premises equipment and the local and interexchange carriers to the store's satisfaction, according to Al Ladwig, manager of telecommunications.

The test is being conducted over primary-rate (1.5M bit/sec.) ISDN lines and involves network access equipment from Teleos Communications, Inc. and carriers Southwestern Bell and MCI Communications Corp. The intercarrier interoperability issue is significant in that long-distance carriers have been more aggressive in offering primary-rate service than the local carriers, which have focused on basic-rate (144K bit/sec.) ISDN service. The disparity has been one inhibitor to end-to-end communication over ISDN.

Often described as a technology seeking an application, ISDN has found a couple of important ones at J. C. Penney, according to Ladwig. The firm is dialing up 64K bit/sec. chunks of a 1.5M bit/sec. channel — up to 384K bit/sec. — for linking LANs in geographically dispersed stores. The main attraction of the technology, Ladwig said, is ISDN's switched nature, which allows customers to access and pay for bandwidth only when they need it.

"In a store, you usually have a limited number of lines that you use for voice, and you dedicate a link to data," Ladwig explained. "Bandwidth on demand allows us to allocate more bandwidth to data when our needs dictate it."

J. C. Penney's transport of still images between stores could eventually lead to implementation of ISDN to enhance the company's full-motion, one-way video broadcasts now being transmitted by satellite to speed the final selection of merchandise styles and colors.

Ladwig said the company has 800 stores that would all be candidates once service is available from carriers in those companies' locations.

While other higher speed switched services such as Synchronous Optical Network and Switched Multimegabit Data Service are imminent and often discussed in terms of obviating ISDN, Ladwig pointed out, "the distinction here is that we're talking about small offices using limited bandwidth. These other services are very exciting but may be more expensive than what a store can afford."

ISDN represents the vision of a global, dial-up network that integrates several digital services on one link. Its ultimate goal is to allow users to dial up data, video, image and voice connections ubiquitously in the way they place voice telephone calls today.

ISDN was conceived years ago but has been slow to come to the masses because of the onerous task of upgrading the world's telecommunications systems.

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HP Task Broker ports to Sun

BY J. A. SAVAGE
CW STAFF

Aiming to reap profits from its software technology regardless of hardware platform, Hewlett-Packard Co. announced that its Task Broker product will be available to run on Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) platforms.

Task Broker takes a problem that is too big or time-consuming to run on the user's workstation and parcels it out to other available processors on the network.

Porting Task Broker to Sun workstations is another action in HP's plan to rely more on software revenue: Last month it ported its computer-aided software engineering package to the Sun platform. The company is trying to grow its software revenue from the current 10% to 30% in the next three years, according to Bob Frankenberg, vice president of HP's Cooperative Computing Group.

Curiously, HP is providing software for Sun's older workstations — those based on Motorola, Inc.'s 68000 processors — while Sun has said it will no longer support the older systems with new software. Task Broker reportedly will also run on Sparc-based systems that use the Sun operating system Version 4.03 or higher.

Task Broker will be available through San Diego-based Science Applications International Corp. A 10-node license costs $5,000 and is scheduled to be available in June.

NEW PRODUCTS

Local-area networking hardware

Storage Dimensions, Inc. has announced a series of Extended Industry Standard Architecture bus-based storage systems designed for Novell, Inc. Netware local-area networks.

The internal, hard-disk subsystems — part of the company's Lanstor product family — provide 330M, 650M or 1G bytes of storage, depending on model.

Pricing ranges between $3,920 and $7,495, depending on type of model.

Storage Dimensions
2145 Hamilton Ave.
San Jose, Calif. 95125
(408) 879-0300

H-Three Systems Corp. has rolled out a token-ring network card designed to connect Apple Computer, Inc. Macintosh II series computers to token-ring local-area networks.

The Macring NB 16/4 ($995) includes Texas Instruments, Inc.'s 16M/4M bit/sec. token-ring chip set and a ring interface developed to eliminate jitter, the vendor said.

H-Three Systems
100 Park Drive
Research Triangle Park, N.C. 27709
(919) 549-8334



Western Digital's *Elite 16 Combo is part of the Elite family of LAN adapters*

Western Digital Corp. has announced the Ethercard Plus Elite 16 Combo, a 10Base-T-compatible local-area network adapter that features connectors for coaxial and 10Base-T unshielded twisted-pair cabling.

The 16-bit board is part of the Elite family of LAN adapters.

The series also includes the Ethercard Plus Elite 16, which features connectors for thick and thin coaxial cable; the Ethercard Plus Elite 16T, which provides an interface for 10Base-T unshielded twisted-pair cable; and the Ethercard Plus Elite, which features dual-ported, shared-memory architecture for 8-bit operations. Prices range between $249 and $399.

Western Digital
P.O. Box 19665
Irvine, Calif. 92713
(714) 932-5000

Modems

PSI Integration, Inc. has announced an internal facsimile/data modem designed for Apple Computer, Inc. portable systems.

The Comport 5/42 Fax/modem ($799) operates at 9.6K bit/sec. as a fax and at 2.4K bit/sec. as a data modem. Its fax utility software allows Macintosh portable users to send and receive faxes, and its Quickfax desk accessory allows users to send faxes from within an application, the vendor said.

The product is scheduled to begin shipping this month.

PSI Integration
2005 Hamilton Ave.
San Jose, Calif. 95125
(408) 559-8544

UDS, a unit of Motorola Information Systems Group, has announced the UDS V.3227, a modem designed for central-site and modem-pooling applications.

The device complies with CCITT V.32 for 9.6K bit/sec. communication and V.42 bis standards for error correction and data compression. It can reportedly operate at 9.6K, 4.8K, 2.4K or 1.2K bit/sec. without requiring data compression.

The UDS V.3227 is scheduled to ship in the first quarter and is priced at $1,145.

UDS
5000 Bradford Drive
Huntsville, Ala. 35807
(205) 721-8000



Countywide network stitches together security blanket

County links agencies with private X.25 TCP/IP network

BY CAROL HILDEBRAND
CW STAFF

CONTRA COSTA COUNTY, Calif. — So you haven't paid a few parking tickets in Martinez. What's to worry? The officer who pulls you over in Pacheco is never going to know, right?

Guess again. With the network currently being set up among the Contra Costa County's 18 cities and several county law agencies, chances are that the uniformed person peering in your car window will know all about those indiscretions down the road.

"In effect, we needed a path to connect [the agencies'] disparate computers so they could talk to each other without a lot of special programming," said Cecilia Baird, project director for the network system.

Network Solutions, Inc. and Pacific Bell worked jointly to provide the county with a private X.25 network using Transmission Control Protocol/Internet Protocol (TCP/IP) and packet switching.

"This gives the ability for a DEC to talk to an IBM and vice versa without writing a lot of special interface software," Baird said.

All cities represented

Not all of the cities have their own computers. In all, there are about 14 computers on the network. "Some of the smaller towns are hooked onto someone else's computer, but they're all represented," Baird said.

Several applications are in the works. For example, agencies can now determine the status of court cases and the schedule for court appearances. This makes it much easier for an officer to check on whether he is needed in court, Baird said.

Another application, still under construction, is a centralized name index that will allow a law office to quickly check which other agencies have had dealings with an individual.

This index is currently up and running for courts and probation, and the individual cities are working with their computer vendors to be able to feed their information into the index. Baird said she hopes to see some of that data later this month.

And those parking tickets? Well, if you have avoided appearing in court to pay them, another program in the works could mean trouble. Arrest or bench warrants issued for failure to appear in court will be stored in a countywide warrant system. When a police officer pulls somebody over, he will be able to check the system for outstanding warrants, according to Baird.

Neighboring county Alameda has a similar system in place, Baird said, and access to that has proven extremely useful. "We're looking at either going out on our own or working with Alameda to enhance that system," she said.

EDI

CONTINUED FROM PAGE 55

next three to four years," says Marshall Spence, president of the EDI Council of Canada in Toronto.

Experts stress that implementing EDI in Europe is a business decision — one that can add up to big bucks.

"You have the technology to buy and to put in place, which almost always requires you to redesign your business processes and re-establish interfaces with your customers and suppliers," says Jeff Sturrock, senior manager of the information systems practice at Ernst & Young in Dallas.

However, there are also numerous technical hurdles. Most U.S. firms use the ANSI X12 standard, whereas European firms are embracing Edifact. Ken Hutcheson, co-chairman of the X12 committee, announced one year ago that his goal was to "align" Edifact and X12 by 1994, but most experts dismiss this as overly optimistic.

"Thinking it could be done by 1994 or even 1995 was daydreaming," says Robert Hurd, director of international programs at the Data Interchange Standards Association in Alexandria, Va.

Each has its own standards

There is an additional standards complication: Because Edifact is still in its infancy, a majority of European firms have not yet adopted it. Instead, they still use EDI standards created within their own country or industry.

"There are not yet sufficient [methods] for international cargo tracking to do all our EDI business with Edifact," Weiting says. "So we will translate from ANSI X12, which we use in the U.S., to any proprietary standard used overseas in Asia or Europe."

For the more widely used standards, translation is not a problem, Weiting says, because available software makes it a relatively painless process. However, for companies using more obscure standards, figuring out how to use EDI can be a headache.

"Obviously, we try to discourage this [use of a proprietary standard] as much as possible because then we have to write our own translation software," says Weiting, who adds that such a project is "no easy task."

Still, he says, EDI is so important to the way his company does business that "this is no longer a real barrier."

Many EDI managers at U.S. corporations say translation is no longer a burning issue.

"There are literally hundreds of companies manufacturing translation software that can provide transparent translation between ANSI X12 and a host of other standards," says Bill Cafiero, manager of corporate financial services at GE Information Services in Dallas. Cafiero is managing an international EDI funds transfer project and is also a member of the Edifact board.

"People who say they can't use EDI in Europe today because of the lack of standards are really just making excuses," Cafiero says.

An additional hurdle U.S. companies must face is an often substandard quality of telecommunications services overseas, EDI consultants and corporate users warn. Although the UK, France and Germany have sophisticated facilities, other European countries are less reliable, experts say.

Breakdowns and other problems

According to Ovum, chief problems include slow speed transmission rates — only 300 bit/sec. in some countries — and network breakdowns. Then there are transborder data flow issues in which the postal telephone and telegraph authorities (PTTs) of individual countries wish to control the movement of information using their facilities to go across borders.

These issues, however, have largely disappeared for many U.S companies through the use of value-added networks (VANs) that provide complete EDI services throughout Europe, eliminating the need to build a network "piecemeal" using the services of individual PTTs.

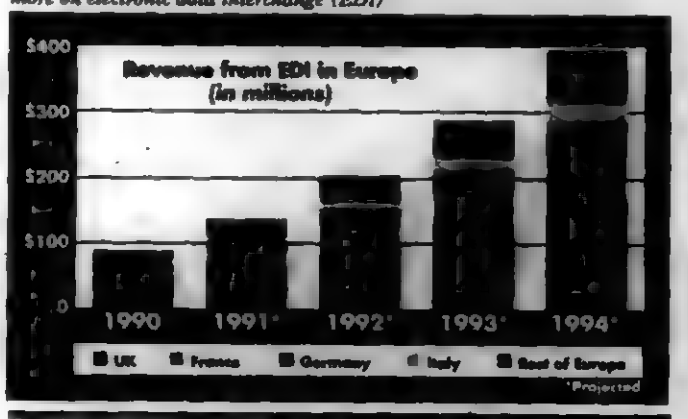
"The VANs know all the laws and regulations of the various countries and provide you with services that are legal within each country," Cafiero says. "This means that individual companies don't need to be telecommunications legal experts."

Instead, U.S. companies' primary focus on using EDI in Europe should remain on the actual business and trade issues, says Nicole Willenz, senior manager of the EDI consulting group at Price Waterhouse in Chicago. "The biggest challenge is to be able to understand the business practices of your foreign trading partners and come to some agreement about how they should be harmonized."

LaPlante is a free-lance writer based in Palo Alto.

Good connections

As Europe moves toward 1992 and beyond, business will count more and more on electronic data interchange (EDI)



Source: Ovum Ltd. CW Chart: Doreen St. John

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MANAGER'S JOURNAL

EXECUTIVE TRACK



David M. LeVan has been named senior vice president of corporate systems at **Consolidated Rail Corp. (Conrail)** in Philadelphia.

Heading the newly formed corporate systems department, LeVan is responsible for information services, administrative services and resource development. He reports to James A. Hagen, chairman, president and chief executive officer.

LeVan, 44, was previously vice president of corporate strategy at Conrail. He joined the 14-state rail network in 1978 in the finance department. He has held the positions of assistant controller of general accounting, assistant vice president of auditing, assistant vice president of treasury and vice president/treasurer.

LeVan holds a bachelor's degree in business administration from Gettysburg College in Gettysburg, Pa.

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Joseph R. Phelan, manager of corporate electronic data interchange programs at Ford Motor Co., has been appointed 1991 executive director of the **Automotive Industry Action Group (AIAG)** in Southfield, Mich.

The AIAG, with 700 member firms in the vehicle and component industries, develops technology and business practice standards to improve productivity and quality.

Phelan, a 25-year auto industry veteran, has held management positions in transportation and traffic, MIS and production planning control.

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Who's on the go?

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Technology succeeds at Failure

IS helps Failure Analysis discover why things go 'boom' in the night

BY MAURA J. HARRINGTON
CW STAFF

After the North Sea oil platform Piper Alpha exploded and burned off the coast of Scotland in July 1988, killing 167 people, Failure Analysis Associates, Inc. in Menlo Park, Calif., was called in to investigate the tragic accident — and to apply a lot of information technology in doing so.

Failure Analysis is a research firm that analyzes explosions of cars, trains, airplanes and helicopters, as well as engine failures, breakdowns in nuclear power plants and missile systems and other engineering disasters. The $60 million firm also tests consumer products for possible defects before they reach the market.

"Computers are used for about 90% of everything we do," says Roger McCarthy, chairman of Failure Analysis. For example, the company's 15 years of research into automobile accidents is stored in an object-oriented database containing more than 50 million automobile accident records. The company claims its database is the largest single collection of accident information in the U.S.

Dummy crash

When conducting an analysis of a car crash or when testing a car's durability by test-crashing it (which accounts for almost 50% of the company's business), the company uses specially designed computers attached to dummies and to the automobile. The computers measure everything going on during the test crash, from the impact of the dummy's body against the windshield to the fluid dynamics in and around the car at the time of the explosion.

After the analysis is completed, all the information is stored in the database, which includes animated graphics and video used for further study, says Malladi Subbaiah, senior vice president at Failure Analysis and head of the computer systems department.



Cindy Charles

Failure Analysis' *Subbaiah and McCarthy see leading-edge technology as vital to their business*

At Failure Analysis' 160-acre test and engineering center in Phoenix, engineers imitate an accident by reconstructing and blowing up the product or site. To record the accident or failure as accurately as possible, engineers use high-definition video and other high-technology equipment in the hope of finding the reason the usually bizarre or unexpected failure occurred.

Because Failure Analysis' work is so specialized, most software is developed in-house, as is some high-technology analysis equipment for certain uses. An internally developed, solar-powered monitoring unit was used to test the groundwater in a small Midwestern town located near a nuclear facility, for example.

"One of the things that distinguishes us from our competitors is that everything we study is backed up by scientific facts and figures," principal engineer Paul Johnston says.

Needle in a haystack

Failure Analysis used a scientific formula called finite element analysis to determine that a leak in a 22-ft wide Pacific Gas & Electric Co. pipe was the result of a crack.

While it may seem easy, Johnston says that looking for a crack in such a large underground pipe is like looking for a needle in a haystack.

"This type of work is perfect for computers . . . in fact, it couldn't be done without computing technology," Johnston says.

Founded in 1967 by five engineers with just $500 in capital, Failure Analysis went public in 1988 and reported revenue of almost $60 million in 1990. With no advertising budget, the company relies on its engineering expertise and word of mouth for all of its business.

While Failure Analysis' reputation

Continued on page 70

MIT report: IS potential remains unfulfilled

BY CLINTON WILDER
CW STAFF

The potential of information technology to transform businesses remains largely untapped, according to the findings of the six-year Management in the 1990s research program at the MIT Sloan School of Management.

The findings have been summarized in the book *The Corporation of the 1990s: Information Technology and Organizational Transformation*, published by New York-based Oxford University Press.

Edited by Michael S. Scott Morton, a professor at Sloan School, the book details the research carried out by MIT in conjunction with 12 sponsoring organizations.

The book concludes that to take full advantage of the business benefits of information systems, companies must undergo significant organizational change. The traditional ways of doing business "are very hard to discard, and it appears to be harder yet to learn new ones," Morton wrote in the book's introduction.

In presenting "the challenge of the 1990s," Morton said, there are "isolated examples of successful [IS] exploitation in particular functions or business units. However, on average, the expected benefits are not yet visible."

The steps necessary for successful transformation include aligning corporate and IS strategies, having a clear business vision, having a strong technology infrastructure and being organizationally flexible. Human resources management is a critical component because the changes that are essential to transformation are very threatening to many workers.

"The problem is knowing when to change to using new capabilities and when new capabilities should not be employed," Lester C. Thurow, dean at Sloan School, wrote in the book's foreword. "The problems are management problems and not hardware or software problems," he added.

CALENDAR

The Society for Information Management's (SIM) annual Institutional Member Conference will be held April 10-12 at the Westin La Paloma resort in Tucson, Ariz.

The theme of the conference is "Bridges to the Future — Theory and Practice." Speakers include Harvard Business School Professor F. Warren McFarlan, Naisbitt Group President John Elkins and Larry Ford and William Filip of IBM. Topics include business simplification, organization and the extended company.

For registration or information, contact SIM in Chicago at (312) 644-6610.

MARCH 10-16

LOMA Systems Forum and Exhibit. Orlando, Fla., March 10-13 — Contact: Susan Fowler, LOMA, Atlanta, Ga. (404) 984-3775.

Perspectives: Maximizing Profits through Information Technology. Amelia Island, Fla., March 10-13 — Contact: Lynda Rosenthal, *CIO*, Framingham, Mass. (508) 935-4213.

Platforms for Computing Forum. Tucson, Ariz., March 10-13 — Contact: Edventure Holding, Inc., New York, N.Y. (212) 758-3454.

National Automated Clearing House Association '91. San Francisco, March 10-13 — Contact: NACHA, Herndon, Va. (703) 742-9190.

Corporate Contingency Planning Seminar and Exhibition. Palm Springs, Calif., March 11-13 — Contact: Disaster Recovery Journal, St. Louis, Mo. (314) 846-1091.

Architecture and Implementation. Los Angeles, March 11-13 — Contact: Short Course Program Office, UCLA Extension, Los Angeles, Calif. (213) 825-3344.

Computers in Libraries '91 Conference and Exposition. Oakland, Calif., March 11-13 — Contact: Kim Devus, Meckler Co., Westport, Conn. (203) 226-6967.

ICCM: Interleaf's Users Conference. Anaheim, Calif., March 11-14 — Contact: Kathy Rezino, Interleaf, Waltham, Mass. (617) 290-0710.

Knowledgeworx User Group Metro New York Initial Meeting. New York, March 12 — Contact: Candy Zarr (212) 989-9629.

Conference and Exposition of Machine Perception Technology. San Jose, Calif., March 12-14 — Contact: Herb Greenbaum, Expocon Management Associates, Trumbull, Conn. (203) 374-1411.

Sensors Expo West. San Jose, Calif., March 12-14 — Contact: Susan Reuter, Expocon, Trumbull, Conn. (203) 374-1411.

User Alliance for Open Systems Conference. Dallas, March 12-14 — Contact: Steve Whitney, COS, McLean, Va. (703) 883-2216.

Opcom West. Palo Alto, Calif., March 12-15 — Contact: Soft Letter, Watertown, Mass. (617) 924-3944.

LAN Expo '91. Tokyo, March 13-15 — Contact: Marcom International, LAN Management Office, Tokyo, Japan (011) 81 3 403-8515.

Cebit. Hannover, Germany, March 13-20 — Contact: The German American Chamber of Commerce, Atlanta, Ga. (404) 264-1761.

Directions '91. San Jose, Calif., March 14 — Contact: International Data Corp., Framingham, Mass. (508) 879-6700.

Advanced Computer Law Institute. Washington, D.C., March 14-15 — Contact: Sherri Williams, Georgetown University Law Center, Washington, D.C. (202) 408-0990.

Computer Virus and Security Conference. New York, March 14-15 — Contact: IEEE, Washington, D.C. (202) 371-1013.

2021 AD: Visions of Society, Technology, Information and Communications. Phoenix, March 14-15 — Contact: National Engineering Consortium, Chicago, Ill. (312) 938-3500.

MARCH 17-23

Guide 79. Anaheim, Calif., March 17-22 — Contact: Guide Headquarters, Chicago, Ill. (312) 644-6610.

Conference on Multimedia and CD-ROM. San Jose, Calif., March 18-20 — Contact: Cahners Expositions Group, Customer Services, Stamford, Conn. (203) 964-8287.

Directions '91. Boston, March 19 — Contact: International Data Corp., Framingham, Mass. (508) 879-6700.

Making the Investment in Imaging. Marlboro, Mass., March 19 — Contact: Monica Palanzi, AIIM, Wakefield, Mass. (617) 245-0660.

Usenix Symposium. Atlanta, March 21-22 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

MARCH 24-30

SB/Expo '91. San Francisco, March 24-26 — Contact: Norm De Nardi Enterprises, Los Altos, Calif. (415) 941-8448.

Computers, Freedom and Privacy Conference. Burlingame, Calif., March 25-28 — Contact: CPSR, Palo Alto, Calif. (415) 322-3778.

Fiber Optics Conference. Leningrad, March 25-29 — Contact: Jennifer Katy, Information Gatekeepers, Boston, Mass. (617) 232-3111.

The Software Solution Show and Conference for Manufacturing and Distributing Businesses. Toronto, March 26-27 — Contact: Alwyn Mitchell, Software Matchmakers, Willowdale, Ont. (416) 756-3221.

Quick Response '91. Nashville, March 26-27 — Contact: Quick Response '91, Pittsburgh, Pa. (412) 963-8588.

MARCH 31 - APRIL 6

The Information Systems Security Association Conference. San Diego, April 1-5 — Contact: Richard Rueb, Irvine, Calif. (714) 854-2500.

Network Analysis Users Group Meeting. Vail, Colo., April 1-5 — Contact: Sandy Moretto, NAUG, Menlo Park, Calif. (415) 688-2700.

The Global Economy: Implications for Telecommunications Policy and Management. Los Angeles, April 4-6 — Contact: Matthew Berndt, Center for Telecommunications Management, Los Angeles, Calif. (213) 740-0980.

APRIL 7-13

Corporate IRT/Financial SIG Conference. Chicago, April 7-10 — Contact: UNC Business School at Chapel Hill, The University of North Carolina, Chapel Hill, N.C. (919) 962-3032.

Focus on Operations XI. Las Vegas, April 7-11 — Contact: Computer Operations Management, Orange, Calif. (714) 997-7966.

IEEE International Conference on Robotics and Automation. Sacramento, Calif., April 7-12 — Contact: Robotics and Automation, Boca Raton, Fla. (407) 483-3037.

Service Trends Conference. San Francisco, April 8-9 — Contact: Lori Larsen, Ledgeway/Datagent, Lexington, Mass. (617) 863-8500.

Information Security Managers Symposium. Chicago, April 8-10 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Loop Implementation: The Next Steps. Monterey, Calif., April 8-10 — Contact: Electronicast, San Mateo, Calif. (415) 572-1800.

Turning Audit Costs into Profits: Superstrategies for the Internal Audit Department of the 1990s. San Francisco, April 8-10 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

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COMMENTARY

Daniel Borgen and Michael Silverman

The art of managing expectations





"Let me tell you what I've come to expect from systems development projects: They take twice as long as promised, cost twice as much as anticipated and provide half the functionality they were designed for in the first place."

That is how one jaded end user described his experience with the project life cycle. Upon consideration, it raised some basic questions. Is this guy a chronic whiner who got picked on a lot in elementary school? Maybe. Is he surrounded by room-temperature-IQ technical incompetents who bring new meaning to the term "artificial intelligence"? Perhaps.

Regardless of his individual quirks, however, the software developers in this case forgot to adequately address a key component of successful system design and implementation: expectation management.

As system architects, we can properly define functional requirements, select the most appropriate technology, write elegant software and install an objectively viable system. But if user expectations aren't managed effectively, the whole project may still be met with an abundance of apathy, frustration and expletives.

Some statements appear simple on paper, but they are complex when put into motion. Look at $E=mc^2$. Look at "safe sex."

Expectation management sounds simple, too. It's a basic three-part process comprised of determining what the users expect, analyzing which expectations can't be met and managing the discrepancies to minimize negative results.

What could possibly go wrong? Everything.

The process starts in the needs assessment phase. This is an ideal time to establish a communicative rapport with the system's end users:

- Determine levels of computer literacy.
- Define acceptable degrees of the impact that the system will have on their existing work flow and culture.
- Differentiate the desirable from the mandatory.
- Locate the most convenient place to go for beer and pizza together.

Successful development efforts require project champions. Identify and nurture two or three "key users." These are the people that the rest of the staff comes to for help and whose opinions carry a lot of weight with their co-workers. Get these people on your side — or better yet, on your development team — early in the game. They are your advocates for buy-in, compromise and reason.

Once the foundation has been laid, the users' "expected deliverables" can be divided into three categories: included within the scope of the effort, available as a future enhancement or designed out.

Features such as an on-line Help subsystem may not be provided with the initial system, but the desired interface can be designed into the on-line software for later addition with minimal impact.

Other features may be completely excluded because of a variety of factors such as the hardware architecture, operating system and physical database design.

Schedule a set time and date on a recurring basis to keep key users up-to-date on project status and issues. These meetings provide an ideal forum to promote your cause. Plan carefully for them.

Prepare an outline form of tasks performed, tasks in progress and plans for the next period. Most importantly, maintain and review an "issues/resolution" report that highlights areas of concern, related dates, responsible parties and resolutions. Anticipate, document and put issues to rest as early as possible.

Finally, manage expectations about the status meetings. You are running the show. Create an atmosphere in which your attendees expect a brief, directed, purposeful session where they won't nod off into their coffee cups.

Beware of the packaged software installation. Typically, vended systems offer limited customization options and may handle particular functions in conflict with the way end users are used to performing these tasks.

Let users know about this. If possible, arrange for the users to attend a hands-on demonstration of alternative packaged software options before a contractual commitment is made. But remember not to let them test-drive a Mercedes if their IS budget says Yugo.

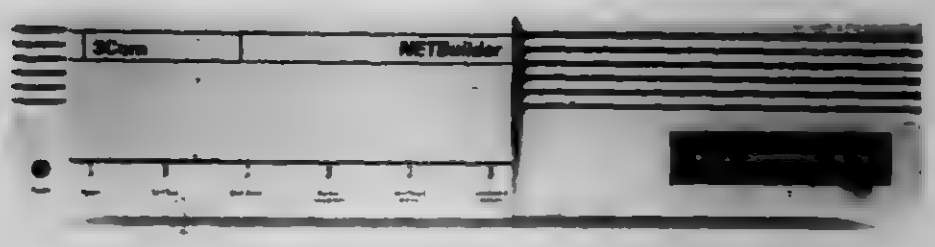
Managing expectations takes time and practice, and nobody's perfect: Moses told his people to wait for 40 days while he scaled Mt. Sinai to bring back God's commandments. But he wasn't clear in his directions. His followers starting counting the days right away instead of waiting until the sun went down, as Moses had intended. They gave up when he didn't come back as expected, made a golden calf and got into a lot of trouble.

In the final analysis, though, Moses did pretty well. To this day, everyone credits him with doing a great job on that commandment project. Maybe they were expecting fewer than 10 of them.

Borgen and Silverman are managers at the information technology consulting practice of Deloitte & Touche in Seattle.

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Managing IS in Hawaii is no vacation

Distance and time zone differences create challenges beyond what mainland IS shops face

BY JEAN S. BOZMAN
CW STAFF



HONOLULU — If you think you have trouble managing information systems on the mainland, how about trying to run a computer shop in the middle of the Pacific Ocean?

While many U.S. mainlanders find themselves pining for a Hawaiian vacation at this time of year, they may also have misguided notions about the work ethic of people who happen to live in Hawaii. "The atmosphere is more relaxed than it is on the mainland," said Gary Hakoda, senior vice president of IS at Central Pacific Bank in Honolulu. "But we don't run around wearing hula skirts and living in grass shacks."

IS managers who live here face the same challenges as mainland IS executives: hardware maintenance, software upgrades and how to have uninterrupted operations.

There are also disadvantages: Technical publications arrive two weeks late, and IS managers can plan on attending few conferences because of the expense of traveling to mainland cities.

"I think we are at a disadvantage," said Sadie Tanoura, director of IS at the Honolulu Department of Education. "If we want to attend large seminars held on the mainland and view the latest products, we have to spend a lot more time and money to get there."

Adding staff is also difficult. Hawaii's cost of living is among the highest in the nation, while pay is slightly lower than average.

Hakoda said many employers believe they can pay less because Hawaii's inherent beauty is an extra benefit. With an unemployment rate of about 3% — roughly half the national average — the available employee pool is smaller, too. Most IS jobs are centered in Honolulu because hotels and banks on the outer islands of Maui, Kauai and the big island of Hawaii tend to use smaller computer systems or terminals tied to computers on Oahu.

Distance and time zones are the main complaints of the Hawaiian IS community. "If you have an end-of-day problem here, you end up having to beep somebody on the mainland," said David Enersen, director of information services at Liberty House, a retail subsidiary of Chicago-based JMB Realty Co. "Availability of parts is always a concern. As a vendor, you've got to have the parts to back you up or be able to get them in quick, or you're dead."

However, technology is giving Hawaiians an assist when help is not available nearby. Answers are often just a telephone call away. "It doesn't really matter where you are in the world anymore, as long as you can get hold of someone by telephone, even if you have to get them out of bed," said Robert Lurito, vice president of MIS at DFS Hawaii, which operates duty-free shops. Time zones or no, software vendors find they must respond to user questions, even if it is 2 a.m. on the East Coast.



Dana Edmunds

Liberty House's Enersen *finds distance and time zones to be a hindrance: 'If you have an end-of-the-day problem here, you end up having to beep somebody on the mainland'*

Product news gets around quickly. The scale of the island of Oahu — 598 square miles — makes Hawaii's IS community a very close one. "If a vendor comes out here and they do a good job for one company, that spreads throughout the whole island," Lurito said. "And if they do something wrong, that also gets around." Monthly Data Processing Management Association chapter meetings help keep Oahu's 40 key sites together.

There are a handful of dominant computer suppliers in Hawaii — IBM and Digital Equipment Corp. are chief among them. Users said these two firms have prevailed against most competitors largely because of their ability to provide onsite support far from their warehouses on the mainland.

"We stick to the major vendors," said Don Fujimoto, MIS director at Alexander & Baldwin, which operates resorts and shopping centers. IBM and DEC are the dominant players, Fujimoto said. "If we use smaller vendors than that, we frequently have problems."

However, recent years have seen stepped-up competition from Hewlett-Packard Co. and Wang Laboratories, Inc. Wang used its Honolulu sales office as a stepping-stone to the Pacific Rim countries until it switched to an Asian sales office for Pacific sales.

State-of-the-art computers are outnumbered by aging IBM 4300s and DEC VAX 11/785s, users said. Support difficulties and slow growth in IS operations often limit users' hardware decisions.

Still, there are several IBM 3090 shops, including Hawaiian Telephone; the Hawaii Medical Service Association, which handles medical claims; and the Queens Medical Center, a large hospital complex. Large DEC installations include Hawaii's military complexes, such as the U.S. Naval Station at Pearl Harbor.

While mainframe sales may be stable, sales of personal computers and local-area networks are clearly taking off, just as they are elsewhere. Looking to the future, many users said they are planning to install distributed computer systems.

National and global networks are also growing because Hawaii's numerous satellite ground stations support links with remote computers. Honolulu's Central Pacific Bank recently linked up with the national Plus/Cirrus automated teller machine network.

It is the small-town aspects of computing in Hawaii that impress outsiders. "I think the IS community is more tight-knit here than in most other U.S. cities," Hakoda said. "People know who the other people are, what their reputations are."

Lurito could not agree more: "A vendor doesn't really have to advertise if he sells his product right the first time."

West Coast correspondent Jim Nash contributed to this report.

Hawaiian tropics

Hawaii's tropical climate has traditionally been a benefit great enough to allow island salaries for data processing professionals to remain lower than those on the mainland. However, a recent shortage of highly skilled programmers and telecommunications experts has driven salaries higher, said Gary Hakoda, senior vice president of information services at the Central Pacific Bank in Honolulu.

"People used to be willing to make the sacrifice in salary for a nice lifestyle here," he said. "But we recently used a headhunter to recruit a telecommunications specialist from California." The salary for the new hire was competitive with California rates, Hakoda said, and the bank also paid a finders' fee. "University of Hawaii graduates tend to look for jobs on the mainland," said Steve Carpenter, president of Hawaii operations at Dallas-based Affiliated Computer Systems, Inc. "You can attract people to come here from the mainland, but they must make a conscious decision to change their lifestyle, mostly because of the high cost of living here."

JEAN S. BOZMAN

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MIT professor earns ACM award

NEW YORK — An MIT professor is the recipient of the 1990 A. M. Turing Award from the Association for Computing Machinery (ACM).

Fernando J. Corbato, professor of computer science and engineering at Cambridge, Mass.-based MIT, was honored for pioneering the development of two early operating systems he worked on during the 1960s: Compatible Time-Sharing System and Multics.

The Turing Award, first presented in 1966, is ACM's highest honor. Corbato will receive the award March 5 at the ACM Computer Science Conference in San Antonio.

Three other awards will also be presented. Retired IBM consultant and former ACM President Walter M. Carlson will receive the Distinguished Service Award.

Gerald J. Sussman, professor of electrical engineering at MIT, will receive the Karl V. Karlstrom Award for contributions to the teaching of computer science. Sussman has taught at MIT since 1973. The ACM Outstanding Contribution Award will go to William B. Poucher, professor of computer science at Baylor University in Waco, Texas. Poucher will be honored for leading the ACM Scholastic Programming Contest.

CLIPS



Tim Lamb

Summaries from leading scientific and management journals

"Reliability of function points measurement: A field experiment"

By Chris F. Kemerer

MIT Center for Information Systems Research
Working paper

■ This statistically rich analysis of the popular function point metric for analyzing software complexity concludes that function points are more reliable than many people think.

Major concerns about the function point approach have centered around its validity as a measure of complexity when measured across different projects and by different people. A field experiment using actual software development projects found that function point counts done by two different people on the same project differed by only about 10%, while the correlation of the metric across two different development methods was as high as 0.95.

However, the study noted, the data collection effort is time-consuming and may account for the low use of function point analyses on software development projects. It recommends automated tools to speed data collection. This will make function points useful to a wider audience. — *Paul Gillin*

"The CIO/GIO as catalyst and facilitator"

By Jerry Kanter and Richard Kesner

Babson College Center for Information Management Studies
Working paper

■ The role of today's chief information officers is being redefined by the trend toward global business operations, leading to proposals for the job title of global information officer, or GIO. But the new title is less important than the substantive changes in management style that are needed to transform a traditional information systems executive into a global manager.

The global information officer may maintain a core group at headquarters to run the voice/data network, monitor standards compliance and scan the technology horizons for new opportunities, but the bulk of the systems development work will be done in the field. Further, the global information officer is not likely to have direct control over budgets and personnel in far-flung operating units.

The global information officer will have to become a respected consultant, guiding the IS executives in each of the host countries toward the goal of a global "information utility." Along the way, the global information officer will need to master the culture of each host country in which corporate IS operations reside. — *Mitch Betts*

"The Impact of CASE on software development"

By Eileen Sousa

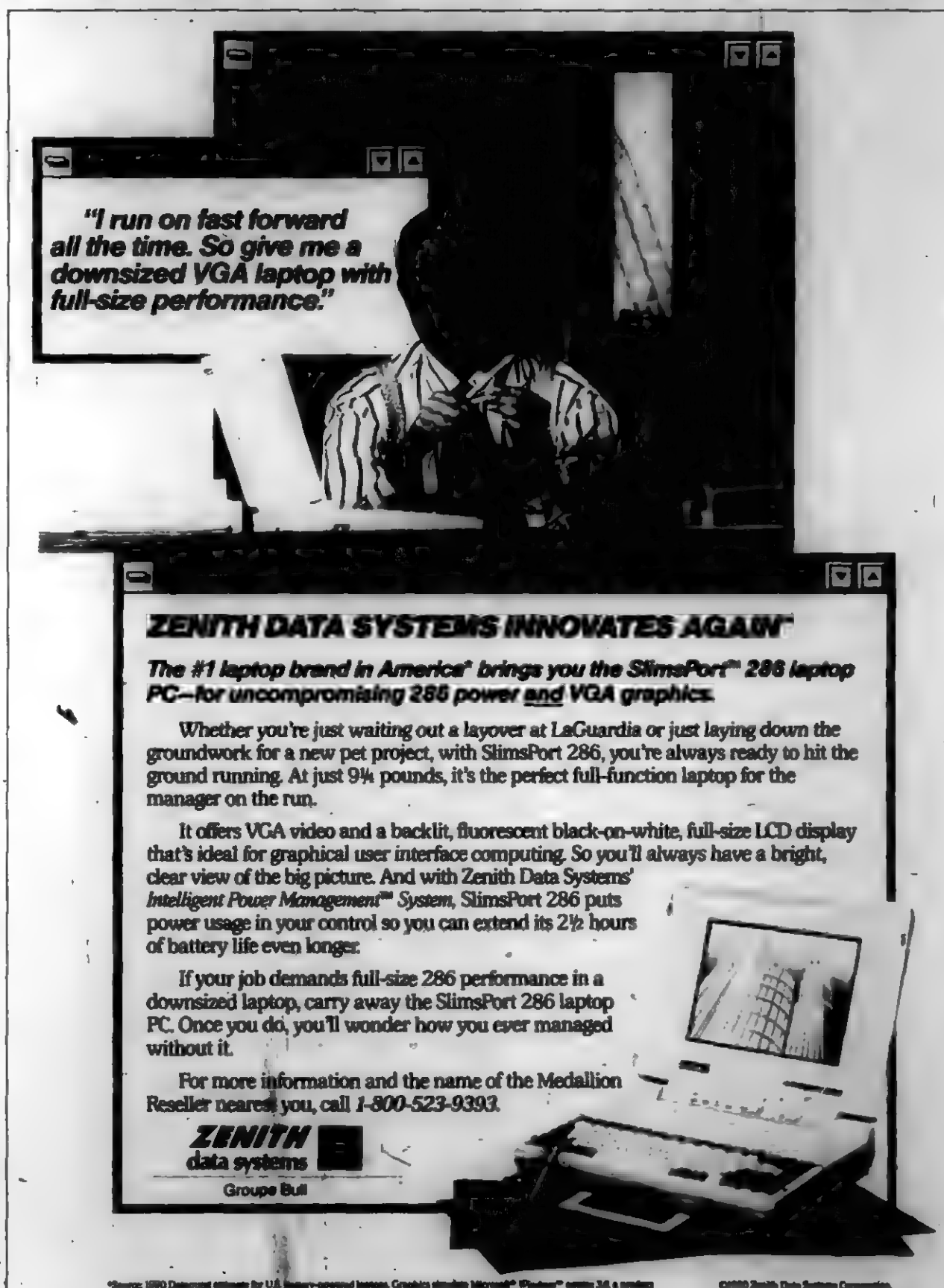
Journal of Information Systems Management
Winter 1991

■ Computer-aided software engineering (CASE) is changing traditional methods of systems development through automation. Traditional software development methodology focused on tools that addressed the back end of the life cycle, including debugging aids and report generators. Later, fourth-generation languages, screen painters and code generators were developed, and in the past decade, front-end tools such as joint application developers, expert systems, personal workstations and local-area networks have appeared.

CASE has emerged to provide automation to the entire life cycle, with development emphasis on front-end tools.

The CASE life cycle has six phases:

- The business software planning phase. Incorporates the company's strategic plans into the software development life cycle, ensuring that development efforts advance business goals.
- The architecture definition phase. Partitions the enterprise model into discrete business areas for future analysis, determining the long- and short-term environmental needs required to support planned software development.
- The business-area analysis phase. Gives birth to specifications for the business area, documenting the accepted solution from the business perspective.
- The design phase. Transforms the models developed during the business-area analysis into design specifications.
- The development phase. Produces working program products and trained [illegible].
- The operational management phase. Supports the system or release in a production environment. — *Jodie Naze*



MANAGEMENT BRIEFS

Kaiser takes on new IS director

Philip Newbold has been named to succeed **Neil Bell** as director of information services at the **Kaiser Permanente Medical Care Program's** Northern California region, which is based in Walnut Creek, Calif.

Bell retired in January after 22 years at Kaiser, but Newbold is not expected to start until March, the company said last week.

Newbold, 46, was most recently vice president and general manager of business support systems at Bankamerica Corp., headquartered in San Francisco. A manager in the area of financial applications development, Newbold joined Bankamerica in 1986.

Kaiser North operates 15 hospitals and 15 additional health clinics throughout Northern California.

The prepaid health maintenance organization serves about 2½ million subscribers.

The Society for Information Management (SIM) is beginning to review abstracts for its 1991 International Awards Competition for academic papers in information systems.

Authors of abstracts chosen by the selection committee will be asked to submit papers by May 17. Three papers will be chosen for awards, which will be presented at the 1991 SIM annual conference Oct. 6-10 in Chicago.

Gary D. Bell, director of the U.S. Internal Revenue Service's (IRS) Internal Audit Division, has been named Internal Auditor of the Year by the Association of Government Accountants.

Bell directs the development of strategies to assist IRS management in establishing financial systems, providing independent reviews of systems modernization projects and ensuring internal audit systems modernization. He joined the IRS in 1973 and was appointed to his current position in 1989.

Failure Analysis

CONTINUED FROM PAGE 63

for accuracy in its research has spread throughout the years, it was the advent of the personal computer that really gave the company the boost it needed to expand, McCarthy says.

"When I first got to this company in 1978, there wasn't a single computer here," he says. "About half the staff used computers for scientific work back then, but they used Stanford University's IBM 3081 mainframe for everything."

It wasn't until 1982 that Failure Analysis purchased its first computer, a Digital Equipment Corp. VAX 11/750 with 16M bytes of memory, McCarthy says.

Now the company has more than one computer per employee and has invested almost $11 million in hardware and software. Failure Analysis has more than 500 employees throughout its Menlo Park headquarters, a test site in Phoenix and several offices in the U.S. and abroad.

TO RECORD THE accident or failure as accurately as possible, engineers use high-definition video and other high-technology equipment.

Desktop systems installed at headquarters include hundreds of Intel Corp. 80386- and I486-based IBM Personal Computers and compatibles, Apple Computer, Inc. Macintosh computers, Hewlett-Packard Co. workstations and Sun Microsystems, Inc. Sparcstations.

There is also a Vaxcluster with five VAX systems, an IBM 3083 mainframe and a total of 64G bytes of hard-disk storage. Much of the memory on the IBM 3083, Subbaiah says, is used as storage space for Failure Analysis' clients using the company's newest service, a customized computer information system.

This application allows Failure Analysis to act as a specialized IS management company. Failure Analysis takes a client's data and organizes it with cross-references for every piece of data so the client can find virtually anything with a one-word search, Subbaiah says.

"It is not uncommon for our system to have 100 clients accessing their customized systems that are stored in our IBM mainframe at any given time," McCarthy says. Clients who subscribe to the special program can also access information on the company's internal databases, which include 15 years of data in some cases.

Because Failure Analysis depends on computers for virtually everything it does, it is perhaps more willing than most companies to rely solely on computers to get the job done. That way of thinking has led to some pretty ambitious goals for IS. McCarthy says that within five years, he would like to eliminate paper altogether.

"We're toying with the idea of having a high-end workstation — possibly reduced instruction set computing-based — on every employee's desk, connected to a centralized network with shared data resources," he says. "Each of the networks in our offices would then be connected to an overseeing mainframe center.

"Our philosophy here," McCarthy adds, "is that if it's on paper, it's lost."

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Pricing and maintenance	7.5	5.7	6.7

*Based on results of Computerworld Survey published July 16, 1990

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"The Scorecard system (a custom-ready application delivered with Executive Edge) was something ideal for our needs. We wanted to install a customized prototype of an EIS that we could deliver to our managers quickly."

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Let's make a deal

Better bargaining skills help IS managers traverse the tricky thicket of user and executive demands

BY ALAN RADDING

When Bill Donner first came to Key Tronic Corp. in Spokane, Wash., he soon realized that information systems project priorities were determined by a combination of politics and the "squeaky wheel syndrome."

"It was a question of who you reported to," says Donner, vice president of IS. "When MIS reported to finance, financial projects got done first. What was left went to whoever screamed the loudest."

Indeed, in many organizations today, squeaky wheels and political pets still get much of the "grease." But as IS becomes more critical to strategic missions and budgets tighten, some managers and consultants are questioning whether there are better ways of setting IS priorities. Many are also honing negotiation and bargaining skills to better navigate the tricky thicket of user, executive and steering committees.

"It's a problem of allocating scarce resources," explains Sid Diamond, vice president of worldwide information services at Black & Decker, Inc. in Towson, Md.

Some IS chiefs survive by juggling vocal users or setting firm priorities. At Key Tronic, for instance, Donner invented a three-phase system (see story page 73) for establishing priorities. Diamond categorizes each request as discretionary, mandatory maintenance or mission-critical, as defined by top management.

Along with the standbys of partnering with business executives, more IS executives are learning new approaches. A few rules include the following:

Rule 1: Negotiate from a position of strength. Effective negotiation builds on IS credibility and respect, users and consultants say.

If IS is considered an obstacle to be overcome, the IS manager has no negotiating clout. True, he may win battles through force, but he'll lose the war and never be able to achieve real partnering.

"Unless we enable [users] to be successful, they will ignore us, go around us — or get rid of us," explains Jerry Weinstein, director of corporate MIS at Lyndhurst, N.J.-based General Instrument Corp.

Conversely, managers say, successful projects can do wonders for IS credibility.

For example, John Tanner, director of IS at Penrose-St. Francis Healthcare Systems in Colorado Springs, used money from his own budget to buy a laser disc storage system for his firm's business office. "What we save just from microfiche conversion will pay for it," he says. "And it will help [users] understand that we're working for their good."

IS managers agree that having a reservoir of goodwill is valuable when working on politically tricky cross-functional or multidepartmental systems.

Rule 2: Master the business. For many IS managers, this is familiar but crucial advice. Effectiveness in negotiation is closely tied to understanding the business' goals and language, advises John Nevison, chairman of Oak Associates in Concord, Mass., who teaches negotiation at the Boston University Center for Project Management.

Despite endless warnings to steer clear of technical jargon, Nevison says, many "IS managers still talk about millions of instructions per second and CPU cycles rather than measurable business performance."

Some managers, however, have mastered the business-oriented approach. "We no longer focus on [return on investment]," Donner says. "That was good for the 1980s, not the 1990s. Now we talk about corporate objectives and missions."

Frank Scafidi, director of patient management and financial systems at Johns Hopkins Hospital in Baltimore, Md., not only participates in corporate strategy sessions but also brings his project managers up to speed so that they are informed when they deal with users.

"I read all the strategic plans and disseminate the nonconfidential stuff to the staff," he says. IS supervisors and the managers who negotiate project priorities can then raise the discussion beyond politics.

At Penrose-St. Francis, Tanner's knowledge of the business paid off when he negotiated with all the clinical departments over implementation of a $7 million integrated patient care system.

Tanner found himself talking about technology in terms of medical risk management through better documentation

Continued on page 72



Robert Burns

Key Tronic's Donner: *In many organizations, priority for IS service goes to the squeakiest wheel. His solution: an executive committee to review projects*

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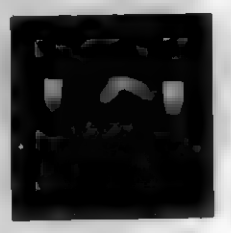
Radding is a free-lance writer in Newton, Mass.

Continued from page 71

and health care cost containment.

"Staying on top of the business aspects is a full-time job for me. I have to learn their business and spend a lot of time listening and talking. It's gotten to the point where I depend on managers below me to do the IS job," Tanner says.

Rule 3: Develop negotiation skills. Armed with goodwill and business smarts, IS managers are in a better position to negotiate.



Understanding the nature of negotiating is an important start, says Bud Mathaisel, managing director at Ernst & Young Center for Information Technology and Strategy in Boston. "People may misunderstand negotiation," he says. "It's not horse-trading. It really means using diplomacy to be convincing."

Unlike negotiations with vendors, Mathaisel adds, you "can't walk away from your users."

Howard Miller, assistant vice president of administrative computing at Boston University, says negotiation gives him more clout than playing the political power game. By not setting priorities, Miller says, users do what he wants while believing they are doing what they want.

Once negotiations begin, experienced managers say, it is often wiser to act more like an educator than a hard bargainer. "I approach priority-setting as a colleague rather than as a tough business negotiator," says Bob Hodge, chief information officer at Taylor University in Upland, Ind. "I use it as an opportunity to teach them, to bring them to the point where they see the larger view. It sounds idealistic, but it works."

"People still don't understand the IS process," adds Richard Smith, director of information services for Snohomish County in Everett, Wash. "They think things happen magically. You have to take the time to help people understand rather than getting frustrated with them."

The key to any negotiation, Nevison says, is avoiding a situation in which there is a winner and a loser. Instead, reach an agreement everybody can live with. "A good agreement is better than no agreement for all parties involved," he says, even if it is not the ideal agreement from an IS standpoint.

Rule 4: Work toward partnership. Some consultants and academics, however, note that negotiation is just the first step. They say IS must also develop partnership-building skills.

"Negotiation suggests competing interests. The real question is how IS can develop a true partnership from the beginning," says Lynda Applegate, a professor at Harvard Business School in Cambridge, Mass.

Unfortunately, negotiation and partnering skills don't come naturally to most managers, notes Leslie Ball, a principal at Index Group, Inc. in Cambridge, Mass.

To illustrate, Ball cites an exercise in which managers are asked to draw pictures of their concept of the IS/business team. Typically, he says, the pictures show a bus going off a cliff or two separate stars in the sky. "The pictures clearly show these people are not working together."

Subsequent exercises focus on helping both managers see their shared stake in the success of the larger enterprise.

Rule 5: When all else fails, play politics. When negotiation and partnering aren't possible, IS must play politics. "We've done dumb things that would bear no fruit because it was politically smart," Key Tronic's Donner says.

However, he adds, once the credibility of IS is established, you are less subject to raw political pressure. "Once you are credible, you are freer to communicate with the business managers," Donner says.

However, Bell warns, there will always be some political pressure in even the best negotiations. Since you can't eliminate it completely, expose it. "Make people realize that the politics are there," he says. "Then, try to take the personalities out of the process. Focus on the issue, not on the person." •

Silver tongue

Your chances of becoming an effective negotiator are best if you follow these steps, according to John Nevison, chairman of Oak Associates in Concord, Mass., who teaches negotiation at the Boston University Center for Project Management.

- Do your homework so you can talk in specifics about cost, payback and business goals.
- Present your case in terms of business, not technology, and make an effort to see the user's side of the story.
- Work toward an outcome that is spelled out concretely and to which all parties are committed.
- When the negotiations are finished, make sure you're in a position to negotiate another agreement. In other words, don't burn your bridges.

ALAN RADDING

Tips on making trustworthy deals

Celebrity negotiator Bob Woolf advises would-be wheelers and dealers

No one would accuse this Woolf of wearing sheep's clothing. Bob Woolf, sports and entertainment attorney and professional negotiator for the likes of Larry Bird and the New Kids on the Block, can play but says the way to succeed in negotiations is to be honest and realize that a negotiation is not a conflict.

Woolf, a practicing lawyer for 38 years and a celebrity in his own right, has negotiated with such infamous deal makers as Donald Trump, ABC News President Roone Arledge and owners of major professional sports teams, who have made Woolf's clients among the highest paid in their fields. In all, Woolf has negotiated more than 2,000 contracts for professional athletes alone.

Last fall, Woolf's book, Friendly Persuasion: My Life as a Negotiator, ***was published by G. P. Putnam's Sons of New York. He recently spoke from his Hollandale, Fla., office with*** Computerworld ***Senior Writer Alan J. Ryan on proven techniques for effective negotiation.***

Q: What are the mistakes that inexperienced negotiators commonly make?

A: Most of them start off thinking it has to be a fight. The important thing is being prepared and understanding what you are saying and making sure it is sound and reasonable. If it is outlandish, you don't deserve to have the agreement.

Do you apply different principles to different types of negotiations?

I've discovered that a negotiation is a negotiation no matter what it is — no matter what the stakes are. The same basic principles are used.

Your book has 101 tactics, techniques and strategies for negotiating — what are your personal favorites?

Let them make the first offer, try to get as much information as possible and let them make the first suggestions. If you come out with yours right away, you've already tipped your hand.

I would say the most important tip is, "Don't split the difference." Every negotiation always comes to, "You're here, I'm there; let's meet in the middle." I always say, "Gee, I can't do that." Why? Because I already have them meeting me in the middle. So, the worst I'm going to get is meeting with them in the middle.

If they say, "You're asking $100,000, I'm saying $80,000; let's meet in the middle," I'll say, "I can't do that, but make it $94,000." They might say, $92,000, and I've made $2,000.

What about dealing with internal clients who constantly ask for more than you can give them?

Be honest and decent and forthright, and explain, "This is as far as we can go within our structure." But try to make the other person feel special and try to be sympathetic to the other person's problem. I'll say, "Tell me your problems, and I'll see if I can help." Now, all of a sudden, we are partners.



Nancy Hilliard

Bob Woolf: *"Trust is very important. If you develop a trust, negotiation is like nothing . . . Don't violate it'*

Do you find that companies take the time to train their employees on how to negotiate?

It is amazing how corporations will let anybody go out and negotiate, just assuming they know how to negotiate.

Some people are just not temperamentally prepared to negotiate properly.

When making a deal with someone powerful or a superior, should the negotiator try to be assertive?

A lot of people say, "I am dealing with a CEO, so I had better be rough on him to show him where he stands." But don't take that attitude.

Take the attitude that you want to go forward. "Where can we find a common ground so that you are satisfied and I am satisfied? I am not trying to beat you. I am not trying to win over you. I am not trying to show you that I am smarter than you are and all that. We are just trying to reach something amicably."

Is language important in negotiation?

Everything, in the way it is expressed, is important. I hate the word "demand." You can say the same thing and get a wonderful response by saying, "These are my suggestions. Could you live with this?" The response will be kindlier.

Are there any ways you can help move the balance of a negotiation in your favor?

You can give them one reasonable doubt about why they should be going in a different direction, and you have a better chance of making your own agreement.

What if people on the other side of the negotiation turn nasty?

They will say things that are negative in order to lower expectations. They don't really believe it, but they will say it because it has a psychological effect. You have to counter with what is factual and what isn't.

What is the most important feeling to get out of a negotiation?

Trust is very important. If you develop a trust; negotiation is like nothing.

I was in Egypt, and there was a fellow out there at the pyramids who was obviously an Egyptian. He was running around and calling to everyone, "Howdy, pardner," wearing a cowboy hat and pretending to be a cowboy. He had me step aside, opened up his coat, and he had about 44 watches up and down his arm! And he says, "Hey, pardner, you can trust me. You can buy my watch because I'm a fellow American." I say, "No kidding! Where are you from?" He answers, "I'm from Houston, Dallas!"

Trust is very important — don't violate it. •

How one IS manager KO'd politics

BY ALAN RADDING

After five years, Bill Donner, vice president of information systems at Key Tronic Corp. in Spokane, Wash., says he has devised a surefire, politics-busting process for negotiating project priorities.

As things now stand, squeaky wheels must justify what they want in terms of corporate objectives and then find someone to put his money where his mouth is. Donner did the work in steps:

• **Phase 1:** First, he established a steering committee. At this stage, the committee lacked real involvement and simply rubber-stamped IS decisions.

"It was a one-way street. They didn't meet often. They didn't question us about objectives. We'd just tell them what we were doing," Donner recalls.

Behind the scenes, it was politics as usual.

• **Phase 2:** The next step was to increase involvement by the steering committee. Donner set up a business analyst/advocate to correspond with each business function. Discussion shifted to cost/benefits, but Donner was still unhappy with this arrangement.

"Responsibility got relegated too low. The analysts knew their area, but they lacked corporate insight. They didn't have a sense of the corporate direction," Donner says. "Without reference to corporate goals, the strongest business function analysts got what they wanted."

For example, cost/benefit analyses were reviewed in a vacuum. Eventually, analysts became just another squeaky wheel.

• **Phase 3:** Next, the steering committee was replaced by an executive committee and vice president willing to fund a portion of the proposed project. Now each project is analyzed and justified not only in terms of return on investment but also according to how it helps the particular department fulfill its role in the overall corporate strategy.

The executive steering committee "gets together, looks at goals and sees dependencies between strategies," Donner explains. The result "is a dialogue — not screaming or a squeaky wheel," out of which comes the IS priorities.

The new executive steering committee takes the political heat off Donner and the IS department. When painful tradeoffs in the timing, scope or resources of a project have to be made, the executive committee makes the decision based on the corporate strategy.

"It's improved my customer relationships," Donner says. •

Never say never

Experienced negotiators say the touchiest problem in the process is when an IS manager has to reject a user's request. "Our challenge is to never say no to a client," says Ronald Cybyske, senior vice president of development and operations at Banc One Services Corp. in Columbus, Ohio. However, when Cybyske does have to say no, "we do it very tactfully."

Ideally, Cybyske's managers get other users to make it apparent to the client that the request isn't feasible. "We'll play requests off other clients. We'll ask if this [request] would also make sense for them. If they say no, then we'll ask the client if he'll fund it himself," he says. The client invariably backs off.

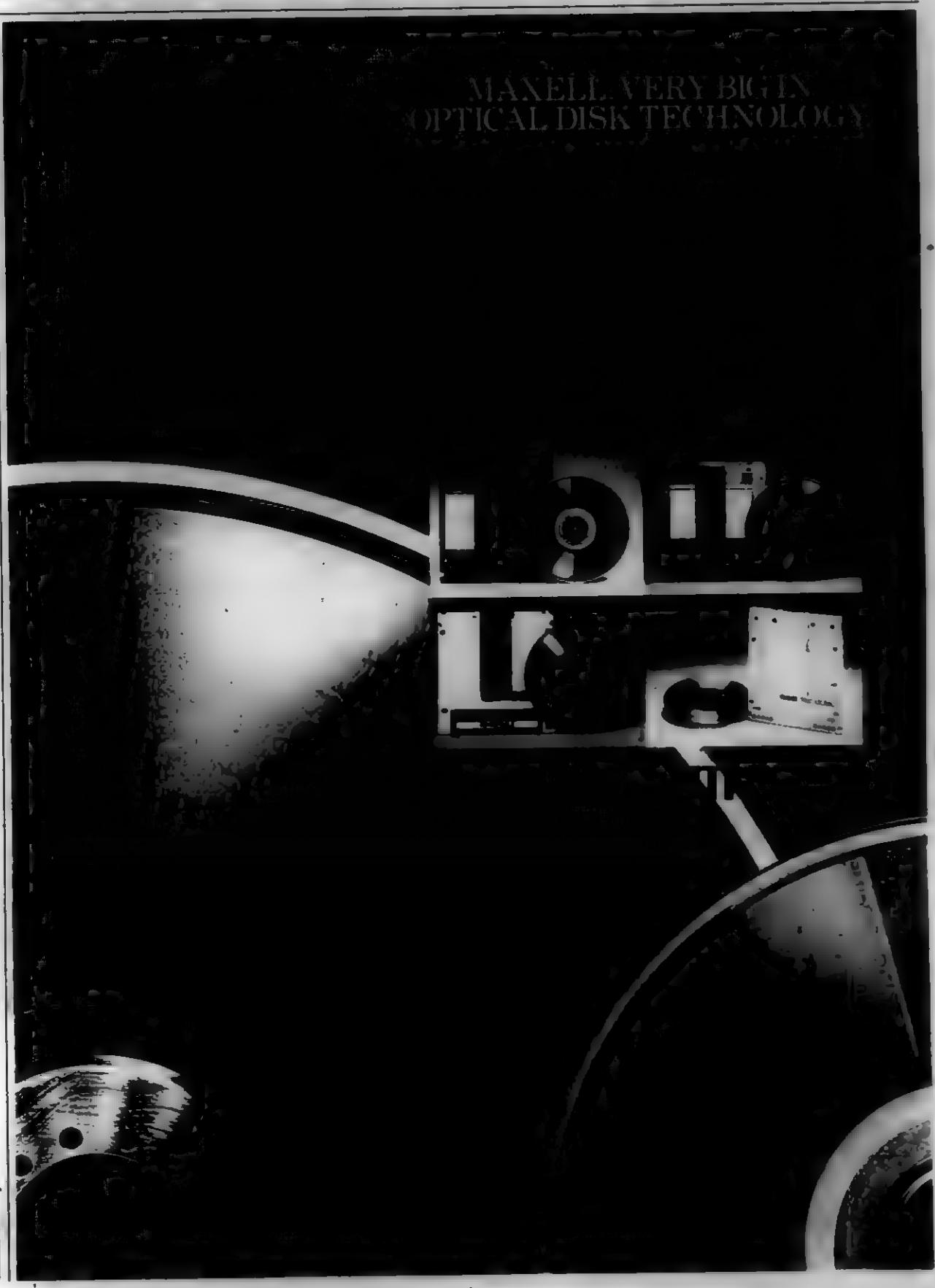
Howard Miller, assistant vice president of administrative computing at Boston University, never says no. "It's not my call to tell them they can't have it. I'll go to inordinate lengths to discourage them, but I'll do anything if they'll pay for it."

John Parady, executive vice president of technical services at the Pacific Stock Exchange in Los Angeles, shoots down requests by explaining why in terms the user can understand: cost, payback and business objectives.

The best strategy is to avoid getting into a situation in which the IS manager has to square off alone against a client over a project. Sid Diamond, vice president of worldwide information services at Black & Decker, Inc. in Towson, Md., finds users whose projects have been put on the back burner. "You want to work in concert with other users to try to avoid a confrontation," Diamond says.

Negotiation — not confrontation — is the key, says Dale Fieldcamp, director of corporate information services at Caterpillar, Inc. in Peoria, Ill. "You want discussions so that it becomes self-evident that the project isn't right." Then IS never has to say no.

ALAN RADDING





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The Newsweekly of Information Systems Management

Evaluate, don't procrastinate

Seven steps to sizing up user application requests

BY LARRY M. SINGER

There is no quicker way to bog down the workings of the information systems department than to constantly postpone small application projects. Most major backlogs begin with minor change requests from users IS puts off or ignores. Routinely shelving user requests guarantees frustrated users, poor business applications, obsolete systems and management concern.

IS needs to set up a responsive evaluation process that can make IS and user areas more productive and improve the user/IS relationship.

Efficient management of user requests — maintenance fixes, system enhancements, new reports and small applications — improves IS productivity by doing the following:

- Reducing the need for large, costly projects that "replace an application" simply because the system has not been maintained.
- Enabling problems to be solved without IS resources.
- Providing a way to effectively use technical resources idled during slack periods.
- Delivering small but beneficial enhancements to users.
- Educating users in IS life cycles and procedures to help them work more effectively with IS on large development projects.

Putting in place a better evaluation process can also dramatically improve the perception of IS in the user community. Users often view IS as the black hole of requests. When IS managers finally do complete a request, users are often dissatisfied because it's not timely or it's not exactly what they need.

In fact, many IS shops treat requests for application service as if the poor user were trying to purchase a can of custom-mixed paint at the local discount store: "You want a change to the order-entry system? Well, we can't do it right now, but because we're so nice, just fill out this handy-dandy form, and we'll get back to you in a few months, or maybe years. Don't call us; we'll call you. Thank you for shopping internal IS. On your way out, pick up our *Evils of Outsourcing* brochure. Next!"

Quick request response

The most effective way of dealing with user requests is to concentrate on a "quick response" approach to receiving, evaluating and prioritizing service requests. User-request evaluators must be the best and the brightest (see text page 76). They should be business partners with the authority to make decisions and commitments rather than simply taking orders.

The following guidelines form the basis of a quick response service evaluation process:

1 ***Before recommending an information technology answer, first look for immediate, low-cost non-IS solutions.***

Users come to IS because they want help with a business problem, not because they automatically need a system change. A knowledgeable IS evaluator can suggest alternatives that do not involve a mainframe or minicomputer.

For example, here's how savvy evaluators would handle the following request:

A user wants to check addresses of test market customers and verify their ZIP codes. Instead of an expensive, mainframe-based application, the evaluator recommends checking personal computer shareware catalogues for a package that edits cities against ZIP codes.



Stephen Tuck

The lack of IS support after installation is offset by the package cost — less than $100. By helping the user send a facsimile of the purchase order to the software firm and then loading the software, IS can have the program up and running in less than a week.

2 ***Explore other areas or departments that have the information the user needs.***

Some requests can be

Continued on page 76

Singer is the author of two books and various articles on information technology. He lives in Columbus, Ohio.

- **'Quick response' method**
- **Making IS productive and users happy**
- **A business partner personality quiz**

Continued from page 75

satisfied with reports, screens or data from other departments. Interdepartmental cooperation is something the evaluator should nurture, because this sharing benefits everyone. When users all have a common source of data, it enhances communication.

Furthermore, a small tweak to an existing system — with the permission of the owner — is preferable to and cheaper than creating an entirely new system.

For example, the accounting department may have an on-line item inquiry screen that can display information needed by the production control staff, or perhaps the accounting screen needs only a few additional data elements to provide the data the production control staff is looking for. By making use of existing resources, IS can satisfy the user, avoid unnecessary application enhancements and reduce application redundancy.

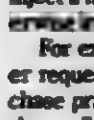


Understand the why of a request rather than accepting a casual explanation from the user.

The underlying reason for a request seldom comes through on a form or on the telephone. Getting to the root of the request can suggest alternatives or clarify the request. The IS evaluator can often inject a note of common sense into an otherwise irrational situation.

For example, if the accounting manager requests a new report to identify purchase price variances, it may be because she really wants the data for the operations vice president, who is concerned about supplier problems. After researching the situation, the business partner notifies everyone that the new general ledger package will have a specialized supplier tracking report in 12 months.

The evaluator has discerned the reason behind the request and has suggested the option of waiting rather than creating a new report. Solving problems is more profitable than reporting them.



Know when doing the work would take less time than adding the request to the official backlog.

Restrictive procedures can require an analyst to spend more time filling out paperwork than it would take a programmer to make the change. Rigid IS policies often force a simple request to lie in a backlog when it could be placed in a "ready pool" to be completed as time permits.

Every programming group should have a file of simple, low-risk — but obviously justifiable — application system changes they can tackle during slack periods. Despite the many first-line managers who protest that projects are so carefully planned that idle time never occurs, such interruptions are inevitable: A programmer may have to wait several hours for test data sets to be allocated, for instance, or an analyst could be forced to wait for a user to come back from vacation.



Reject the myth that any request labeled "fix the problem" must be done. Separate critical needs from cosmetic changes — and don't be afraid to make the distinction.

IS evaluators should approach applications development as a limited resource. They must stand ready to assist users but not squander technical staff on projects or requests that have little value.

The same holds true for maintenance. Application systems may contain errors, but the cost of fixing an error must be weighed against the benefits.

Let's say the billing supervisor discovers that an infrequently used pricing routine has been undercharging for several years. Only one customer is on that particular pricing option, however, and it is unlikely that any other accounts will ever be. To remedy the situation, billing clerks have been manually correcting their weekly invoices.

The IS evaluator estimates that the glitch's current impact on the billing department is negligible. He weighs this against the fact that it would take several work weeks to correct and test the complex logic. The problem may be annoying, but annoyance is not necessarily automatic justification for change.

There is a qualitative difference between a program problem that causes an incorrect value on a report and eventually affects decision-making and a problem that results in a cosmetic screen error that can be corrected manually with minimal effort.



Don't be afraid to build "throwaway" application systems to meet particular business needs.

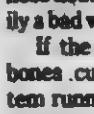
An unchallenged theorem in IS states that application systems must be perfect and long-lasting. Therefore, they must meet the highest levels of documentation, standards, recovery and flexibility. There are, however, occasions in which a simple, quick and discardable computerized solution is the answer to a time-critical business need. "Throwaway" is not necessarily a bad word.

If the user explains he needs a barebones customer response tracking system running in less than 30 days, a comprehensive system that would take nine months to prepare would be of little value.

It's not sufficient for IS to say, "Sorry, I know the test market starts in 30 days and this new product is important to our company's survival, but the database design alone would take at least a month."

The business partner who looks at nontraditional approaches may suggest a "quick and dirty" PC-based program to capture the responses in less than 30 days. However, only one telemarketing representative could work on the survey at a time, he would have to work from printed customer lists, and there would be no program enhancements.

Still, a partial solution that is ready on time is almost always better than a complete solution that never arrives.



Look for solutions to problems or opportunities the users have not yet asked for.

Users typically come to IS with only a fraction of their requests. The rest languish in a "hidden backlog" because users either are too busy to write them up or do not believe IS can work on so many requests. The business partner should use any spare time to roam the user areas and look for needs IS can meet.

The benefits to the company of unearthing these application gems can be great. Furthermore, some can be completed with little or no IS effort: A good evaluator may notice order-entry clerks continually calling customer credit to obtain authorization numbers. He may suggest that these clerks get authorizations themselves by accessing credit screens. This speeds clerk response time and improves customer service. Training would take an hour.

When setting up an evaluation mechanism, companies must realize that the introduction of an evaluation process cannot take place in a vacuum. It requires management support as well as an IS department that buys into the idea.

User evaluations should no longer be approached as mundane, paper-shuffling undertakings. Evaluating users' requests for service should be an important part of systems work. ■

The IS evaluator personality test

To play a certain type of IS person to act as a user request evaluator or business partner. See how you and your staff measure up by taking the following very unscientific test.

Check the following traits that describe you:

1. ☐ Knowledgeable about current systems
2. ☐ Ignorant about current systems
3. ☐ Creative about business solutions
4. ☐ Unimaginative
5. ☐ Flexible about procedures
6. ☐ Rigid
7. ☐ Excellent communication skills
8. ☐ Poor communication skills
9. ☐ Self-motivated
10. ☐ Unmotivated
11. ☐ Politically sensitive
12. ☐ Politically obtuse

For the next questions, circle yes or no:

Can you deal with complicated tasks within a tight time frame? yes no
Do you work well under pressure? yes no
Do you work well with users? yes no
Do you receive gratification meeting users needs? yes no
Is paper pushing an anathema to you? yes no
Do small requests have as much clout with you as major projects? yes no
Are you willing to let others take the spotlight? yes no

If you checked a majority of the odd-numbered traits and circled "yes" to the questions above, then you've got what it takes to be an IS evaluator and business partner.



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NATIONAL

BRIEFS

Novell settles

▶ Novell, Inc. has agreed to pay $100,000 to an unspecified number of its shareholders who sued last year to halt Novell's proposed merger with Lotus Development Corp. The agreement, covering attorneys' fees and expenses, came Jan. 22 after lawyers for the plaintiffs requested their case be dismissed. Five class-action suits were filed in the Court of Chancery in Deleware just after the proposed merger was announced April 6, 1990. The merger fell apart when Novell demanded more control of the combined entity.

Quick step up

▶ IBM executive **Ned Lautenbach**, who last month stepped up from his post as general manager of the company's Application Solution line of business to senior managing director of IBM's Asia Pacific operations, seems to be making promotion a monthly affair. Last week, Lautenbach was named president and representative director of **IBM Asia Pacific**, taking over the helm of the key territory from IBM Vice President **Edward Lucente**, who will leave the firm March 1 to become senior vice president of marketing at **Northern Telecom, Inc.**

New lease on Europe

▶ Independent computer leasing market leader **Comdisco, Inc.** pumped $75 million into its European operations last week, bringing total capital investment in its European leasing ventures to $112 million. The company has reason for its high hopes for the European leasing market: In fiscal 1990, according to recently released figures, the firm's lease base across the Atlantic grew from about $600 million to $1 billion.

Cuts across the board

▶ Hedging against a first-quarter deficit triggered largely by shortfalls in payments from economically battered OEMs such as **Unisys Corp.**, systems vendor **Sequent Computer Systems, Inc.** has implemented a onetime, companywide pay reduction plan. The program holds back approximately one week of pay per employee over a seven-week period. Sequent is banking on this measure to save an estimated $1.5 million to $2.0 million.

Cray spin-off unfazed by losses

Technical successes have lessened the impact of Cray Computer's losses

BY ELLIS BOOKER
CW STAFF

COLORADO SPRINGS — What does it take to faze Cray Computer Corp.? Whatever it is, it apparently is not slipped schedules or reported losses of more than three times its annual revenue.

More than six months behind schedule for showing a prototype of its next-generation supercomputer, Cray reported a net loss of $46.4 million last month on revenue of $13 million for 1990.

However, officials at the supercomputer supplier, which was spun off from Minneapolis-based Cray Research, Inc. in 1989, said they were not frazzled by either the production delay of the Cray-3 or the financial situation.

"We built a foundry last year to supply our own chips, and we redesigned our circuits... There's a six-month delay there," President and Chief Executive Officer Neil Davenport said. No supercomputer has ever been delivered on time, he said.

Indeed, the 16-processor YMP/16, the machine Cray hopes to demonstrate by year's end, was originally named the C90 and was expected last year.

The company was created under the leadership of Seymour Cray, who left Cray Research, the firm he co-founded in 1989, to pursue a supercomputer architecture based on gallium arsenide semiconductors. While difficult to manufacture, gallium arsenide chips consume about one-third the power, withstand higher temperatures than and are theoretically capable of five or six times the performance of silicon devices.

Davenport said he expects to have a working prototype assembled this summer and plans to deliver the unit to Lawrence Livermore National Laboratory by the end of the year. To date, Cray has demonstrated a 32-bit foreground processor running at 500 MHz. The foreground module tells the background module what to do; the background processor does the computing.

Analysts watching Cray said it has scored some technical successes that have lessened the impact of its year-end loss.

"The financial situation [for Cray] is not as painful as it might have been," said Jeff Canin, an independent analyst in San Francisco. One year ago, Canin said it was vital that the company hit its manufacturing targets to keep its investors happy [CW, Feb. 26, 1990].

It is significant that Cray is claiming a far better yield rate for its gallium arsenide chips than it had budgeted originally, according to Canin. "They'd internally budgeted yields of 20%, but because they brought the [fabrication] in-house and simplified the circuits, they are getting consistently over 50% yield."

This will lower the unit price of the gallium arsenide chips and quicken the rate at which Cray can enter full production, Canin said.

While Davenport declined to confirm these numbers, which he called misleading, he did say his company was achieving much better yields than expected.

Also helpful for Cray has been the accommodation of Cray Research, which extended the payout term of a $100 million note toward the development of the Cray-3 by six months.

From the beginning, the two Crays have faced different challenges. Although Cray may face a financing crunch, it does not have to defend the desirable territory of Cray Research, which, with 262 systems currently installed, is estimated to have between approximately 33% and 60% of the worldwide supercomputer market.

"Demand is not going to be the issue [for Cray]," Canin said. At its current staffing levels, the company needs to sell just three of its $28 million to $30 million machines per year to be profitable, he added.

Davenport said his cash reserves will take him through the second quarter of 1992, at which point he expects to see revenue from system sales.

Cray Research, meanwhile, must defend itself against low-end competitors such as Richardson, Texas-based Convex Computer Corp. as well as the high end of the market targeted by Cray and Japanese competitors. At the same time, it must make up for a flattening demand for supercomputers in the public sector by increasing its penetration in commercial markets.

Like all computer makers, analysts said, both Crays face "lengthened" sale cycles as potential buyers closely weigh their options in a recessionary economy.

Japanese competition

The long-looming threat of Japanese supercomputer competition has failed to make much of a dent so far in the U.S. domestic market, analysts said.

First, the Japanese lag behind U.S. companies in developing software and multiprocessor capabilities, and foreign competitors face considerable political obstacles trying to penetrate the U.S. with their products.

"The bad news is, there are a finite number of sites" that require supercomputers, according to Gary Smaby, an analyst at Needham & Co. in Minneapolis. Moreover, he added, these users are very sophisticated, tending to show loyalty to performance rather than company brand for their $15 million-plus computers.

"There are going to be a number of competitors for the attention of [80 to 85] existing supercomputer sites," Smaby said. Cray Research, currently the unquestioned market leader, will probably lose some market share in the next product cycle, he noted.

THE OTHER CRAY

Do you know where Cray Computer is?

- Spun off from Cray Research in October 1989 when founder Seymour Cray left to head production of a gallium arsenide-based supercomputer.
- The bad news: reported 1990 net loss of $46.4 million on sales of $13 million; products were six months late.
- The good news: Yield rate for homegrown gallium arsenide chips is outstripping expectations.
- Working prototype of the the gallium arsenide-based Cray due this summer; full production expected by year's end.



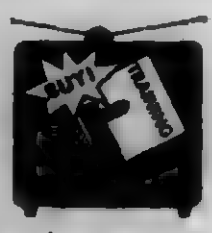
Seymour Cray: *Firm yielding high rate for gallium arsenide chips*

Sales training viewed as competitive tool

BY KATHY PORTEUS
SPECIAL TO CW

"New hire sales training" may not be everyone's idea of a hot topic. However, it absolutely sizzles in the back rooms of a growing number of computer systems and service vendors. Battling steeper competition than ever during a nationwide recession, companies view sales training as a competitive tool that can better leverage internal resources and increase the effectiveness of a field sales organization.

The strategic importance of training has moved front and center with the industry's shift from selling boxes to providing business solutions that involve an array of hardware, software and network products and services. This trend, in turn, is spurring the need to effectively sell "intangibles" such as value and to successfully build close customer relationships. Both shifts turn the spotlight on training.



One sign of the newly critical role sales training plays at some firms is the high level of involvement of senior management in the planning of training programs. At Andersen Consulting and Sun Microsystems, Inc., for example, advisory committees or training and development councils staffed with senior executives determine training priorities and ensure that these reflect current business objectives. "This committee probably spends more time discussing new hire training than anything else," said Herb Deach, managing partner at Andersen Consulting's Professional Education Division.

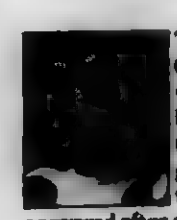
Companies use a variety of approaches to hiring, training and evaluating new sales representatives (see story page 78). Underscoring the diverse methods and strategies is a recognition that the training process is always evolving.

Continued on page 78

COMMENTARY

Jean S. Bozman

A big brother for Sybase?



To paraphrase Gail Sheehy's watershed book *Passages*, there are two great questions that must be answered after adolescence: Where am I going, and who will go along with me?

Sybase has spent its first five years in the relational database management system industry answering the first question: It wants to go wherever client/server computing leads it. But it still hasn't answered the second, and many industry observers are wondering: Will Sybase be going along with Lotus, Microsoft or both?

Lotus is a Sybase stakeholder. Microsoft is a development ally. Industry speculation that one of the firms will acquire Sybase abounds. Since Microsoft and Lotus executives say the status quo is just fine, only time will tell. However, Sybase executives do have an explanation for the duality of having Lotus as Sybase part-owner and co-marketer — and having Microsoft as co-developer of the SQL Server database engine.

"It helps us preserve our independence," said Bob Epstein, Sybase's executive vice president. "As an investor, Lotus has a direct interest in our success. And I think Microsoft is getting the best benefit of us the way it is. If they owned us, it would foul up their distribution channels." So much for appearances.

It's not hard to see what Lotus and Microsoft get from their ties to Sybase. Porting code has been a nettlesome problem for Microsoft's LAN Manager, analysts report. Sybase serves Microsoft as an advanced technology lab that has already dealt with porting code to multiple platforms. Microsoft also needs Sybase's Open Server gateways to reach Unix networks and IBM mainframe hosts.

To Lotus, Sybase is a marketing partner with database experience and the kind of large-user government contracts that open doors to new business. Together, Lotus and Sybase sales representatives go calling on large clients; Sybase provides systems consulting for Lotus customers who are outgrowing their stand-alone PC applications. As an added draw, Sybase's network management technology and security techniques complement Lotus' desktop spreadsheets and office programs.

Can this double-partnering thing really work? It probably can, for the time being. Microsoft and Lotus aren't complaining, and Sybase, at this point, probably stands to reap more from the three-way alliance than just a hedge against losing its independence to either ally.

On the surface, it seems that Sybase is successfully riding the wave of downsizing mainframe applications for use on Unix processors and beefed-up PC servers. However, reports of slim profit margins trouble some observers, as did a layoff of 50 employees last year. Users at the company's users' conference last month raised concerns about the quality of technical support and about delays in product testing and shipment schedules.

Yet, Epstein used the occasion to outline a five-year plan for Sybase's evolving product strategy, including everything from object-oriented programs to bolting inference engines onto the corporate network.

The forecast was ambitious, especially given the current economic climate. Sybase says that with the right kind of technology partnerships with other firms, it can reach its product goals on time.

For now, both Lotus and Microsoft seem more than eager to help.

Bozman is Computerworld's West Coast senior editor.

Sales

FROM PAGE 77

Increasingly, companies want their sales representatives to be the customer's business partner in making technology-related decisions. As a result, today's training primers spill over with phrases such as "working as teams," "professional" and "consultative" selling. New hire training, therefore, stresses the importance of establishing contacts throughout the corporation and knowing how to effectively use internal resources to help close a sale.

According to John Maxwell, manager of new hire sales training at Digital Equipment Corp., field assignments "get new sales reps to understand the environment they will be working in and the organizations they will be working with as a team." Most new sales representatives at DEC come from within the company and go through a formal five-month new hire training program that combines field assignments and central training at sites in Merrimack, N.H., and Boylston, Mass.

At Electronic Data Systems Corp. (EDS), the training focus is on selling professionally rather than on sales techniques. A piece of business at EDS is defined by how partnerships are built with outside prospects and within EDS and then "marries the two," said Steven P. Leakey, EDS director of sales development.

While firms such as DEC and Sun still use paper-based courseware for self-study training, the trend is toward computer-based training.

According to Tad Bogdan field training and development manager, Sun's self-paced courses have been structured with hypertext/hypermedia technology in mind. Similarly, "Multimedia is the trend that we are seeing and are investing in," Deuch said.

Classroom technology

Technology in the classroom is also on the rise. Using interactive video as a classroom tool accelerates learning and engages student interest, said Lee Kleppinger, director of training at Apple Computer, Inc.

Last year, NCR initiated use of the "electronic classroom" in a pilot program. This pilot will be expanded in 1991, Lysiak said, owing to the 15% to 20% learning gain she estimates was achieved through the highly participatory electronic classroom approach.

In this new learning environment, students respond to questions using "response pads." Instructors can gauge how well students are understanding the lesson because the responses feed into their personal computer-based system for immediate feedback.

Bottom-line impact is always a critical consideration, especially during a recession. Essentially, training's return on investment is measured by how well representatives perform in the field. But with many variables at play and a sizeable investment at stake, new hire programs tend to treat evaluation as an integral part of the training process.

In general, evaluations are derived from two sources: graded competancy exams typically given at the end of each training segment and subjective assessments of ability. EDS trainees give oral presentations to senior management panels, from whom they receive candid feedback, Leakey said. Similarly, Apple evaluates trainees through role plays and presentations.

Post training

Determined to maximize their investments and hone their competitive edge, firms are also beginning to implement post-training evaluation as well. Sun, for instance, has begun to test new representatives three months after their formal training is completed to determine how well they have retained and applied information to their jobs, Bogdan said.

While most training evaluations measure the competence of new representatives, the question of what skills and knowledge constitute "competence" is a moving target in the fast-paced computer industry. The frantic forward pace of technology and of customer sophistication and demands can quickly outdate an existing training course and thus lessen the effectiveness of the entire training program.

This factor, coupled with the need to minimize costs while maximizing the "bang for the training buck," is fueling a trend toward training "modules" that comprise one course or a series of courses. The modular approach allows training programs greater flexibility in adapting to changing requirements. In addition, it lets the firms better accomodate the fact that not all trainees need the same type or amount of training to reach the targeted competency level.

To reduce costs and minimize a new representative's time away from the field, self-paced instruction is being used whenever possible. Companies are also attempting to cap training costs by licensing or purchasing third-party courseware, subcontracting segments of training to outside instructors and supplementing full-time trainers with managers from field offices and product divisions.

The next wave of new hire training changes will likely reflect trends such as "just-in-time" training and individualized instruction, made possible in part as computer-based instruction becomes more available and affordable. "Industrywide, a key trend is for training to be delivered in a 'learn what I need' mode rather than 'one size fits all,' " Lysiak said.

Porteus is a free-lance writer based in Centerville, Mass.

How now?

Dwindling customer dollars and tough competition are sharpening sales training at computer firms as a competitive tool

Apple Computer, Inc.

- Hires a mix of recent college graduates and experienced sales representatives
- Training methods include computer-based training (CBT), interactive video, self pacing, role playing and presentations
- Evaluation includes exit testing and performance testing in controlled environments

Digital Equipment Corp.

- Hires internal transfers for sales force
- Training methods include lectures, laboratory exercises, case studies, role playing and field assignments
- Evaluation consists of testing at end of each central training session

IBM

- Hires a mix of recent college graduates and experienced sales representatives
- Training methods include self pacing, CBT, role playing, case studies, practice demonstrations and supervised job-related activities
- Evaluation includes measuring and assessing students on communications skills, presentation techniques, general business knowledge and customer interaction

Standard course menu

It is well and good to tout the strategic importance of training new sales representatives, but even the best programs boil down to a series of courses or modules that companies' new recruits must complete. Though by no means exhaustive, the following sample of courses taught at various computer firms reflects the variety of topics that are emphasized during new hire training programs.

- **Apple:** Local office orientation; company history and culture; product presentation skills; channel and market strategies; differentiation strategies and tactics; local-area network literacy; desktop publishing and presentations; product training; account management development; and selling skills and advanced technical training (i.e., third-party solutions and networking).
- **DEC:** Selling skills; corporate structure and philosophy; company resources; field activities (i.e., interviewing, attending sales calls and studying company's full product line); and test configurations addressing customer scenarios.
- **IBM:** Company policies; IBM products, sales policies, marketing practices and computer concepts; knowing and using the IBM support structure; competitive knowledge; and interpersonal skills.
- **Sun Microsystems:** Self-paced modules, including orientation toward working for Sun; networking; hardware, graphics and visualization; applications environment; software engineering technology; and customer service and satisfaction.

KATHY PORTEUS

INTERNATIONAL BRIEFS

Growing power

▶ **Taiwan** will be capable of manufacturing information technology products worth $28 billion annually by the turn of the century, according to the **Institute for Information Industry**. The republic turned out information products valued at $6.1 billion in 1990, making it the world's sixth-largest manufacturer. According to institute estimates, Taiwan's information industry will grow by 13.5% this year, a 1.5% increase over 1990.

Investing in New Zealand

▶ **IBM** is doing its bit for the **New Zealand software industry** with an equity investment in Wellington-based developer and IBM remarketer **Computer Systems Implementation**. Although neither firm would divulge the exact size or value of IBM's stake, IBM New Zealand's general manager, Fraeme Murray, described it as a substantial minority shareholding.

Cold shoulder

▶ **Esprit**, Europe's influential information technology roundtable, has excluded UK-based **International Computers Ltd.** (ICL) — acquired last summer by Japanese industrial giant **Fujitsu Ltd.** — from membership, in what some industry observers see as the first concrete indication of the icy reception Japanese takeovers will receive from European companies. Meanwhile, the managing board of the **Joint European Submicron Silicon Initiative** project has put off until next month any decision about ICL's continued participation in the project's research into the next generation of super silicon conductors.

An open initiative

▶ The **European Commission** has announced that it will launch a new microprocessor development program in April. The project, called the **Open Microprocessor Initiative**, is expected to last for approximately five years and cost about $397 million. Participants in the Open Microprocessor Initiative project include France's **Groupe Bull**, **SGS-Thomson** and its **Inmos** subsidiary, Germany's **Siemens AG** and Italy's **Ing. C. Olivetti & Co.** and its UK subsidiary **Acorn**. OMI is expected to focus on designing a processor with 100 million transistors that supports Unix — something that even Intel Corp. is not expected to achieve before the year 2000.

U.S./Japan trade agreement wins support

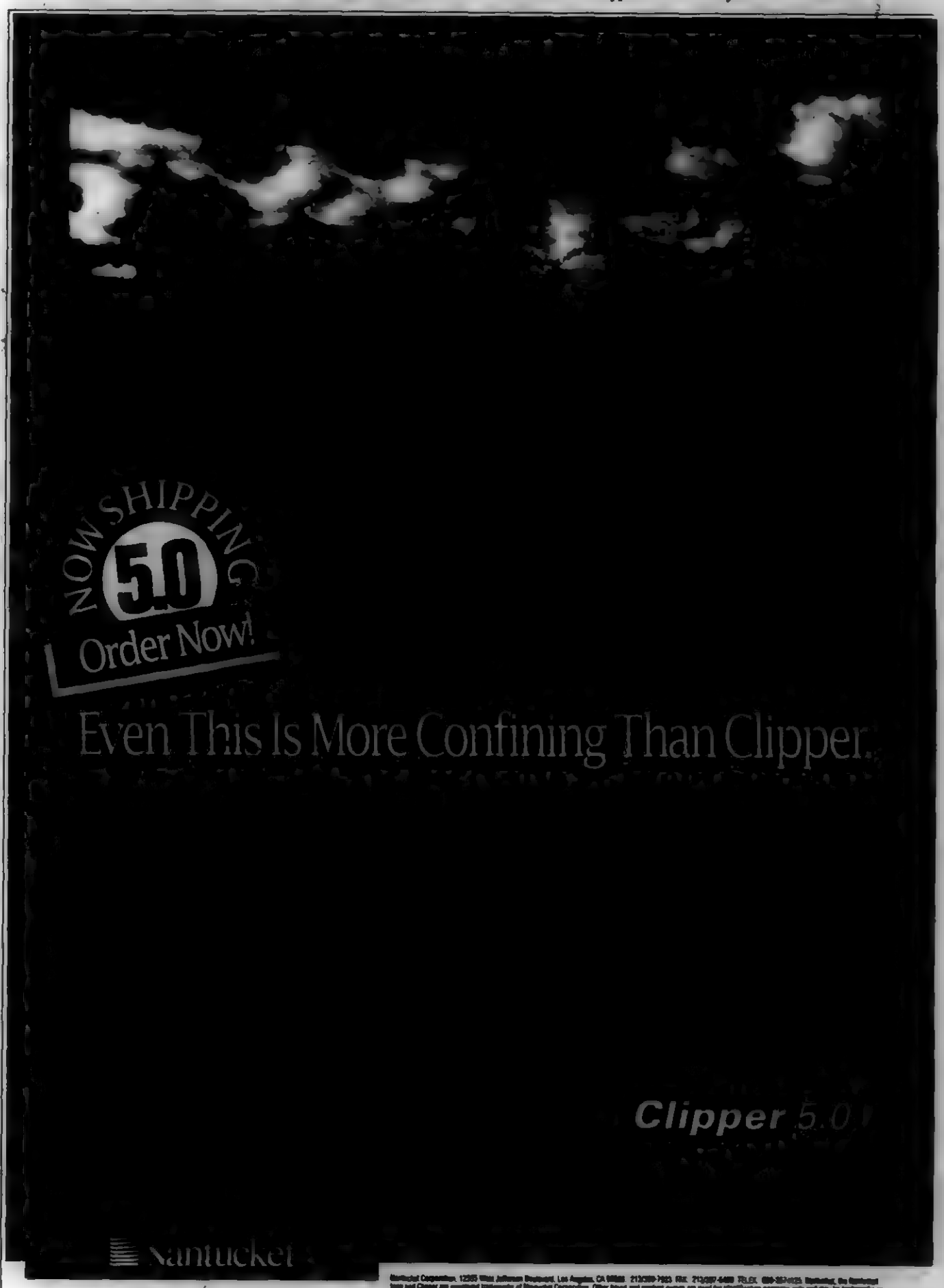
A joint proposal issued last fall by the Semiconductor Industry Association and the Computer Systems Policy Project urging a new U.S./Japan semiconductor trade agreement has garnered an impressive array of computer industry support, according to a statement released by the proposal's sponsors earlier this month.

The proposed agreement would include terms aimed at preventing dumping and seeking an open Japanese market for semiconductors, according to the statement.

The backing has come from a wide and diverse group of industry associations including software and services industry association Adapso, the Electronics Industry Association and the Computer Business Equipment Manufacturers Association.

The show of support is winning the proposal priority attention in Washington, D.C., according to Ken Kay, executive director of the Computer Systems Policy Project.

Meanwhile, Kay added, the unexpectedly united front presented by U.S.-based industry associations will most likely win the plan earlier, more serious attention from authorities in Tokyo.



Colleges seek corporate money

BY MICHAEL ALEXANDER
CW STAFF

Life on campus is not cheap, and the business world apparently must pay the price.

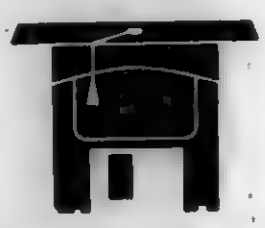
These days, a lot more universities are making the rounds to corporations in hopes of drumming up money for research. While federal funding of university research has increased over the years, it is still not enough to keep up with rising costs and an influx of scientists seeking funding. With the economy on the skids, funds may be even harder to come by.

As a result, many more corporations are being asked to pick up the tab, according to university researchers and their corporate sponsors. Computer companies are among the most active contributors.

It is an old coalition: Industry foots the research bill and in return receives technology that can be turned into lucrative new products. It can also be an opportunity to employ top scientists who do not want to leave the university.

In turn, the university receives royalties for products and funds or equipment to help defray research costs. However, the dire threat of dwindling public dollars leading to a downturn in U.S. technological clout just when an upswing is needed is giving new urgency to the old industrial/academic alliance.

"Every computer science department worth its salt has an industrial liaison program," said John Savage, who is chairman of the computer science department and runs the liaison program at Brown University in Providence, R.I. Eight corporations, including Digital Equipment Corp., Sun Microsystems, Inc. and IBM, pay $35,000 apiece each year to participate in Brown's industrial partners program and to swap technical knowledge with Brown's computer scientists. DEC's recently introduced Fuse for Ultrix, a Unix programming environment, came from research that was conducted at Brown.



Corporations still contribute only a small percentage of the money universities spend on research. Last year, for example, corporations provided about 6.6% of the $15 billion universities spent on research. However, that amount has risen dramatically during recent years, according to the National Science Foundation (NSF). Last year, universities spent close to $984 million worth of corporate cash, up from $293 million in 1983.

MIT, the Georgia Institute of Technology, Carnegie Mellon University and Cornell University are among the top recipients of corporate cash, receiving close to $100 million last year, the NSF said.

DEC is sponsoring 300 research projects at 150 universities and research centers around the world, said Jack McCreadie, director of DEC's external research program. Funds, equipment and other forms of participation amount to tens of millions of dollars per year, he said. "We're not in this for goodwill," McCreadie said. "What we get for our support is a license to technology."

Several important products have been spun out, including Decwindows interface, a variant of the X Window System interface developed at MIT, and Ultrix, DEC's flavor of the Unix operating system developed with input from the University of California at Berkeley.

US West Communications, Inc. gave Ron Cole, a computer scientist at Oregon Graduate Institute of Science & Technology in Beaverton, Ore., $230,000 to further his work on English Alphabet Recognizer, a neural network system that recognizes spoken letters. US West hopes the system can be used to automate telephone directory assistance. "Every second shaved off any directory telephone call can save a [telephone] company $5 million to $10 million," Cole said. The project has also received about $200,000 from Apple Computer, Inc.; the NSF and an Oregon state agency.

U.S. pays price for tight funds

University researchers are strapped for funds and, as a result, the U.S. is falling behind in the world's technology race, a Nobel laureate said recently at a press conference called to publicize the problem.

Although Congress has voted for significant increases in research dollars and has favored science over other areas of the budget, there is a shortfall of some $10 billion per year, said Leon Lederman, a physicist from the University of Chicago and the president-elect of the American Association for the Advancement of Science. "Twenty years of neglect have caught up."

There is little prospect that the government will significantly increase science funding during these troubled economic times, Lederman said.

MICHAEL ALEXANDER



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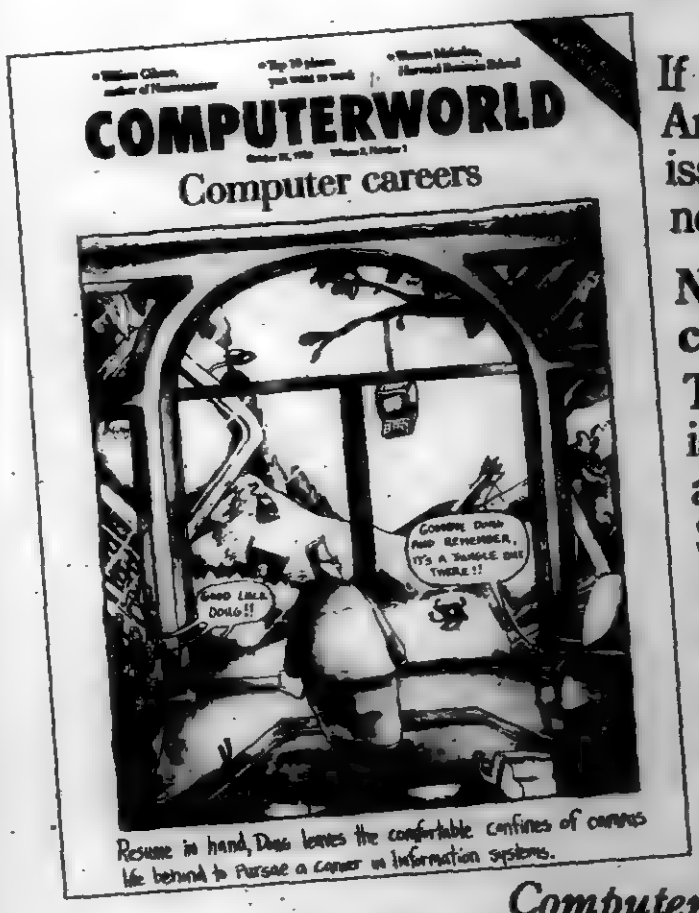
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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Prospects for minorities in computing.
- Merits of an Electrical Engineering degree for a computer career.
- Information Systems salaries from Computerworld's annual survey with the Data Processing Management Association.

COMPUTER CAREERS

Higher pay vs. higher education

It's a well-known fact: The utilities industry treads the high wire in pay, while education walks the low road. But both offer unique features to IS professionals.

Information systems managers in the utilities industry who ranked at the top of *Computerworld*'s 1990 salary survey are the first to admit that the pay is good. The reason: Although IS positions are not unionized, the pay structure of the company requires IS managers to receive higher than average compensation to keep pace with the pay levels of other positions, which are established through collective bargaining.

For example, at Boston Edison Co., "we're told [by other people outside IS] we're overpaid," says John Dubiel, manager of systems assurance. However, he says, salary surveys can be deceiving in terms of title discrepancies. For instance, at Boston Edison, the position of programmer actually has a large analyst component and should be compared with higher paying analyst titles in other industries.

The appeal of the utilities industry is its stability, Dubiel says. Although there have been periods of rapid growth and occasional reorganizations, utility companies generally provide slow, steady, dependable growth. "We don't go through roller-coaster rides. It's a stable environment," he notes. Layoffs among regulated utilities are almost unheard of, Dubiel adds.

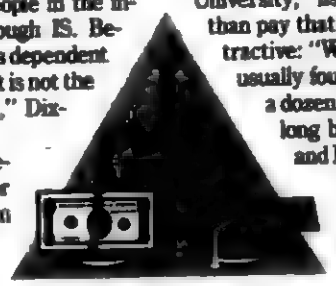
Save and steady

The result is very low turnover in IS. Dubiel joined Boston Edison 20 years ago. "Our turnover is well under 10%, and that includes retirees," he says. The longevity of the staff results from and contributes to the high salaries.

With such stability, the utilities industry has long been regarded as dull, but that is changing. "We were fat, dumb and lazy. We had a protected turf. We did a good job, but there was no competition until about 1983," says Tod Dixon, vice president of information resources at Northeast Utilities Co. in Berlin, Conn.

New regulations in the early 1980s forced the industry into a much more competitive posture and put pressure on IS to help create a strategic advantage. For instance, Dixon now has systems to assist with the daily buying and selling of power among utilities, a high-pressure/high-stakes affair. "If you don't have your contracts in place in about half an hour, you can miss some good sales," he says.

Despite the growing importance of IS to the bottom line and its good pay, the profession is not the path to the utility company's chief executive officer's suite. "I don't know any top people in the industry who came in through IS. Because the industry is not as dependent on IS as other industries, it is not the way to become chairman," Dixon says.



Yet, IS has its own rewards and challenges. For instance, IS is utilized in managing and operating nuclear power plants, giving new definition to the term "mission-critical." It is a telecommunications professional's paradise: "How many industries have the right-of-way to build their own fiber-optic network?" asks John Scoggin, supervisor of network operations at Delmarva Power and Light Co. in Newark, Del. He has already run 200 miles of fiber cable.

The industry is more like an engineering environment than a button-down corporate office, and most promotions come from within the company. IS professionals typically enter as programmers. From a technology standpoint, the utilities industry is "middle- to forward-edge but not bleeding-edge," Dubiel says.

Most information systems professionals in education are not surprised by their industry's low ranking in the pay hierarchy. But they want people to know that the differences in salaries are balanced by other benefits and cultural conditions and have little to do with the nature of the IS work.

"The salaries are low, but we do [offer a more complete compensation package] to be competitive," says M. Stuart Lynn, vice president of information technologies at Cornell University in Ithaca, N.Y.

Howard Miller, assistant vice president of administrative computing at Boston University, lists compensation other than pay that makes educational IS attractive: "We get a lot of time off" — usually four weeks of paid vacation, a dozen paid holidays and a week-long break between Christmas and New Year's.

Tuition breaks for employees and their families are also an envied benefit. For instance, at Taylor University in Upland, Ind., employees receive tuition reimbursement that amounts to $8,000 annually, says Bob Hodge, Taylor's chief information officer.

Educational computing is divided into two parts: administrative and academic. Administrative computing is very similar to the corporate world, according to Martin Smith, assistant vice president of administrative computing at the University of Massachusetts at Amherst. Academic computing is more informal — a blue jeans environment in which IS professionals closely support the work of students and faculty on personal computers, workstations and networks.

Smith, who has worked at the school for 20 years after serving a stint in the corporate systems world, says IS professionals should look beyond salary. "When experienced people come here from the business world, they have to take a cut in salary," he points out, but they leave behind many of the pressures of the corporate world.

On the other hand, many young people "start here and see that the salaries are low and jump to the corporate sector," Smith says.

Academic security

Job security is another hallmark of university life, but that may be changing. "I don't know if we've ever had a major layoff, although some universities are facing that now," Miller says. Enrollments are down because of a significant decline in the number of high school students. Still, universities rarely, if ever, merge, downsize or restructure, laying people off in the process.

The university culture is also attractive to many people. There is no pressure to conform to a rigid corporate image, Lynn says. "It's a vibrant, intellectual community."

Intellectual stimulation, however, doesn't pay the rent, and even with generous time off, tuition reimbursement, and job security, "the pay is at the low end, and small private colleges are often at the low end of the low end," Hodge says.

The bottom line, therefore, is something different: quality of education, not high compensation. "You are working for an organization whose goals are teaching and research. There's a quality of life here."

Stories were written by Alan Radding, a free-lance writer based in Newton, Mass.



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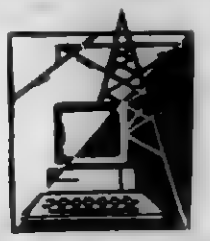
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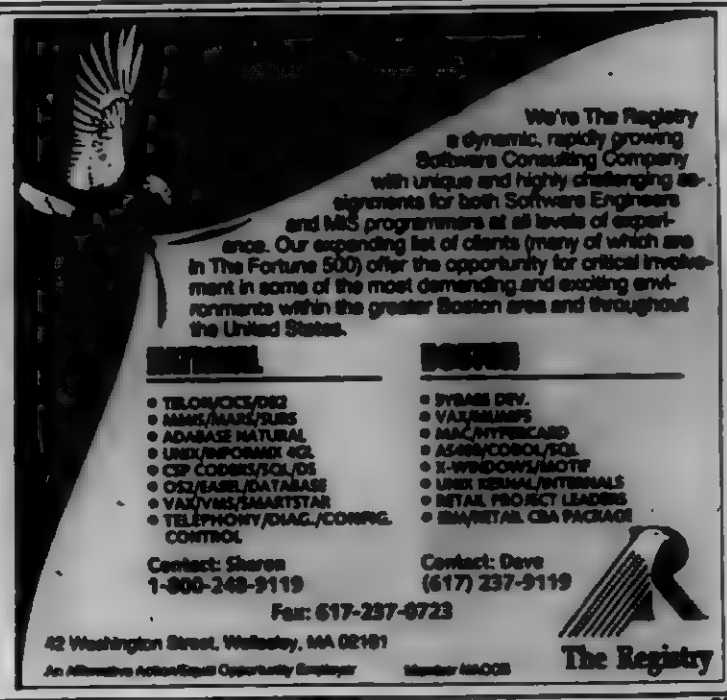
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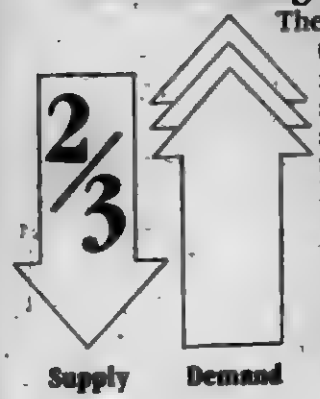
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

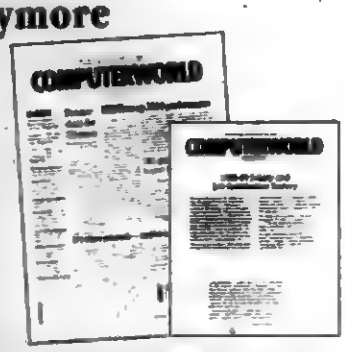
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand

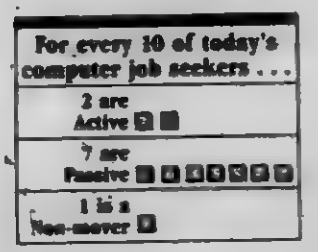


The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

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That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)



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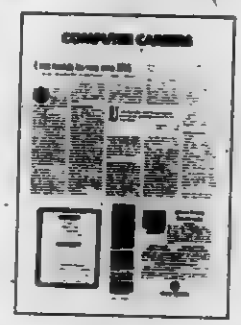
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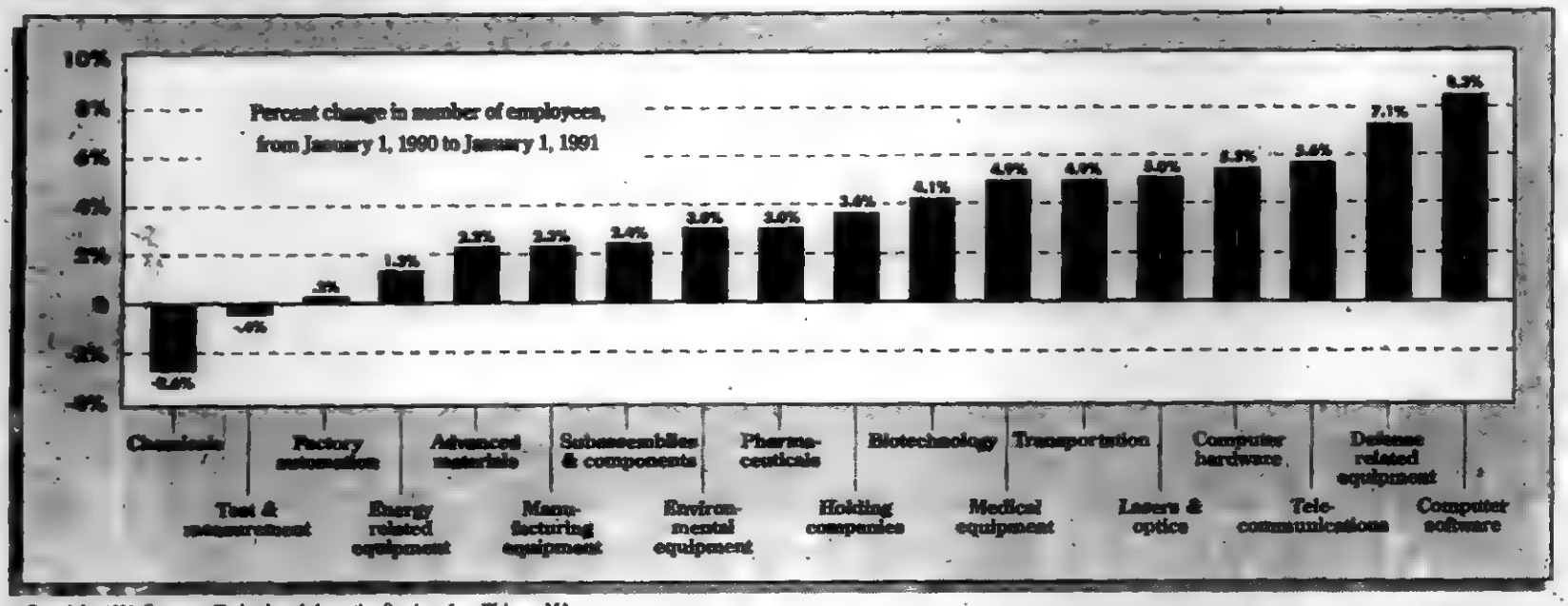
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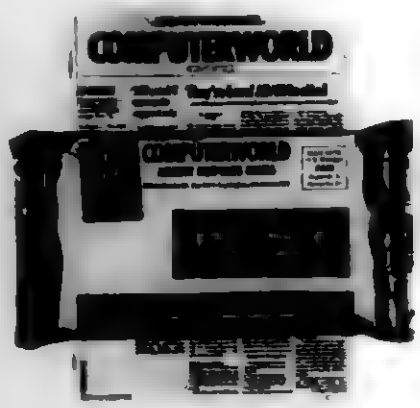
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COMPUTERWORLD
DIRECT RESPONSE CARDS

Curbing employees from pirating software

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY LOU OLENICK
SPECIAL TO CW

One of the greatest dangers to a company's competitive advantage is the possibility that disgruntled employees will make illegal copies of vital software for their own use. And employers have grounds for their fears: The Software Publishers Association estimates that for every copy of software in use, there's at least one illegal copy made.

However, companies can combat theft by taking several steps, the first of which is education. Much of this can take place when employees are hired. At this stage, the company should explain its ethical standards on software theft issues. For employees already on the payroll, companies can reinforce existing policies by holding meetings that brief them about their continuing duty to keep trade secrets confidential and the dangers of unauthorized copying.

Because no company wants to earn a reputation for permitting or condoning illegal activity, many of them have already adopted codes of conduct that prohibit employees from violating the terms of software licenses. Among other things, software licenses prohibit making multiple copies of protected material. To drive the point home, most codes of practice inform everyone involved that employees who are caught violating the code are subject to immediate dismissal.

For example, two workers were overheard talking about trading software they had copied from their computers at work. Unfortunately for them, they were overheard by the security chief at a neighboring technology company who reported them to their employer. When they returned to work the next morning, they were greeted with pink slips, persuaded to sign releases and escorted out of the building.

Sign the dotted line

A second way companies can protect themselves is to require employees to sign hiring agreements. These agreements usually cover proprietary information and ownership of work products. Employees are asked to agree that any tools they develop are the property of the employer. This means that an employee who leaves the employer for any reason and takes away software to use personally or to sell to somebody else would be committing a crime.

In addition, some companies require new employees to state that they are not bringing any information or material with them that is proprietary to a previous employer to apply to their new job.



Case in point: One Wall Street financial analyst was recruited from the Federal Reserve System. His expertise was in recommending changes in the prime rate. After he began work for his new employer, he continued to access files from the Federal Reserve computer. He tapped confidential economic indicators that he then used to predict changes in interest rates for his new employer. This person's new career ended abruptly when his new employer learned what he was doing.

A third effective approach is for a company to limit physical and other access to software to protect it from unauthorized use. Especially in areas where company trade secret information is used by employees, the company can limit access to only those carrying authorized passes.

As part of this approach, a company can put a "clean desk" policy in place. This policy would require employees to keep confidential information under lock and key each night.

Nondisclosure agreements are also effective in limiting access. These permit only those personnel, consultants and customers who have signed the agreements to have physical or electronic access to confidential materials. Furthermore, nondisclosures apply to all sorts of information well beyond computer software. Design, planning or pricing materials are examples of protected information. Marketing plans for new products also fall into this category.

Another tack firms are taking is to track installed software. To control their corporate liability, some companies provide a centralized source for all software used by their employees. This centralized service negotiates companywide licenses with vendors, tracks installed software and keeps tabs on who is using what.

Software tracking is wise for three reasons. First, some of these site licenses allow vendors to ask for and to receive audit reports related to the use of their software. Second, it allows the company to efficiently provide technical support and software upgrades to everyone using the systems. Most importantly, the company may find itself at risk because it fails to control the purchase of software by its employees.

Corporate liability

Unbeknownst to some, a company becomes liable to the terms of a software license agreement when one of its employees buys a license to use a package in the company's name. These days, when multinational corporations can have tens of thousands of personal computers worldwide, neglecting details of software purchases can be very costly — especially if the company gets audited.

For example, one software vendor discovered widespread illegal copies of its software in a major corporation. The offending company ended up paying the list price for each illegal copy to avoid bad publicity. The final cost to the firm ran into the millions.

Finally, companies can discourage copying by requiring employees and contractors to mark program materials with confidentiality and copyright notices.

Olenick is a partner at the New York law firm Olenick and Yarnell.

Buy/Sell/Lease

The BoCoEx index on used computers

Closing prices report for the week ending February 8, 1991

	Closing price	Recent high	Recent low
IBM PC Model 176	$300	$450	$200
XT Model 086	$500	$550	$450
XT Model 089	$500	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$750	$1,025	$700
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,000	$1,300	$1,000
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,000	$3,500	$2,500
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,450	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,800	$2,300
LTE 286	$2,200	$2,500	$1,900
Deskpro 286	$900	$1,000	$700
Deskpro 386/20	$2,850	$3,000	$2,300
Apple Macintosh Plus	$800	$975	$700
SE	$1,150	$1,450	$1,100
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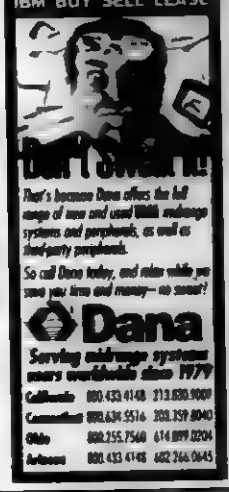
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MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

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RFP No. 1982, due Tuesday, March 5, 1991 at 3:30 p.m. for the acquisition of nine (9) display terminals to connect to an existing Data General MV/7800XP computer for the MISSISSIPPI DEPARTMENT OF HEALTH.

RFP No. 1985, due Monday March 4, 1991 at 3:30 p.m. for the acquisition of a 20-workstation microcomputer-based lab with printers and software for HINDS COMMUNITY COLLEGE, Utica Campus.

RFP No. 1986, due Monday March 4, 1991 at 3:30 p.m. for the acquisition of a turnkey, LAN-based system for JONES COUNTY JUNIOR COLLEGE.

RFP No. 1987, due Monday March 4, 1991 at 3:30 p.m. for the acquisition of a minicomputer-based system with related peripherals and software for JONES COUNTY JUNIOR COLLEGE.

RFP No. 1988, due Monday March 4, 1991 at 3:30 p.m. for the acquisition of 44 hard disk drives, 88 memory upgrades, and 44 extended keyboards to upgrade existing PC labs in the Computer Technology and Business Technology Departments of EAST MISSISSIPPI COMMUNITY COLLEGE.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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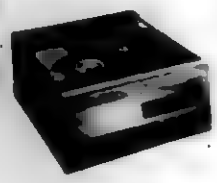
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Laughing all the way to the learning bank

BY JOEL GOODMAN
SPECIAL TO CW

"Here in America, we have an immensely humorous people in a land of milk and honey and wit, who cherish the ideal of the 'sense' of humor and at the same time are highly suspicious of anything that is nonserious."

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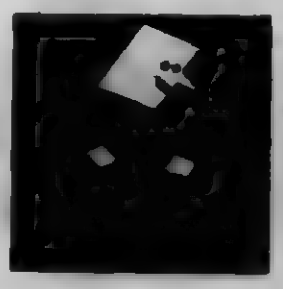
The above quote captures the essence of the paradox experienced by many information systems trainers: They value humor personally but question its use in serious training contexts. However, humor can play a positive part in the learning process.

When used appropriately, humor can maximize learning and creativity. Here is a rundown of the many misconceptions trainers and educators across the nation face.

• **Laughing and learning are mutually exclusive.** Most trainers fear they will lose control of their classes — that if students are laughing, they aren't learning.

In fact, ha ha (humor) and aha! (insight, learning) can go hand in hand. This works because humor can serve many functions in the learning process: It captures people's attention and reduces the tension — which, in turn, increases retention. Ultimately, learning can be fun but not for fun.

• **To be humorous, you have to be a natural joke teller.** Although joke telling is one way to transmit humor, it's not the only way. In fact, there are literally thousands of ways — in addition to joke telling — to invite smiles and laughter within a classroom context. If delivering a punch line is not your forte, or if it is inappropriate for you to become the stand-up comic on the job, then there are alternatives. Here are some tips to get you going:



1. Put humor into the environment. By osmosis, it may filter into the corporate culture. This can be accomplished by having posters in your training room with lighthearted sayings. For example: "The brain is a wonderful organ. It starts the moment you get up in the morning and does not stop until you get to the office." (Robert Frost)

Or perhaps you could have humorous items on a bulletin board in your office. One trainer from Appleton, Wis., has the following pinned to a wall: "On a clear disk . . . you can seek forever."

2. Anticipate ways of injecting humor into the course contents. One trainer from San Diego has a handout with some "daffynitions" such as Auto Exec = Lee Iacocca; hard disk controller = shuffleboard stick; Hypercard = Robin Williams.

3. Develop your comic vision. Look for humor, and it will find you. Make believe you are Allen Funt, the creator of the television show *Candid Camera*, for five minutes each day . . . especially in the most serious of places.

4. Use humor as a tool rather than as a weapon. Laughing *with* others builds confidence, brings people together and pokes fun at our common dilemmas. Laughing *at* others reduces confidence, destroys teamwork and singles out individuals or groups as the "butt." In the words of one trainer: "You don't have to blow out my candle to make yours glow brighter."

5. Laugh at yourself. Set the tone by modeling your ability to take your job seriously and yourself lightly. One of the simplest and most powerful ways of doing this is to "tell stories on yourself" whenever possible and appropriate.

• **Humor is not serious.** On the contrary, the bottom line and the punch line can go together. Perhaps the most important reason trainers should be serious about humor is for the health of it!

Stress and burnout became household words in the 1980s. They certainly come with the territory of being a trainer these days. A report to the President's Science Advisor places the costs of stress to the economy at $200 billion annually. Cents of humor might save dollars. Humor can be a powerful antidote to stress because it can help us move from a "grim and bear it" mentality to a "grin and share it" orientation.

This notion is captured well by George Burns, who says: "You can't help growing older, but you can help growing old."

With humor you can prevent a "hardening of the attitudes." If you stand rigidly in the face of stress, you are much more easily knocked off balance. If you are flexible mentally, you are in a much better position to "roll with the punches" that life throws you.

To wit, a businessman ordered flowers to be sent to the opening of his friend's new office. When the businessman got there, he was delighted to see a beautiful floral arrangement. However, he was more than distressed when he saw the card that had accompanied the flowers: It read, "Rest in Peace"!

He made a beeline to the flower shop and immediately started yelling at the florist. After the shouting had subsided, the florist reassured him by saying, "Hey, don't worry! Just think . . . somewhere today in this city, someone was buried beneath some flowers that read, 'Good luck in your new location!' "

Regardless of your location in life, humor can help.

• **Training is serious vs. training is a laughing matter.** Both of the above statements are true. The wonderful thing is that you have the choice. By choosing humor, you can help yourself — and your learners — survive and thrive.

HUMOR CAN SERVE many functions in the learning process: It captures people's attention and reduces the tension — which, in turn, increases retention.

Goodman is director of The Humor Project in Saratoga Springs, N.Y., and author of several books.

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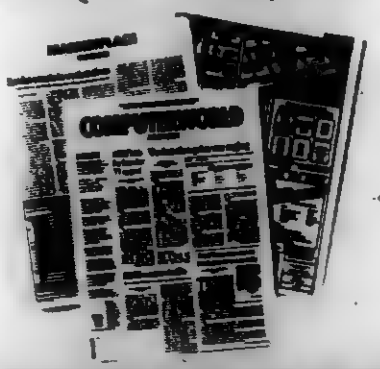
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

UPGRADED FROM NEUTRAL TO BUY: Network General Corp. (Alex. Brown & Sons, Inc.). Reason: Sharp jump in third-quarter profits; leads market in diagnostic tools for local-area networks.

UPGRADED FROM MARKET PERFORMER TO OUTPERFORM: Oracle Systems Corp. (Montgomery Securities). Reason: Company management expects to keep expenses in check; predicts postive cash flow within two quarters.

DOWNGRADED FROM OUTPERFORM TO MARKET PERFORMER: Lotus Development Corp. (Montgomery Securities). Reason: Profits for first half of the year will drop as customer demand for company's current spreadsheets slacks off in anticipation of new versions.

UPGRADED FROM HOLD TO BUY: Lotus (Prudential-Bache Securities, Inc.). Reason: Though firm is spending heavily as it integrates Samna Corp. into business plan, new releases of spreadsheets will increase revenue.

ANALYSIS IN BRIEF

December 1990 orders improved over November's by 2%. Industry probably hit bottom in November and will improve until May, which marks the start of a traditional seasonal downturn. Chip stocks will likely follow chip orders upward. Intel Corp., whose 1990 sales increased 29%, is a good investment now. Initiate long-term holdings in domestic semiconductor makers this year, as Japanese chip firms lost market share for the first time in eight years. — *Semiconductors: Industry Update, Prudential-Bache, Jan. 21, 1991.*

Getting smaller is the way to grow. Personal computer memory cards are shrinking, but they can hold more data than ever before and may soon attract a large chunk of the market away from floppy disk makers. These cards are not cheap — priced at about 100 times comparable floppies — but prices will fall rapidly as more players enter the memory card arena.

Demand for cards will shoot up in proportion to buyer's desire for portable computers. While desktop machines currently show no growth, notebooks and laptops are growing at a healthy 40% to 50%. — *Miniaturization: Key for the '90s, Paine Webber, Inc., Feb. 1, 1991.*

GUEST SPEAKER

John Robal, communications analyst, Alex. Brown, Baltimore:

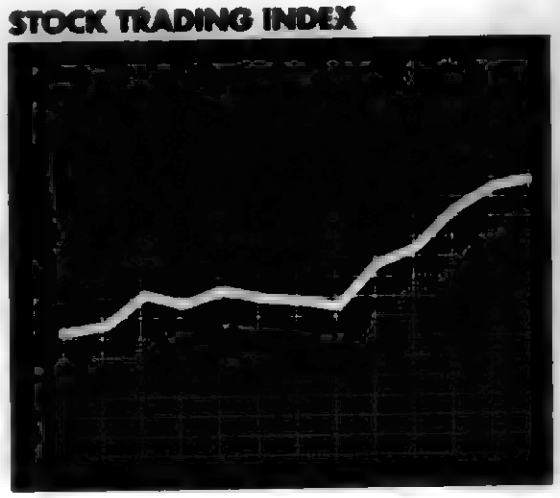
"The local-area networking, internetworking and wide-area networking markets will grow at different rates this year. LAN growth will jump between 25% and 35%, propelled by firms adding more nodes to existing networks. Smart-hub business appears ready to take off at 45% to 50%.

"Internetworking products, which let different kinds of LANs talk to each other, are fast moving now. In 1991, internetworking will grow by 50%, due to lots of firms installing new networks and connecting those already in place.

"However, people are confused about WAN technology, wondering whether to go with private or public networks and whether to use T3 rather than T1 lines. Buyers are also unclear about how and why to use frame-relay vs. packet-switching technology. Don't expect more than a 10% growth rate among WAN vendors."

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- IBM and Novell, Inc. gained points last week after signing a marketing agreement to put Novell's Netware in the hands of IBM sales agents. IBM soared 6⅝ points to 135¼ by Thursday; Novell climbed 1⅛ points to 47½. The pact may strain IBM's relationship with Microsoft Corp., which fell 2¼ points last week to 100¾.
- American Software, Inc., which makes financial and manufacturing packages, dove 4⅜ points to 12⅛. Early in the week, the company said it expects disappointing third-quarter earnings.
- Motorola, Inc. last week unveiled a wireless way to connect computers using radio waves. Its stock soomed up 2¾ points, ending Thursday at 58⅜..
- Other semiconductor firms stumbled. Intel Corp. and Western Digital, Inc. each suffered 2 point lapses, closing at 47⅛ and 4⅛, respectively.
- After hitting new highs early last week, Apple Computer, Inc. ultimately lost ⅝ of a point to 57⅛.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, FEB. 14, 1991

TOP PERCENT GAINERS

Alloy Computer Prod.	$0.40
Network Equipment Tech.	28.57
Unisys Corp.	28.09
On Line Software Int'l	21.05
MAI Systems Corp.	20.00

TOP PERCENT LOSERS

Western Digital Corp.	-31.37
Ariel Communication Corp.	-28.00
American Software Inc.	-26.52
Masstor Systems	-18.17
Isotron Systems Corp.	-12.50

TOP DOLLAR GAINERS

IBM	6.63
Motorolla Electronics	5.00
Symantec Corp.	4.50
3M Corp.	4.00
Microgate	4.00

TOP DOLLAR LOSERS

American Software Inc.	-4.38
System Software Assoc.	-3.25
Evans & Sutherland	-2.75
General Motors E (EDS)	-2.38
Microsoft Corp.	-2.38

Exch	52-Week Range			Feb. 14 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Up 2.08%
OTC	19.00	5.38	3 COM Corp.	9.63	0.13	1.32
NYS	69.75	52.50	American Info Techs Corp.	57.63	0.13	0.19
NYS	44.13	28.00	AT&T	33.88	-0.25	-0.73
OTC	9.63	0.88	Ariel Communication Corp.	2.25	-0.88	-28.00
NYS	56.25	39.50	Bell Atlantic Corp.	50.75	0.88	1.75
NYS	57.63	48.00	Bellsouth Corp.	53.00	0.88	1.68
OTC	18.38	8.25	Compression Labs Inc.	15.00	0.63	4.35
NYS	39.13	23.38	Comsat Corp.	38.00	0.50	1.33
OTC	4.50	1.75	Data Switch Corp.	4.13	0.50	13.79
NYS	28.75	8.88	Digital Comm. Assoc.	15.25	-0.75	-4.69
OTC	22.75	12.25	Dynatech Corp.	21.50	0.50	2.38
OTC	12.88	5.50	Fibronix Int'l Inc.	8.50	-0.25	-2.86
OTC	4.00	1.75	Gandalf Technologies Inc.	2.88	0.25	9.52
NYS	4.63	1.63	General Datacomm Inds.	2.75	0.00	0.00
NYS	34.13	23.50	GTE Corp.	30.38	0.00	0.00
OTC	7.00	0.61	Isotron Systems Corp.	0.88	-0.13	-12.50
NYS	60.88	40.25	ITT Corp.	57.00	2.00	3.64
OTC	44.13	17.88	MCI Communications Corp.	26.88	2.88	11.88
OTC	21.00	2.75	Microcom Inc.	5.00	0.13	2.56
NYS	34.38	4.00	Network Equipment Tech.	8.75	1.50	20.67
OTC	14.63	4.00	Network General	11.25	0.75	7.14
OTC	15.50	8.13	Network Systems Corp.	11.75	-0.50	-4.08
NYS	30.50	22.13	Northern Telecom Ltd.	30.13	1.38	4.78
OTC	51.25	16.75	Novell Inc.	47.50	1.50	3.26
NYS	88.50	67.00	Nynex Corp.	75.75	1.88	2.54
NYS	47.88	36.25	Pacific Telesis Group	42.75	-0.13	-0.29
ASE	11.38	4.75	Pairol Corp.	10.75	0.25	2.38
NYS	29.13	8.88	Scientific Atlanta Inc.	16.38	0.50	3.15
NYS	69.50	47.25	Southwestern Bell Corp.	58.00	0.63	1.13
NYS	46.38	29.63	United Telecom	35.63	1.13	4.39
NYS	40.50	33.38	US West Inc.	38.75	1.38	3.69
Computer Systems						Up 2.57%
OTC	8.75	0.56	Alliant Computer Sys.	1.00	0.00	0.00
ASE	16.88	10.00	Amdahl Corp.	16.00	0.00	0.00
OTC	61.50	34.25	Apple Computer Inc.	57.13	-0.63	-1.08
OTC	13.88	4.25	Archive Corp.	8.88	-0.13	-1.73
OTC	48.75	13.88	AST Research Inc.	44.75	-0.25	-0.56
NYS	6.88	3.88	Bolt, Beranek & Newman	6.63	0.50	8.16
NYS	19.38	4.50	Commodore Int'l	17.00	0.75	4.62
NYS	74.13	35.50	Compaq Computer Corp.	70.13	0.63	0.90
OTC	3.63	0.13	Computer Automation Inc.	1.25	0.00	0.00
NYS	21.63	6.75	Control Data Corp.	12.63	-0.13	-0.98
NYS	20.88	8.38	Convex Computer	18.13	0.25	1.57
NYS	53.25	20.00	Cray Research Inc.	41.75	0.13	0.09
NYS	13.25	3.50	Data General Corp.	9.25	0.75	8.82
NYS	3.88	0.75	Datapoint Corp.	2.00	-0.25	-11.11
OTC	27.38	8.50	Dell Computer Corp.	24.75	0.50	2.06
NYS	95.13	46.50	Digital Equipment Corp.	73.88	3.88	5.54
NYS	38.13	13.75	Harris Corp.	25.50	-0.38	-1.45
NYS	30.38	24.88	Hewlett Packard Co.	40.25	2.00	5.23
NYS	135.13	99.25	IBM	135.13	6.63	5.16
OTC	14.00	7.75	Information Int'l	8.75	-0.50	-5.41
OTC	23.50	10.50	Intergraph	19.25	-0.50	-2.67
NYS	3.13	0.50	MAI Systems Corp.	0.75	0.13	20.00
NYS	156.00	114.00	Matsushita Electronics	135.50	5.00	3.83
OTC	26.00	9.00	Mentor Graphics Corp.	17.00	1.38	8.80
NYS	62.88	44.50	NCR Corp.	91.88	2.88	2.94
OTC	30.50	11.00	Pyramid Technology	19.63	0.13	0.64
OTC	34.00	9.75	Sequent Computer Sys.	14.00	0.00	0.00
NYS	43.50	18.00	Silicon Graphics	39.38	3.38	9.38
NYS	30.25	14.63	Stratus Computer Inc.	27.63	0.13	0.46
OTC	37.25	15.00	Sun Microsystems Inc.	29.13	-1.38	-4.53
NYS	20.13	8.88	Tandem Computers Inc.	13.88	-0.63	-4.31
NYS	39.50	23.50	Tandy Corp.	32.13	-0.13	-0.39
OTC	35.00	8.75	Teradata	13.50	-1.75	-11.48
NYS	7.88	1.38	Ultimate Corp.	4.38	0.13	2.94
NYS	17.13	1.75	Unisys Corp.	3.63	0.75	26.00
ASE	8.25	2.00	Wang Labs Inc. (B)	3.25	0.38	13.04
Software & DP Services						Up 2.74%
OTC	50.75	17.00	Adobe Systems Inc.	42.25	2.75	6.96
OTC	43.25	18.75	Altus Corp.	40.50	0.25	0.62
OTC	24.00	11.00	American Mgmt. Systems	23.25	0.38	1.64
OTC	16.25	7.50	American Software Inc.	12.13	-4.38	-26.52
NYS	3.75	1.38	Answorp Inc.	2.75	0.38	15.79
OTC	23.00	10.00	Analysts Int'l	15.50	-0.75	-4.62
OTC	15.13	4.88	Ashton Tate	6.88	0.13	1.85
OTC	10.38	4.00	ASK Computer Sys.	6.88	0.00	0.00

Exch	52-Week			Feb. 14 Close	Wk Net Change	Wk Pct Change
NYS	65.25	45.25	Auto Data Processing	61.00	-1.63	-2.60
OTC	60.25	32.00	Autodesk Inc.	46.75	-0.50	-1.06
OTC	29.00	12.00	BGS Systems Inc.	29.00	3.75	14.86
OTC	42.50	17.75	BMC Software Inc.	38.25	-0.25	-0.65
OTC	31.50	11.00	Boole & Babbage Inc.	12.75	0.50	4.08
OTC	32.25	11.88	Borland Int'l	30.50	2.13	4.36
NYS	11.88	0.88	Businessland Inc.	2.38	-0.13	-5.00
OTC	15.50	4.38	Cognos Inc.	14.50	2.25	18.37
NYS	16.88	4.38	Computer Associates	10.00	0.50	5.26
OTC	17.75	7.75	Computer Horizons	14.50	-0.50	-3.33
NYS	59.88	28.75	Computer Sciences	58.63	2.13	3.76
NYS	12.25	6.63	Computer Task Group	9.75	0.50	5.41
OTC	26.25	13.00	Comshare Inc.	15.75	0.50	3.28
OTC	18.00	3.75	Corporate Software	8.50	-0.50	-5.56
NYS	47.00	29.75	General Motors E (EDS)	43.38	-2.38	-5.19
OTC	18.25	7.25	Goal Systems Int'l	16.50	-0.25	-1.49
OTC	4.75	1.88	Hogan Systems Inc.	3.75	0.00	0.00
OTC	9.75	8.50	Index Technology	8.88	0.38	4.41
OTC	16.63	7.75	Information Resources	15.88	1.63	11.46
OTC	17.50	2.63	Informix Corp.	4.88	0.00	0.00
OTC	7.88	1.38	Intelicorp Inc.	2.06	-0.06	-2.86
OTC	8.00	2.50	Interleaf Inc.	5.00	0.25	5.26
OTC	23.75	16.00	Knowledgeware Inc.	33.75	2.25	7.14
OTC	37.75	16.75	Legent Corp.	38.00	0.25	0.70
OTC	39.25	12.50	Lotus Development	23.00	3.50	17.95
OTC	32.00	13.63	Microgate	30.00	4.00	15.38
OTC	109.00	47.75	Microsoft Corp.	100.75	-2.25	-2.18
NYS	9.88	4.00	On Line Software Int'l	8.63	1.50	21.05
OTC	26.38	4.88	Oracle Systems	9.38	-0.75	-7.41
NYS	17.88	7.00	Parasophic Systems	11.38	0.00	0.00
OTC	7.38	1.25	Phoenix Technologies	6.75	0.00	0.00
NYS	50.50	31.63	Policy Management Sys.	46.88	-0.38	-0.79
NYS	23.63	11.50	Reynolds & Reynolds	19.25	1.88	10.79
OTC	16.13	6.88	Sage Software Inc.	8.88	-0.25	-2.74
OTC	23.25	14.75	SEI Corp.	22.75	0.50	2.25
OTC	18.50	12.25	Shared Medical Systems	17.38	1.00	6.11
OTC	38.00	12.50	Software Publishing Corp.	35.38	0.88	3.67
NYS	11.00	5.50	Sterling Software	10.75	0.63	6.17
OTC	28.00	9.50	Sungard Data Sys.	14.50	-0.25	-1.69
OTC	44.25	17.00	Symantec Corp.	42.00	4.50	12.00
NYS	24.88	4.50	System Center Inc.	5.50	0.25	4.76
OTC	37.25	12.75	System Software Assoc.	30.25	-3.25	-9.70
OTC	27.38	4.75	Wang Labs Inc. (A)	14.00	1.00	7.69
Semiconductors						Up 0.21%
NYS	25.88	17.88	Advanced Micro Devices	22.38	-0.25	-1.10
NYS	9.25	5.50	Analog Devices Inc.	8.63	-0.13	-1.43
OTC	23.50	5.25	Chips & Technologies	11.50	0.50	4.55
OTC	52.00	38.00	Intel Corp.	47.25	-2.00	-4.06
NYS	13.00	5.13	LSI Logic Corp.	8.50	0.50	6.25
NYS	16.38	6.75	Micron Technology	12.25	0.75	6.52
NYS	66.38	46.75	Motorola Inc.	58.88	2.75	4.90
NYS	8.88	3.88	National Semiconductor	6.50	0.25	4.00
NYS	44.00	22.50	Texas Instruments	40.75	0.50	1.24
OTC	12.25	3.00	VLSI Technology	7.88	0.88	12.84
ASE	14.88	4.88	Western Digital Corp.	4.38	-2.00	-31.37
Peripherals & Subsystems						Up 4.22%
OTC	2.38	0.00	Alloy Computer Prod.	0.19	0.06	58.40
OTC	2.50	0.88	Apertus Technologies	1.94	-0.06	-3.10
OTC	24.00	7.50	Banctec Inc.	10.25	0.13	1.23
ASE	9.00	4.13	Cognitronics Corp.	8.88	0.75	9.23
NYS	31.25	14.63	Conner Peripherals	25.75	-2.00	-7.21
ASE	22.00	7.00	Data Int'l Corp.	11.00	0.75	7.32
NYS	10.88	4.25	EMC Corp.	8.38	0.13	1.55
NYS	47.25	33.75	Eastman Kodak Co.	46.38	1.50	3.42
OTC	8.88	4.38	Emulex Corp.	8.13	0.13	1.56
OTC	34.50	14.00	Evans & Sutherland	20.75	-2.75	-11.70
OTC	8.25	3.25	Iomega Corp.	5.38	0.44	8.85
OTC	25.25	8.50	IPL Systems Inc.	25.25	2.75	12.22
OTC	2.06	0.13	Masstor Systems	0.88	-0.13	-18.17
OTC	17.00	2.63	Mentor Corp.	4.25	-0.38	-8.11
OTC	13.38	3.88	Micropolis Corp.	12.63	0.88	7.46
NYS	81.75	73.63	3M Corp.	81.25	4.00	4.58
OTC	14.50	6.00	Prestolite Inc.	9.25	0.25	3.13
NYS	21.25	8.50	QMS Inc.	19.13	0.63	3.38
OTC	26.75	10.25	Quantum Corp.	22.88	0.38	1.67
NYS	6.88	4.38	Recognition Equipment	5.88	0.13	2.17
OTC	9.88	4.00	Reuon Inc.	7.13	0.13	1.79
OTC	19.75	5.63	Seagate Technology	14.88	0.63	4.39
NYS	35.25	11.00	Storage Technology	30.38	2.25	8.00
OTC	4.00	0.31	Tandon Corp.	3.44	0.38	12.24
NYS	22.88	11.63	Tektronix Inc.	20.50	-0.25	-1.20
OTC	0.63	0.16	Televideo Systems	0.22	0.03	16.49
NYS	68.75	28.00	Xerox Corp.	63.00	3.38	5.68
Leasing Companies						Up 4.56%
OTC	18.75	6.88	Amplicon Inc.	10.50	-0.25	-2.33
OTC	4.38	0.31	Capital Associates	0.56	0.06	12.50
NYS	28.50	14.63	Comdisco Inc.	27.75	2.63	10.46
OTC	16.25	6.38	LDI Corporation	12.25	0.25	2.08
OTC	6.88	2.25	Sytsemcom Inc.	3.50	0.00	0.00

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Power play

FROM PAGE 1

but the down side is that users are saying [to IBM], 'You led me down a primrose path' with LAN Server," said Bill Conley, manager of information technology services at Loral Aerospace, Inc. in Newport Beach, Calif. "I could have been getting to know Novell a long time ago."

With an approximate 8% market share, LAN Server has been outdistancing Microsoft's shrink-wrapped LAN Manager (3%) and Banyan Systems, Inc.'s Virtual Networking Software (6%), according to Meta Group, Inc., a Westport, Conn.-based consultancy.

Tipping the scales

Blending Novell's 57% LAN market share with the might of the IBM distribution channel could tip the LAN market share scales more than a little. For example, some users questioned whether IBM's sanctioning of Netware will leave its long-term partner, Microsoft Corp., out in left field with its "open" OS/2 LAN Manager network (see story at right).

The vendors said that they plan to be able to provide for management of Netware under IBM's enterprise network manager, Netview, and to allow Netware communications protocols to pass through IBM's 8209 Ethernet-to-Token-Ring bridge.

In addition, the companies will team up to allow Novell to port Netware to 32-bit OS/2 and the RISC System/6000 computing platform by year-end 1992. The RS/6000's AIX operating system currently supports SNA protocols for homogeneous IBM networking.

Powerful lure

Even though growth rates are slowing, demand for office local-area networks translates into major revenue gains

Year	Revenue (in millions)	Growth rate
1986	$1,772.2	—
1987	$2,952.6	66.6%
1988	$4,675.6	58.4%
1989	$7,104.6	52.0%
1990*	$9,869.9	38.9%
1991*	$12,842.7	30.1%
1992*	$15,862.3	23.5%

Source: Market Intelligence Research Corp.
CW Chart: Doreen St. John

IBM said it will then provide a feature to allow Netware for OS/2 and the RS/6000 to interoperate with OS/2 LAN Server.

Phillip Gordon, manager of end-user computing at Charles Schwab & Co., a Novell user, said the relationship is significant for him because he is looking closely at Unix. "It's nice to know that if IBM provides Netware for the RS/6000, we can cosy up to IBM in the Unix market and move to Novell at the same time," he said.

Previously, IBM had touted OS/2 LAN Server as the network operating system of the future. Art Olbert, program system director of client/server computing at IBM, said that now, "the application choice will dictate which LAN IBM sells."

In positioning the products separately, IBM seems to be admitting that there is room in the market long-term for an alternative to LAN Server.

Concerns addressed

The joint distribution, licensing and support agreement addresses customer concerns about interoperability and enterprise networking. For example, Novell and IBM announced that Netware for the 16-bit OS/2 multitasking operating system is currently available and that MS-DOS and OS/2 clients can concurrently access OS/2 LAN Server and Netware servers.

The relationship "ratifies the decision of larger corporate clients to buy Novell networks," explained Phil Gilbert, a principal at consulting firm Gilbert and Associates in Pacific Palisades, Calif. "A lot of IBM users who bought Novell were uneasy about whether a big software migration might be needed down the line."

Senior Editor Patricia Keefe contributed to this report.

Netware pact leaves LAN Manager up in air

BY JIM NASH
CW STAFF

Microsoft Corp. had little to say about the alliance announced last week between IBM and Novell, Inc. However, the pact had many observers abuzz about the impact it will have on Microsoft's LAN Manager, which is licensed to IBM.

Although speculation about the alliance had been circulating for some time, "it's way too early to make an educated guess about the ultimate effect" on LAN Manager, said Mike Murray, Microsoft's network business unit general manager.

Network managers, resellers and analysts contacted said the effect on Microsoft could range from neutral to negative.

"This is probably a bad thing" for LAN Manager, said Steve Wigginton, project manager at U.S. Computer Services Corp. in Sacramento, Calif. IBM and Novell could force LAN Manager into a permanent disadvantage. Or, he added, Microsoft could hurt itself.

"Microsoft seems a little wishy-washy," Wigginton explained. "They say some LAN Manager pieces might go into Windows, some into OS/2. I'd just like to see a clear direction."

Many of those contacted last week dismissed the idea that IBM would do anything to shortchange LAN Server, its own licensed version of LAN Manager. Microsoft said work by both companies to converge the two products will not slow down.

Many network administrators — particularly those already sold on IBM — said they see little effect on them. "If anything," said Dale Miyasaki, personal computer specialist at Central Pacific Bank in Honolulu, "I think we will be even more likely to go with OS/2 LAN Server."

"If IBM is rallying behind Novell, nice for IBM. I think it's a terribly ridiculous move on their part," said Stephen Turner, technology consultant at Chevron Canada Corp. LAN Manager is superior to Netware and, in the long term, will overtake Netware in unit sales, he added.

Microsoft's "guiding thought" is that someday OS/2 will also be a network operating system, Murray said. Until that day, he said, Microsoft will examine which LAN Manager features will be moved onto OS/2.

Other observers are focused more on the present, with fresh memories of abrupt Microsoft moves and even a miscue or two. "As a practitioner of networking who specializes in LAN Manager, I am a little nervous," said Richard Westerman, president of Houston-based consulting firm Westerman and Associates.

Rocky road

It has been a bumpy couple of months for Westerman and other 3Com users. 3Com acknowledged that its 3+Open product was not selling and handed the LAN Manager-based network operating system over to Microsoft last month. Earlier this month, Microsoft said it remained committed to OS/2 but clearly indicated that its own intentions are focused on its Windows 3.0 graphical user interface for DOS and a future version of OS/2 designed for a range of hardware platforms.

Miyasaki said he sees some contradiction in IBM marketing its PC networking product alongside its chief rival, Netware, but that would not be the first time for such a situation. He said IBM markets banking software produced by competitors next to its own programs.

The true effect of the move could be on new accounts for IBM or for companies looking to bring in a new network operating system. IBM, which will market, service and support Novell's Netware 286, 386 and V. 3.11 lines, may give LAN Server a lower priority in sales calls, said Bill Whitlow, securities analyst at Gallagher Capital Corp.'s Seattle office.

Vines, Stargroup LANs to interoperate

File- and print-sharing and E-mail exchanges available between the two

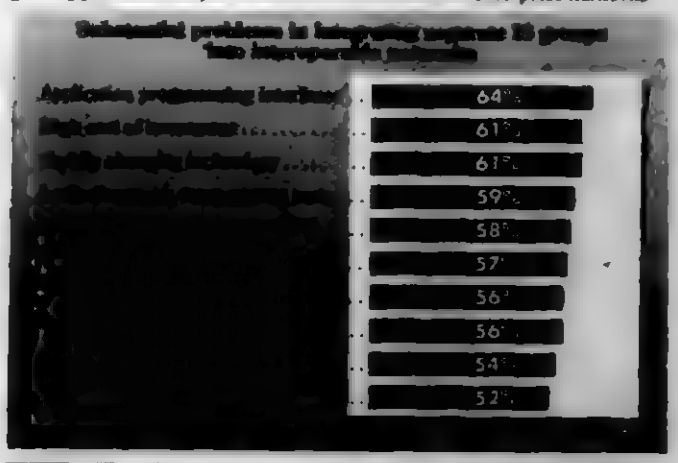
BY JOANIE M. WEXLER
CW STAFF

BOSTON — Users of Banyan Systems, Inc. Virtual Networking Software (Vines) and AT&T's Stargroup LAN Manager local-area networks will be able to interoperate on several levels, according to statements issued by the two vendors at last week's Networld show.

The companies said products that allow file- and print-sharing and electronic-mail exchanges between the two networking environments are immediately available. In addition, Banyan's Streettalk global naming service — which has given Banyan an edge in the enterprise network market — can now reportedly straddle both LANs.

Woe is me!

Large end-user companies agree that they face multiple problems in integrating personal computer local-area networks into enterprise networks



Source: Business Research Group
CW Chart: Paul Mock

In addition to these applications, Oracle Systems Corp. databases can be accessed from both networks by "buying a SQL bridge from Oracle and Transmission Control Protocol/Internet Protocol options from Banyan and AT&T for their respective systems," said Bill Johnson, Banyan's director of business development.

E-mail appeal

Johnson indicated that the LAN Manager/Vines interoperability may appeal to users who like Banyan's naming and mail systems but shy away from dumping existing Stargroup investments. One analyst, however, said this will probably be rare.

"I don't see a lot of need for Vines and Stargroup interoperability," commented Frank Michnoff, a program director at Meta Group, Inc., a Westport, Conn.-based consultancy. "AT&T simply doesn't have much of a LAN presence, despite the fact that it has good products."

Michnoff said that there is some synergy between the two firms and that it makes sense for AT&T not to put all of its networking eggs into one LAN Manager-based basket. "Microsoft [LAN Manager's original architect] is talking about adding functions found today in LAN Manager, such as security, fault tolerance and multiprocessing, to the OS/2 operating system itself," Michnoff explained. "LAN Manager will sit on top of it but may become more of a utility layer. Providing interoperability with Vines is a way not to get stuck out there all by yourself."

Vines will now run on AT&T's Intel Corp. 1486-based Starserver E and Starlan 10 Extended Industry Standard Architecture platforms. Simple Network Management Protocol support and Vines hooks to AT&T's Accumaster enterprise network management system were demonstrated at Networld but have not yet been formally announced.

A commitment that was made last spring to provide interoperability between Vines and Microsoft Corp.'s OS/2-based LAN Manager has yet to be fulfilled, and Banyan would not say when integration of the two environments would be completed.

NEWS SHORTS

NCR pleads with FCC

Tossing yet another obstacle in the way of AT&T's hostile takeover attempt, NCR Corp. filed a petition with the Federal Communications Commission last week asking for an "immediate investigation" into AT&T's proposed $6.1 billion acquisition. In its petition, NCR argued that acquiring and operating NCR's computer business would strain AT&T's investments in its regulated telecommunications business.

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Packer heads Bankers Trust group

Bankers Trust Corp. named former MAC Group consultant Michael Packer to head its centralized Technology Strategic Planning group last week. He is responsible for information systems architecture planning, global networks and human resources issues for the bank's 1,400 IS employees worldwide. Packer replaces Geoff Penney, who became technology chief at a Bankers Trust business unit. Packer reports to Chief Technology Officer Carmine Vona.

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Fujitsu pairs with Systems Center

Systems Center, Inc. added Japanese computer vendor Fujitsu Ltd. to its list of joint development partners last week. According to Systems Center general marketing manager Michael Matthews, the two companies will integrate Systems Center's IBM network management platform, Net/Master, with Fujitsu's Compo-I management platform so users will be able to run the same management applications across both systems. Users will be able to extend those applications to Tandem Computers, Inc. hosts as well, as a result of a similar development agreement between Tandem and Systems Center, Matthews said. The first fruits of the Fujitsu Systems Center agreement are set to ship in Japan in the third quarter.

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Disk capacities hit 2G bytes

Fujitsu America, Inc. announced last week hard disk drives that it said will beat the highest capacity Winchester drives available when they ship next quarter to OEMs and value-added resellers. The 2G-byte, 5¼-in. M2652 drives, which start at $5,995, are intended for use in systems ranging from high-end personal computers to supercomputers. They offer an 11-msec average seek time and a drive transfer rate of 4.7M byte/sec. The drives are available in Small Computer Systems Interface 2 and Intelligent Peripheral Interface 2 configurations.

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EDS lands outsourcing contract

Electronic Data Systems Corp. (EDS) last week announced a 10-year outsourcing contract with Sunnyvale, Calif.-based Sigsetics Co. The contract is worth approximately $100 million, according to the company. EDS will manage the firm's 20,000 sq-ft data center and will also use the center to provide services to Ask Computer Systems, Inc. EDS was a major equity partner in Ask's acquisition of Ingres Corp.

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Butler retires from Microsoft

Microsoft Corp. announced last week that Jeremy Butler, senior vice president of international and OEM business, will retire June 30. Butler, 47, joined the company in 1985, and prior to joining Microsoft, worked at Cognos Corp. Microsoft vice presidents who handle international businesses will now report to President and Chief Operating Officer Mike Hallman.

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Wireless LAN debuts

Motorola, Inc. has turned the wireless local-area network technology announced last fall into a microwave-based Ethernet-compatible product dubbed Altair. Altair consists of a user module, which connects up to six Ethernet devices via thin coaxial cable and transmits data through the air to a centrally located control module. Users contend for transmission access through the user module just as they would contend for bandwidth on a cabled Ethernet. A 30-user Altair network costs $715 per port, excluding the cost of the Ethernet card that goes into Ethernet-attached devices.

Apple enhances Mac portable

Users skeptical; criticism concerns weight, readability and price

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. embellished the features and slashed the prices of its slow-selling portable last week, but users said the long-overdue upgrade still falls short, because it leaves the machine's bulky weight unchanged.

The enhancements reflect 1½ years of mixed reviews for the 15-pound machine, which has been criticized as too expensive, too heavy and too hard to read. The upgraded portable "is the machine they should have had out two years ago," said William Walker, manager of business planning at Pan American World Airways in Rockleigh, N.J. "And at 15 pounds it's hardly a portable; it's more of a draggable."

Apple officials continue to downplay the weight issue, however, by promoting the portable as a transportable machine rather than a truly portable unit. "Our focus was on making the technology and price more competitive," said spokeswoman Kate Paisley, who would not indicate whether Apple was working on a slimmer model of the machine.

Illuminated screen

The new model's most salient feature is the addition of backlighting, which makes the screen easier to read by shining light in it from behind. The backlit feature also adds faster response for better mouse tracking and higher contrast.

> "OUR FOCUS WAS on making the technology and price more competitive."
>
> KATE PAISLEY
> APPLE COMPUTER

The portable will offer the same sealed lead-acid batteries available on the older models, but the energy required for the backlit screen has forced Apple to downgrade the operational time of the batteries to three to six hours rather than six to nine hours, Paisley said.

Apple also added an extra 1M byte of random-access memory to the portable to allow it to run System 7.0, the Macintosh operating system update expected later this year.

The portable will offer both 2M bytes and 4M bytes of RAM instead of the earlier version's 1M byte of RAM. Both of the newer models offer a 40M-byte hard disk drive. In addition, the portable can accommodate up to 8M bytes of memory when configured with third-party RAM cards. A 2M-byte version of the portable will cost $4,199, down from $5,499. The 4M-byte version will sell for $4,699.

Apple officials said they will also offer a $1,095 dealer-installable upgrade package that retrofits current owners with the same backlighting available on the new model.

Liberty

FROM PAGE 1

60% of Liberty Mutual's older applications run on IBM platforms, more than three-quarters of new applications run on servers, minicomputers or workstations from other vendors.

The IBM mainframe, however, remains an important part of Liberty Mutual's IS strategy. In fact, the firm installed an IBM Enterprise System/9000 Model 720 in its Portsmouth, N.H., data center three weeks ago. Two 3090-400E models were traded in, but two additional 400Es remain.

Displacing IBM "would not be consistent with the multivendor approach," said David Sluyter, a project leader in IS research and development. "And there are still things that IBM does better than everyone else, like transaction processing for claims."

Liberty Mutual's break from insurance industry tradition began in 1985 with the arrival of 29-year-old Maryann P. Burke as vice president of IS. Two years later, Burke hired Grady, a financial services IS veteran who had gone to work for DEC, to help lead the move to multiple vendor platforms.

Grady "began to advocate a much more open-minded approach," Sluyter said. "He has been a forceful advocate of change, and the compelling argument is price/performance."

Grady said it is hard to quantify the benefits of the strategy because "as fast as the price/performance increases, the appetite for performance increases."

Examples of Liberty Mutual systems running on non-IBM platforms include the following:

- Applications on the Apple Macintosh for employees selling Liberty Mutual products to businesses. The firm has more than 4,000 Macintoshes in the U.S.
- A DEC VAX-based report generator with a Macintosh front end.
- Applications development work on Sun Sparcstations.



> "I CAN DEMONSTRATE concretely that we've saved the company money in some cases."
>
> MARYANN P. BURKE
> LIBERTY MUTUAL

- Relational databases with more than 100G bytes of data running on a Teradata 1012 machine with access from IBM, DEC and Apple platforms.

Burke, now senior vice president of IS, hesitated to call the company's direction "downsizing" but rather "sizing solutions appropriately to the business problems."

Although the firm will not disclose specific dollar figures, Burke said she "can demonstrate concretely that we've saved the company money in some cases and have used that to invest in more applications."

Multivendor does not mean any vendor. Liberty Mutual has standards for user interfaces, information architectures and network architectures that vendors must comply with.

"Unix is a tool that gives us vendor compatibility and flexibility, but it's not a key of our strategy," Grady said. "We don't have a religious fervor for open systems; we can get business benefits long before there is binary compatibility across platforms."

Nonetheless, the company's direction toward open systems stands out in the insurance industry, which lags behind others on the issue. Only 21% of 36 insurance industry IS executives surveyed by Index Group, Inc. last fall said they are moving to open environments in the next two to three years, compared with 33% of 394 IS executives in all industries.

Competition

FROM PAGE 1

much better way of selling a spreadsheet than through a two-page, four-color magazine spread," he added.

But how well have the plots to create a *microburst of market* momentum really worked? Probably not as well as vendors think.

"We're not going to realign our corporate strategy just because [a software vendor] is having a special deal for two months," said John Robinson, director of corporate information systems at Cox Enterprises, Inc. in Atlanta.

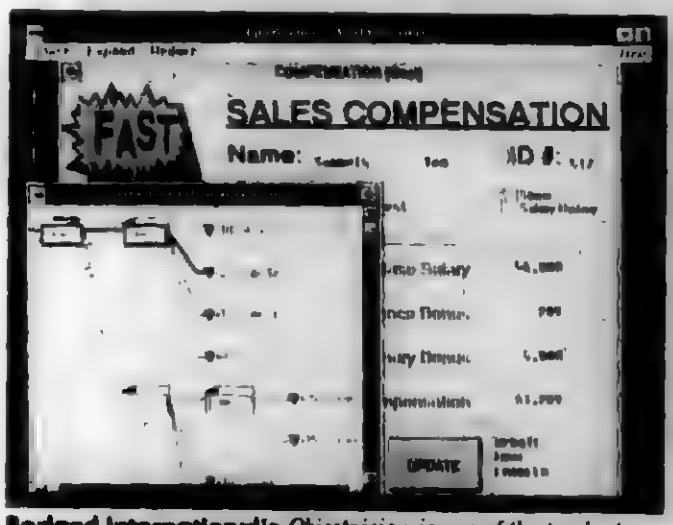
Vendors said underpricing, at least in a product's early days, will continue to be an integral part of their marketing game plan. "It's a way to capture attention early," said Spencer Leyton, senior vice president of business development at Borland. "We want to take the price out of the decision equation."

However, vendors wave away speculation about the death of the $500 software package, saying they cannot afford to indefinitely bloody others' noses financially. "Long-term, it would be a pretty dead-end strategy," said Scott Oki, senior vice president of sales, marketing and services at Microsoft. "We couldn't afford to continue to invest heavily in research and development by giving away software."

Borland, which set the tone for cost cutting with its $99.95 promotion of Quattro Pro, said the promotion has been so successful it is being continued indefinitely. "As long as there are Lotus users out there who haven't upgraded to Quattro Pro, the program will be in place," company spokeswoman Catherine Miller said.

Whether short- or long-term, promotional price cutting seems destined to become a traditional component of future marketing plans, and that has made users very happy. "It's OK with me if they knock each other out," said Steve Birgfeld, manager of the product evaluation unit at Martin Marietta Information Systems in Chantilly, Va. "In the long and the short run, we're the winners."

One element that does get hammered by the vendors selling direct is the dealer channel, which is often regarded as unwieldy, if not downright inept.



Borland International's *Objectvision is one of the products receiving cut-rate pricing in current software promotions*

"None of [the price cutting] would happen if it wasn't for the historical incompetence of the reseller channel," Tarter said.

While vendors' margins may suffer from the lower price offered through direct mail, they are saving big money in marketing costs.

The result is that vendors have played fast and loose with bottom-line pricing:

- Through the end of April, Lotus will give a free copy of the $495 Ami Pro word processing package to buyers of the $695 1-2-3 Release 3.1 spreadsheet.
- For the next 10 weeks, Microsoft will charge only $129 for an upgrade to either Microsoft's Word for Windows or its Excel Version 3.0 spreadsheet for users who say they are currently using another word processing or spreadsheet product. The suggested retail price of the products is $495.
- Borland has set a retail price of $495 for its Objectvision package for Windows but will charge only $99.95 through May 31.

The moves follow a successful precedent. Part of the enormous success of Microsoft's popular Windows 3.0 graphical user interface is because of its price — now less than $100 at most retail outlets.

Microsoft has long promoted Windows through low pricing and bundling with hardware.

Lotus enhances Notes, buys top E-mail firm

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. rolled out Release 2.0 of its Notes groupware product last week along with a program to get smaller starter packages of Notes into users' hands.

Lotus also announced plans to purchase privately held CC:Mail, Inc. for an estimated $25 million. Not only is CC:Mail's namesake electronic-mail package the leading E-mail package for personal computer users, but it also has overlap with Notes users.

Lotus said it will provide a mail gateway between Notes and CC:Mail. It also plans to synchronize directory services between the two, possibly settling on a single directory. Lotus added that it would support X.400, X.500 and X.25 standards in addition to IBM's Systems Network Architecture.

In addition, plans are in the works to move Notes to Apple Computer, Inc.'s Macintosh.

The additions to Notes are timely, given that the package is starting to draw the attention of would-be Officevision users following the latest setback for IBM's office environment. Officevision LAN Release 2.0 has been delayed indefinitely.

June Rokoff, vice president of Lotus' Communications and Information Services Group, said most of these users are looking at Notes as a complement to Officevision or similar systems.

Release 2.0 provides enhancements in five key areas: better connectivity and integration of remote laptops; expanded imaging capabilities, including support for IBM Super Video Graphics Array-compatible displays; applications integration with Microsoft Corp.'s Dynamic Data Exchange (DDE) and Object, Linking and Embedding (OLE) standards; enhanced security; and improvements to database management and network administration.

Engineering Notes

Notes can now import large bit-mapped files, paving the way for users to bring engineering drawings, documents and scanned pictures into its environment. Support for DDE and OLE means users can set up active links between Notes and other programs that support OLE.

Security was "a giant issue" with users, but the "biggest heat we took" on the first release of Notes was the lack of a smaller starter package for firms that wanted to test it or take a slow route to growth, Rokoff said.

Lotus has no plans to decrease its standard $62,500 per 200 users offering.

There are no plans to merge CC:Mail into Notes. The pending purchase positions Lotus well in the hot E-mail market, analysts said. "Lotus gets more bang for the buck from CC:Mail than it did for the $65 million purchase of Samna Corp.," said Nancy McSharry, an analyst at International Data Corp. in Framingham, Mass.

DEC to brave retail PC market again

BY MARYFRAN JOHNSON
CW STAFF

Digital Equipment Corp. is racing toward a showdown with its old nemesis: the retail channel for personal computers.

DEC officials confirmed last week that they are signing a series of new PC distribution agreements and preparing major marketing and sales efforts to draw attention to their PC multivendor integration abilities.

Among those efforts are plans to become a "major vendor" in the laptop market with the introduction, possibly later this year, of a DEC laptop computer running the MS-DOS operating system, a company spokesman said.

DEC President Kenneth H. Olsen "probably spends more time with our organization than any other in the company," said William Stowe, who manages consultant and analyst relations at DEC's PC business organization. "He is very enthusastic about what we're doing with PCs and PC networking."

Last week, DEC introduced another round of its "Pathworks" PC networking products, including internetworking products that allow users to run both Novell, Inc. Netware and the LAN Manager-based Pathworks client services concurrently from their DOS-based PCs.

"DEC has recognised that PCs and PC LANs are a vital part of its future," said Kevin O'Neill, vice president of research at Business Research Group in Newton, Mass. "They are positioning themselves with the right product to nicely dovetail the leading PC LAN environments into their robust Decnet environment."

Since 1988, DEC has sold PCs manufactured for it by Tandy Corp., but that relationship will be changing as well. "In the future, we may be developing PCs which have less of a Tandy content," Stowe said.

Analysts familiar with DEC's plans said the vendor cannot make money in the PC channel unless it starts buying subcomponents and doing the final assembly itself.

"I know DEC is desperate for new sources of revenue, but I wish them luck. It's an incredibly cutthroat business," said Dave Passmore, a network analyst at Ernst & Young in Fairfax, Va.

If DEC could break into new accounts with its own PCs, that could open the door to selling DEC Pathworks networking products and VAX/VMS server platforms, Passmore said. "It would create more demand for VMS, which is what Pathworks runs with," he noted.

Today, DEC sells about 35% of its PCs through indirect channels and the remainder through its own sales force. "We want to reverse those numbers," Stowe said.

The one channel DEC will not touch, however, is mass merchandising.

"You won't be walking into a K Mart or a Lechmere to buy a DEC PC," Stowe said. "But we are looking at some kind of retail channel through major outlets — maybe a Computerland or Businessland, although we haven't reached any conclusions yet," he added.

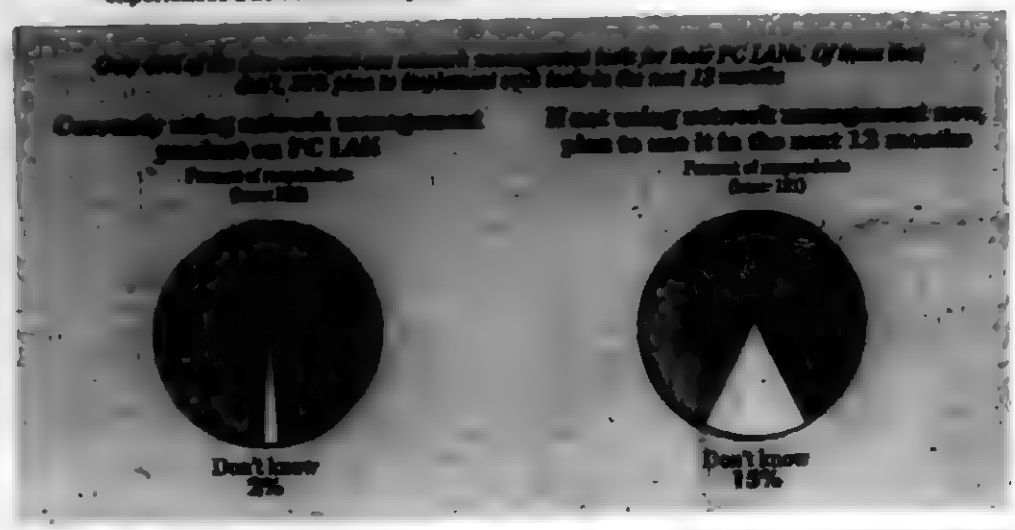
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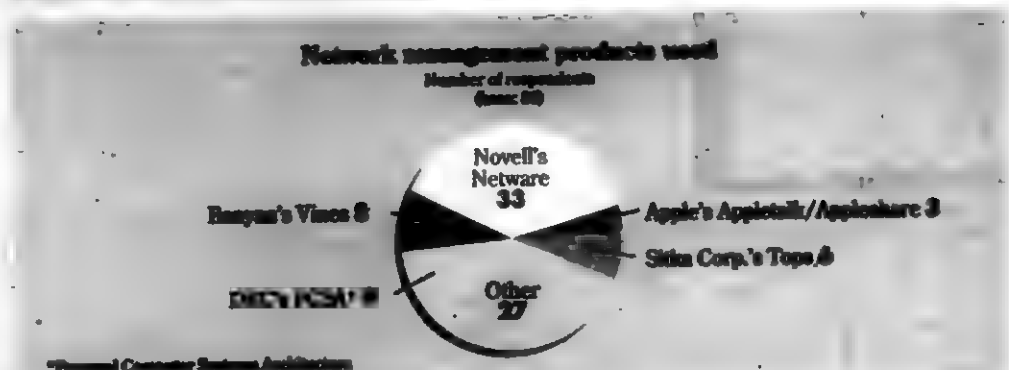
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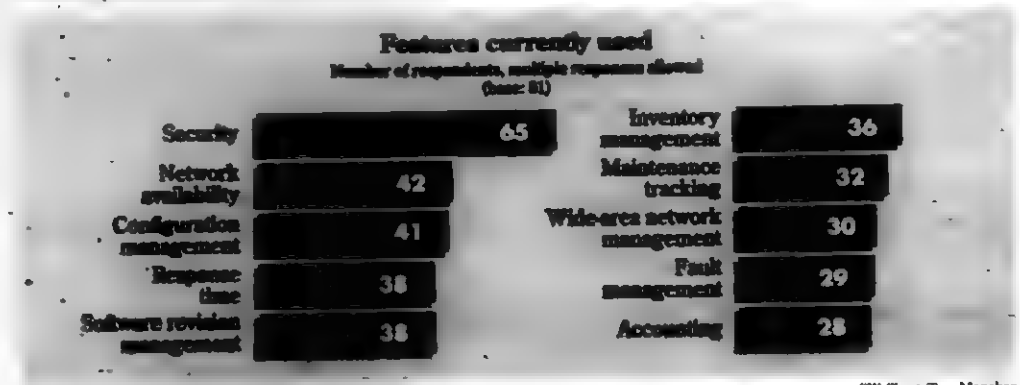
TRENDS

PC LAN Network Management

Sites with personal computer-based local-area networks are still in the early stages of introducing formal network management practices. Less than half claim to use any type of network management tool, but this is expected to increase as the PC LAN market experiences a 28% to 35% compound annual growth rate over the next five years







Source: Business Research Group, Newton, Mass.

CW Chart: Tom Monahan

NEXT WEEK

A new monthly feature in Manager's Journal, *The CEO View*, kicks off with an in-depth look at the technology philosophy of Federal Express CEO **Frederick W. Smith.** According to Smith, information technology is "the single most important element" that made Fedex the first services firm to win a Malcolm Baldrige National Quality Award.



George Lange

It has been said that everything is relative, and in databases, almost everything is relational — or going that way. Product Spotlight examines strategies for breaking down the walls between relational and nonrelational worlds and list recently shipped products. Buyers' Scorecard provides user ratings of top relational database management systems.

INSIDE LINES

No duplication on Portable OS/2

IBM Personal Systems executive Lee Reiswig, assistant general manager of programming, emphatically denied a published report last week that said IBM is working on a portable version of OS/2 designed to run on the RISC System/6000 separate from Microsoft. "There's zero truth to it," he said. "We are putting a team in place in Redmond, Wash., to work with Microsoft on Portable OS/2," he conceded, but added, "I don't have any efforts in place" to develop a separate version of Portable OS/2."

Can you say, 'A day late, a dollar short'?

Look for a major IBM statement of direction on systems software, including OS/2, Officevision, Systems Application Architecture and Microsoft's Windows, possibly in March but no later than June, sources in and close to IBM say: IBM apparently underestimated the need to respond to the Microsoft statement of direction on Windows, analysts say. Among the issues the announcement is expected to cover are: how IBM is positioning OS/2, its position on Windows and the unbundling of OS/2 Extended Edition.

Taking a shine to consolidation

More data center consolidations may be in the offing at Bankamerica. IS chief Marty Stein says the bank is heartened by the results of closing its Hong Kong data center last year and is studying consolidation possibilities for its five data centers in the U.S. He says he expects to make a recommendation to the bank by the end of the first quarter.

Dare we mention fault tolerance?

Not unlike the Loch Ness Monster, Novell's System Fault Tolerance Level III (SFT III) continues to make unexpected and fleeting appearances. A source at American Airlines who is "extremely anxious" about the development of network management goods says he recently saw a working version of SFT III. The long, long, long-awaited product reportedly mirrors entire servers rather than mere disks. A Novell spokesman has hinted that SFT III, now being beta-tested, could be released as early as this fall.

Nothing to write home about

After acquiring 3+Open last month from 3Com, Microsoft started crowing about having the rights to Demand Protocol Architecture (DPA). DPA, developed by 3Com, enables servers to load multiple protocols on demand. Despite Microsoft's "scoop," a source at 3Com noted that the essential DPA has been a part of LAN Manager since 1987, when 3Com licensed the network driver interface specifications to Microsoft.

They just put it together for fun

Wang insists that the quad-processor, Intel-based I486 board that was shown to a select few at the recent Uniforum show in Dallas was *not* a new product. According to a Wang spokeswoman, it was simply a "demonstration of technology." Analysts say otherwise, however, predicting a Wang product with quad-processing capability will be announced soon.

Outsourcing beginning to pale

Add Occidental Petroleum and Norton to the list of companies that have considered outsourcing operations and decided to stay in-house. At Occidental, an internal committee submitted the lowest bid for consolidating and running data centers. Norton did not go through a formal bid process but does not see potential savings from outsourcing, IS chief John Wilkins says.

DEC seems to be having a little trouble learning how to be fiscally stringent. Company letterhead envelopes arriving in Computerworld staff mailboxes on Friday were addressed to reporters both present and departed, had the new 29¢ first class postage metered onto them and were sealed. They were also empty. If you can't rely on the mail, call News Editor Pete Bartolik for free at (800) 343-6474, fax what would be inside the envelope to (508) 875-8931, or avoid all loopholes and post it directly to our electronic mailboxes: Compuserve, 76537,2413; Prodigy, MHTS78A; and MCI Mail, COMPUTERWORLD.

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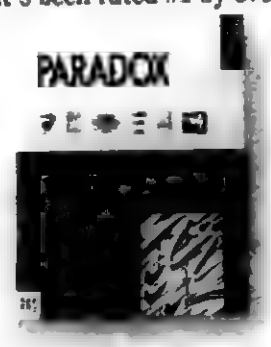
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COMPUTERWORLD

RISC standard at stake

Compaq/Mips alliance could hobble Sun

ANALYSIS

BY J. A. SAVAGE
CW STAFF

There is more on the line than just a simple OEM contract in Compaq Computer Corp.'s reported search for a reduced instruction set computing architecture. With two rival architectures battling it out to create an industry standard, analysts and industry executives said a move by Compaq to popularize RISC systems could prove decisive.

The rivalry rages between Sun Microsystems, Inc., the dominant workstation vendor, and Mips Computer Systems, Inc. If RISC technology were to migrate to the personal computer level, Mips Computer could "overtake or at least catch up to Sun," said David Brown, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Compaq is intent on developing RISC systems and is apparently close to signing up with Mips Computer, according to users and analysts who said they have received various hints from company officials (see story page 103).

Although Sun had reportedly been bidding for Compaq's allegiance during recent months, Sun Chief Executive Officer Scott McNealy earlier this month belittled the prospect of the PC vendor competing in his company's backyard. Compaq "can't out-engineer us, and they have no

Continued on page 103

Spring revamp set for AS/400

BY MARYFRAN JOHNSON
CW STAFF

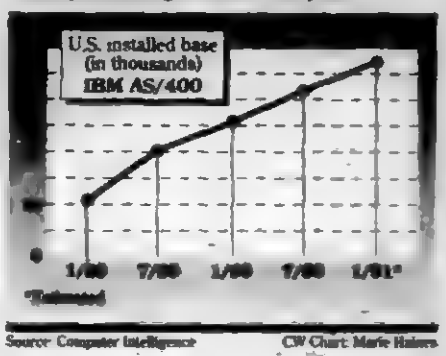
In late April, IBM mid-range customers will get their first look at a "completely refreshed" line of Application System/400s as well as a new version of the OS/400 operating system, according to industry sources and customers briefed by IBM.

The AS/400 D models, based on new CMOS chip technology, will replace the entire B line with a price/performance boost running as high as 35% on some models. At the top of the line will be a dual-processor model 2½ times more powerful than the top-of-the-line AS/400 B70, which IBM rates at more than 53,700 transactions per hour. The new models will be equipped with N-way architecture, enabling eventual growth to a six-way processor, sources said.

All of the new models are expected to be field-upgradable from the present machines, with IBM assuring compatibility for all applications.

Still going

The AS/400 continues to gain in popularity, showing threefold growth over two years



Source: Computer Intelligence — CW Chart: Marie Haines

The second version of the operating system will include multiprocessing capabilities and new features for higher availability as well as more cost-effective disk mirroring, according to customers familiar with IBM's plans. Also expected is the introduction of a new tape subsystem that takes advantage of 8mm helical-scan technology.

Some customers are watching for anticipated increases in software tier pricing with no small measure of dread.

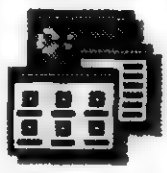
Rick Hollahan, network manager at Georgia-Pacific Co. in Atlanta, said users with the first version of OS/400 will not be charged for an upgrade to the second one. However, he said,

Continued on page 4

No user rush for Windows applications

BY JAMES DALY
CW STAFF

Windows 3.0 has been a gold mine for Microsoft Corp. since its introduction last May, but it has not yet generated a similar financial windfall for developers who built applications specifically designed for the graphical user interface.



However, resellers said the flock of so-called "killer" Windows applications expected by year's end could create a powerful slipstream that will draw in users who have bought Windows 3.0.

So far, most Windows users are apparently content to run their old applications under it. "The motivation to buy some of the new applications is just not there yet," said Steve Asche, director of sales and marketing at the Computerland Corp. retail chain in Pleasanton, Calif.

Users said their hesitancy stems from fiscal rather than emotional concerns.

"We've got a tremendous amount of money and training tied up in the older applications, so for now, we're stuck with them," said Ron McCarty, senior management consultant at Avis Car Leasing in Hunt Valley, Md. McCarty uses Windows 3.0 as a front end to a series of older DOS-based spreadsheet and

Continued on page 8

LAN users shun IBM's route to SNA connection

BY ELISABETH HORWITT
CW STAFF

IBM is expected to announce a key component of its local-area network integration strategy next month: an OS/2 version of its Advanced Peer-to-Peer Networking platform. However, few LAN users have bought into the peer-to-peer LU6.2 and PU2.1 networking protocols APPN rides on.

APPN is the basis of a distributed computing strategy that promises users transparent access to all of IBM's Systems Application Architecture computing resources across a multinode network. As APPN nodes, OS/2 servers will be able to act as intermediaries between OS/2 and DOS clients on their own LANs and other resources throughout the enterprise, IBM said.

However, many LAN users seem to eschew Systems Network Architecture backbone in favor of routers from companies such as Cisco Systems, Inc. and Wellfleet Communications, Inc.

Forrester Research, Inc. and Ernst & Young both estimated that SNA traffic over wide-area networks is growing at a rate of about 10% per year. However, they said, multiprotocol router traffic is doubling each year.

Continued on page 105

Parlez-vous ASCII? You may not have to!

BY JOHANNA AMBROSIO
CW STAFF

MOUNTAIN VIEW, Calif. — An Esperanto for the electronics age arrived last week when a group of computer vendors announced a coding standard to help computers speak many national languages.

The consortium, called Unicode, Inc., includes IBM, Apple Computer, Inc., Microsoft Corp., Sun Microsystems, Inc., Lotus Development Corp. and Xerox Corp. among others. The group will propose that its standard, also called Unicode, be adopted by standards organizations in hope that it has more success than the ill-fated Esperanto universal language.

However, users said, computer systems need to do much more than simply be available in different languages to be truly multinational. In areas from accounting to operating systems, users said, they have learned the hard way that software has to take into account legal, cultural and even religious differences to support companies' needs in different countries.

For now, though, the new coding standard may break through an important set of barriers. Currently, formats such as ASCII are based on 8-bit code and allow for 256 characters, although languages such as Japanese require many more.

Unicode is based on a 16-bit

Continued on page 6

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INSIDE



George Lange

The CEO View, a new feature on how top execs perceive information technology. This month: Fred Smith of Baldrige award winner Federal Express. Page 61.

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10 Alliant beefs up its RISC-based FX/2800 supercomputer and introduces a new family member, the FX/800.

12 SAS Institute's Application System will be spreading like wildfire to numerous Unix-based platforms by the end of this year.

14 Dell Computer gives in to pressure from local government and severs its ties with South African distributor Incorporated Data Systems, which does not fully meet certification statutes.

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105 Rather than posing a threat, IBM's ties with Novell are apparently strengthening some users' determination to stick with Banyan.

Quotable

"Common sense isn't very common and often makes little sense."

KEN MATEJKA
AUTHOR

From his book on managing and motivating employees. See book review page 63.

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EXECUTIVE BRIEFING

■ **Federal Express Chief Executive Officer Frederick Smith credits information technology with the highly rated service that won his company a Malcolm Baldrige National Quality Award. In the first installment of a new monthly series on CEOs' views of information systems, Smith says technology's goal should always be improved quality. He says he also believes in focusing technology spending on "high leverage points" where investments can be justified. Page 61.**

■ **A new IBM Application System/400 and midrange operating system** will be shown to customers this spring. The new D models are based on CMOS chip technology and boast price/performance increases of up to 35%. Some users, however, are concerned about paying more for new operating system licenses if they upgrade to more powerful models. **Page 1.**

■ **DEC goes back to the future** with new VAX 9000 mainframes customized for its traditional buyer base: technical and scientific users. This time, DEC is aiming to take sales away from Convex and Cray Research. **Page 4.**

■ **An international coding standard** has been proposed by a vendor consortium. The 16-bit standard allows coding in complex languages such as Japanese. But users in global corporations say software must also overcome cultural as well as language barriers to be truly international. **Page 1.**

■ **To get the most from your information technology investment** (and keep your job), you must know where your dollars are going. Consultant Peter G. W. Keen, in an excerpt from his upcoming book *Shaping the Future*, offers suggestions on how to tally *and* explain the real costs of upkeep and expansion. **Page 77.**

■ **Resolution Trust Corp. is admonished again** for its slow pace in developing information systems. A GAO official says the agency responsible for resolving the thrift crisis has failed to show how its systems will integrate. **Page 10.**

■ **Apple Chairman John Sculley** scoffs at the idea that Windows on IBM Personal Computers will threaten Macintosh sales. In a speech in Tokyo, Sculley said Windows indicates that the computer industry believes in graphical user interfaces. **Page 8.**

■ **Smaller IS shops in health care** may be ahead of their larger brethren in moving toward open systems. At a recent conference, larger mainframe-bound health care institutions were accused of suffering from "paradigm paralysis." **Page 61.**

■ **Opportunities for disaster recovery planners abound** as companies realize misfortune could strike them. **Page 90.**

■ **CASE growth in IS organizations** is slower than consultants expected, and improper training is one big reason why. **Page 100.**

■ **Companies are leasing used equipment** at substantially lower prices, according to the CDLA/Gartner Group 1990 leasing industry survey. **Page 96.**

■ **On-site this week:** Niagara Mohawk Power moves some applications from an IBM 3090 to an IBM LAN, where users can access data faster, cheaper and better. **Page 52.** Pick-compatible database management software from Prime helps Sacramento, Calif.-based Aerojet bid on a $1 billion space shuttle engine contract from NASA. **Page 29.** After four years of use, CASE technology is producing improved applications at Mass Mutual Life Insurance. **Page 29.** High tech meets ancient times in Brooklyn, N.Y., where a PC-based error-checking system scans hand-lettered Hebrew Torah scrolls to ensure their required perfection for prayer services. **Page 41.**

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DEC airs cheaper VAX 9000

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. is scheduled to announce five new, lower priced models of its mainframe VAX 9000 this week in a bid to attract more technical, scientific and government customers.

By stripping away additional memory, consulting services, storage adapters and the commercial instruction set, DEC produced a specialised server VAX 9000 aimed at users who now buy from Convex Computer Corp. or Cray Research, Inc.

Priced at $920,000, the VAX 9000 Model 110 is a $400,000 savings over the Model 210's price tag. The four models in the 300 series range from $1.4 million to $3.7 million.

"The [Model] 110 is still not inexpensive, though it certainly is an improvement over what you might be looking at with a fully loaded model," said Paul Stieman, associate vice president for computing and information services at the University of Pittsburgh.

With its diverse user community, the university could be a candidate for the commercial and server VAX mainframes, he said. "We continue to see our demand for mainframe services grow at 30% to 40% per year, even with the dramatic demand for PCs and workstations."

While DEC officials said VAX 9000 models are "broadening their market" rather than simply cutting the entry price point, some analysts were skeptical. "This is nothing but a repackaging exercise to get the price down," said Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn.

The new models should attract users looking to upgrade Vaxcluster performance with a less expensive machine, Schay added.

He said the move was an "appropriate one" for DEC to make with its VAX 9000 line.

Technical users with numerically intensive applications may have to add back in the memory that DEC stripped out, some customers said.

"Stripping memory may get the price down, but considering DEC's memory cost [of $1,695 per 1M byte], maybe this just opens the market for third-party vendors," said Jen Louie, a senior programmer/analyst at Synergy, Inc. in Washington, D.C.

As an engineering research and development contractor working primarily for the U.S. Department of Defense, Synergy had packed its VAX 9000 Model 210 "with a lot more memory than the base model," Louie noted.

The mainframe was destroyed in a freak flooding accident last November, however.

No excess baggage

By stripping out the commercial instruction set, vector processing, consulting service and storage adapters, DEC has created lower priced server models of the VAX 9000

SYSTEM	PRICE	
VAX 9000 Model 110	$920,000	128M bytes
VAX 9000 Model 310	$1.41M	128M bytes
VAX 9000 Model 320	$2.43M	256M bytes
VAX 9000 Model 330	$3.15M	512M bytes
VAX 9000 Model 340	$3.69M	512M bytes

CW Chart: Marie Haines

IBM enhances high-end tape drive capacity, discards 3380

BY ROSEMARY HAMILTON
CW STAFF

IBM trotted out a second generation of high-end tape drives last week that offer twice the capacity of the current 3490s and will eventually come with full support of IBM's fiber-optic channel architecture, Escon.

At the same time, the company announced the official death of the 7-year-old 3380 tape drives. Support for the commonly used A22 and B22 models will be withdrawn in May. IBM also announced two revamped releases of its system-managed storage software products.

Large system users contacted last week said the new 3490s, which IBM is referring to as 3490 Enhanced or E models, should provide a boost in tape management by reducing manual intervention. Because enhanced recording techniques will allow each tape cartridge to hold so much more data — up to 1.2G bytes — a user will be required to change tapes less often.

"This product has a lot of creative ideas, and it looks like someone thought a lot about it," said Tom Loane, vice president of information systems at Alamo Rent A Car, Inc. based in Fort Lauderdale, Fla.

There is one glitch that may hit users who are expecting to quickly move into the Escon world. Although IBM said basic Escon support will be available in June, the full-blown Escon features will not be available until sometime in the fourth quarter.

IBM said it will provide an Escon attachment in June, which will allow users to connect the tape controller to a fiber channel and achieve the greater distances that Escon provides.

However, IBM will not follow up with a feature that provides the faster Escon data transfer rates of 9M byte/sec. until sometime later in the year.

"There may be a perception that the I/O time will be cut in half, but that won't be the case until the fourth quarter," said Thomas Meehan, a vice president at Innovation Data Processing, Inc., which sells backup software for IBM MVS environments.

A key aspect of the new drives is IBM's continued use of its Improved Data Recording Capability, which was a standard feature with the older 3490s. This enables IBM to load cartridges with millions of more bytes of data and is a technique that most IBM competitors have not capitalized on as much, said Robert Abraham, a vice president at Freeman Associates, Inc., a market research firm in Santa Barbara, Calif.

"IBM appears to be a little more than a step ahead now," Abraham said.

Race to the tape

New IBM tape cartridge units offer twice the storage capacity and will double the transfer rate when full Escon support arrives

3490s	Price	Availability	Escon feature / Availability	Capacity per cartridge	Capacity per unit
Old A01	$56,400	Oct. '90	Fiber, distance/ June '91	600M bytes	28.8G bytes
New A10	$82,100	April '91	Fiber, distance/ June '91 9M byte/sec. transfer/4Q '91	1.2G bytes	57.6G bytes

Source: IBM

CW Chart: Paul Mock

AS/400

FROM PAGE 1

"the 'gotcha' is that if you're going from a model B50 to a D60, that performance increase will jack you into a new tier, and the pricing will get you there."

Users who keep their older models but move to the new version of the operating system will not be charged an upgrade fee, but a version of OS/400 expected in late 1992 will require upgrade fees from all customers.

"What we're discussing heavily with IBM is the issue of how long they're going to maintain the older version," said George Perera, group director of MIS at Ryder Truck Rental, Inc. in Miami and a member of the AS/400 Customer Advisory Council. Larger users are asking for at least one year of maintenance, while IBM wants to limit it to six months, Perera said.

"How they package it and price it makes a real difference to us," said Dennis Klinger, vice president of MIS at Ryder, which has a network of at least 100 AS/400s. "If this is a replacement line and you have remaining accounting life in [earlier models], you have to write those down, and it could mean a cost to you."

SOME CUSTOMERS ARE watching for anticipated increases in software tier pricing with no small measure of dread.

IBM has been fielding harsh criticism from some of its largest users about the reliability and uptime of the AS/400, Perera said. "The advisory council really hit IBM severely on the fact that availability, reliability, fault tolerance and quick uptime are the highest priorities we have on the AS/400," he said.

Another concern is the expense of disk mirroring, a capability IBM provided in a new release of OS/400 last August. This option proved to be too expensive for most users, Perera said, because it required the purchase of two machines to guarantee the uptime of one. "In OS/400 Version 2, there will be a more compact utilization of [direct-access storage device] for the disk, so IBM is addressing that," he added.

From an applications point of view, the new multiprocessing capabilities in OS/400 will present a single image to systems operators, with shared access to both memory and buses. When one processor is running at full capacity, work will be off-loaded to the companion processor by the operating system.

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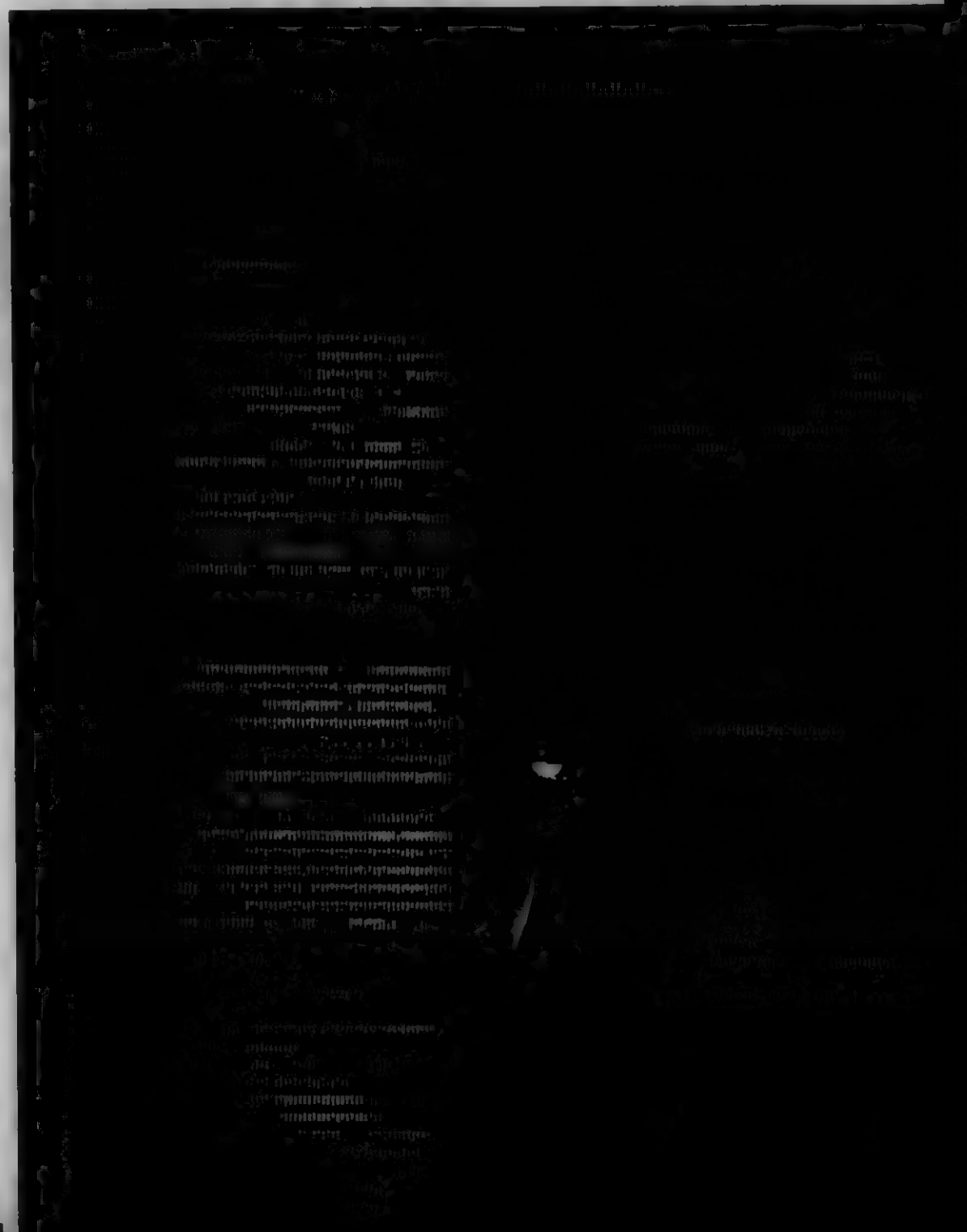
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NEWS SHORTS

Manny Hanny's Nyce to step down

Veteran Manufacturers Hanover Trust Co. information systems boss H. Edward Nyce will retire next year, the bank confirmed last week. Nyce joined the company in 1973 and was named executive vice president of information technology services in 1986. Nyce has not yet chosen a successor.

Weyerhaeuser group on the block

Inovin Interactive Technologies, whose flagship software product lets home improvement buffs design and spec projects ranging from simple shelves to decks and garages on-line in the lumberyard or hardware store, is on the block — a victim of corporate parent Weyerhaeuser Co.'s back-to-basics drive.

Microsoft redoes Office

Microsoft has begun shipping an updated version of its Office for Windows business applications package that includes its recently released Excel 3.0 spreadsheet. The Version 1.5 suite of applications also includes Word for Windows and Powerpoint and will sell for $995. Current Office users may upgrade for $129, while those who bought the package after Dec. 7 will receive the upgrade free, Microsoft officials said.

NCR to add terminal servers

NCR Corp. has signed a $60 million three-year contract with Xylogics, Inc. to incorporate Xylogics' Annex Three terminal server into the NCR System 3000 Unix-based computer. Terminal servers connect terminals or other devices to networks and allow them to access multiple computers. Annex Three, which was announced last week, supports Transmission Control Protocol/Internet Protocol (TCP/IP) and Digital Equipment Corp.'s Local Area Transport protocol.

IBM, Coopers pair on consulting

IBM and Coopers & Lybrand joined forces last week to create Meritus Consulting Services, a company that will provide management consulting services for consumer package goods and pharmaceutical/health care supplies companies. The two companies will share equal ownership of the new entity, which will be located in Greenwich, Conn.

Cognos releases OS/2 port

Cognos, Inc. announced that it is porting Powercase, its computer-aided software engineering (CASE) software, over to the OS/2 platform. The firm said the software is the first CASE tool integrated in both a fourth-generation language environment and ANSI-standard SQL relational databases.

Express to MCI

MCI International, Inc. has signed an agreement with Lotus Development Corp. that gives MCI development and marketing rights to Lotus Express. The communications software package allows users to receive and send messages, spreadsheets and documents and includes message management capabilities. MCI and Lotus, which retains ownership of Express, have co-marketed the product since 1987. Under the new arrangement, MCI will be responsible for supporting the product and will issue a new release of Express before year's end.

DEC backs protocol

Digital Equipment Corp. plans to announce today that it has joined six internetworking vendors in its support of the Intermediate System-to-Intermediate System (IS-IS) routing protocol, a proposed standard for TCP/IP and Open Systems Interconnect (OSI) networks. IS-IS allows network administrators to install routers from different vendors under one routing scheme that determines the paths taken by TCP/IP and OSI packets through the network simultaneously. DEC will reportedly be conducting IS-IS interoperability tests with other router vendors supporting IS-IS.

More news shorts on page 104

Write-once technology still too costly for most

BY MAURA J. HARRINGTON
CW STAFF

Rick Harley made the switch about one year ago, moving from magnetic disk drives to write-once compact disc/read-only memory (CD-ROM) storage.

"We had so much paper, we were buried in it. Now we store almost 100G bytes of data on write-once CD-ROMs, using Windows 3.0 as our front-end filing system format," said Harley, information systems manager at Complete Health Co. in Birmingham, Ala.

Write-once technology is becoming increasingly popular for IS shops and software companies that can afford the higher costs or for whom cost is not as important as having access to write-once CD-ROM drives. Still, even those users need improved standards, such as a compatible user interface from disc to disc, said analyst Bob Katzive, vice president at Disk/Trend, Inc., a market research firm based in Los Altos, Calif.

To that end, the CD Write-Once Ad-Hoc Division — also known as the Frankfurt Group — is expected to introduce write-once CD-ROM specifications at next month's Microsoft Corp. CD-ROM conference. Those specifications could set guidelines for allowing users to write to a CD-ROM, said Fred Meyer, president of CD-ROM manufacturer Meridian Data Corp., who sits on the newly formed standards committee led by Sony Corp. and Philips Telecommunications N.V.



1989	375,000	21.6M
1990	560,000	23.6M
1991*	750,000	26.2M
1992*	1,100,000	29.1M
1993*	1,600,000	32.5M

Source: Helgerson Associates, Inc. and International Data Corp.

Write-once CD-ROM technology is a method of producing customized prototype or very small-volume CD-ROMs instead of stamping the more generic information onto a disc, as is done with the mass-produced CD-ROM discs found in retail stores, Katzive said.

While the cost of write-once CD-ROM technology has fallen from $100,000 to about $40,000 for a customized in-house production system in the past year, Katzive said, it will nevertheless be at least five years before IS managers find write-once technology inexpensive to use because of standards problems.

The Frankfurt Group's standard specifications would allow users to write data to the CD-ROM in sections or blocks rather than all at once, Meyer said. This would be an addition to the International Standards Organization's "Orange Book" specifications — CD-ROM standard specifications written a few years ago by the High Sierra Group, he added.

"Our main objective is to make writing to a CD-ROM as seamless to the end user as writing to a floppy disk is today," Meyer said. "I think that we are about a year away from that goal."

However, Katzive and analyst Kathryn Hilton at San Jose, Calif.-based Dataquest, Inc. said other issues must be addressed before producing write-once CD-ROMs in the back room of the IS shop becomes commonplace.

"CD-ROM technology is growing, but it is still too expensive, and there are not enough standards established yet to make it a mainstream product," Hilton said.

ASCII

FROM PAGE 1

system, allowing for 65,536 characters to be represented. So all the characters of all the languages of the world will be able to have their own computerized code. Thus far, Unicode has defined 27,000 characters.

There are problems, however. For one, the 16-bit system requires more memory and storage capacity than did the 8-bit systems.

Also, Unicode is practical for the development of new software but requires translation to work with the installed software base. To that end, the group has compiled a database of conversion tables between Unicode and other character encoding standards such as ASCII.

Hard to account for

Because they are by nature complex, accounting systems are especially tricky in a multinational environment. They have to handle the legal requirements of both the country being reported on and the country the corporation is based in and support multiple currencies as well as things such as hyperinflation.

JoBette McCann, vice president of systems and development at LBI Trading, Inc. in New York, recalled the problems she encountered at Paine Webber, Inc. when the securities firm was implementing a global trading system.

Each country had its own accounting system, McCann said, so everything was done manually and shipped back to headquarters.

"It was labor-intensive and created redundant data," she said. Even seemingly simple things were difficult, such as the size of the fields used to enter data. "They weren't large enough to accommodate some currencies," she said.

Cultural and religious practices also need to be considered. In countries where polygamy is legal, just one allotted space under "spouse" will not do.

Also, in Middle Eastern nations, it is considered unconscionable to charge interest, so that item is best left off the balance sheet.

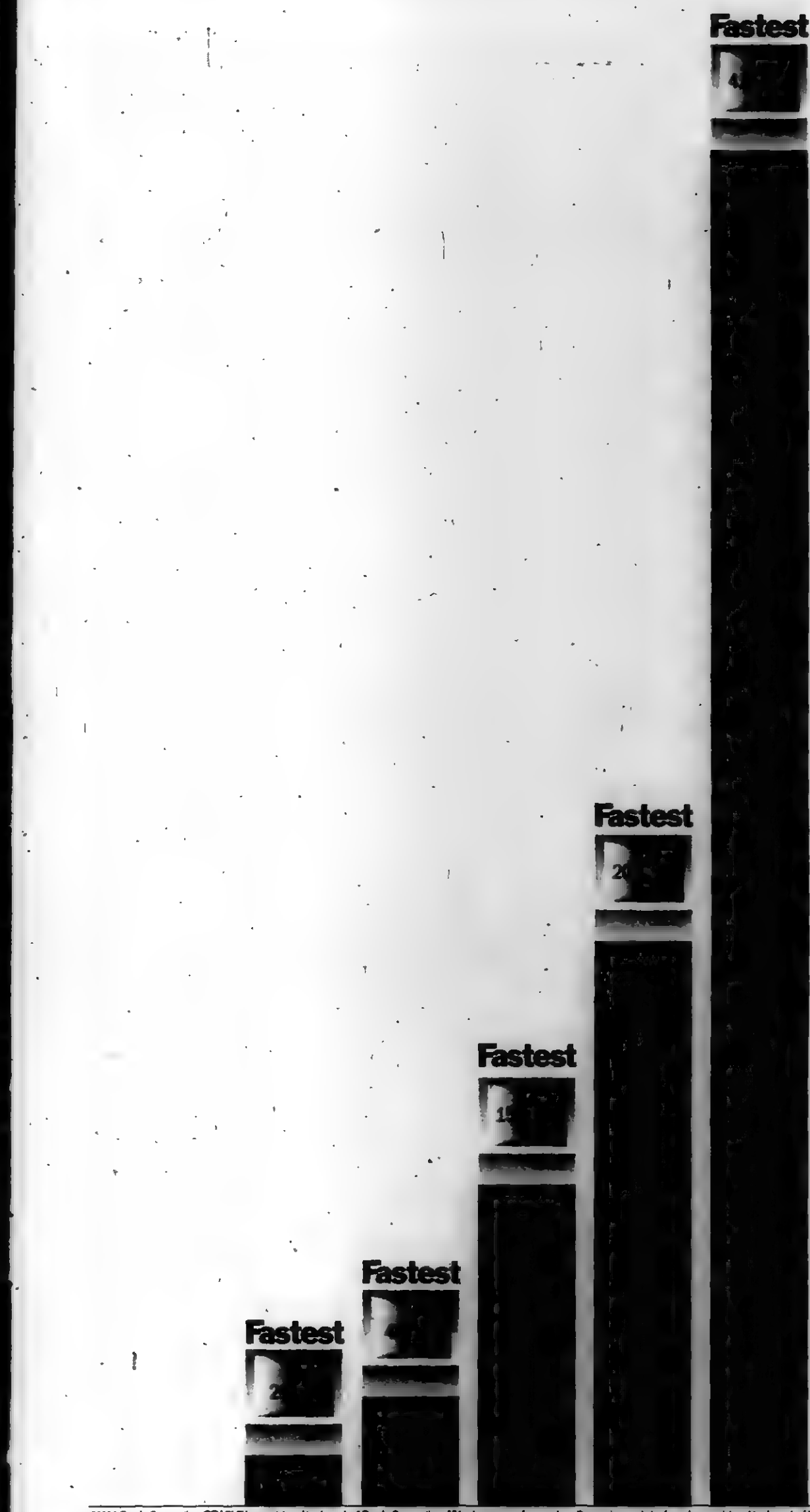
New York-based Sterling International, which has 70 locations worldwide, used to need at least eight days to close its books, according to Bernard J. Brisendine, Sterling's area director of MIS. With a multinational accounting package from Systems Union, Inc. in New York, that time frame has been reduced to two days.

Still, in most applications areas, there is a dearth of multinational packages. Brisendine said his company is still searching for a manufacturing resource planning package to use worldwide.

Nothing is immune

Nor is it just applications that require this focus. Michael Braude, senior vice president at Gartner Group, Inc. in Stamford, Conn., said that virtually all software — including database management systems, operating systems, computer-aided software engineering packages and systems management tools — needs to be revamped.

Brian Sommer, director of software intelligence at Chicago-based Arthur Andersen & Co., said most of what is available comes from European-based vendors. "North American vendors have ignored this problem until very recently, but for European vendors, it's a matter of survival. They have to do business in different countries, so they build these features in as a matter of course."



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Developer shift to Windows puts IBM OS/2 in quandary

BY PATRICIA KEEFE
CW STAFF

IBM's OS/2 plans are mired in a catch-22 that developers said may have already killed OS/2 on the desktop.

IBM is painfully aware that developers are not building OS/2 applications because users are turning to Microsoft Corp.'s Windows — and because there are few OS/2 packages. In a recent interview, Lee Reiswig, assistant general manager at IBM's Programming of Entry Systems Division, conceded that he has to prove to developers that OS/2 is worth their time.

It is imperative that IBM find a way to wrest developer attention away from Windows. How IBM plans on doing that is unclear, but the consensus among developers and analysts is that it is going to be a tough sell.

User enthusiasm for Windows has not been lost on developers such as David Proctor at Ashton-Tate Corp. and Fred Gibbons at Software Publishing Corp. (SPC).

Proctor, who is general manager of the database division, said his top priority this year is to get a Windows version of Dbase out the door. OS/2 is not even his second priority — support for Apple Computer, Inc.'s Macintosh is. An OS/2 package is a possibility in 1992, he said.

Gibbons, president and chief executive officer of SPC, strongly endorsed OS/2 as the way to go on the server. But for the desktop user, "currently, there is simply no more attractive or painless path to a graphical user interface than going with Windows," he said.

Infoalliance, SPC's client/server environment, initially shipped running on OS/2, but because of customer requests, a Windows client will be released this summer. Today, SPC, once a strong proponent of OS/2, is advocating Windows on the client and OS/2 on the server.

"The question to ask IBM is if they hope to capture the desktop from Windows, what are they doing to make OS/2 more convenient and easier for users?" Gibbons asked.

"They haven't made that effort," said Stan Levine, a vice president at Automated Design Systems.

IBM could start by taking a few tips from Windows. Levine noted that Windows comes bundled with a number of client-oriented tools — "all the friendly things that IBM left out of Presentation Manager." These include a card file, terminal emulator, paint box and file manager. In addition, loading OS/2 "is a serious operation," Levine said.

Windows also provides users with a level of application consistency that OS/2 lacks, said John Dunkle, an analyst at Workgroup Technologies, Inc. It is necessary to switch out of Presentation Manager when using the Communications Manager or Data Base Manager, he said.

For developers, the issue is one of economics. "We will all jump through hoops if the brass ring is big enough. I just don't see OS/2 being as compelling a case as is Windows on the desktop," Gibbons said.

The issue is also one of confusion. Developers and users are still waiting for a show of unity between Microsoft and IBM, said Mike Sherwood, Pagemaker product manager at Aldus Corp. "So much stuff is up in the air from Microsoft. Do you write to Presentation Manager or to 32-bit Windows, and will it be New Technology OS/2-compatible?"

Windows

FROM PAGE 1

word processing packages.

In a tight economy, developers must stretch their creative boundaries if they hope to get users reaching for their checkbooks. "Users must be convinced that the quality of the newer Windows packages is significantly better than their DOS counterparts," said Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash.

Despite the uphill struggle developers face, sales of Windows 3.0 applications are nothing to be sniffed at. According to the Software Publishers Association (SPA), the firms offering Windows 3.0 applications rang up close to $140 million in sales during the third quarter of 1990, nearly equaling the software sales for Apple Computer, Inc's Macintosh. The figure represents a whopping 213% growth over results from one year earlier.

Several recently released applications should further enhance those sales. Microsoft Word for Windows and the Excel 3.0 spreadsheet from Microsoft have gained early accolades, as has Corel Systems Corp.'s Coreldraw 2.0 graphics tool.

Other products expected to generate buyer interest are Lotus Development Corp.'s 1-2-3 for Windows, expected in June; Aldus Corp.'s Persuasion presentation package, expected next quarter; Wordperfect Corp.'s word processing package for Windows, due within the next few months; and a summer update of Word for Windows.

Resellers said the release of these key applications will ignite the market's latent potential. "It's sort of like waiting for your favorite movie to come out on video, but this time everyone is waiting for their favorite application to come out on Windows," said David Weiss, director of software at Merisel, Inc., a computer products distributor in El Segundo, Calif.

However, once those applications arrive, users said, there is often still a lot of tough slogging between the product's purchase and widespread implementation.

Officials at Hughes Aircraft Co. in Long Beach, Calif., have already approved the switch to Microsoft Word for Windows, but upgrading the 30,000 personal computers installed in the massive site is a process "that could certainly take years," said Jack Baumann, manager of the end-user consulting department at Hughes.

Despite the rapid growth expected in the Windows 3.0 applications market, large functional gaps still need to be filled. According to SPA data, there is a notable absence of database and spreadsheet applications in the Windows environment.

Sculley: Windows no damper on Mac

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — The million dollar question for Japan's Apple Computer, Inc. Macintosh watchers is likely the same heard elsewhere in the world: How will Microsoft Corp.'s Windows 3.0 for IBM Personal Computers and compatibles impact Apple's fortunes? Apple Chairman John Sculley said that after nine months on the market, Windows has not dampened Macintosh sales but has boosted enthusiasm for the concept of graphical interfaces.



Apple's John Sculley *claimed Windows has had little effect on Mac use*

"MS-Windows is a statement that the rest of the computer industry believes in the future of graphics," Sculley said, adding that users of Windows and the Macintosh are quite different: Users of MS-DOS and Windows have specific applications, while Macintosh users employ the system for all applications under a common interface.

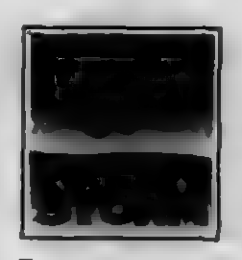
Sculley declined to discuss details of another hot topic, the Apple notebook computer. However, he did say Apple would release a notebook model before year's end.

Although rumors persist that Apple is talking with both Sony Corp. and Toshiba Corp. to buy display technology, Sculley would not comment on any discussions. He did, however, say Apple would be getting its screen technology from Japan.

Sculley said punitive tariffs that may be imposed on imported Japanese flat-panel displays [CW, Feb. 18] will hurt more than it will help U.S. industry's competitiveness. "There has been a pattern in the U.S. that started a few years ago — first with the 256K [-byte dynamic random-access memory] and now with flat-panel displays — that a small group of companies who make and sell parts has lobbied politicians and ended up holding the computer industry as hostages," Sculley said.

Valigra is the Tokyo bureau chief for the IDG News Service.

HIGH-TECH BATTLEFIELD



The Theater Display Terminal is a Sun Microsystems, Inc. workstation with software that displays strategic missile launches on a world map — the kind of large-scale attack expected in a global nuclear war. However, it was not well-suited for a war in the Middle East, where the symbol for a missile launch would cover up five countries on the world map.

At the request of battlefield commanders, the U.S. Air Force Space Command came up with a software fix to accurately display a small-scale launch like the Iraqi Scud missile attacks on Israel, according to a Pentagon source. In the space of five days, about 300 lines of Ada code were extracted from another program, integrated within the terminal's software, tested, flown to the war zone and used for the first time during one of the earliest Scud attacks, the source said.

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If the U.S. Army's battlefield data centers look a little funny, it is only because they have to be transportable both in the air and on the ground. The logistics and support computers are housed in three truck-mounted, rigid-walled shelters, with each shelter connected to the others by a fiber-optic cable for data communications.

The shelters cover Unisys Corp. U5000 multiprocessor systems, which are based on the Motorola, Inc. 68020 chip and run AT&T's Unix System V operating system, a Unisys spokesman said.

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Portable telephones from Taiwan's Microelectronics Technology, Inc. (MTI) have become a secondary means of communication for reporters and dignitaries caught in the Persian Gulf war zone, IDG News Service Correspondent Chris Brown in Taiwan reported.

MTI's portable phone, which folds up into a 65-pound suitcase, comes with an umbrella-like antenna and bounces signals off the Marisat satellite system. It lets a user place calls from any location — "as long as you can see the sky," MTI President Chi Haieh said.

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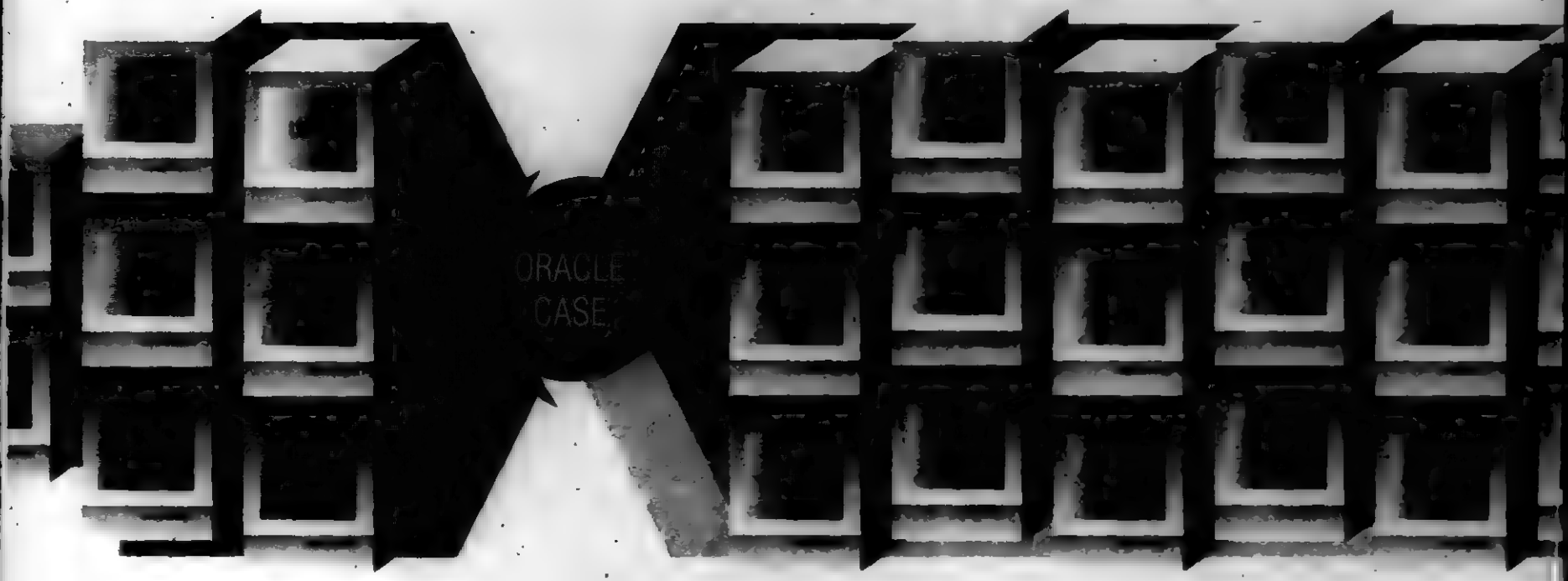
Compuadd Corp. in Austin, Texas, which has already shipped $21 million worth of microcomputer hardware and software to the U.S. Central Command in Saudi Arabia [CW, Feb. 18], said last week it has received a $10.4 million add-on contract. The new order includes Intel Corp. 1486-based desktop systems, 80386SX laptop personal computers and ruggedized carrying cases. The order was funded by Japan.

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Operation Desert Storm apparently has a big appetite for telecommunications equipment and circuits. The Defense Commercial Communications Office, located at Scott Air Force Base in Illinois, has signed 603 telecommunications contracts for Desert Storm so far, with monthly charges for these contracts amounting to $3.1 million, a spokeswoman said.

Compiled by National Correspondent Mitch Betts.

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Alliant unveils enhancements, low-end model

BY SALLY CUSACK
CW STAFF

LITTLETON, Mass. — Alliant Computer Systems Corp. announced several enhancements last week to its reduced instruction set computing (RISC)-based FX/2800 supercomputer family, and it also introduced the FX/800, an entry-level supercomputer system for distributed computing environments.

The six high-end enhancements were specifically developed for I/O- and data-intensive applications, the company said. They include the following:

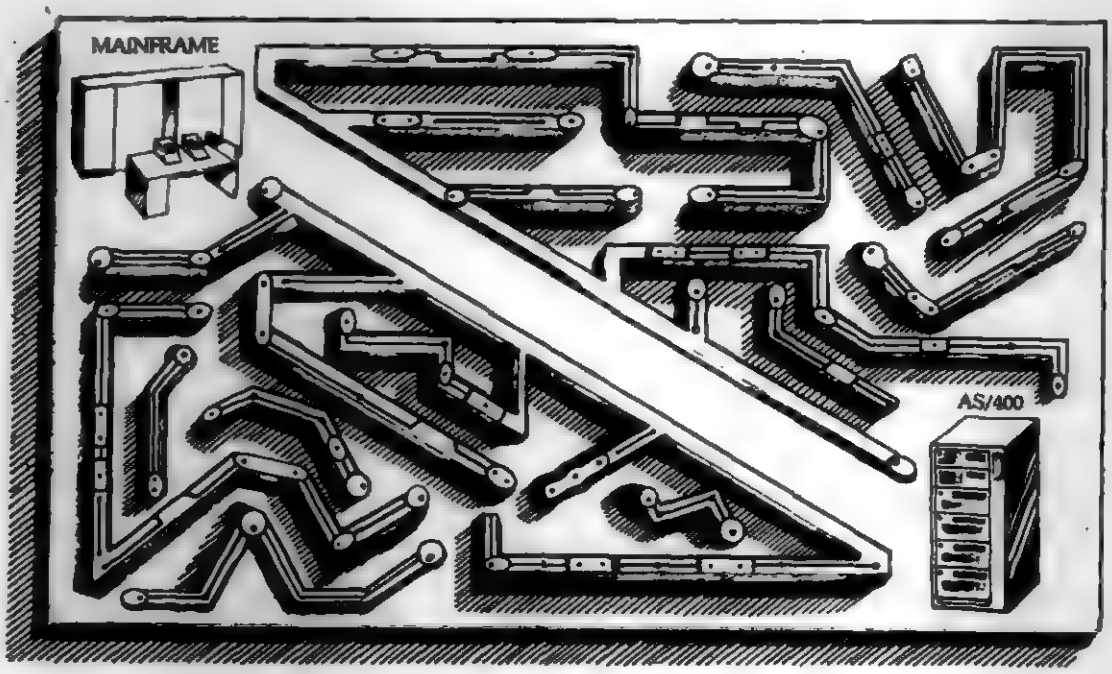
- Support for the ANSI X3T9.3 High Performance Parallel Interface (Hippi) standard for high-performance I/O connection capabilities. Up to five pairs of I/O Hippi channels are supported on the FX/2800.
- Increase in the FX/2800's main memory capacity, from 1G byte to 4G bytes.
- Support for Intelligent Peripheral Interface 2, or IPI-2 disk drives, which double the single-disk transfer rate of the FX/2800 family.
- Software interface support for multiple large-scale disk arrays. Each disk array provides 51.2G-byte capacity, allowing the FX/2800 series to provide more than 500G bytes of mass storage using these devices.
- Fiber Distributed Data Interface networking support.
- A system resource accounting function to allow systems administrators to charge users for the use of various system resources, including CPU time, disk I/O and connect time.

Omri Serlin, editor of the monthly newsletter "Serlin Report on Parallel Processing," noted that although Alliant was once fairly heavy into national laboratories and research facilities, the company is now aiming at the commercial supercomputing market.

Serlin estimated that 40% of the company's revenue is now coming from industrial accounts instead of universities and national laboratories. Alliant lists among its customers Arco Oil & Gas, Sandoz Pharma AG and the San Diego Supercomputer Center.

The new FX/800 system is targeted at distributed environments in which central FX/2800s are surrounded by clusters of "satellite" FX/800 systems connected via high-speed networks, the vendor said.

The FX/800 reportedly offers a peak performance of 320 million floating-point operations per second, supports two to eight processors and offers up to 500M byte of memory. It is priced from $189,000 to more than $600,000. The FX/2800 can support as many as 28 processors and provides as much as 4G bytes of memory. Pricing starts at $525,000.



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Fed agency's IS under fire again

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The federal agency given the job of unloading billions of dollars in assets from dead and dying savings and loans was again taken to task last week over its progress in developing internal information systems.

Resolution Trust Corp. (RTC) has made "disappointing" progress, Charles A. Bowsher, head of the U.S. General Accounting Office (GAO), told a U.S. House of Representatives committee last week.

RTC had developed a strategic plan and architecture for IS, as the GAO had earlier recommended, but had failed to show how data will flow and how various systems will fit together, Bowsher said. "[RTC] still runs the risk of acquiring costly technology that won't meet its needs," he added.

A spokeswoman for RTC said the agency had no comment on the GAO testimony but would present its views at an upcoming hearing that had not yet been scheduled by the House committee.

RTC recently awarded IBM a $14 million contract to develop a system to manage and track real estate assets, but Bowsher questioned whether it will be able to "roll up" asset data with data from other systems for management review.

Extensive burdens

Bowsher also said management requests for information cause extensive reporting burdens on RTC field staff. He cited a GAO survey in which 70% of respondents said reporting requirements were excessive, and 80% said they were duplicative.

Half of the top field managers responding to another GAO survey said RTC had "ineffectively communicated policies and procedures on information systems development." As a result, they said, "field offices have independently developed and acquired numerous manual and automated processes." This unfocused approach is likely to continue until RTC has developed a comprehensive IS plan covering all levels of the agency, Bowsher said.

Bowsher gave RTC mixed marks for its performance to date, in part blaming IS lapses for its problems. In particular, Bowsher found fault with RTC's progress in selling real estate assets, although he acknowledged that the real estate slump had made RTC's task more difficult.

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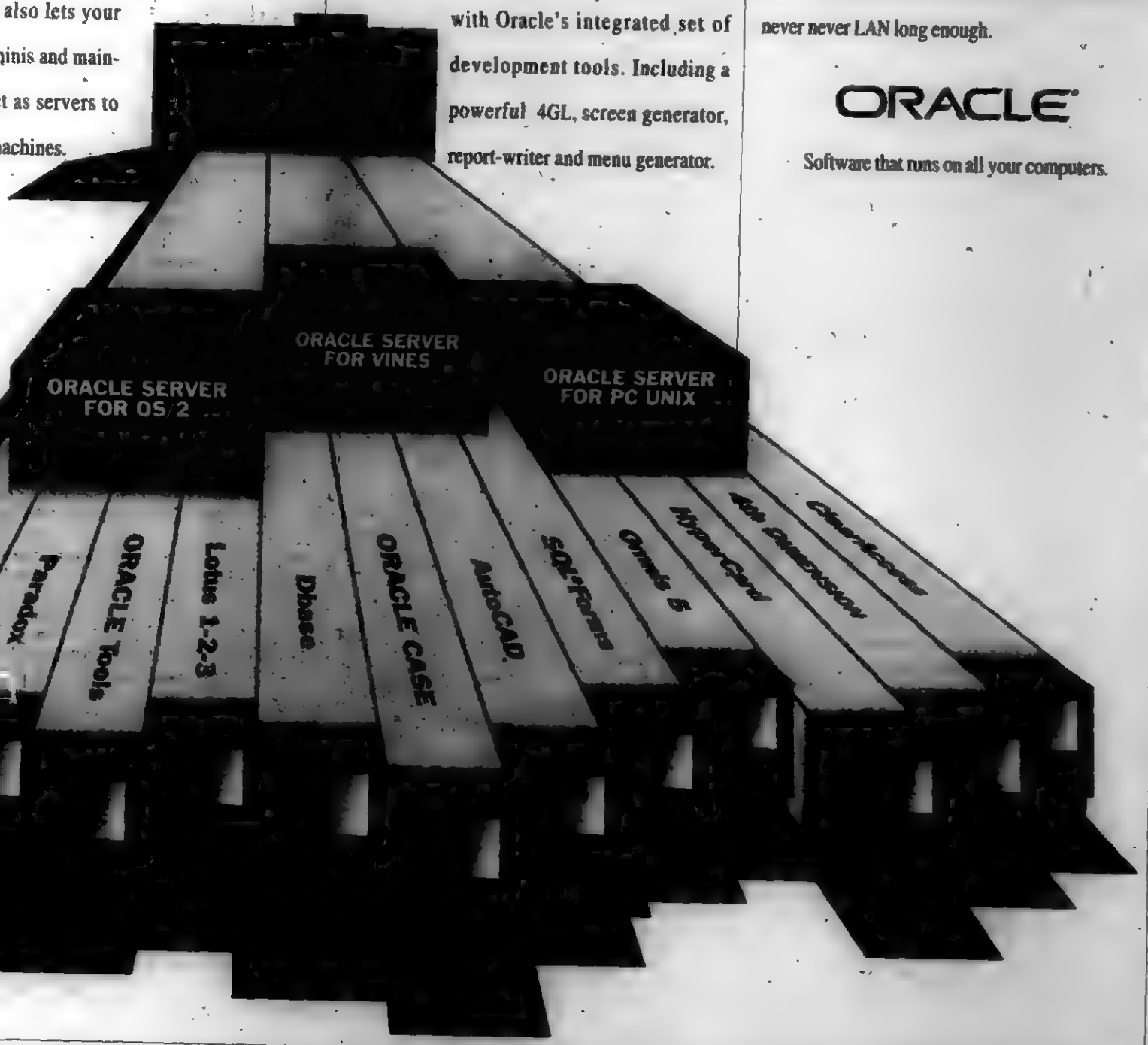
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HDS downloads disk code

BY JEAN S. BOZMAN
CW STAFF

SANTA CLARA, Calif. — Hitachi Data Systems Corp. (HDS) is not content to let its disk drives "call home" when they are not feeling well. Now, the HDS engineering staff can send some prescription medicine down the modem line, the company said last week.

HDS claimed that an enhanced version of its Hi-Track maintenance program adds the dimension of on-line repairs to a 5-year-old automatic failure-reporting system. "We can apply many microcode changes without taking the customer site down," said Jeff German, manager of technical support at HDS.

The new feature, called Dynamic Microcode Download, adds to Hi-Track's existing ability to monitor, detect, diagnose and repair failing storage systems before they crash.

"If you're reacting to the threshold of pain that people at your customer sites have, then you won't prevent failures," German said.

After notifying customers of a device's impending failure, HDS technicians can send the patched software down a dedicated telephone line. Payment for the Hi-Track service is included in the normal maintenance fee; the same automatic call-in service will be extended to the new generation of HDS EX mainframes later this year.

Hi-Track is installed in 3,000 disk drive and tape storage systems worldwide, according to HDS.

The right approach?

However, some industry analysts are unsure whether this kind of service can build HDS' market share relative to IBM and Amdahl Corp. "This feature is not by itself going to convince a customer to buy an HDS 7380 or 7390 disk drive," said Robert Callery, a senior storage analyst at Technology Investment Strategies Corp. in Framingham, Mass. Not all microcode changes will be simple enough to transmit over the wire, Callery added.

"They aren't the first to deliver a proactive maintenance philosophy, but they are the first to do it in the IBM marketplace," said Paul Wolfstaetter, program director at Gartner Group, Inc.'s Enterprise Storage Strategies Group in Stamford, Conn.

IBM has a service director plan that automatically relays disk drive errors to IBM field service centers worldwide. Once error alerts are received, IBM calls the customer site to schedule maintenance, IBM said. Digital Equipment Corp. and Hewlett-Packard Co. also offer automatic device-error tracking services, spokesmen said.

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SAS to blanket Unix market

BY SALLY CUSACK
CW STAFF

NEW ORLEANS — SAS Institute, Inc. said last week that the SAS Application System will be available on almost every Unix-based hardware platform by year's end.

Designated Release 6.07, the newest version of the SAS Application System will be released in two phases, SAS President James H. Goodnight told users at the annual SAS User Group International convention held here.

The first phase, scheduled for delivery by the end of first-quarter 1991, will support the following:

- Digital Equipment Corp.'s RISC/Ultrix Release 4.0.
- IBM's AIX on the RISC System/6000 system.
- Hewlett-Packard Co.'s HP-UX on the HP 9000 Series 300 and HP/Apollo Division Unix-based workstations.
- Data General Corp.'s DG-UX on DG Aviion workstations.
- Mips Computer Systems, Inc. RISC/OS Release 4.5 on Mips and binary-compatible workstations.

A satisfied customer

Scott Pitts, a programmer at the University of Oklahoma's Health Sciences Center, is a beta-test user for SAS on DG's Unix-based Aviion workstation. He said that so far, he is pleased with the software's performance and particularly with its easy-to-use graphics capabilities.

According to Thomas W. Moore III, an analyst at International Data Corp., a Framingham, Mass.-based market research firm, the Unix implementation plan outlined by SAS is ambitious but not unrealistic.

In addition, it was announced that the SAS Application System offers compliance with DEC's Cohesion application development environment and that SAS Institute will deliver an SAS-based executive information system sometime in the third quarter.

A version supporting Microsoft Corp.'s Windows 3.0 is scheduled to be available in the fourth quarter. SAS software currently runs on IBM's MVS, DEC's VMS, MS-DOS and several proprietary minicomputer environments as well.

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Legent Netspy monitors host to LAN

BY ELISABETH HORWITT
CW STAFF

PITTSBURGH — Legent Corp. laid the groundwork last week for what it claimed will be the first enterprisewide performance monitoring system that stretches all the way from IBM VTAM hosts down to local-area network servers.

The company announced Version 4.0 of its Netspy VTAM performance monitoring tool, which is said to alert either IBM's Netview or Systems Center, Inc.'s Net/Master to performance problems. This permits users to monitor VTAM use and response time on the same terminal that manages Systems Network Architecture networks, Netspy product manager Don Imhoff said.

The new version also supports communications between Netspy systems running on different hosts so a user can monitor different VTAM domains from one terminal, Imhoff said.

General American Life Insurance Co., a beta-test site for Netspy Version 4.0, is interested in the product's ability to forward alerts to Netview, said David Gruzeski, a senior systems programmer. "We will be able to set up parameters, such as when a host response time gets over a certain value, and have alerts sent to Netview in real time."

Legent also announced plans to bring out a LAN performance monitoring system, Lanspy, by year's end. Jointly developed with Network Intelligence, Inc. in Palo Alto, Calif., the product will feed into Netspy so a user can trace performance bottlenecks, Network Intelligence President Brian Szabo said.

Better LAN tracking

Lanspy will also report when new personal computer users come onto a LAN, allowing the central manager to better track changing LAN configurations, Szabo said.

General American is very interested in Lanspy as a way to monitor performance on its growing installation of token-ring LANs, Gruzeski said. "We are starting to put in 100M bit/sec. rings, so we really need to know what's going on out there."

While companies such as Network General Corp., with its Sniffer product, provide more in-depth protocol analysis, Lanspy will be the first system to offer end-to-end performance monitoring from a central terminal that feeds into Netspy, Net/Master or Netview, Szabo said.

Lanspy will initially support token-ring LANs with Ethernet support planned for the future, Legent said.

Pricing was not available.

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Dell bows out of S. Africa

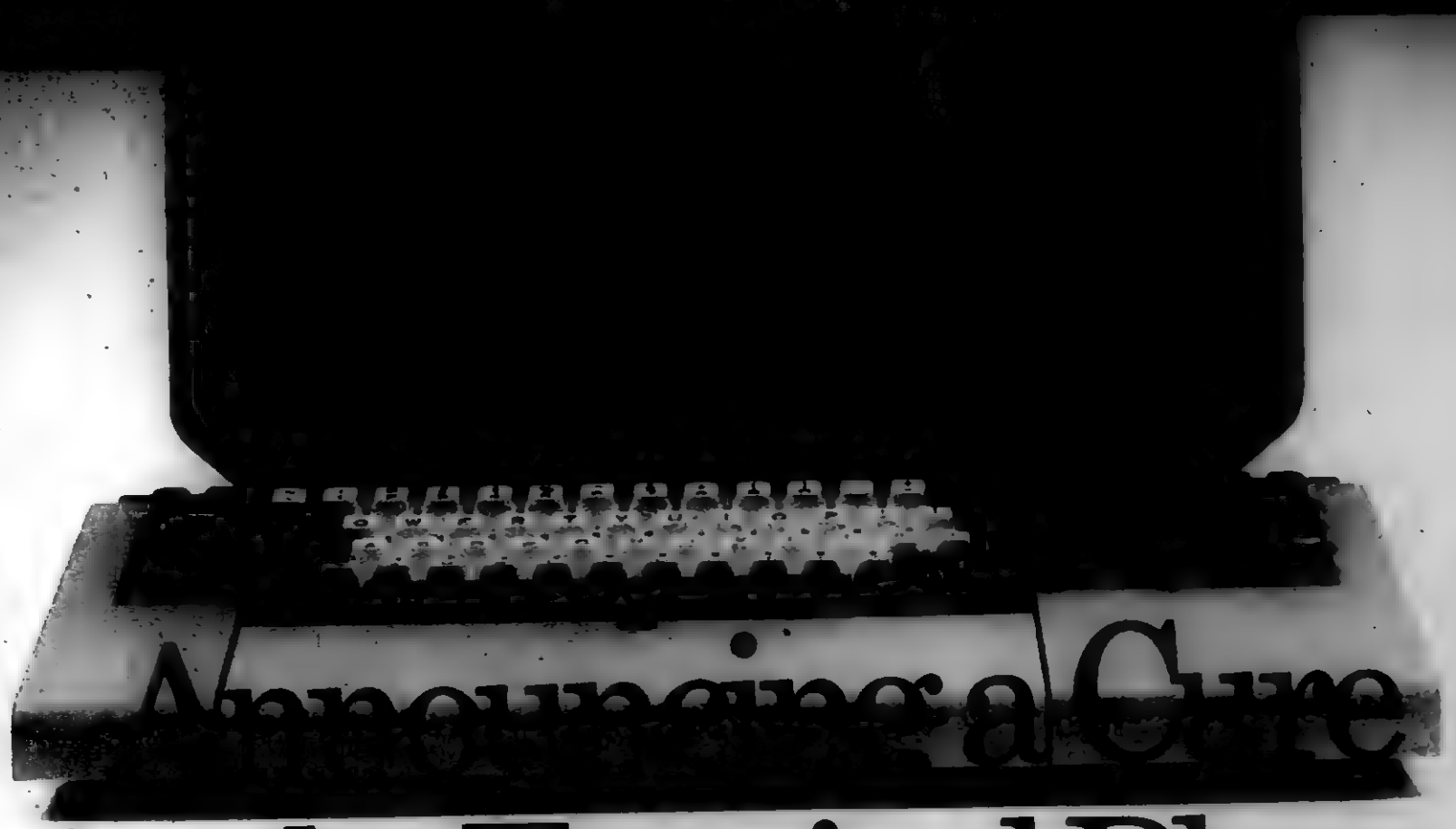
BY J. A. SAVAGE
CW STAFF

Bowing to pressure from three local governments, Dell Computer Corp. has cut ties with its distributor in South Africa.

Dell's vice president and legal counsel, Rick Salwen, said although the company had certified through the U.S. Department of Commerce and the U.S. State Department that Johannesburg-based Incorporated Data Systems was black-owned, certification was not enough to satisfy statutes in the county of Los Angeles, the state of Michigan and the city of Pasadena, Calif. Those entities have rules against doing business with any company that does business in South Africa because it practices apartheid.

The three governments notified Dell last spring that they would not do business with the company and cut off their enterprise with Dell.

"We had no orders from them for three or four months," Salwen said. "Based on that, we terminated the relationship with Incorporated Data Systems in October 1990."



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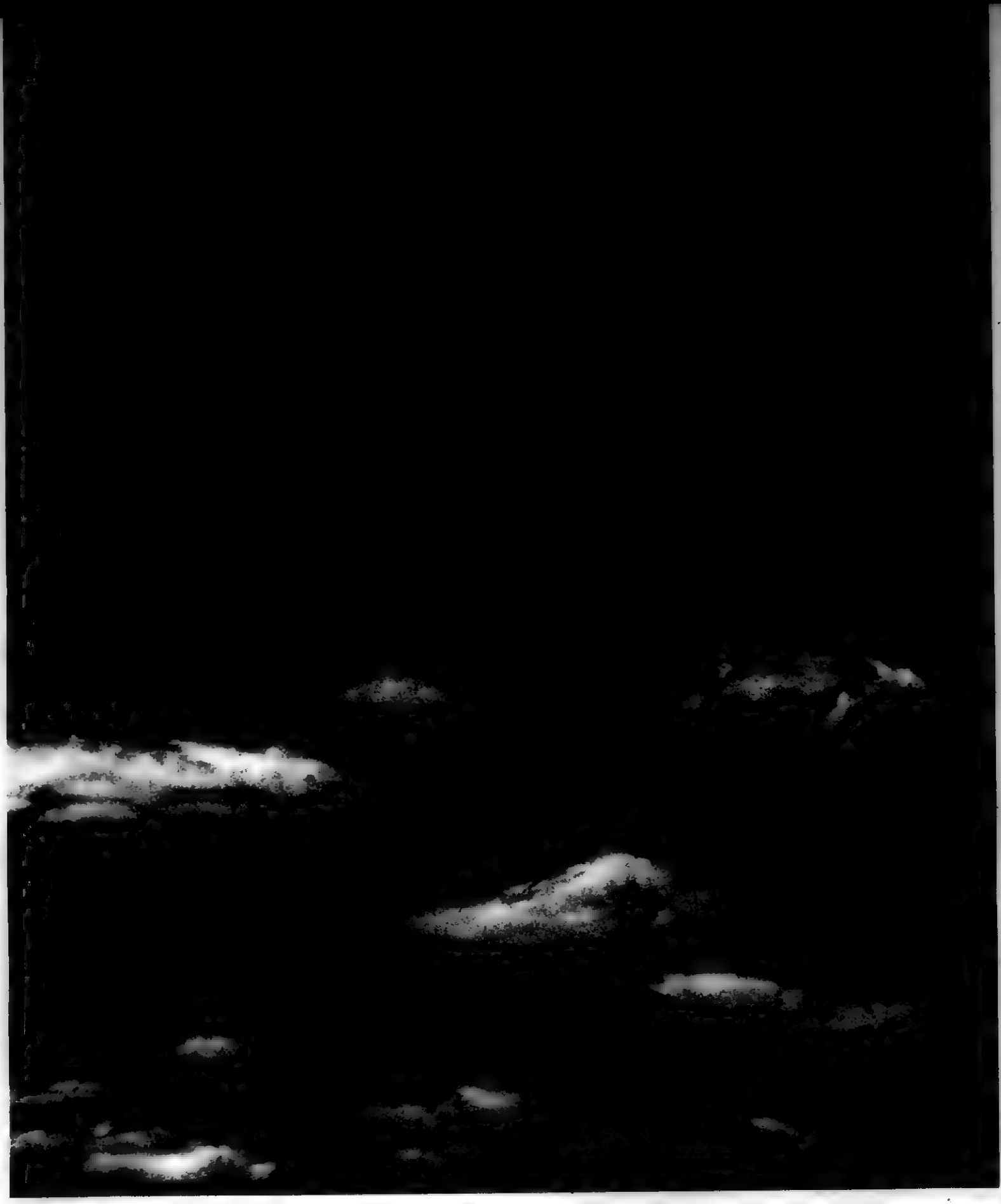
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ADVANCED TECHNOLOGY

TECH TALK

Jumpin' Josephson!

■ Fujitsu Laboratories Ltd., Toyo Sanso Co. and Shinko Electric Industries Co. have developed and tested the world's first cryogenic system for Josephson computers, according to Fujitsu. The new system, which includes Josephson and semiconductor chips, is more than 10 times faster than a system using only semiconductor chips, the company said. Up to now, scientists thought Josephson computers would be impossible to build because high-speed operations would require I/O cables to be longer than 1mm in order to connect logic chips at low temperature and memory chips at high temperature.

DRAM dynamo

■ A new 64M-bit dynamic random-access memory chip with a cell size of only 2 sq microns and an access time of 50 nsec is one of the latest developments at Matsushita Electric Industrial Co. Thanks to a more precise laser lithographic process, the chip will be easier to mass produce than chips using conventional manufacturing methods, the company said. Fujitsu Ltd. and Mitsubishi Electronic Corp. also announced plans to introduce prototype 64M-bit DRAM chips. The 64M-bit DRAM chip, the highest capacity chip developed to date, is capable of storing more than 250 pages of newspaper text.

Pixar's new company

■ Pixar, based in Richmond, Calif., plans to spin off a new company specializing in graphics applications based on the company's Renderman photorealistic rendering software and other technology. The new company, which is unnamed, will market Macrenderman, a rendering program, and Showplace, a program that enables users to create three-dimensional pictures without having to draw wire-frame models. Both products are for the Apple Computer, Inc. Macintosh. Pixar is noted for animated films, including *Tin Toy*, which won an Oscar.

Diebold: Multimedia is growing up

The field is still in its infancy, but it will be a formidable adult, computer expert says

The impact of multimedia on the information technology industry has yet to be appreciated, according to John Diebold, chairman of the board at The Diebold Group, Inc. Computers capable of pulling off multimedia trickery are still in their infancy, but it is already apparent that the technology will become widespread and inexpensive. As a result, Diebold said, what will be more important to companies in the multimedia game is not the hardware but the software. In a recent interview with Computerworld*'s Senior Editor Michael Alexander, Diebold discussed his views on the future of multimedia:*

You say that multimedia will change the economics of the information technology industry. How so?

Multimedia hardware will follow the same pattern as the rest of industry. As multimedia becomes more common, the hardware will become commoditized. You will see a small number of large firms producing commodity products. There will also be small firms with short life spans moving in and out of business.

The character of interplay between small and large companies is uniquely multiplied in multimedia because the software takes on a degree of complexity. The larger firms will need images and the ability to access the talent to create images. You will see more acquisitions as a result. This doesn't mean you can't have a successful commodity hardware business, but you will have a better business with software.

Can small entrepreneurial companies, especially those in creative fields, mesh with larger, perhaps more staid companies and yet remain innovative?

You need to strike a balance between the needs of a small number of highly talented people and an organization's need to turn some things into commercial ventures. In the entertainment industry, there is a history of large organizations interplaying with small organizations to get the talent and other elements they need.



Diebold *predicts multimedia will someday be widely used in the fields of medicine, business and education*

Would you say American firms are less astute than the Japanese in foreseeing the potential of multimedia and the importance of software over hardware?

American companies tend to be slower and have a greater problem making acquisitions that don't have an immediate payoff but one that is more than five years ahead. In the case of Matsushita and Sony, they are paying high prices for businesses that don't currently have substantial earning potential and then positioning them for larger benefit in the multimedia field.

The two acquisitions you noted, MCA and CBS Records, are of companies in the entertainment industry. Is that where the money will be in multimedia?

I don't think so. It will be more in the professional fields. The medical uses of multimedia will be very extensive and very large. Multimedia in marketing will be very important and will change that profession a great deal. The educational use will also be important.

Most business people on the user side have yet to begin to think multimedia in typical business systems.

Let's talk about multimedia from the end-user side for a moment. What would you suggest end-user companies should be doing now?

I think today, for example, there ought to be more experimentation by users using compact discs, digital video interactive and other disc technologies. Then they have the opportunity to go through the teething process so that by the time the hardware is there, they are ready. They could be building demonstration projects that may cost much more today but then using them with a price structure that will apply in years ahead.

There has been quite a bit of discussion already about copyright and intellectual property in the use of multimedia. Any thoughts on how this issue will be resolved?

I don't think legal specialists have yet come to grips with the heart of the problem: getting rights to images, the right to edit them and to use them out of their original context. The complexity of getting rights leads to piracy by people who do not want to do it.

Scientists take a new look at meaning of life

BY MICHAEL ALEXANDER
CW STAFF

Neural networks, expert systems, evolver software that mutates according to Darwinian principles and even computer viruses attempt to mimic living things. However, can such computer programs really be considered "alive?" Some scientists who are exploring the new field of artificial life believe so.

Artificial life aims to replicate life-like behavior on computer screens in hopes of predicting human behavior or uncovering what makes us and other living things tick.

Recently, some scientists have begun to ask if computer viruses — self-replicating computer programs — are a form of artificial life. Simply because computer viruses do not exist as organic molecules may not be sufficient reason to dismiss the classification of viruses as a life-form, according to Eugene Spafford, an associate professor of computer science at Purdue University in West Lafayette, Ind.

However, computer viruses do not evolve in the truest sense of the word. Artificial life proponents want their creations to be able to mutate or adapt and more. Evolver software, for example, generates solutions to a problem and then selects the best based on the survival-of-the-fittest theory.

Thinking Machines Corp. has taken the idea one step further with a number-sorting program that becomes progressively better at solving problems. Eventually, the programming technique could be used to develop self-generating, ever improving software and neural networks.

Computer scientists at IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y., were astonished to discover last year that a computer simulation of human brain waves began giving off waves of its own. The discovery may provide insight into new computer architectures.

Interested in taking a look at artificial life-forms firsthand? Sintar Software, a Seattle software publisher, markets a $45 program called Cellmaster that allows you to set the rules that govern the lives of paramecium-like creatures and jellyfish.

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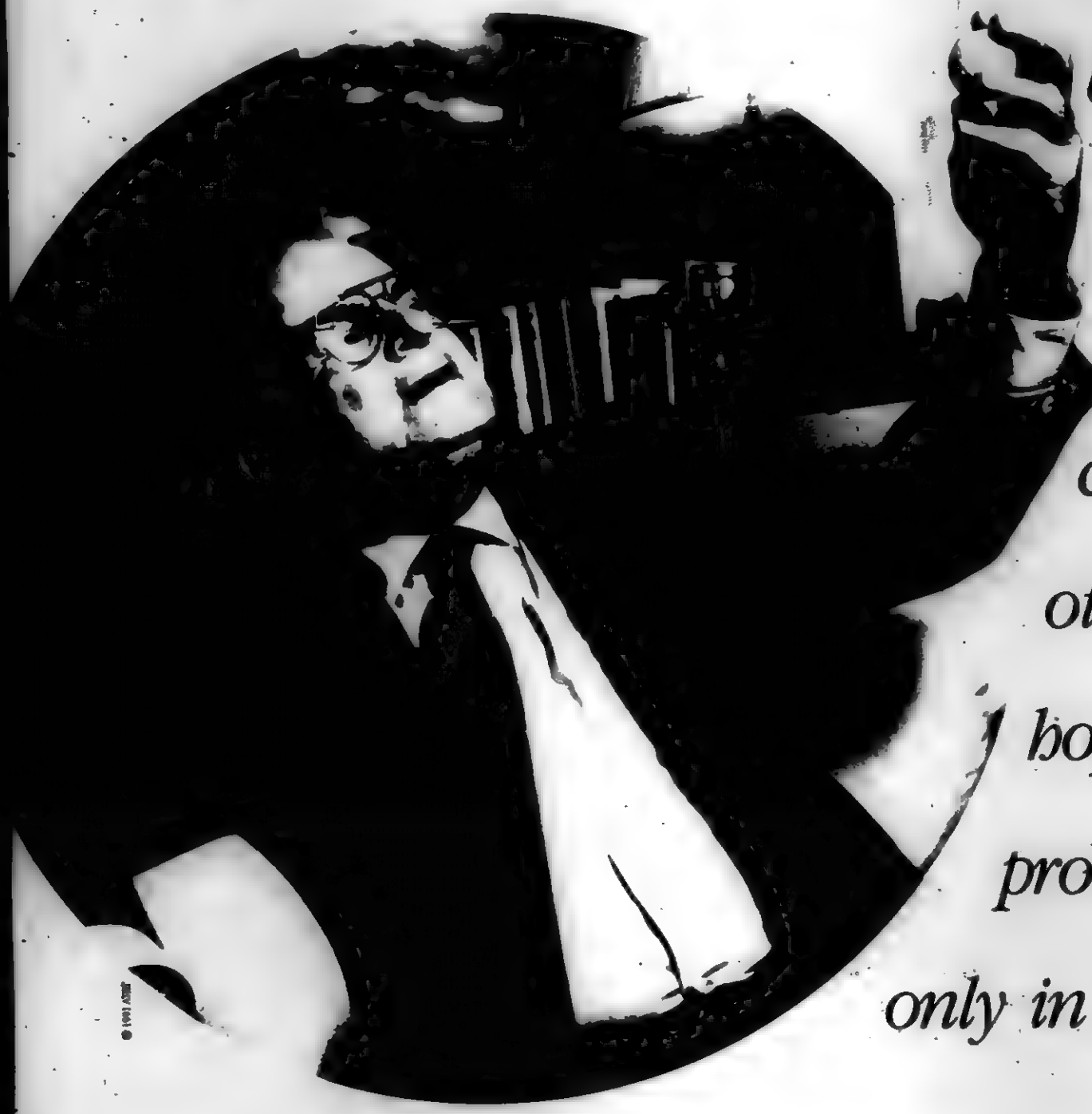
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EDITORIAL

Open for whom?

REPORTS THAT A group of leading PC and workstation vendors is forming to promote a standard for reduced instruction set computing (RISC)-based computers raise questions about what role impromptu standards-setting bodies should play. Would this group, which reportedly includes Compaq, DEC, Mips Computer Systems, Microsoft and The Santa Cruz Operation, really make choices easier for buyers? Or would it try to steal thunder from Sun Microsystems as that company works to push its own Scalable Processor Architecture (Sparc) as a *de facto* industry guideline?

Recent history shows that anything is possible. More than two years ago, a group of heavyweights banded together to form the Open Software Foundation (OSF). The group's stated charter was to standardize Unix, but it was clear that opposition to AT&T and Sun's Unix System V promotion was the bigger issue. Today, the OSF is still struggling to get a product out the door. It has suffered from constant bickering among its members and has recently come under criticism for being too restrictive in licensing its technology to nonmembers. This is open?

Contrast that with the case of the Extended Industry Standard Architecture (EISA) bus specification promoted so aggressively by Compaq for the past three years. True, EISA was an attempt to knock IBM's Micro Channel Architecture (MCA) down a few pegs, but EISA is a qualified success while MCA creaks under the weight of IBM's inability to exploit its purported benefits.

The key difference between these two cases lies in the goal both companies supposedly sought: openness. Compaq promoted EISA as a public domain standard that could be freely licensed by anyone. Independents opted for EISA because it offered incremental improvement over the status quo and carried no risk. To Compaq's credit, it has resisted the temptation to profit from its standards-setting efforts.

In contrast, the OSF has tried to erect a standard that would primarily benefit those who paid to create it. The jury is still out on whether it can succeed, but so far, its performance has been uninspiring.

This begs the question: Is this apparent new effort to establish a RISC standard driven more by altruism or opposition to Sun? Sun's relentless promotion of Sparc as a standard is beginning to bear fruit, in large part because it has pledged to keep the specification open and the risk of cloning it low. If an alternative standard emerges that carries restrictive licensing fees or serves the interests of only a small group of vendors, it will be doomed to failure. The trend is toward open systems, and buyers aren't stupid.

At best, these loose vendor coalitions can bring stability to the market. At worst, they can split it down the middle. Users will let their checkbooks do the talking, sending their dollars to those vendors who they believe share the goal of open computing. To do otherwise would only encourage those who stake their claims in proprietary soil and try to turn back the clock.



LETTERS TO THE EDITOR

The Next case

Regarding *Computerworld*'s reporting on the award-winning Next machine [CW, Feb. 4], Mr. Blickenstorfer's comment that a Next machine "may be rather unfamiliar and exotic for business users" is completely out of line with my own experience.

Perhaps most telling was the following example: A friend of mine who owns a small business recently lamented that his people are screaming for him to computerize. He said he had been investigating various hardware and software but was dissatisfied. We retired to my office, where I cranked up my Next. Simply by asking questions of how he would carry out various tasks, I was able to demonstrate the intuitively simple manner with which Next has developed its computer. It is simple and elegant from the moment you push the power button.

The power of a Next is not only in its hardware architecture but in its simplicity. It is no wonder that Next was the first foreign company to win Japan's prestigious G-Mark award.

Richard P. Casey
American General
Information Services, Inc.
Far Hills, N.J.

Small is beautiful

Although I agree with Charles Wang's title theme that "No software solution is an island" [CW, Jan. 21], I believe his statements claiming that only large companies can provide adequate integrated solutions in the future reflect a self-serving and mainframe-oriented bias.

As Mr. Wang states, "breakthrough" technologies do not always evolve to have as much impact as was originally envisioned — but some do. In the software industry, it is rarely the large company that provides these innovations; it is the small company with its ear close to the user and an ability to respond rapidly and creatively to what it hears.

Increased standardization creates an environment in which even the smallest developer can build an application that appears and behaves like all other applications on the same platform.

I believe that an integrated "comprehensive solution" provided by a large company will fall far short of the same solution provided by smaller, more focused companies that have specialized in a particular niche of that solution and have built their applications using the excellent standards available today.

Kim O. Jones
President
Forecross Corp.
San Francisco, Calif.

Time . . .

In regards to Mr. Hitchens' article [CW, Jan. 28], we at SAS Institute several years ago incorporated a solution to the 21st century transition into our software. We have, for many years, used a "SAS date value" for storing dates in user variables. This value is the number of days since a base date of Jan. 1, 1960, and all our date-processing algorithms take advantage of this. However, we do allow users to input and output dates using two-digit years, using such forms as "91/01/31." The introduction of our user-alterable option, YEARCUTOFF, allows the user to indicate the first year of a 100-year cycle that will correspond to the two-digit year. For example, YEARCUTOFF=1980 would cause the two-digit years 80 through 99 to be interpreted as 1980 to 1999, while 00 to 79 would be 2000 to 2079. Our default value for YEARCUTOFF is now 1900, but it will probably change as we approach the year 2000.

Richard D. Langston
Core Development
SAS Institute, Inc.
Cary, N.C.

. . . and time again

Regarding the story "Dating problems now? Wait 'til the year 2000" [CW, Jan. 28], Mr. Hitchens should consider the fact that most systems designers are not idiots. For example, the Pick operating system uses a date format based on the days from a starting point of Jan. 1, 1968. Feb. 1, 1991 would be 8433, and Jan. 1, 2000 will be 11689.

I think you will find that most of the better systems people have taken dates into account for many years. Those who have not will probably not have a system running on Dec. 31, 1999.

David Carlson
Data Processing Consultant
Eastern Casualty
Insurance Co.
Westboro, Mass.

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Is Microsoft abusing its power?

Smaller vendors find that the software giant casts a long shadow

BOB METCALFE



"Do you think Microsoft is doing anything illegal?" my venture capitalist friend asked as we stood outside the San Francisco hotel ballroom in which Go Corp. had just announced its pen-based operating system for notebook personal computers.

The subject of Microsoft had come up often that day because Microsoft was seen to be preempting Go, as it has done to other small companies in recent years, by projecting vaguely similar future capabilities in its own products. Anticipating Go's announcements, Microsoft had been talking about plans for pen-based extensions to its DOS-based Windows graphical user interface.

With tens of millions of DOS installations giving it an operating system monopoly, Microsoft's product futures formed a chilling cloud over the Go party. The same chill is felt by the whole PC industry, including several companies with which I'm involved. So, despite my love for lawyer jokes, I decided to take my friend's legal question seriously.

"Well, I'm not a lawyer," I answered, "but let's see, there's the Sherman Act. As I recall, that discourages monopolistic collusion on prices and anticompetitive territory allocations. There's the Clayton Act. I think that proscribes unfair trade practices, such as tying the sale of one product to another. And, oh yeah, there's the Robinson-Patman Act, which I think requires companies to offer like prices to like customers."

My friend was not happy with this amateur legal checklist. "No, Bob," he said, "I was thinking more along the lines of the RICO [Racketeer-Influenced and Corrupt Organization Act], which aims to break up organized crime."

Concerns about Microsoft's dominance of the PC software industry are now common and no joking matter, but still, I had to laugh. I thought about all those intelligent young people now streaming by the hundreds to join Microsoft in Redmond, Wash. Is it the Mann Act that outlaws the transport of minors across state lines for immoral purposes? Had we just created a new joke genre?

I was laughing, but my friend wasn't. He was deadly serious. Joking aside, is Microsoft abusing its monopoly?

The word monopoly reminds me of IBM, especially in the 1960s. As I recall my mother telling me, it was often alleged back then that IBM abused its mainframe monopoly by making preemptive announcements to thwart competition. A case in point was its announcement of a subsequently aborted mainframe (the 360/191, I think it was) to rain on Control Data's 6600 parade. IBM was sued, eventually submitted to a consent decree and has since limited such preemptive behavior.

Is Microsoft in a similar situation? Do its hints of future pen-based extensions to Windows constitute unfair competition with Go? I think so. When you begin to dominate an industry, you take on new responsibilities and certain new standards of behavior.

Other Microsoft tactics, also reminiscent of alleged IBM misbehavior in the 1960s, surround its vertical integration into application software. We've all heard how Microsoft got the PC software industry ramping up on OS/2 and Presentation Manager and then suddenly switched to Windows. And what about the abrupt introduction of a new extended memory programming interface with the latest version of Windows?

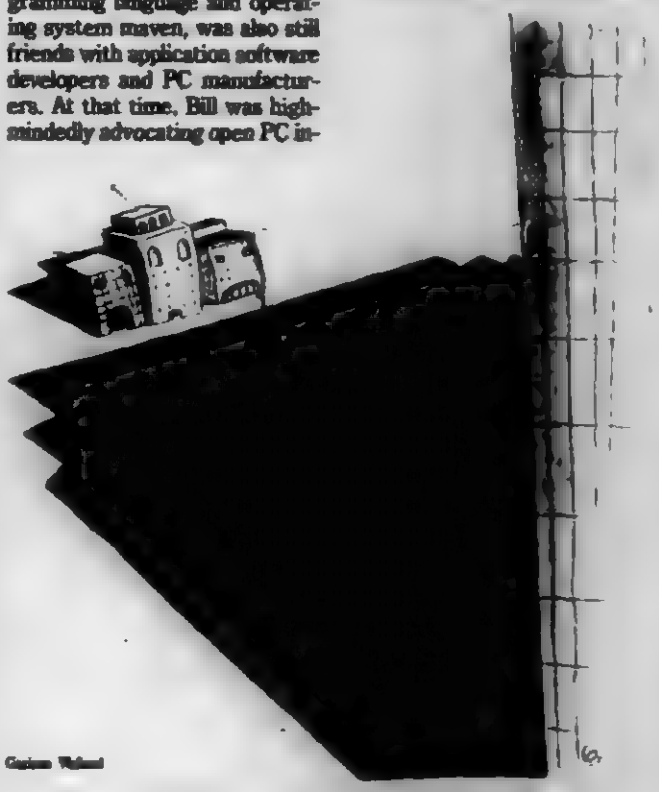
Does this kind of behavior constitute unfair competition against other applications developers who do not have the advantage of early access to Microsoft's operating system plans? I think so. I think that if the DOS world is to remain a level playing field for the development of exciting new applications, DOS' supplier must divest its applications business.

Evidence of abuse of monopoly power may also be found in what many consider Microsoft's extortionate (catch the RICO connection?) software licensing terms. Do you have a choice not to license DOS on Microsoft's terms? Yes, you can opt for Unix or Digital Research's DR-DOS. But considering their market shares, are these real alternatives? I don't think so.

Bill Gates was once my friend. I haven't visited with him since long before Microsoft and my former company, 3Com, entered into their ill-fated partnership on OS/2 LAN Manager. That was way back, when Bill, the programming language and operating system maven, was also still friends with application software developers and PC manufacturers. At that time, Bill was high-mindedly advocating open PC industry standards as liberation from the coercively proprietary mainframe world.

Now, with Microsoft on top, most of Bill's remaining friends are his shareholders. Bill's speeches, long a source of vision for the open PC industry, have become self-serving outlines of Microsoft's rapacious product plans. Bill's industry partnerships have turned one-sided and sour. And Bill's company, known in the past for drawing new customers to a burgeoning industry, is spending too much of its considerable energy on damaging dependent competitors in a stagnant market.

If Microsoft's abuse of its monopoly isn't illegal, it ought to be.



Gustave Weltzel

Metcalfe invented Ethernet at Xerox's Palo Alto Research Center and founded 3Com Corp. He is now writing a book called *Ethernet vs. Godzilla* and is consulting with Patriot Partners, a joint development of IBM and Metaphor Computer Systems.

Multimedia: Big boys use standards as a weapon

HARVEY NEWQUIST



Multimedia is the leading contender for the hottest buzzword of 1991. Multimedia is not really a new technology, just a long-overdue synthesis of different technologies that make data more presentable, understandable and appealing to users. Even so, we're already seeing the beginnings of the kind of gruesome verbal battle that usually breaks out among vendors, analysts, the popular press and users during the early stages of every "new" commercial technology.

What's unusual in the case of multimedia is that the most noise isn't coming from the small start-ups — the tiny companies that make the biggest technological contributions — but rather from a handful of megacorporations, such as IBM, Microsoft, Tandy, Zenith and AT&T, which still haven't quite determined how multimedia fits into their marketing strategies. They know that it ultimately will have to; they just haven't figured out the how, what, when and where of it.

To stall for time, these vendors have introduced (force-fed is probably a better term) a set of standards to the user community, which really muddies the pertinent issues of multimedia.

Led by IBM and Microsoft — neither of which has a dedicated multimedia product offering outside of some splashy promotional ideas — this group of companies wants to impose standards for development and deployment of multimedia applications ranging from the compression of video images to playback rates. And, as is often the case, those who have bestowed this set of standards upon us don't have anything tangible to put behind it.

Cloudy vision

Unlike pioneering multimedia companies such as Macromind, Farallon or Radius, IBM and Microsoft have offered the market nothing in the way of product; they have only offered *vision*.

Standards are fine when it looks like enough companies are taking disparate paths to develop applications that ultimately will not be compatible with each other. But having the two largest and most influential computer companies in software and hardware arbitrarily set their multimedia standards without allowing the industry's users to sort through the existing product offering smells a little too self-serving, like trying to cut up a pie before it's even been made.

Products such as Lotus' 1-2-3 and Microsoft Word became de-facto standards because users gravitated toward them. No one told users, "here's your standard. Like it and love it because that's all you're getting."

This same attitude set the artificial intelligence industry back nearly five years, after a quick growth in the mid-1980s. When the AI vendors changed their attitude and listened to what the customers wanted — a novel concept — sales returned, and revenue skyrocketed. Those who didn't listen slipped quietly into Chapter 11.

The first group this IBM/Microsoft standards activity affects is the one comprised of dedicated multimedia companies such as Radius and Macromind. Having responded to customer demands during the last few years, these firms will now have to further modify their product plans to become "standardized" — if they follow IBM and Microsoft.

The second group of victims is the users. Getting stuck with a standard before it has been thoroughly market tested means users will have to accept products that may not meet their requirements simply because these products are designed, first and foremost, with IBM and Microsoft in mind. Look at the Personal System/2, OS/2 and Windows 3.0, not to mention Officevision. Each of these products is an example of years of broken promises made to customers about the "potential of the future," while substandard revisions of interim products were fed piecemeal to feature-starved users. Need I say more?

Yes, because the third group affected is IBM, Microsoft and, indirectly, their compatriots in this standards process. Users get tired of nonsense. That's why they killed off the PC Jr. and the original IBM RT, stuck with Extended Industry Standard Architecture-based PCs and avoided Micro Channel Architecture-based machines in droves.

Until both IBM and Microsoft put their products and applications where their mouths are, fancy videotapes and full-page advertisements are not going to make them multimedia powerhouses. In other words, I'm not impressed.

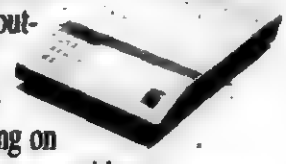
Newquist is chief executive officer of the Relayer Group, which publishes "AI Trends" and the "Multimedia and Text Report."

NEC modems keep information moving as if your life depends on it.



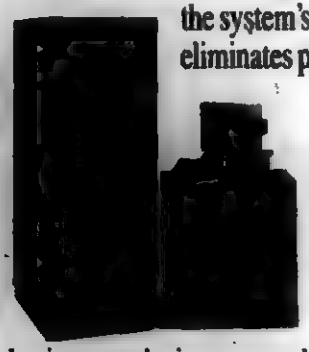
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NEC

COMMENTARY

Johanna Ambrosio

Strange way to win friends

Some Computer Associates customers are switching rather than fighting the company's recent price increases on about one-fifth of its IBM VSE product line. Other observers are simply wondering why CA chose *this particular battle* at this time.

Just as CA is making real progress toward resolving its longstanding support and service problems, the company is again generating bad will over the VSE move and other pricing issues.

CA is demanding fees between $1,400 and $11,500 for users upgrading to VSE/ESA Version 1.1. According to one CA executive, the higher price tags are justified because of the amount of work needed to prepare the new VSE-based releases [CW, Feb. 4].

However, CA appears to be the only independent software vendor to take this tack. Spokesmen from five other vendors — Software Engineering of America, On-Line Software International, Goal Systems International, B.I. Moyle Associates, Inc., and Cincom Systems, said they were not asking customers for any additional costs for the upgrades. Most of those vendors said the amount of work they had to do was minimal, and they felt that it was inappropriate to ask users to ante up more money.

This radical difference in philosophy has not escaped the notice of at least two users, both of whom are pulling out their CA software over the

Continued on page 32

Microvax still making its mark

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

With a roster of big customers such as Toys 'R Us, Inc., Blockbuster Entertainment Corp. and a chain of French banks, there is a reasonable temptation to call Digital Equipment Corp.'s entry-level business computer "The Mighty Microvax."

From the circa-1985 Microvax II to today's Microvax 3100E, DEC has sold nearly 200,000 Microvaxes. The bulk of them have been Microvax 3100s used mainly as servers for local-area networks of personal computers.

But now the powerful little VAX 4000 has crashed the party, dropping the "micro" from its name and making obsolete three other Microvaxes that have yet to see their third birthdays.

Where is the Microvax line headed?

"It seems clear there's going to be one Microvax left — the 3100 — and DEC's plan is to move people into the VAX 4000 line," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass.

"DEC's strategy is to have a block called Entry Systems, which will be the [Microvax] 3100 and 3300 initially," said Robert Kidd, an analyst at Dataquest, Inc. in San Jose, Calif. "They're blooming the upper end of the line and adding products in between with enough different technology and expandability to make it attractive to different buyers."

What Microvax customers can expect during the coming year is "time to take a breath," said Duncan Anderson, a marketing manager at DEC's Entry Systems Business unit. "We're done for a while. The major developments we have coming will be in the software and peripherals," he added.

Some customers may feel a bit disoriented by how quickly the Microvax 3800 and 3900, introduced in April 1989, were replaced when the VAX 4000 showed up in October 1990.

Within three months of installing its new Microvax 3800, Henry's Tackle and Sport Co. saw its new computer undone by the VAX 4000.

"Of course it worries you," said Mickey Bowen, data processing supervisor at the sporting goods distributor in Morehead City, N.C. "You worry that you put your money in the wrong place, but at that point, you have to live with it."

Better price/performance

As DEC's first system designed for client/server applications — and one powerful enough to chomp into low-end VAX 6000 sales — the VAX 4000 Model 300 offers 60% better price/performance than high-end Microvaxes, as well as twice the memory, storage and I/O throughput.

Yet, while it has the same Q-bus backplane as the Microvax 3000s, the VAX 4000 is really aimed at different users, Anderson said. Compared to the average Microvax 3100 price of $15,000, the VAX 4000's $106,000 price tag clearly labels it for a league that requires superior I/O speed, processor power and expandable storage.

"The 3100 is a low-cost, PC-like machine that runs VMS — the kind of machine you string

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FEATURE: MAINFRAME SPREADSHEETS

Feeling the squeeze a decade later

BY MARY LOU ROBERTS
SPECIAL TO CW

Personal computers and spreadsheets. The two seem to go together like baseball and hot dogs, paper and pencil, Burns and Allen.

Yet, it is easy to forget that spreadsheets gained their initial acceptance not on PCs but on mainframes. Joseph Difilippantonio, information center specialist at Pfizer, Inc. in Easton, Pa., notes, "When we first implemented our information center in 1982 or '83, the PC was not all that popular. We needed a spreadsheet, so we bought Dynaplan [a product of Dynasoft Corp.] for our mainframe."

A decade later, however, the mainframe spreadsheet market has fallen on hard times. The widespread acceptance of PCs in the corporate world, coupled with increased hardware and software power on the desktop, have caused spreadsheets to be viewed largely as a desktop function: Hardly a company exists that does not own multiple copies of Lotus Development Corp.'s 1-2-3 or a similar spreadsheet.

Is the mainframe spreadsheet on the verge of extinction? Some think so. Jack McGrath, publisher of "@MAX," a newsletter dedicated to PC spreadsheet computing, suggests "most of the tasks that have to be done anymore can be done on micros or on networks of micros." Bill

Continued on page 33



Timothy Cowell

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Per-user pricing may be fair but a headache, too

BY JEAN S. BOZMAN
CW STAFF

When you go to the butcher, you buy meat by the pound. At the gas station, you buy by the gallon. How about software? Right now, most multiuser database software packages are sold by the yard, either by site license or by hardware platform.

However, database management system vendors are considering a move to per-user pricing, and users are left to wonder whether that approach is going to make them pay more.

Per-user pricing will shift the burden of proof to the user precisely at the time when cost-conscious vendors want to raise their monthly revenues. Until now, most sites have paid a flat fee for DBMS software according to the type of computer hardware used. Accordingly, some DBMS users feel per-user pricing will increase their total costs, and vendors maintain this will be true in many cases. Per-user pricing also creates a new level of complexity in information systems administration, something some users are unhappy about.

"The worst-case scenario is that it would be a headache to administer," said Tom Moore, a senior consultant at International Data Corp. in Framingham, Mass. "It could be difficult to determine how many people are using the system at any one time."

However, users interviewed recently at 10 sites around the country said per-user pricing may prove more equitable than the current system, which works against small numbers of developers using large machines.

"The Oracle financial applications modules we bought are very expensive and based on the processor size," said Lyria Charles, director of IS at Dunn Edwards Corp., a Los Angeles-based retailer of paint products. "We said we would only have a few people using the system, so it wasn't fair to pay such a big price."

Making plans

Sumitomo Bank Capital Markets, Inc., a New York-based trading company that uses Sybase, Inc. software, is already planning for the expected vendor move. "Per-user pricing just means that you're paying a fair share based on usage of the software," said Kevin Scully, vice president of systems and technology at the 60-person firm.

So far, most of Sumitomo's software is paid for on a site-license basis. But per-user pricing is in step with the firm's budgeting practices, which already calculate per-user costs for hardware.

Vendors that have tried per-user pricing reported that the system worked well even if there is some uncertainty at user sites about how to pay for software. Informix Software, Inc. has been selling most of its database products on a per-user basis since January 1990.

"Clients usually notify us when the business changes and they need to put more users on the database system," said Gilbert Wai, vice president of product marketing at Informix. "We do it on the honor system because you can't enforce against software piracy. But we do have built-in [software] monitors to let people know when they've exceeded their bounds."

Sybase, which uses per-user pricing on a limited basis, may soon expand it. Oracle Systems Corp. and Ask Computer Systems, Inc. also said they are considering a wider move to per-user pricing. A taste of what may come has already been seen in local-area network software use.

"If you pay for a 10-user license, and the 11th person logs on, the software may lock that person out," said David Alessandro, manager of technical services at Textron Financial Services, Inc. in Providence, R.I.

Computers help launch space research projects

ON SITE

BY SALLY CUSACK
CW STAFF

SACRAMENTO, Calif. — The U.S. space shuttle program is getting a new type of power boost in the form of the Advanced Solid Rocket Motor, a sophisticated propulsion system from Aerojet that will replace the traditional rocket boosters used to propel objects such as the shuttle and the futuristic space plane through the atmosphere.

As with other projects, there is competition for the research contract, and computers are playing a role in that competition.

Aerojet is a division of Gencorp, Inc., and it is using a Pick Systems Pick-compatible database management system from Prime Computer, Inc. to peform cost analysis for bidding projects such as the $1 billion Advanced Solid Rocket Motor contract from the National Aeronautics and Space Administration.

The DBMS, Prime Information, was developed for the Prime minicomputer environment and provides Aerojet with cost tracking, budgeting, materials and man-hour expenditures for data analysis.

According to Chris Arndt-Kohlway, computer scientist at Aerojet, the facility has been using the software for almost five years and last November began using it in conjunction with the space project.

The company also has experience in the Oracle Systems Corp. Oracle relational database environment.

Aerojet runs Prime Information on a Prime 6550 superminicomputer platform for cost analysis, and the Oracle database resides on Digital Equipment Corp. VAX machines and supports in-house problem tracking and inventory systems. The DEC VAX 6430 and 6330 are used primarily for engineering analysis and computer-aided design and manufacturing applications.

Arndt-Kohlway said he finds that Prime Information provides a better development environment than relational databases currently offer.

Quick fixes

"It really allows us to fix things on the fly," he said, adding that Prime Information records and fields are not restricted by fixed lengths, making quick changes easier.

Aerojet will also be using PI Plus, Prime's version of Prime Information optimized for the Unix environment, for all nonaccounting applications such as internal billing, human resources and inventory functions. The product will also be used for bidding on future contracts.

Noting that cost analysis is not as glamourous as designing the actual space age technology, Arndt-Kohlway said that it is just as critical in many ways.

"Theoretically, one can design anything. But can it be done for a reasonable cost?" he asked. "There is the real issue."

In addition to NASA subcontract projects, Aerojet supplies advanced sensors for sophisticated satellites and plays a major role in the National Aero-Space Plane, which is a runway craft now being designed for space travel.

More than 200 users simultaneously access the Prime Information system on a daily basis, and Arndt-Kohlway said he expects that number to grow to 300 by the end of the year.

All in all, there are 2,000 users connected to the Prime and DEC systems via Ethernet with Transmission Control Protocol/ Internet Protocol and DEC's Local Area Transport. Aerojet is currently in the process of converting all its Prime Information-based applications to a Prime EXL 7680 Unix-based platform. The reduced instruction set computing (RISC)-based system will use PI Plus.

Describing the EXL 7680 as "super powerful," Arndt-Kohlway said the company benchmarked a number of vendors, including AT&T, Hewlett-Packard Co. and various value-added reseller products, before committing to the Prime box.



Computers help contractors determine if projects such as the space plane will get off the ground

"The price/peformance on the EXL was the best," he said. He added that converting the Prime Information software to the PI Plus format has been extremely easy.

"We've actually taken entire applications over without recompiling," Arndt-Kohlway said. "We just had to do some recataloging. We moved an application in one day and tested it the next."

CASE speeds development for insurer

BY ROSEMARY HAMILTON
CW STAFF

SPRINGFIELD, Mass. — After committing to computer-aided software engineering (CASE) four years ago, Massachusetts Mutual Life Insurance Co. is now reaping some rewards.

Earlier this month, it started to phase in an office administration package, the third major module of a CASE project that will overhaul many of the software programs used by the insurance company. Last year, the firm delivered a medical provider system, which gives on-line access to approved medical examiners and facilities throughout the country, and a client management system, a database system of all insured clients.

An application data entry package is slated for release this year.

All of the systems have come from an internal project called Horizon, which relies on the suite of CASE tools from Texas Instruments, Inc., said Peter Daboul, senior vice president of information systems and services.

The company began the CASE project in 1987. It devoted nearly two years to planning, learning the TI methodology, preparing, training and performing initial development before the official software development and installation began.

Although Mass Mutual is now using several software packages from this effort, Daboul said, the company has yet to get the big payback from CASE. He said he expects that it will come later when developers can reuse software from the Horizon project. What is more, maintenance and changes to current applications will require less time because of their CASE foundation.

"There's a near-term payback, but the big hitter will come over time," Daboul said.

Daboul said there are currently 175 staff members involved with CASE. Initially, he was faced with some staff reluctance, which he attributes to the "fear of the unknown." To combat this, Daboul introduced the CASE tools in "vertical slices," or small development projects, in which staff members could work on a program from start to finish. This approach allowed him to phase in the CASE tools and allowed staff members to adjust to them slowly.

He also gave a thumbs up to the TI product and said he has no qualms about tying himself to one vendor's product. This contrasts with IBM's position that a user should select tools from various vendors to achieve a "best of breed" solution.

"If IBM had an integrated tool set, then their marketing pitch would be different," Daboul said. "One of the most difficult issues is the integration of unlike components. I prefer the integrated product approach" that TI promotes.

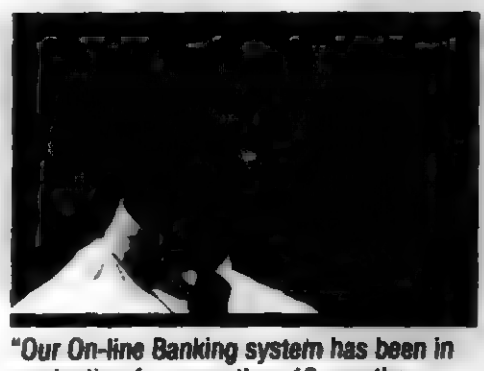
Nonetheless, he has kept an eye on IBM AD/Cycle developments. "We are watching it," he said, "but we trust TI to do whatever they have to do to remain compatible" with IBM.

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Chief Technology Officer
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Division Head – MIS
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Rolls-Royce



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Cloene Goldsborough
Director of Data Resource Management
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op information systems with uctivity and maintainability.

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Major companies have used TI's CASE product, the Information Engineering Facility™ (IEF™), for everything from rebuilding aging high-maintenance-cost systems to development of new enterprise-wide strategic systems.

Study shows zero code defects.

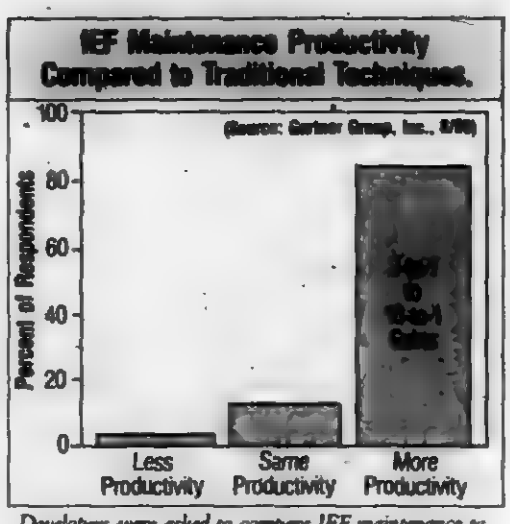
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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Ambrosio

CONTINUED FROM PAGE 25

pricing issue.

"This is completely wrong, and I'm not going to pay it," said one user who did not want to be identified because he is in the midst of negotiations with the new vendor. The user added that it will take him no more than about a weekend to replace his copy of CA-Dynam/T with a competing product.

"There are other viable products out there. For what CA is charging to upgrade, you can buy an alternative," said the second user, Alvin Drake, who is manager of technical support at Spartan Food Systems, Inc. in Spartanburg, S.C. Drake said he plans to replace five of his CA products unless the price increase is rescinded.

So far, CA has stuck to its guns, telling users if they don't pay, they don't get the tapes of the new products. However, Drake said, "I wonder how many customers they'll have to lose before they reconsider that policy."

Especially galling to some users is that they still have not received any formal notification or explanation of the new pricing policy, despite a CA executive's assertion that a letter was sent out to CA customers during the week of Jan. 28.

Although some users are too "married" to their CA products to consider switching, this can't help but further damage CA's already shaky relationship with the user community.

"Even if customers don't switch, it can't help CA to have customers upset," said Charles Phillips, vice president of Soundview Financial Group in Stamford, Conn. "Because even if they can't leave now, maybe they'll start thinking about doing so eventually."

Phillips said that the VSE issue is "just the tip of the iceberg. CA is taking every opportunity to gouge customers with very inconsistent pricing practices." He said he has talked to users that CA has charged up to $100,000 to "re-do the paperwork" in administrative matters such as two data centers merging. "A lot of customers are ticked off at CA," Phillips said.

So far, there has been no great cry from CA's VSE user base, which, by conservative estimates, includes at least 70% of the 10,000 or so VSE users in the U.S.

Some customers have quietly complained to CA and are waiting to see if any action will be taken, while others have decided to pay because they feel it's their only option.

Still, as more users upgrade to the new version of VSE during the next 18 months, time will tell whether they will, in the time-honored tradition of the computer industry, "vote with their pocketbooks."

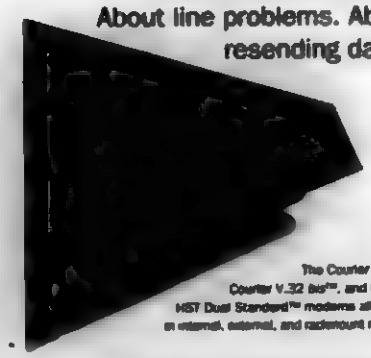
Ambrosio is Computerworld's Mid-Atlantic senior correspondent.



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NEW DEALS

Bull wins court pact

Bull HN Information Systems, Inc. was recently awarded a blanket contract from Massachusetts for the Superior Court, Department of the Trial Court. The $3.4 million contract covers three years and includes two optional one-year extension periods. Under the terms of the agreement, Bull will provide hardware, software, service, support and consultation for the Commonwealth's 20 Superior Court seats.

Quotron Systems, Inc. and **Paine Webber, Inc.** in New York, recently signed a multiyear agreement to upgrade all Paine Webber branches to the Quotron 1000 server and to later migrate some of the securities firm's 275 branch offices to the Unix-based IBM RISC/System 6000 server. The IBM workstations will support brokers by delivering market data and applications to direct-connect or remote terminals. The servers will act as file servers to customer personal computers and workstations.

Phillips Petroleum Co. in Atlanta has signed a $1 million contract with **Dun & Bradstreet Software** for education and consulting services in support of 14 previously licensed applications. Last year, Philips signed nearly $4 million in contracts with D&B for software that was used in the firm's downstream operations, which include refining, supply, transportation, petroleum products and others.

The New York State Office of Mental Retardation and Developmental Disabilities has joined forces with **Digital Equipment Corp.** and **Creative Socio-Medics Corp.** to produce a tracking and billing system for the 70,000 people in long-term care facilities in New York state. The new system, written in the MUMPS language, replaces multiple separate systems and will be one of the largest MUMPS networks in the world.

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> SOFTWARE AG's vision of Client/Server technology is one that has been touted by other vendors. But SOFTWARE AG has products and functionality to show for its strategy.
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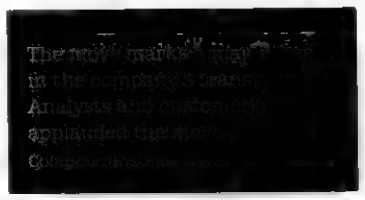
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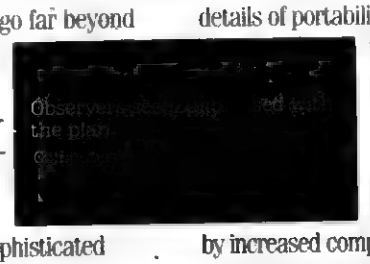
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Microvax

CONTINUED FROM PAGE 25

together in a network," Anderson said.

At Toys 'R Us, which is adding 1,300 Microvax 3100s to its network this year, the machines contain the price look-up file that is accessed each time a clerk runs an electronic wand over the price tag. Microvaxes also perform back-office applications such as credit verification and real-time inventory control.

Insteel Industries, Inc. in Mount Airy, N.C., relies on Microvax 3100s and 3800s for production applications and LANs at its 10 mills and manufacturing plants. Six Microvax 3800s support a network with 200 nodes, while a handful of 3100s create LANs at the plants.

"In our current environment, the Microvax is a perfect match to our needs," said John Claxton, Insteel's systems administrator. "The two things I'm happiest with are the networking, which is close to painless, and the hardware platform itself. We just have not experienced many problems."

Yet Claxton noted that if the VAX 4000s had been available before last October, Insteel would have gone that route rather than choosing Microvax 3800s.

> "THE MICROVAX is a perfect match to our needs. We just have not experienced many problems."
>
> JOHN CLAXTON
> INSTEEL INDUSTRIES

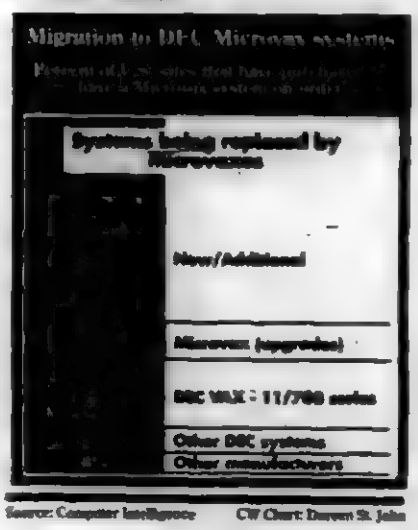
When DEC recently began offering an upgrade path for Microvax users to the VAX 4000 Model 200 — the $75,000 low-end of the 4000 line — the company was startled by the avid response. Microvax users are apparently jumping at the chance to double performance, boost I/O throughput and offload the CPU by upgrading to the 4000 Model 200 at $15,000 for a server upgrade and $21,000 for a time-sharing machine.

The only real catch is that the Model 200 is not upgradable; a move to the 4000 Model 300 requires a box swap.

At CSX Transportation, Inc. in Jacksonville, Fla., where a duo of high-end Microvaxes are used to develop applications, the VAX 4000 did lure away a recent sale. When a new department required more power than the 3000 series could provide, CSX bought a VAX 4000 Model 300 instead, said Art Masson, director of transportation systems. "We still see a lot of utility for the [Microvaxes], especially in a development environment for smaller type applications," Masson said.

New business

The bulk of DEC's Microvax sales are new or add-on installations



Source: Computer Intelligence CW Chart: Doreen St. John

Spreadsheets

CONTINUED FROM PAGE 25

McNee, program director of software services at Stamford, Conn.-based Gartner Group, Inc., said, "The mainframe spreadsheet market is very weak. For the most part, when people say they want to move beyond the PC, what they are really looking for is a more sophisticated modeling tool."

Software vendors see a stagnating mainframe spreadsheet market. "The market is in drastic decline," says Michael J. May, group marketing manager for data center management products at Goal Systems International, Inc. Goal acquired the Omnicalc product as part of its acquisition of Tower Systems International last year and is still supporting it, but "we don't see it as strategic," May says.

"The mainframe spreadsheet market is not very hot," acknowledges F. Tom Cox, vice president of marketing at Trax Softworks, Inc.

Mainframe to PC

One company that has moved from the mainframe to PCs is Amsco International, a manufacturer of hospital equipment in Erie, Pa. "Until the mid-1980s, we had about 100 users using Dynaplan on the mainframe," says Ron DelPorto, supervisor of network assistance. "For the most part, they worked individually without attempting to share data. But back then, we were used to viewing the mainframe as an end-user computing platform."

Today, the company's 500 spreadsheet users still work independently, but they do it using Computer Associates International, Inc.'s Supercalc5 on a Novell, Inc. PC network.

Pfizer has also seen some of its users move away from the mainframe, according to Difilippantonio. "Dynaplan is very compatible with Lotus' 1-2-3, and we do have about 100 people who prefer to use 1-2-3 on their PCs. We offer our users both, and we don't tell them which way to go. But with new users, we are definitely seeing a trend toward using the PC," Difilippantonio says.

However, in spite of the trend away from mainframe use, some users and vendors say there is still justification for mainframe spreadsheet computing. One frequently heard reason is that most corporate data still resides on mainframes. "It is easier to access data when the spreadsheet resides in the middle of the corporate data environment," says Ed Spire, president of Dynasoft Corp. Another reason is that a company might purchase a single mainframe copy of a spreadsheet as an economy of scale instead of purchasing hundreds of PC copies.

Cox divides users of mainframe spreadsheets into three profiles: First, he says, there are large companies with users who want large spreadsheets or who have on-line or real-time access to a database in which the data changes so rapidly that it is impractical to download it. Second, there are those companies that have few PCs. Finally, there are companies with mainframes already that simply cannot afford to purchase PCs or enough copies of a PC spreadsheet product.

Staying with the mainframe

There are users — generally those who have had mainframe spreadsheets for some time — who buck the current trends and continue to prefer the mainframe.

"I don't see the PC as necessarily better," Difilippantonio says. "For large spreadsheets, the mainframe gives you faster processing speeds and more storage capability. And we have a network in place so that data can be moved around easily." He does note one drawback: "The one thing most users don't like is the way in which they enter data. They see the data entry process as much easier and faster on the PC."

John Halligan, manager of information systems at Anaconia Copper and Brass in Anaconia, Conn., an Omnicalc user, also declares himself in favor of the mainframe: "In our company, some people are responsible for generating the spreadsheet and others are responsible for maintaining it. By keeping it on the mainframe, everybody can access it from his or her own terminal."

Also, Anaconia Copper and Brass has not bought a lot of PCs, Halligan says.

Still, that doesn't necessarily translate to a healthy market. "The trend line is turning down because most of the people who want a corporate mainframe spreadsheet have already bought one. Our product is active, and we will continue to support it, but the market isn't growing," Spire says.

> THE MAINFRAME spreadsheet market is very weak. When people say they want to move beyond the PC, what they are really looking for is a more sophisticated modeling tool."
>
> BILL MCNEE
> GARTNER GROUP

While uses remain for mainframe spreadsheets, the computing community — even vendors — accepts the reality of their dwindling importance. "We understood from the beginning that this was a niche sort of thing," Cox says.

1-2-3 for mainframes

Amid the flood of mainframe market pessimism, why did Lotus, which has net the de facto industry standard for PC spreadsheets, decide to deliver a mainframe version of 1-2-3? Is this, in the words of Gartner Group's Bill McNee, "a waste of resources that doesn't make any sense"?

1-2-3/M, which was unveiled last year, has been called a "clone" of the company's PC spreadsheet product, although Lotus takes exception to that description. "The world has a lot more in it than just PCs. We have always had the goal of making the product cross-platform compatible," says Mike Mitsock, senior product marketing manager at Lotus.

However, Mitsock acknowledges, "the vast majority of the code is the same across the platforms on which Lotus runs," suggesting that Lotus and IBM — which have exclusive sales and marketing rights to the product — have positioned 1-2-3/M not as a stand-alone mainframe product but rather as an extension of the PC version that is unlikely to affect other mainframe spreadsheets. This increases the likelihood that purchasers of 1-2-3/M will be existing Lotus PC customers who were unlikely prospects to purchase any other mainframe spreadsheet products.

MARYLOU ROBERTS

Roberts is a free-lance writer and consultant in Glenside, Pa.

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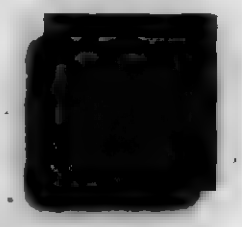
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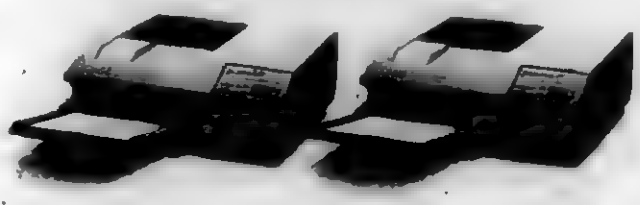
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Applications packages

Jobscope Corp. has announced a software package designed to assist manufacturing companies in authorizing and tracking materials that have been forwarded to outside processors and items returned by customers for repair, replacement or credit.

The External Materials Tracking Module enables users to define multiple shipping destinations for the same material. It also automatically creates shipping records that a billing function can use to create invoices.

The product runs on IBM Application System/400s or Hewlett-Packard Co. HP3000 machines. Pricing begins at $5,000.

Jobscope
P.O. Box 6767
Greenville, S.C. 29606
(803) 233-1853

Digital Equipment Corp. has announced a job scheduling application designed to automate scheduling and execution of routine system management and repetitive production tasks.

Decascheduler for VMS Version 1.1 features a Decwindows interface, which displays job dependency relationships for real-time job control and monitoring; a Decforms menu-driven interface, which provides users with job-status information; and a customizable fiscal calendar.

Pricing ranges from $970 to $62,500, depending on type of Vaxcluster CPU.

DEC
111 Lock Drive
Marlboro, Mass. 01752
(508) 480-5175

Clarity Software, Inc. has announced Rapport, a suite of object-oriented applications designed to run under the Open Software Foundation's Motif or Unix Systems Laboratories' Open Look graphical user interfaces on Unix workstations.

The product enables users of personal computers, Unix systems or Apple Computer, Inc. Macintosh systems who are not working in a Rapport environment to exchange mixed-media formatted documents with Rapport users.

Rapport is scheduled for a first-quarter release. Pricing is $895 per user.

Clarity Software
2700 Garcia Ave.
Mountain View, Calif. 94043
(415) 691-0320

Utilities

BGS Systems, Inc. has announced Release 2 of Best/1-VAX, a set of software tools designed for performance analysis and capacity planning of VAX/VMS systems and Vaxclusters.

The products include Capture/VMS Release 2, which enables managers to view daily reports of systemwide and key work-load performance of a particular VAX system, and Best/1-VMS, which features performance modeling that allows users to predict the effects of work-load growth and system changes on response times.

Pricing for typical installations of Best/1-VAX ranges from $20,000 to $40,000.

BGS Systems
128 Technology Center
Waltham, Mass. 02254
(617) 891-0000

NEW PRODUCTS — HARDWARE

Data storage

Mountain Network Solutions, Inc. has announced a ¼-in. small computer systems interface (SCSI) tape subsystem designed for midrange to high-end workstations and network environments.

The Filesafe 7500 ($3,495) can reportedly store up to 525M bytes of data. It enables users to back up or restore a complete 525M-byte cartridge in less than 45 minutes, the vendor said.

The drive is bundled with Mountain Network Solutions' Filesafe Version 5.1 SCSI tape backup software. A dual-drive configuration, the Filesafe 7500d ($5,495), features more than 1G byte of storage capacity for unattended backups.

Mountain Network Solutions
240 E. Hacienda Ave.
Campbell, Calif. 95008
(408) 379-4300

I/O devices

Interface Systems, Inc.'s ISI 7224 series of IBM mainframe- and midrange-compatible dot matrix printers now features an optional, dual-hopper automatic cut-sheet feeder and output stacker.

Each hopper yields an output of 130 sheets, and escape sequences may be inserted into mainframe or midrange applications to direct outputs to the first or second hopper. The printers operate at a rate of 400 char./sec. and feature 144 by 144 dot/in. graphics resolution.

Pricing ranges between $5,375 and $5,550, depending on options purchased.

Interface Systems
5855 Interface Drive
Ann Arbor, Mich. 48103
(313) 769-5900



WorkFlo Business System software electronically paper clips documents together so they never get separated.

WorkFlo Business System software automatically links, prioritizes, routes, and manages document images for increased productivity and efficiency.

WorkFlo Business System software queues image files for processing according to priority or workloads.

FileNet's WorkFlo Business System software offers the most comprehensive collection of image processing services for PC workstations in the industry.

FileNet's PC imaging software adds imaging to your other PC applications such as Excel,™ Word® for Windows, and RUMBA.®

WorkFlo Business System software creates suspense files. It waits until all information is gathered before sending the file on.

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WorkFlo software helps you to automate the repetitive, high-volume paper processes that overwhelm today's businesses — processes that existing computer technology can't effectively address. In doing so, WorkFlo software actually allows you to reshape the way you do business.

WorkFlo software gives you the ability to design new processing systems that can grow with your needs. It enables you to network hundreds of PCs on a FileNet imaging system. A system that can enhance productivity up to 100% or more by making people more efficient. Efficiency that can reflect in your competitive position, in your customer service, and in your bottom line.

Free information

To find out how WorkFlo software can make your company more productive, ask for a free brochure. Call Ray Brown at (714) 966-3900. Or write FileNet, 3565 Harbor Blvd., Costa Mesa, California 92626.

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Multiprocessor wait continues

ANALYSIS

BY RICHARD PASTORE
CW STAFF

Now that IBM will apparently join the notebook personal computer fray sometime in late March, there remains just one PC niche in which the firm is unaccounted for: the symmetric multiprocessor superserver. While observers said such a system is necessary and inevitable, IBM is following a strategy of upgradable uniprocessor and loosely coupled multiprocessor technology.

Users said they see an obvious gap in IBM's high-end product line. "You've got the 486, and then you go to RISC," Medical Cost Control, Inc. President Joesph Duane said, referring to IBM's Intel Corp. 1486-based Personal System/2 and the very different technology of reduced instruction set computing (RISC) platforms.

Users who are interested in multiprocessing claimed that IBM representatives have been stringing them along. "They say they are working on it and expect to have news for us sometime midyear," said Stephen Anderson, information systems architect at the state of Washington's Department of Social and Health Services.

However, IBM's teasers were not enough to make some users delay purchase. "I wasn't going to base my ability to upgrade on IBM's word as to whether they're going to do [multiprocessing] or not," said Gerard Nussbaum, director of MIS at Premier Hospitals Alliance, Inc. in Westchester, Ill. The firm bought a Systempro from Compaq Compter Corp.

> "I WASN'T GOING to base my ability to upgrade on IBM's word as to whether they're going to do [multiprocessing] or not."
>
> GERARD NUSSBAUM
> PREMIER HOSPITALS ALLIANCE

IBM said it is not currently interested in tightly coupled, symmetric multiprocessing in which the CPUs share memory and require specialised operating software. "There is relatively little software today that can exploit that configuration and fewer multiuser applications," said Robert Carberry, assistant general manager of systems technology at IBM's Personal Systems Division.

Carberry said multiprocessor-capable operating systems such as Portable OS/2 and the Open Software Foundation's OSF 2 — which are 12 to 24 months away — must be delivered before such technology would be practical to implement.

Meanwhile, IBM hopes to satisfy users' power-enhancement needs by designing upgradable uniprocessor systems such as the PS/2 Models 90 and 95.

There were two design choices, Carberry explained. A user could add a second proces-

Continued on page 47

Kit for OS/2 released

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. claims it has untangled some of the problems of Windows developers wishing to target OS/2 without rewriting their applications with its recent release of the Windows Libraries for OS/2 Development Kit.

With the new kit, developers can write to a single set of application programming interfaces and simultaneously create both Windows and OS/2-based applications. "OS/2-specific features [can then be added] to the converted OS/2 applications if they have the time and desire," Senior Vice President of Systems Software Steve Ballmer said.

The package — an extension for the Windows Software Development Kit — includes the tools necessary to convert a Windows 3.0 or later application to run on OS/2. The converted applications interact with native OS/2 applications as well as other converted applications as if they were all native OS/2 Presentation Manager applications, Microsoft officials said.

One beta-test user said the $150 Windows Libraries for OS/2 Development Kit provides a capable way of killing two development birds with one stone. "Not only have we found the conversion process painless, but we're pleased with the performance of the converted applications," said Daniel Browning, president of Precision Software, Inc. in Irving, Texas.

Wordperfect pacifying users with interim Office

BY PATRICIA KEEFE
CW STAFF

OREM, Utah — In response to customer enhancement requests and reported problems with Wordperfect Office Version 3.0, Wordperfect Corp. has released an interim version, Office 3.01.

Also announced was Wordperfect Connections MCI Mail Gateway for Wordperfect office users, which retails for $495.

In addition, the word processing company updated some product plans. Office for Apple Computer, Inc.'s Macintosh and Unix are slated to ship in the second quarter, and work has begun on a Windows version. A gateway supporting Retix Corp.'s X.400 software is expected to ship in the second quarter as well.

The improvements in Office 3.01 include marking within mail in/out boxes, enhanced mail/scheduled notification, X.400 addressing changes and Banyan Systems, Inc. Virtual Networking Software (Vines) Streettalk System Administration.

Users can now mark messages in either the in or out mailboxes to copy, print, save or delete. Notification has been enhanced to improve speed, interaction with calendar alarms and different network types. Multiple users can now access the same machine and receive individual notification.

Critical support

A key change, according to the vendor, is support in the User Information Files for X.400 addressing and cross-platform compatibility.

These changes allow user lists to be sent across various platforms that support Wordperfect Office and will reflect the X.400 specification. Office 3.01 also now provides a utility to extract information from the Vines Streettalk directory service and automatically put it into the Office user administration file.

There will be no free upgrade period. The interim update can only be purchased from Wordperfect. The cost is $10 for Office PC and $20 for Office LAN.

The MCI Mail Gateway provides access to the following services: wordwide electronic mail, facsimile, telex, IBM's Professional Office Systems, X.400, postal services, Compuserve and Wang Laboratories, Inc. services. The MCI Mail messaging system can extend Wordperfect Office LAN configurations across a wide-area network.

It's Time ...



To Attend the 1991 Micro Focus Users Conference

May 13-16, Orlando, Florida

If you develop applications with Micro Focus COBOL products you can't afford to miss the Third Annual Micro Focus Users Conference. This year's Conference offers a record number of sessions and includes something for everyone:

MIS Managers will learn how PC-based programming can provide additional productivity while leveraging current investments in sessions that examine:

- *Micro Focus Workbench - Making The Financial Case*
- *Strategies for Implementing Programmer Workstations*
- *COBOL in the 90's, including Object Oriented COBOL*

Enterprise Application Programmers will learn how PC-based application development can save time and money in sessions that include:

- *Micro Focus CICS and IMS Options for Workbench*
- *Mainframe Compatibility - Enhancements and Issues*
- *MF 370 Assembler - An Overview.*

PC Programmers will be shown the newest Micro Focus tools and technologies in sessions that include:

- *The User Interface Solution*
- *File Handling - The Technical Details*
- *COBOL - The Database Connection*

UNIX Application Developers will see how COBOL and open systems can be an efficient combination in sessions that include:

- *Mixed Language Application Development Under UNIX*
- *Writing Portable Applications*

These are just a few of the 50+ technical sessions scheduled for this year's Conference. But the Micro Focus Users Conference is more than three days of seminars; it's a unique opportunity for developers to meet the Micro Focus technical and support staffs and share solutions with other users through the Conference's Special Interest Groups.

The Micro Focus Users Conference is the forum for Micro Focus COBOL users ... Consider how your company could benefit from attending this year ... ***And Don't Miss It!***

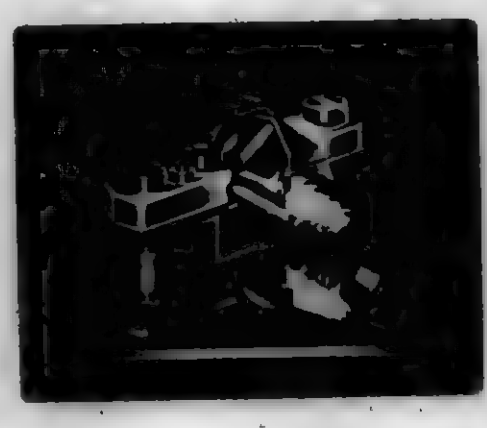
For more information or to register, call: 415-856-8817 and ask for the Users Conference Desk.

MICRO FOCUS®
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IBM lets the Now 486 technology

Without the proper venue, dazzling ability often falls short of expectations. That's certainly been the case with the Intel 486™ microprocessor, a processor that hasn't been utilized to its full potential. So that's what IBM set out to do. Just as it takes a seasoned jockey to turn a thoroughbred into a champion, it took IBM to give the 486 processor every opportunity to work its genius. Introducing IBM Personal System/2® Model 90 XP 486 and Model 95 XP 486.

From speed and storage capacity to graphics capabilities and upgradability, the new PS/2® Models 90 and 95 are designed to optimize the power of the Intel 486 processor and deliver a truly balanced performance—equipping you with solutions for today, and providing a platform of growth for tomorrow.





The 90's Are A Powerful Breed.

Right out of the starting gate, the Models 90 and 95 will astound you with their power and sophistication. Featuring a 33 MHz processor and a 25 MHz processor that's easily upgraded to 33 MHz, they deliver blazing speed and balanced performance, expanding your capacity for computer-intensive applications like CAD/CAM, financial modeling and multimedia. The course between your data and your processing has also been strengthened—the Micro Channel™ 32-bit data path, combined with a lightning-quick data-transfer rate, not only optimizes the present power of the 486 processor by feeding it a steady stream of information, but also provides for processor enhancements and will allow you to benefit from advanced operating systems to come. Plus these other innovations: a wider 64-bit data path which optimizes the 486 processor's access to system memory; 4MB memory standard (expandable to 32MB); and a 256KB cache option for even greater speed. All in all, it's easy to see how the concept of computer "power" has been enhanced, and how IBM helps you take full advantage of every second of computing time.

Brilliance On Display.

With increased power comes increased capabilities—the most visually stunning of which is Extended Graphics Array (XGA), standard on the PS/2 Models 90 and 95, and the heart of IBM's spectacular new display presentation.

With high resolution (1,024 x 768 pels) and execution that's significantly faster than VGA, XGA's sharper, clearer picture, coupled with the IBM 8515 color display, gives you swifter performance in windowed environments, and provides graphics-intensive applications such as desktop

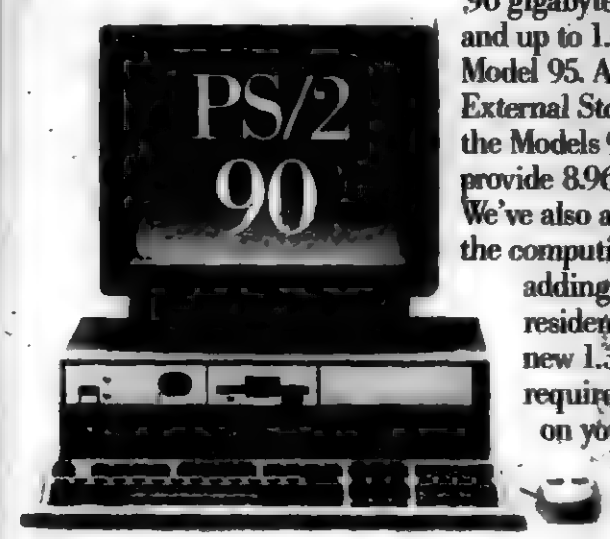
horses run. realizes its full potential.

publishing, image processing and engineering design with a stunning new look.

FAST TIMES ARE IN STORE.



To satisfy even the most demanding storage needs, from LAN systems to data base management to numeric-intensive applications like financial analysis and modeling, IBM has one of the most advanced solutions available. IBM's super-fast SCSI hard disks are pure state-of-the-art performers. With additional hardfile expansion bays, the PS/2 Models 90 and 95 have enormous storage potential—up to 96 gigabytes on the Model 90 and up to 1.6GB on the Model 95. And with the PS/2 External Storage Enclosures, the Models 90 and 95 can provide 8.96GB and more.



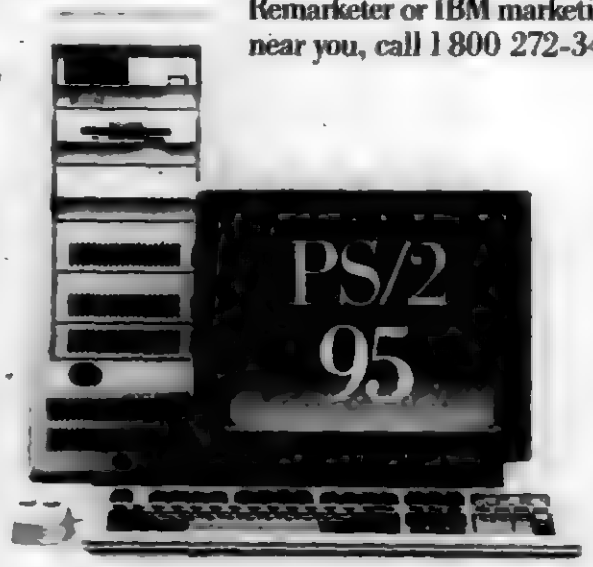
We've also augmented the computing power by adding more flexibility to resident memory—our new 1.3 version of OS/2® requires as little as 2MB on your system. With this streamlined version you not only get more room for applications, but some users will experience a substantial performance increase in system functions as well. So when you need to make great strides with your computing power, you can count on IBM to give you terrific storage capability wherever you may need it.

Features	IBM PS/2 Model 90	IBM PS/2 Model 95
Microprocessor		
Standard	80486	80486
Clock speed	25-33 MHz	25-33 MHz
Optional upgrade	33 MHz	33 MHz
Memory		
Standard	4MB (70ns)	4MB (70ns)
Maximum	32MB	32MB
Integrated Functions	Extended Graphics Array (XGA) and display port, DMA serial port (dual ports on Model 90), DMA parallel port, pointing device port, keyboard port, diskette controller support for three drives, SCSI Adapter with Cache.	
Fixed Disk Storage		
Standard	80-320MB	160MB-320MB
Display Modes	XGA (includes all VGA modes) 640 x 480 x 256 colors/64 gray shades; 1024 x 768 x 16 colors/gray shades; hardware support for 132 column text mode; 16-bit direct color mode at 640 x 480 x 64K colors	
Available Expansion Slots	three 32-bit	six 32-bit
Bus Architecture		
Data path	MCA 32-bit	MCA 32-bit

DESIGNED TO KEEP YOU OUT IN FRONT.

For the turns and hurdles ahead, you'll need technology that has foresight built in. Through a unique design, the Expandable Processor (XP) allows for an architected family of upgradable processor enhancements that can extend the life of your system. With Micro Channel busmaster adapters, you can incorporate multiple processors—like adding "computers" to your computer. And coupled with the industry-standard Small Computer System Interface (SCSI), you'll be able to support new applications and continue to build on your system as your needs become more varied and complex.

With optimized performance in balance, power, speed and adaptability, the new PS/2 Models 90 and 95 are designed to keep you ahead of the pack. To find out more about the new leader in 486 computing, contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438.



How're you going to do it?

PS/2 it!

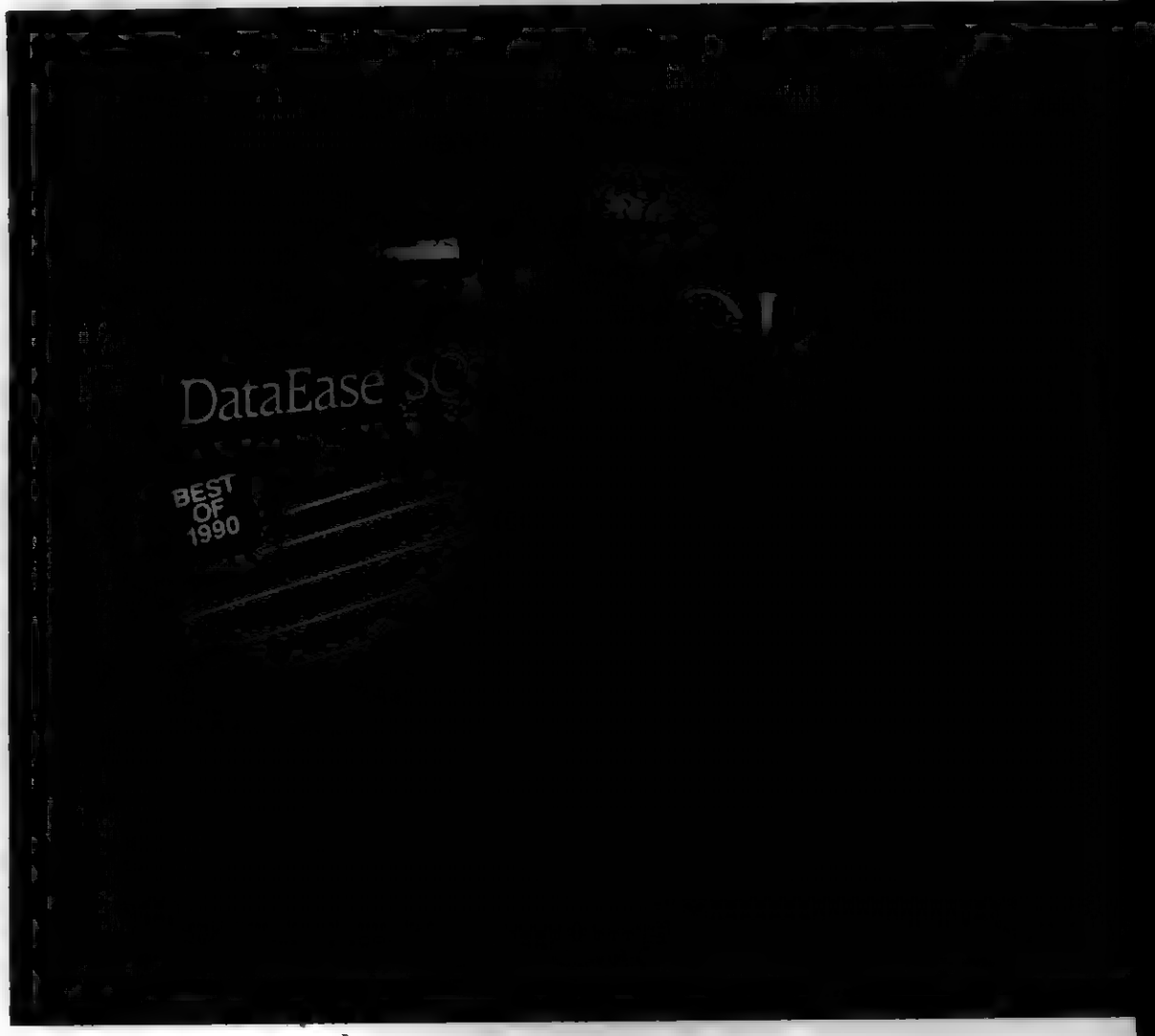
IBM

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PC Magazine just confirmed what Microsoft and DataEase already know.

The qualities which led *PC Magazine* to name DataEase SQL *Best of 1990* also prompted Microsoft to name us a key SQL Business Partner.

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DATAEASE: A PROVEN WINNER.

DataEase 4.2, which our SQL front-end product is based on, has long been the corporate solution for "industrial strength" database applications development.

Not only did it place first at the *PC Week* Database Shoot-Out, but we converted the standalone application into a fully-functional client-server system in only 19 minutes. It also won *PC Magazine Editor's Choice* in '86, '88, '89, and *Best of 1988*.

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Now that many corporations are making a strategic investment in client-server computing, it only makes sense to invest in the winning team: DataEase and Microsoft.

Only Microsoft SQL Server makes optimum use of client-server architecture with something called Server Intelligence. It lets you centrally manage critical corporate data for your entire PC network with ease.

And only DataEase SQL takes full advantage of Microsoft's technology by giving you transparent access to all its server capabilities, like triggers and stored procedures, distributed updates, and multi-threaded server access. Plus, DataEase SQL supports both DOS *and* OS/2 workstations.

When you team the award-winning features of DataEase with the performance, security and integrity of Microsoft SQL Server, you have *one* powerful business computing solution.

AN OFFER YOU CAN'T REFUSE.

And now for a limited time, you can buy both DataEase SQL and Microsoft SQL Server for only $995 (regularly, $1990). Or DataEase SQL alone is only $595 (regularly, $995).*

To take advantage of either of these limited time offers, or for the name of an authorized dealer, call DataEase Inside Sales at 1-800-334-EASE (in CT, 374-8000). For more information on Microsoft SQL Server, call Microsoft Inside Sales at 1-800-227-6444 and mention Account P60.

DataEase INTERNATIONAL

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Ancient Torah art gets new look via computer

ON SITE

BY MEL MANDELL
SPECIAL TO CW

Computers are supplementing a craft — Hebrew calligraphy — that goes back millennia. A computerized service is automatically proofreading Torah scrolls to ensure that there is not a single error among the 304,805 characters.

For more than 2,500 years, centuries before the famous Dead Sea Scrolls were written, scribes have been hand lettering the first five books of the Old Testament. To this day, they still use quill pens on parchment made from the skin of sheep. At least four times per week, congregants read from the scrolls. A Torah must be "perfect" to be used in prayer services. If an error is detected, the scroll is immediately set aside and not used again until it is corrected.

Unfortunately, despite years of training, today's scribes sometimes fall short of the performance of earlier calligraphers. According to Rabbi David Greenfeld, who conceived the computerized service Vaad Mishmereth Stam 15 years ago, more than 90% of new Torahs contain errors. In contrast, few of the older Torahs contain mistakes.

Categories of errors

The unacceptable errors fall into five categories: wrong letters, missing letters, extra letters, missing words and, rarest of all, extra words. After a scribe completes a Torah, which can take 12 to 18 months, three proofreaders or teams proofread the new scroll, according to custom. Nevertheless, errors still escape them, Greenfeld said.

"One reason for the failure to detect all errors is that today's proofreaders are paid a standard fee [ranging from $500 to $1,000 per Torah], whereas old-time proofreaders were paid per error detected," Greenfeld said.



Michael S. Klein

That is where the service, which is now located in Brooklyn, N.Y., Jerusalem and Strasbourg, France, comes in. For a fee of $750, it matches Torahs that have already been proofread by humans against the "perfect" standard in the memories of the computers, Intel Corp. 80386-based personal computers from Dell Computer Corp. The perfect copy takes up 25M bytes on a 320M-byte hard disk.

To date, more than 3,500 scrolls, some from synagogues as far away as Australia, have been proofread.

Copies made

Each Torah to be checked is first photocopied. The photocopy is scanned page by page into computer memory. To ensure that every one of the approximately 250 columns in a Torah has been included, the system displays blowups of the corners of each scanned column to the operator manning the scanner.

After the Torah is scanned, it is compared automatically letter by letter with the standard. The comparison process employs a number of algorithms. For instance, the "stroke-analysis" technique used in systems that recognize hand-printed characters is one such algorithm.

If an error is detected or there are any uncertainties that may be induced by discolering of the parchment, a bell sounds. If there is a letter or word in error, the operator commands it to be stored in memory with its position by column and line.

At the end of the comparison process, which takes about two hours, any errors with the phrases in which they appear and their locations are printed out on a Hewlett-Packard Co. Laserjet II.

Crime deterrent

The printout indicating errors and the complete photocopy of the Torah are returned to the owner. Coincidentally, since the service was launched in 1984, there has been a marked decline in the once-lucrative trade of stolen Torahs because the photocopies provide a positive means of identification, Greenfeld said.

Greenfeld and his associate, Rabbi Shmuel E. Granatstein, are constantly striving to improve the technology to cope with the many subtle variations in styles of calligraphy. For instance, they are planning to replace the present 300-dot/in. scanners with 400-dot/in. versions. The dozen or so programmers working part-time on the technology are steadily refining the algorithms, which are mostly written in C language.

Benefactors have contributed about $2 million to the the nonprofit service, which has yet to break even.

When the service was introduced, the ultra-Orthodox scoffed at it. However, once it proved itself by detecting errors in Torahs that have been in weekly service for decades, the scoffers became, in Greenfeld's words, "true believers."

Mandell is a technical writer based in New York.

Torah goes to the Gulf

Among the Torahs recently proofread by Vaad Mishmereth Stam was a rare miniature Torah.

The decades-old Torah, most likely the creation of a pre-World War II Polish scribe, was destined for the Persian Gulf to meet the religious needs of the approximately 1,500 Jews serving with U.S. forces in that region.

The six-inch-wide Torah, less than half the width of today's Torahs, was selected because it could be transported in a small container that would not indicate its contents. The Allied forces downplay all religious expressions other than Muslim because Saudi law does not sanction any other religious expression.

PC buyers scout new retail outlets

BY RICHARD PASTORE
CW STAFF

Personal computers? Third aisle on the left opposite the frozen waffles.

No, supermarkets are not selling PCs yet. But warehouse clubs, which sell everything from butter to bicycles at less than 9% markup, will sell hundreds of thousands of systems this year. For corporate and business buyers who are members of the clubs, these may be a lower cost alternative to the traditional dealers and mail-order channels.

Like the computer superstore channel, warehouse clubs are aimed at cost-conscious buyers who already know what they want. "Users who don't require hand-holding can get what they want at an attractive price," said Andy Bose, an analyst at Link Resources Corp. in New York. The warehouse club is particularly suited to PC upgrade buyers, he said.

The 5% to 7% markups of national clubs such as Sam's and Price Club contrast well with traditional channel markups of up to 25%. As much as 60% of club sales are to business buyers rather than home consumers, according to retail analyst Robert Cheadle at Montgomery Securities in San Francisco.

While a majority of these sales are to small firms, corporate customers are on the rise as budgets tighten and alternative channels become more acceptable, analysts said.

"At first, companies are suspicious. Before they order in volume, they buy two and tear them apart for evaluation," said Bryan Kerr, executive vice president of Positive Corp., a PC maker that markets its boxes exclusively through the clubs.

The domestically built Positive line, which begins with a $1,499 Intel Corp. 20-MHz 80386SX, was extended earlier this month to include a $3,999 33-MHz 1486-based model. The high-end unit includes a 64K-byte cache, a 200M-byte hard disk, a Super Video Graphics Array monitor, a mouse and preloaded DOS 4.1 and Microsoft Corp.'s Windows 3.0. A similarly configured name-brand unit from a dealer could run $8,000 to $12,000.

Positive and other club vendors try to answer support concerns by offering toll-free telephone support and depot returns. Positive also contracts with dealers located near club stores to provide on-site service.



Reviewers find few faults with Excel 3.0

Technology Analysis — a roundup of expert opinion about new products. Summary written by Computerworld intern Derek Slater.

Three years after its most recent upgrade, Microsoft Corp.'s Excel has beaten its biggest spreadsheet rivals to the Windows-compatible market with Version 3.0. Reviewers said the new Excel is worth the wait, citing powerful analysis functions and graphics capabilities.

Performance: Because it is a heavily graphical program, Excel is not the fastest gun among spreadsheets. However, Excel 3.0 sports powerful number-juggling features such as worksheet outlining, which allows the user to graph and present only significant summary data while still manipulating less important numbers in the background. Linking or consolidating different worksheets is also easily accomplished.

Compatibility: Excel is compatible with all versions of Lotus Development Corp.'s 1-2-3 files and includes a special dialog window to help translate 1-2-3 commands into their Excel equivalents.

Graphics: Operating under Windows provides a natural advantage in graphics capabilities over DOS-based programs. Excel's charts and graphs can be rotated on any axis, labeled with icons and arrows and placed anywhere on a worksheet. Text wraps automatically around graphs where desired and can also be placed within a graph.

Database: In addition to its own flat-file database capabilities, Excel includes bundled software that allows it to import files from Microsoft's SQL Server and Ashton-Tate Corp.'s Dbase III and IV.

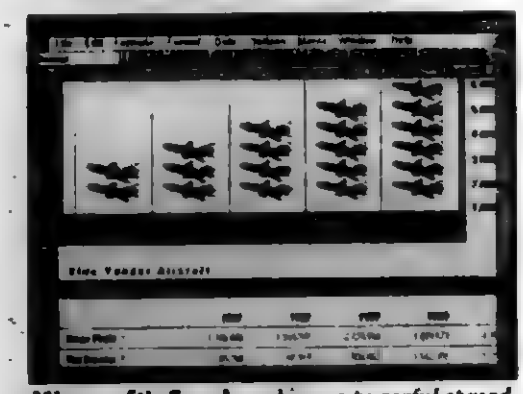
Output: What you get is what you see on the program's display. Formatting control is excellent, according to reviewers. Users can reduce print size to keep larger worksheets on a single printed page and create style sheets that make future worksheets conform to a standard output format.

Documentation: Excel's documentation has been completely revamped for the Windows version. Reviewers also noted the addition of on-line Help windows.

Ease of use: Ease of use is enhanced by the point-and-click Windows environment. A tool bar offers quick and simple cell formatting, and graphs are also easy to set up. The outliner feature enables users to handle complicated, multilevel worksheets.

Support: Microsoft offers solid technical support, reviewers said. Telephone support is unlimited and free, although not toll-free. Excel also comes with a 30-day return policy.

Value: Excel is one of the best values on the spreadsheet market, reviewers reported. Priced at $495, Microsoft is offering the package for $129 for the next nine weeks to users who say they are currently using another spreadsheet product.



Microsoft's Excel *combines a powerful spreadsheet with the easy-to-use Windows interface*

Reviews Summary

Criteria			
Performance	Excellent	No speed demon	NC
Compatibility	[illegible]		
Graphics	Excellent	Superior integration	Lacks[illegible] major rivals
Database	[illegible]		
Output	Excellent	Has an edge in presentations	Brings report formats to a higher level
Documentation	[illegible]		
Ease of use	Excellent	Easier than previous version	Spectacular
Support	[illegible]		
Value	Excellent	NC	A new caliber of style and substance
Reviewer's score	8.9		

Numeric rating: are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

What the experts say



Contel ASC's Remmert

• Users: Bill Remmert, manager of end-user computing, Contel American Satellite Co. (*overall performance of product:* 10, *cost to get product up and running:* 10)

"Microsoft has made a tremendous leap from Version 2.0 to this version. It's as big as the leap from Word to Word for Windows. The outlining feature, excluding certain columns from view with the click of a button, makes some things 10 times easier to do. The ability to design my own macros is also important. The cost isn't even a question. You'll get your money back," Remmert said.

Bob Cohen, division systems manager, Baxter International, Inc. (9,8)

"The graphics are excellent, and the formatting options for a spreadsheet are really nice; it's almost like a word processing environment. It's not inexpensive, but it's a lot of product for the money," Cohen said.

Steve Alverson, project engineer, Cincinnati Milacron (9,8)

• Analysts: Amy Wohl, Wohl Associates (*overall performance of product:* 10, *cost to get product up and running:* 7)

"The interface on Excel is very appealing and very easy to use. Also, customers find feature-rich products very appealing, and right now, it has the most features," Wohl said.

Marshall Moseley, Dataquest, Inc. (8.5,8); David Cearley, Gartner Group, Inc. (8,8)

• Financials: Christopher Mortenson, Alex. Brown & Sons, Inc. (*overall financial performance of product and company:* 9)

"Excel is about 10% of Microsoft's revenues and earnings. Although Version 3.0 is just starting to ship, I have a very positive feeling about it," Mortenson said.

David Bayer, Montgomery Securities (10)

"Excel is the spreadsheet to beat for Windows 3.0," Bayer said.

Thomas Erickson, Wessels Arnold & Henderson (9); Jim Weil, Soundview Financial Group (9)

Excel 3.0

score:

Points (maximum)	Category
27 (30)	Published reviews
18 (20)	Analysts' ratings
14 (15)	Users' ratings
16 (20)	Cost evaluation
14 (15)	Vendor financials

(Maximum score: 100)

Microsoft responds

Comments from Rich Tong, product manager:

Performance: We designed Excel to run on [Intel Corp. 80286-based] machines with 1M byte of random-access memory. Excel has one of the fastest recalculation speeds out there. Most of the problems with speed come from trying to run too many applications at once. The point of Windows is to be able to load as many programs as possible. Whether good or bad, it doesn't tell you, "Hey, this is really dumb to load 18 applications."

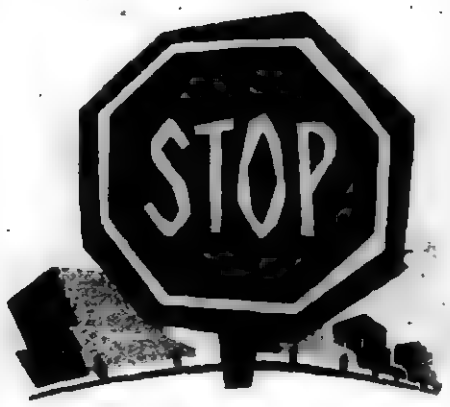
Database: We'll continue to write drivers to support additional databases. But since most databases can convert to Dbase files, you can work around this already. Also, managers can write their own browsers because the format is open-ended. The SQL Server is really the crucial thing because it will allow people integrating mainframes with personal computers to bring their database data down to the micros.

Support: We recently changed from a 30-day return policy to a 60-day policy. But the return rate is extremely low, regardless.

NEXT WEEK

▶The latest version of Computer Associates International, Inc.'s Supercalc5 keeps pace with the market leaders.

Methodology: *Published reviews: average of numeric scores from product reviews published by personal computer publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of financial analysts' ratings of vendor financials and ability to support product multiplied by 1.5.*



INFORMATION GRIDLOCK

You're not alone if you're drowning in too much paper and electronic information. Because of the explosive growth of desktop computing and networking capabilities, any workgroup that produces volumes of documentation, and the IS people that support it, are apt to be facing this problem.

Howard Woolf, Digital's Manager of Network Application Support and Electronic Publishing, discusses how a new networked application area called Document Management offers an integrated solution.

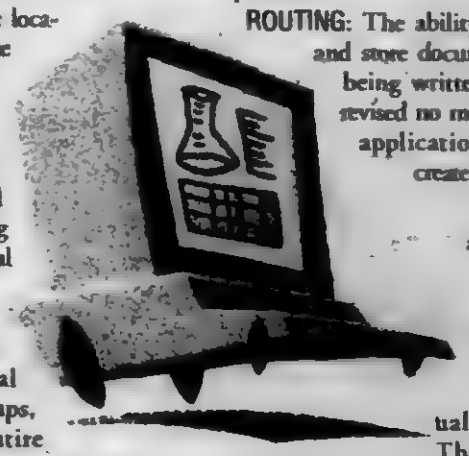
Too many files, in too many places, in too many formats? Document Management lets you keep information on track and flowing smoothly.



WHAT IS DOCUMENT MANAGEMENT? AND WHAT INFORMATION MANAGEMENT PROBLEMS DOES IT ADDRESS?

It's now fairly simple for people to create professional-looking documents on their computers, including graphics, images, and other types of information with their text, then distribute that information quickly and easily to others. And, of course, it's also much easier to revise such documents at any time.

But along with the benefits of desktop publishing have come a host of problems—electronic files that can't be located when you need them; obsolete and incomplete information; different versions of the same document in multiple locations. The problem is made worse because most documents result from the contributions of various people—writers, editors, graphic designers, and reviewers all working together to produce the final document.



Keeping track of that document from creation through revisions to final approval across workgroups, departments, and the entire organization can be a management nightmare. Equally difficult is ensuring that the document is kept current and accessible to the people who depend on the information it contains.

A good way of addressing these problems is through networked applications that integrate desktops and other systems in a client/server computing environment. That's what Document Management is all about.

WHAT SORT OF BUSINESSES WOULD BENEFIT MOST FROM DOCUMENT MANAGEMENT?

Discrete and process manufacturers such as aerospace, petrochemical, and pharmaceutical companies are all good examples of organizations that produce a massive amount of documentation and can certainly benefit from Document Management. Both state and federal agencies, as well as organizations that deal with government agencies, have an urgent need for Document Management. For instance, the government requires the filing and tracking of millions of pages of safety documentation, technical manuals, and other mission-critical documentation from many organizations.

WHAT MAKES A GOOD DOCUMENT MANAGEMENT SYSTEM?

You should look for a Document Management system that embraces the following capabilities:

ROUTING: The ability to track, route, and store documents as they are being written, reviewed, and revised no matter what desktop application is used to create the document.

STORING: The ability to store documents in a structured text database—versions of a technical manual, for instance. These documents should also be available to all authorized users over a network.

RETRIEVING: The ability of any desktop system to retrieve compound document information from within multiple applications without needing to know where the information is stored.

LINKING: The ability to link associated objects. For instance, having a maintenance manual linked to relevant OSHA regulations.

continued ➤



Howard Woolf
Manager of Network Application Support and Electronic Publishing

"Any successful Document Management strategy must address how to get information to and from the desktops in a mixed-vendor environment."

HOW ARE THOSE CAPABILITIES REFLECTED IN REAL PRODUCTS?

We have a variety of excellent products for Document Management, including:

- ODMS from Odesta Corporation, which works as client/server software and allows users to route documents, track revisions, and control versions of the document. Digital jointly markets ODMS with Odesta today, and plans to sell, distribute, and support a future version of this product.
- BASISplus, from Information Dimensions, Inc., which provides a large, centralized library where writers and reviewers can check out and work on documents.
- TOPIC, from Verity, Inc., which allows users working in a distributed client/server environment to retrieve documents in order of importance. Digital sells and distributes this product.
- PixTex, from Excalibur Technologies, which is an ideal application for locating information in image documents. PixTex can search documents that contain misspellings. For example, if a document has been scanned and then converted into text with an optical character reader, the chances are good it contains some misspellings—but PixTex can still find the desired information even if the words it is searching for are incorrectly spelled. Digital sells, distributes, and supports PixTex.
- EDCS II, which provides a secure structured library for engineering drawings and technical documents.

These are only a few of the many products available as part of the Digital Document Management strategy—all based on Network Application Support (NAS) services as the integration software.

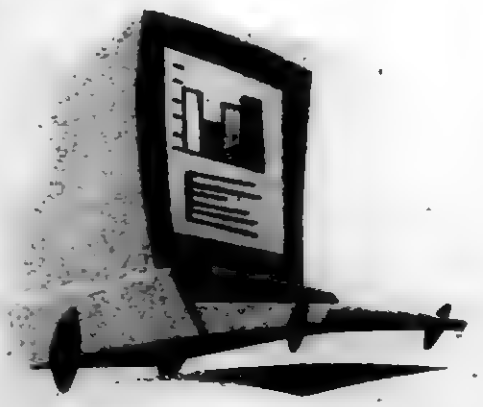
HOW DOES DIGITAL FIT INTO THE DOCUMENT MANAGEMENT PICTURE?

That's a key point. Obviously, Document Management won't work unless it works for everyone who needs access to the document. There are over 40 million desktop computers in use today, and any successful Document Management strategy must address how to get the information to and from those desktops in a mixed-vendor environment.

Also, documents often include such things as graphics and charts as well as text—what we call compound documents. People who need access to documents need access to the entire document. It shouldn't matter what applications or computers are being used.

That's where Digital comes in. Thanks to our NAS software, we believe that Digital already leads in ease of interoperating with other vendors' systems—from DOS-based PCs to Apple Macintosh systems, to UNIX workstations, and IBM mainframes. Because of NAS, all the Document Management products I've mentioned are interoperable in multivendor environments.





We're also working closely with the application vendors to ensure that their Document Management products support all the key NAS services such as Digital's Compound Document Architecture (CDA).

SO, ALL THESE PRODUCTS WORK USING NAS?

Yes. ODMS currently supports Macintosh and VT clients on a VMS server, and will soon be available for Motif and MS-Windows clients on a VMS server.

BASISplus supports VT, X-Windows, and MS-Windows as time-sharing clients with a VMS server. TOPIC supports the MS-Windows, Macintosh, and Motif clients, with UNIX and/or VMS servers. PixTex supports X-Window clients on a VMS server, and a RISC/ULTRIX server is under development for PixTex.

HOW DO YOU GET STARTED WITH DOCUMENT MANAGEMENT?

Everyone has their unique needs. The best way to get started is by contacting a Digital salesperson. Together, you can select products that will match your Document Management needs and integrate with your current or planned computing systems.

New MEMORY MODULES for VAX 6000 Systems

Today's applications—whether they are database, scientific, or vector processing applications—require superior performance. Digital now offers three new memory modules to help you obtain the performance these applications demand.

Designed specifically for VAX 6000 systems, the new MS65A modules come in 128 MB, 64 MB, and 32 MB sizes. All offer marked improvements in speed, flexibility, and capacity over the existing MS62A memory.

The modules provide a smooth system growth path, working to protect your investment in existing equipment. They are forward compatible, so you can use them when you upgrade to the VAX 6000 Model 500. And they are backward compatible, so you can use them with earlier VAX 6000 systems, including Models 200, 300, and 400.

Bigger and Faster

Thanks to high-density, state-of-the-art 4-Mbit DRAM technology, the modules have larger memory capacities. When you upgrade to the VAX 6000 Model 500, the new modules support a write-back cache that bolsters the efficiency of the system bus to make your whole system still faster.

The new memory modules' unique design gives you faster access to your memory data. On the average, the modules are 25 percent faster than the MS62A. A new streamlined memory controller design provides memory bandwidths that surpass those previously available for VAX 6000 systems. The new memory modules let you double the size of your memory, from 256 MB to 512 MB.

Flexible and Secure

The range of memory options and a new mixed-module interleaving capability give you flexibility when configuring memory. You can free up slots in heavily-loaded systems by replacing your MS62A memories with the new, higher-density modules. You can mix MS65A and MS62A modules on the same VAX 6000 system (Models 200, 300, 400) and still benefit from the performance advantages of interleaving.

More memory means more performance. And that's what you get with the three new MS65A modules.

Flexible also means cost effective. You can buy memory in the increments that best suit your needs—32 MB, 64 MB, or 128 MB. By choosing the 128 MB module, you can save 20 percent of the cost you would pay if you bought equivalent amounts of memory in the 32 MB or 64 MB options.

Whatever new module you choose, your data is safe. The new memories are tightly integrated with the VAX 6000 system architecture—to deliver superior data integrity and high systems availability. The modules come with built-in self-test capabilities, battery back-up capability, and error detection and correction.

With Maintenance Included

In the United States, maintenance for memory is free of charge when your system is covered by a Digital service contract. This cost-of-ownership savings adds up over the lifetime of your system. System service is done on-site, so you can avoid extended periods of downtime.

For more information on configuring memory options for VAX 6000 systems, contact your local Digital sales representative, or call our Technical Consulting Center at 800-343-4040.

february
march
april
may
june
july
august
september
october
november
december
january

VTXpress is compatible with Digital's PATHWORKS for Macintosh product—software from Digital enabling MicroVAX and VAX computers to act as application, data, electronic mail, and resource servers for large groups of Macintosh computers. To order or for more information on VTXpress, contact:
White Pine Software, Inc.
94 Route 101A
Amherst, NH 03031
603-886-9050

[redacted]

Licenses to Save for MicroVAX Users

Thanks to the new VAX/VMS Unlimited User License Upgrade program, existing MicroVAX sites that plan to upgrade before June 28, 1991 can save as much as 77 percent off the cost of the standard VAX/VMS unlimited user license. Approximately 60,000 MicroVAX II and MicroVAX 3000 system customers with time-

[redacted]

extends low-cost [redacted] support to the VT1300 X Window graphics terminal; VAXstation 2000 and VAXstation 3000 workstation graphics; graphics accelerators in the VAXstation 3100 SPX workstation and the MicroVAX 3500/3600/3800/3900 computers; the DEClancontroller 400 high-performance Ethernet/802.3 controller; and the RV20 Write-Once Optical Drive.

Integrating OS/2 into the Network

DIGITAL'S STRATEGY

Certainly you are already familiar with OS/2—the newest personal computing operating system from IBM, offering multitasking capability and virtual memory management. You know you can use OS/2 to develop and support more powerful applications than were available under MS-DOS. OS/2 includes the Presentation Manager graphical user interface and is an excellent platform for networked applications.

Of course, to get the most out of OS/2, you'll want to integrate it into your corporate network.

The following series of questions and answers addresses Digital's strategy for doing just that. (First, some foundation-building information; then to the heart of the matter.)

What is PCSA?

The Personal Computing Systems Architecture (PCSA) is Digital's solution for integrating personal computers into your total computing environment, so that they can share all of the information and resources that your business possesses.

As the architecture that underlies the PATHWORKS family of products, PCSA is based on DECnet and LAN Manager, with support for the TCP/IP transport to be offered in the future. PCSA offers basic file and print services, as well as value-added applications and utilities such as terminal emulation and mail.

PCSA support also extends to Macintosh systems using AppleTalk and AFP. In this way, Digital supports Macintosh systems within our networks by using the industry standards preferred by Macintosh users, much like we support DOS and OS/2 users via LAN Manager.

What does Digital's PATHWORKS offer that competitive products don't?

First, PATHWORKS provides interconnectivity between all Digital LANs and host systems, so you can access services from any server in the network. The PATHWORKS product family includes servers on VAX-based VMS systems, on VAX-based and RISC-based ULTRIX systems, and on OS/2-based Intel systems.

Second, PATHWORKS is based on industry-standard architectures, such as LAN Manager, MS-DOS, and OS/2 Standard Edition. Digital believes in open computing, so PCSA is not a proprietary architecture.

Third, you benefit from Digital's high-quality product engineering and state-of-the-art technology. You also receive our comprehensive service and support, plus guaranteed customer satisfaction.

Now, the key questions:
What is Digital's strategy for OS/2 support?

Digital supports OS/2 under our Network Application Support (NAS) strategy. NAS offers you transparent access to a backbone set of applications and services that are located anywhere on the network, yet are available to users of any desktop platform. Digital has licensed Microsoft's LAN Manager network operating software as the basis of our PATHWORKS for OS/2 (formerly PCSA for OS/2) product. PATHWORKS for OS/2 allows OS/2-based PCs to be used as both clients and servers.

Digital is developing a number of other OS/2 products under the NAS program. Two products which are currently available are DECwrite for OS/2, a desktop publishing application; and CDA Base Services for OS/2, a collection of tools which brings the power of Digital's Compound Document Architecture to OS/2 users.

What are the principal features of PATHWORKS for OS/2?

PATHWORKS for OS/2 gives you all of the software and documentation you need to configure an OS/2 client or server in a single package. PATHWORKS for OS/2 provides full support of the LAN Manager Application Programming Interface (API) so that you can develop distributed OS/2 applications. V1.1 includes server software which has been optimized for superior performance on IBM 386 and 486 systems. V1.1 of PATHWORKS for OS/2 will also include support for the LAN Manager Peer Services feature that lets individual OS/2 users share local disks and printers with other users, one connection at a time.

PATHWORKS for OS/2 includes DECnet network transport software, so OS/2 users can participate in DECnet computer networks. Some key features of DECnet include task-to-task communications, network file transfer, network management utilities, and NETBIOS interface support.

A PATHWORKS for OS/2 client can access file, print, and mail services of VMS, ULTRIX, and OS/2 PATHWORKS servers. You can access one or more servers simultaneously, so that all resources of the network are available to you.

The PATHWORKS for OS/2 server software also includes mail server software, allowing the OS/2 server to route electronic mail messages between PC users. Both DOS and OS/2 PATHWORKS clients can have mail accounts on the OS/2 server.

The OS/2 client mail utility lets you send mail to PC, VMS, and ULTRIX mail users. Other client applications and utilities provided with PATHWORKS for OS/2 are VT320 terminal emulation, a full-screen editor, a broadcast sender, and a broadcast receiver.

PATHWORKS for OS/2 supports the Network Device Interface Specification (NDIS). NDIS was jointly developed by Microsoft and 3Com Corporations and is a standard which allows network software and hardware to work together. When you purchase PATHWORKS for OS/2, you receive NDIS-compliant drivers for several Ethernet controllers, including the DEC EtherWORKS products. PATHWORKS for OS/2 may also be used with other vendors' Ethernet controllers, which are supplied with NDIS-compliant drivers. Digital's support of NDIS is another example of Digital's commitment to standards and to open computing.

Does PATHWORKS for OS/2 support Presentation Manager?

Yes. PATHWORKS for OS/2 utilities run in full-screen mode. Applications that use Presentation Manager windowing features are supported under PCSA, and can run in a networked environment.

What are the configuration requirements for a system running PATHWORKS for OS/2?

PATHWORKS for OS/2 V1.1 supports OS/2 Standard Edition V1.1 and V1.21 on client configurations; it supports OS/2 V1.21 on server configurations. PATHWORKS for OS/2 may be run on a wide variety of PCs, including IBM 286, 386, 386sx, and 486 models. Supported models include Digital's DECstation PCs, IBM AT and PS/2 models, as well as models from COMPAQ, Olivetti, Tandy, Toshiba, and Zenith Data Systems. A minimum of 4 MB of memory is required on client systems. A minimum of 6 MB of memory is required to run the server or Peer Services software. An Ethernet controller is also required in each OS/2 client or server system.

Is it difficult to configure PCs as clients?

Not at all. PATHWORKS for OS/2 comes with a menu-driven utility which makes installation and configuration quick and simple. You use a single utility to install the software and configure an OS/2 system as a client or server. The installation utility gives you context-sensitive help and default settings for most of the required input values, so that even a novice user can install and configure a PATHWORKS for OS/2 system.

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Tax programs ease the burden

PRODUCT REVIEW

BY PETER BARTOLIK
CW STAFF

If you do your own tax returns, the question is not whether to buy a tax preparation software package, but which one to buy — and write off on next year's return.

Considering that tax preparation services charge from $40 at the storefront to astronomical amounts for full-fledged accounting time, even a hesitant self-filer can easily justify the up-front expense of the popular software packages now available.

Last year was my initiation into this technology via Chipsoft, Inc.'s Turbotax. Emboldened by that experience, this year I decided on a head-to-head evaluation of both Turbotax, because it was familiar, and Softview's Macintax for Windows 3.0, quite simply because it was designed for Microsoft Corp.'s Windows interface.

Both scored well in terms of functionality and, most important, usability. For Windows aficionados, the choice is easy: Macintax has the point-and-click process down pat so the user can click on line 34 of Form 1040 and up pops the intimidating Schedule A for itemized deductions.

If you are comfortable with the mouse, navigating through related forms and schedules is much more convenient than Turbotax's functional but ponderous menu scheme.

Despite the absence of a bona fide graphical user interface, Turbotax is well ahead of the game in terms of intuitive assistance to the tax filer. While both packages employ checklists to determine which forms and schedules should be used, Turbotax systematically takes you through the process of filling in data on one form that will be subsequently consolidated into another.

For example, in compiling data on an independent business, a depreciation worksheet compiled data that was pulled into Form 4562 that was then consolidated into Schedule C.

However, Macintax's reliance on Windows actually detracts from the product in a couple of areas.

First, the graphical representation of tax forms becomes tiresome after a while. Not only does the white form representation seem glaring after spending some time in front of the screen, but the character fonts are just not robust enough for the job.

Turbotax provides the option to switch to a graphical representation, but memory is an apparent issue as I was unable to make this switch when using 640K bytes of memory on an Intel Corp. 80286-based system. The hard-core data entry seems much easier in the standard character-based display format.

Secondly, while Turbotax provides a convenient pop-up calculator, Macintax ironically seems to rely on the Windows calculator, which you cannot access unobtrusively unless you are running the package in an inadequate-size window.

Both provide electronic filing options. Macintax gets a plus here because it bundles the required software right into the package, whereas Turbotax requires you to order its supplemental Chiplink disks. With Macintax, you have to mail a disk to a service bureau for transmission to the Internal Revenue Service. But with Turbotax, you can transmit via modem to its service bureau. The service bureau fee is $29.95 for Macintax users and $15 for Turbotax users who have to pay an additional $11.50 for the Chiplink software.

Both service bureaus also provide for IRS direct deposit of refunds into the user's bank account. However, the electronic age still has its limitations: Filers will have to mail in the W-2 form along with a signed form that the IRS requires for electronic filing. Do we need further proof that bureaucracy is self-sustaining?

Will they tax your system?

Chipsoft's Turbotax
- List price: $75 (plus $11.50 for electronic filing software; $15 for service bureau filing fee)
- System requirements: 512K bytes random-access memory, DOS 2.0 or higher
- State versions: 44 state supplements, $40 each

Softview's Macintax
- List price: $99 ($29.95 for service bureau electronic filing fee)
- System requirements: Intel 80286- or 80386-based system; 1M-byte RAM minimum; Microsoft's Windows 3.0
- State versions: 14 state supplements, $69 each

Peachtree offers accounting modules for Windows 3.0

NORCROSS, Ga. — Peachtree Software has announced Crystal Accounting, a six-module accounting system for the Microsoft Corp. Windows environment. Priced at $495, it is scheduled to ship later this month.

The product was originally developed by Accounting by Design in Berkeley, Calif., and was sold under the name Bookkeeping by Design. Peachtree officials said they are the first major software publisher to market an accounting package for the Windows environment.

Crystal Accounting uses Windows' graphical user interface to provide accounting features that are said to be visual and intuitive.

Pop-up menus and on-line Help are available from within any of the system modules: General Ledger, Accounts Receivable, Invoicing, Accounts Payable, Payroll and Financial Writer. Sample data and transactions, which can be used as models for customizing accounting records, are also provided.

The package supports Windows Dynamic Data Exchange (DDE), enabling hot links to other Windows applications. For example, data from one of the modules can be included in a Windows word processing document or spreadsheet using DDE. When changes are made to the module, the linked files are simultaneously updated.

The accounting modules are fully networkable and can handle an unlimited number of transactions and accounts. Switching modules is fast and simple, the vendor claimed, adding that "on-the-fly" hookups and record alterations are possible. Also featured are import/export capabilities through ASCII files as well as automatic backup and data repair utilities.

Crystal Accounting comes with a 60-day money-back guarantee. Technical support is available through Peachcare on a per-call basis or priced at $99 for 60 minutes of telephone support. The package requires Windows 3.0; IBM's Enhanced Graphics Adapter-, Video Graphics Array-compatible or a Hercules Computer Technology Co. Hercules-compatible graphics card; and a minimum of 640K bytes of memory, although 1M byte of memory is "highly recommended," the vendor said.

Multiprocessor

CONTINUED FROM PAGE 37

sor to a symmetric multiprocessor system; upgrade his operating software to recognize it and gain only a 60% performance improvement. On the other hand, with a uniprocessor box, he could swap the old chip for the latest generation, retain the same uniprocessor software and double the CPU performance. "We view the latter approach as the more viable in the relatively near term," Carberry said.

IBM has also been customer-testing a loosely coupled superserver, Carberry confirmed. In this system, the processors are distributed across various I/O boards, run in parallel and access separate memory. The only link is a simple communication protocol.

This architecture lets users upgrade the entire system or only specific portions "in a very cost-effective manner," Carberry said. He would not comment on when such a box would be generally available except to say it has been widely tested since the latter half of last year.

According to analysts, IBM should not wait much longer to announce some sort of multiprocessor. "Otherwise, they're going to get eaten alive" by the Intel-based competition, said Will Fastie, editor of the Baltimore-based "Fastie Report."

At least seven firms — Compaq, Advanced Logic Research, Inc., Netframe Systems, Inc., Wyse Technology, Inc., Tricord Systems, Inc., AT&T and Parallan Computer, Inc. — have announced or are shipping multiprocessor systems.

Do unattended terminals expose your VTAM network?

Fact #1 Terminal users leave their terminals signed on to VTAM applications.

Fact #2 Inactive terminals consume resources and create security exposures.

Fact #3 Now you can do something about it no matter what application has the terminal's session.

The Network Center's ***Timeout*** component from North Ridge Software operates at the VTAM level, monitoring activity for all terminals in ***Timeout's*** VTAM domain.

Terminals connected to any and all VTAM applications, such as CICS, TSO, NetView, IMS/DC, etc., can be monitored and the session can be timed out based upon ***Timeout*** Rules. Inactive virtual sessions from Session Managers can also be terminated automatically.

Rules can be created online through SAA/CUA compliant panels. For example, Rules can be created easily to terminate VTAM sessions that have been inactive over 10 minutes. Or, Rules can be created to terminate sessions that exist with CICS after 5:00 pm weekdays. Rules can be changed dynamically.

Timeout is now available for MVS and VM VTAM environments. Contact the VTAM experts at North Ridge Software for complete information and a ***Timeout*** demonstration diskette. Call or FAX today.

The Network Center™

North Ridge Software, Inc.
14450 NE 29th Place, Suite 111
Bellevue, Washington 98007-7699 USA
Phone: (206) 882-2600
FAX: (206) 881-6904

Timeout and The Network Center are proprietary to North Ridge Software. VTAM, MVS, VM, CICS, TSO, NetView, and IMS/DC are proprietary to IBM.

NEW PRODUCTS

Software applications packages

Metier Management Systems, Inc.'s Artemis Planner Version 2.0, a recently announced, graphical user interface-based planning tool for IBM Personal Computers, enables users to convert a desktop PC into a professional planning tool.

The product's user interface includes pull-down menus, enabling users to draw, annotate and modify plans interactively on-screen via a mouse, the vendor said.

Artemis Planner Version 2.0 is priced at $865.

Metier Management Systems
12701 Fair Lakes Circle
Fairfax, Va. 22033
(703) 222-1111

IXI Ltd. has announced X.desktop 3, the third component of its Open Software Foundation Motif-compliant desktop management software package.

The product is a graphical user interface that features a drag-and-drop protocol that can be used to drag data as objects between a desktop and another application, the vendor said. It runs on platforms such as Sun Microsystems, Inc.'s Sun 3 and Sun 4, Digital Equipment Corp.'s Ultrix-based systems and Hewlett-Packard Co.'s 9000 Series 300 and 800 workstations.

X.desktop 3 is scheduled to begin shipping next month and is priced between $175 and $795, depending on number of users.

IXI
6274 Burleigh St.
Cambridge, England CB1 1QJ
(011-44) 223-462-131

Richmond Technologies and Software, Inc. has announced Version 2.1 of Maximizer, its contact management software package designed for IBM Personal Computer XTs, ATs or compatibles.

Features include Maxmerge, which automatically creates a separate set of data files that can be transferred to other Maximizer users, and the ability to switch among separate Maximizer databases while remaining within a program.

The product costs $395 for a single-user version and $895 for a local-area network version.

Richmond Technologies and Software
6400 Roberts St.
Burnaby, B.C.
Canada V5G 4C9
(604) 299-2121

Software utilities

Softrax has announced Odd, a software product that comprises three utilities frequently omitted from Ashton-Tate Corp. Dbase-compatible applications.

The product includes a utility for determining optimal field widths within a database, a duplicate and nonduplicate record detection utility and a frequency distribution analysis utility for numeric, date and character fields.

The product requires an IBM Personal Computer XT, AT or compatible, Dbase-compatible files, MS-DOS Version 2.01 or higher and 512K bytes of memory. It is priced at $35.

Softrax
4 Van Ness St.
Springfield, Mass. 01107
(413) 746-5175

Mapping Information Systems Corp. (Mapinfo) has introduced an add-in software tool designed for Autodesk, Inc.'s Autocad Release 11.

Mapinfo CAD Link ($395) enables files to be transferred between Autocad and Mapinfo's desktop mapping software package. Users can access Mapinfo maps directly from Autocad, edit the files with Autocad drawing tools and save the files in a Mapinfo format, the vendor said.

Mapinfo
Hendrick Hudson Building
200 Broadway
Troy, N.Y. 12180
(518) 274-6673

Irwin Magnetic Systems, Inc. has announced an OS/2 backup software package that can be used under IBM Presentation Manager.

Extape PM complies with IBM's and Microsoft Corp.'s Common User Access windows management guidelines for Presentation Manager. The software enables users to start any backup function from the main menu at any time without going through a set of backup steps.

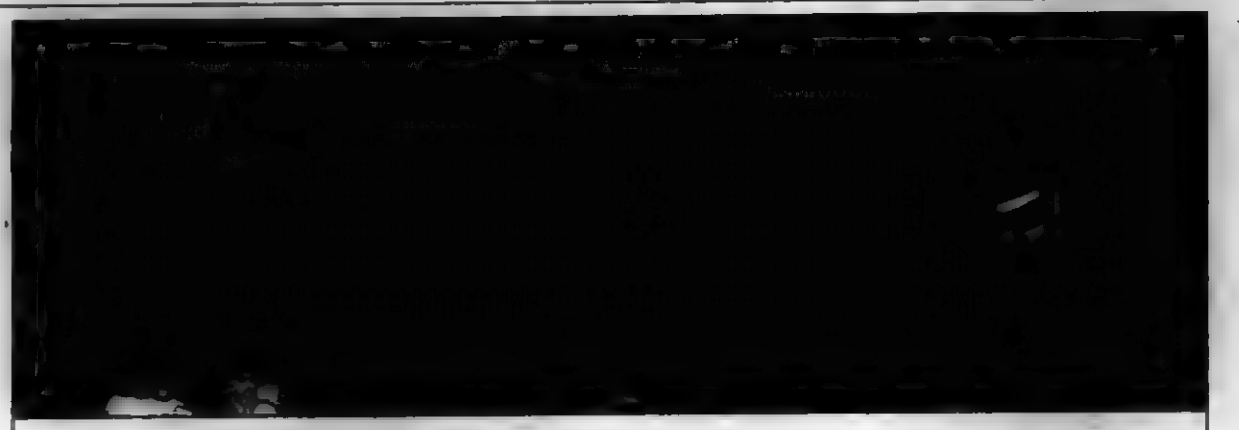
The product is scheduled to begin shipping next month and costs $329.

Irwin Magnetic Systems
2101 Commonwealth Blvd.
Ann Arbor, Mich. 48105
(313) 930-9000

Witzend Software has announced a text editor designed for IBM Personal Computer XTs, ATs and compatibles.

The Witzend Editor ($39) is written in assembly language and uses standard ASCII formatting. Features include drop-down menus; context-sensitive, on-line Help; and a word wrap procedure with automatic formatting. The product requires a single disk drive and 85K bytes of memory.

Witzend Software
10810 37th Ave. SW
Seattle, Wash. 98146
(206) 439-9371



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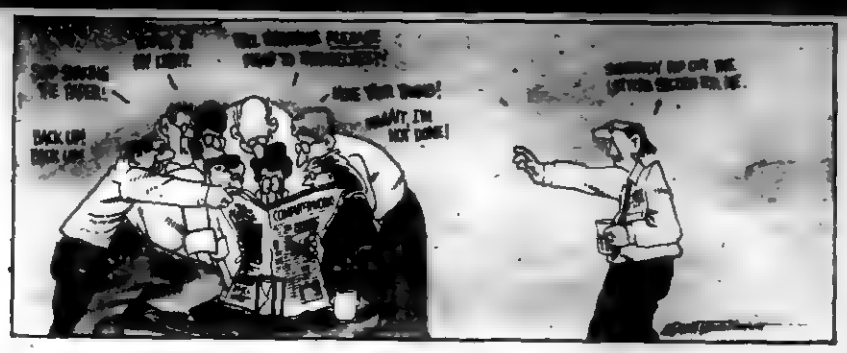
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NSF network: Still plenty of work to do

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — The 45M bit/sec. upgrade to the National Science Foundation's (NSF) Nsfnet backbone is proceeding on schedule, with implementation on all 12 nodes slated for year's end. However, the foundation has other areas to address before the academic, scientific and research communities can take full advantage of Nsfnet's potential, according to Steve Goldstein, program director for interagency and international coordination at the NSF.

One major project recently started [CW, Feb. 18] is the interconnecting of domestic Nsfnet users to their counterparts on overseas regional networks. One potential stumbling block to this venture is how to ensure connectivity between the NSF and other regional networks. Domestic Nsfnet uses a proprietary system developed by IBM as its router. However, Nsfnet's overseas links will be based on Cisco Systems, Inc. routers, and overseas networks will have their own types of routers. None of these devices now interoperate.



The foundation faced a similar problem when it was setting up links between Nsfnet and other federal agency backbones, each of which used a different type of router, Goldstein said. The solution was to set up Ethernet hubs that accept and packetize various routers' transmissions so they can be exchanged, Goldstein added.

What the NSF is really waiting for, however, is widespread vendor implementation of the Point to Point Protocol, a de facto standard that ensures interoperability across different routers, Goldstein said.

Another important step for Nsfnet to take is migration from Transmission Control Protocol/Internet Protocol to Open Systems Interconnect (OSI) protocols. While this has long been an NSF goal, the overseas links add urgency because European academic and scientific users are aggressively implementing the standard, Goldstein said.

On a basic level, the foundation wants to ensure that the transition to OSI is as easy as possible for users, Goldstein said. The organization is looking at services it can provide to users, such as a network information center that explains how to access electronic mail and other Nsfnet services, he added. "Right now, if you're not in Internet, you say, 'How do I get connected? How do I get mail? Someone help me.' "

The move to OSI is also presenting NSF with some unique challenges, such as how to organize user addresses under OSI's hierarchical system, which insists that each user be tied to a specific region. Because users often belong to more than one region and change regions, this will be quite a task.

Goals and obstacles

The following are areas of the National Science Foundation's Nsfnet that need work if the high-speed backbone is to fulfill its potential:

Goal: To effectively interconnect with the users of other government and research networks.

Obstacle: Different networks use different types of routers that cannot talk directly to one another.

Goal: To provide users with easy access to each other and to Nsfnet services during the migration to OSI protocols.

Obstacles: Tracking users' changing allegiances to regional networks under OSI's hierarchical addressing scheme and helping users get comfortable with the differences between the new OSI-based services and the older Transmission Control Protocol/Internet Protocol regime.

Wireless networks pass early tests

BY JOANIE M. WEXLER
CW STAFF

When the concept of a wireless network running at local-area network speeds was introduced in technology form by Motorola, Inc.'s Radio/Telephone Systems Group last October, the industry was intrigued but skeptical as to how such a network would measure up to its cabled counterparts.

Motorola turned its wireless technology into a microwave-based Ethernet-compatible product called Altair at the recent Networld '91 show in Boston, and other vendors are jumping into the market.

"Our users find their response time to be the same and haven't noticed any difference in the way they interact with the network," commented Richard Shankle, telecommunications associate at The Dow Chemical Co. in Midland, Mich., and an Altair beta-test user.

Jim Scott, who is running a 20-user Altair test at Boeing Computer Services, Inc., is having similar results. "Our wireless users are connected to a corporate backbone, and the performance levels are very acceptable," he said. "We've seen no difference between air and wire."

Shankle said his company's three- to five-year future "definitely includes wireless," and he added he is hoping for a wireless product that merges both voice and data applications.

Motorola's Altair consists of a user module, which connects to six Ethernet devices via thin coaxial cable and transmits data across low-frequency radio waves to a centrally located control module. The control module acts as a "traffic cop" that checks addresses for up to 32 Ethernet devices and forwards data packets to their destination.

An Altair user module is priced at $3,495, and a control module costs $3,995. Sample pricing is $715 per port for a 30-user Altair network, not including the cost of the Ethernet adapter card that must go into any Ethernet-attached device.

"Cabling is responsible for the lion's share of network downtime. As the amount of traffic on networks continues to grow, the vulnerability of cable becomes a greater issue," said Ed Anderson, president of Computerland Corp. U.S.A., a Motorola reseller.

Industry analysts have expressed concern about the security of wireless technology in the past. Motorola said that Altair implements security at several levels, including the ability to simply pass encrypted data through the air.

In addition, the company said, Altair includes a "restrictive access" feature that allows network administrators to specify which user modules can communicate with a control module.

The wireless LAN market, which market research firm International Data Corp. predicted will reach $267 million by 1995, is already picking up steam. Last month, for example, The Travelers Corp. said it has committed to installing six initial $2,995 base units of Infralan, a 4M/16M bit/sec. token-ring-compatible infrared wireless LAN from BICC Communications in Auburn, Mass. [CW, Jan. 14].

Windata, Inc., a start-up company in Northboro, Mass., said it is on the brink of rolling out a standards-based wireless LAN that uses spread-spectrum technology.

NCR Corp.'s Wavelan was first out of the gate with a spread-spectrum LAN last September. Wavelan, however, transmits data at just 2M bit/sec. speeds, which is not on a par with LAN speeds.

Hub support anticipated

Vendors of intelligent wiring hubs are expected to support the wireless medium soon. Ralph Ungermann, president of smart-hub company Ungermann-Bass, Inc., sanctioned Altair, saying that it "gives customers more choices" and is "complementary" to cabled LANs.

Wireless technology is "making waves" in the wide area, too. For example, Persoft, Inc. in Madison, Wis., recently introduced Intersect, a wireless remote bridge that connects separate Ethernet LANs up to 800 feet apart over spread-spectrum radio waves. It is said to link LANs at T1 speeds and can communicate through structures.

Laser Communications, Inc. has offered Ethernet and token-ring remote bridging with its laser-based Lace product line for some time. The Lace product — unlike Intersect — requires line-of-sight positioning but passes data at native channel speeds.

Cable cut

Motorola's microwave-based local-area network eliminates the need for wires connecting desktops to the wall-mounted control module



CW Chart: Doreen St. John

TCP/IP key element in Netware V3.11

BY JOANIE M. WEXLER
CW STAFF

The Ides of March is slated to bring Novell, Inc. users capabilities that will allow them to integrate the widespread yet proprietary Netware local-area network with other communications protocols and computing environments.

Netware V3.11, which was announced two weeks ago [CW, Feb. 11], is slated to start shipping March 15 and will come bundled with "five protocols right out of the box," said Mark Calkins, Novell's vice president of product marketing.

Perhaps most significant is the bundling of Transmission Control Protocol/Internet Protocol (TCP/IP) into the core operating system. TCP/IP represents a widespread, de facto standard for communications protocols that are often "spoken" over Unix-based networks. TCP/IP networks cannot speak to Netware LANs, which run proprietary IPX/SPX communications protocols, without one set of protocols being converted to the other by a gateway function.

"Third-party gateway functions are cumbersome and very

Continued on page 56

The Death



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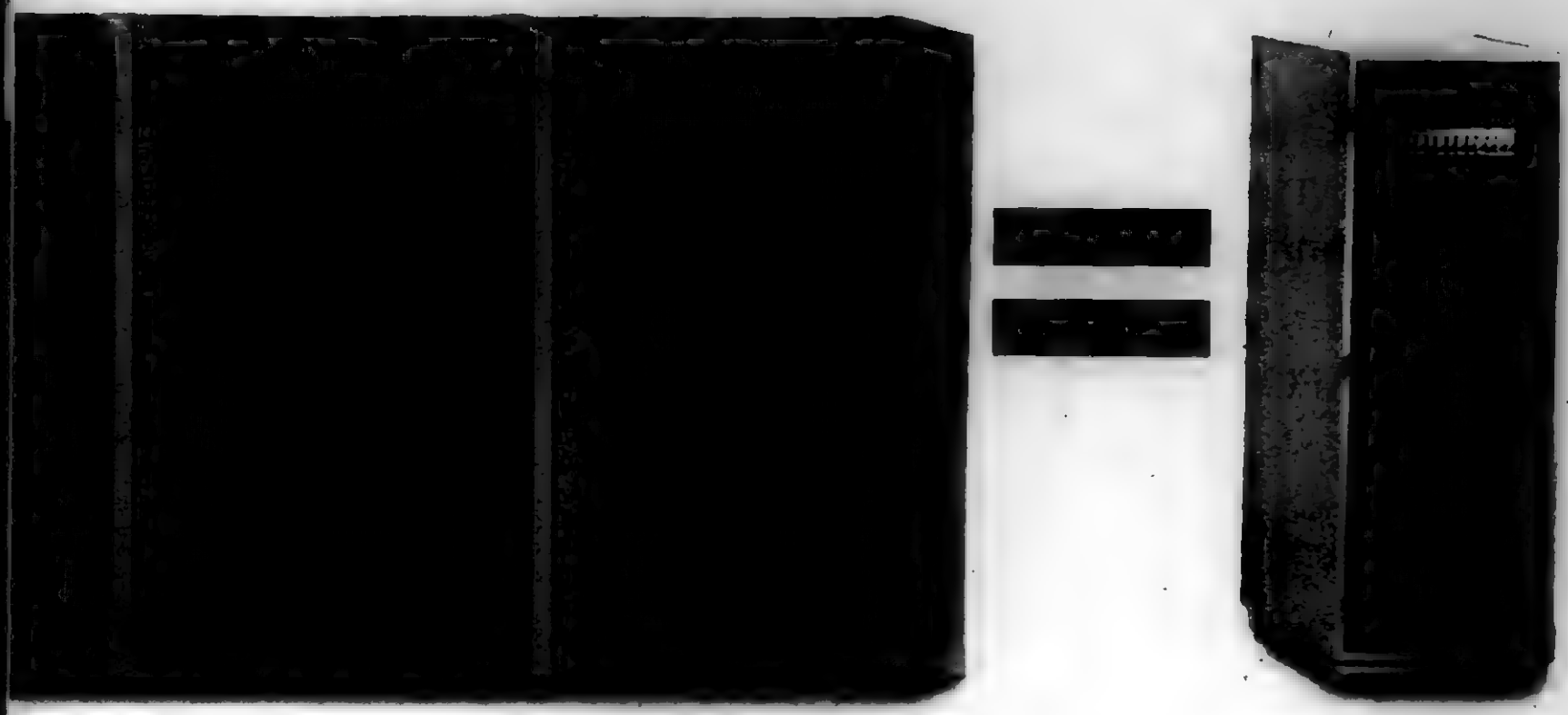
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Niagara Mohawk looks to tap the power of networking

ON SITE

BY JIM KASH
CW STAFF

SYRACUSE, N.Y. — Enticed by the possibility of increasing database access by as much as 25%, Niagara Mohawk Power Corp. is moving some of its employees off the mainframe and onto personal computer-based networks.

The upstate New York utility company sees local-area networks as one way of boosting the efficiency of work groups using specialized data that is now accessed through an IBM 3090 Model 400S. Niagara Mohawk even expects to see modest savings in the process.

Frank Mantha, Niagara Mohawk's information center supervisor, estimated users will access data 10% to 25% faster once the data is downloaded from the mainframe. He said the company also anticipates faster in-house software development and upgrades for network users.

Mantha said Niagara Mohawk could save $2,000 annually for every mainframe user who can be switched to a networked PC. It is not yet clear how many of the 5,000 employees will eventually be moved to PCs, he said.

A typical four-person department accessing the mainframe a total of 14 hours each day will be charged $12,000 per year for mainframe access, Mantha said. A one-time expenditure of $10,000 buys that department PCs, a printer, networking software and support for one year.

Mike Cullen, manager of information systems, said Niagara Mohawk will continue to exploit the strengths of the mainframe: central control, disaster backup, recovery, support and security.

Cullen and Mantha said only selected business applications will be transferred to the company's 12 IBM OS/2 LAN Server and three OS/2 Extended Edition networks.

By March, at least one work group will be using such a transferred application that records fixed assets at one of Niagara Mohawk's two nuclear plants. The software, developed on IBM's MVS/XA operating system, is written in Information Builders, Inc.'s Focus, Mantha said.

"The justification [behind moving applications onto networks] is to be able to put everyone in their own MVS environment," said Louis Kowalski, associate senior systems analyst in the company's management systems and services department. "That way, they have 100% of their own CPU, and you're not vying for any resources the way you have to on a mainframe."

Kowalski said his department makes a recommendation on whether an application goes on Niagara Mohawk's mainframe, networked PCs or 3,126 stand-alone PCs. About 850 of the stand-alones have micro-to-mainframe connections. Mantha said decisions about which applications to use are made on a case-by-case basis. "The major factors are how many people will be using it and whether the application is needed across several departments."

> "EXTENDED EDITION'S PROMISE is that you can merge data from it and DB2. If it does, that will be another point in favor of downsizing more applications."
>
> FRANK MANTHA
> NIAGARA MOHAWK

The 3090 currently holds 90 to 100 systems applications, including IBM's Netview, according to Kowalski. Niagara Mohawk is waiting to see how well OS/2 Extended Edition works in partnership with database management systems on the mainframe. "Extended Edition's promise is that you can merge data from it and DB2," Mantha said. "If it does, that will be another point in favor of downsizing more applications."

All corporate information programs such as the company's in-house payroll and accounting applications will remain on the mainframe, Cullen said. Typically, if there are more than one dozen users for an application, it goes on the mainframe, Kowalski said.

Niagara Mohawk already has in place a nascent enterprisewide network hooking LANs to the mainframe in Syracuse via the company's own telephone lines or in-house microwave transmissions. All networks have either token-ring or coaxial cable adapter cards.

Niagara Mohawk is working to ensure that data remaining on the mainframe can be accessed by PCs. The company bought 20 licenses for Software Publishing Corp.'s Infoalliance database integration software. The licenses allow 20 networks to access Infoalliance. Kowalski said Infoalliance has been used to build a directory of users combining Ashton-Tate Corp.'s Dbase II and OS/2 databases.

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At Compaq, we approach connected computing from your point of view. Not ours. That's why our hardware solutions are designed to meet *your* needs. For optimized performance. Seamless compatibility. Flexible multivendor solutions. Unquestionable reliability. And complete technical support.



The COMPAQ SYSTEMPRO Family of PC Systems is just one powerful example. Since its introduction, it has literally defined a new class of server personal computers.

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It also expands to meet the needs of your network or multiuser system. You can use up to 11 expansion slots, store up to 4.28 gigabytes of data and add up to 256 megabytes of memory.

All of these innovations give the COMPAQ SYSTEMPRO the technical muscle to excel in a range of server functions. From resource sharing to departmental database management and client-server applications.

The COMPAQ SYSTEMPRO also represents a price/performance breakthrough for companies that are migrating applications from their minicomputer or mainframe to the power of a personal computer server.

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At Compaq, network performance also means delivering the highest possible levels of reliability and compatibility. We ensure this through exhaustive compatibility and reliability testing. And through unique partnerships with industry leaders like Banyan, Microsoft, Novell and The Santa Cruz Operation (SCO).

These partnerships allow for joint product development, testing and support, creating solutions that are optimized to work together now and in the future. So your company can work together. Faster. And better.



Our commitment to connected computing has not gone unnoticed. *Systems Integration* magazine readers named Compaq the 1990 Hardware Manufacturer of the Year, awarding the COMPAQ SYSTEMPRO winner in both file server and multiuser PC categories. *PC Magazine* also gave it top marks for technical excellence in the PC category.

You'll find the same attention to detail in the COMPAQ DESKPRO 486/33L and COMPAQ DESKPRO 386/33L Personal Computers. These powerhouses are ideal servers for your smaller networks or for less demanding applications.

To see which COMPAQ server is right for you, call your Authorized COMPAQ Computer Dealer. Our dealers are trained to build integrated multivendor solutions using the best connectivity hardware and software. And since each offers different levels and areas of expertise, you can choose the one that best fits your needs. The result: a multivendor solution that will serve you right. For the nearest Authorized COMPAQ Computer Dealer, just call 1-800-231-0900, Operator 142. In Canada, please call 1-800-263-5868, Operator 142.

COMPAQ

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Netware

FROM PAGE 49

ory hoga," commented Francis Paquin, a LAN support and design consultant at Ontario Hydro, a large Canadian utility based in Toronto. Paquin runs 8,000 Novell nodes in addition to seven other computing platforms. He said he is anxious to get his hands on Netware V3.11 because "the only common denominator among my platforms is TCP/IP."

The Novell-engineered TCP/IP capability in Netware V3.11 will allow the tunneling of IPX through TCP/IP internetworks to connect Netware servers across the internetwork, routing of TCP/IP packets from one LAN to another, Simple Network Management Protocol support and other functions.

Prices are $3,495 for a 20-user version, $6,995 for a 100-user version and $12,495 for a 250-user version.

"The only disappointments are the pricing, which has always been extravagant at Novell, and the lack of a 500-user 3.11 version," noted Nigel Newsham, one of Paquin's colleagues at Ontario Hydro.

Paquin added that he just upgraded his 250-user version of Netware 286 Version 2.15 for $10,660 and could have saved about $1,300 had he known that V3.11 was coming and moved straight from Version 2.15 to V3.11.

Novell is aiming to address the enterprise network with the addition of TCP/IP and other protocols as well as with its recent reseller and licensing agreement with IBM [CW, Feb. 18]. Appletalk, Open Systems Interconnect (File Transfer, Access and Management) support, Network File System file and print services for Unix clients and hooks to IBM's Netview enterprise network management system will be available in V3.11 as extra-cost options.

Hayes eyes niche in networking

BY CAROL HILDEBRAND
CW STAFF

Hayes-compatible is certainly the standard in the personal computer modem market, but what about local-area network operating systems?

Hayes Microcomputer Products, Inc. recently stepped further into the LAN arena with the introduction of Lanstep, an operating system targeted for small and medium-size businesses and work groups.

A key function of Lanstep is its ease of installation and maintenance, according to Hayes' spokesman Joe Fuller. "You don't need a full-time network administrator or even a LAN expert on-site," he said. "Someone with a working knowledge of DOS and familiarity enough to install a network interface card can install the product and actually serve as system manager."

Beyond beginner

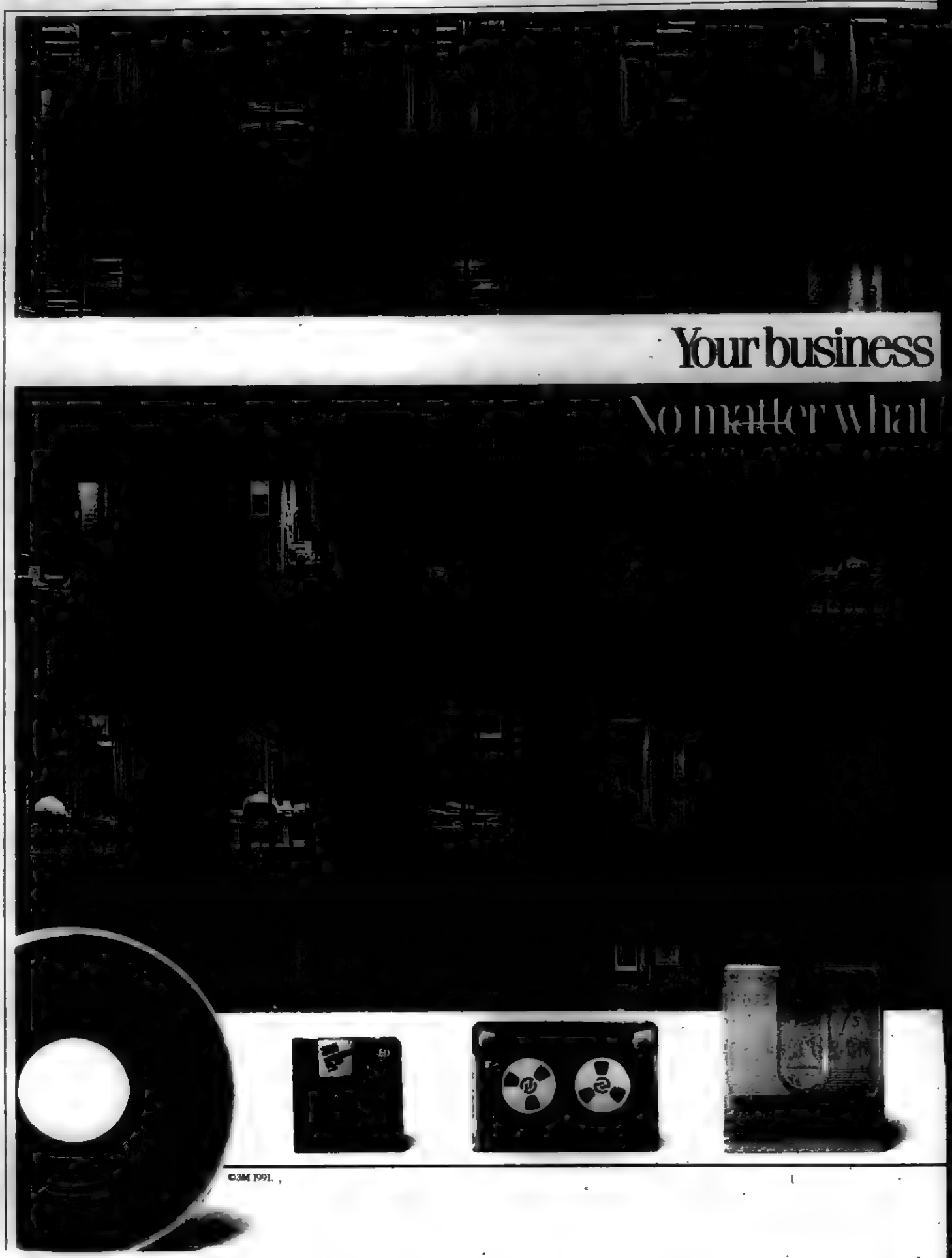
Fuller said he expects the system to cover entry-level customers but added that it expands to handle midrange networking needs as well. "It's designed to provide a growth path for customers eventually expanding their network," he said.

The product is the first rollout from Hayes Canada, a division formed from the acquisition of Waterloo Microsystems, Inc. in December. Lanstep provides file and printer sharing. It is also IBM Netbios-compatible.

The system supports Ethernet, token-ring and Arcnet and has built-in electronic mail.

The announcement was met with skepticism. "We need some standards; we don't need yet another operating system," said John Girard, senior analyst at New Science Associates, Inc. in Southport, Conn.

The operating system is priced at $595, but that can be misleading, Girard said: "It's a small price to pay to buy it off the shelf, but look what you're going to have to pay in person-years when you add it to the load of systems that have to be reconciled later."



Synoptics airs customer support plan

BY JIM NASH
CW STAFF

While it lacks the skill of downhill skiing and the grace of gymnastics, finger-pointing is so well practiced in some circles that it could end up as an Olympic sport.

One of those circles is networking customer support, and some vendor firms are promoting service-and-support agreements that tie in many related companies. Synoptics, Inc. in Santa Clara, Calif., recently began to showcase its version of the new agreements, called the Customer Support Affiliate Program.

AT&T, Hewlett-Packard Co. and two other firms have signed on to the program, a Synoptics spokesman said. Each will receive technical training and access to advanced support and resources from Synoptics. The aim, according to the spokesman, is to give network administrators one vendor to call for network help.

Steve Ehlerding, systems engineer at Ford Motor Co.'s Central Glass Division, said, "All you hear from [vendor] reps is, 'Well, that's not our equipment.' " The division, in Dearborn, Mich., is installing an integrated voice, video and paging system manufactured by five major vendors.

Synoptics and AT&T are two of the contractors, Ehlerding said. As part of Synoptics' new support program, AT&T will co-market, service and support Synoptics wiring products. HP will work with Synoptics to solve problems, sharing resources and publicly available technical information.

The agreement is not unique for Synoptics. For the past year, it has had a similar, but separate, program in place with Digital Equipment Corp. However, the latest offering is the first time the company has played up such a pact, according to Synoptics.

Ehlerding said he has not heard of a program similar to Synoptics', noting, "I do think customers will force [similar] agreements on a lot of companies."

Jeff Kaplan, an analyst at Ledgeway/Dataquest in Lexington, Mass., added, "We're now seeing companies making a strategic decision to ally themselves with an assortment of service and production companies for the purpose of building a support bond" with customers.

Strategic manufacturing alliances designed to use the expertise of two or more companies on a new product or technology have given birth to the new support alliances. Compaq Computer Corp. and Apple Computer, Inc., he said, both have made low-key support agreements with other vendors.

Many companies that strike such agreements are recognizing that "service and support is not the way they are going to win," Kaplan said. "It's still important, and they've allied themselves with good firms." However, they have decided to put more money into research and development, he said.

BIT BLAST

Price cuts for 3+Open

Microsoft Corp. is discounting its LAN Manager Version 2.0 network operating system for users upgrading from **3Com Corp.**'s 3+Open and 3+Share software. Both 3Com products are being absorbed by LAN Manager. Reduced prices will range from $595 for a 3+Open Entry system to a five-user LAN Manager, to $995 for 3+Open to a LAN Manager 2.0 server.

An on-line service for the communications and microcomputing industries is available from **General Electric Information Services.** Quiknews Newsletter delivers daily news summaries of data communications, public policy, distribution agreements and other issues to electronic mailboxes.

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NEW AT NETWORLD '91

The following were among the products introduced this month at Networld '91 in Boston.

Gateways, bridges, routers

Madge Networks, Inc. unveiled a token-ring-to-token-ring source-routing bridge that supports unshielded twisted-pair and shielded twisted-pair wiring operating at 4M or 16M bit/sec.

The Smart 16/4 AT bridge comprises two Smart 16/4 AT bridge nodes and a source-routing bridge program that can reportedly be installed in any IBM Personal Computer AT or compatible. The product can forward 28-byte frames at a maximum speed of 8,500 frame/sec.

The product is scheduled to ship in April and is priced at $3,995.

Madge Networks
1580 Oakland Road
San Jose, Calif. 95131
(408) 441-1300

Cabletron Systems, Inc. has introduced gateways that tie its Remote Lanview and Spectrum network management platforms into IBM's Netview mainframe-based management system.

Spectrum, Cabletron's Unix-based network management software package, can be directly linked to Netview via a built-in Systems Network Architecture (SNA) gateway. The gateway uses Brixton Systems, Inc.'s SNA interface software to communicate with the Netview interface. A gateway for Remote Lanview/Windows, a midrange network management platform, connects to the SNA environment via IBM's Netview PC.

The Spectrum and Remote Lanview/Windows gateways are priced at $11,995 and $5,995, respectively. Both are scheduled to begin shipping in mid-April.

Cabletron Systems
35 Industrial Way
Rochester, N.H. 03867
(603) 332-9400

Network management

The Network Products Division of Lansystems, Inc. has announced Lansight Version 2.0, a network management software package that enables users to view, control and monitor workstations, file servers and special-purpose servers on a Novell, Inc. Netware-based local-area network by using a single program.

The product allows administrators to communicate on-line with users and respond to their needs by executing programs from a remote workstation and sending files to user-accessible areas of the network.

Lansight Version 2.0 also features configurable hot keys and support for 43- and 50-line text modes. A single-server unlimited license is priced at $395.

Lansystems
300 Park Ave. South
New York, N.Y. 10010
(212) 473-6800

NEW PRODUCTS

Gateways, bridges, routers

Ungermann-Bass, Inc. has announced a multiple serial port bridge/router designed to connect devices on remote Ethernet networks.

The Access/One ASM 8320, part of a line of multiprotocol bridge/router modules designed for Ungermann-Bass' Access/One smart wiring hub, is a hub-based router that reportedly provides token-ring and Ethernet connections. The product can also provide Fiber Distributed Data Interface and Apple Computer, Inc. Macintosh network connections. It can be configured with one or two serial ports and can serve as a remote or local router, according to the vendor.

The device can route protocols concurrently, and multiprotocol routing or bridging can be done on the same port, the vendor said. Routing can also reportedly be performed via point-to-point serial lines or via private or public X.25 data networks.

The ASM 8320 is priced at $7,495. A single-port version costs $4,995, and bridging/routing software is $995. An X.25 software option is priced at $495.

Ungermann-Bass
3900 Freedom Circle
Santa Clara, Calif. 95054
(408) 987-6509

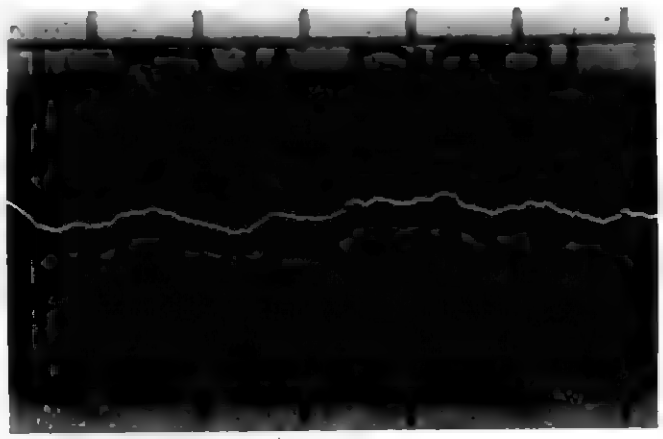
Local-area networking software

Digital Equipment Corp. has announced Vaxeln Window Server, a layered software package designed to allow users to simultaneously access multiple hosts via Decnet or Transmission Control Protocol/Internet Protocol or both.

The product allows users to access applications running under VMS or Ultrix and features support for Vaxstation Models 2000, II, 3200, 3100 and 3500.

The product is licensed at $570 per Vaxstation, and a media kit for the host VAX system costs $310.

DEC
[illegible] Main St.
Maynard, Mass. 01754
(508) 493-5111



EDUCATION DEVELOPMENT FOUNDATION

The East-West Education Development Foundation, a not-for-profit foundation, is seeking donations of surplus personal computers and peripherals for placement in educational institutions in the USSR and Eastern Europe. The goal of the Foundation is to introduce information technology into the educational system of those countries evolving toward a democratic, free market society. By educating the students on the power of information technology, they will be better equipped to compete in the global market of tomorrow.

Information Technology Vendors:
Excess inventory donated to the East-West Education Development Foundation may earn an additional tax deduction*, as well as build market share for your brand in emerging markets.

Corporations:
As systems are upgraded to new technology platforms, East-West Education Development Foundation will place your old equipment where it will be used and valued. Your corporation may earn an additional tax deduction.*

Of special note:
The East-West Education Development Foundation will match computer donations to schools in the USSR and Eastern Europe with donations in the United States.

For further information, please contact:

The East-West Education Development Foundation
One Exeter Plaza, 15th Floor
Boston, MA 02116
Tel: (617) 542-1234
Fax: (617) 542-3333

*Under IRS Section 170(e)(3), corporations which donate their inventory (property sold in the normal course of business) to certain charitable educational organizations, receive an additional tax benefit. The deduction will be the total of (a) the donor's tax basis in the donated inventory, plus (b) one-half of the difference between the inventory's tax basis and its fair market value, (c) any incidental costs associated with donating the inventory, such as shipping, postage or warehousing.



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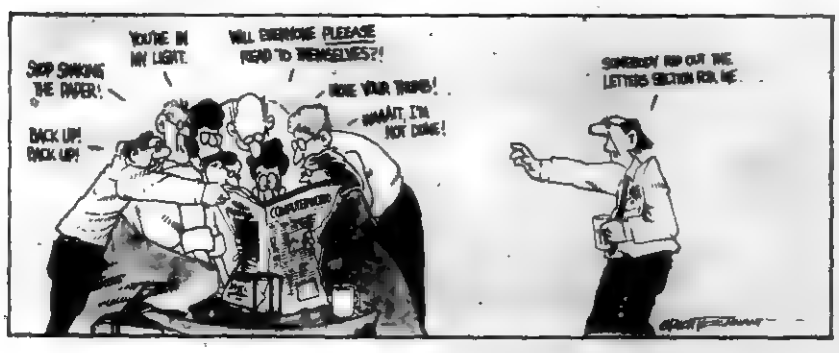
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22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt. Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs. - Supry. of Programming, Software Dev.
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65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
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98. Others _____ (Please specify)

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MANAGER'S JOURNAL

EXECUTIVE TRACK



Donald N. Reeves was named to the newly created position of senior vice president of systems at **R. R. Donnelley & Sons Co.**, a large Chicago-based printer of catalogs, magazines, books and computer documentation.

Reeves, 54, is part of the company's recently restructured information technology unit. He is responsible for integrating the operations and information systems of the unit's key operating groups.

Reeves joined Donnelley in 1959 as a sales trainee. He became head of the financial printing operation in 1988.

A native of Minneapolis, Reeves is a graduate of the University of Minnesota.

.....

The **Internal Revenue Service** announced two recent IS appointments:

John A. Ressler was named assistant regional commissioner of data processing for the IRS Southeast Region. He assists the regional commissioner in planning and coordinating returns processing, computer services, telecommunications, revenue accounting and other functions.

Ressler was most recently assistant director at the Memphis Service Center, a position he had held since 1988. Before that, he was director at the IRS office of user requirements in Washington, D.C. He joined the IRS in San Francisco in 1969.

Ressler holds a bachelor's degree from the University of Oregon in Eugene, and a master's degree from New Hampshire College in Manchester.

Richard P. Oakes was named projects director for the service center support system and corporate systems modernization transition for IS development.

Oakes had been chief of the collection systems branch since 1984. Before that, he was chief of the automated data processing standards branch for one year. He joined the IRS in 1971 as a computer programmer in Washington, D.C. He holds a bachelor's degree in IS management from the University of Maryland in College Park.

Being the best in business

Fedex CEO Smith credits effective use of technology as key to his $8 billion firm

BY JOSEPH MAGLITTA
CW STAFF

Federal Express Corp. Chief Executive Officer Frederick W. Smith doesn't have a personal computer on his desk. "I never have liked to type," admits the amiable founder of the world's largest express transportation company.

But don't be fooled. Smith's Memphis office is among the few corners of the $8 billion company that doesn't boast the latest computer and telecommunications technology.

Since its founding in 1973, Fedex has been known as a technology company. The firm that pioneered airbill bar coding uses multiple vendor systems and highly distributed computing to handle 14 million transactions daily. Last year, it spent more than $243 million on information technology.

It's no surprise that Smith, 46, credits the effective use of technology with Fedex's having won the 1990 Malcom Baldrige National Quality Award. Technology, Smith says, "is absolutely the key to our operations."

To keep abreast of new developments, Smith, a Yale graduate and former U.S. Marine Corps officer, reads voraciously, consuming computer and defense trade newspapers, Wall Street analyses and business publications. He has strong opinions on technology and how it should be used.

• On the role of information technology in quality:
Smith says the quality goals that technology must support at Fedex are as simple as they are awesome: "100% on-time deliveries, 100% accurate information on every shipment to every location in the world and 100%

Continued on page 64



George Lange

The man: *Frederick W. Smith, 46; B.A., economics, Yale University, 1966; Captain, U.S. Marine Corps., 1966-1970*

The firm: *Federal Express is the world's largest express transport firm, handling 1.5 million daily shipments to 127 countries*

Accomplishments: *Construction of worldwide tracking system using handheld computers, vehicle on-board systems and 11,000 computers at customer sites to provide real-time information on package location almost instantly*

Future goals and projects: *Reduce error index to one-tenth of the present size by 1995, while increasing volume of shipments by two to three times. Continue development of the Cosmos² relational database and distributed processing systems*

Smaller may be better in health care IS

BY J. A. SAVAGE
CW STAFF

Chief information officers at large health care organizations are beginning to consider open systems and networked systems under pressure to control the spiraling cost of health care. However, smaller hospitals, with more flexibility and fewer resources, appear to have already embraced the open systems concept.



This dichotomy in awareness and implementation of open systems showed up during the annual Healthcare Information and Management Systems Society conference in San Francisco earlier this month.

"Industry says it's had enough [of high health care insurance costs], and they say they're not going to pay anymore," said Ward Keever, senior vice president of information systems at the Medical Center of Delaware in Wilmington. He admonished other CIOs to consider nonmainframe-based solutions, largely networking, to improve the quality and cost of service. "But I question whether many of us have strategic plans to deliver transformed health care," he said.

CIOs from other large institutions acknowledged that health managers should be looking into the less expensive Unix-based systems but relegated their current use to specialized applications such as research and imaging.

"The large institutions have a paradigm paralysis," said Stephen Wood, director of IS at Middlesex Hospital in Middletown, Conn. "They think of Unix as a small box with no power."

Ludwig Johnson, vice president of IS at The Stamford Hospital in Stamford, Conn., agreed. "There's not a lot of consciousness in health care about Unix; the larger institutions are entrenched in IBM mainframes," he noted.

Obstacles to open systems in health care include the lack of standards. "Other industries, like financial institutions and airlines, have standard methods of operation," said Lynn Schatek, director of IS at Stanford University Medical Center in Palo Alto, Calif.

NEA program hopes to turn PC into teacher's newest pet

BY [redacted]
CW STAFF

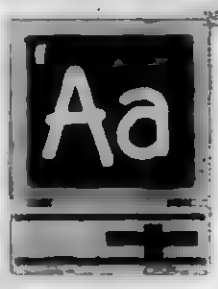
Skip the apple. Give the teacher a PC.

Education advocates are calling for putting personal computers in the hands of more teachers. However, the National Education Association (NEA), recognizing that cash-strapped public schools are unlikely to get "a PC on every desk," is trying a different tactic to expose its members to PC technology.

Last summer, the Washington, D.C.-based NEA began Edstar, a project to sell computers at cut rates to teachers for use at home. The computers would have to be easy to operate and preloaded with appropriate software and templates.

A pilot of the program began late last month in Tampa and Clearwater, Fla., where NEA, the nation's largest teacher group, has about 10,000 members.

For $2,249, NEA members will be able to purchase an IBM Personal System/1 with printer. The so-called NEA Edstar Special Edition — a $3,000 value — will also come loaded with Microsoft Corp.'s Works integrated software. Other preloaded programs include applications for tracking student grades and attendance as well as a desktop publishing program for creating newsletters.



Join the club

The PCs will also come loaded with communications software for the Prodigy national on-line service, which will soon have an Edstar club to answer teachers' technical questions and allow them to share information. NEA members will be able to get 15 months of Prodigy for the price of a three-month subscription.

A Macintosh Edstar configuration from Apple Computer, Inc. will also be available soon, according to NEA officials.

Arleigh Greenblat, director of special services at the NEA, estimated the program will sell 350,000 to 450,000 Edstar computers to its 2 million members during the next five years.

"We are very proud of the fact that we are on the leading edge. NEA will help literally tens of thousands of teachers get comfortable with this technology," Greenblat said. He added that about 30% of NEA members currently use computers at home, but many of those systems are old or discontinued brands.

Christine Flynn, who teaches 6th grade English at General Wayne Middle School in Malvern, Pa., is one of the first NEA members to buy an Edstar system. A self-described computer illiterate, Flynn said she has high hopes for using the computer to better manage her at-home administrative chores such as grading her classes. She admitted that getting a PC was necessary to keep pace with her precocious pupils. "My students know more about this stuff than I do," she said.

Computers may be able to help the educational system in general, according to Clifford Cox, chief information officer at the Chicago Public Schools. Cox said he hopes more data on students, teachers and schools will mean a more methodical understanding of what works and what does not work in education.

"I believe we're going to be able to evaluate the impact of educational programs," he said. "Right now, frankly, [education] is a lot about politics and subjective assessments."

> "I THINK THE biggest issue in the '90s is how technology will be used in assessing students and schools."
>
> DAVID WALLACE
> CHRISTA MCAULIFFE INSTITUTE

The broader view

However, David Wallace, director of the Christa McAuliffe Institute at the National Foundation for the Improvement of Education, an independent group associated with the NEA, wants educators involved in the development of systems for evaluating students and curriculum.

"My concern is that unless we look at broader uses of the technology, we won't get a full picture of the student's performance and potential," he said.

Collecting test scores is not enough, Wallace said. He noted that some progressive school districts are building student "profiles" using test scores, writing samples and videotapes of projects. "I think the biggest issue in the '90s is how technology will be used in assessing students and schools," Wallace said.

This and other issues will be on the agenda when the NEA holds its conference focusing on technology March 8-10 in San Francisco.

How can you know which lease proposal is best?



BOOK REVIEW

Advice for the joblorn, their companies and their managers

WHY THIS HORSE WON'T DRINK
By Ken Matejka
Amacom, $22.95

"What would you think if you were a horse, and I told you to head toward the water and then held a bunch of carrots in the opposite direction? Confusing, isn't it? We wouldn't do that to a horse, would we? Then why do we do it to people?"

This is the foundation of Ken Matejka's fast-reading and sometimes humorous book on how to motivate employees.

The 206-page book is well worth a read by information systems managers and employees who are accustomed to the dictatorial management style described above. Managers get a chance to look at their role in employee problems and to receive some good advice on how to deal with the variety of people they work with, whether they be dissatisfied programmers, annoying users or an unbearable chief executive officer. Employees will discover ways to deal with "baffling bosses" and may get a bit of insight into themselves at the same time.

The author breaks the subject into four sections: "What are we doing instead of managing performance?" "Managing payoffs to get maximum effort," "Turning on turned-off employees" and "Managing commitment to get results." Each section is divided into short chapters that end with "action exercises" intended to help readers apply the information to their own companies.

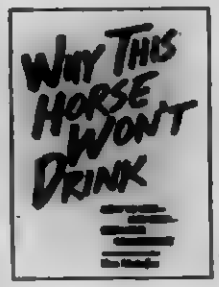
Matejka, who is a consultant and professor of management at Duquesne University's School of Business Administration in Pittsburgh, says most firms, managers and employees in the U.S. suffer from "diseases of excellence." These diseases "occur when great amounts of effort are expended on being excellent at unimportant things or excellent in the wrong directions," he says.

Ailments such as "corporate elephantiasis," in which corporations grow beyond their ability to react effectively, and "management by mind reading," in which managers assume their subordinates know what is expected of them without ever telling them, restrict U.S. companies' ability to compete in the world market, Matejka claims.

After describing the problems that affect companies' corporate culture, the author suggests a variety of techniques for more effectively managing people. His methods, based on behavioral psychologist B. F. Skinner's theories, work from the idea that "people tend to repeat behavior that is rewarded, avoid behavior that is punished, and drop or forget behavior that produces neither."

This may seem straightforward, but as Matejka points out, putting theory into practice is not easy. Determining what people consider to be rewards or punishment can require considerable effort. But the effort is worth it because improper use of reward and punishment systems leads to lack of commitment, a decrease in productivity and loss of good staff.

Even with well-tuned reward systems, managers will encounter dissatisfied staff members. The book offers advice on how to deal with problem employees.



Matejka first describes techniques for identifying the "problem self." He invites the reader to look for "blind spots" and "hidden biases" that might be the real causes of problems at work. He then goes on to discuss techniques for overcoming these shortcomings.

Chapters on dealing with "baffling bosses" and "difficult employees" stress taking a caring approach and trying to find a middle ground on contentious issues, tempered with the advice that people should not waste their lives finding a solution to an unworkable situation. To that end, Matejka also offers counsel on how and when to quit and under what circumstances to fire someone.

The final chapters of the book promote techniques to enhance employee ownership of work and to build commitment to the company. Matejka is a strong proponent of employee participation and delegation of authority.

One real-world example he uses to illustrate such methods is the Skippy Peanut Butter plant in Little Rock, Ark. Matejka describes the plant as having 130 employees and no traditional line managers. Teams of workers decide the best way to accomplish company goals and then act accordingly — with great success. His answer to why this experiment has not been applied elsewhere? Managers' fear. "If workers can achieve goals themselves, then why do companies have all those managers standing around?" he explains.

While readers will find no radical new ideas here, they will find a carefully constructed description of the problems facing people in most companies and a series of possible solutions to them. Common sense would seem to dictate most of the answers Matejka proposes, but as the author writes: "Common sense isn't very common and often makes little sense."

CHRISTOPHER LINDQUIST

Lindquist is a Computerworld copy editor.



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UDS
MOTOROLA

Fedex

FROM PAGE 61

customer satisfaction."

The task is enormous. Fedex delivers 1.5 million packages every workday to 127 countries around the world with the help of its 420 aircraft, 94,000 employees and 30,000 computer- and radio-equipped delivery vehicles.

The entire quality process depends on statistical quantification, according to Smith, which in turn depends on state-of-the-art technology. "That measurement system is the key link in our overall quality effort. Without it, there would be no quality, no Cosmos or Cosmos 2 or Cosmos[3]," Smith says, referring to the company's various package tracking systems.

"We had to come up with a system that actually measured our performance on every transaction — regardless of the fact that we're talking about hundreds of thousands of transactions," Smith explains.

"We now have two measurement systems, which are absolutely the key to our operations. Quite frankly, they are why the company received the Baldrige Award.

[You must have] the ability to manage information on a real-time basis and be able to slice and dice it to really understand what's happening in the operation. Whether it's the number of rejects per 10,000 units of widgets or measuring the SQI indicator at Fedex, if you don't have the ability to measure that and improve on it, then you're not going to be effective. And, in most cases, that has to be produced by the application of information and telecommunications technology."

Smith can barely contain his enthusiasm about the systems — or technology in general. "It's amazing," he says. "You go into [Cosmos] and ask where that shipment is, and 99.99% of the time it's going to tell you within a very short period of time exactly where that thing is. In fact, it's generally limited by the time it takes the systems to dial up and get into the computer."

• On measuring service quality:

"We use what we call SQI (pronounced sky) service quality indicators. We have 12 things that we know disappoint our customers, and we measure them every single day — how many packages were delivered on the wrong day, how many were delivered on the right day, how many packages were delivered late, how many we damaged, how many billing corrections we had to make and things like that.

These 12 indicators are weighted in terms of the way they are viewed by the customer. If we lose a package, it's rated 10 times more than if something is a little bit late. We measure it every day there is a mathematical measurement of Fedex service levels."



George Lange

"YOU MUST HAVE the ability to manage information on a realtime basis... to really understand what's happening in the operation."

Fred Smith
Chairman and CEO
Federal Express

• On Fedex's philosophy of information technology:

"Our approach has always been more pedestrian than a lot of people. I have always felt ... that the application of information and telecom technology has to be very incremental and very user-friendly. Its main goal must be to improve quality one way or another, whether it's the quality of the employee's work life or the quality of the information to the customer. [We don't do] what a lot of people have tried to do — use technology to save labor or to be Big Brother to employees."

• On technology spending:

"We certainly are pouring the coals, trying to exploit information and telecommunications advantages. We do a lot of justifying; we don't want to just spend money for the hell of it. We think we understand where the high leverage points are, and when we put the money in there we can get a good return on it."

• On tracking technology's success:

"We monitor the rollout of all our strategic projects, many of which are information- and telecommunications-based. Presentations are made monthly to the entire senior management group of 12 people, which includes the chief operating officer and the chief information officer."

• On organizing information systems:

"We consider our information technology division a line organization; it's an operating unit that is absolutely involved in the day to day operation of the company. We measure its performance. I'm just as close to the information technology division as to our sales division — and the salespeople are the ones who bring in all the bacon."

• On IS project failure:

"[Unsuccessful projects] are usually run by people who have unrealistic expectations of human nature on the one side and funded by corporate executives who have a very poor knowledge of what the technology can do on the other side. I think that people who follow that model in the future are going to be competitively annihilated."

Federal Express uses a team approach that gives IS a degree of participation unmatched in most organizations. Smith depends heavily on COO James L. Barksdale, a former IBM executive who previously ran Fedex's Information and Telecommunications Division, and CIO Ron J. Ponder.

Because of his appreciation of technology, Smith keeps his IS staff hopping. "I keep asking for the moon, and they keep saying they can only provide a small satellite," he says. Judging by Fedex's recent technological accomplishments, that may be enough.

CALENDAR

The U.S.' largest conference on intercompany electronic payment and data interchange, the fourth annual Corporate EFT/Financial EDI Conference, will be held April 7-10 at the Palmer House Hotel in Chicago.

Some 70 workshop sessions, mostly by corporate users of electronic data interchange (EDI), will outline steps to cost-justify, implement and integrate EDI with other corporate information systems.

For registration or information, contact Ruth Blalock, University of North Carolina Business School, Chapel Hill, N.C. (919) 962-[illegible].

MARCH 17-23

Guide 79. Anaheim, Calif., March 17-22 — Contact: Guide Headquarters, Chicago, Ill. (312) 644-6610.

Conference on Multimedia and CD-ROM. San Jose, Calif., March 18-20 — Contact: Cahners Exposition Group, Customer Service, Stamford, Conn. (203) 964-8287.

Divestiture '91. Boston, March 19 — Contact: International Data Corp., Framingham, Mass. (508) 879-6700.

Making the Investment in Imaging. Marlboro, Mass., March 19 — Contact: Monica Palmeo, AGS, Wakefield, Mass. (617) 438-0660.

Unesix Symposium. Atlanta, March 21-22 — Contact: Unesix Conference Office, El Toro, Calif. (714) 582-6649.

MARCH 24-30

DB/Expo '91. San Francisco, March 24-26 — Contact: Marm De Nardi Enterprises, Los Altos, Calif. (415) 941-8449.

Computers, Freedom and Privacy Conference. Burlingame, Calif., March 25-28 — Contact: CPSR, Palo Alto, Calif. (415) 322-3778.

Fiber Optics Conference. Lexington, March 25-29 — Contact: Jennifer Kady, Information Gatekeepers, Boston, Mass. (617) 232-3111.

The Software Solution Show and Conference for Manufacturing and Distributing Businesses. Toronto, March 26-27 — Contact: Alwyn Mitchell, Software Matchmakers, Willowdale, Ont. (416) 756-3221.

Quick Response '91. Nashville, March 26-27 — Contact: Quick Response '91, Pittsburgh, Pa. (412) 963-8588.

MARCH 31-APRIL 6

The Information Systems Security Association Conference. San Diego, April 1-5 — Contact: Richard Bath, Irvine, Calif. (714) 854-5508.

Network Analysis Users Group Meeting. Vail, Colo., April 1-5 — Contact: Sandy Marotta, NAUG, Menlo Park, Calif. (415) 688-2700.

The Global Economy: Implications for Telecommunications Policy and Management. Los Angeles, April 4-6 — Contact: Matthew Berndt, Center for Telecommunications Management, Los Angeles, Calif. (213) 740-0980.

APRIL 7-13

Focus on Operations XI. Las Vegas, April 7-11 — Contact: Computer Operations Management, Orange, Calif. (714) 997-7966.

IEEE International Conference on Robotics and Automation. Sacramento, Calif., April 7-12 — Contact: Robotics and Automation, Boca Raton, Fla. (407) 483-[illegible].

Service Trends Conference. San Francisco, April 8-9 — Contact: Lori Larsen, Ledgeway/Dataquest, Lexington, Mass. (617) 862-8500.

Information Security Managers Symposium. Chicago, April 8-10 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Loop Implementation: The Next Steps. Monterey, Calif., April 8-10 — Contact: Electronicast, San Mateo, Calif. (415) 572-1880.

Turning Audit Costs into Profits: Superstrategies for the Internal Audit Department of the 1990s. San Francisco, April 8-10 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Computers and Software for Manufacturing Expo. Chicago, April 8-11 — Contact: Doug Kunz, Cahners Exposition Group, Stamford, Conn. (203) 352-8202.

National Design Engineering Conference. Chicago, April 8-11 — Contact: National Design Engineering, Stamford, Conn. (203) 964-0000.

Business Re-engineering Forum. Cambridge, Mass., April 8-12 — Contact: Margaret Murphy, Computer Sciences Corp. Exchange, Cambridge, Mass. (617) 439-1227.

The Conference Board Information Management Conference. New York, April 9-10 — Contact: Conference Board Registrar, New York, N.Y. (212) 339-0290.

Seybold Technology Forum. Cambridge, Mass., April 9-11 — Contact: Deborah Hay, Seybold Computing Group, Boston, Mass. (617) 742-5200.

The Software Development Management Conference. San Francisco, April 9-12 — Contact: Software Development Conferences, San Francisco, Calif. (415) 905-2471.

Supercomputer Conference. Newport, R.I., April 9-12 — Contact: John Miguel, Federal Information Processing Council, Middletown, R.I. (401) 841-4591.

Society for Information Management 1991 Institutional Member Conference. Tucson, Ariz., April 10-12 — Contact: SIM, Chicago, Ill. (312) 644-6610.

Unix Challenge 1991. Tyngsboro, Mass., April 10-12 — Contact: Andree Fitzsime, Boston University, Corporate Education Center, Tyngsboro, Mass. (800) 446-[illegible].

Voice '91. Anaheim, Calif., April 10-12 — Contact: Voice '91, Houston, Texas (713) 974-[illegible].

APRIL 14-20

Congress on CIM Databases. Cambridge, Mass., April 14-17 — Contact: Wilma A. Hurwitz, CAD/CIM Alert, Boston, Mass. (617) 232-8080.

International Technical Communication Conference. New York, April 14-17 — Contact: ITCC, Thornwood, N.Y. (914) 742-5998.

Information User Association Architecting for the '90s. Salt Lake City, April 14-18 — Contact: IUA Headquarters, Chicago, Ill. (312) 644-6610.

Hostec 3.0. Atlanta, April 14-19 — Contact: Dave Cockerine, National System Programmers Association, Milwaukee, Wis. (414) 423-[illegible].

Custom Users' Exchange. Baltimore, April 15 — Contact: Ron Black, CUE, New York, N.Y. (212) 633-5360.

Cardtech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4250.

Securetech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4250.

Wireless Data Networks Conference. Washington, D.C., April 15-17 — Contact: Business Communications Review, Hinsdale, Ill. (800) 227-1234.

Lap & Palmtop '91. New York, April 16-17 — Contact: Peter O'Connor, Laptop Expositions, New York, N.Y., (212) 682-7968.

Networking Conference: Moving from Mainframes to PCs. Boston, April 16-17 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Electro/International. New York, April 16-18 — Contact: Alexes Rzesvich, Electro/International, Los Angeles, Calif. (213) 215-3978.

IBM User Group Europe Conference. Paris, April 17-19 — Contact: Karen G. Morales (713) 782-6080.

Instore Systems: The Key to Better Customer Service. Orlando, Fla., April 17-19 — Contact: National Retail Federation, New York, N.Y. (212) 583-5113.

World Computer Law Congress. Los Angeles, April 18-20 — Contact: Michael D. Scott, Center for Computer/Law, Manhattan Beach, Calif. (213) 688-[illegible].

RELATIONAL DBMS

Making peace with the past

BY AARON ZORNES



The walls that separate nonrelational and relational database management systems are gradually starting to crumble. Even IBM's rigidly structured IMS database appears to be opening its domain to what some traditionalists have considered to be the anarchist world of Unix and even Apple Computer, Inc. Macintosh relational databases and tools.

Considering the difficulty of migrating legacy databases and nonrelational applications to the relational model as well as the length of time it takes to do so, the ability for the two to interact will be very important.

Applications written for relational databases often need to access either the master mainframe databases or shadow extracts of those databases. Furthermore, data generated by new applications databases often needs to be integrated into existing application systems. In the interim, you'll need the two databases to collaborate.

Squeaky wheels

People are demanding products that go beyond maintaining the databases as separate entities and allow closer interaction. Each type of product differs in its approach, however, and achieves such interaction to a lesser or greater degree.

Most of the major RDBMS vendors are now positioning their gateways as products that can map SQL onto non-SQL databases. This allows programmers to access old databases with the latest SQL-based access tools, such as fourth-generation languages (4GL), graphically oriented query and report writing tools and computer-aided software engineering tools.

The gateway applications access the database, not a dated copy of the database. Extract tools, on the other hand, take data from the non-SQL database and dump it into the SQL database (see story page 69). As such, gateways achieve a higher degree of data currency.

The gateway software keeps the entire process transparent to the user or programmer, so there is no need to be concerned with different SQL dialects, error handling, catalog and dictionary conventions or communications protocols.

There are still some problems with gateways, however. Such up-to-date data comes at the expense of performance degradation. In fact, the future popularity of gateways depends on the vendors' ability to increase throughput and lessen impact on operational systems.

Currently, gateways are best used in organizations that need to have current data but have enough capacity to tolerate the extra processing load. They started appearing as off-the-shelf packages only about one year ago and are still fragile products. Vendors have been implementing them on a one-of-a-kind basis in large firms that can afford a high degree of support.

Stocking up

Implementing DBMS gateways also requires organizations to purchase components such as the DBMS, the gateway and networking software from multiple vendors. The issues that arise include staffing and release coordination between compo-

Costs can also run high. DBMS gateways cost from approximately $1,000 per personal computer up to more than $100,000 on a midrange system, exclusive of any DBMS licenses.

Computer Associates International, Inc., on the other hand, offers a single-database strategy. The company's emulator product can physically migrate legacy databases such as Cincom Systems, Inc.'s Total, IMS, DL/1 and VSAM into CA's relatively new RDBMSs, CA-IDMS Version 12 and CA-Datacom/DB Version 8. According to CA, existing applications can continue to run unchanged.

The legacy applications are managed by a CA service-layer product that maps the old DBMS data structures and data manipulation routines onto the relational model of CA-IDMS or CA-Datacom/DB. This eliminates duplicate software licenses, negates the processing overhead of keeping both databases in sync, gets rid of duplicate direct-access storage device requirements and eliminates duplicate DBMS expertise.

What you do lose with CA's approach is strong SQL support. CA's SQL is not as robust or as compatible with DB2 as other vendors' implementations. As a result, there is a lack of portable applications development tools supporting CA-IDMS and CA-Datacom/DB databases.

This is a relatively large issue,

Continued on page 66

Zornes is vice president and director of application development strategies at Meta Group, Inc., a consulting firm in Westport, Conn.

INSIDE

Product Guide
A listing of RDBMSs shipped after January 1990. Page 68.

Another SQL Standard
The next version may not help to clear the confusion. Page 72.

Buyers' Scorecard
Users rate Software AG's Adabas the top RDBMS in survey. Page 74.

Three varieties of coexistence

Vendor	Product	Interfaces
• Gateways:		
Apple Computer, Inc.	Data Access Language	Oracle, RDB, Ingres
Ask Computer Systems, Inc.	Ingres/Star	IMS, DB2, SQL/DS, VSAM, RDB, RMS
DB/Access, Inc.*	Access/Star, View/PC	DB2, VSAM, SQL/DS, RDB
Digital Equipment Corp.	Decnet DTF	VSAM, SQM
	Rdbaccess	DB2, VSAM, RDB, Oracle
	SQL Services	DB2, RMS
Evolutionary Technologies*	Extract	IMS, IDMS, DB2, Oracle
Gupta Technologies, Inc.	Sqlgateway	DB2, Oracle
Information Builders, Inc.*	Focus Interfaces	All major file and database managers
Micro Decisionware, Inc.	PC/SQL-Link	DB2, SQL/DS, Tandem, Teradata
Natural Language, Inc.	NLI Gateway	Oracle, RDB, Ingres, Informix, Sybase
On-Line Software, Inc.	Bamis	DB2, SQL/DS, IMS, DL/1, CA-IDMS, Adabas, VSAM
Oracle Systems Corp.	SQL*Connect	IMS, DB2, SQL/DS, VSAM
Sterling Software, Inc.	Micro/Answer II	DB2, VSAM, CA-IDMS
Sybase, Inc.	Open Gateways	DBII
• Emulation products:		
Computer Associates International, Inc.	CA-Datacom/DB Version 8 Escape series	IMS, VSAM, Total, DL/1
	CA-IDMS Version 12 Transparency series	IMS, VSAM, Total
• Transparency products:		
Cincom Systems, Inc.	Supra IMS Coexistence Facility	IMS, VSAM, Total

* Extract products that can function as gateways

Source: Meta Group, Inc. CW Chart: Marie Haines

Continued from page 65

considering that one of the anticipated benefits of coexistence strategies is to leverage all the new tools, such as graphics-oriented query and report writer products that are based on standard SQL application program interfaces.

Cincom takes a similar approach to CA, but unlike CA's products, database migration is unnecessary. With Cincom's Supra database, users can keep their IMS, DL/1 and VSAM data in place and use Supra's full SQL and Mantis 4GL to develop new relational-based applications against the old data.

As an alternative, developers can also use the language with which they're familiar to develop new databases and applications in the old systems.

With Supra, users can integrate and control data from multiple, heterogeneous data sources from one portable application development environment.

As with CA's coexistence strategy, there will continue to be a lack of third-party application development tools to use with Supra because of its SQL dialect.

CA and Cincom offer their products in hopes of migrating customers to their RDBMSs. This is in direct competition with IBM and Digital Equipment Corp.

Both of these companies are, of course, privy to the internals of their DBMSs. As a result, they can provide low-level hooks between nonrelational and relational databases, thereby creating a new class of coexistence facilities known as data propagators or distributors.

IBM's announced Data Propagator (Dprop) is intended to maintain old and new databases as mirror images. Because the two are made into one logical database, IS departments need not dread the conversion of IMS legacy systems.

Dprop updates are propagated either asynchronously or synchronously. With the asynchronous method, transaction files are built when the nonrelational database is being updated and are then used later to update the relational one.

Makes no difference

The benefit here is that there is no impact on the performance of operational or mission-critical systems. The operational system doesn't have to wait for the mirrored system to complete updates.

Synchronous updates work on both databases within the same transaction; that is, two-phase commit is required in each of the target DBMSs. While this provides the maximum level of currency of data, it also slows down and complicates operational procedures for backup, recovery and warm restart.

Some users anticipate disadvantages from Dprop. For instance, transaction performance under IMS may be adversely affected by the wait for two-phase commit to be completed under the DB2 transaction recovery manager. While the asynchronous method will have minimal operational impact on IMS database performance, the less current data may be less valuable to end users.

Like gateways, the cost of maintaining dual databases should be a major consideration. IBM has announced support only for IMS/DC, the communications portion of IMS, not CICS in the first release.

DEC goes one step further than IBM by providing reverse propagation with its Data Distributor. Data Distributor provides timer- or event-based and user-initiated propagation. For example, extracts of a master price list can be downloaded from IMS, DB2 or VSAM into an RDB database on a VAX system. This can be routed across a Decnet or Systems Network Architecture network to distributed VAX or Unix systems.

Data Distributor can also roll up entire databases or just the logged updates as part of its reverse propagation options. So far, it reverse-propagates only to

Continued on page 69

Coexistence conditions

Not everyone will want to consider products that facilitate coexistence. They are best used if your next generation of applications needs data that is tied up in the mainframe or minicomputer nonrelational database or if you cannot cost-justify a massive re-engineering of existing applications into a relational environment.

There are cases, however, in which gateways, propagators and migration strategies offered by independent software vendors are not for you. For instance, in all cases, it will probably be difficult to map your nonrelational applications and database into a new, relational one.

You will not want to consider any of these strategies if the following are true:

- The file structures of your older databases are not especially well designed.
- You are unwilling to risk the on-line performance of operational systems.
- You are looking for high-performance, fully distributed databases.

AARON ZORNES

Emigrants

Most of the RDBMS users surveyed said they plan at some point to move fully to relational, although more than 30% said they intend never to do so

Less than 1 year	8.1%
Within 1-2 years	6.4%
Within 3-5 years	13.2%
More than 5 years	10.2%
[illegible]	[illegible]
Never	31.5%
[illegible]	[illegible]

Percent of respondents (Base: 235)

Source: Computerworld survey CW Chart: Marie Haines

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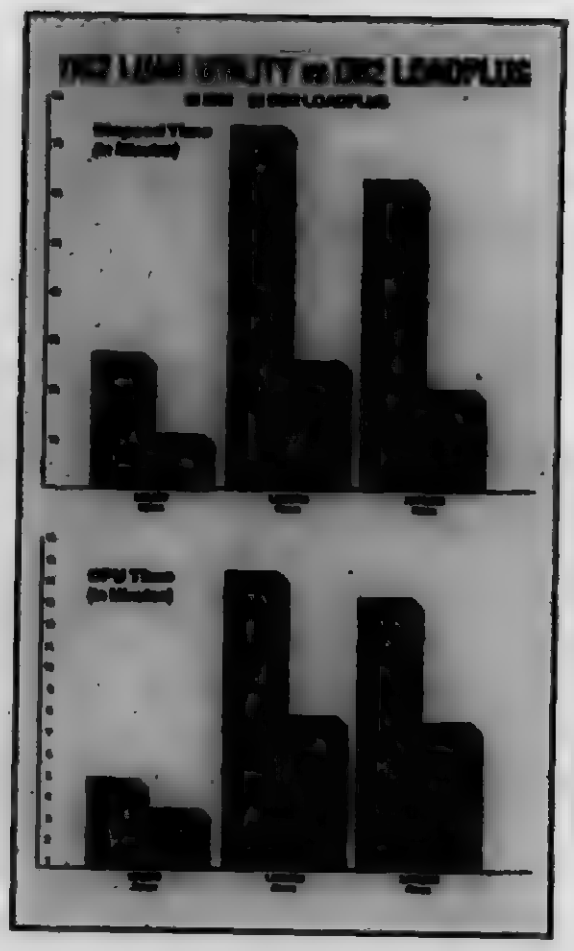
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RDBMSs for mainframe, midrange systems[1]

VENDOR	PRODUCT	HARDWARE REQUIRED	OPERATING SYSTEMS SUPPORTED	IMPORT/EXPORT FILE FORMATS SUPPORTED	TYPE OF SQL	SQL EXTENSIONS INCLUDED	APPLICATION DEVELOPMENT TOOLS INCLUDED	RECOVERY FUNCTIONS	SECURITY FEATURES PROVIDED	ACCESS METHODS USED	NETWORKS SUPPORTED	PRICE	MAINTENANCE FEE[2]
Ask Computer Systems, Inc. Palmer Pavilion Exhibit (415) 780-4455	Ingres Enterprise Access	Amdahl 5990 series, Bull DPS-900, DG MV, Auspex series, IBM (all models), IBM 370 and PCs, Pyramid, Sequent, Tandem, Unisys 5000, 6000, 7000 series	UTS, Unix System V Release 3, AIX/370, DOS, VMS, Ultrix, Remotely IBD, AIX, OSX, Xenix	ASCII, binary, DIF, SYLK	Interactive, embedded	Knowledge and object management rules	4GL, form, menu and report generators	Roll back and forward, transaction logging, Vaxcluster node failure failover	Limited user access via role and group permission, page locking	B tree, hash, direct, index	NP	$4,000 - $400,000	18% of license fee
Bull HN Information Systems, Inc. (800) 284-8378	Informix-4GL Interactive Designer	Bull DPS 8000 Model 41 through DPS 9000 Model 94	GCOS 8	ASCII, DIF, Excel, Lotus' 1-2-3, SYLK, WKS	Interactive, embedded	Teradata TQL extensions	4GL, form, menu and report generators, CASE tools	Roll back and forward, transaction logging, disk mirroring	Page locking, user views, grant/revoke permissions	B tree, index	Bull DSA, SNA, OSI, TCP/IP	$1,800 - $6,600 per month	None
Chorus Systemes, Inc. (33) 1-30-64-82-00 (800) 342-3939	Chorus	IBM System 370s and PCs, DEC VAX, HP, Pyramid, Sequent, Sun, Sequoia, Fujitsu, Compaq	DOS, VM/SP, MVS/SP, VM/CMS, AIX, VMS, Ultrix, MSP, FSP, HP-UX, OSX, Dynix, Sun OS, Tops, Interactive SCO	ASCII, binary, EBCDIC	Interactive, embedded SAA, ANSI, DB2	Referential integrity, domains, subroutines, scroll cursor	Fourth development tools, integration with other vendors CASE tools, project management	Roll back and forward, transaction logging, disk mirroring, dual logging	Row locking, limited user access via assigned privileges	B*tree, hash, direct, index	LAN Manager, LAN Server, Netware	$1,100 - $400,000	18% of price
Cognos, Inc. (617) 229-6600 (800) 426-4667	Powerhouse Starbase	DEC VAX, HP 3000 and 9000 Series 800/900, DG Aviion	DEC VMS, HP MPE XL, HP-UX, DG-UX	ASCII, binary, any that can be read, stored in BLOB data type	Interactive, embedded	Triggers, computed fields, domains, user-defined functions, two-phase commit	4GL, form, menu and report generators, CASE tools	Roll back and forward, transaction logging, disk mirroring, database shadowing	Record locking, limited user access, group security	B tree, direct sequential scan, heap	TCP/IP, Decnet, HP Advanstar	$10,000 - $200,000	15% of license fee
Computer Associates International, Inc. (800) 225-5224	CA-Datacom Relase 8.0	IBM Models 9370, 3081, 3090, 3090, System 370, PCs and compatibles	MVS, VSE, VM, DOS	Supercalc, Dbase III and IV	Interactive, embedded	32-character name, ANSI Cobol record structures, CASEQL	4GL, form, menu and report generators	Roll back and forward, transaction logging, disk mirroring	Record locking, limited user access	B tree, direct, index	SNA, Netbios	$96,300 - $137,500	19% of price
	CA-DB/VAX Relase 1.5	DEC Minivax 9000	VMS	ASCII, binary	Interactive, embedded	32-character name, ANSI Cobol record structures, CASEQL	Menu, report and code generators	Roll back and forward, transaction logging, disk mirroring	Record locking, limited user access	B tree, direct, index	Any VMS- or Unix-based networks	$5,000 - $161,500	19% of price
	CA-IDMS Relase 12.0	IBM Models 9370, 3081, 3090, 3090, System 370, PCs and compatibles; Hitachi, Fujitsu, Siemens mainframes	MVS, VSE, VM, DOS	ASCII, binary, DIF, Excel, Lotus' 1-2-3, SYLK, WKS, Supercalc, Dbase III and IV	Interactive, embedded	32-character name, ANSI Cobol record structures, CASEQL	4GL, form, menu and report generators	Roll back and forward, transaction logging, disk mirroring	Record locking, limited user access	B tree, hash, direct, index	SNA, Netbios, TCP/IP	$73,500 - $141,000	19% of price
Concurrent Computer Corp. (201) 758-7515	Reliance	Concurrent 3200 series	OS/32	ASCII, DIF	None	None	4GL, form, menu, report generators	Roll back and forward, transaction logging, disk mirroring	Record locking, limited user access, file and application locking	B tree	OSI	$6,900 - $28,870	10% of price
Data General Corp. (800) 328-0811 (800) 328-0430	DG/SQL Revision 5.0	DG MV series	AOS/VS, AOS/VS II	ASCII, binary, DIF, Excel, Lotus' 1-2-3, SYLK, WKS, CSO, DIF	Interactive, embedded, ANSI	Set and cursor functions to fetch, insert, select	Data dictionary, query tool	Roll back and forward, transaction logging, disk mirroring, entity and referential integrity	Record locking, limited user access, read and update at table, column, row levels	B tree, hash, index, clustering, partitioning	Xodiac, TCP/IP, PCI	$4,070 - $48,720 for full license; $1,080 - $12,945 for runtime license	$936 - $2,340 for full license; $300 - $936 for runtime license
Digital Equipment Corp. (800) 344-4825	Rdb/VMS Version 4.0	DEC VAX	VAX/VMS	ASCII, DEC's *export* format	Interactive, embedded	Some SQL2 features	Precompiler, ISQL, SQL module language	Roll back and forward, transaction logging, disk mirroring, Vaxcluster support	Record locking, limited user access via grant/revoke privileges and VMS access control lists	B tree, hash, direct	Decnet	$3,680 - $236,600 for development license	$120 - $6,680
IBM (800) 426-3400 Contact local IBM sales office	SQL/400 Release 3	IBM AS/400	OS/400 Release 3	ASCII, DIF, SYLK, *DOS Random*, BASIC Sequential and Random	Interactive, embedded	Prompting support, online Help, access to and from native applications, dynamic SQL functions, group security	None	Roll back and forward, transaction logging, disk mirroring, point-in-time recovery, save/restore single objects, back out, multiple isolation levels	Record locking, limited user access to field, view, record, library, object-level locking, storage protection	Direct, index	VTAM, SNA	$1,575 - $11,400	None
	SQL/DS Version 3.1	IBM Enterprise System/9000, System 370	Vm, VSE	Binary	Interactive, embedded	Referential integrity, dynamic SQL functions	None	Roll back and forward, transaction logging, audit trails	Record locking, limited user access	B tree, direct, index, direct scan	VTAM, SNA	$364 - $4,610 monthly license fee	None
Informix Software, Inc. (415) 926-6300	Informix-Online Version 4.0	DEC VAX, Pyramid, AT&T 3B series, HP 9000, Sequent Symmetry, DG Aviion	Ultrix, DG-UX, Unix System V	ASCII, binary	Interactive, embedded	Matches, unique keyboard, into temporary tables	None	Roll back and forward, transaction logging, disk mirroring, archive, restore	Record locking, grant/revoke permissions	B tree	TCP/IP, Stargroup	$5,000 - $168,000	$900 - $30,240
	Informix-SE Version 4.0	Same as above	Unix System V, DOS Xenix, Ultrix, DG-UX	ASCII	Interactive, embedded	Matches, unique keyboard, into , temporary tables	None	Roll back and forward, transaction logging	Record locking, grant/revoke permissions	B tree	TCP/IP, Stargroup	$2,500 - $142,000	$450 - $25,700
Interface Software Corp. (800) 359-5283	Interface Version 3.0	DEC VAX, HP 9000, DG Aviion, Sun, Silicon Graphics	Sun OS, Domix, VMS, Ultrix, HP-UX, IPIX, AIX 3.3	ASCII, DIF, Rdb, Sunbase	Interactive, embedded	Dynamic SQL functions, triggers, some ANSI SQL2 features, GDML, proprietary language	4GL, form, menu and report generators,	Roll back, disk mirroring and shadowing, multigeneration record structures, recovery	Record locking, limited user access via grant/revoke permissions	Direct	TCP/IP, Decnet, Apollo Mailbox	$5,000 - $200,000	18%
Microsystems Engineering Corp. (708) 882-8111	Muse-II Manager Version 9.0	DEC VAX	VAX/VMS 4.2 and higher	ASCII	None	None	Form and report generators, proprietary command language	Maintain backup files	Limited user access	Direct	None	$1,000 - $21,000	15% of price; first 6 months free
Mimer Software International (703) 742-2999 (800) 441-6375	Mimer 3.0 for VAX/VMS	DEC VAX, Microvax, Vaxstation	VMS 5.1 and higher	DIF, Lotus' 1-2-3, Dbase, Mimer	ANSI	Some ANSI SQL2 features, procedural language, outer joins	4GL, form, report, schema and maintenance code generators, procedural language	Roll back	Record locking, limited user access	Index	Digital Pathworks, Decnet, TCP/IP, Modulex	$3,000 - $125,000	12% - 18% of price; first year free
Oracle Systems Corp. (415) 506-7000 (800) 345-3267	Oracle Version 6.0	Stratus XA2000, Prime 50 series	VOS, Prime	ASCII	Interactive, embedded	Some SQL2 functions	4GL, form, menu and report generators, CASE tools	Roll back and forward, transaction logging, disk mirroring	Record locking, limited user access	B tree, index	Stratalink, Stratanet, TCP/IP, Primenet	$7,700+ for Stratus version; $11,000+ for Prime version	15% of license fee

[1]All products listed started shipping after January 1990. [2]All maintenance fees are per year unless otherwise noted.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE REQUIRED	OPERATING SYSTEMS SUPPORTED	IMPORT/EXPORT FILE FORMATS SUPPORTED	TYPE OF SQL	SQL EXTENSIONS INCLUDED	APPLICATION DEVELOPMENT TOOLS INCLUDED	RECOVERY FUNCTIONS	SECURITY FEATURES PROVIDED	ACCESS METHODS USED	NETWORKS SUPPORTED	PRICE	MAINTENANCE FEE?
Progress Software Corp. (617) 270-6500	Progress 4GL/ RDBMS Release 6.0	AT&T 3B2, Decstation, IBM PCs and compatibles	AIX, Unix System V, Ultrix, DOS, VAX/VMS, CTOS/BTOS, OS/2, Xenix, AIX	ASCII, DIF, Excel, Lotus' 1-2-3, SYLK, Unipoint, Multiplan, DBMS, Wordperfect, Wordstar, Microsoft Word, BTOS Odo Writer	Interactive, embedded	Progress 4GL extensions	4GL, form, menu, report and DBF generators	Roll back and forward	Record locking, limited user access at database, file and field levels	B tree	Netbios, Decnet, SPX/IPX, TCP/IP	$1,000 - $250,000	15% of price
Recital Corp. (800) 750-1040	Recital	DEC VAX, NCR, Sun, IBM, HP, DG	VMS, Ultrix, Unix System V, Release 3.2, SCO Unix, Xenix	ASCII, binary, DIF, Excel, Lotus' 1-2-3, SYLK, WKS	Interactive, embedded	Triggers, ANSI extensions, dynamic SQL functions	4GL, form, menu and report generators	Journaling before and after image	Limited user access via permissions for time, location, file, column, table levels	B tree, hash, direct, index	Decnet, TCP/IP, NFS	$5,625 - $47,500 for VAX version; $995 for single-user Unix version to $9,380 for 16-user Unix version	First year free, then 15% of price for VAX or Unix version
Sharebase Corp. (408) 378-7868	Server/ 8000 Model 300	Sharebase Server/8000	DOS, Sun OS, VAX/VMS, Unix, Ultrix, MVS, VM/CMS, OS/2	ASCII, DIF, Excel, Lotus' 1-2-3, SYLK	Interactive, embedded, ANSI	Compiled commands, dynamic SQL functions, exceptions, referential integrity	4GL, form, menu and report generators	Roll back and forward, transaction logging, disk mirroring	Limited user access via passwords, permissions to column level	B tree, index	3Com, Netware, Decnet, TCP/IP, RS232	$165,000 for hardware and software	10% of price
Sterling Software, Inc., International/AD Labs Division (613) 737-1397	ZIM Release 3.11 for Arrius	DG Arrius and Model 88	DG UX, 88 Open	ASCII	Interactive	Some SQL2 features	4GL, form, menu and report generators	Roll back and forward, transaction logging	Record locking, limited user access via passwords, field level security	B tree	NFS	$1,725+	$385+
Sybase, Inc. (415) 596-3500	Sybase Release 4.0	DEC VAX, HP 9000, AT&T Starserver, Sequent, Pyramid Mesaver, DG Arrius	VMS, Unix, VOS, OS/2	ASCII, binary, Lotus' 1-2-3	Interactive, embedded ANSI	Stored procedures, triggers	4GL, form, menu, application and report generators	Roll back and forward, transaction logging, disk mirroring	Limited user access	B tree, clustered index	None	$3,750 - $250,000	10% - 15% of license fee
Tandem Computers, Inc. (408) 285-6000	Non-Stop SQL	Tandem Non-Stop machines	Guardian	ASCII, binary, DIF, Excel, Lotus' 1-2-3, SYLK, WKS, DDE, EBCDIC, RBS, RPT, WKI	Interactive, embedded	OLTP optimizations, parallel queries, dynamic SQL functions	4GL, form, menu and report generators, CASE tools	Roll back and forward, transaction logging, disk mirroring, fault tolerance	Record locking, limited user access, integrated systems security	B tree, direct, hash, index, sequential block	OSI, SNA, TCP/IP, LAN Manager, Netware, 3Com, Starlan	$1,495+	$385+
Unidata, Inc. (303) 786-8897	Unidata XDBMS Release 2.0	DEC Ultrix- and VMS-based machines, IBM RS/6000, Tandem Integrity S2, DG Arrius, Pyramid, Sun, HP	VMS, Unix	ASCII, binary, user-defined formats	Interactive, embedded	ANSI extensions	4GL, form, menu and report generators	Transaction logging, disk mirroring (on VMS only)	Record and table locking, field-level security	B tree, hash, index	TCP/IP	$900 - $210,000	18% of price
Unisys Corp. (215) 986-3501	XDMS1100	Unisys 1100, 2300 series	OS1100	None	Interactive, embedded	Area management, triggers	4GL, report generator	Roll back, transaction logging, disk mirroring, auto recovery, message recovery	Record locking, limited user access	B tree, hash, direct, index	Oracle Sqlnet	$43,084 - $110,033 for five-year license	Included in price

Extractors take the wheelbarrow approach

The quickest, dirtiest and oldest method of maintaining two databases is via extract products.

Extract products are like wheelbarrows, pulling production data from operational databases on a periodic basis and then reloading the data into a relational database. An example is IBM's DXT product, which extracts databases from IMS and VSAM into DB2 and SQL/DS.

With extract products, updates to the decision support system (DSS) databases are not usually rolled back up into the operational databases. Because the data is only as current as the last extract, this method is best used for DSSs, which do not require highly current data. SQL databases are also well-suited for ad hoc querying, reporting and analysis.

The cost of maintaining shadow databases may appear high because they require duplicate disk storage, plus duplicate or additional software licenses for the second database. Extract software typically costs $10,000 to $20,000 per database interface.

In addition, DSS applications can be very expensive in terms of operational resources.

Nevertheless, this method does not require any differentiation in who accesses the database, sidestepping organizational politics.

The extract method has been successfully marketed by IBM in its Information Center efforts, as well as by independent software vendors such as Information Builders, Inc. and Must Software International, Inc., whose DSS-oriented fourth-generation language products fit nicely into this architecture. •

AARON ZORNES

Continued from page 66

DEC-supplied data managers.

Aside from this propagator, DEC has gone to considerable effort to line up products for coexistence strategies with both IBM and third-party databases with extract facilities and gateways.

The Rdbaccess family of gateways provides on-line access to DB2 and Oracle Systems Corp. databases. When used with its extract product Vaxlink, it can tap into almost any mainframe data source.

DEC remarkets the Sterling IMS and VSAM gateways, while Sterling markets gateways to databases such as Total and CA-Datacom/DB.

Vaxlink is primarily an extract facility; however, the extracts go into an RDB database, which allows the DEC Data Distributor to propagate the extract through the environments.

Although its Dprop has invoked a lot of interest, IBM is not alone in recognizing the market requirements for coexistence with legacy systems. Independent software vendors have had such strategies and products in place for years.

By 1993, when DBMS vendors work out kinks in their gateways and products mature, coexistence products will become strategic for IBM, DEC and key independents to assist users in migrating and converting legacy databases and applications. •

Everything's relational

As most information systems professionals know by now, the relational model is the most popular form of database management system. Users are gradually migrating toward relational standards, especially SQL, which is used by many products to access the database.

However, the debate rages on about what is relational and what is not.

The discussion is fueled by vendors that try to modify their nonrelational systems to look and act more relational and by purists who insist on relational guru E. F. Codd's 12 rules for relational DBMSs [CW, Oct. 14, 1985] as the only definition.

For practical purposes, the definition of relational is less important than the behavior of a given database. If a system is labeled relational, it creates certain expectations for the user — SQL conformance among them.

According to Colin White, president of Database Associates, a consulting firm in Morgan Hill, Calif., there are three key aspects to Codd's model that should be reflected in any RDBMS:

- **Language.** Not only should SQL be fully supported as the database query, administration and programming language, but the physical file structure of the database should also be optimized for SQL.
- **Structure.** Data must be organized as values in tables at the logical level. Data elements should be logically accessible through the use of a primary key. Null values representing missing or inapplicable information should be explicitly supported.
- **Integrity support.** Data integrity must be built into the database and into its access language, rather than into the applications.

MICHAEL L. SULLIVAN-TRAINOR

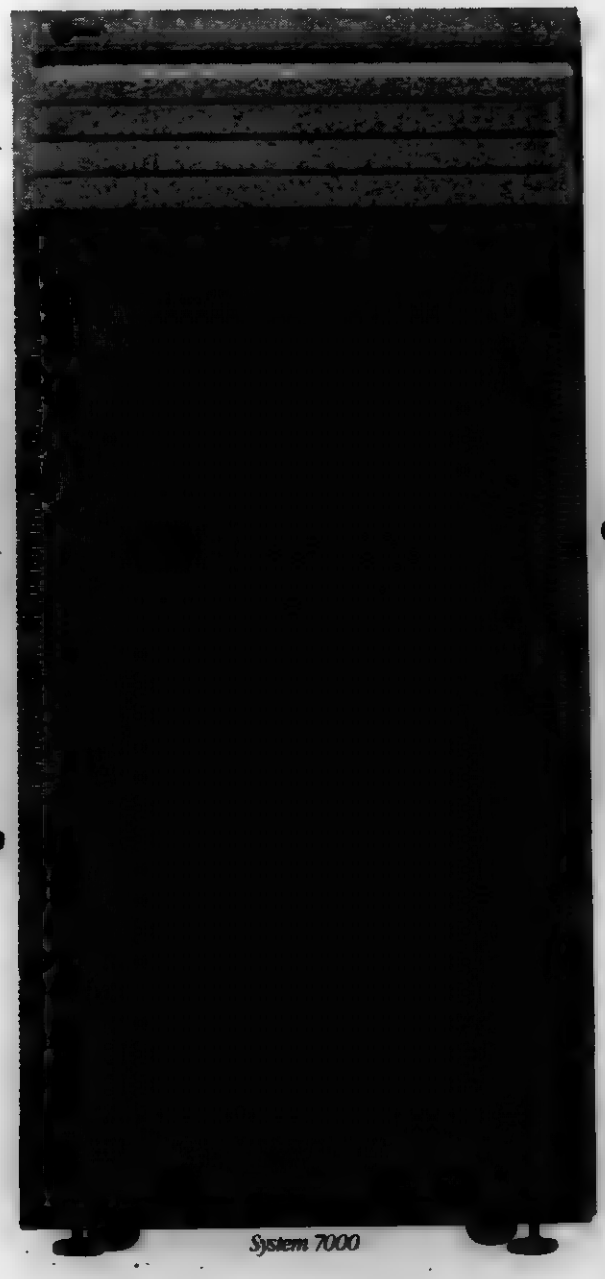
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	512 MB		768 MB	384 MB
(Informix® TP1 benchmark)	201	N/A	N/A	175[1]
CPU Performance Range		13-72 VUPs	MIPs	
	128 GB	.5 TB+		
Ethernet® Channels	12	6	N/A	4

Customers choose System 7000 for its high degree of scalability
[1]Source: Cobb and Data

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AT&T Computer Systems

The next standard for SQL and what it will mean to you

BY ALLEN G. TAYLOR

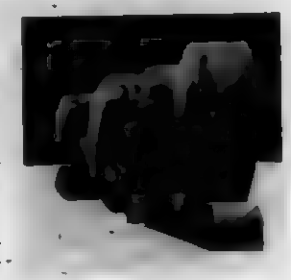
If you thought SQL-89, the last ANSI standard for SQL, was complex, you haven't seen SQL2.

From the preliminary drafts, it is clear that SQL2 — the informal name for the next SQL standard that has been formulated but not officially adopted — will be big and extremely complex. Database vendors have access to this draft, but no one is anywhere near compliance with it.

Taylor is a seminar speaker, writer and systems consultant in Westminster, Calif.

If vendors did fully comply with one standard or another, SQL could serve as a common language for accessing all data in all databases, whether it resided on a mainframe, personal computer or minicomputer. This would do wonders to forward the trend of computing in heterogeneous environments in which different computers running different operating systems and applications need to share data.

As it stands, not even vendors claiming full compliance with SQL-89 necessarily offer compatible products.



They may comply with the 100 pages of rules that address the basic, core capabilities of SQL, but they've also found it necessary to add proprietary extensions that go beyond the facilities defined in the ANSI standard to produce a hopefully richer language.

As a result, major incompatibilities exist among the different vendors' products, even though they may all claim to be SQL-89-compliant.

SQL2 is an attempt to overcome the limitations of the earlier standard. The work that the American National Standards Institute (ANSI) and the International Standards Organization began in 1987 to develop a richer standard has produced more than 700 pages of documentation, broken into two parts.

The first part is SQL2. It consists of those features that the committee thought could be implemented within a few years. The second part, SQL3, includes facilities that will be harder to implement.

When SQL2 is finally approved, it will be formally named SQL-92 or SQL-93, depending on which is appropriate.

Now, however, because the new standard has so many rules to comply with, the stakes of full compliance have been raised even higher. Many moons will pass before any vendor offers all the features specified in the standard.

IF VENDORS DID fully comply with one standard or another, SQL could serve as a common language for accessing all data in all databases, whether it resided on a mainframe, personal computer or minicomputer.

Moreover, SQL2 will offer three levels of compliance — entry, intermediate and full — just as SQL-89 offered two levels. The entry level is only a small step beyond SQL-89, consisting mainly of bug fixes, according to Colin White, president of Database Associates in Morgan Hill, Calif. Intermediate is the level most users need, and the full level contains additional functions that only a few users will need.

This raises a couple of issues for buyers. The many levels of compliance — not to mention the many different SQL "standards" — are a prescription for confusion. When vendors claim to be ANSI SQL-compliant, it will be difficult, if not impossible, to know what they mean.

Furthermore, even if two products comply with the same level of the same standard, it is unlikely that they will be compatible with each other. Extensive as the SQL2 standard is, vendors will continue to incorporate nonstandard extensions into their products.

At best, SQL2 will serve as a guide. If a vendor is going to incorporate a new feature into its product, it will probably do it the SQL2 way rather than inventing its own. However, if a desired feature is not addressed by SQL2, most vendors will add their own version instead of waiting for a new standard to emerge.

Buyers truly interested in using SQL to access data across platforms should make sure that all used versions of SQL comply with the same standard at the same level.

Beyond that, they should use only ANSI-standard features in their application code. Nonstandard vendor extensions, no matter how helpful they might be, will almost certainly not work on more than one platform. •

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How vendors have and have not met criticism

BY ALLEN G. TAYLOR

Poor performance. Difficult to use. Impossible to tune. Since IBM released DB2 and relational databases were unleashed in the world, people have voiced these and other complaints about relational database management systems.

Although some of these criticisms still apply, they do not appear to have caused much permanent damage to the popularity of relational technology.

According to a *Computerworld* survey of 235 users of RDBMSs, 57% installed their first version more than three years ago, and 81% started right in with production rather than test applications.

Here's what vendors have and have not done to meet user criticism:

• **Criticism No. 1: Too slow.** One of the first criticisms of relational database technology was that it was slow. In recent years, improvements in performance have been substantial, and industry experts envision further improvements.

"Performance is at an acceptable level for perhaps 80% to 90% of companies that use mainframes," says William Backs, president of the International DB2 Users Group and a senior consultant at CSC Partners in Oak Brook, Ill.

However, he adds, there are still many things that could be done to improve performance even further.

The 10% to 20% of companies that may still have a performance problem are typically Fortune 100 companies running the world's largest business applications, Backs says.

• **Criticism No. 2: Hard to tune.** Sometimes poor performance is symptomatic of a poorly tuned system. This may often be the case because relational databases are infamous for being difficult to tune.

Some relational products have added tremendously to tuning flexibility; unfortunately, however, such added capability seems to go hand in hand with complexity.

For example, according to Dave Kellogg, director of server product marketing at the Ingres Division of Ask Computer Systems, Inc., "Ingres . . . has more dials and knobs than most people know what to do with."

He adds, "Paradoxically, extensive tuning capability can make it hard to tune a system."

The solution Ingres offers is to hold classes for users, although Kellogg says the company is looking into tools that would make tuning easier.

The design and maintenance of relational systems is inherently complex, says Dave McGoveran, principal at Alternative Technologies in Santa Cruz, Calif.

Extensive training, according to McGoveran, is currently the only way to ensure the production of efficient applications.

• **Criticism No. 3: Hard to use.** Although some contest it, complaints about complexity extend into Structured Query Language (SQL), the query language used to manipulate data in a relational database.

Vendors have addressed the problem by shielding users from SQL with query builders and other tools that generate SQL code.

Because the user interfaces only with the tool, he may never see the SQL code the tool generates.

Information Builders, Inc.'s Focus falls into this category, as does Oracle Systems Corp.'s SQL*Forms.

Although some applications will always have to be implemented at least partially with SQL, the goal of tools vendors is to reduce that as much as possible.

The more the development process can be automated, the quicker applications can be built and debugged.

• **Criticism No. 4: Unreliable.** Original relational products were also pegged as deficient in enforcing basic integrity constraints.

However, says Herbert A. Edelstein, a principal at Euclid Associates in Potomac, Md., current products do a good job of ensuring data integrity.

A number of products abide by the ANSI SQL-89 specification (see story page 72), which calls for referential integrity. These products include IBM's DB2 and SQL/DS; Cincom Systems, Inc.'s Supra; Computer Associates International, Inc.'s CA-Datacom and CA-IDMS; Digital Equipment Corp.'s RDB; and Ask's Ingres.

• **Criticism No. 5: No arrays.** Some problems arise because of the relational model itself. For instance, strict adherence to the relational model does not allow the inclusion of arrays, or repeating groups, in a database.

Each row in a database table must contain no more than one data item per column. Arrays of numbers are strictly forbidden because they violate the first normal form of a relational database.

However, there is general agreement — even among people who might be classified as relational purists — that array processing can be valuable in some applications.

Most vendors either already support repeating groups or have committed to supporting them in the future.

Unidata, Inc. in Denver, claims to offer the first commercial implementation of the nonfirst normal form data model.

Both CA-Datacom and CA-IDMS support repeating groups. •

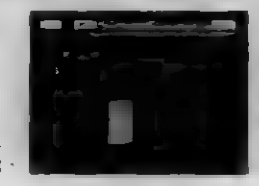


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BUYERS' SCORECARD

Users rate Adabas function over relational form

Mainframe RDBMSs

Scores reflect user ratings on all criteria and their user-assigned importance
Response base: 40 per product set, except Datacom (20) and IDMS (16)

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Cincom's Supra SCORE 46	Availability and crash recovery On-line transaction performance	Distributed updating, remote features Support for standard SQL
CA's IDMS SCORE 45	Availabilty and crash recovery On-line transaction performance	SQL extensions Integration of CASE tools
IBM's SQL/DS SCORE 45	Support from standard SQL Effective user-defined integrity	Integration of CASE tools Performance and system monitors

BY MICHAEL L. SULLIVAN-TRAINOR
Staff

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Adabas users rated their product highest in systems availability and recovery from crashes — by far the most important category for all users surveyed. In addition, the product received the top rating for providing effective programming tools.

Rather than integrating relational functionality within Adabas, the current version of the product in the field provides relational capabilities by using a SQL access layer above the database engine.

More than 235 users of mainframe RDBMSs rated their products on a one-to-10 scale across the categories. Each user group rated only its own products.

Forty responses were included for each of the products, with the exception of Computer Associates International, Inc.'s Datacom (20 responses) and IDMS (16 responses), both of which are new to the market with relational features (see methodology next page).

Coming in with the second highest ratings from its users was Oracle Systems Corp.'s Oracle, which is more firmly built on a relational and SQL cornerstone.

This attribute is reflected in its top rating in the useful SQL extensions category. The product also scored second highest in decision support applications performance, integration of the operating system and RDBMS security and integration of computer-aided software engineering tools.

Datacom and IDMS have long histories as leading nonrelational DBMSs but with the latest versions, CA has moved them into the relational league. They have been rebuilt as hybrids with relational and nonrelational attributes.

Datacom scored the highest user rating in performance of on-line transaction, the second most important user category. The product also topped the end-user tools category.

The relational version of IDMS, which is still in beta testing, rated highest in providing performance and system monitors but generally did not fare as well as Datacom. For example, it received the lowest score in providing effective end-user tools.

IBM's DB2, the most popular RDBMS on IBM and compatible mainframes, scored a fourth-place position. DB2 never rose to the top of the pack in terms of user ratings, but it scored two second-place positions for useful SQL extensions and support for standard SQL.

DB2's counterpart, SQL/DS, fared even worse, tying with IDMS for last place. But SQL/DS did achieve the highest rating in support of standard SQL. A last-place rating in system availability and recovery from crashes didn't help the product's positioning.

Finally, Cincom Systems, Inc.'s Supra topped another key relational category: providing effective user-defined integrity. However, the rating was outweighed by last-place finishes in decision support performance, distributed updating, support for standard SQL and useful SQL extensions. ●

KEY RATINGS

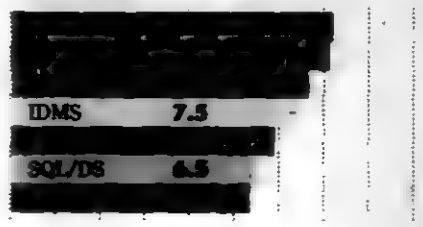
Adabas achieved the highest rating in the category most important to users: system availability and crash recovery. Datacom received two top ratings. Despite low ratings overall, Supra and IDMS each captured firsts in key areas

User importance rating:

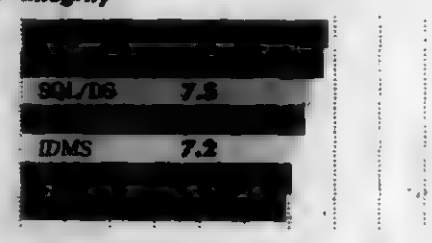
9.2 System availability and recovery from crashes



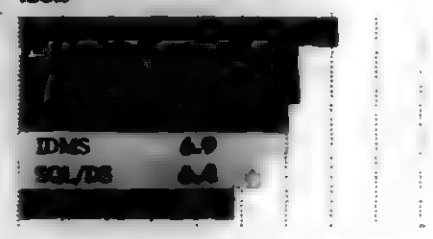
8.5 Performance in processing on-line transactions



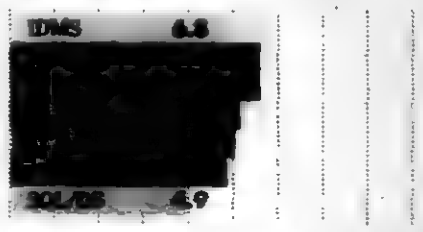
7.8 Providing effective user-defined integrity



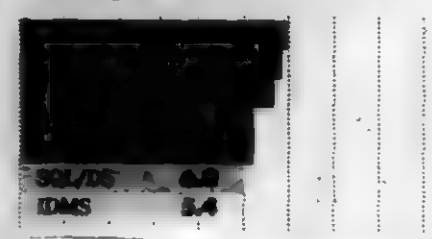
7.8 Providing effective programming tools



7.3 Performance and system monitors



7.3 Providing effective end-user tools



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A CLOSER LOOK

Adabas users rated it highest in six out of nine remaining categories. Oracle achieved the highest ratings for auditing functions and useful SQL extensions. Although a low scorer overall, SQL/DS edged ahead of DB2 in user ratings of support for standard SQL.

User importance rating:

7.1 Integration of DBMS and operating system security



7.1 Multilevel security features



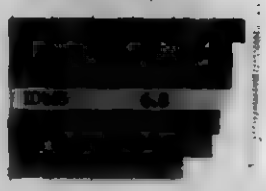
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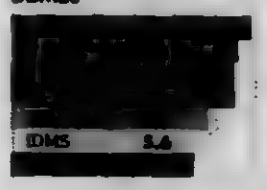
6.7 Performance in decision-support applications



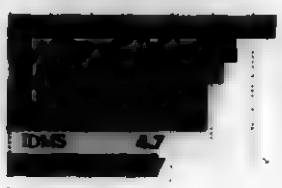
6.7 Auditing functions



6.4 Ease of migration from nonrelational DBMSs



6.3 Useful SQL extensions



6.2 Distributed updating, recovery and remote administration



5.8 Integration of CASE tools



Loyalties

How likely would you be to purchase this product again if you were making the decision today?
(Reasons based on most frequently stated responses)

Adabas
Response base: 40



Number of respondents

Likely
The reasons:
Good experience with product

Unlikely
The reasons:
Newer/better products available

Oracle
Response base: 40

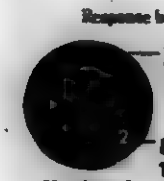


Number of respondents

Likely
The reasons:
Good product

Unlikely
The reasons:
Problems/ Bugs

Datacom
Response base: 20



Number of respondents

Likely
The reasons:
Reliability

Unlikely
The reasons:
Other/better products available

DB2
Response base: 40



Number of respondents

Likely
The reasons:
Good product

Unlikely
The reasons:
Lack of tools

Supra
Response base: 40



Number of respondents

Likely
The reasons:
Good product

Unlikely
The reasons:
Obsolete

IDMS
Response base: 15



Number of respondents

Likely
The reasons:
Flexibility

Unlikely
The reasons:
Difficult to use/Complex

SQL/DS
Response base: 40



Number of respondents

Likely
The reasons:
Reliability

Unlikely
The reasons:
Too costly

Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answers)

Likes
Ease of use
Flexibility

Dislikes
Slow
Security features

Likes
Runs on multiple platforms
Flexibility

Dislikes
Price
Lack of support

Likes
Performance
Data dictionary

Dislikes
Integrity features
Outdated

Likes
Ease of use
Relational capability

Dislikes
Security features
Resource consumption

IDMS

Likes
Ease of use
Performance

Dislikes
Lack of SQL features
Lack of service/support

IDMS

Likes
Recovery capabilities
Good tools

Dislikes
Documentation
Updating between test and production

SQL/DS

Likes
Ease of use for programming
Flexibility

Dislikes
Not user-friendly
Performance problems

Vital statistics

Total number of respondents: 235

What is your position?

Database administrator	125
IS manager	110

For how many years have you been involved with RDBMSs?

5 or more years	137
3 to 4 years	67
1 to 2 years	28
less than 1 year	3

METHODOLOGY

To qualify for *Computerworld*'s Buyers' Scorecard on mainframe relational database management systems, a product had to run on an IBM or compatible mainframe, be one of the market leading databases on those platforms and support relational features, including SQL.

Forty responses were collected for each product type, with the exception of Computer Associates International, Inc.'s Datacom and IDMS. Minimum responses were reduced to 20 and 16, respectively, for these two groups because although the nonrelational versions have large installed bases, the relational versions are new to the market, and IDMS is still in beta testing.

The survey was conducted by First Market Research Corp. in Austin, Texas, an independent telephone research firm. Results were tabulated with the assistance of IDG Research Corp. Random lists of users were obtained from objective nonvendor sources as well as from vendors.

The total weighted scores were computed by multiplying the mean scores users assigned to the importance of each criterion by the mean scores each user group gave its own products. Ratings are presented in order of importance to all users based on these mean importance ratings.

ACKNOWLEDGEMENTS

Computerworld would like to acknowledge assistance provided by the following individuals and companies: Computer Intelligence; Installed Technology International; Richard Finkelstein, Database Associates; David McGovern, Alternative Technologies, Inc.; Colin White, publisher of *InfoDB* and *Database Review*.

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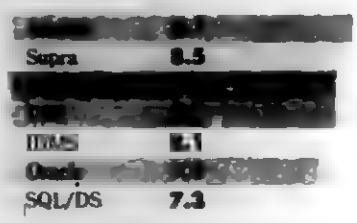
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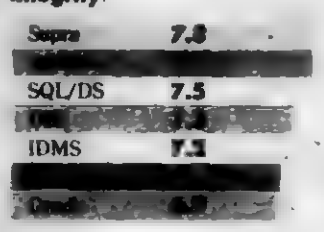
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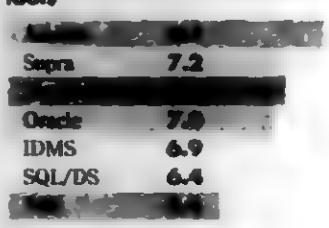
8.5 Performance in processing on-line transactions



7.8 Providing effective user-defined integrity



7.8 Providing effective programming tools



7.3 Performance and system monitors



7.3 Providing effective end-user tools



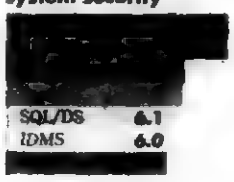
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A CLOSER LOOK

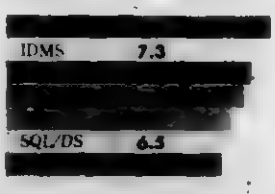
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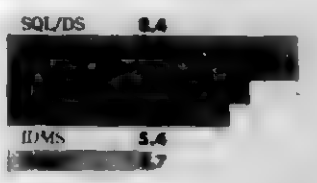
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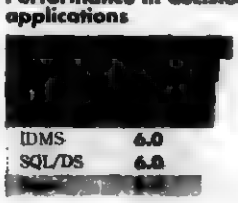
7.1 Multilevel security features



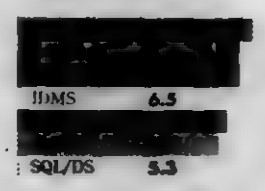
7.0 Support of standard SQL



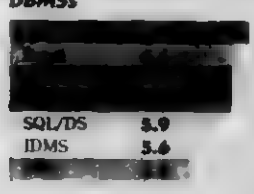
6.7 Performance in decision-support applications



6.7 Auditing functions



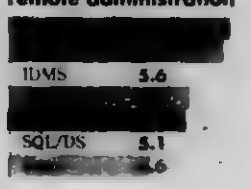
6.4 Ease of migration from nonrelational DBMSs



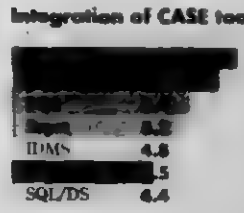
6.3 Useful SQL extensions



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5.8 Integration of CASE tools



Loyalties

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(Reasons based on most frequently stated responses)

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Response base: 40



Number of respondents

Likely
The reason: Good experience with product

Unlikely
The reason: Newer/better products available

Oracle
Response base: 40



Number of respondents

Likely
The reason: Good product

Unlikely
The reason: Problems/ Bugs

Datacom
Response base: 20



Number of respondents

Likely
The reason: Reliability

Unlikely
The reason: Other/better products available

DB2
Response base: 40

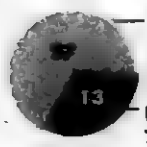


Number of respondents

Likely
The reason: Good product

Unlikely
The reason: Lack of tools

Supra
Response base: 40

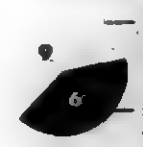


Number of respondents

Likely
The reason: Good product

Unlikely
The reason: Obsolete

IDMS
Response base: 15



Number of respondents

Likely
The reason: Flexibility

Unlikely
The reason: Difficult to use/Complex

SQL/DS
Response base: 40



Number of respondents

Likely
The reason: Reliability

Unlikely
The reason: Too costly

Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answers)

[redacted]

Likes
Ease of use
Flexibility

Dislikes
Slow
Security features

[redacted]

Likes
Runs on multiple platforms
Flexibility

Dislikes
Price
Lack of support

[redacted]

Likes
Performance
Data dictionary

Dislikes
Integrity features
Outdated

[redacted]

Likes
Ease of use
Relational capability

Dislikes
Security features
Resource consumption

[redacted]

Likes
Ease of use
Performance

Dislikes
Lack of SQL features
Lack of service/support

IDMS

Likes
Recovery capabilities
Good tools

Dislikes
Documentation
Updating between test and production

SQL/DS

Likes
Ease of use for programming
Flexibility

Dislikes
Not user-friendly
Performance problems

Vital statistics

Total number of respondents: 235

What is your position?

Database administrator	125
IS manager	110

For how many years have you been involved with RDBMSs?

5 or more years	137
3 to 4 years	67
1 to 2 years	28
less than 1 year	3

METHODOLOGY

To qualify for *Computerworld*'s Buyers' Scorecard on mainframe relational database management systems, a product had to run on an IBM or compatible mainframe, be one of the market leading databases on those platforms and support relational features, including SQL.

Forty responses were collected for each product type, with the exception of Computer Associates International, Inc.'s Datacom and IDMS. Minimum responses were reduced to 20 and 16, respectively, for these two groups because although the nonrelational versions have large installed bases, the relational versions are new to the market, and IDMS is still in beta testing.

The survey was conducted by First Market Research Corp. in Austin, Texas, an independent telephone research firm. Results were tabulated with the assistance of IDG Research Corp. Random lists of users were obtained from objective nonvendor sources as well as from vendors.

The total weighted scores were computed by multiplying the mean scores users assigned to the importance of each criterion by the mean scores each user group gave its own products. Ratings are presented in order of importance to all users based on these mean importance ratings.

ACKNOWLEDGEMENTS

Computerworld would like to acknowledge assistance provided by the following individuals and companies: Computer Intelligence; Installed Technology International; Richard Finkelstein, Database Associates; David McGovern, Alternative Technologies, Inc.; Colin White, publisher of *InfoDB* and *Database Review*.

Due to a lack of photographic contrast, this page did not reproduce well.





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Wa$te not, want not

Reaping benefits from information technology begins by knowing where your money is going

BY PETER G. W. KEEN

For each of the past three decades, information technology (IT) budgets — for hardware, software and telecommunications — have grown at about 15% per year, which is far greater than the rate of business growth. It will be impossible to sustain this rate in the 1990s.

A growing number of senior executives are worried that IT costs may be out of control.

IT now amounts to about half the incremental investment for large firms. It has become a contender for scarce business capital and not just for tomorrow's expense budget. There is little evidence that the investment is producing adequate benefits. What is more, there are no reliable methods for measuring the business value of IT.

Senior executives are caught in a worrisome double bind: Economically, companies cannot afford to increase capital spending on IT; competitively, they cannot afford not to do so. The economics of information capital is firmly on the top management agenda, and corporate managers are clamoring for help.



Debbie Palen

Counting all costs

Many companies do not know what they are spending on IT. End-user computing and telecommunications expenditures are scattered across business units' budgets, and many organizational costs are not even tracked.

How can firms make rational decisions about IT when they do not know its true costs? The starting point for managing the economics of information capital is to understand that IT costs are of two types: supplier costs (the costs incurred by the information services function) and user costs (the growing portion of firms' total IT expenditures that is being shifted out of central corporate information systems units in the business).

Supplier costs. Corporate IS groups are a form of internal supplier, analogous to a utility. They operate corporate data centers and telecommunications facilities and provide services such as systems development and information management. Their costs are charged back to the business users.

Computer hardware and operating systems and telecommunications equipment comprise the power plant for information services. Frequent changes in the components of this power plant, driven by rapid technological change, require continual retraining of the people who operate and maintain it.

An increasing proportion of the operations function is committed to ensuring the reliability, security and availability of key business services that depend on the IT base. When an airline's reservations system is down, so, too, is its business. Operations skills and resources are essential to the on-line business enterprise and are a vital element in the technical infrastructure. They are also not cheap.

The business services delivered via IT hardware are realized in applications systems. Development — and subsequent operation and maintenance — of these systems is also people-dependent. Whereas systems development costs are discretionary, operations and maintenance costs are not. Inasmuch as maintenance can amount to one to three times the development cost, today's development budget sets the IT budget for the next several years.

For every dollar of initial development expenditure for a large system, operations costs will average 20 cents per year and maintenance 40 cents per year. At any given time, only about 10% of a corporate information services unit's staff is developing new systems; maintenance occupies 50% or more of its scarce human resources.

The cost of support is growing rapidly as IS groups shift from building systems to supporting business units. The support facilities for a $5,000 personal computer, for example, typically amount to at least $8,000 per year, according to research organization Gartner Group, Inc. Much of that will be paid for by the business unit, but it is a new burden on IS units.

On the supplier side, only new development is truly a variable cost.

User costs. User costs vary widely, depending on company policy regarding IS cost allocation and recovery. Some of these costs, being hidden, are unbudgeted.

Allocations and chargeback of central IS unit/supplier costs obviously become user costs. To these are added direct acquisition and usage costs. PCs are a frequent element of the former. Direct usage costs, which largely depend on transaction volumes, can grow rapidly and be hard to control.

For example, a single PC accessing an outside information service may not need

Continued on page 78

Keen is founder and executive director of the International Center for Information Technologies, a research organization in Washington, D.C.

- **Counting all costs, including hidden ones**
- **A technology balance sheet you can use**
- **Infrastructures are an economic drain**

Continued from page 77

special justification or budgeting. But with IT, supply often creates demand.

There is an obvious and immense difference between initial small-scale, ad hoc computer use and wider departmental capability. To manage such investment case by case (piecemeal) is to likely overlook how a series of $5,000 PC purchases can become a million dollar capital plan just for hardware acquisition. The hidden costs of support and telecommunications can dwarf this expenditure.

Central IS units have long struggled to manage compounded costs driven by software development. Business units now face similar stresses. With the advent of PCs, distributed development, office technology, departmental operations and end-user computing, these units began to incur many of the costs of distributed information management previously borne by the central information services group.

Perspectives on costs

Business units often do not see the scale or value of central IS infrastructures. They do see the money they are charged for these resources, whether directly for usage or through an allocation for their part of the shared base. Similarly, many business unit managers view as an expense, rather than as an essential service asset, the legions of IS staff members who develop the software and information management asset that is so critical to competitive positioning and a basic element of efficient business operations.

For their part, IS managers have no ready formula for allocating infrastructure costs fairly. Consider this representative sample of the questions they face:

- Should the first users of a telecommunications service carry the full burden, even though the marginal cost is low?
- Who should pay for the development of a customer master database, an infinitely reusable resource that will eventually be of value to many business units?
- Where outside services are cheaper, should business units be allowed to use them and thereby reduce the customer base for the shared corporate resource?

Senior management, if it takes any notice at all, is not likely to be helpful. Top management response to the fixed-cost nature of supplier costs is usually to demand that IS budgets be cut.

An information technology asset balance sheet

Know where your information technology money is going

Any organization can begin to manage information technology costs by creating an asset balance sheet showing all equipment, software and data resources in use. This report is used to increase management awareness of the capital tied up in information technology resources.

The following is a prototype balance sheet you can adapt. The figures used here are for a large bank that spends about $200 million per year on information technology.

After studying the balance sheet, bank management realized its $2 billion in information technology assets were undermanaged. Furthermore, the organization now reuses its data, has merged decentralized facilities into corporate information technology and makes sure business managers spend time on policies relevant to the biggest capital element in its fixed asset base.

Hardware	Assets	
Centrally managed computers	$120M	This is the most obvious component of the information technology base and the one that accountants track; information technology is just 5% of this bank's real assets
Distributed computers	$84M	Mainly personal computers. In many organizations, PCs, workstations and departmental systems now account for more expenditures than do central expenditures
Network equipment	$105M	Telecommunications facilities, often distributed across many different operating budgets
Distributed telecommunications	$59M	Local-area networks and departmental equipment
Total hardware	**$368M**	
Facilities (data center and operations)	$192M	
Software		
Applications development	$420M	Software development expenditures are expensed. The bank had no idea how much it had spent to build the software in use, nor did the accounting system make it easy to find out. This and the figure for "other" software are really educated guesses. They also ignore replacement costs, which the firm's information technology planners estimated as at least $1.2 billion, three times the original development cost
Other, including PC software	$68M	
Total software	**$488M**	
Data resources	$1,200M	This is the estimated capital cost of the salaries, processing and storage incurred in creating the on-line data resources that are the basis for the bank's products and services. It is an indefinitely reusable asset. Data resources do not wear out as they are used
Total assets:	**$2,248M**	

Source: *Shaping the Future: Business Design Through Information Technology*

In late 1989, for example, top management in one of the world's 20 largest banks, viewing IS costs as too high, decided to cut the firm's IT budget from $520 million to $400 million. IS expenditures on maintenance, operations and ongoing development represented $460 million of the $520 million. Because support for core business services such as credit card processing could not be cut easily, IS' only practical choice was to cut corners on testing, operations and security, which meant cutting quality, service and reliability. The bank subsequently fired the hapless head of IS.

It is easy for managers to demand that IT costs be brought under control, but it is reasonable for them to do so only if they acquaint themselves with the origins of those costs. They should understand, for example, that real expenditures grow much faster than software development budgets. We have seen that today's systems development costs compound tomorrow's committed budget for operations and maintenance.

Senior management should also recognize that a firm that moves toward basing most or even much of its operations, product delivery and customer service on its IT base has to make greater and greater investments in the infrastructures that support the practical and cost-efficient creation of individual applications.

No one said it was cheap

There is no cheap and easy way to build the global telecommunications networks and large-scale data and network management systems that constitute the corporate IT infrastructure. Most senior business managers, and many IS managers as well, are unaware of these basic realities. Tradition has led them to view IT as an annual expenditure.

In good times, the IS manager makes the case for an increase of X% or adds up all the approved new software development requests from the business units and factors in aggregate operations costs. In bad times, senior management demands either a decrease in the rate of growth or even an absolute cut in the budget (a very new phenomenon for IS).

Both approaches ignore the cost dynamics of IT. Assuming that every dollar of development generates 20 cents of operations and 40 cents of maintenance, one can see how IT costs are compounded.

Following a strategy that calls for

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maintaining a level total budget, given the reality of compounding IT costs, would all but eliminate development within five years, virtually assuring that the firm would suffer competitively either from skimping on maintenance and operations and thus on customer service, quality and reliability or on development and thus on business innovation.

Maintaining or growing development is not possible without budget growth. A mere 10% growth in development, for example, would increase the overall IT budget by a factor of four in just five years. In light of these figures, the 15% rate of growth in IT expenditures across the U.S. economy in the 1970s and 1980s no longer seems so large.

It is clearly not enough even to keep systems development level to ensure adequate operations and maintenance. The natural rate is closer to 20%.

A GROWING NUMBER of senior executives are worried that IT costs may be out of control.

For firms that are aggressively spending on IT for effective competitive positioning, the rate is often closer to 30%. This latter rate can obviously be sustained for only a few years unless the benefit flow keeps pace with the costs.

But if a firm doesn't commit to a growth of at least 15% to 20% per year, it is effectively cutting back its IT capability, unless it can dramatically improve development productivity.

Infrastructure investments compound the problem of managing IT costs by adding to the fixed-cost base without providing direct benefits. Infrastructures are all cost; benefits come indirectly from the business applications they make practical.

There are many opportunities to reduce infrastructure costs by consolidating separate facilities, especially in the area of international telecommunications. One firm, for example, cut its total telecommunications costs by 30% by linking separate services to a shared high-speed, low-unit-cost fiber-optic transmission facility, centralizing network management and routing international traffic so as to avoid high-cost countries.

The company should, of course, have done this years ago, but no one in the firm — literally — knew either how large the costs of telecommunications had become or where they were incurred.

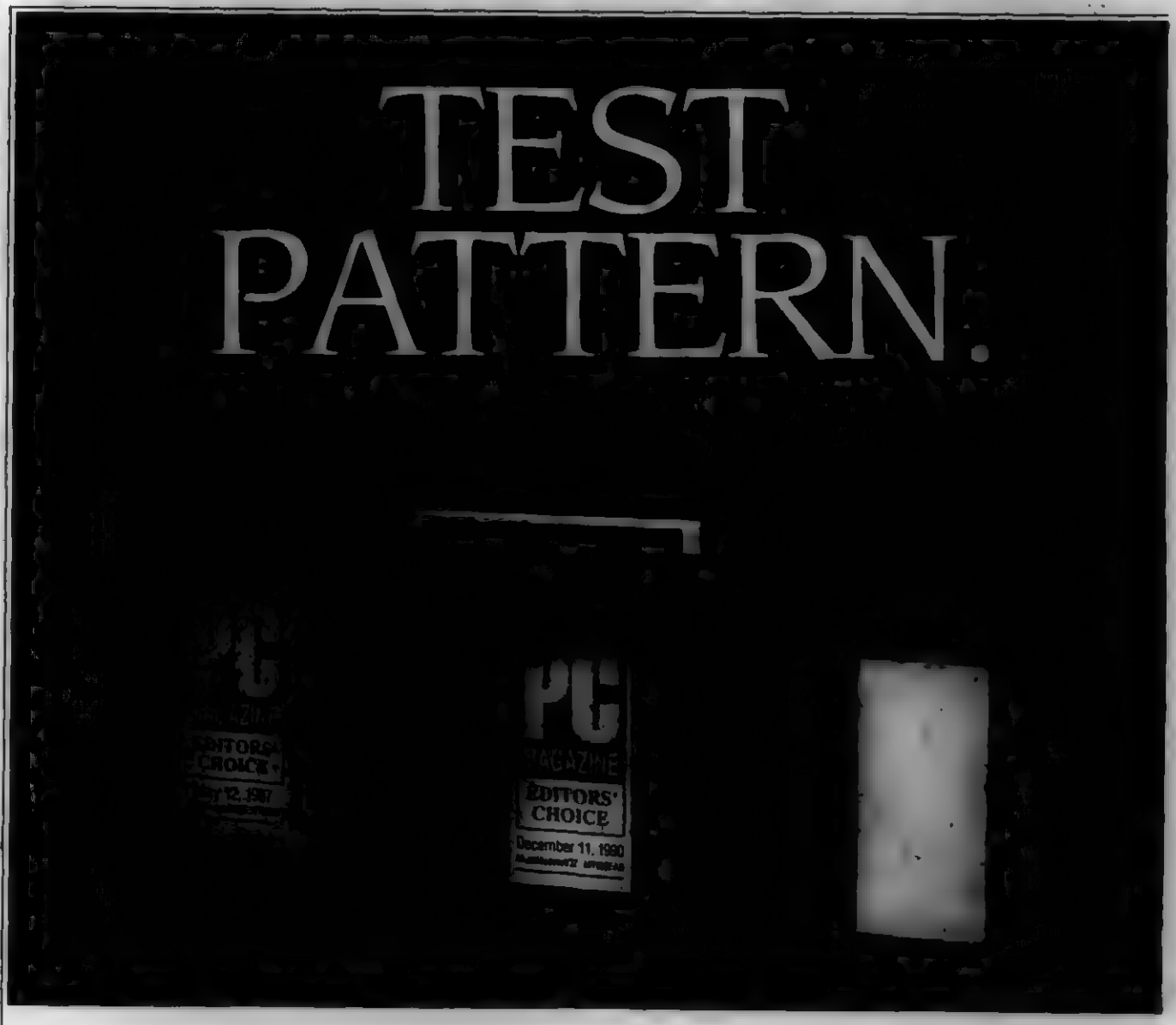
Expenditures were scattered across several hundred budgets.

With costs growing far faster than business profits, evidence of payoff limited or absent and small sanctioned increases in annual budgets generating long-term expenses, it is no wonder that corporate IS units are under siege.

Frustrated and worried, senior management asks, "How on earth, with the costs of PCs dropping by the week and the price/performance of the microelectronics industry continuing to improve by 30% per year, can our IS spending be growing by 10% to 20% per year with no increase in development or business productivity?"

The answer, "That's the way it is," is not a justification for uncontrolled IS budget growth but a challenge to business managers to face up to the reality of IT costs and work to ensure that [redacted] exceed those costs.

This is an excerpt from Peter G. W. Keen's forthcoming book Shaping the Future: Business Design Through Information Technology, to be published by the Harvard Business School Press in March. Copyright 1991 by Peter G. W. Keen.



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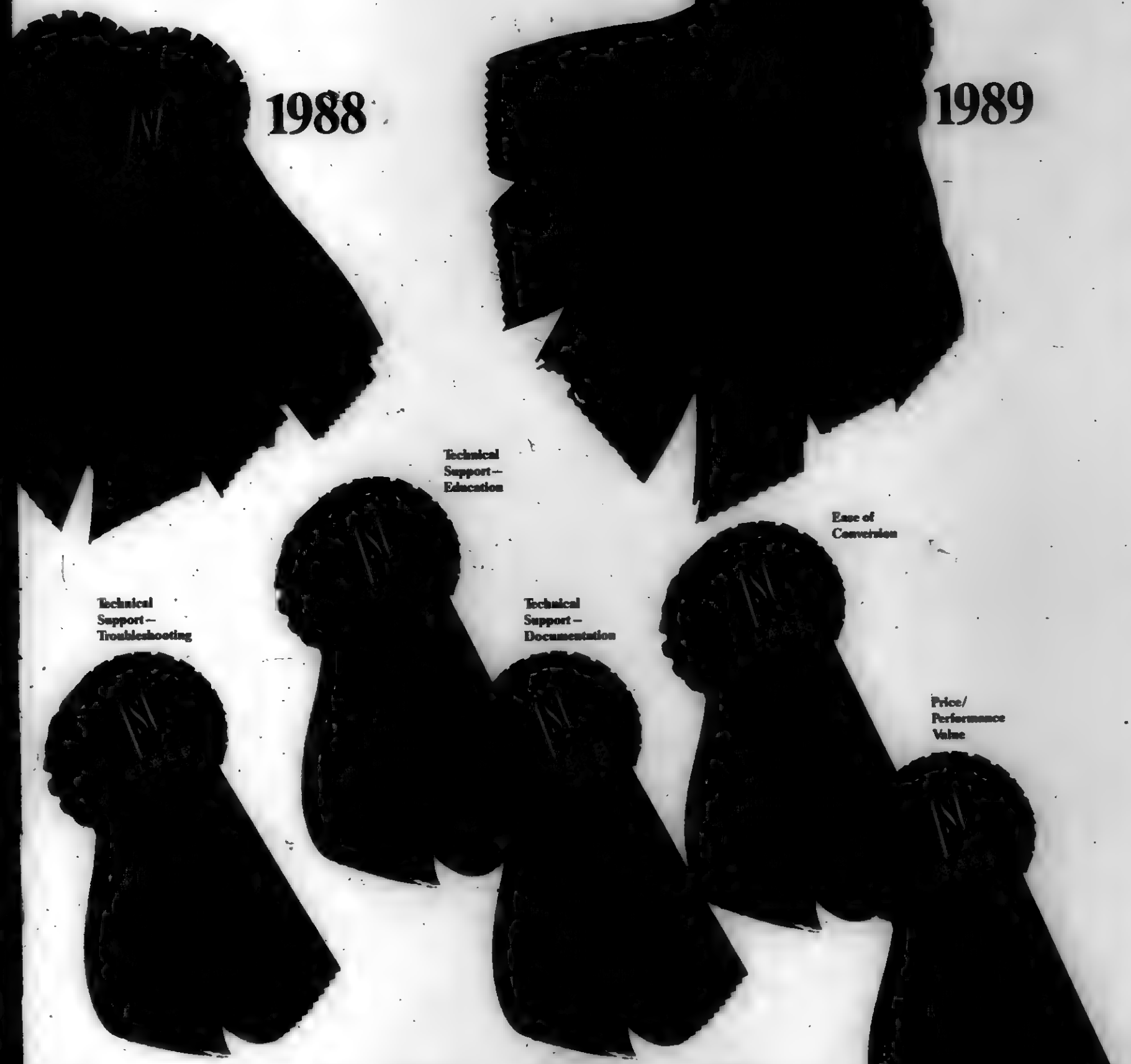
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Shift at Concurrent

▶ **Concurrent Computer Corp.** has reorganized its North American sales and marketing groups to focus on three vertical market segments: government programs, technical systems and commercial systems. International operations have also been realigned, with the Asian/Pacific area being hooked together under centralized management. A single continental European operation has also been formed, the company said. The changes come in the wake of a second-quarter loss of $12 million on net sales of $62.2 million.

Looking better in Texas

▶ Lone Star state-based **Dell Computer Corp.** reported preliminary fourth-quarter results of $167 million for fiscal 1991 last week, a 52% increase over the same period last year. The company announced preliminary unaudited revenue for the entire fiscal year of $546 million, a 41% increase.

Success, success

▶ Focusing on strong growth figures from **IBM** and **AT&T**, Stamford, Conn.-based **Gartner Group, Inc.** reported that information industry revenue grew 8.1% in fourth-quarter 1990 as compared with the same period in 1989. The company said the industry's net profit margin — 7.8% for fourth-quarter 1990 — was the highest in two years. The report also noted that the fastest growing segment of the market was companies that make personal computer disk drives.

In with the INN crowd

▶ **Electronic Data Systems Corp.** and Vero Beach, Fla.-based marketing communications firm **Redgate Communications Corp.** are teaming up to launch **Multimedia Marketing Networks Ltd.**, a company aimed at integrating electronic media technologies to wrap specialty niche marketing into news-oriented networks. The joint venture's maiden entry, to be implemented in North America and Europe by the close of the current year, is Industry News Networks, a private, multimedia network that promises to tie high-tech companies, chosen press members, analysts and consultants together by way of business television, audio links and facsimile machines.

Bellcore in search of new ideas

New Jersey firm paves way in data services for local telephone companies

BY GARY H. ANTHES
CW STAFF

LIVINGSTON, N.J. — Irwin Dorros has six telephone numbers on his business card: two for his home and one each for his office, car, portable telephone and fax machine.

The executive vice president for technical services at Bellcore seems a trifle embarrassed about his tiny directory; he thinks telephones should reach people, not places.

Bellcore gets paid to think about things like that, and personal number calling — by which network software maps numbers to individuals rather than to hardware — is just one item in Bellcore's billion-dollar-per-year pipeline of projects, which range from blue-sky feasibility studies to product deployment.

Bellcore was established as the research arm of the regional Bell companies when they were spun off from AT&T in 1984, effectively compensating them for the loss of Bell Telephone Laboratories, which stayed with AT&T. Bellcore was given the task of ensuring technical compatibility among the local telephone companies.

The seven regional Bell companies are forbidden to manufacture equipment, but Bellcore may and does design hardware and license the technology to manufacturers. Most of what Bellcore gives the regional Bells is software tools to help them manage and optimize their networks.

Little done in return

The regional Bells inherited 100 years of voice communications history from AT&T, but they have done little for the data communications market, providing mostly leased lines and dial-up data service, Dorros said.

Now, the Bell companies have seen the handwriting on the wall, Dorros said. "Our owners see the double-digit annual growth in information networks. Voice is only growing at 3% per year."

Going after that market is not so simple, however. Before divestiture, a monolithic Ma Bell called the shots.

"Now, changing the infrastructure is very difficult," Dorros said. "To bring in [Integrated Services Digital Networks] or intelligent networks is much more of a challenge because you have to synchronize the parties — local exchange carriers, equipment manufacturers, interexchange carriers and so forth."

Bellcore now provides the glue — standards and interface definitions — that AT&T once supplied to interconnect the nation's local telephone networks. It does so by developing a uniform suite of technologies and vigorously participating in 54

Continued on page 86

Bellcore
Bell Communications Research

Bellcore at a glance

- Established Jan. 1, 1984
- 1991 budget: $1.17 billion
- Employees: 8,700
- 50% of projects are software-oriented; 300 systems now in use by Bellcore's owner firms
- Granted 170 U.S. patents; 120 pending
- Issued 6,000 product licenses to nonowner firms since 1984
- Defined Synchronous Optical Network standard for interfacing fiber-optic systems at speeds above 45M bit/sec.
- Defined switched, multimegabit data service for wide-area internetworking

CW Chart: Doreen St. John

Bang for the buck

The seven Bell system spin-offs each entrust to Bellcore $110 million to $160 million annually, and they give it generally good marks, praising in particular the tools Bellcore has given them to support network operations.

"Bellcore gives us a lot of leverage — $7 of work for $1," said Jerry Wilson, an executive at Bellsouth Services, Inc. He said power-saving technology developed by Bellcore has saved Bellsouth millions of dollars in operating costs.

However, the regionals do not put all their research dollars in one basket. In 1989, a sizable chunk of Nynex Corp.'s $218 million research and development budget went into its own Science and Technology Center. Scientists at the 3-year-old center tailor Bellcore products and services for Nynex customers, and they explore new applications in areas such as artificial intelligence and speech recognition.

Nynex finds it more efficient to do its own development work if a particular large customer needs very fast or specialized response. "There's strength in numbers, but sometimes it's better if you go it alone," a Nynex spokeswoman said.

Sometimes the regionals do it alone for competitive reasons, although the seven regional companies compete in only a few business segments, such as cellular telephones. "Sometimes we don't want to share [our technology] with other regions," said Beverly Adkins, district manager for Bellcore administration at Southwestern Bell. But she said her company's funding for Bellcore has increased over the years as Bellcore continues to support old systems while developing new ones.

Some of the regionals have grown especially independent. US West, for example, wanted to be able to fund proprietary research through Bellcore. It persuaded Bellcore to bar for two years access to private projects funded by just one regional Bell.

"We were all kids cooped up in the playpen. Some stayed close, and some went off in other directions," the Nynex spokeswoman said.

GARY H. ANTHES

Lessor able to grow in tough market

BY NELL MARGOLIS
CW STAFF

Battered by breakneck competition and nationwide recession, scarred by a series of scandalous bankruptcies and squeezed by IBM Credit Corp., the independent computer leasing industry has lost some of its freewheeling boomtown allure.

However, there is still plenty of gold in the hills, industry executives and analysts insist. One example of this is El Camino Resources, Inc.

Northridge, Calif.-based El Camino got a shot in the bottom line and possibly pointed the way of the future for embattled computer lessors last May when it sold 25% of its equity to two Japanese partners for an undisclosed sum.



Tokyo-based Applied Technology Corp. and Japan Leasing Corp., which is owned by a vast consortium of Japanese banks, insurance companies and commercial firms, each bought 12.5% of El Camino; Japan Leasing has since placed a member on the El Camino board.

Earlier this month, El Camino spurted ahead once more, this time by acquisition. The company bought the computer systems leases of floundering lessor Econocom USA, Inc. in a cash deal valued at "upwards of $20 million," according to one of the investment bankers who financed it.

The deal, industry analysts said, bails out Econocom, long troubled and reputedly for sale for the past year.

In addition, it virtually doubles El Camino's overall leasing clout and positions the company, which was formerly an IBM mainframe lessor, in the growing Application System/400 leasing market.

"At a time when leasing companies were reducing or liquidating their portfolios, our assets grew by 33% to [$186.3] million," said Chief Executive Officer David Harmon, trumpeting El Camino's 63% revenue increase, which was logged in its latest fiscal year.



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Jay Dinwoodie, Senior VP/Information Systems, GE Capital Fleet Services

While some companies are wondering what IBM SAA™ can do for them, the people at GE Capital Fleet Services already know.

And so do their customers.

The company is America's leading car and truck fleet services business, and their goal is to cement that position by changing the rules, by redefining the word *service*.

SAA, or Systems Application Architecture, is key to that strategy.

They've built a complete SAA system, with a variety of applications running cooperatively on three IBM platforms: an ES/3090,™ an AS/400® and a multitude of PS/2's® using OS/2.®

Easy to build.

According to Jay Dinwoodie, development has been quick and smooth.

"We implemented the first modules in March '90, and since then we've been adding new ones like building blocks. Which is the whole idea. SAA lets us hook things together—data, image, you name it—in ways we never could before. What we're doing here today could *never* be done the old-fashioned way."

Jay's users agree, especially the 45 mechanics who man the phones helping customers who have car trouble.

With SAA applications in multiple windows, they provide a level of service that's truly unique: diagnosing the problem, finding the best nearby garage, estimating the cost, negotiating discounts, determining warranty status, scheduling preventive maintenance and more; all while keeping detailed records, in minutes, in one phone call.

To a salesman stuck on the road, that's money in the bank. Ditto for GE Capital Fleet Services.

Easy to learn.

Says Jay, "We bring customers in and show them what we're doing. Nobody walks away unimpressed, and in fact, SAA's helped us win a number of new accounts."

Another big SAA advantage is training time, or lack of it.

"When we first got running, we went to the mechanics' area for a training session, to get some thoughts for writing a manual. We started at one end of the room, spent a few minutes with each guy, then moved on. We weren't half-way across the room when the first people were actually using the system, doing real work. We never did write a manual."

Easy to live with.

Their system is now running about 35,000 PC-host transactions a day, and Mr. Dinwoodie estimates that traditional technology would require about 250,000 transactions to accomplish the same work. He says, "Our SAA apps are just incredibly efficient, and they've been completely reliable."

How strange that some people are still asking if SAA is for real.

"It's just a question of confidence," says Jay. "We knew exactly where we wanted to go and that ultimately SAA was the only way to get there. So we took that first step, we've never looked back, and expectations—both ours and our customers'—have been exceeded."

For more details about SAA and GE Capital Fleet Services, call IBM at 1-800-IBM-6676, ext. 888.

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Bellcore

FROM PAGE 83

standards groups. Dorros said Bellcore has more influence than any other firm, including AT&T, in standards development.

"We explore different ideas in network architecture, try them out and then let our owners pick and choose," said Alan G. Chynoweth, Bellcore's vice president for applied research.

Dorros said sophisticated users will not look to the regional companies to put together their corporate networks, and the telephone companies do not have that in mind anyway. They see their opportunity as interconnecting corporate networks to support technology such as electronic data interchange.

Bellcore is pushing for "dial tone for data," by which a company's local-area network can access the LANs of another company as easily as people make voice telephone calls. That is where switched multimegabit data service (SMDS) comes in. SMDS, a public packet-switched service operating at speeds between 1.5M bit/sec. and 45M bit/sec., was defined by Bellcore, and six of the seven regional companies have announced plans to offer it commercially.

Initially, the companies will sell SMDS as a way to interconnect high-speed LANs to metropolitan-area networks (MAN). Within two years, one or more long-distance carriers are expected to embrace SMDS, offering the ability to link LANs and MANs across the nation.

"SMDS will offer something new that private networks cannot: public, high-speed information interchange between companies that previously would not have considered dedicated interconnection," said Robert Campbell, a division manager at Southwestern Bell Telephone Co.

"Bellcore is finally giving computer users the means to move data the way they want to, not the way the phone companies want to move data," said Dan Lynch, president of Interop, Inc. "Bellcore has a lot of good people working on it, and they're not shying away from the hard problems."

New head at Bellcore

Bellcore announced last week that George H. Heilmeier will succeed Rocco J. Marano as president and chief executive officer. Marano, 63, will become chairman before retiring May 1.

A Bellcore spokesman said Marano had planned to retire for some time.

Heilmeier, 54, will assume his post March 1. He is currently senior vice president and chief technical officer at Texas Instruments, Inc., where he heads research and development, engineering, corporate development and planning. He joined TI in 1977 after seven years of government service.

Marano, Bellcore's first employee, began planning the organization's structure in late 1982, more than one year before it was officially formed by the consent decree that broke up the Bell system.

EXECUTIVE CORNER

AI Corp. promotes Chisholm

As executive vice president of worldwide operations at Waltham, Mass.-based AI Corp., **Frank Chisholm** led the sales and support buildup credited by Chief Executive Officer **Robert Goldman** as a key factor in the firm's recent growth. Last month, Chisholm was promoted to the post of president and chief operating officer at the firm he helped expand. Prior to joining the knowledge-base software developer, Chisholm, whose executive roots go back to the former **Cullinet Software, Inc.**,

"Have You Heard What They

served as president and COO of **Soft-Switch, Inc.**

SPSS, Inc. has advanced **Nicole S. Williams** from senior vice president of finance and administration to executive vice president of worldwide operations. In addition to the post, which is a new creation at the Chicago-based software firm, Williams continues as a director and secretary of the board.

Norman Klugman is the new president and COO of Atlanta-based **Advanced Telecommunications Corp.**, the nation's largest regional long-distance telecommunications firm, according to the company. The move promotes Klugman from his former post of executive vice president and moves him from Boca Raton, Fla., to the firm's Atlanta headquarters.

Western Union Corp. CEO **Robert J. Amman** has been selected as vice chairman of Tustin, Calif.-based **MAI Systems Corp.** (formerly MAI Basic Four, Inc.). Amman, a veteran computer industry executive, assumes the vice chairmanship of MAI as the firm attempts to reposition itself as a value-added reseller serving such targeted market niches as manufacturing and health care.

William N. Sick, 55, formerly CEO of **American National Can Co.** and once president of **Texas Instruments, Inc.**'s Semiconductor Division, has been named chairman of **Shipnet Systems, Inc.** in Lisle, Ill.

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▶ An already noted shakeout in the Western European computer market is far from over, according to Philippe de Marcillac, director of the European computer group at market research firm **Dataquest Europe**. De Marcillac confirmed that sluggish growth, low margins, increased competition, layoffs and consolidation are all currently affecting the region's hardware and software vendors.

A Japanese development

▶ Seattle-based **Pacific Software Publishing, Inc.** has opened a development center for U.S. software vendors hoping to break into or expand their presence in the Japanese microcomputer market. The Double-Byte-Character Support Center is equipped with Japanese hardware platforms, translation aides and technical and marketing training sources. Developers can also meet Japanese distributors at the company's Mercer Island, Wash., location.

A Far East connection

▶ One software developer already on its way to Japan is **Empress Software, Inc.** The Unix relational database developer has engaged Japanese software consultant **MKC Co.** to distribute Empress equipment in the Far East. The deal is expected to yield future joint development for the markets of Korea, China, Hong Kong and Singapore.

HP invades Japan

▶ According to a **Mitsubishi Electric Corp.** source, the firm is negotiating with **Hewlett-Packard Co.** to sell HP's reduced instruction set computing workstations in Japan. HP ranks second behind **Sun Microsystems, Inc.** in the engineering workstation market, according to **Dataquest Japan.**

Little effect from war

▶ The Gulf war will not slow aggressive growth plans at **Toshiba Corp.**, according to President Joichi Aoi. Predicting 15% growth this year, Aoi said earlier this month that semiconductor growth will begin rising toward a new peak after this spring. Toshiba did feel the effects of a weakened U.S. economy, however. It recently cut back production of its laptop personal computers by 50,000 units.

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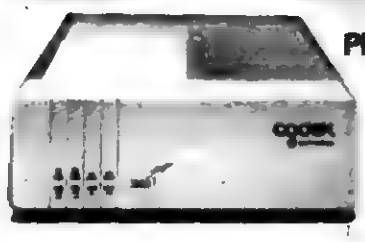
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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Prospects for minorities in computing.
- Merits of an Electrical Engineering degree for a computer career.
- Information Systems salaries from Computerworld's annual survey with the Data Processing Management Association.

New posts for disaster planning

BY JON WILLIAM TOIGO
SPECIAL TO CW

Calamities such as Hurricane Hugo, the San Francisco earthquake and the Hinsdale, Ill., switching station fire — along with tougher legal and safety regulations set by federal authorities — have prompted companies to make more room for a new kind of information systems employee: the disaster recovery planner.

According to a biannual survey of financial institutions conducted by CHI/COR Information Management, Inc. in Chicago, disaster recovery planning is now being considered by 80% of the responding companies. More than 95% of the companies now maintain a plan for the recovery of IS centers.

These numbers represent a substantive increase over 1986 statistics, which found that fewer than 47% of the firms possessed a centralized disaster recovery planning function.

All of this translates into the creation of new posts for disaster recovery planners, especially in the more sensitive areas such as financial organizations, utilities firms, medical institutions and companies located in disaster-prone areas. These planners, who can expect salaries from $45,000 to $75,000 (see chart), develop disaster recovery plans of action and continually rewrite, update and maintain them.

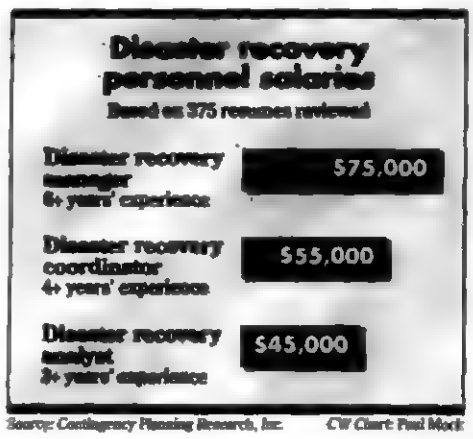
At First Security Service Co., a financial services vendor for several Utah and Idaho banks, disaster recovery planning was instituted as a formal function for practical and legal reasons, according to Charles Fox, disaster recovery manager.

"We had a couple of airplane crashes near our facility, and we are located near the Wasatch Front fault line — somewhat similar to the San Andreas fault — that exposes us to earthquake threats. Disaster recovery planning was instituted because of these situations as well as in response to [Office of the Comptroller of the Currency] banking circulars and regulations," he says.

Protecting banks

Ostensibly, the financial industry, because of the importance of on-line information, provides the most opportunities for the disaster recovery planner — but only in certain areas.

"The banks that hold the greatest amount of promise are the ones with $500 million and less in assets. Those are the institutions that have escaped the ire of the federal regulators these past few years," says Tari Schreider, president of Contingency Planning Research in Jericho, N.Y. "They're the ones coming under the greatest scrutiny because the vast majority of those banks still do not have disaster recovery plans in place."



Source: Contingency Planning Research, Inc. CW Chart: Paul Mock

According to Howard Peace, president of Peace of Mind Consulting in Blountville, Tenn., many firms follow the lead of the financial industry. "In a recession, managers work on asset retention. So it's not surprising that they would focus on safeguarding data center equipment."

Another industry adding planning functions to the IS roster is the utility sector — particularly companies that rely on nuclear and fossil fuel. According to Schreider, the Public Service Commission has played a part in the boom by more seriously regulating the on-line availability of the utility companies. "But even more important than that is the critical nature of what the utilities do. If they have to stop to work on maintenance, the cost for them to reopen a plant is millions of dollars a day."

Trailing behind utilities in disaster recovery planning is the medical industry. For legal and safety reasons, hospitals are turning to these planners for an added measure of security.

Where they fit in

Because disaster recovery planners are fairly new, a certain fuzziness exists about where they fall within the corporate hierarchy. Although 46% of the respondent banks in the CHI/COR study indicate that a vice president (of IS or otherwise) was responsible for disaster recovery planning, professional organizations for disaster recovery planners suggest that the planner's status is rarely so grand. Disaster recovery planners are typically drawn from the systems analysis or IS operations staff.

"Many people are choosing disaster recovery planners by default. Once companies decide to install a plan, they pick someone out of the hat. Usually, that is someone out of data processing," says John Bannon, president of the Delaware Valley Disaster Recovery Information Exchange, a professional association based in Cherry Hill, N.J., with more than 2,000 members predominantly from New York, New Jersey and Pennsylvania.

One of the biggest hurdles that disaster recovery planners face is not being treated as bona fide professionals. Quite often, a contingency planner is a company technical staff member who has had responsibilities for planning added to an already full plate of other duties, according to the CHI/COR study.

Schreider says there is much to do in developing a disaster recovery plan — not just for an IS department but for the total business. "If that disaster recovery planner is not busy every day doing new things and updating the plan and writing test scripts and handling vital records management, then he's not doing his job properly," she says.

Bannon, who served as manager of security and procedures for RCA and General Electric Co. for 27 years, suggests that disaster recovery planner positions should be established at the highest levels of the company, making information security and disaster recovery planning positions equivalent to the chief operating officer or chief financial officer. Bannon says he advocates a professional certification of disaster recovery planners to help make this ascendancy possible.

Toigo is a free-lance writer based in Clearwater, Fla.

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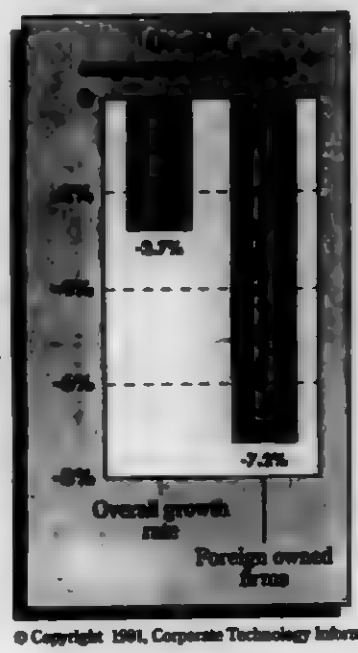
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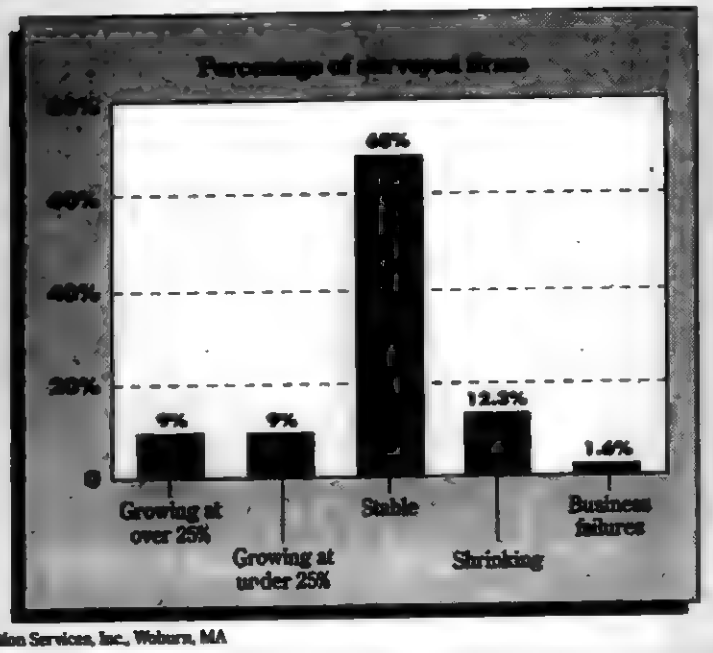
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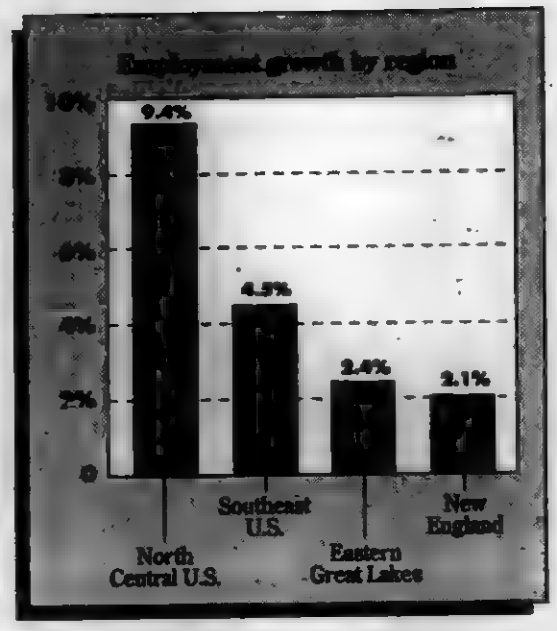
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Computerworld/CorpTech Career Index

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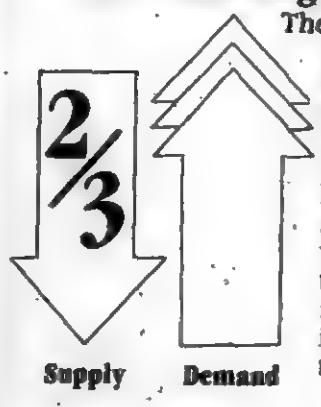
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

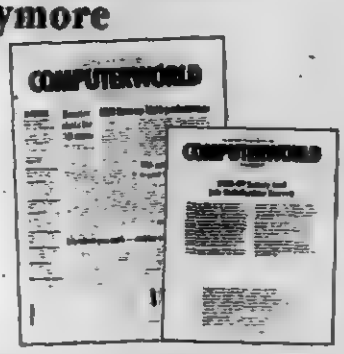
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
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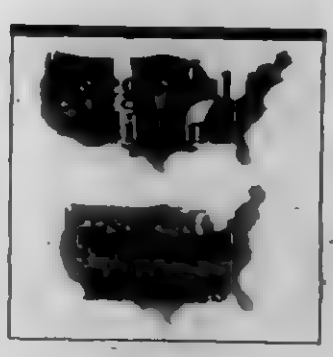
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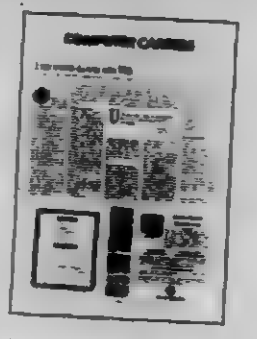
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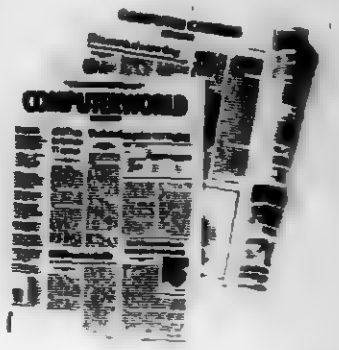
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Q: Why are users starting to lease more used equipment?

A: In 1989, there was still a lot of new equipment being shipped, so there were more opportunities to lease new equipment than used. But now, the general economic conditions are causing companies to tighten their belts and lease used equipment at substantially lower prices.

Q: When would users be forced to lease new systems?

A: They would have to lease new equipment in cases where the application absolutely requires leading-edge capabilities, or if a piece of equipment is just not available on the used market.

Q: How much savings could a user potentially achieve by leasing used computers over new?

A: It all depends on the type of equipment. If a customer were to lease a very late-generation machine that was still selling at a high percentage of its new price, then the savings would be small — maybe 10% to 15%. But it's not uncommon to find machines that are trading at only 20% of the list value. In those cases, the savings could be in excess of 50%.

Q: If the leasing industry is making less money because of the shift toward used equipment, will overall leasing prices rise?

A: No. Leasing companies will not boost prices to compensate for any losses because the competition is too keen. Users will see the leasing companies tightening their belts in other ways — mainly, by surviving on a lower volume and diversification of product offerings.

Q: What does the future hold for the leasing industry?

A: The entire future of the leasing industry of high-tech equipment and computers is going to hinge on IBM. It sets such a pace and direction; you might say it's the barometer of the industry.

LEASING INDUSTRY OVERVIEW

The buy, sell or trade arm of leasing is slowly edging ahead

U.S. computer leasor and dealer industry volume growth trends (in billions)



*Estimated

Top concerns identified by leasing companies

1. IBM/IBM Credit Corp. (ICC) practices
2. Competition
3. Economy
4. Product life cycles
5. Funds availability
6. Vendor captive practices (non-ICC)
7. Tax laws



Source: CDLA/Gartner Group

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XT Model 089	$500	$625	$400
AT Model 099	$650	$775	$500
AT Model 239	$750	$925	$700
AT Model 339	$925	$1,000	$900
PS/2 Model 30-286	$1,100	$1,200	$1,000
PS/2 Model 60	$1,400	$1,700	$1,300
PS/2 Model 70P	$3,300	$3,500	$2,500
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,350	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$2,200	$2,500	$1,900
Deskpro 286	$800	$1,000	$700
Deskpro 386/20	$2,850	$3,000	$2,300
Apple Macintosh Plus	$800	$975	$760
SE	$1,150	$1,350	$1,100
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Government	62,201
Utilities, Communications Systems, Transportation Services	18,516
Mining, Construction, Petroleum & Refining	17,618
Manufacturers of Computers & Peripherals	18,589
Systems Integrators, VARs, Computer Service Bureaus and Consulting	109,673
Computer Dealer, Distributor, or Retailer	16,569
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*Source: Projected Total Audience Research Study Conducted Among Paid Subscribers of Computerworld, IDG Research Services, August 1990.

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Making a CASE for better training

BY ALICE LAPLANTE
SPECIAL TO CW

Like so many other products of the computer age, computer-aided software engineering (CASE) was first hailed as a miracle solution that was going to remedy such software development issues as overdue applications, bug-riddled programs, poor user requirements analysis and difficult documentation.

In practice, however, CASE is proving to be an important aid to programmer productivity, but it's no cure for all the issues of applications development. In fact, its growth within information systems organizations is slower than many managers and consultants expected. One reason for this, CASE experts say, is improper training.

One reason CASE training lags behind other subjects is that it is more expensive. "CASE is difficult to teach. CASE training is 33% more expensive than training for other IS subjects," says Sharon Williams, supervisor of IS staff development and training at Kaiser Foundation Health Plan in Walnut Creek, Calif.

Nevertheless, the full benefits will not come until proper training is applied. "Until we teach people to be better analysts, communicators and designers and to better understand the business they are in, CASE will be a promise unfulfilled," says Vaughan Merlyn, a partner at Ernst & Young's Center for Information Technology and Strategy in Boston.

Indeed, at a recent training conference, Michael R. Danziger, a senior manager at Deloitte & Touche in New York, headed off a session by asking how many members of the audience had successfully implemented CASE training. Only one man raised his hand. His question: "Could you please define successful?"

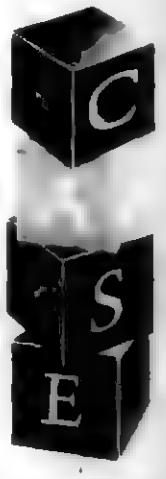
Back to basics

According to CASE experts, there are some basic precepts of progressive CASE training:

- CASE methodology and techniques must be taught in addition to the CASE tools being used in a specific project.
- CASE training must be customized to fit each corporation's unique needs.
- Each student in a CASE class must have hands-on access to a keyboard.
- There should be "just-in-time" training — training provided just before, or even during, a CASE pilot project.
- Management expectations of productivity gains must be tempered with reality.

For example, at Boeing Computer Services in Bellevue, Wash., where dozens of CASE projects are under way simultaneously, the biggest challenge for the IS training department is overcoming a poor understanding of software design methodology independent of the CASE tools used.

"Because CASE is such a brand-new technology, it is not just a tools issue," says Wendy Wagner, project manager for CASE deployment at Boeing. "For example, teaching word processing is easy because people have a basic understanding of how to write a letter or a memo. But often, even our most experienced programmers do not know enough about software design methodology concepts such as data or process modeling."



Boeing has tried to solve this problem by having software engineers take prerequisite overview courses on CASE concepts and methodology. To qualify the students even more, Boeing trainers interview each potential CASE student to assess his skill level.

In addition to integrating methodology and tool training, many consultants recommend that CASE be taught within the context of an appropriate size software development project. "Too many companies bite off more than they can chew with their first CASE project," Danziger says.

For instance, at Tellabs, Inc. in Lisle, Ill., the initial CASE project was carefully planned at a slow pace, according to Steven Morvich, chief information officer at Tellabs.

First, Morvich picked a team of seven programmers from his IS staff. Then he chose a low-risk but high-payoff CASE pilot project: an application that would help Tellabs, a telecommunications equipment vendor, track the performance and efficiency of its supplying vendors.

With the help of Andersen Consulting, Morvich put together a CASE educational program that included preproject, hands-on training to familiarize his design team with the tools they would be using, initial classroom overview training on what CASE is, actual work on the project and advanced training for more sophisticated CASE techniques as the project progressed.

The project took six months to complete and was a success, says Morvich, who then took the seven IS employees from that project and "seeded" them into other pilot projects, using the same mix of classroom and actual project work in the educational process. "This way, we grew into CASE gradually and didn't shoot ourselves in the foot," Morvich says.

In another approach, Kaiser placed a strong emphasis on end-user involvement in CASE training. But because Kaiser has many CASE projects going on at once — each of which involves an entire user community as well as a data center design and programming team — the desire for end-user involvement raised serious training, planning and communication issues, Williams says.

Kaiser subsequently worked out a process: When a user makes a request for a CASE application project, in addition to filling out the usual IS paperwork, he joins a team that consists of potential users of the new system and data center personnel. The team works with Williams and her training staff to develop a curriculum for all the training courses that must be offered to accomplish the project.

After all the training required for CASE, many users ask: Is it worth it?

Organizations with successful CASE implementations say the quality improvement in their software projects makes it a good investment. "Before, we spent two years developing a system and a year correcting it; now, we finish a project, and it's done," Morvich says.

LaPlante is a free-lance writer based in Palo Alto, Calif.

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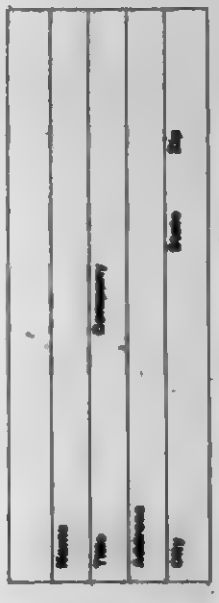
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

DOWNGRADED FROM HOLD TO AVOID: Mips Computer Systems, Inc. (Bear, Stearns & Co.). Reason: Continued pricing pressure in desktop market combined with high costs associated with new R4000 microprocessor make earnings unpredictable.

DOWNGRADED FROM BUY TO HOLD: Texas Instruments, Inc. (Prudential-Bache Securities, Inc.). Reason: Little room for near-term share price improvement, but company holds long-range promise as it whittles defense business and focuses on semiconductors.

DOWNGRADED FROM BUY TO NEUTRAL: Paychex, Inc. (Alex. Brown & Sons, Inc.). Reason: Recession, higher unemployment have sliced into paycheck service sales. One quarter of firm's clients have moved from weekly to biweekly payroll, further reducing business.

UPGRADED FROM HOLD TO BUY: Lotus Development Corp. (Prudential-Bache). Reason: Will soon close product line gaps; still a high-risk buy, but troubles have already been reflected in stock price.

UPGRADED FROM MARKET PERFORMER TO OUTPERFORM: Autodesk, Inc. (Montgomery Securities). Reason: U.S. sales up last month, portending earnings gains this quarter.

UPGRADED FROM SELL TO HOLD: Unisys Corp. (Prudential-Bache). Reason: Rumors of impending asset sales spark hope of offsetting financial troubles; caution warranted, though, as first-quarter loss of $100 million expected.

INDICATORS

The Dow Jones industrial average continues to bound skyward, rising 11.4% during the past four weeks. Analysts bristled, however, at computer firms whose share prices have shot up because of the rally and are concerned that profit-taking may stamp the stocks back down.

Witness the latest investment judgments from Donaldson Lufkin & Jenrette Securities Corp. analyst Scott Smith, who cited "price appreciation" as he knocked down ratings on **Knowledgeware, Inc., Micrografx, Inc., Microsoft Corp.** and **Borland International, Inc.**

Charles Taylor Jr. analyst at Prudential-Bache, had also rated Microsoft a "hold," along with **Policy Management Systems Corp.**, calling their stocks "fully valued." However, Taylor recently upgraded his assessment of the two firms to "buy," forseeing healthy earnings in the latter half of the year and subsequent price increases.

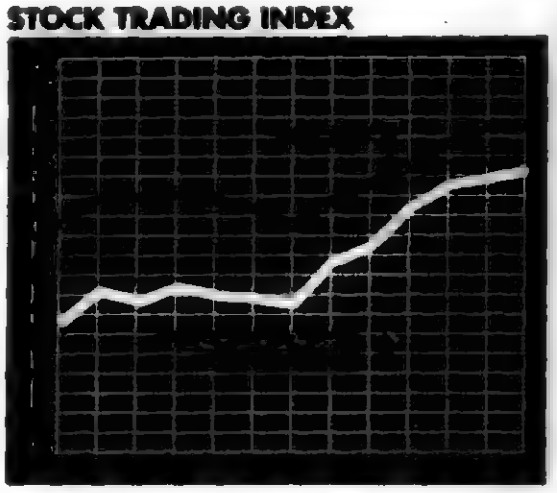
FINANCIAL SPOTLIGHT

Earnings reports can indeed impact stock prices, as demonstrated by market movement last week. Shares of **Software Toolworks, Inc.**, an applications vendor based in Novato, Calif., sank 20% Friday, losing ¾ of a point to 2½ when the firm released poor quarterly financials that day.

After it posted an 18% jump in profits for its first quarter on Tuesday, **Hewlett-Packard Co.**'s stock gushed up nearly 14%, increasing 5½ points to 45⅝. Investors were especially giddy about these results in light of the company's previous three disappointing quarters. HP is currently rated as a "hold" by Prudential-Bache, while Paine Webber, Inc. called the stock "unattractive."

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- AT&T extended its $90 per share tender offer for NCR Corp. through April last week, and NCR scooped up 8% of its holding to create an employee stock ownership plan. NCR gained 1⅝ points, closing Thursday at 93⅛, while AT&T slipped ⅝ of a notch to 33¼.
- Sun Microsystems, Inc. also advanced last week, closing Thursday at 30⅝, up 2½ points.
- Corporate Software, Inc. gained 2½ points and rose to 11 after revealing that fourth-quarter profits were down compared with the same period last year.
- Novell, Inc. and Lotus Development Corp. both lagged last week, with Novell sliding 1⅜ points to 45⅝, and Lotus losing 1¼ points to 21¾.
- Digital Equipment Corp. said it hopes to horn in on the minisupercomputer territory of Cray Research, Inc. with a new version of the VAX 9000. Investors drove DEC shares up 2⅝ points to 76½.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, FEB. 21, 1991

[illegible] GAINERS

Datatrans Inc.	30.00
Corporate Software	29.41
Ariel Communication Corp.	27.78
Amptron Inc.	21.43
Ultimate Corp.	20.00

TOP DOLLAR GAINERS

Hewlett Packard Co.	7.00
Adobe Systems Inc.	3.25
Digital Equipment Corp.	2.63
Sun Microsystems Inc.	2.50
Corporate Software	2.50

[illegible] LOSERS

System Software Assoc.	-58.30
Phoenix Technologies	-16.67
Goal Systems Int'l	-13.64
Network Equipment Tech.	-12.50
Storage Technology	-11.11

TOP DOLLAR LOSERS

System Software Assoc.	-11.50
3M Corp.	-3.63
Storage Technology	-3.38
American Mgmt. Systems	-2.25
Goal Systems Int'l	-2.25

	Each	52-Week Range		Feb. 21 Close	Wk Net Change	Wk Pct Change
Communications and Network Services					Up 0.39	
OTC	19.00	5.38	3 COM Corp.	8.88	-0.75	-7.79
NYS	69.75	32.50	American Info Techn Corp.	68.00	-1.63	-2.40
NYS	44.13	29.00	AT&T	33.25	-0.63	-1.86
OTC	9.63	0.88	Ariel Communication Corp.	2.88	0.63	27.78
NYS	55.25	32.50	Bell Atlantic Corp.	49.38	-1.38	-2.71
NYS	57.63	40.00	Bellsouth Corp.	53.25	0.25	0.47
OTC	16.38	8.25	Compression Labs Inc.	15.38	0.38	2.50
NYS	38.13	23.38	Comsat Corp.	36.00	1.00	2.83
OTC	4.50	1.75	Data Switch Corp.	4.88	-0.88	-1.50
NYS	28.75	8.88	Digital Comm. Assoc.	15.63	0.38	2.46
OTC	23.75	12.25	Dynatech Corp.	20.50	-1.00	-4.65
OTC	12.88	5.50	Fibronics Int'l Inc.	9.13	0.63	7.35
OTC	4.00	1.75	Gandalf Technologies Inc.	2.81	-0.06	-2.16
NYS	4.88	1.63	General Datacomm Inds.	2.75	0.00	0.00
NYS	34.13	23.50	GTE Corp.	31.13	0.75	2.47
OTC	7.00	0.75	Infotron Systems Corp.	0.88	0.00	0.00
NYS	60.88	40.25	ITT Corp.	54.63	-0.38	-0.68
OTC	44.13	17.88	MCI Communications Corp.	26.50	-0.38	-1.40
OTC	21.00	2.75	Microcom Inc.	5.25	0.25	5.00
NYS	34.38	4.00	Network Equipment Tech.	5.88	-0.88	-12.96
OTC	14.88	4.00	Network General	11.50	0.25	2.22
OTC	15.50	8.13	Network Systems Corp.	11.25	-0.50	-4.26
NYS	31.00	22.13	Northern Telecom Ltd.	30.25	0.13	0.41
OTC	51.25	17.25	Novell Inc.	45.63	-1.88	-3.95
NYS	89.50	67.00	Wyse Corp.	76.00	0.25	0.33
NYS	47.88	36.25	Pacific Telesis Group	41.88	-0.88	-2.05
ASE	12.00	4.75	Pairet Corp.	12.00	1.25	11.63
NYS	28.13	8.88	Scientific Atlanta Inc.	15.38	-1.00	-6.11
NYS	89.50	47.25	Southwestern Bell Corp.	84.75	-1.25	-2.23
NYS	46.38	20.63	United Telecom	24.50	-1.13	-4.39
NYS	46.75	32.38	US West Inc.	38.13	-0.63	-1.57
Computer Systems					Up 1.65	
OTC	8.75	0.88	Alliant Computer Sys.	1.00	0.00	0.00
ASE	19.88	10.00	Amdahl Corp.	16.75	-0.25	-1.56
OTC	61.50	24.25	Apple Computer Inc.	66.00	1.88	3.28
OTC	13.88	4.25	Archive Corp.	7.63	0.75	10.91
OTC	46.75	14.25	AST Research Inc.	46.88	1.13	2.51
NYS	5.88	3.88	Bell, Benjamin & Newman	5.63	0.00	0.00
NYS	16.38	4.50	Commodore Int'l	17.88	0.88	5.15
NYS	74.13	36.50	Compaq Computer Corp.	71.88	1.50	2.14
OTC	3.50	0.13	Computer Automation Inc.	1.13	-0.13	-10.00
NYS	21.63	6.75	Control Data Corp.	12.25	-0.38	-2.97
NYS	20.88	8.38	Convex Computer	17.75	1.63	10.08
NYS	61.25	20.00	Cray Research Inc.	41.00	-0.75	-1.80
NYS	13.25	3.50	Data General Corp.	9.50	0.25	2.70
NYS	3.88	0.75	Datapoint Corp.	2.38	0.38	18.75
OTC	27.38	9.63	Dell Computer Corp.	26.63	1.88	7.59
NYS	85.13	46.50	Digital Equipment Corp.	76.50	2.63	3.55
NYS	26.13	13.75	Harris Corp.	24.00	-1.50	-5.88
NYS	50.38	24.88	Hewlett Packard Co.	47.25	7.00	17.39
NYS	139.75	98.25	IBM	126.50	0.38	0.28
OTC	14.00	7.75	Information Int'l	9.25	0.50	5.71
OTC	23.50	10.50	Intergraph	18.50	0.25	1.37
NYS	3.13	0.50	MAI Systems Corp.	0.75	0.00	0.00
NYS	149.88	114.00	Massachusetts Electronics	136.13	0.63	0.46
OTC	26.00	9.00	Mentor Graphics Corp.	17.00	0.00	0.00
NYS	53.38	44.50	NCR Corp.	93.13	1.25	1.36
OTC	36.50	11.00	Pyramid Technology	20.50	0.88	4.49
OTC	34.00	9.75	Sequent Computer Sys.	14.75	0.75	5.36
NYS	43.50	18.00	Silicon Graphics	40.13	0.75	1.90
NYS	30.25	14.63	Stratus Computer Inc.	28.63	1.00	3.62
OTC	37.25	16.00	Sun Microsystems Inc.	30.63	2.50	8.89
NYS	30.13	8.88	Tandem Computers Inc.	14.00	0.13	0.90
NYS	38.50	23.50	Tandy Corp.	31.88	-0.25	-0.78
OTC	35.00	6.75	Teradata	13.75	0.25	1.85
NYS	7.88	1.38	Ultimate Corp.	5.25	0.88	20.00
NYS	17.13	1.75	Unisys Corp.	4.00	0.38	10.34
ASE	8.25	2.00	Wang Labs Inc. (a)	3.38	0.13	3.85
Software & DP Services					Up 1.39	
OTC	69.75	17.00	Adobe Systems Inc.	45.88	3.25	7.69
OTC	44.50	18.75	Aldus Corp.	41.00	0.50	1.23
OTC	34.00	11.50	American Mgmt. Systems	21.00	-2.25	-9.68
OTC	18.25	7.50	American Software Inc.	13.00	0.88	7.22
NYS	3.75	1.38	Anacomp Inc.	2.50	-0.25	-9.09
OTC	23.50	10.00	Analysts Int'l	14.75	-0.75	-4.84
OTC	15.13	4.88	Ashton Tate	7.13	0.25	3.64
OTC	10.25	4.88	ASK Computer Sys.	6.38	-0.50	-7.27
OTC	82.25	46.25	Auto Data Processing	82.25	1.25	2.09
OTC	60.25	32.00	Autodesk Inc.	45.75	0.00	0.00
OTC	20.00	12.00	BGS Systems Inc.	20.00	0.00	0.00
OTC	42.50	17.75	BMC Software Inc.	37.75	-1.00	-2.58
OTC	21.50	11.00	Boole & Babbage Inc.	13.50	0.75	5.88
OTC	53.75	12.25	Borland Int'l	30.50	0.00	0.00
NYS	11.88	0.88	Businessland Inc.	2.38	0.00	0.00
OTC	15.00	4.38	Cognos Inc.	14.50	0.00	0.00
NYS	16.88	4.38	Computer Associates	8.38	-0.63	-6.98
OTC	17.75	7.75	Computer Horizons	14.75	0.25	1.72
NYS	69.13	36.75	Computer Sciences	58.63	0.00	0.00
NYS	12.25	8.63	Computer Task Group	9.63	-0.13	-1.28
OTC	25.25	13.00	Comshare Inc.	17.00	1.25	7.94
OTC	16.00	3.75	Corporate Software	11.00	2.50	29.41
NYS	47.00	25.75	General Motors E (EDS)	41.25	-2.13	-4.90
OTC	16.25	7.25	Goal Systems Int'l	14.25	-2.25	-13.64
OTC	4.75	1.88	Hogan Systems Inc.	3.63	-0.13	-3.33
OTC	9.75	5.80	Index Technology	9.00	0.13	1.41
OTC	16.88	7.75	Information Resources	15.63	-0.25	-1.57
OTC	17.50	2.63	Informix Corp.	5.50	0.63	12.82
OTC	7.38	1.38	Intellicorp Inc.	2.06	0.00	0.00
OTC	8.00	2.50	Interleaf Inc.	5.75	0.75	15.00
OTC	35.00	10.00	Knowledgeware Inc.	32.00	-1.75	-5.19
OTC	29.50	16.75	Lawpert Corp.	26.88	0.88	2.43
OTC	39.25	12.50	Lotus Development	21.75	-1.25	-5.43
OTC	32.00	13.63	Micrografx	20.63	-0.38	-1.25
OTC	109.00	48.88	Microsoft Corp.	100.00	-0.75	-0.74
NYS	9.88	4.00	On Line Software Int'l	8.00	-0.63	-7.25
OTC	28.38	4.88	Oracle Systems	9.00	-0.38	-4.00
NYS	17.88	7.00	Parasophic Systems	12.00	0.88	5.49
OTC	7.38	1.25	Phoenix Technologies	5.63	-1.13	-16.67
NYS	50.75	31.63	Policy Management Sys.	46.88	1.00	2.09
NYS	23.63	11.50	Reynolds & Reynolds	19.38	0.13	0.65
OTC	16.13	8.88	Sage Software Inc.	9.25	0.38	4.23
OTC	24.00	14.75	SEI Corp.	22.75	0.00	0.00
OTC	18.38	12.25	Shared Medical Systems	17.13	-0.25	-1.44
OTC	28.00	12.00	Software Publishing Corp.	26.50	1.13	4.43
NYS	11.25	5.80	Sterling Software	10.63	-0.13	-1.16
OTC	28.00	8.50	Sungard Data Sys.	13.50	-1.00	-6.90
OTC	44.25	17.00	Symantec Corp.	43.25	1.25	2.98
NYS	24.88	4.50	System Center Inc.	5.38	0.88	19.91
OTC	37.25	12.75	System Software Assoc.	19.25	-11.00	-36.36
OTC	27.38	6.75	Wang	13.75	-0.25	-1.79
Semiconductors					Up 2.02	
NYS	25.88	19.00	Advanced Micro Devices	21.75	-0.63	-2.79
NYS	9.38	5.50	Analog Devices Inc.	9.13	0.50	5.80
OTC	23.50	5.25	Chips & Technologies	11.50	0.00	0.00
OTC	52.00	26.00	Intel Corp.	48.50	2.25	4.78
NYS	13.00	9.13	LSI Logic Corp.	9.13	-0.38	-4.41
NYS	16.38	6.75	Micron Technology	13.13	0.88	7.14
NYS	58.38	46.75	Motorola Inc.	51.25	2.38	4.88
NYS	8.88	3.00	National Semiconductor	7.25	0.75	11.54
NYS	44.00	22.50	Texas Instruments	42.00	1.25	3.07
OTC	12.25	3.00	VLSI Technology	7.38	-0.31	-4.07
ASE	14.88	4.00	Western Digital Corp.	4.38	-0.13	-2.88
Peripherals & Subsystems					Up 0.34	
OTC	2.38	0.09	Alloy Computer Prod.	0.19	0.00	0.00
OTC	2.50	0.88	Apertus Technologies	1.94	0.00	0.00
OTC	34.00	7.50	Banctec Inc.	10.25	0.00	0.00
ASE	9.13	4.13	Graphtronics Corp.	8.50	-0.38	-4.23
NYS	31.25	14.63	Conner Peripherals	26.13	0.38	1.46
ASE	22.00	7.00	Data man Corp.	10.75	-0.25	-2.27
NYS	10.88	4.25	EMC Corp.	9.13	-0.25	-2.67
NYS	47.25	33.75	Eastman Kodak Co.	46.75	0.38	0.83
OTC	9.88	4.25	Emulex Corp.	8.88	0.75	9.23
OTC	34.50	14.00	Evans & Sutherland	19.50	-1.25	-6.02
OTC	8.50	3.38	Iomega Corp.	5.25	-0.13	-2.33
OTC	39.25	8.75	IPL Systems Inc.	27.50	2.25	8.91
OTC	2.09	0.13	Maxstor Systems	0.63	0.06	11.01
OTC	17.50	2.63	Mentor Corp.	4.13	-0.13	-2.94
OTC	13.38	3.88	Micropolis Corp.	11.63	-1.00	-7.92
NYS	93.75	73.88	3M Corp.	87.50	-3.63	-3.97
OTC	14.50	6.00	Printronix Inc.	8.75	0.50	6.06
NYS	21.25	8.50	QMS Inc.	10.25	-0.88	-4.88
OTC	25.75	10.63	Quantum Corp.	24.25	1.38	6.01
NYS	8.88	4.38	Recognition Equipment	8.00	0.13	2.13
OTC	9.88	5.00	Rexon Inc.	7.50	0.38	5.26
OTC	18.75	6.63	Seagate Technology	16.00	0.13	0.84
NYS	35.25	11.00	Storage Technology	27.00	-3.38	-11.11
OTC	4.00	0.81	Tandon Corp.	3.44	0.00	0.00
NYS	22.88	11.63	Tektronix Inc.	21.13	0.63	3.05
OTC	0.63	0.16	Televideo Systems	0.22	0.00	0.00
NYS	58.75	39.00	Xerox Corp.	54.38	1.50	2.83
Leading Companies					Up 0.67	
OTC	12.75	6.88	Amptron Inc.	12.75	2.25	21.43
OTC	4.25	0.31	Capital Associates	0.56	0.00	0.00
NYS	28.50	14.88	Comdisco Inc.	27.25	-0.50	-1.80
OTC	16.25	9.25	LDI Corporation	12.25	0.00	0.00
OTC	5.88	2.25	Datatrans Inc.	3.25	0.75	30.00

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RISC

FROM PAGE 1

direct sales force, so they can't out-distribute us," McNealy said in a meeting with *Computerworld*. "I don't know where they think they can add value."

Both IBM and Hewlett-Packard Co. have plans for low-end, low-cost RISC machines, and HP's is slated to debut at the end of March. But IBM has not licensed its architecture to others, and HP has not done so widely, although it would both like to.

With Mips Computer and Sun vying for the larger shares, a market heavily weighted in one direction would draw resources such as software developers to it like ants to a picnic. This could result in more connectivity, more applications and lower costs to users.

If Sun's architecture stays on top, it would benefit from an expanding workstation market estimated to grow over sixfold by 1995, according to Tom Kucharvy, an analyst at Summit Strategies, Inc., a market research firm in Boston.

Sun's share is currently estimated at 53%, in units, for 1990. Mips, through its major vendors Silicon Graphics, Inc. and Digital Equipment Corp., has about 25%, according to Summit.

Without a change to the status quo, Kucharvy estimated, Sun's share would only decline to 45% by 1995, and Mips would dive to 15%. However, if Mips is able to corner more high-profile vendors, Kucharvy estimated its share would climb to 30%, leaving 40% for Sun.

It has taken until this year to even consider one architecture taking over the RISC market. Analysts, including Michael Goulde at Open Systems Advisors, Inc. in Boston, agreed that "it's a tumultuous period, reshaping the face of the workstation industry."

Sun licensed its first vendor, Solbourne Computer, Inc., in 1987. Sun compatibles and clones just began hitting the market with force at Comdex Fall '90. Although Sun has had some success with U.S. firms signing on, they generally have been smaller ones.

Mips has signed up larger U.S. firms such as DEC and also claims some Asian companies. It offers systems for resellers as well as the basics of processors and compilers.

Most vendors also evaluated Motorola, Inc.'s 88000 processor, but few have chosen it. The major reason given for this by Dick Snyder, president and general manager of Prime Computer, Inc., and others was, "In our judgment, the market would come down to two architectures: Mips and Sparc."

Technology vs. clout

Even some allies of Sun said its Scalable Processor Architecture (Sparc) is not the best technology available. But a viable business plan does not rely solely on technology, and Sun's market presence carries clout.

Vendors who have signed up for Sun's RISC standard, such as Tatung Science and Technology, Inc. and Solbourne, frankly concede that the Sparc technology may not be the best available. "From a technical point of view, Sparc is the worst," said Kam Chan, president of Tatung.

However, the vendors said, Sun's aggressive marketing and its ever-growing software catalog can offset any marginal technological advantage offered by RISC rival Mips Computer. "Whether or not you feel comfortable with Sun, it's a very effective marketing machine," said Doug MacGregor, chairman and chief executive officer at Solbourne.

A spokesman for Pyramid Technology Corp., which uses the Mips architecture, said technology is insignificant compared with business and marketing decisions. Primarily, Sun was seen by Pyramid as moving into its high-end marketplace, and Pyramid did not want to compete with the vendor, according to the spokesman.

Solbourne evaluated Mips, Sparc and Motorola architectures and found them all within 5% of each other, with Mips having the edge in performance. "If you have a choice, you'd pick the leader in both marketing and technology. But if you pick only one, you pick marketing," MacGregor said.

Tony Levy, product marketing manager for Unix/RISC at DEC, said Mips Computer's current processor is 50% more efficient than Sparc. "The faster a chip set has to operate [to overcome lack of efficiency], the more power requirements you have and the more heat exchange necessary. Thus, it's harder to design small workstations around it," he said. DEC also owns a minority share of Mips Computer stock.

J. A. SAVAGE

HP unveils interface for Sun systems

BY J. A. SAVAGE
CW STAFF

Users of Sun Microsystems, Inc.'s workstations will have the choice of the Open Look or Motif graphical user interface with a software package introduced by Hewlett-Packard Co. last week. HP also unveiled a high-end personal computer and several networking devices, including a long-range hub using fiber optics.

HP stands to further Motif as an interface standard by porting its Visual User Environment package to Sun's Scalable Processor Architecture-based workstations.

While Motif is endorsed by the Open Software Foundation (OSF), Sun has stubbornly kept to its interface, Open Look. Sun officials, including Chief Executive Officer Scott McNealy, have said that sticking to Open Look is a matter of principle for the company and that Sun wants nothing to do with OSF. OSF is led by HP, IBM and Digital Equipment Corp., all Sun rivals in the workstation market.

HP also made several hardware announcements last week. It introduced the Vectra 486/33T PC aimed at network support. Ranging in price from $9,499 to $17,799, the 14.4 million instruction per second system can support 200 local-area network users or 100 Unix terminals, HP said.

HP is expanding its networking line with seven modular products, including an HP Fiber Optic Hub. The device can serve eight floors or eight buildings using fiber-optic wire, according to an HP spokesman.

From a main fiber connection, twisted-pair cable is used for local networking. The hardware does not yet support a new router standard protocol, called open shortest path first, although HP is in support of that standard, according to Carolyn Ticknor, general manager at HP's Roseville Networks Division.

HP is also offering network management software called Openview Hub and Bridge Manager. This DOS-based system is currently stand-alone. It cannot be managed by other management software, said Bob Frankenberg, vice president of HP's Cooperative Computing Group. "Eventually it will be integrated" into other vendors' network management, Frankenberg said.

Compaq RISC plans leave users wary

BY RICHARD PASTORE
CW STAFF

While the ink may not be on the contract yet, Compaq Computer Corp. clearly has pen in hand and will sign up for RISC technology, industry observers confirmed last week. However, some are already questioning the value and viability of a Compaq reduced instruction set computing (RISC) system.

Niti Young, an analyst at Meta Group, Inc. in Westport, Conn., said Mips Computer Systems, Inc. chief scientist John Hennessy told her late last month that only volume supply questions were delaying an agreement between Mips and Compaq for a single-chip RISC design.

Compaq was working on a RISC system in its own laboratories last year, apparently trying and failing to build a RISC machine to support DOS, said Jim Poyner, a market analyst at William K. Woodruff & Co. in Dallas.

Hanging in

However, reports of talks between Compaq, Mips and Microsoft Corp. indicated Compaq has not given up. Indeed, one user who asked for anonymity said Compaq representatives recently told him the firm is working toward minicomputer- and mainframe-level processing, "including things like RISC."

A Mips spokeswoman said the R4000 RISC chip is expected to ship by midyear, and volume supply is not currently a concern. The company will not comment on any discussions with Compaq. Compaq also refused to comment.

While a RISC system might fit with Compaq's growth plans, it might not fit with those of users. Several Compaq Systempro users said they have no foreseeable need for RISC. Others using Sun Microsystems, Inc. or Digital Equipment Corp. RISC architectures said they saw no need to switch.

At sites where RISC is under consideration, the Compaq name on a RISC box would not guarantee a sale. "Compaq's known for their quality, but they're also known for their prices. They would be just another vendor we'd give consideration to," said Jack Mellon, manager of MIS planning and architecture at Ryder Truck Rental in Miami.

A major kink in Compaq's RISC plans could also be distribution. In light of Compaq's slow start with its advanced technology Systempro, the firm may have trouble pushing RISC boxes through its dealer-only channel, observers said.

"I don't know how many dealers are satisfied enough with their return on their Systempro investment to go into the RISC marketplace," said Michael Dripps, senior strategist at US Sprint Communications Co. in Kansas City, Mo.

Compaq dealers were hardly gung-ho at thoughts of RISC. "It's not something we would want to jump into. We're not in a position now psychologically or economically to be a pioneer," said Ed Michelson, a partner at a San Diego Computerland Corp. franchise.

"Customers are not telling us they want RISC machines right now," Michelson added.

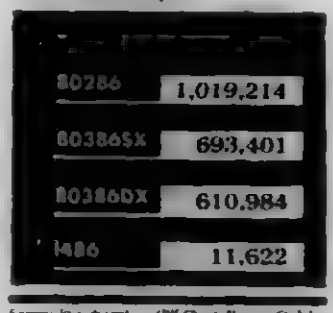
Users and dealers said they would be more interested if Compaq came up with a RISC processor that runs DOS; OS/2 or Microsoft's Windows derivations and their myriad associated applications. Unix, the current de facto RISC operating system, supports far fewer business applications.

Microsoft, which has announced plans to port its upcoming Portable OS/2 and Windows 3.2 to RISC, has reportedly been in discussion with both Mips and Compaq. "Microsoft's involvement would make a difference," said Matt Fitzsimmons, owner of a Computerland franchise in White Plains, N.Y. "If it was a DOS-based high-end workstation, it would definitely be of interest to us."

However, at least one user was dubious about the immediate worth of a DOS RISC system. Because today's Intel Corp.-based applications were designed for complex instruction set systems, they would not fully use RISC's speed advantages, said Sean McLinden, director of systems development for the decision systems laboratory at the University of Pittsburgh. "It would make more sense for Compaq to go with a Unix environment," he said.

Power glut

A survey of several hundred U.S. computer stores indicates dealers are having only marginal success in selling high-powered personal computers based on Intel chips



Source: Storeboard CW Chart: Doreen St. John

NEWS SHORTS

HP airs upbeat report

Citing strong sales of its Laserjet printer, international demand for computers and internal cost-cutting, Hewlett-Packard Co. last week reported quarterly profits up 18% over last year and a 10% increase in revenue. Orders were up by 20% internationally and only 3% in the U.S. The report surprised analysts, including John Girton at Van Kasper & Co. in San Francisco, who had projected less than half the profit growth.

Core States' executive resigns

The executive responsible for electronic product services at Core States Financial Corp. in Philadelphia resigned last week. Chief Operating Officer Bipin C. Shah resigned effective March 1 as part of a larger reorganization at the $23.5 billion regional bank. Shah was promoted from executive vice president of operations and technology last year. A company spokesman declined to comment on reasons for the departure. Executive Vice President Douglas Anderson took over the electronic processing services, which include Core States' automated teller machine network and point-of-sale and merchant processing services.

SPA settlement due

The Software Publishers Association (SPA) is expected to announce a $300,000 settlement today, its largest ever in a software copying case. The SPA conducted a search-and-seizure raid on Davy-McKee Corp.'s Chicago office Nov. 19, 1990, on behalf of Wordperfect Corp., Lotus Development Corp. and Software Publishing Corp. The case was settled last week. As part of the settlement, Davy-McKee, an international construction engineering firm, must audit all personal computers at its nine U.S. locations, and the SPA will be allowed to conduct annual audits of Davy-McKee for the next two years. Davy-McKee is the first company with multiple offices to be raided by the SPA.

Coke's Currid forms consultancy

Cheryl Currid, a highly visible spokeswoman for downsizing applications, has left her information systems position at Coca-Cola Co.'s Foods Division to consult on downsizing. Currid, 40, resigned as director of applied information technology to form Currid & Co., a Houston-based consultancy. Paul Wilson, the division's vice president of information services, refused to comment on a possible successor.

Apple unveils handwriting system

Apple Computer, Inc. recently began customizing its computers to the Japanese market and unveiled the $70 Machandwriter, which recognizes handwritten Chinese and Japanese characters as well as the Roman alphabet. The product was developed by Communications Intelligence Corp. in Menlo Park, Calif., according to Apple Chairman John Sculley.

Adapso picks dispute overseer

Adapso, the computer software and services industry association based in Arlington, Va., announced last week the appointment of Philadelphia-based Judicate, Inc. to administer an "alternative dispute resolution" program for the industry. Judicate is a national private court system that uses retired judges and independent specialists to resolve legal disputes.

Firebomb attempt on IBM Germany

A branch office of IBM's subsidiary IBM Germany was the scene of an arson attack early last Wednesday morning. The Freiburg, Germany, office — which was hit with a crude gasoline bomb — sustained minor damage, and there were no injuries, according to an IBM spokesman. IBM said authorities are investigating the incident, adding that nobody has yet claimed responsibility. Security measures are in place worldwide, but further comment might compromise them, according to the IBM spokesman.

NCR's new ESOP could diminish AT&T threat

BY MICHAEL FITZGERALD
CW STAFF

DAYTON, Ohio — NCR Corp. last week started what one analyst called a game of "chicken" with AT&T in a bid to stave off the telephone giant's takeover effort.

NCR said it will hold on the same day both its regular annual shareholders meeting and a special meeting of its shareholders to vote on an AT&T-sponsored measure to oust NCR's board. The company also created an employee stock ownership plan (ESOP) that could lessen AT&T's ability to gain enough votes to oust NCR's board.

NCR set March 28 as the date for both meetings. The special meeting was requested by NCR shareholders through a proxy sponsored by AT&T.

AT&T's ability to oust NCR's entire board may be weakening. Last week, AT&T extended its tender offer to April 30, 1991, saying the number of shares tendered had fallen from approximately 70% to 66%. Some analysts, such as Dean Witter Reynolds, Inc.'s Jay Stevens, said they think this is a natural effect of a rising stock market. Others said NCR's stock price increase is causing the dip.

However, the dip, combined with the ESOP, which gives 8% of NCR to its employees, could signal that AT&T will not get the 80% vote it needs to oust NCR's board at the special meeting.

"I think that the ESOP move is going to make it more difficult for AT&T" to replace NCR's board, said David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago. Schofield said he thinks NCR may have scheduled the two meetings back to back in hopes that an NCR win in the special meeting could carry over to the regular meeting, in which AT&T would need only a simple majority to remove the four directors up for re-election.

If the surge in stock prices continues, AT&T may be forced to sweeten its offer for NCR. Analysts contacted said the current market, while not vindicating NCR management's repeated demand for $125 per share, made $90 per share look less generous.

"Between the move in the market for tech stocks and the additional impediments that NCR has thrown in [e.g., the ESOP and the quick meeting date], if AT&T really wants this company, it's becoming more clear that they're going to have to come across with more cash," Scofield said.

NCR also paid out a special $1 per share dividend to shareholders last week. NCR said it would ordinarily have used the money to repurchase shares, but the takeover effort has "prevented" it from doing so.

State of siege

AT&T's battle to buy NCR has become a lengthy siege. The following is a chronology of the struggle:

- **Nov. 15:** AT&T Chairman Robert Allen telephones NCR Chairman Charles E. Exley Jr. asking for a meeting. They meet at the Cincinnati airport to discuss Allen's merger proposal.
- **Nov. 19:** Allen sends Exley a letter confirming the offer of a friendly merger in an $85 per share stock swap.
- **Nov. 30:** Exley sends a "Dear Bob" letter to Allen rejecting the bid but saying NCR would consider a higher bid.
- **Dec. 2:** AT&T announces its negotiations with NCR and says it will offer $90 per share, or $6.12 billion, in stock.
- **Dec. 5:** Exley says NCR's board will consider a price of $125 per share for the company. AT&T initiates hostile bid.
- **Dec. 13:** NCR's board rejects the $90 per share bid.
- **Jan. 2:** AT&T sends a second proxy asking NCR shareholders to request a special meeting of NCR's board.
- **Jan. 16:** AT&T announces it has received tenders for more than 70% of NCR's shares; extends tender offer to Feb. 15.
- **Jan. 22:** NCR files an antitrust suit against AT&T.
- **Jan. 24.:** The Federal District Court of New York rules that NCR must give its stockholder list to AT&T.
- **Feb. 18:** AT&T extends its tender offer to April 30; tendered shares have dropped to 66%.
- **Feb. 21:** NCR adopts ESOP, which will own 8% of the firm.

Nationwide ISDN predicted for 1992

BY JOANIE M. WEXLER
CW STAFF

The "islands of ISDN" in existence today are slated to blend into a nationwide archipelago by year's end 1992, according to the Corporation for Open Systems International's (COS) ISDN Executive Council.

The council said it will officially announce this week an implementors' agreement among switch vendors, the regional Bell operating companies (RBOC) and Bellcore, the RBOCs' research and development arm, that will result in interconnected Integrated Services Digital Networks becoming available to a significant number of users across the country by the end of next year.

The ISDN Executive Council, which comprises RBOCs, switch vendors, computer manufacturers and user companies, was formed a few months ago by COS "because the industry needed an executive-level focus on the issues surrounding ISDN," said Mike Walter, vice president of marketing and corporate services at COS.

ISDN's ultimate raison d'etre is to give users worldwide, dial-up voice, data and video services over the public telephone network at speeds of up to 1.544M bit/sec. The technology has been slow to mature because of interoperability glitches and the major task of upgrading the world's telecommunications infrastructures. Users, then, have been limited to communicating with others who have ISDN service available in their areas.

Various ISDN players have now apparently agreed, however, to upgrade equipment to a common implementation of CCITT-sanctioned ISDN standards. The move should allow "full interconnection of voice and circuit- and packet-switched traffic," said Joe Gustafson, director of ISDN market planning at Nynex Corp., an ISDN Executive Council member.

"This will greatly expand the geographic coverage of ISDN and thus increase the technology's application possibilities," he said. More companies being able to link up with each other on the fly for voice, data and video communication parallels the state of the facsimile market, Gustafson explained.

"One fax machine is useless. Two fax machines are useful. A million fax machines have a million uses," Gustafson said.

"The big barrier to widespread ISDN deployment has been interoperability. This is a signal that the problem will be resolved shortly," said a spokesman for Bell Atlantic Corp., which is also a council member.

Banyan need not despair — yet

IBM/Novell deal poses a marketing challenge, not a technological threat

BY JOANIE M. WEXLER
CW STAFF

For the short term, it appears that local-area network company Banyan Systems, Inc. need not wring its hands over IBM's and LAN market leader Novell, Inc.'s recent partnership power play.

Users and industry analysts acknowledged that IBM's and Novell's licensing and resale agreement poses some marketing and perception challenges to Banyan's position as the "enterprise" network vendor. But, they added, the firm's Virtual Networking Software (Vines) will for some time remain a choice operating system for large networks.

"The Novell/IBM relationship reaffirms my decision to stick with Banyan," said Jonathan Oski, a senior technical engineer at the Boston branch of Bank of Tokyo. "The partnership clouds the future of LAN Server and what IBM and Microsoft are doing with OS/2."

IBM and Novell announced two weeks ago that IBM would immediately begin reselling and providing direct support for Novell's Netware 286 and 386 operating systems in addition to LAN Server (CW, Feb. 18). LAN Server is a fruit of IBM's long-time development relationship with Microsoft Corp.

In addition to reselling Novell software, IBM said, the companies will work together to port Netware to IBM's OS/2 and RISC System/6000 platforms. "If anything, the relationship will slow down the Netware development because of having to penetrate layers of IBM bureaucracy to get a product out the door," Oski said.

Clinging to Vines

Linda DuRussell, a communications programmer at Pennsylvania Blue Shield, recently selected Vines to run on the token-ring LANs her company is installing. She said the market's turn of events — including Novell's planned mid-March rollout of Netware V3.11, which includes several wide-area enhancements — has not altered her opinions.

"I wouldn't want to be a pioneer with what Novell and IBM are promising. It sounds nice, but how it will actually work is yet to be seen," she said.

With its Streettalk global naming service and robust wide-area communications protocol support, Banyan has historically had a technical foot forward in enterprise networking over work group-oriented Novell. The routing tables within Streettalk, for example, allow users to log onto a network just once to access all network services.

Novell and IBM have not yet announced a retaliatory solution to Streettalk, stating only that they would eventually link their proprietary directory services with the "open" X.500 protocol.

Scott Stein, director of client/server research at Technology Investment Strategies Corp., a Framingham, Mass.-based market research firm, predicted that "when others get close to competing with Streettalk, Banyan will get sucked up by another company."

Stein estimated that Vines accounted for 6% of the worldwide personal computer LAN node shipments in 1990. He said an average multisite Vines installation supports about 1,500 nodes, while Netware generally spans about 500 nodes in large, dispersed companies and 350 nodes [illegible].

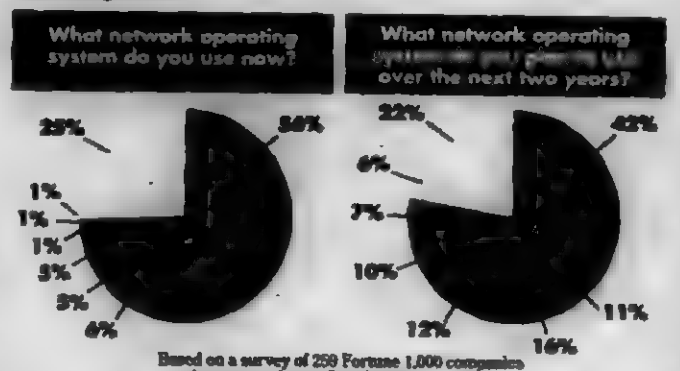
Because Netware does not offer a global directory service, users on a Novell network must relog on to access network services residing on different work groups.

While Banyan has been technically ahead in the wide area, it has been weak in marketing its products. In fact, Banyan officials have in the past acknowledged that when they created Vines, they thought "the technology would sell itself."

"Banyan needs to get the word out that its architecture was built from the ground up for wide-area networking based on LANs," asserted Hub Vandervoort, president of Horizon Strategies, Inc., a consultancy in Brookline, Mass. "Netware was created for the work group, and IBM really doesn't view the LAN as the basis for a wide-area backbone," he said.

Net diversity

Netware faces a host of challengers to its dominance of the corporate networking market



Source: Business Research Group — CW Chart: Doreen St. John

LAN users

FROM PAGE 1

The attractions of the routers, users said, include better LAN-to-LAN cost/performance than an IBM front end, support of popular LAN and high-speed wide-area protocols and, lately, even SNA support.

With a peer-to-peer SNA platform, IBM is just starting to address LAN users' priorities.

Testing the waters

The Travelers Corp. tried out IBM's recommended solution of using an existing backbone of IBM 3745 front ends to interconnect LANs.

Such a configuration is especially attractive to large IBM shops because it allows them both to leverage an existing SNA backbone and to avoid setting up a separate, high-speed network just for LAN connections.

The more LAN traffic Travelers put on its 3745s, however, the less satisfactory was the front end's performance, according to Robin Layland, manager of SNA software engineering.

Even more serious to Travelers' users was the front end's inability to interconnect LAN applications that were not based on SNA. Many key business applications in use on Travelers' LANs are based on LAN protocols such as Novell, Inc.'s IPX and IBM's Netbios, Layland said.

IBM is reaping the bitter fruits of its inability to sell its LU6.2 as a de facto standard for personal computer LANs. Introduced approximately five years ago, the peer-to-peer SNA protocol has never kicked its reputation among users as a memory hog or its reputation among applications developers as hard to work with. Both Ernst & Young and Forrester Research estimated that LU6.2 use makes up less than 5% of total SNA traffic in IBM shops.

Best laid plans . . .

Even if information systems has big plans for SNA and LU6.2, IBM may still run into resistance from companies whose LAN installations are "bottom-up phenomena driven by business units and individual departments," said David Passmore, a principal at Ernst & Young.

At the New York Metropolitan Transit Authority, for example, a central IS department handles SNA communications for several large IBM mainframes and is experimenting with LU6.2 software from Spectrum Concepts, Inc. as a way to download demographic and geographic data to PCs, according to data center manager John Vito.

However, Robert Kirschenbaum, manager of the authority's information center, said integrating the LANs he manages with SNA "is not a main concern of mine at the moment."

Currently in the process of migrating some 550 to 600 users from Wang Laboratories, Inc. systems to PCs on Novell Netware LANs, Kirschenbaum said his "main problem is connecting all of the LANs to support station-to-station communications" among agency users. He added that his group recently implemented a Cisco Systems router to coordinate traffic among the different sites.

IBM's to-do list

Among items high on IBM's work list for SNA systems are the following:

- Revamp the IBM 3745 to better support demanding LAN-to-LAN, peer-to-peer communications. The front end will eventually support 1G bit/sec. speeds as well as broadband industry standards, a spokesman said.
- Provide interconnectivity for other LAN protocols besides IBM's LU6.2 on an SNA backbone. On Sept. 5, 1990, IBM addressed this problem with the new LAN-to-LAN over Wide-Area Network program, which allows Netbios applications to communicate over an SNA network. The vendor is expected to add SNA support for other protocols, such as Novell's IPX.

Two weeks ago, IBM announced plans to resell Novell's Netware and provide interoperability between the operating system and IBM's OS/2 Extended Edition LAN Manager.

- Make LU6.2 more palatable to users and application developers. IBM is working on a "more streamlined, easy-to-use, memory-efficient LU6.2 on DOS," to be shipped within 1½ years.

In addition, IBM has promised to implement the Common Programming Interface for Communications (CPIC) on OS/2 by year's end. CPIC is an application programming interface for LU6.2 that is said to be easier to use than the current interface.

The real breakthrough will be when Novell delivers on its promise to support CPIC, the IBM spokesman said. This will enable applications based on Novell software to access resources across a peer-to-peer SNA network.

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TRENDS

CIO CHALLENGES

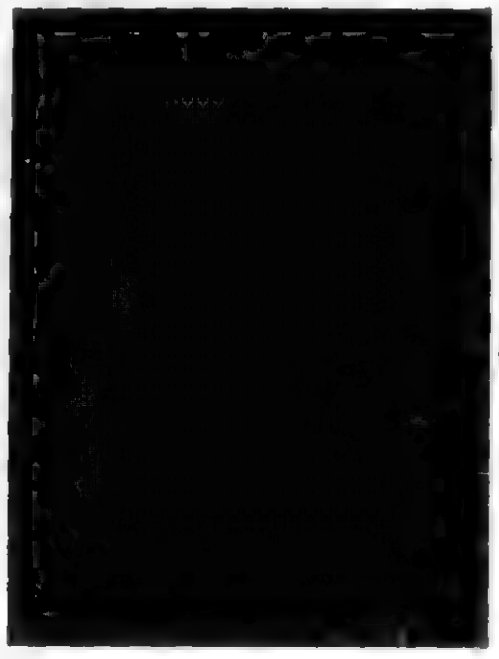
CIOs expect their IS budgets to increase by an average of 5% in 1991, but changing user needs and budget constraints are major challenges that could impact IS and its level of service

What percent do you expect your IS budget to change in 1991?

Percent of increase
(Dependent base: 614)

The health care and travel industries received the largest increases in their IS budgets in 1991. Engineering did not fare as well, experiencing slight cutbacks

Health care	10%
Travel and leisure	10%
Distribution	8%
Telecommunications	8%
Financial services	7%
Insurance	6%
Retail	6%
Banking/Thrifts	4%
Energy	4%
Transportation	4%
Education	2%
Manufacturing	2%
Engineering	-3%



Major initiatives

Regardless of budgets or industry, the current focus of CIOs is in improving end-user productivity through developments in relational database technology and PC applications development tools

(Based on a scale of 1-11, where 1=most common, 11=least common)

	Current initiative	Planned initiative
Relational database technology	[redacted]	
PC applications development	[redacted]	
Applications development using CASE tools	[redacted]	
Computer platform changes	[redacted]	
IS function reorganization	[redacted]	
Executive information systems	[redacted]	1*
Distributed database technology	[redacted]	
Data center consolidation	[redacted]	
Image management systems	[redacted]	1*
Revenue generation by selling internal applications	[redacted]	
Reverse/Re-engineering	[redacted]	

*Equal number of responses

Source: Deloitte & Touche, Chicago

CW Chart: Tom Monahan

NEXT WEEK

Since its introduction last May, Microsoft's **Windows 3.0** has easily been the most talked about product in the world of computing, with a graphical interface that spells an end to the dreaded DOS prompts. But has it delivered more than just a pretty picture? Find out what corporate managers say in our Special Report: The Windows Payoff.



Brady Lyhus

Low-key but firm and progressive is the style of Southern New England Telephone's information systems department and general manager of IS and technology, Raymond Fletcher. Manager's Journal looks at how the growing regional phone company blends technology such as CASE and EDI with strong IS/user partnerships for a competitive edge.

INSIDE LINES

We've been consulting the Oracle

Oracle sources said they expect changes at the top during the coming weeks. Geoff Squire, president of Oracle's Worldwide Distribution Sales Division, is expected to be named chief operating officer. Chief Financial Officer Jeffrey Walker is expected to leave that post to take over Oracle's Applications Division. It's possible that these changes will free Oracle Chief Executive Officer and founder Larry Ellison to spend more time developing new products.

Perfect temps

Katherine Borsecnik, director of operations at the Software Publishers Association (SPA), told a packed house at the Chicago Association for Microcomputer Professionals that the SPA's first three raids in New York were based on evidence provided by the same person: a temporary worker who specialized in Wordperfect's word processor, Wordperfect. In each case, photocopied templates caused the temp to tip the SPA to possible illegal software use. Borsecnik joked that the temp was now in the SPA's witness protection program.

Dodge can now speak frankly

For most of us, last Monday was just President's Day; for the former president of McCormack & Dodge, it was also Independence Day. Frank Dodge said he celebrated the expiration of his one-year noncompete contract with Dun & Bradstreet Software by getting in touch with some of the folks "who have made approaches in the past year that I couldn't follow up on." Within the next few months, he said, look for him to head up, acquire or launch a software firm, "definitely in nonmainframe application software and definitely in Massachusetts."

Is this any way to intimidate?

IBM is expected next month to turn OS/2 systems into Advanced Peer-to-Peer Network nodes (see story page 1). But that will only be the beginning: During the next 60 days, look for IBM to announce a slew of interoperability alliances with vendors in the computer, network management, LAN, WAN, systems software and operating systems arenas.

Spotted on the radar scope

Ralph Ungermann was a mystery guest at Motorola's Radio-Telephone Systems Group's rollout of the Altair wireless Ethernet LAN during a recent conference. A guess as to why he attended might be that Ungermann-Bass' Access/One intelligent wiring hub is slated to support wireless Ethernets. Ungermann, who is founder, president and CEO of Ungermann-Bass, sanctioned Altair, saying it "gives customers more choices" and is "complementary" to cabled LANs.

Is it Memorex, or is it Fujitsu?

Memorex Telex Corp. is reportedly putting the finishing touches on a new disk drive to compete with the IBM 3390 high-end disk drive for 1992 delivery. The disk unit is built around an existing Fujitsu 3390-compatible drive, according to Paul Wolfstaetter, program director at Gartner Group's Enterprise Storage Strategies Group. Another Memorex product, a redundant array of inexpensive disks-type disk-array drive, should follow in late 1992, he said.

Foreign intrigue

Sometimes the solution to your problems is right in front of your nose; other times you have to fly halfway around the world to find it. IBM's OS/2 evangelist, John Soyring, flew to Australia last week to meet with a developer who has come up with "an interesting solution for integrating non-OS/2 clients into OS/2," a source said. If it works, it could show up in OS/2 Version 2.0, we're told.

Wyse Technology is considering sending end-user guides and computer manuals to customers on floppy disks or as a loaded program in the hard drive of its computers, according to company executive Bob Goodman, director of channel marketing. You, too, can cut down on paper by contacting us via our electronic mail drops: 76537,2413 on Compuserve; MHTS78A on Prodigy; and COMPUTERWORLD *on MCI Mail. Or you can contact News Editor Pete Bartolik by phone at (800) 343-6474 or zap to our fax at (508) 875-8931.*



AT&T introduces the biggest thing to hit contact lens sales since shag carpeting.

AT&T Integrated Services Digital Network (ISDN) gave Bausch & Lomb the capability to take 1,000 more orders per week.

Ask most people what AT&T ISDN has to do with the contact lens business and they'll probably tell you it's the first line on the eye chart. But if you ask the people at Bausch & Lomb, they'll tell you about a digital technology so innovative, it lets them answer a lot more calls using the same number of live operators they had before.

Not too long ago, Bausch & Lomb's customer service center was getting a lot more calls than they could handle. Realizing that lost calls can turn into lost customers, they called AT&T for help.

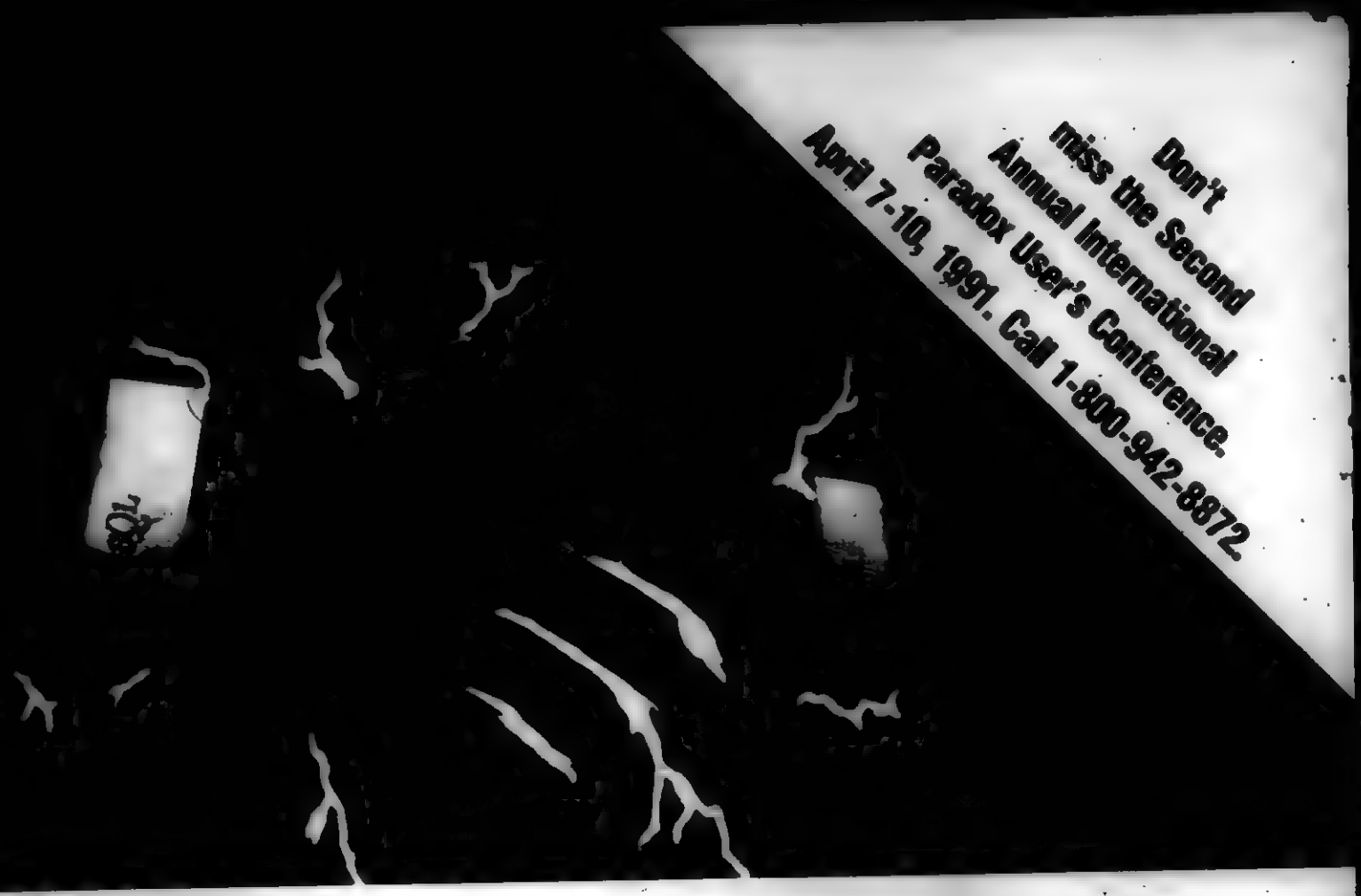
Through AT&T ISDN, Bausch & Lomb got a feature called Automatic Number Identification (ANI). With ANI, their computers can automatically capture each caller's phone number and match it to the customer's record. The end result? Call handling time has been cut by an average of four seconds per call. Which means Bausch & Lomb's customer service representatives can now handle about 1,000 more weekly calls than they could before.

So if you've been looking for a way to boost sales without taking on more overhead, call off the search. AT&T's contact lens solution could be the answer for your business, too.

Innovation. Another AT&T advantage.

For more information about AT&T ISDN, call your AT&T Account Executive or 1 800 247-1212, Ext. 144.

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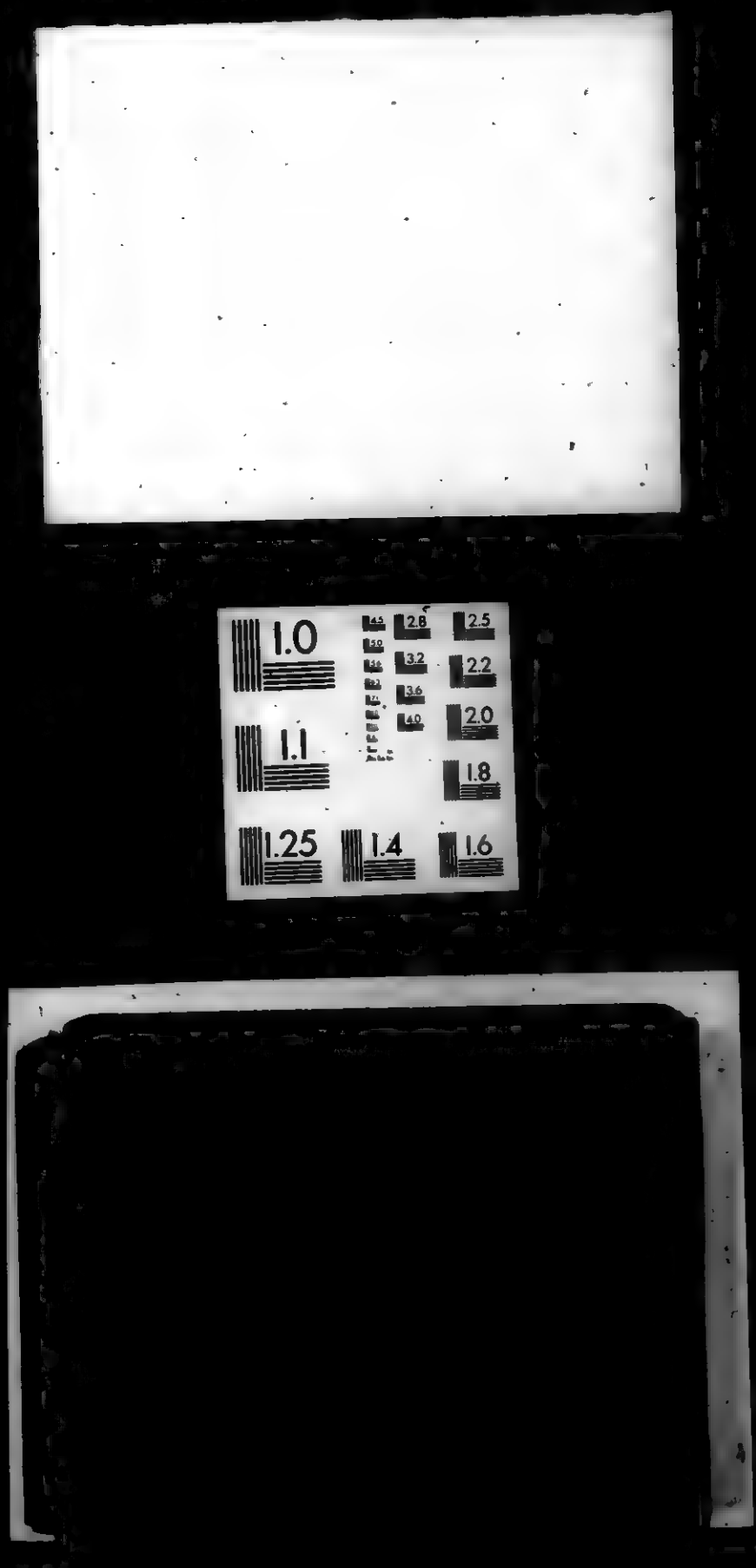
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SPECIAL REPORT: THE WINDOWS PAYOFF

COMPUTERWORLD

Canadian credit firm rates OS/2 Extended a net risk

Version 1.2's host links, IBM service fall flat

BY MICHAEL FITZGERALD
CW STAFF

HALIFAX, Nova Scotia — Distribute mainframe functions to networked PCs? For Trans Canada Credit Corp., that promise proved too good to be true.

Problems with IBM's OS/2 Extended Edition Version 1.2 have forced the company to abandon plans to implement an ambitious 150-site network and instead put the application on a cheaper IBM mainframe and dumb terminal setup.

TCC, a subsidiary of $15 billion-in-assets Central Guaranty Trustco Ltd., said OS/2 Extended Edition has problems with functionality, remote network management issues and IBM's inability to provide effective service.

Things are different

Each of TCC's offices was to run its operations from an OS/2 network connected to a host IBM 3090 mainframe in Toronto. Now, a combination of the 3090, IBM 3174 controllers, dumb terminals and stand-alone Personal System/2s will run the offices.

Dan Montgomery, manager of distributed systems at Central Guaranty Trust, said technical glitches such as interface problems between OS/2 and CICS on the host stalled the project after 30 sites had been rolled out, leading to its eventual demise. Despite these problems, TCC will continue with a stabilized and functional OS/2 in its branch offices until it implements the IBM 3174 controllers and terminals.

"The experience has been unfortunate, but the system is not a major operational or financial problem because the system has been stabilized in the 30 branches that have it, and we'll

Continued on page 7

IBM users get outsource itch

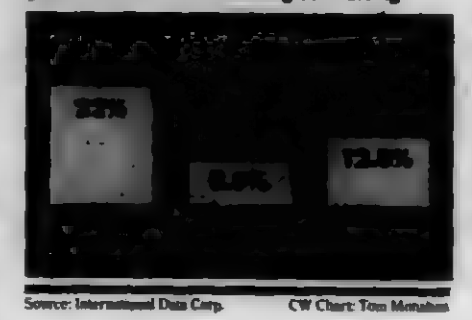
BY CLINTON WILDER
CW STAFF

FRAMINGHAM, Mass. — IBM mainframe-based shops are far more interested in outsourcing than companies using other hardware platforms, according to research that will be presented this month by International Data Corp.

More than 30% of the 264 IBM mainframe users surveyed said they are either considering or actively pursuing outsourcing, compared with about 18% of the entire survey base. IDC, a market research firm, surveyed 1,500 U.S. information systems organizations between Nov. 15, 1990 and Jan. 7, 1991.

Shifting priorities

IBM mainframe sites are more interested in outsourcing than are users of other equipment



Source: International Data Corp. CW Chart: Tom Monahan

The survey revealed another potential threat to IBM mainframe hegemony in the form of moving applications to smaller platforms or downsizing. As with outsourcing, IBM mainframe shops showed the most interest, with 62% gradually or strongly pursuing downsizing. That was not dramatically different at sites using other equipment: 57% of non-IBM mainframe users said they are downsizing, as did 54% of Digital Equipment Corp. shops.

The pressure to downsize was borne out by a question on budgets. More than half of those surveyed, 54%, identified mainframe and minicomputer hardware as the area in which they face the most budget pressure. Only 29% said they felt pressure in the personal computer, workstation or local area network areas.

Outsourcing interest among IBM mainframe shops "dwarfs all the others," said David Moschella, senior vice president at IDC. "In the IBM mainframe world it can be economically feasible and there are a lot of [outsourcing] suppliers out there."

By contrast, just over 13% of IS organizations with host mainframes from vendors other than IBM or DEC expressed any interest in outsourcing, while 87%

Continued on page 83



The rebuilding begins

Computer and communications companies are joining the rush to get a share of the business of reconstructing Kuwait after the war devastated the country's infrastructure

- IBM has an agreement to replace stolen or destroyed machines
- AT&T will provide emergency service for outgoing calls
- Ericsson GE Mobile Communications will create a mobile communications network for returning government ministries
- Mitel is bidding to supply private branch exchanges

Details, other war coverage, page 6

SAA data access plan coming

Wheeler outlines user-transparent 'warehouse'

BY ROSEMARY HAMILTON
CW STAFF

ARMONK, N.Y. — IBM will present a broad plan for enterprisewide data access and delivery later this year, according to Earl Wheeler, a senior vice president and general manager at IBM's Programming Systems Division.

This latest Systems Application Architecture initiative, informally referred to as the "data warehouse," is characterized by Wheeler as a step beyond distributed databases. Yet it comes at a time when some of the basic SAA tools IBM has announced for database links have no announced shipment dates, and some observers said they do not expect them to be available for at least another year.

However, the warehouse concept is intended to give users a minimal number of access methods to request any data, regardless of its format or the operating environment in which it resides.

"What it says is, wherever your data is, on whatever hardware, on whatever operating system, in whatever structure — that data exists," Wheeler said. "With the minimum number of interfaces, perhaps one, we will retrieve that data for you and deliver it to your application that requested it or your

Continued on page 6

Insurer lures away MCI's Ditchfield

BY CLINTON WILDER
CW STAFF

ARLINGTON, Va. — One of the nation's most successful technology chiefs, Allan Ditchfield of MCI Communications Corp., surprised his peers last week by leaving the telecommunications powerhouse for the top information systems job at a Cleveland-based auto insurance firm.

Ditchfield, whose leadership helped make MCI the most effective user of IS in the *Computerworld Premier 100* for two years in a row, will become senior vice president of information services at Progressive Corp. this week. Progressive, which has carved a successful niche by insuring "nonstandard" risks such as convicted drunk drivers, had been searching for a new IS chief for almost one year.

Ditchfield, 53, said he was contacted about the job less than one month ago, but he was not interested until he learned more about Progressive's business position and philosophy of IS. "I wasn't actively looking, and when I got a call about a job in the insurance industry in Cleveland, I was not too overwhelmed, initially," he said. "But they are poised for enormous growth, rely very heavily on information and have smart ways of applying it to underwriting."



Ditchfield *leaves MCI for Progressive*

One of Ditchfield's key MCI lieutenants, James Zucco, vice president of product development, was named last week to fill Ditchfield's post of senior vice president of IS. Zucco, 39, joined MCI in 1986 after consulting stints at Arthur Young and Nolan, Norton & Co.

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INSIDE

HP's upcoming RISC workstation rollout will leave the Apollo Domain operating system behind. Page 4.

You mean there's another DOS? Digital Research's DR DOS, an application-compatible alternative to Microsoft's operating system, is finding some proponents in corporate sites. Page 8.

ISDN part leaves users cool; decade of promises wears thin as alternatives take hold. Page 85.

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"This is all a last gasp for ISDN. Very few have chosen to take advantage of it."

KENNETH BOSOMWORTH
INTERNATIONAL RESOURCE DEVELOPMENT

On switch vendors' efforts to standardize ISDN links.
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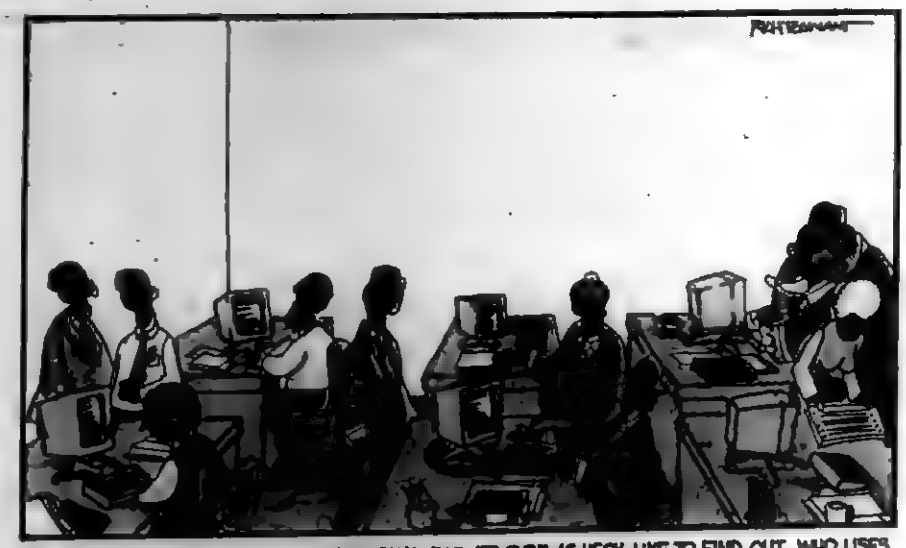
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59 Guidelines for ensuring the success of your **executive information facility**. By Louis Fried.

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"SOMEONE KEEPS GOING INTO MY PERSONAL FILE. I'D SURE AS HECK LIKE TO FIND OUT WHO USES THE PASSWORD 'PEANUT BREATH.'"

EXECUTIVE BRIEFING

■ **A major Canadian firm abandons its downsizing plan,** which called for a 150-site personal computer network to replace a mainframe application. Trans Canada Credit cites problems with OS/2 Extended Edition Version 1.2, including glitches with a CICS interface, in its decision. **Page 1.**

■ **The top IS executive at MCI joins Progressive Corp.,** a Cleveland-based auto insurance firm. Allan Ditchfield says he wasn't actively seeking a new job, but he was excited by Progressive's growth potential and heavy use of data in its business. MCI, which ranked No. 1 in the *Computerworld Premier 100* for the past two years, promotes software development head James Zucco to replace Ditchfield. **Page 1.**

■ **IBM confirms it has replaced** 1,000 to 2,000 faulty disk drives produced at a British manufacturing plant. The 9335 drives for midrange systems were replaced during the past year. Shipments of the next-generation 9336 drives are bogged down by production delays. **Page 85.**

■ **Kuwait enlists IBM, AT&T and others** to help rebuild its IS infrastructure after the war. Initial indications are that much rebuilding is needed. **Page 6.**

■ **Outsourcing is more popular in IBM mainframe shops** than in others, according to a survey of 1,500 IS sites. More than 30% of IBM mainframe sites are pursuing or considering the outsourcing option, compared with about 20% of DEC sites and just 13% of non-IBM mainframe users. **Page 1.**

■ **IBM cuts PC prices** 5% to 20% to counter earlier cuts by Compaq and other vendors. Analysts say IBM was forced to make the cuts to stay competitive and overcome gaps in its PC product line. **Page 84.**

■ **Sears' new centralized back-office system** is up and running on schedule in most of its 863 stores. The hub system streamlines financial applications and allows customers to pay credit card bills at any point-of-sale terminal. **Page 6.**

■ **NASD picks MCI** to manage security and disaster recovery for its nationwide network for over-the-counter stock trading. **Page 12.**

■ **An executive information facility** offers business managers not only internal data but links into external information such as the Dow Jones stock ticker. This facility can be at the core of a corporate "war room" from which strategic decision-making occurs. **Page 59.**

■ **Overseas IS experience** commands a premium as international businesses begin to operate in borderless, global markets. **Page 68.**

■ **Pizza Hut is serving** a new multimedia training solution to its restaurant managers. **Page 80.**

■ **IS managers are turning to hot sites** to guard their computer operations. To choose the right site, managers must balance equipment needs with cost, support and service, geography requirements and telecommunications capacity. **Page 76.**

■ **On-site this week:** A pilot Filenet imaging project at Orange County, Calif., Superior Court aims to convert 180,000 legal documents to optical disc and even place workstations on the judge's bench. **Page 46.** In adjacent Los Angeles County, engineers are fighting California's drought with an automated basin management system based on networked Compaq PCs. **Page 37.** Students will be on-line next fall at Bowling Green State University in Ohio, where PCs on dormitory desktops will access library databases and tuition accounts. **Page 40.** New scheduling and production software on Tandem computers keeps things running at AM General's Hummer military jeep factory in Mishawaka, Ind. **Page 37.** Sybase databases at Johns Hopkins University are tackling the intricacies of human gene structure. **Page 28.**

COMPUTER ASSOCIATES

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March 4, 1991

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The purpose of this letter is to explain what the Computer Associates policy is with respect to the operation of our VSE software products under the VSE/ESA operating system. Put as simply as possible, (i) all of our VSE products already support VSE/ESA, (ii) all of our VSE products can be run under VSE/ESA without payment of any additional license or maintenance fees, and (iii) we have developed for certain of our VSE products chargeable but optional ESA product modules that exploit the ESA extensions of VSE.

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Chief Executive Officer and
Chairman of the Board

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HP pushes RISC workstations

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Leaping ahead in the market for reduced instruction set computing (RISC) systems, Hewlett-Packard Co. will announce a series of engineering workstations March 26 that will leave behind the Domain operating system acquired when HP bought Apollo Computer, Inc.

The HP 9000 Series 700 workstations, with the company's next generation of RISC architecture, will run at 57 to 76 million instructions per second (MIPS). The entry-level system will offer twice the performance at roughly half the price of systems currently offered by Sun Microsystems, Inc. and IBM, according to HP.

The workstations will be the first in which the Apollo division has taken the engineering lead, an Apollo spokesman said.

However, despite Apollo engineers' input, the systems will not run Domain, the old Apollo operating system, said Doug Eltoft, president of the Apollo Users Group. "Users are resigned to the fact that Domain is going to go away. They are putting their hope into OSF/1," Eltoft said.

Coexisting applications

Once HP puts its software layer, Distributed Computing Environment, on the Open Software Foundation's OSF/1, applications that run on Domain will be able to coexist with the new operating system, Eltoft said.

One year after HP and Apollo merged in April 1989, the company said the next generation of RISC architecture would incorporate some features of Apollo's Prism architecture.

At the low end will be the Model 720 running at 57 MIPS, according to Jim Hamilons, an analyst at The Sierra Group, Inc. in Tempe, Ariz. The basic model will be diskless and will have 16M bytes of memory and a 19-in. monochrome monitor. It will be priced between $12,000 and $13,000, according to Cliff Friedman, an analyst at Bear Stearns & Co. in New York.

Work to do

HP/Apollo is having trouble keeping pace with Sun's growth in the workstation market

Percent of worldwide market share (by shipments)

	1990	1991*
Sun**	34.2%	43.3%
HP/Apollo	24.0%	22.5%
DEC	20.0%	18.6%
IBM	5.9%	6.9%
Total shipments	433,316	526,730

*Projected **Only includes Sparc

Source: Workgroup Technologies, Inc

At the high end, the Model 750 will run at a faster clock speed and will generate over 70 MIPS, Friedman said. That computer will cost about $30,000.

At the entry level, the HP workstation will cost $227 per MIPS. HP's current RISC multiuser systems run at $2,750 per MIPS for its HP 9000 Model 852S. Comparatively, at the low end, Sun's 28.5-MIPS Sparcstation 2 costs $526 per MIPS, and IBM's 29.5-MIPS RISC System/6000 Powerstation 320 costs $472 per MIPS.

At the high end, Sun charges $4,420 per MIPS for the Sparcserver 490, and IBM charges $2,443 per MIPS for its Powerstation 550.

HP's current generation of RISC machines, the HP 9000 Series 800, is aimed at multiuser, commercial environments. Floating-point performance and graphics are usually associated with single-user engineering workstations.

Sun and HP pledge oneness in object-oriented business

BY J. A. SAVAGE
CW STAFF

REDWOOD CITY, Calif. — Putting aside their differences in system software direction and their cutthroat rivalry in the workstation bazaar, Hewlett-Packard Co. and Sun Microsystems, Inc. met last week to propose an object-oriented standard for sharing information in a networked environment.

HP and Sun's proposal was one of seven submissions to the Object Management Group (OMG) — a group of over 100 vendors whose goal is to develop a common framework for object-oriented applications. The group is attempting to create a standard level of software that can show where data objects reside on a network and can manage their movement irrespective of the operating system.

A decision by the OMG is expected in August, and if chosen, HP and Sun's software will work on the two premier versions of the unified Unix operating system, the Open Software Foundation's OSF/1 and AT&T's Unix System V, Release 4, said Webb McKinney, general manager of HP's Cooperative Object Computing Division.

Microsoft Corp.'s OS/2 operating system will be included "over time," McKinney added.

A standard would make it cheaper and faster for software developers to embrace object-oriented applications, both companies agreed.

No matter which vendor's submission is chosen, other object-oriented vendors will have the choice of licensing from the chosen vendor or writing to the chosen interface, said Liz Freburger, manager of Digital Equipment Corp.'s object-oriented program.

Poles apart on interfaces

HP and Sun got together on this level of software, despite different attitudes on other parts of Unix system software. Sun swears by its graphical user interface, Open Look, and HP will not budge from the OSF's Motif, although last month, HP provided Motif-based software that will run on Sun's hardware.

"The graphical user interface discussion is up another level. We wanted to get to more real things besides arguing between Motif and Open Look," said Ed Zander, president of Sun's new software business, Sunsoft, Inc.

McKinney said the companies had been discussing the co-sponsored submission for more than two years at the OMG. It was not, as one analyst suggested, that they recently found something in their shared Silicon Valley water "that made common sense break out."

The deal appears similar to one announced by IBM and Mountain View, Calif.-based Metaphor Computer Systems, Inc. this past September. The resulting company, Patriot Partners, is set to develop software for Unix and Microsoft's OS/2 operating systems, which would shield the complexities of different operating systems from software developers.

Speedier Aviion on-line

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — In what may be its biggest announcement since the introduction of the Aviion workstation two years ago, Data General Corp. is expected to unveil a 100 million instructions per second (MIPS) Aviion server next month.

Rather than being aimed at the workstation market, the system will be positioned for the commercial on-line transaction processing (OLTP) market.

According to Bill Sines, director of midrange systems research at Technology Investment Strategies Corp. in Framingham, Mass., the DG announcement, scheduled for March 13, will mark the appearance of a quadprocessor Motorola, Inc. 88000-based Aviion server with symmetric multiprocessing capabilities.

David Novy, a DG Aviion user and technical computing specialist at a large Midwestern manufacturing firm, said a 100-MIPS Aviion would complete the product's transition from a workstation to a high-capacity network server and position DG as a serious contender in the commerical OLTP marketplace.

Some analysts said such a product could give DG the niche market it has been looking for, provided it can compete in price/performance against early entries in Unix transaction processing such as AT&T, NCR Corp. and Sequent Computer Systems, Inc.

"If OLTP is their thrust, they are going to have to include some software with this announcement, particularly things like scheduling and loading, balancing and performance monitoring," said George Weiss, an analyst at market research firm Gartner Group, Inc.

Little competition

Weiss noted that aside from Motorola, DG is the only significant hardware player in the 88000 marketplace, and much of its success will depend on the quality and quantity of third-party software vendors willing to port to the 88000 architecture.

Sources said DG has obviously made some changes to the DG-UX kernel and speculated that the product will include leading-edge technology such as redundant arrays of inexpensive disks, hierarchical storage management and fault tolerance.

"This four-way processor technology gives DG a 12- to 15-month jump on IBM and may make some hay with the value-added resellers," Weiss said. "Obviously, DG figures that no one has a monopoly on this market yet and that they have as good a shot as anyone else."

CORRECTIONS

"IBM enhances high-end tape drive capacity" [CW, Feb. 25] should have referred to its older generation as the 3480 instead of the 3380. IBM will discontinue marketing 3480 models. No such announcement was made for the 3380 disk drives.

"ISDN for the masses" [CW, Jan. 28] should have said that the ISDN Primary Rate Interface's D channel supports 64K bit/sec., not 16K bit/sec.

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U.S. vendors enlisted to help rebuild Kuwait

BY MITCH BETTS
CW STAFF

The Kuwaiti government last week began lining up U.S. vendors such as IBM and AT&T for help in rebuilding the country's war-ravaged technology infrastructure.

IBM has signed a preliminary agreement to help Kuwait "replace all machines either stolen or destroyed" during the Persian Gulf war, said IBM spokesman Mac Jeffery in Armonk, N.Y. "Apparently, computers are a significant component of the early reconstruction plans."

Meanwhile, employees at Saudi Aramco, Saudi Arabia's oil conglomerate, are reportedly itching to seize what they see as golden opportunities in Kuwait, according to one American information systems employee at Aramco who asked not to be named.



A Saudi-based chapter of the American Business Association is informally coordinating dissemination of information on opportunities in Kuwait. "I think a lot of us will respond to it," the employee said.

Several weeks ago, the Kuwaiti government-in-exile contacted Gulf Business Machines, a Bahrain-based IBM dealer, about helping with the recovery effort, Jeffery said. IBM's regular dealer in Kuwait, Khorafi Business Machines, "dropped out of sight Aug. 2, and we don't know its status," Jeffery said.

Details about IBM's computer replacement program will not be available until a damage assessment is completed, Jeffery said.

AT&T said it will provide emergency telephone service so Kuwaiti residents can make outgoing calls for the first time since Aug. 7. The rudimentary service involves a portable satellite dish and a bank of 120 telephones in Kuwait City, AT&T spokesman Andy Myers said.

Representatives of AT&T and the Kuwait Ministry of Communications are conducting a damage assessment to determine what is needed to rebuild the country's regular telecommunications network.

Dozens of AT&T employees were working on a telecommunications modernization project when Iraqi troops invaded Kuwait Aug. 2.

Another form of emergency communications will be provided by Ericsson GE Mobile Communications, a Paramus, N.J.-based joint venture of Ericsson Corp. and General Electric Co. The firm was awarded a multimillion dollar contract from the Ministry of Communications to provide a mobile land radio communications network for the returning government ministries, Ericsson spokeswoman Kathy Egan said.

Mitel Corp. in Ottawa has submitted bids to supply private branch exchanges to Kuwait, a spokeswoman said, but it has not received word on whether it has won the contract.

Senior Writer Richard Pastore contributed to this report

Marines build high-tech muscle

As the number of U.S. Marines sent to the Persian Gulf rose to some 70,000, the Marine Corps found that its two IBM 9377 Model 90 mainframes in Saudi Arabia could not keep up with the work load. So the Marines recently installed a more powerful EX-33 mainframe from Hitachi Data Systems Corp. and high-capacity storage peripherals to handle personnel and logistics data processing, according to the Marines.

The hardware was installed in a transportable trailer called the Force Automated Services Center, which measures 8- by 8- by 35-feet.

.....

The U.S. Central Command in Saudi Arabia may be one of the biggest users of Microsoft Corp.'s Windows software in the world. Under contracts with Compuadd Corp., the command has 2,476 desktop and laptop computers loaded with Windows 3.0. It also bought 1,791 packages of Microsoft's Project for Windows, making the war headquarters one of the top three users of the project management software, a Microsoft spokeswoman said.

.....

The best way to send a letter to Operation Desert Storm soldiers is through electronic information services, military postmaster Mike Whitaker told pool reporters in Saudi Arabia. He said letters sent via computer networks such as Genie and Prodigy take only three or four days to arrive, compared with several weeks for conventional letters. The electronic mail is transmitted to a facility in Saudi Arabia that prints it out and distributes it to military bases.



Similarly, the Association for Electronic Communication in Roeland Park, Kan., has been collecting mail messages from 1,300 bulletin board systems for transmission to Saudi Arabia. The military welcomes the E-mail because it reduces the volume of mail carried on military planes ferrying equipment and supplies to the troops.

Whitaker said soldiers are also receiving facsimile transmissions from home. "One soldier got the footprints and handprints of his newborn baby faxed to him," he said.

.....

The military must fill out forms, even in a war zone. So the U.S. Central Command ordered 350 copies of Perform, a forms processing software package from Delrina Technology, Inc. in Toronto. The $100,000 order included digital versions of 60 of the Pentagon's most used forms, including requisition forms and "Secret" cover sheets.

Compiled by National Correspondent Mitch Betts.

SAA

FROM PAGE 1

decision support system."

While the end result sounds straightforward, it will likely be a highly complex task to provide relational and nonrelational SAA data, non-SAA data and even non-IBM data to users via a few standard access methods.

Paul Hessinger, chief technology officer at Computer Task Group, Inc., said IBM's Distributed Relational Database Architecture, announced last year, could provide the distribution mechanism for users, while the warehouse would be the place where users could "take things out of inventory."

"It is the technology to extract data from multiple data stores, to massage it and then present a usable file to a user on a workstation," Hessinger said.

Emmanuel Ackerman, manager of data administration at Depository Trust Co., said he heard a presentation by IBM late last month on a "global data architecture."

"This sounds like it would definitely help data administration and could bring us to the next step of having a mainframe as a big corporate file server," he said.

Hessinger said IBM's repository will play a big role by managing and maintaining a warehouse model that governs this structure. He also described it as a complex topic involving multiple technologies that will call for third-party involvement, as the AD/Cycle strategy does.

In fact, Wheeler's plan is to map out a strategy or framework for users in much the same way he rolled out the plan for application development. "Around June or July, we will begin talking about it like we talked about AD/Cycle three or four months before we introduced it," he said.

"We will be gluing the disparate products together, so it's going to be an evolutionary journey," Wheeler added.

Users and analysts said they were unfamiliar with the plan but would welcome such a blueprint.

"We are certainly interested in working to be able to access data wherever it may be, particularly when it's not IBM platforms," said Dick Stromberg, a consultant in information systems at Du Pont Co.

However, some users and observers raised concerns that an architecture could be long on strategy and short on real products for some time.

"I have one problem here, and it's the same problem I have about lots of SAA," said George Schussell, president of Digital Consulting, Inc. "Nice concept, but the engineering takes four times longer than it should take."

However, Daniel J. Cavanagh, a senior vice president at Metropolitan Life Insurance Co., said he would find a long-term architecture useful. "The architecture statements are sometimes criticized, but as a customer, I need this," he said.

Back-office system up and running at Sears

BY MICHAEL FITZGERALD
CW STAFF

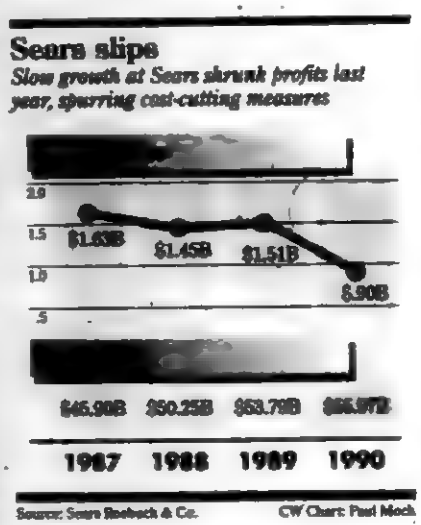
CHICAGO — The back office at Sears, Roebuck and Co. will be a little different this week, thanks to the information systems department's meeting a major deadline at Sears' Merchandise Group.

March 1 was the stated deadline for rolling out what Sears calls "the Hub," a centralized system for back-office functions that, in some cases, were done by hand and a new set of customer service options centered largely on giving customers direct lines to Sears' service groups.

The Hub was up and running in 843 of its 863 stores, the company reported.

The purpose of the Hub strategy is twofold. On the one hand, Sears wants to improve its customer service.

On the other hand, the Merchandise Group, which runs the retail arm of Sears, is battling slumping profits and has lost its long-standing place as the nation's No. 1 retailer, slipping to third place behind discounters Wal-Mart Stores, Inc. and K Mart Corp. Installing back-office systems in-store is expected to help Sears eliminate 21,000 positions and slash $250 million per year from its operating expenses.



Now Sears has organized its customer service into one center and gives customers the option to call service representatives directly rather than going through the customer service desk.

In the back office, general ledger, payroll, time card and accounting functions that had been done by hand for years are now automated. Customers will also be able to pay their Sears credit card bills at any point-of-sale terminal in a store.

The changes have been immediately effective, according to J. Kevin Coffee, manager of the Sears store in the Orland Square shopping mall in Orland Park, Ill. The Orland Square store was one of Sears' 10 test stores for the back-office project.

Coffee said the shift to automation has greatly improved store efficiency and has improved his ability to do his own job.

Sears had no comment on when it would automate the remaining 20 stores.

Transaction council asks IBM, Unisys to restructure benchmarks

BY J. A. SAVAGE
CW STAFF

Noting that IBM and Unisys Corp. took advantage of low-cost storage media to weight their transaction processing benchmarks, the Transaction Processing Performance Council recently voted to ask the two companies to redo their benchmarks.

"Up to now, everyone used hard disks. IBM and Unisys used tape drives, which cost less, and, as a result, had a better price/performance ratio," said Kim Shanley, spokesman for the organization. The 37-member council is a nonprofit consortium whose mission is to put out a standard benchmark for transaction processing.

Shanley said the council, which gave IBM and Unisys 90 days to rerun their tests, considered the transgressions "an honest mistake." He added that the council's specifications required there be eight hours worth of on-line storage and that storage must be able to be randomly accessed within one second.

Unisys, which is set to announce transaction benchmarking results on its mid-range and high-end Micro A systems Wednesday, would not detail which systems were the target of the council's vote, but according to Frank Stephens, an in-house systems design consultant at the company, what the company has published so far on its low-end Micro A and U6000 series followed the council's data storage procedures.

No confusion intended

An IBM spokeswoman noted that the complex TPC/A structure was open for ambiguity and that IBM was not trying to be misleading. She said IBM will reprice its results, and the addition of disk prices should have a minimal, perhaps 5%, impact on the total price.

IBM's disputed benchmarks on a local-area network for its RISC System/6000 Model 550 produced 32 trans/sec. and cost $20,400 per transaction. Three other models were also cited.

Unisys would not make its disputed benchmarks available.

In comparison, Tandem Computers, Inc. published a benchmark on a wide-area network of $28,850 per transaction for its CLX 840 and $31,290 per transaction for its CLX 820 with 25.9 and 13.2 trans/sec., respectively.

Hewlett-Packard Co. benchmarked its HP 9000 Model 842S on a LAN at 33 trans/sec. at a cost of $25,500 per transaction.

Canadian

CONTINUED FROM PAGE 1

be reusing the equipment when we implement the new platform," said Bill Rowe, vice president of information technology services at Central Guaranty.

Still, there is disappointment and frustration that the project did not go through.

"Basically, OS/2 proved to be unserviceable in the field," said John Williams, OS/2 project manager at TCC. Williams and Montgomery agreed that handling upgrades or fixing software problems at remote sites was more than TCC could handle from within its 200-person information systems staff, and IBM was unable to provide effective service.

"The thing that got utterly maddening was that we couldn't predict when something would happen or wouldn't happen," Montgomery said. "We'd have problems reported out in the field, and we couldn't duplicate them in our model office here."

Not up to par

While IBM resolved some of the issues facing TCC, such as a tendency for the local-area network to crash when documents were printed, its service fell short, despite a last-minute push to save the project, which was canceled in December.

An IBM spokeswoman said Version 1.3 of OS/2 Extended Edition, which shipped at the end of December, corrected many of the problems with OS/2 Extended Edition Version 1.2, and IBM said it was providing effective service to TCC.

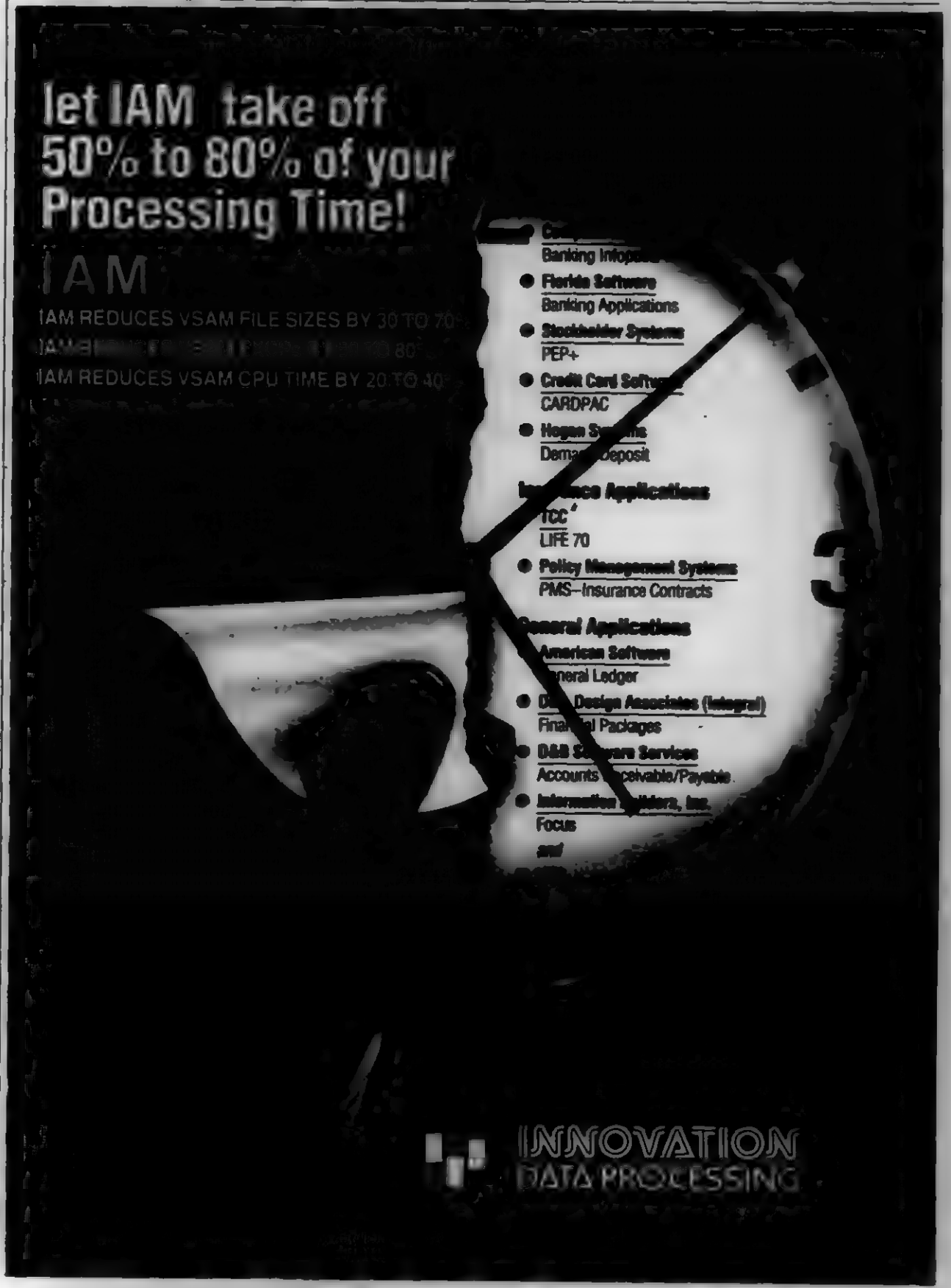
"We'll work with them to give the solution they want, whatever that is," the spokeswoman said.

"There definitely were some general performance and size issues with 1.2 that we've seen some tremendous savings on since we started with 1.3," said Mark Jankowski, director of data services at Frito-Lay, Inc. in Dallas. Frito Lay is in the process of migrating from OS/2 Extended Edition Version 1.2 to Version 1.3.

Despite TCC's dissatisfaction with IBM's overall OS/2 service, Montgomery praised individual IBM representatives for their efforts.

Montgomery said he did not think the project's death was a potential nail in OS/2 Extended Edition's coffin, despite the product's sluggish reception by the market.

"It's hard to say that [this is] a damning indictment of OS/2," Montgomery said, although he added that TCC will continue to use OS/2 as an application development tool.



NEWS SHORTS

Apple has "near final" System 7

The long-awaited next-generation operating system for the Apple Computer, Inc. Macintosh moved a step closer to reality last week when Apple said it is ready to ship a "near final" version of System 7 to 13,000 Macintosh hardware and software developers. Apple said it expects to ship System 7 to users later this year.

Memorex releases midrange disk

Memorex Telex announced its 3936 Disk Storage Subsystem for connection to IBM's Application System/400, 9370 and System/38 midrange systems last week. The Memorex disk offers full compatibility with IBM's 9336 5¼-in. disk, which was introduced last August but is still not shipping in volume. The 3936 also emulates the IBM 9335 14-in. disk, Memorex officials said. The new disk is 40% smaller than its IBM counterpart and sells for $69,000 in a base configuration that stores up to 3.4G bytes of data, Memorex said.

OEMs get OS/2 Version 1.3

Microsoft said it is now shipping OS/2 Version 1.3 to more than 100 OEMs, including Compaq Computer Corp. and NCR Corp. However, Microsoft recommends OS/2 1.3 for "mission-critical and server-based applications," while IBM has been touting its memory savings on the desktop. The Microsoft OS/2 1.3 OEM Adaptation Kit is functionally equivalent to IBM's OS/2 1.3 and includes improved performance for memory constrained environments, reduced memory and disk requirements, better font support, improved printer drivers and a number of other Systems Application Architecture features.

Ross releases Ultrix port

Redwood City, Calif.-based Ross Systems, Inc. announced last week that it has ported its accounting distribution software product line to Digital Equipment Corp.'s Ultrix. The Renaissance Open Series product line, due out in June, includes everything in Ross's VMS accounting distribution software line except the human resources package, which is due out later in the year, according to Ross Chairman Dennis Vohs. Pricing starts at $16,000 per module, he said.

HDS disks shipping in volume

Hitachi Data Systems Corp. (HDS) said last week it has resolved some engineering problems that cropped up during an early support program for its HDS 7390 disk drive. The IBM 3390-compatible drives are now shipping in volume, HDS said, adding that customers can expect delivery in 60 to 120 days. While 7390s have officially been in "general availability" since January, customers have reported delays in shipments. HDS said it made minor "engineering changes" in the disk drives' electronic components. These included adjustments to the "gain" of channel signals passing through a disk controller circuit board used for remote maintenance.

Novell profit soars

Novell, Inc. saw its income for the first quarter more than double compared with one year ago. Profit for the quarter ending Jan. 26 rose from $15.1 million last year to $30.4 million this year. Revenue increased from $105.9 million in the first quarter of last year to $134.6 million this year, a 27% boost. Software accounted for 90% of sales in the first quarter, compared with 72% one year ago for the networking vendor.

Unisys wins piece of HUD deal

Unisys Corp. has moved in as part of Martin Marietta Information System's recent $526 million, multiyear outsourcing contract with the U.S. Department of Housing and Urban Development (HUD). The deal calls for Unisys to provide multiple 2200/400 mainframes and 1100 series mainframes as well as Unisys U 6000 Unix-based minicomputers to Martin Marietta data centers supporting the HUD applications.

More news shorts on page 84

Digital Research hopes to exploit MS-DOS gaps

BY PATRICIA KEEFE
CW STAFF

After years of laboring in the shadow of Microsoft Corp.'s MS-DOS operating system, Digital Research, Inc. (DRI) has launched an aggressive promotional assault designed to spur corporatewide defections to its DR DOS alternative.

During the next 90 days, users can upgrade to DR DOS Version 5.0 for $79; it normally sells for between $120 and $199. Gold Disk licensees will pay $59 or $69 per user. MS-DOS retails for $99.

Early reports from converts, mostly front-line managers and programmers who have tested DR DOS against Quarterdeck Office Systems' QEMM and beta-test copies of Microsoft's DOS 5.0, indicated that DR DOS is technically superior — particularly in memory-constrained, networked environments.

Better memory management, coupled with the ability to install drivers in high memory, has won over at least one large account, a major U.S. government financial agency. Rick Seymour, chief of electronic data processing, said the agency, which he requested not be identified, has already installed DR DOS on 4,000 machines and will boost that number to 14,500 by April.

While DR DOS has won over some engineers and technical gurus, its progress has been stalled by lengthy product evaluations.

DRI "shot itself in the foot" by not shipping DR DOS at $99 in the first place, said Bjorn Billings, Pan American World Airways' data center manager of microprocessing.

Searching for approval

Both the company and its supporters conceded that DRI faces an uphill battle getting DR DOS on corporate "approved lists."

DR DOS allows users to load both the DOS kernel and network drivers in high memory, freeing up at least 50K bytes. Users said it also provides better file management and task switching, a friendlier interface, fewer maintenance headaches and built-in utilities that can save as much as $300. For example, a built-in link eases data transfer.

Conversely, one user dismissed MS-DOS 5.0 as a minor upgrade. "I'm not impressed," he said. He added that a fellow beta tester gets 8K fewer bytes of memory under DOS 5.0 than under DR DOS. Still other users said DR DOS has proven to be more stable running Windows than DOS 4.01 or 5.0.

More damning are charges that DOS 5.0 will force rewrites of communications packages. "By the time you buy DOS 5.0 and connectivity upgrades, you'll easily be up to $200," said a systems analyst at a Fortune 100 company. DR DOS, meanwhile, picks up kudos for its compatibility with DOS and networking applications.

Memory gains have ranged from 50K to 120K bytes, depending on configuration.

The New York State Health Department's Division of Health Care Financing is trying to downsize a mainframe application to personal computers. The need for large spreadsheets, network drivers and other memory-resident programs outstripped MS-DOS' memory, forcing the health agency to switch to DR DOS.

However, technical superiority isn't everything. "It was a problem bringing [DR DOS] in," acknowledged Ron Kosar, office automation development manager for the Aero & Naval Groups at Martin Marietta Corp. The reigning attitude, he said, was that "if it doesn't have 'Microsoft' on the front, it wasn't any good."

User needs, coupled with experience, are said to be keys to winning over leery department and information systems managers. It has brought skeptics around at Martin Marietta, where engineers in particular love the package, according to Kosar. He has 200 licenses, 70 of which are in use.

Bellcore speeds time with laser clock

BY GARY H. ANTHES
CW STAFF

LIVINGSTON, N.J. — Bellcore said last week it has developed an ultraprecise laser-based clock that could boost the speed of high-performance computers up to 10 times.

Bellcore said its clock, which is the size of a grain of sand, can work at up to 8 GHz. Quartz clocks in today's supercomputers tick every billionth of a second or so, effectively limiting the number of instructions performed each second to that rate.

Ken Young, a district research manager, said the technology may find commercial applications within five years. Companies could license the technology from Bellcore or build their own clocks.

One of the first commercial uses may be in computers from Supercomputing Systems, Inc., the firm started by ex-Cray Research, Inc. supercomputer designer Steve Chen. Chen's firm and Bellcore are jointly conducting research on the techniques underlying the Bellcore invention, Young said.

Industry analyst Gary Smaby said there is speculation that Supercomputing Systems will bring out a 32-processor prototype by the end of next year. He also said the firm has lined up three "investor/customers": Du Pont Co., Ford Motor Co. and The Boeing Co.



Bellcore laser, *no bigger than the pupil in Washington's eye on a one dollar bill, may solve computer synchronization problems*

Bellcore attached the laser to a "star coupler" that splits the emitted light into 1,024 laser beams, each of which can then be sent down an optical fiber to control a processor or other device on a circuit board.

The accuracy of the timing signal stays true to 12 trillionths of a second over all 1,024 circuit boards, Bellcore said. Conventional clocks are subject to about 10 times that much variation, requiring that their processors run at slower speeds in order to mask the random fluctuations in frequency, called "jitter."

According to Young, Bellcore's owners, the regional Bell telephone companies, may be able to use the clock in new high-speed switches.

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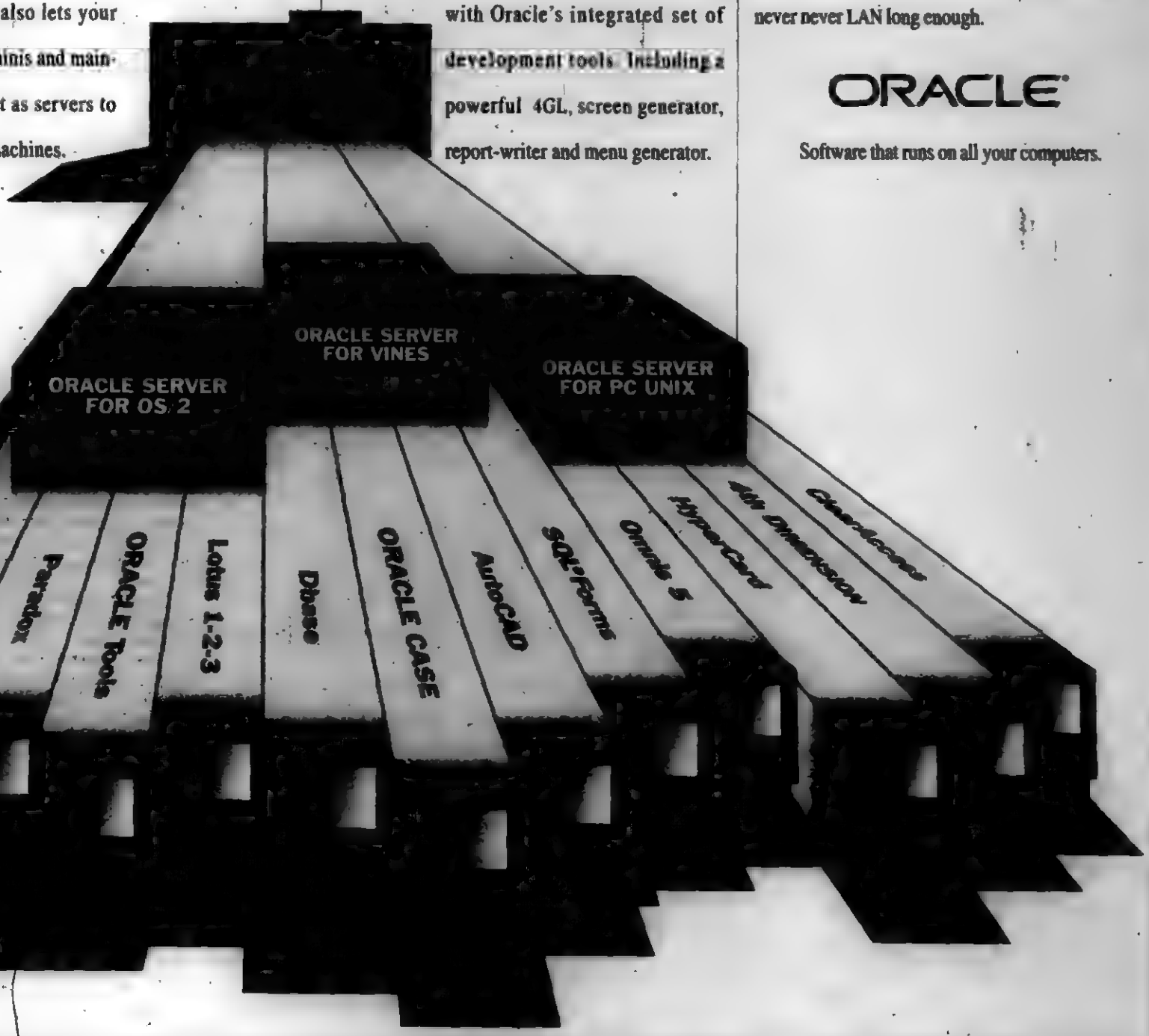
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Response to SQLwindows for Btrieve divided

BY JIM NASH
CW STAFF

REDWOOD CITY, Calif. — Observers saw as many questions as answers coming from last week's Gupta Technologies, Inc. SQLwindows for Btrieve announcement. The Menlo Park, Calif.-based database front-end and gateway developer said it would begin shipment of the tool this week.

With SQLwindows, Gupta's front-end development package, programmers can create and alter Microsoft Corp.'s Windows 3.0-based applications for Novell, Inc.'s Btrieve record management Netware Loadable Module (NLM). Last year, Provo, Utah-based Novell purchased a 19% interest in Gupta. This is the first product to come from the relationship.

Rich Finkelstein, a partner at Chicago-based consulting firm Performance Computing, said development for both Windows and NLMs can be risky. Both are unprotected environments, Finkelstein said, allowing one application to infringe on another and destroy it.

SQLwindows is a credible tool for developing Windows applications that access Btrieve, he explained, but the lack of protection in Windows and Btrieve is likely to scare off some potential users. Speaking last week at a press and analysts briefing, Gupta President and Chief Executive Officer Umang Gupta said there are 18,000 registered Btrieve developers.

One developer for Btrieve, whose firm has served as a beta-test site for SQLwindows for Btrieve since last March, said he has been satisfied with its performance. Bill Radford, a principal at Radford Associates, a Lyndhurst, N.J., developer of human resources software, said he has had no complaints with Btrieve on his file servers. The product, Radford said, offers a graphical user interface that prevents him from having to write his own.

Another beta test user of SQLwindows for Btrieve, Don Awalt, president of RDA Consultants Ltd. in Hunt Valley, Md., said the product quadrupled software productivity for the company over Cobol applications development.

At last week's briefing, some questioned the wisdom of Novell and Gupta, two companies with competing database engines, working so closely together. How will they reconcile Btrieve sales with Gupta's SQLbase sales?, asked Mike Heylin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif. A Gupta spokesman said the two would coexist, each being sold on its own merits. A Novell spokeswoman said only a detailed examination of each engine would reveal advantages of either.

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Price entitles user to year of free upgrades	YES	NO	YES
Automatic distribution of product upgrades	YES	NO	NO
Benchmark compile-and-link speed[c]	25 sec. (3 times faster)	1 min. 14 sec.	1 min. 14 sec.
Benchmark execution speed[c]	4 min. 11.4 sec. (4.3 times faster)	18 min. 17.2 sec.	18 min. 17.2 sec.
Benchmark executable file size[c]	104,713 bytes (2.6 times smaller)	282,288 bytes	282,288 bytes
Benchmark source available for review[c]	YES	N/A	N/A
DOS memory extender included	YES	NO	YES
No-charge run-time for DOS memory extender	YES	NO	NO
No-charge support for both EBCDIC and ASCII under CICS and IMS	YES	NO	YES
Dynamic Link Library (.DLL format) support under DOS as well as OS/2	YES	NO	NO
Dialect support for IBM VS COBOL, VS COBOL II, ANSI-74, ANSI-85, etc.	YES	YES	YES

a. Both are Micro Focus products. Company and product names are registered trademarks of their respective holders. Product information was current as of 12/1/90.
b. The COBOL/2 list price is $900. To get the editor, it's necessary to pay a $45 postage and handling charge.
c. This benchmark was created by Realia to test the competing compilers. Different benchmarks can lead to different results: the best benchmark is your own application.

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Attachmate buys up 3Com OS operations

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. continued its divestiture of network operating system operations last week with the sale of its IBM Systems Network Architecture (SNA) gateway product, newsletter and seminar operations to Attachmate Corp. in Bellevue, Wash.

The sale consisted of virtually everything 3Com picked up in 1988 with its purchase of Communications Solutions and Information (CSI). It is the latest in a series of steps back from network operating systems taken by 3Com [CW, Dec. 17, 1990]. Terms of the agreement have not been disclosed.

A spokesman for Attachmate said last week that the purchase was aimed more at building a strong consulting arm for the company than continuing the division's Maxess SNA gateway.

Maxess support continues

Attachmate will continue to sell, service and support Maxess gateways, which began shipping last year. Attachmate has said a new version of Maxess is in the pipeline, but added that this version will be the last. No further enhancements will be made to the product, according to the spokesman.

Financial carrots will be dangled to encourage Maxess users to switch to Attachmate's Extra gateways. Extra is a DOS-based gateway. The spokesman said Attachmate is working on an OS/2 version, but he could not say when the product would be released.

This is troubling news for 3Com users who enjoyed having 3Com products that hove closely to Microsoft Corp.'s LAN Manager. According to Bill Birckhead, leader of a 3Com user group based in New Jersey, users had been looking forward to greater security, naming conventions and other features from LAN Manager. Most of 3Com's networking products and divisions have been licensed to Microsoft.

Birckhead said users needing SNA gateways had hoped whoever bought the CSI department from 3Com would tie new development to LAN Manager enhancements.

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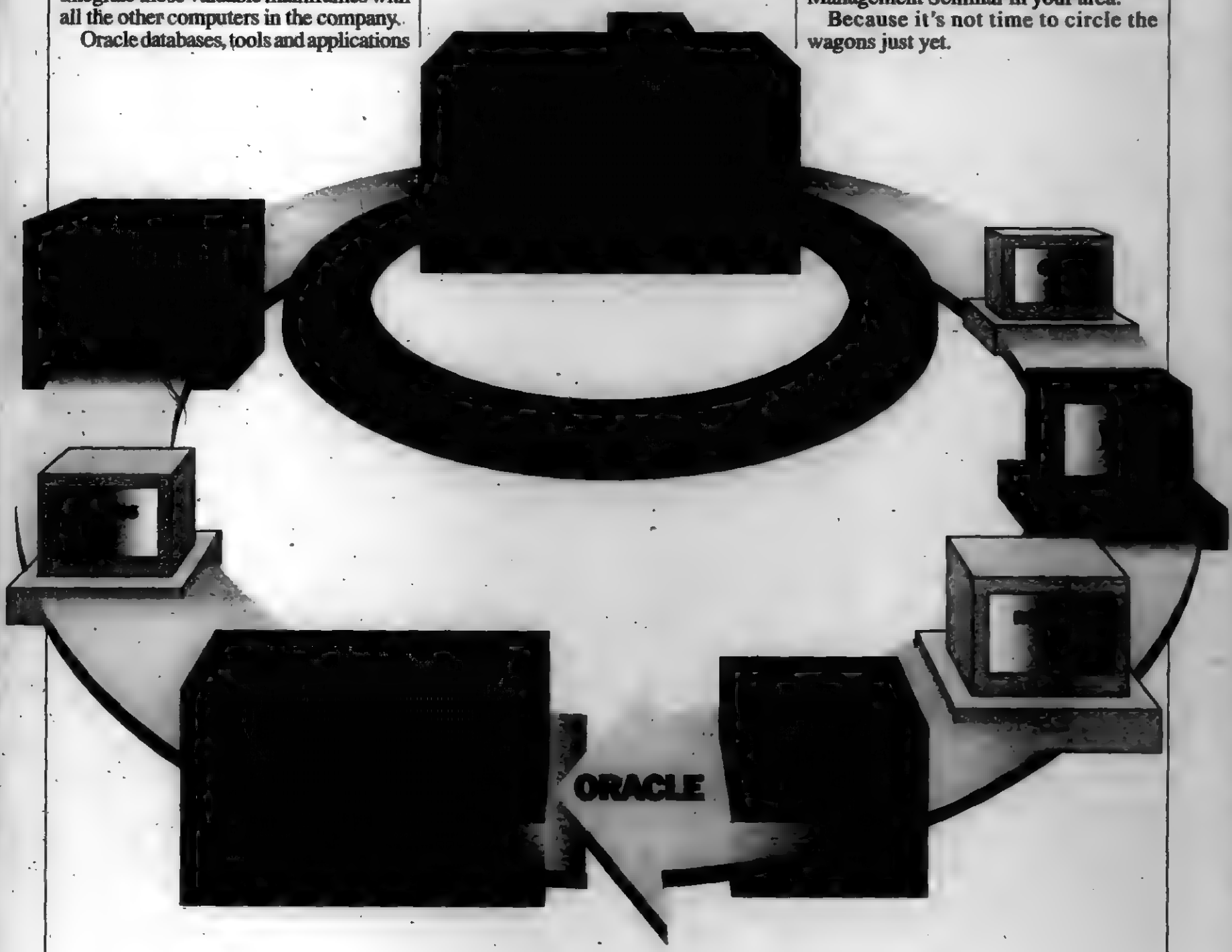
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NASD gets fail-safe network

MCI to provide stock market security and disaster recovery

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — MCI Communications Corp. said last week it will set up and manage a nationwide data network to provide security and disaster recovery for users of over-the-counter stock market information from the National Association of Securities Dealers (NASD).

Information about trades, prices and volume will be broadcast from NASD's data center in Trumbull, Conn., to more than 80 subscribers and vendors, such as Quotron Systems, Inc., who in turn distribute the data to 170,000 terminals at brokers' offices and elsewhere throughout the world. The data will move over an MCI digital backbone to eight access points throughout the U.S., where subscribers will tie in via leased lines.

In addition to the broadcast data, the network will carry information from market makers in NASDAQ stocks to Trumbull. Market makers are required to report their trades within 90 seconds.

"Disaster recovery was the main impetus for this," said Doug Moore, associate director of network planning and operations at NASD. Under the current scheme, subscribers have arranged for their own dedicated lines to the Trumbull data center.

The cost of those lines has prevented most subscribers from also leasing lines to NASD's backup computer hot site in Rockville, Md., leaving them unprotected in case of an outage at the Trumbull data center.

With the new network, if the Trumbull site goes down, NASD will direct MCI to route traffic to Rockville. Similarly, if MCI's ring-shaped network is broken, MCI will automatically route traffic over another path.

Subscribers will pay no more — and many will pay less — than they are currently paying for communications, Moore said. Those at considerable distances from Trumbull will pay as much as 50% less, he said, because the backbone cost is shared with other users while the cost of a separate link to Rockville can be avoided entirely.

An estimated $10 million over the life of the five-year contract will be paid by NASD members, brokers and data vendors that use the network, Moore said. MCI will be subscribers' single point of contact for installation, modem equipment, billing and trouble reporting.

The nationwide network is scheduled to be in operation by August. Access points will be located in Trumbull, Rockville, New York, Chicago, St. Louis and San Francisco.



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Sybase cuts out SQL middleman

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — Sybase, Inc. said last week that it will cut out the middleman in the link between personal computer-based applications and Sybase relational database management systems running on Unix and Digital Equipment Corp. VAX computers.

The company announced PC Net-Library, which eliminates the need to use the Sybase/Microsoft Corp. SQL Server as a database gateway on an OS/2 local-area network. This could save users the $2,500 cost of OS/2 SQL Server and increase the number of supported network protocols from one to more than 20.

SQL Server is also a full release behind the current Sybase 4.0 RDBMS running on Unix and VAX machines. For $145 per interface, PC users can now load the PC Net-Library modules of their choice and directly connect with remote Unix and VAX servers outside their LAN.

Seeds of support

Sybase's PC Net-Library of software modules works with SQL Server's DB Lib 1.1 utility, which is supported by scores of independent software applications suppliers. The 20 new protocols in PC Net-Library add support for Transmission Control Protocol/Internet Protocol, DEC's Decnet, Microsoft's LAN Manager, IBM's LAN Server, Novell, Inc.'s Netware and AT&T's Stargroup, among others.

Some Sybase users questioned last week said they believe the new product will bring PCs closer to the enterprisewide network and its corporate databases. "This product gives us more reasons to migrate our stand-alone Personal System/2s and Compaqs into our networked database applications," said George Reid, information systems director at Sanford C. Bernstein and Co., a New York investment brokerage firm that uses the Sybase RDBMS on multiple VAX systems.

"We can use data on the SQL Servers we already have and deliver a database environment to our PC community for the price of some extra disks," Reid added.

Microsoft and Sybase have agreed to share software support duties with a network of third-party vendors through Sybase's Synergy maintenance program.

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For the Jet Propulsion Laboratory (JPL) in Pasadena, California, and its "Magellan" Venus Probe, SYBASE is the key to a new computer system called Spaceflight Operations Center.

SYBASE handles huge amounts of on-line data from Magellan for Spaceflight Operations, filling an 8 gigabyte database roughly every month. SYBASE also supports true distributed processing capabilities by presenting data, divided among multiple workstations, as a single, seamless database. And it helps deliver high application availability, with transaction logic changes, backups, recoveries, and diagnostics all taking place while applications run.

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Amdahl sets Escon date

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — Amdahl Corp. said last week that it will match the IBM Enterprise System/9000's Escon fiber-optic channel features on its 5990 and 5995 mainframes in the second quarter of 1992, about two months later than analysts had expected.

Amdahl had promised support for Escon when the 5990 and 5995 were announced last September.

"There's no question that Amdahl's Escon support is coming on the far end of the range that customers expected," said Frank Gens, vice president of technology assessment at Technology Investment Strategies Corp. in Framingham, Mass. "Amdahl had been saying earlier that it would deliver Escon support within 12 to 18 months of IBM's delivery."

Various models shipped

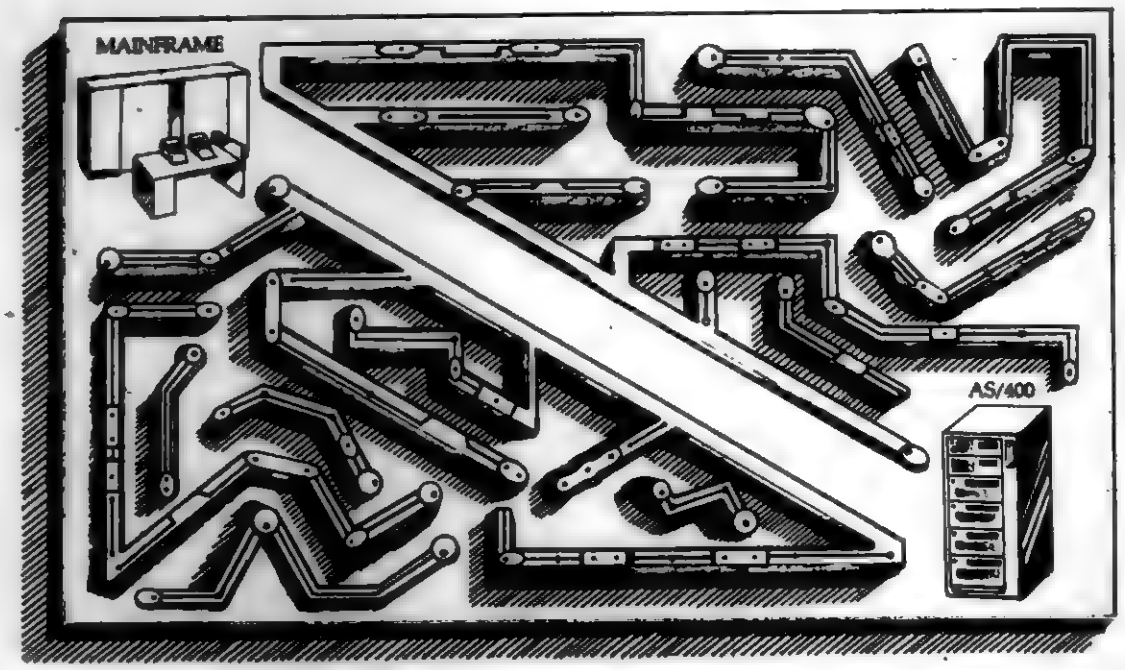
IBM began shipping the Escon feature shortly after the ES/9000 introduction in September and accelerated shipments in November, Gens said. Amdahl plans to ship three- and four-way models of its answer to the ES/9000, Amdahl 5995M mainframes, in the fourth quarter of 1991; six- and eight-way models of the 5995M will follow in the second quarter of 1992.

However, support for IBM's Escon Converter will come in the fourth quarter of this year for Amdahl's 6100 disk drive controller, the firm said. In practical terms, Amdahl customers who own IBM machines will then be able to use IBM's Escon Converters with their Amdahl disk drives, bypassing the Amdahl CPUs and linking Amdahl and IBM systems.

"At that point, the motivation to get Escon out the door quickly is not as great," said John Jones, a senior analyst at Montgomery Securities in San Francisco. The Escon converters link older bus-and-tag cables with the Escon fiber channels.

Amdahl will match other new IBM ES/9000 features, including IBM's Sysplex clustering architecture, the Sysplex Timer and the Cross-System Coupling Facility, in the third quarter of 1992 on Amdahl 5995M models and in the fourth quarter on Amdahl 5990 and 5995A models.

The lag in Escon support may not be a concern for Amdahl sites, some users said. "It would be nice if Amdahl could ship that kind of feature closer to the time IBM ships it," said an information systems planner at a large West Coast site that teams IBM and Amdahl mainframes. "But we think we're going to slowly transition to Escon since that move has to be coordinated with other sites around the country."



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Two charged in plot to push hot PCs on Exchange

BY RICHARD PASTORE
CW STAFF

BOSTON — The Boston Computer Exchange, the country's first and largest used personal computer reseller, was used as an unwitting fence for thousands of dollars worth of stolen PC equipment, Exchange executives said last week.

Exchange records show that two Massachusetts residents used the brokerage to conduct approximately 75 PC hardware transactions. The transactions included about $20,000 worth of equipment identified as stolen from sites around New England, particularly colleges and schools.

According to the State Attorney General's Office, a warrant has been issued for the arrest of Carl Reid on charges of receiving stolen property. Louis Jatta of Waltham, Mass., was arrested on the same charge, posted bail and then fled. Both men are still at large.

A crack in the system

The stolen goods slipped through the Exchange's safety net, which involved serial numbers and caller identification.

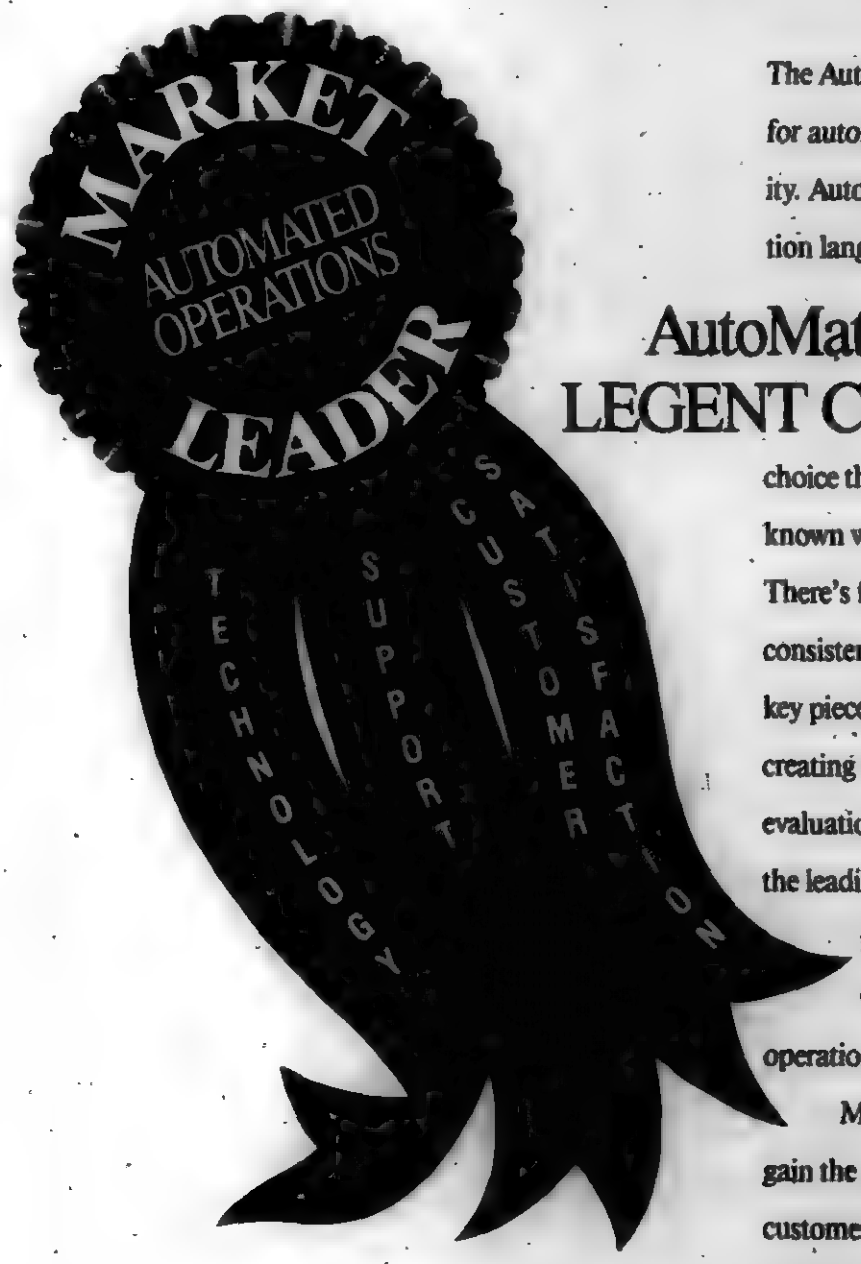
"We were duped," Exchange President Alex Randall said, noting that this was the first such incident that he knows of in the Exchange's nine years of operation.

The brokerage has since tightened controls, which Randall declined to describe for security reasons. The Exchange has offered to reimburse all customers who purchased the stolen equipment.

The real problem facing secondary market resellers is the lack of ownership records, Randall emphasized. He is proposing to industry manufacturers and associations that a central recording facility be established to maintain original owner names and serial numbers. The information would be available by telephone and could be checked before any after-market transactions are made.

"I see this case as an opportunity to make poignant to the industry the seriousness of this problem," Randall said. If measures to ensure ownership integrity are not taken, "PCs could become the car radios of the 1990s."

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TECH TALK

Parallel computing action

■ The Northeast Parallel Architectures Center at Syracuse University has launched a program to bring parallel computing technology to businesses in the state of New York. The program, called Advanced Computing Technology as an Innovative Opportunity Now (ACTION), offers training, education and development programs in computational science — the hybrid field of applying computers to scientific and industrial applications. ACTION team members will assist corporate researchers in electronics, transportation, manufacturing and other fields in identifying applications suited to parallel computing. The team will also develop customized software tools and applications for industrial applications.

Powerful in Pittsburgh

■ The Pittsburgh Supercomputing Center has linked two supercomputers of radically different design and successfully distributed an application between the two at data rates approaching 1G bit/sec. Linking the two computers — a Thinking Machines Corp. Connection Machine and a Cray Research, Inc. Cray Y-MP — allows scientists to distribute tasks according to what each does best, creating one of the most powerful computing environments ever, according to scientists at the Pittsburgh center. The high-speed data transfer was accomplished with a High-Performance Parallel Interface, an industry standard developed at Los Alamos National Laboratory. "This is a critical step for supercomputing," said John Mucci, vice president for research at Thinking Machines. "This kind of application-based collaboration will allow the computational science to address a whole new class of supercomputing tasks." The Pittsburgh center is a joint project of Carnegie Mellon University, The University of Pittsburgh and Westinghouse Electric Corp.

Looking ahead to the next century

Future technology will be discussed at an upcoming conference in San Antonio

BY MICHAEL ALEXANDER
CW STAFF

Are you ready for the 21st century? That is the question that will confront some 2,000 computer scientists convening in San Antonio this week for the Association for Computing Machinery's 19th annual Computer Science Conference. The scientists are slated to discuss emerging technologies as well as ways to prepare for the coming century.

Keynote speakers are scheduled to deliver talks on research trends in four key areas: global networks, improved workstations, parallel computing and memory programming. Following is a preview of what they plan to say based on interviews conducted last week.



Mindy Hobson

Global networks

Craig Fields, president of Microelectronics and Computer Technology Corp. in Austin, Texas, said he foresees an explosion in global digital networking and distributed computing driven by changes in telecommunications regulation and fiber optics, among other technologies.

Some characteristics of this global infrastructure include user-friendly interfaces; commonplace use of artificial intelligence; security privacy; and trust for protection from intrusion, multinational capabilities, scalability and customization, Fields said.

"It will be transparent, seamless, high-capacity — up to gigabytes per second between fixed sites — and ubiquitous, sustaining a large number of portables and mobile subscribers with increased availability of spectrum and digital signal processing," he predicted.

The network will be routinely used to transmit not only text and speech but also images, video and other permutations of multimedia, Fields said. "The raw data rate will be a few gigabytes, although the on and off ramps might slow you down. That will occur in the mid- to late '90s.

"The intelligent network, or global network, will become integral to the way we do business and even the way we live our lives," Fields said. "It will reach not only businesses, government and schools but homes as well."

Improved workstations

"I would say by the mid-'90s, we are easily going to have workstations capable of 100 plus [millions of instructions per second] and are likely to have photorealistic, three-dimensional visualization capability and interfaces to create a virtual reality presence," said Phil D. Hester, director at IBM's Advanced Workstation Division Engineering Center in Austin. Hester is responsible for the development of IBM's reduced instruction set computing hardware.

"It is also very clear we'll have large amounts of real memory to do computing on a real-time basis," Hester said.

"It would not surprise me to see well in excess of 128M bytes as typical, particularly at the high end. To play back in real time a series of interactions, we'll need more than 32 bits of addressing, and we'll have applications with more than 4G bytes of addressability. At some point in the 1990s, we'll start to see 64-bit systems show up," Hester added.

Industrial, electrical and other forms of design have reached the end of a progression that began with a paper and pencil and ended with computers capable of realistic simulations, according to Hester.

"Now you can simulate a bridge, for example, inside a workstation and do all sorts of optimizations," Hester said. It is no longer necessary to build models before actually building the product, he added.

"The question is, what happens next?" Hester said. "Now we start getting into interaction with design through virtual reality. We're not really doing interactive modeling of how a person will deal with objects. We'll extend into 3-D space and insert the self into a reality that is simulated on-screen."

Parallel computing

Parallel processing will move out of research centers and into the mainstream, assuming that certain conditions are met, according to H.T. Kung, a professor of computer science at Carnegie Mellon University and a leading researcher in parallel computing.

"One, we need to have a more widespread model of parallel computing to allow for the development of software tools that could be used to create applications for a variety of parallel machines instead of specialized applications for each machine," Kung said.

"The second point is to improve interprocessor support," Kung said. The goal should be to develop ways to link parallel processors not only to each other but also to processors in sequential computers.

"This trend is clear: [Intel Corp.'s] I486 and 586 and Motorola, Inc.'s processors will have better support for parallel computing so that you can piggyback on mainstream architecture investment," Kung noted.

The third condition that must be met is to increase the use of parallel processing machines in general environments, Kung said.

"We need a network that supports a variety of applications, including business. It is very hard for one parallel machine to handle all kinds of applications, so it must be paired with other general machines, each one doing what it does best. The bottom-line way to do that is a network," Kung said.

Memory programming

"I have been thinking about a programming language that I call Elephant 2000," said John McCarthy, a professor of computer science at Stanford University.

McCarthy is a pioneer in the study of AI and is credited with having coined the term artificial intelligence in 1955 and inventing the LISP programming language in 1958, among other accomplishments.

"Elephant 2000 is associated with a language that communicates in a significant way with people or programs," McCarthy said. The term was derived partly from the adage that an elephant never forgets and from a line in a children's rhyme that says an "an elephant is faithful 100%," he added.

"Consider a computer program that communicates with people or other computer programs, and suppose that these programs belong to different organizations and have to communicate commercial matters like buying and selling," McCarthy said. "For a program to be able to do this, it must be capable of understanding sentences that go beyond those that are simply true or false."

The program must be able to understand other kinds of sentences: assertions, questions, requests, permissions and so forth, McCarthy said.

"You want it to perform these 'speech acts' correctly. If it makes a promise, it fulfills a promise. When a priest says, 'I now pronounce you man and wife,' he is not merely stating an opinion but is also creating the fact that he is doing that," McCarthy explained.

For example, the Elephant 2000 language could be used to design a business program that could be used to accept orders for widgets and automatically arrange for the products to be delivered, according to McCarthy.



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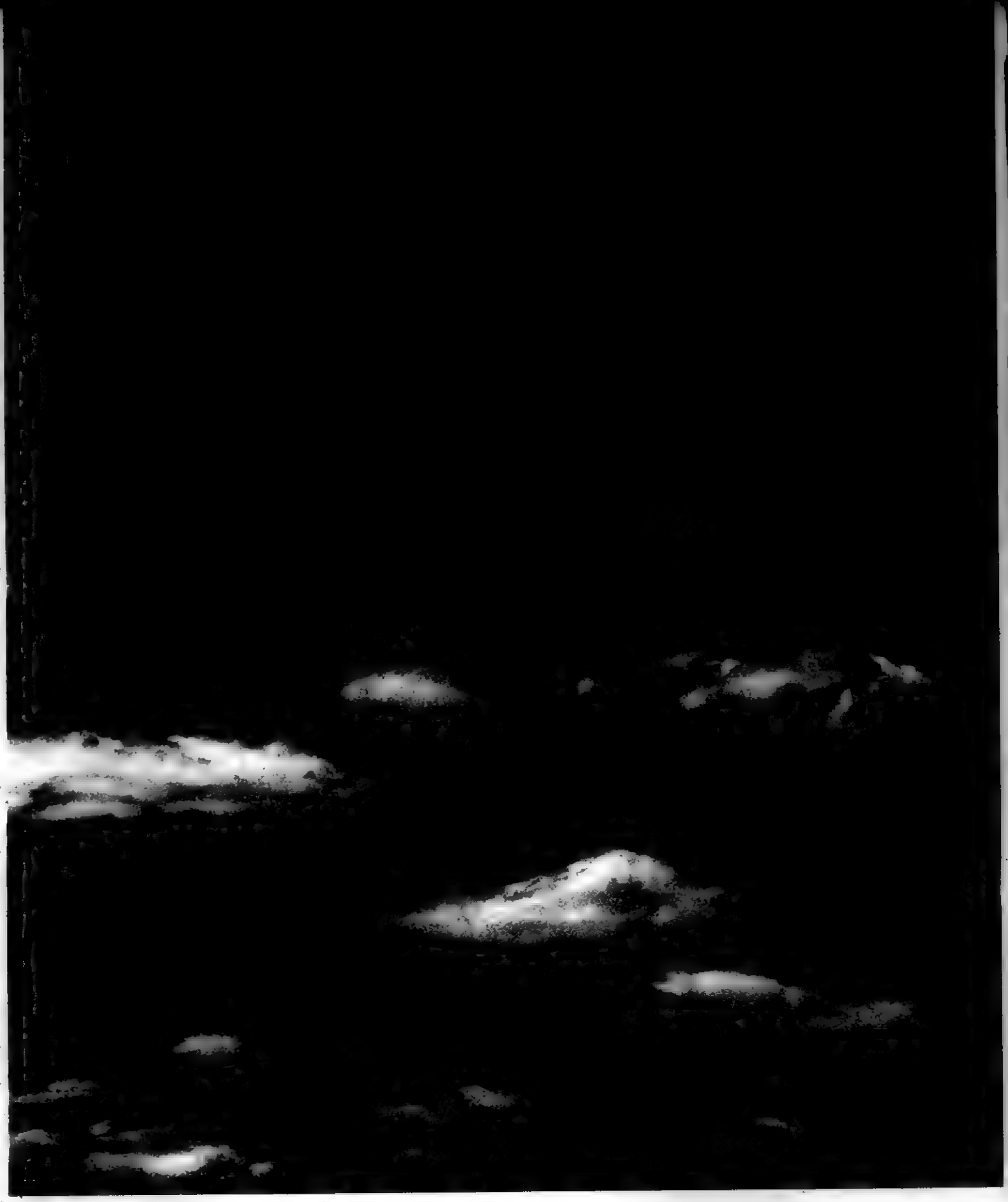
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EDITORIAL

Revolving doors

While recessions and wars come and go, and business fortunes accordingly ebb and flow, one fact of corporate life has remained naggingly consistent: namely, the high turnover of senior information systems executives.

There are no precise turn-over metrics, but estimates of top-job seat changing in the IS suite range as high as 25% annually, with some of the brightest luminaries among those on the move.

Why do the mighty continue to fall or at least move around so much?

The answer will certainly vary from case to case and from company to company, but a recurrent theme has to be connected with the perception at the top of the company that IS hasn't fulfilled its main mission. In recent years, that has been the promise of linking IS strategy more closely with the corporate strategy, thereby creating the elusive grail of competitive advantage.

Have IS strategies failed in large measure? Or have those strategies and the people who hatched them become scapegoats for miscast corporate plans?

The answer, most likely, is somewhere in between these extremes. And while IS management can't do a heck of a lot to rectify senior corporate miscues, consider the hard lesson learned by IS at a large, Connecticut-based insurer.

Two years ago, central IS was put in charge of building a financial management system in one of the largest business units. The corporate directive was to "empower" the unit with a system planned and implemented by IS, but the system would also have to be largely turnkey in nature, with the business unit closely assisting in the design requirements.

Squabbling broke out between the unit and a control-seeking IS department. The project fell hopelessly behind schedule and over budget. Guess who got moved aside?

The company then appointed a non-IS manager to take over the project. The manager had the novel idea of creating a task force comprising business unit and corporate staff members and selected IS consultants as well as an outside consultant.

Today, the project is well on its way toward completion, and the manager is looking to step aside and relinquish control to another IS professional — but one who has greater respect for and understanding of the primacy of the business unit.

So ultimately, the fall of IS in this case had little to do with a failed systems investment or an inherent inability to link that investment to some sort of competitive advantage — at least not directly. The problem was much more fundamental, and fixing it required a clear understanding of the rapidly changing nature of business structures. To quote an old proverb, "The lightning said to the oak tree, 'Stand aside, or take what's coming at you.' "



LETTERS TO THE EDITOR

Don't have a cow

I was quite interested in your news short in the Feb. 11 issue about the deceased cow who "udderly destroyed" the AT&T link in Alabama when a farmer attempted to bury her in a pasture over a fiber-optic cable.

My manager was sad to hear the plight of the cow and was "deeply mooed." But our president thought that it was a "bunch of bull" and that it was the silliest story he'd ever herd. But knowing how you steak your reputation on the facts, you won't get any beef from me.

Hal S. Crawford
Systems Engineer
Modems Plus
Atlanta, Ga.

Filling a niche

Regarding "No software solution is an island," by Charles Wang [CW, Jan. 21], the majority of the piece consisted of unsubstantiated statements and generalizations.

While Wang is correct that we need "carefully designed frameworks and industry standards," this does not force the conclusion that all software using these must come from one vendor.

- Historically, innovation has come primarily from individuals and small companies. Wang states that "it is the same single-product software vendors that fall increasingly short in providing comprehensive solutions." Who asked them to?
- Monolithic vendors such as Computer Associates seem to think more about their bottom lines than about the services they provide. A result is the general neglect of niche products and products for niche industries by the larger vendors.
- If there are any savings because of scale, they are not passed on to the customers. In practice, larger vendors have larger overhead, and it is the smaller supplier who delivers better cost effectiveness.

Gerhard Postpischil
President
Expert System Programming, Inc.
Vienna, Va.

Blaming the victim

Who's the real villain?

IBM Credit Corp., in its suit against Comdisco, Cambex and EMC, states that we are all engaged in the practice of taking ICC's property. In other words, IBM is trying to convince the world that it has been robbed. Furthermore, it is trying to identify the robber: "The Third-Party Gang." Somehow, I simply cannot visualize IBM in the role of victim.

At the termination of a lease, IBM takes possession of its equipment in the exact same configuration in which it was originally delivered. As a matter of practice, IBM provides continuous service for these systems, whether or not the configuration has been altered.

IBM also "recertifies" the equipment immediately after the upgrade and after the restoration. ICC also allows its leased equipment to be maintained by third-party maintenance companies, which routinely replace worn-out or defective parts with other equipment.

The above is a long-standing industry practice that, in fact, helped give birth to the leasing industry. Now that IBM has become the dominant lessor, they want to change the rules to suit their requirements.

Yes, a theft has been committed: the theft of the right of any company that does business with IBM to make a sound, reasoned business decision in its own best interests.

Richard J. Egan
Chairman and
Chief Executive Officer
EMC²

Optimum capacity

Having read Tony Baer's article "How to schedule in unexpected events" [CW, Feb. 11], I was very disappointed not to see Capacity Management System from Manufacturing Management Systems (MMS) in Kingwood, Texas, in the top vendor list.

We at Camshaft Machine Co. have been very satisfied users of this finite scheduler since 1986. MMS originally installed it on our System/38 and then migrated it to our AS/400 in 1989. The product is designed as a stand-alone module to be interfaced with a company's manufacturing system. Its capability definitely provides us with a manufacturing competitive advantage.

Gary C. Greenwood
Manager of
Information Systems
Camshaft Machine Co.
Jackson, Mich.

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Beware the fruits of war-tech

U.S. needs to put emphasis on technology for something other than battle

GARY CHAPMAN



The war in the Persian Gulf has demonstrated the extraordinary effectiveness of the U.S.' high-technology arsenal. Pictures of "smart bombs" falling straight down Iraqi smokestacks, of cruise missiles blowing up buildings while leaving adjacent buildings intact and of Patriot missiles destroying hostile Scuds have had a dramatic effect on the country's perception of high-tech weapons. There is, understandably, a feeling of pride and satisfaction among many Americans that U.S. weapons are superior to any in the world.

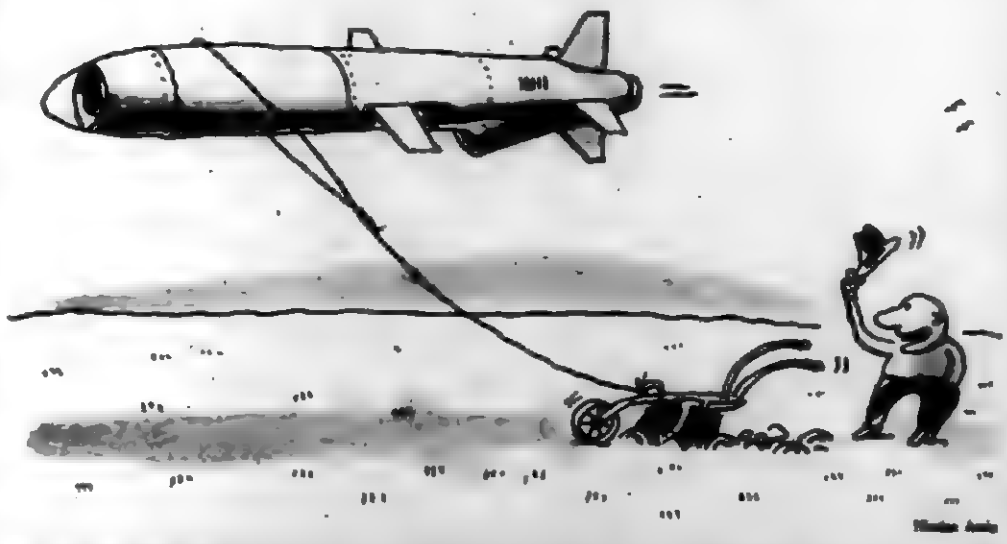
Of course, we need to be careful about our assessment of the performance of U.S. weapons because for now our only source of information about the weapons used in the war is the military. The Pentagon has a notorious history of putting the best face on its weapons and even of falsifying reports on weapons performance.

But perhaps as important as our weapons' actual performance is the widespread perception of exemplary performance, especially among members of the U.S. Congress. One likely result of the successful use of smart bombs, computer-aided phased array radars, cruise missiles, electronic countermeasures and other high-tech weapons is increased support for such weapons among members of Congress over the long term.

Already, there is talk of stepping up the Strategic Defense Initiative (SDI) or "Star Wars" program, and the Bush administration is pushing hard for more funding for SDI. The B-2 bomber, all but dead in the last Congress, is likely to be resurrected. The Advanced Tactical Fighter, which until now has been the subject of scathing Congressional criticism, will have smoother flying ahead.

There are two important reasons to be concerned about this expected result of the conflict with Iraq. The first is that, as the war in the Gulf demonstrated, weapons proliferation comes back to haunt us. Continued development of advanced weapons technology will inevitably put dangerous tools into the hands of people whose ambitions threaten regional or world security.

Iraq was a lucrative customer for military technology, and many countries, including the U.S., were only too glad to sell Saddam Hussein anything he wanted. Defense industries were sitting on profits made from sales to Iraq, while coalition pilots and soldiers were dying from the weapons Hussein purchased.



The second reason we should be concerned about the long-term impact of the war is that the U.S. has been losing its technological leadership to countries that put their high technology into commercial products instead of weapons. The U.S. apparently needs a war to demonstrate its technological prowess these days, and that's not a credit to our country.

During the 1980s, the Pentagon's share of government support for research and development in computer science climbed to over 60%. At the best schools, such as Stanford, Carnegie Mellon and MIT, departmental budgets were almost entirely funded by the U.S. Department of Defense. Moreover, Pentagon funding became skewed toward applications development and away from basic research. In contrast, Japan's Fifth Generation Project was explicitly cut off from military priorities.

Even though the technology that was showcased in the Gulf war is from the 1970s, the Pentagon and the Bush administration are bragging about the investments made in high tech during the 1980s. The message is clear: To maintain world leadership, the U.S. must continue heavy investments in military technology — especially in computers, telecommunications, software and signal processing.

The U.S. may be able to sustain world military dominance with even higher tech weapons than are being shown on CNN. But world leadership no longer depends on military superiority.

If the U.S. continues to direct so much money, talent and attention toward unproductive military systems, the industrial base of the U.S. economy will continue to wither in the face of foreign competition, and U.S. leadership in all nonmilitary aspects of modern life will vanish. The U.S. will become the greatest military power in history with a ruined economy at home.

The defense industry in the U.S. is basking in glory because of the performance of its products in the Middle East. We should be grateful that our weapons worked, but we should be making plans to stop working on weapons. We should take advantage of the unprecedented multilateralism demonstrated in the handling of the Gulf crisis by shutting down the international arms market once the war is over. And we should take whatever steps are necessary to allow computer scientists and all other talented people in the global weapons industry to work on making the world a more peaceful and productive place.

Chapman is executive director of Computer Professionals for Social Responsibility in Palo Alto, Calif.

Gloomy tales don't tell the computer industry's story

AXEL LEBLOIS



What is wrong with the U.S. computer industry? From a macroeconomic perspective, contrary to popular doom and gloom, not much.

The basic indicators look good. Worldwide information industry sales topped $300 billion in 1990, exhibiting an annual growth rate of more than twice the worldwide economic growth. The information technology business is a bright spot in the worldwide economic picture, and U.S. computer companies are carrying the torch. If there is reason to worry, it is because gloomy economic forecasts are rampant.

Taken in the context of the generally gloomy economic picture, statistics can easily be misinterpreted in ways that produce anxiety about the U.S. market and U.S. vendors. For example, a cursory look at spending might indicate that the Western European market is now growing faster than the U.S. market. Western European growth was indeed higher than in the U.S. last year, a growth that was heavily weighted by the appreciation of Western currencies against the U.S. dollar in the second half of 1990. In local currencies, Western European spending grew 11%; in 1989 dollars it would still have been smaller than the 1990 U.S. market.

Despite the recession, industry profitability remains strong. A sample of 31 leading U.S. firms that reported financial results for each year between 1985 and 1990 shows pretax margins in calendar 1990 were only a little lower than normal and were higher than in 1989.

In addition, the computer industry's importance to the overall economy is growing. Through 1980, the value of computer systems shipments in the U.S. was approximately 5% of overall durable-goods capital expenditures. The wild, early 1980s personal computer growth bumped that figure up to 10%, where it remained last year.

Historically, there is little evidence to prove that the computer industry's performance is tied to the economy. Over the past 26 years, no correlation between changes in economic activity and computer industry growth is apparent.

Why? New technologies and product cycles are far more important energizers for the industry than the GNP. So while the U.S. economy has fallen, the information technology sector keeps growing.

At some point, the industry may become more vulnerable to changes in the general economy. For the moment and for the foreseeable future, however, U.S. information technology suppliers are fundamentally healthy.

Information technology managers are largely carrying on with little regard for the doom and gloom. In International Data Corp.'s recently completed annual survey of information technology users, only 22% reported that their information technology behavior has changed as a result of the "weak economic climate and the instabilities in the Middle East." Internal factors, such as the organization's current performance, were judged to have a far greater effect than the expectations of a recession on budgeting decisions. This was before the Gulf war actually began but was at a time when oil cost $30 per barrel, the stock market was depressed and the economic picture looked at least as gloomy as it does today.

Marketing executives at vendor organizations are generally far more gloomy about the economywide outlook than about their own companies, according to a spot poll taken last month. While 91% saw the economy deteriorating, only 21% felt the same way about their own company. More than 65% felt their company's 1991 performance would surpass 1990 results.

Where does all of that leave us? In pretty good shape, really.

Sure there'll be casualties. The midrange squeeze continues. Minicomputer vendors and retail distributors are getting by on very lean margins. Open systems migration remains perilous at present. The move toward distributed computing is more jitterbug and stutterstep than graceful waltz. The net result, however, is that the U.S. computer industry is in good shape despite well-publicized failures in specific technology areas.

U.S.-based companies still dominate the information technology billion-dollar club. Only two of the $22 billion information technology companies formed within the last 30 years are not U.S.-based. And growth opportunities still abound.

Spectacular failure or pervasive gloom impress easily. At such times, companies must keep a clear, long-term and global perspective.

Leblois is chairman and chief executive officer of market research firm International Data Corp. and is vice chairman of International Data Group, which publishes *Computerworld*.



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Bull torn by market forces

ANALYSIS

BY SALLY CUSACK
CW STAFF

No one needs to be told that times are tough for most proprietary computer hardware companies.

Perhaps Bull HN Information Systems, Inc. has a different challenge than the rest of the pack. The systems vendor has to satisfy an existing customer base consisting of *both* midrange and mainframe customers while planning ways to open up the proprietary GCOS operating system architecture.

To that end, Bull HN, the U.S. operating arm of France's Groupe Bull, has spent the better part of the past 12 months downsizing operations and repositioning product lines in an effort to stabilize its precarious financial situation.

As large- and medium-scale systems sales decline, the company — traditionally identified with its DPS 6 minicomputers and big iron mainframes — has introduced several Unix-based systems and workstations as well as several software applications targeted at vertical markets including state and local government, the legal profession and health care industries.

Longtime Bull HN customers said they were satisfied with the products, upgrade paths and overall maintenance, but they were anxious about the vendor's financial difficulties.

Dale Good, director of information systems at the Minnesota Supreme Court in St. Paul, Minn., said he is pleased with the systems, service and support, but he is concerned about Bull HN's long-term viability.

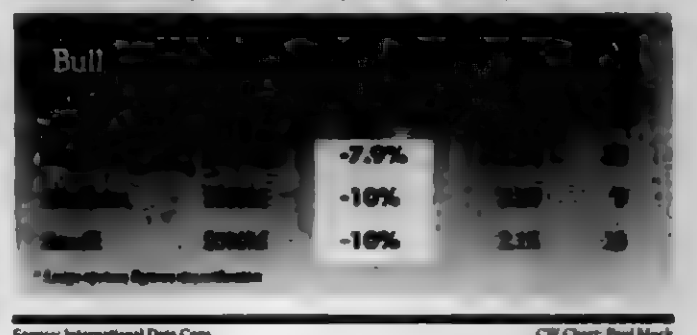
"It's a trade-off situation," he said. "We could have spent a lot of money going to a different vendor, but then, a lot of other vendors are having money problems right now."

The Minnesota Supreme Court has spent the past year upgrading from the DPS 6 to the more robust 7000 series platform, which can support 4,000 users at the high end.

The presence of an upgrade path was an important factor in the purchase decision, Good said, adding that there are now seven 7000-class machines installed throughout the state's court system, supporting a total of about 1,200 users.

"The key issue is that they are continuing to sell into their existing base, and it is important that they continue to offer high-end customers a growth path," said Stephen Josselyn, a senior analyst at International Data Corp., a Framingham, Mass.-based market research firm.

Down slope
Bull saw its sales slip in three major product areas last year



Source: International Data Corp. CW Chart: Paul Mack

Shrinking market

Josselyn said Bull HN's large systems sales were impacted significantly when Digital Equipment Corp. and Tandem Computers, Inc. launched new entries into the mainfame market, cutting an already shrinking pie into even smaller pieces.

Graybar Electric Co. had a Bull 9000/92T under GCOS8 installed at its St. Louis headquarters last June. Graybar, a longtime Bull HN (formerly Honeywell, Inc.) shop, also maintains 19 Bull DPS 6 midrange computers in the field, all of which are linked to the mainframe over an X.25-based network. The main-

Continued on page 28

IBM puts Showcase on display for AS/400

BY MARYFRAN JOHNSON
CW STAFF

IBM recently rolled out the red carpet for Showcase, a cooperative processing tool designed to let users tap directly into an Application System/400 database from a spreadsheet running on an IBM Personal Computer or workstation.

Showcase integrates Microsoft Corp.'s Windows 3.0 and Excel spreadsheet on PCs or Personal System/2s. It can be used to create graphics on the workstation with data stored on the AS/400. Access to the application is as simple as selecting an icon, company officials said.

"A good spreadsheet writer can run a query, go into the spreadsheet, the Showcase macro kicks in and boom, here comes the pie chart from information in the AS/400," said James Louys, vice president of ADM, Inc., an AS/400 consulting firm in Cheshire, Conn.

Developed by Rochester Software Connection, Inc. in Rochester, Minn., Showcase is the brainchild of a group of former IBM executives who started the software firm in 1989. The product has been shipping for about six months and has about 300 users, but IBM only gave its blessing last month and will now sell it directly to customers.

"What these guys are producing are the bells and whistles that IBM has promised its AS/400 customers but hasn't had the time to do itself," said Teresa Elms, president of Elms Information Services Group in San Diego.

Elms said PC users who need access to AS/400 data appreciate the way Showcase masks the midrange machine's complex operating system. "This lets you use the Excel spreadsheet to manipulate data on the PC and the AS/400 in a completely seamless way," she noted.

Off and running

One new user is Nike Shoes, Inc. in Beaverton, Ore., where the Excel spreadsheet has been a company standard for years. Nike is exploring the use of Showcase to build decision support tools and executive information systems (EIS), said Roger Avise, group manager of financial systems at Nike's systems development department.

The sporting goods retailer has two AS/400 B50s at headquarters and uses AS/400s throughout its U.S. retail operation.

"We're looking at using Excel 3.0 as a basic decision support tool, which can be tapped into by another higher level EIS," Avise said. "The AS/400 and Showcase give us a fairly user-friendly way to extract data."

What distinguishes Showcase from other computer-aided software engineering tools or fourth-generation languages on the AS/400 is that Showcase contains cooperative processing modules to build macro programs, Elms said.

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Oracle passes beta test at Hartford Insurance

BY JEAN S. BOZMAN
CW STAFF

HARTFORD, Conn. — The Hartford Insurance Co., one of the few sites to beta-test Oracle Systems Corp.'s repaired release of its Version 6.0 relational database management system for Digital Equipment Corp. Vaxclusters, reports substantial performance improvements over using Version 6.0 on a single VAX machine.

"What used to take 30 to 50 seconds now takes two to 10 seconds to do," said James J. Bosco, manager of Group Information Processing and Reporting at Hartford's Employee Benefits Division. "We concluded in the week we tested it that we had put enough [data] through it to know that it worked," he said. "We have a sophisticated [claims] application, and every aspect of it worked fine." The Employee Benefits Division sells group insurance to outside customers.

The test came in December 1990, when database managers from Hartford set up a test bed of two VAXs. Bosco said the claims application used in the test was one used in production on single VAXs at Hartford. Until now, single copies of Oracle 6.0, running on separate VAXs, have had to share data over Hartford's Decnet communications network.

"We use Decnet because we couldn't run the Vaxcluster version of Oracle 6.0," Bosco said. Instead, Oracle's SQL*Net interconnect software links the multiple Oracle DBMSs at Hartford. Once Oracle 6.2 is shipped, however, multiple machines on a Vaxcluster will be able to share a copy of Oracle's DBMS, storing data in shared disk memory.

Oracle was forced to remove Oracle 6.0 support for Vaxclusters in late 1989, when excessive resource contention forced users to abandon the product [CW, Feb. 18]. While repairs were being made to Oracle 6.0, which had special transaction processing features and the new PL/SQL development language, users continued to use Version 5.0 on Vaxclusters or to support Oracle 6.0 on single VAX machines.

Deferred updates

Analysts said they believe that Oracle 6.2 works by deferring database updates, reducing the number of I/O transactions that must pass through the Vaxcluster's DEC Lock Manager. The DEC Lock Manager is integral to any Vaxcluster, preventing multiple VAXs from writing to the same portion of disk memory at the same time.

Although Oracle 6.2 cooperates with the DEC Lock Manager, it also contains its own "distributed lock manager," Oracle executives said recently. "They're doing their own logging [of Oracle 6.0 transactions] and their own locking effectively," explained Donald Feinberg, director of the Software Management Strategies program at Gartner Group, Inc. in Stamford, Conn. "Using the DEC Lock Manager function is expensive, so they use it minimally. If you use the DEC Lock Manager too much, your instruction path adds too much overhead [to the Vaxcluster system]."

Like others in the beta-test program, Bosco said he is ready to install 6.2 as soon as it officially becomes available. (The product is to be formally introduced later this month.) The Hartford has some 40 VAXs in a corporate network, in addition to a number of IBM mainframes. However, the firm has had to hold off on clustering some of those VAXs in the absence of the Oracle 6.2 software. "As soon as they release it," Bosco said, "we're ready to go."

Wheels keep rolling at AM General

Firm uses Tandem, IBM systems to make military vehicles used in Gulf

ON SITE

BY JEAN S. BOZMAN
CW STAFF

MISHAWAKA, Ind. — They call it the Hummer, a nickname for the military's High-Mobility Multipurpose Wheeled Vehicle. This replacement for the U.S. Army Jeep, camouflaged in shades of tan, has been winding through the war-torn desert of Saudi Arabia, Kuwait and Iraq.

Some 20,000 Hummers are estimated to have been involved in the Persian Gulf war, and they all come from one AM General plant.

AM General, a wholly owned subsidiary of LTV Corp.'s Aerospace and Defense Co., is the sole source of Hummers — whether used by the U.S. Air Force, Marines, Navy or Army. Since 1984, more than 80,000 Hummers have been made, mostly in shades of army green. A five-year contract begun in 1989 calls for another 23,000 to be built.

AM General's plant, with 1,000 employees, is a spin-off of the former American Motors Corp., which once made the Jeep and was sold to Chrysler Motors Corp. in 1987.

Hummer hodgepodge

Flexibility is a key at the 400,000-sq-ft plant, which can churn out a variety of Hummer models, ranging from three-quarter-ton troop carriers to military ambulances. The factory, powered by dual Tandem Computers, Inc. TXP processors and a remote IBM mainframe, operates as a just-in-time facility.

However, it has not always been that way: Until January 1990, the factory had larger stockpiles of parts, an IBM mainframe in a nearby South Bend, Ind., factory and a longer set-up process. The information systems department had 30 employees, more than double the current 12-person staff.



AM General *sent Hummers to the Persian Gulf*

However, the addition of new scheduling and production software, written for the Tandem systems by MPACT Systems, Inc. in Brookfield, Wis., updated older paper-based processes. "In the old method, we had to manually set up our [production] lines, and that took two people a day and a half to do," said Craig Weyers, manager of material systems at the plant. "Now, one person can break our weekly orders into a specific vehicle sequence, including variations, in 30 minutes."

In early 1990, an AM General reorganization resulted in the closing of the South Bend plant and reduced the overall work force by more than 500 people. Since then, efficiency and streamlining have become top priorities, as factory planners try to minimize overhead to weather governmental belt-tightening. The company also streamlined operations by outsourcing spare-parts storage and truck-packing as well as the South Bend IBM system.

MPACT software, which runs under the Tandem Guardian operating system, catalogs all materials received on the AM General plant's loading docks and matches those materials against Army orders placed on the remote IBM mainframe.

After that, all shop floor work is scheduled by the Tandem system and tracked as it winds its way toward the shipping docks.

Workers at the plant can access both the Tandem computer and the remote IBM 3090 mainframe from a network of aging IBM 3178 terminals. The remote IBM mainframe, owned by Genix, Inc. in Pittsburgh, is accessed over a multiplexed T1 line.

The 20M-byte, fault-tolerant Tandem system would blunt the effect of a power failure, IS managers said, adding that data for the Tandem databases is fully mirrored in 12 disk drives, with a total of 1.5G bytes of capacity.

Databases in sync

Communications between the Tandem and IBM databases is key to smooth operations, said Bill Smith, a senior IS manager at AM General. "We download data from the IBM mainframe every day, and we update its files at the same time," he said. "That way, both databases are in sync."

The IBM machine hosts Dun & Bradstreet Software's Millennium database for financial applications. Another database handles ordering and purchasing transactions.

There are a small number of personal computers at the plant connected by a Novell, Inc. local-area network, but IS managers still have to design a LAN/WAN connection between the plant's PCs and those at an engineering center in Livonia, Mich. AM General does not plan to upgrade the IBM 3178 terminals or the twin TXP processors anytime soon, Weyers said, citing budgetary constraints.

Even in wartime, the Hummers are being made on a one-shift-per-day basis, with just 60 vehicles rolling off the assembly line. Top production on two shifts would yield 95 to 100 vehicles per day.

SOFT BITS

Cray airs Unicos 6.0 software

Users of Cray Research, Inc. supercomputers have a new operating system release to sink their teeth into. Unicos 6.0 sports X Window System-based performance analysis and application development tools and supports Posix and the Open Systems Interconnect standards.

Another new feature is the Unicos Storage System, which Cray announced in July 1990. The storage system provides high-speed access to a large number of files on a variety of different vendors' storage media, Cray said. Beta-test sites for 6.0 included the NASA Ames Research Center and Sandia National Laboratory.

Books and Babbage, Inc. has formalized its consulting services arm and is now offering consulting in direct-access storage device management, automated operations and capacity planning and management.

Hughes Aircraft Co.'s Radar Systems Group has awarded a subcontract to Telesoft. The vendor will develop Ada cross compilers and development tools for Hughes to use on real-time Intel Corp. 80960 microprocessors embedded into avionics, radar, navigation and other systems.

Calera Recognition Systems, Inc. announced that it has signed an OEM agreement with **Bull Worldwide Information Systems** in Massy, France. The agreement will license Calera's optical character recognition (OCR) board and developer's tool kit software on Bull's Imageworks document image management system on a worldwide basis. The decision was based in part on Calera's ability to recognize special character requirements of several European languages — a requisite to support Bull's multinational clientele.

Calera's international OCR engine currently supports English, French and German character sets.

A step beyond a database

Johns Hopkins' networked databases benefit genetic research

ON SITE

BY GARY H. ANTHES
CW STAFF

BALTIMORE — An interdisciplinary team at Johns Hopkins University has developed a new way to create and codify knowledge, one that combines the attributes of databases, electronic mail and books while blurring the distinction between creators and users of information.

The university's Laboratory for Applied Research in Academic Information has put together a linked pair of networked databases of human genetic information. One is On-line Mendelian Inheritance in Man (OMIM), a catalog of more than 5,000 inherited disorders and traits.

Logically tied to OMIM is the Genome Data Base (GDB), which was developed to support the international human genome initiative, whose goal is to completely describe the human genetic structure. GDB now holds 2,000 "mapped" genes showing the precise locations of genes on their respective chromosomes and information on 5,000 DNA segments. The GDB, which is based on Sybase, Inc. products, went on-line in September.

More than 3,200 users, mostly medical researchers and practitioners, access the two databases via Telenet or Internet.

More than simple data

The databases are not just repositories of raw genetic data; they also capture and reflect the ongoing wisdom of their creators and users. The GDB contains pointers to other databases and a bibliography of approximately 20,000 sources. Some are standard literature references, but increasingly, the sources are personal communications from researchers and users from the 75 to 100 scientific editors around the world who have authority to update GDB.

GDB draws data from the literature but also accepts unvalidated data directly from users for later submission to an on-line peer review process by globally distributed experts. "The database is both a product and a process," said Richard E. Lucier, the laboratory's director.

"Editors correspond with other experts; they have dialogs within the database," Lucier said. The dialogs are codified by an annotation and messaging system developed by Lucier's staff using C and Sybase's development tools.

A credible source

Because the resulting data is based on considerable give and take, the gene maps are known as "consensus maps." The consensus concept gives the GDB a very high degree of credibility among scientists, Lucier said.

Lucier calls the policies, procedures and technologies employed "knowledge management," which goes well beyond the traditional concepts of data storage and retrieval and whose goal is to integrate the library more fully into the scholarly communication process.

"People thought we wanted to build on-line books," Lucier said. "Electronic libraries just take existing information and digitize it. But GDB and OMIM are much more dynamic. Knowledge management forms partnerships with people creating information."

Because libraries focus on use of published data, their first worry is always access, Lucier said. However, the knowledge management approach worries first about collaboration between creators and editors, next about building a knowledge base and last about access. "We're not pushing the frontiers of technology; we are pushing useful applications of technology in everyday working environments," he said.

Lucier said the genome project could go forward without the database but in a slower, more disorganized way. "Results would be scattered throughout literature, there wouldn't be a dynamic gene map, and there wouldn't be the broad consensus of the scientific community."

Lucier said the knowledge management techniques developed at the laboratory are transferable to other disciplines besides medicine. "The primary problem is not technical; it's sociological, political and financial," he said.

Development of GDB and its associated software took one year, cost between $1 million and $2 million and was funded by the Howard Hughes Medical Institute. Although it is up and running, Lucier said, development will never be finished.

> THE POLICIES, PROCEDURES and technologies employ "knowledge management," which goes well beyond the traditional concepts of data storage and retrieval.

"Organization of the database will be good for about five years, then scientists will want to organize it differently, and that will require a whole new database," he said. Lucier added the successor to the relational database is likely to be a more flexible, object-oriented database.

Read-only copies of GDB are maintained in the UK and Germany, but all updates are networked to the database at Johns Hopkins. Both databases reside on a pair of Sun Microsystems, Inc. Sun-4/490 servers, which are attached to a campus-area network with gateways to Telenet and Internet.

One GDB editor is Phyllis McAlpine, a professor of human genetics at the University of Manitoba in Winnipeg. She has the final say on how each of the estimated 50,000 to 100,000 genes is to be named, and she said she may make 800 to 1,000 database entries per year, each of which is based on suggestions from around the world coming in by telephone, facsimile, mail or the database.

"It's a really neat concept," McAlpine said. "The contribution of the database to the field is invaluable. It's the one and only official record of every gene and piece of DNA that's mapped in the world."

Bull

FROM PAGE 25

fraime supports 2,500 end users and inventory applications for the electric parts distributor's 200 warehouses.

Roy McRee, assistant general manager of IS, characterized Bull HN's service and support as excellent and said Graybar has no reservations about the proprietary architecture because the Bull 9000 series offers plenty of room for growth.

He added that Graybar currently has no plans to implement Bull HN's recently announced workstation products.

McRee did, however, express some concern for Bull HN's current financial status and seeming internal instabilities. "Their lack of settling is disturbing. Constant change within an organization ultimately results in failure," he said.

Major revenue builder

According to Maurice Gervais, director of Enterprise Systems Marketing at Bull HN, the high-end Bull 9000 series mainframe provides approximately half of Bull HN's U.S. revenue. While he acknowledged that the system has attracted little new business, he said there is activity in existing accounts both from upgrades and from midrange users eliminating multiple midrange systems in favor of one large machine.

"Most people want to avoid the agony and cost of climbing off platforms," said George Lindamood, program director at Gartner Group, Inc., a Stamford, Conn.-based market research and development firm.

He cautioned against vendors becoming too complacent with customer loyalty, however. "It either means you really are doing a good job or you're in for a hell of a shock somewhere down the road."

One Bull HN mainframe user, who asked not to be identified, said Bull HN's future did not concern him very much because he was sure that NEC Technologies, Inc., which owns approximately 15% of Bull HN, would be capable of maintaining the installed base.

Bull HN officials emphatically stated that high-end customers can expect more enhancements and additional product peripheral announcements during the coming year.

Good summed up overall user concerns for Bull HN's future. "As long as you see your support maintained at a reasonable level and there is no immediate handwriting on the wall, you always hope for the best."

Change in the works



Met Life's Cavanagh is satisfied with Bull

With more than 1,000 DPS 6 minicomputers located at branch offices across the country, Metropolitan Life Insurance Co. quickly became one of Bull HN's most visible sites, and Senior Vice President Daniel J. Cavanagh one of its most oft-quoted users.

Now, almost one decade after the system installations at Metropolitan Life, Cavanagh said that while the insurance company is still committed to the DPS 6, it is moving slowly to replace the systems with LANs and intelligent workstations.

The DPS 6s are currently linked to the company's two IBM 3090-class mainframes over IBM's Systems Network Architecture.

According to Cavanagh, Bull HN will be the systems integrator for LAN and PC installation.

"Bull has done a good job for us, and the business side of the house is satisfied, but the DPS 6 is 7-year-old technology," Cavanagh said.

He added that in some cases, the minicomputers will remain as file servers, but the company is basically interested in MS-DOS platforms with a server running under the OS/2 operating system.

While Cavanagh acknowledged that MS-DOS is not as open as Unix, he pointed out that it is not a proprietary platform, either. The insurance company has been working successfully with Zenith Data Systems MS-DOS-based laptops for more than three years, issuing them to field sales agents who in turn can plug them into the DPS 6 platforms.

SALLY CUSACK

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   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Local Area Networks
   - F. No Computer Involvement

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   - 70. Mining/Construction/Petroleum/Refining/Agric
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Retailer
   - 75. User Other _____
   - 95. Vendor Other _____ (Please specify)

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   - 21. Dir./Mgr. MIS Services, Information Center
   - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt. Dir./Mgr. PC Resources
   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Supry. of Programming, Software Dev.
   - 32. Programmers, Software Developers
   - 99. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President, Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific R&D; Tech. Mgt.
   - 51. Sales & Mktg. Management

   OTHER PROFESSIONALS
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educator, Journalists, Librarians, Students
   - 99. Others _____ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Supermins
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
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PRODUCT REVIEW

IEF: A worthy CASE competitor

Texas Instruments, Inc.

This is the ninth in a monthly series of performance benchmarks that focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd., and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at the Information Engineering Facility (IEF) from Texas Instruments, Inc.

DEVELOPMENT PRODUCT BRIEFINGS WORLD

•

Carried out by Texas Instruments in Plano, Texas, a team of three people demonstrated that integrated CASE tools can deliver ready-to-use information systems generated from analysis and design specifications. Completion of the benchmark was an achievement. Other integrated CASE tool vendors withdrew from the benchmark series when the full size of the task became visible. The IEF's final solution was robust; however, the tool's pedantic insistence on detail created unnecessary complexity. The application logic was difficult to comprehend at times, even by expert developers. This resulted in excessive development times and forced the team to curtail certain stages of the benchmark. We rated level of completion as "fair."

•

The initial development was carried out on three IEF personal computers. The PCs were coordinated by a central mainframe encyclopedia. This required much up- and downloading, which also took considerable time to compile. Combined with the burden of attention to detail, the time of 66 hours for an incomplete solution was longer than average and, at best, rated "fair" for speed of development.

•

The maintenance stage was impressive. For the first time, we saw maintenance from the design level. The team not only analyzed the maintenance requirements using the logical models, but they also implemented the changes at this level. The resulting physical changes were implemented almost automatically, which resulted in a fast and rigorous solution. We gave IEF an award of "excellent" for speed of maintenance.

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At all levels, documentation was also "excellent." The graphics were of exceptionally good quality and easy to derive. More importantly, the documentation is dynamically synchronized with all steps of development.

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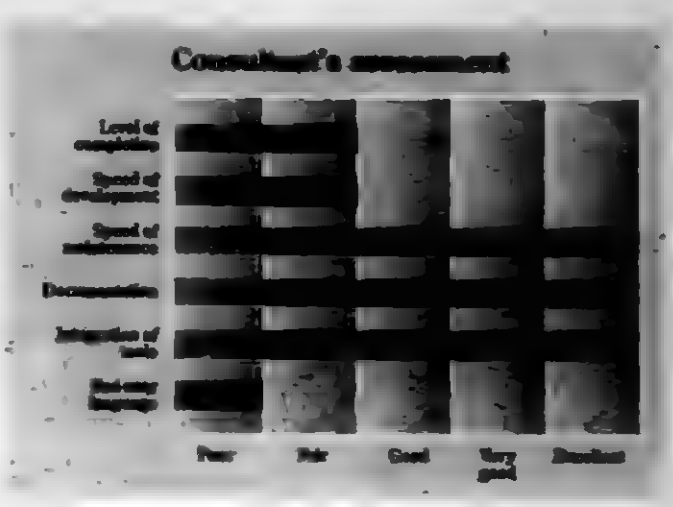
IEF's development of the solution was an excellent demonstration of a fully integrated platform. The initial analysis and design flowed through to the implementation, mastering the hard part of generating code from the design level. We have no hesitation in awarding a mark of "excellent" for the level of integration.

•

IEF does not provide an end-user language, although TI could have used third-party products. Instead, it chose IEF code generation for the inquiry stage. Even for a professional programmer, such report generation is difficult to handle. As an end-user language, we rated it "poor."

•

In summary, IEF proved that CASE tools can deliver operational information systems even under tight user constraints. While its support of the analysis and design stages is excellent, improvements are needed in the implementation stage. At that level, the tool is quite inhuman, causing unnecessary programming errors. It is pleasing to see that IEF can successfully compete with established development environments at all stages.



The IEF tool kit

- Information Engineering Facility — Full-cycle CASE tool including Cobol generator
- DB2 — IBM database

Development and maintenance report card

Performance is graded from A (excellent) to F (poor).

ANALYSIS AND DESIGN: A
Within a few minutes, the team generated the initial entity relationship diagram that formed the basis for the analysis and design of the system. The business logic supported by the benchmark application was also included.
Strength: It is fast and effective.
Weakness: None was found.

DATABASE SETUP: A
The data structures defined in the planning stage were physically implemented on the mainframe computer in DB2. The necessary data definition statements and job control language were automatically generated.
Strength: Code is automatically generated.
Weakness: Again, none was observed.

FILE MAINTENANCE TRANSACTIONS: D
This was a slow process. Although IEF enforces generation of syntactically and semantically correct code, many logical errors occurred. Developers were forced to make modifications at a very low program level, and this turned even small tasks into many lines of code. Some maintenance transaction features could not be completed in time.
Strength: It is robust when finally working.
Weakness: It is very time consuming and a breeding ground for logical bugs.

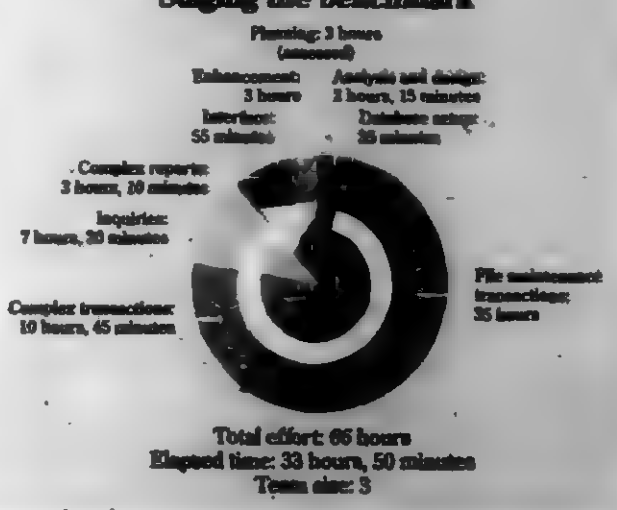
COMPLEX TRANSACTIONS: B
With increased complexity, the attention to detail paid off, and an experienced team member delivered a fully functional and pleasing solution.
Strength: Solution is well-presented and without flaws.
Weakness: Much attention to detail is still required.

INQUIRIES: F
Although the solution would have allowed the use of third-party end-user languages, the team decided to create the end-user inquiries in IEF. This was an extremely time-consuming process that required the skills of a professional programmer.
Strength: The solution finally worked.
Weakness: Excessive time is required, and it is hard to write.

COMPLEX REPORTS: C
Without a report writing facility, the team had to write an external Cobol program to complete the reporting procedure. Because of time constraints, the result could not be fully tested.
Strength: External routines can be integrated into solutions.
Weakness: It lacks a report writing facility.

INTERFACE: F
The Ashton-Tate Corp. Dbase files were converted into sequential files on the mainframe, making them accessible for IEF. The initial conversion to ASCII files was done using personal computer software. The upload to the mainframe was generated automatically. Time constraints kept the team from attempting to process the interface data and producing the error report.
Strength: Some conversion tools are available.
Weakness: Batch processes are time-consuming to develop.

ENHANCEMENT: A
For the first time, we observed an enhancement that was designed and implemented based on initial analysis and design. The strength of the integrated CASE tool approach was clear, leading to a rapid solution. However, it could not be fully tested because of time constraints.
Strength: Enhancement is derived from design.
Weakness: It is carried out without completing the initial solution.



The solution was developed on three IBM Personal System/2 workstations, one of which was connected to an IBM 3090 under MVS. The final system was tested and run on the 3090 with DB2.

Details about the product are available from Texas Instruments, Inc., The Information Facility, The Information Engineering Group, 50 Chase Oaks Blvd., MS 8474, Plano, Texas 75023, (214) 575-3683.

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HP survey details '91 trends

BY J. A. SAVAGE
CW STAFF

High-revenue companies place more importance on making diverse computers work together, while information systems managers in small- and medium-size companies are most concerned with refining database technology, according to a survey by Interex, the Hewlett-Packard Co. user group.

In a survey of 638 users, Interex found that companies with annual budgets of less than $500,000 are more concerned with acquiring and managing database technology than their counterparts with larger budgets. Those with budgets of more than $500,000 are more concerned with their applications development environments, interoperability and network integration.

Database concerns were also tops when Interex broke down the numbers between users of open systems and those with HP's proprietary systems. With Unix users, Unix standardization was the No. 2 concern, trailed by applications development environment.

Personal computers appeared to be what users worried least about. PCs placed fifth for concerns of users with a budget of under $100,000 and fourth for those who had less than $500,000 to spend. Those with budgets over $500,000 did not even find PCs worth ranking.

Solbourne introduces Sparc server

Aiming at the office instead of the computer room, Solbourne Computer, Inc. in Longmont, Colo., recently introduced a server based on Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc).

An earlier Sparc-based server introduced in mid-1990 used the same 40-MHz processors but was designed for the computer room, according to a spokeswoman. It topped out at eight processors. The new Series 5E/800I is in a desk side, modular package and can be configured with up to four processors.

Pricing for a single-processor 5E/800I starts at $74,900, and four-processor prices begin at $271,995. The latter is rated at 114 million instructions per second and 71.6 SPECthruput (a measure of workstation speed rated by a coalition of companies called the System Performance Evaluation Cooperative), according to the company.

IBM reworks storage tools

IBM recently announced that it has fine-tuned its system-managed storage product set with the enhancement of two key components.

The new releases of Data Facility Hierarchical Storage Manager (DFHSM) and Data Facility Sort (DFSort) will start shipping later this month, a company spokesman said.

According to IBM, Version 2 Release 6 of DFHSM is a major step up from the previous release with its new facilities to ease data migration to the system-managed storage environment.

One addition is the ability to manage primary space management in a multitasking mode. According to an IBM spokeswoman, performance gains of as much as 50% can be achieved, although improvements will vary for individual customers.

Customers can upgrade to Release 6 at no extra charge.

The latest DFSort, Release 11.1, will provide more tools to increase productivity, including one facility called Icetool. This tool enables users to perform several operations on one or more data sets within the same job step, according to the company.

NEW PRODUCTS — SOFTWARE

System software

Raxco Software, Inc. has announced Version 5.0 of Perfectdisk, a Digital Equipment Corp. VAX/VMS performance management product that features disk defragmentation and directory compression.

Other features include disk auditing and analysis with presentation graphics, multiheader consolidation, a single-screen disk map and a real-time status display. The product costs between $1,050 and $8,750, depending on CPU size.

The company also initiated a foray into the distributed systems management arena with the announcement of Nodeview, a VMS/Unix resource management software package designed to facilitate various processes of tracking resource use of systems on local- or wide-area networks.

Pricing ranges from $150 to $300 per node, depending on the number of nodes.

Raxco Software
2440 Research Blvd.
Rockville, Md. 20850
(301) 258-2620

Computer-aided software engineering

Cognos, Inc. has introduced a computer-aided software engineering tool designed for Digital Equipment Corp. VAX machines.

Powercase is said to be completely integrated with Cognos' Powerhouse fourth-generation language, ANSI standard SQL relational databases and DEC's Record Management System. This integration enables users to automatically generate menus, screens, reports and batch programs required for high-quality business applications, the vendor said.

An initial license fee for a DEC workstation running Decwindows costs $15,000.

Cognos
67 S. Bedford St.
Burlington, Mass. 01803
(617) 229-6600

Software Architecture and Engineering, Inc. has introduced its Strategic Networked Application Platform template, a computer-aided software engineering tool designed to accelerate the development of distributed applications.

The product features ready-made software components, including an object-oriented data model, a graphical user interface and links to both networks and relational databases.

The template runs on workstations from IBM, Digital Equipment Corp. and Hewlett-Packard Co. Pricing begins at $28,000.

Software Architecture and Engineering
1600 Wilson Blvd.
Arlington, Va. 22209
(703) 276-7910

Cadre Technologies, Inc. has announced that its Teamwork/Ada is now available on Digital Equipment Corp. reduced instruction set computing-based Decstation and Decsystem product families running under Ultrix 4.0.

The product's structure graphs support most Ada constructs and facilitate transitions from design to code via one-to-one mapping of graphic design elements to Ada code, the vendor said.

The cost per user for a typical Decstation configuration is $5,000.

Cadre Technologies
222 Richmond St.
Providence, R.I. 02903
(401) 351-5950

ECS Associates, Inc. has announced SQL-Link-Plus, a software product designed to link two computer-aided software engineering tools: Cadre Technologies, Inc.'s Teamwork and Six Sigma Case, Inc.'s Canonizer.

The product enables designers and database managers to use Teamwork/IM's Entity Relationship Diagram to model a relational database's logical design, and Canonizer's normalization feature allows data to be normalized in third normal form and an output schema to be generated, according to ECS.

SQL-Link-Plus is currently available on Sun Microsystems, Inc. Sun 3 and 4 workstations, IBM RISC System/6000s and IBM systems running IBM AIX Release 1.0. Pricing ranges from $5,000 to $12,500 for versions that support from five to 20 users.

ECS Associates
3812 Sepulveda Blvd.
Torrance, Calif. 90505
(213) 378-9260

Utilities

Accelr8 Technology Corp. has announced a file conversion software package that runs on Digital Equipment Corp.'s VMS/Ultrix Connection 1.3, DEC's implementation of Transmission Control Protocol/Internet Protocol.

Transl8 was designed to resolve binary data differences between VMS systems and implementations of the Unix operating system, such as DEC's Ultrix.

Pricing begins at $2,076.

Accelr8 Technology
303 E. 17th Ave.
Denver, Colo. 80203
(303) 863-8088

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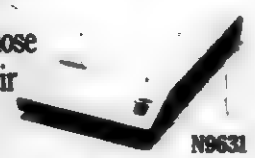
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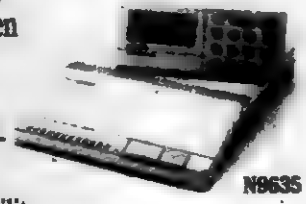
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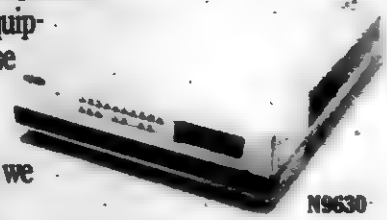


N9631



N9635

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Photo courtesy of United States Forestry Services.

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NEC

NEW PRODUCTS — HARDWARE

Power supplies

Sutton Designs, Inc. has added four new models, the MM-0.5kVA, MM-1.0kVA, MM-3.0kVA and MM-5.0kVA, to its MM-Series of on-line uninterruptible power supplies.

The units provide from 500-VA to 5kVA of continuously regulated output. Prices range from $1,290 to $7,990, depending on model.

Sutton Designs
The Dewitt Building
215 N. Cayuga St.
Ithaca, N.Y. 14850
(607) 277-4301

I/O devices

Vista Control Systems, Inc. has announced a 100-MHz, 24-bit multichannel scaler designed for Digital Equipment Corp. VAX 3000, 4000 and 8700 machines.

The Camac MCS 727 ($3,100) can simultaneously count random pulses into 32 independent scalers at a maximum rate of 100 MHz. Its time-framing input works in tandem with on-board memory to frame data into timed segments, and shadow registers are used with each scaler to accelerate memory updates, the vendor said.

Vista Control Systems
127 Eastgate Drive
Los Alamos, N.M. 87544
(505) 662-2484

Abaton Technology, Inc., a subsidiary of Everex Systems, Inc., has announced a six page/min, 300 dot/in. printer designed for multiplatform or networking environments.

The Laserscript LX is an Adobe Systems, Inc. Postscript-compatible device that is equipped with a National Semiconductor Corp. 25-MHz processor. Features include a serial port, two parallel ports and an Apple Computer, Inc. Appletalk port; a single paper tray for processing letter- and legal-size paper; and the ability to be used in Apple Macintosh or IBM Personal Computer environments.

The product is priced at $1,995.

Abaton Technology
48431 Milmont Drive
Fremont, Calif. 94538
(415) 683-2226

Output Technology Corp. has announced its Duraline series of 240 line/min printers designed for multiuser office environments.

The series includes a serial/parallel model and twin-axial and coaxial models. All the Duraline models feature built-in bar codes, print buffers up to 20K bytes and 12 international character sets.

The printers are priced at $2,995 or $3,995, depending on type of model purchased.

Output Technology
E. 9922 Montgomery Drive
Spokane, Wash. 99206
(509) 926-3855

Data storage

Dataram Corp. has introduced a memory expansion board designed for Digital Equipment Corp. Vaxstation 3100 Model 76 and Decsystem 5100 workstations.

The DR-5100 is available in three versions: The 4M-byte board for the DEC Vaxstation 3100 Model 76 is priced at $1,000, and the 8M- and 32M-byte models for the Decsystem 5100 workstations are priced at $2,000 and $10,000, respectively.

Dataram
P.O. Box 7528
Princeton, N.J. 08543
(609) 799-0071

Control Data Corp.'s Computer Products Group has announced a file and storage management system designed to handle large volumes of information within data centers or client/server environments.

The Unitree System was developed by Distributed Computing Solutions, a division of General Atomics. It automatically migrates files among peripheral devices to minimize the amount of on-line storage on a system.

Some file access can be done transparently, depending on what type of Unitree program is installed on a client platform, the vendor said.

The system also features a Unix interface. The product is scheduled for a second-quarter release, and pricing begins at $47,500.

CDC
8100 34th Ave. South
Minneapolis, Minn. 55440
(612) 853-8100

Metrum Information Storage has announced a helical-scan technology-based digital tape drive that uses ½-in. T-120 tape cartridges as its storage medium.

The RSP-2150 Rotary Storage Product features data transfer rates of 4M bytes in burst mode and 2M bytes in sustained mode. The product can store up to 14.5G bytes of data on a single T-120 cartridge, according to the vendor.

The device is scheduled to begin shipping in the second quarter and is priced between $10,000 and $25,000, depending on configuration and number of drives purchased.

Metrum Information Storage
4800 E. Dry Creek Road
Littleton, Colo. 80122
(303) 773-4700

An invitation from Texas Instruments . . .

Beta test of IEF™ tutorial offers fast, low-cost evaluation of CASE technology.

We're looking for qualified developers to help us beta-test a new tutorial module for our integrated CASE product, the IEF™ (Information Engineering Facility™).

In return, those who participate will have an opportunity to gain an in-depth understanding of a successful application of CASE technology...at a special low cost...and in a very short time.

Learn to use IEF toolsets within one week.

You'll be verifying our own experience that analysts and programmers with as little as one year of practical experience can learn to use the IEF design and construction toolsets *within one week.*

Build a system—48,000 lines of COBOL—within one week.

As you use the tutorial, you will design and construct a working system of more than 48,000 lines of COBOL. Of course, you can go on from there to more fully explore the IEF's design and construction capabilities. You may want to rebuild some of your own existing system components for productivity and quality comparisons. We're sure you'll agree that actually using CASE to build a working system is the best way to evaluate its potential for your organization.

Limited availability, qualified developers only.

To meet our beta test requirements, we must reserve the right to (1) limit this offer to qualified participants, (2) discontinue the offer when our participation goal is achieved, and (3) limit participation to one set of beta program materials per customer company. We must also require that you complete the tutorial and return the completed product evaluation form within 90 days of receipt of the product.

Less than half the price of standard IEF OS/2™ toolsets.

We've specially packaged the beta program materials in what we call the Rapid Development/Tutorial module and priced it at $10,000—less than half the cost of our currently available OS/2 toolsets.

The module includes:

- IEF analysis, design and construction OS/2 PC toolsets (virtually identical to our standard OS/2 versions).
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Applications will be compatible with fully configured IEF—including regeneration for IBM® mainframes and, soon, Digital VMS and selected UNIX™ platforms.

Systems generated with the RD/T module will run only in simulated IBM mainframe environments on independent OS/2 workstations. However, applications developed with the RD/T are compatible with the IEF and could be integrated into a fully configured IEF environment—including automatic regeneration for IBM mainframes. Soon, regeneration software will be available for Digital VMS and selected UNIX platforms, as well.

For more information, call 800-527-3500.

TEXAS INSTRUMENTS

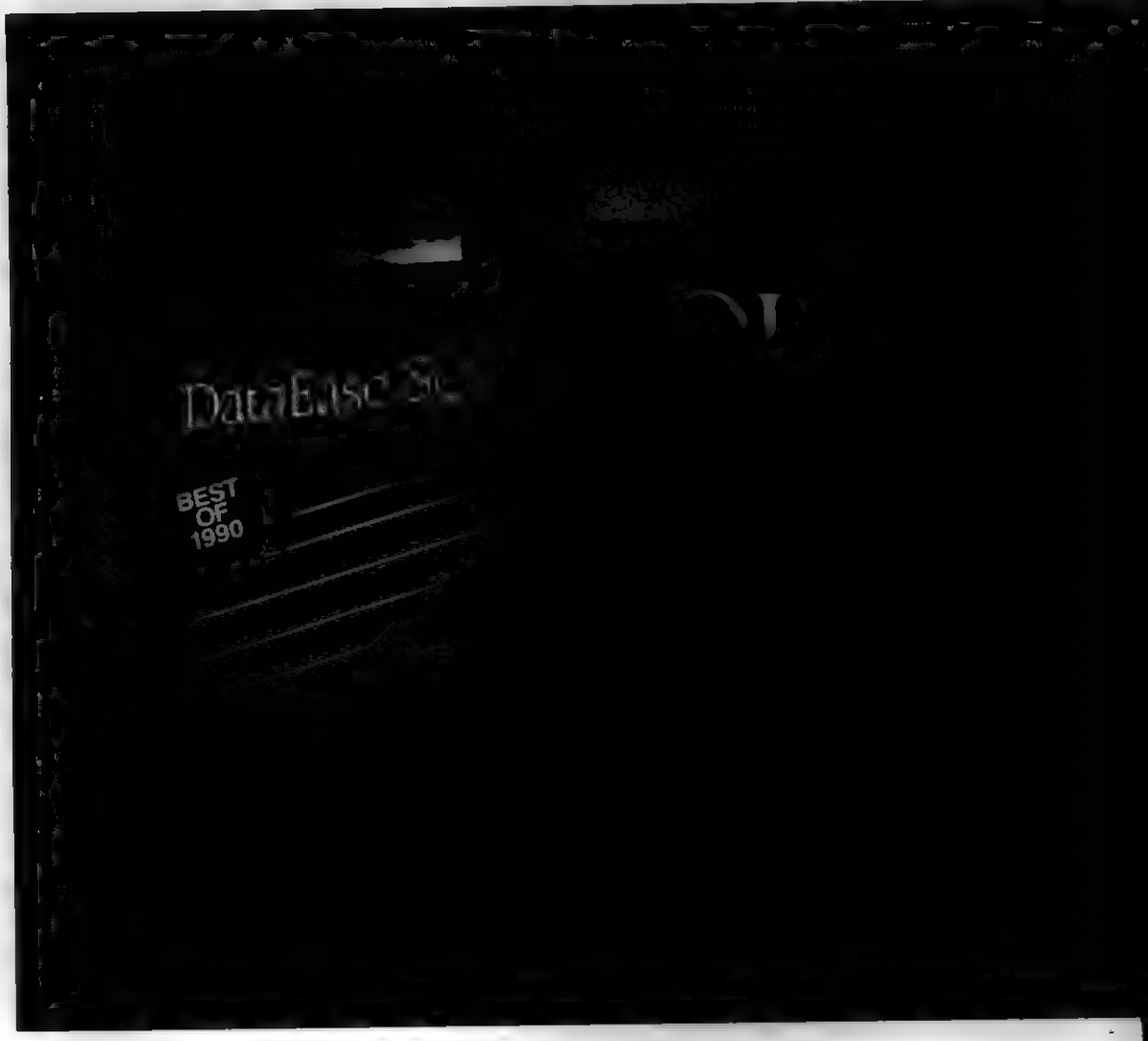
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COMMENTARY

Patricia Keefe

Promotional consideration



You guys kill me, Bob Holmes, a research analyst at Southern California Gas Co., found cause for great amusement when he first heard Lotus was offering a free copy of its Microsoft Windows-compatible Ami Pro word processor to 1-2-3 Release 3.1 buyers. He speculated that giving users a Windows word processor to play with might actually encourage them to go look at a Windows spreadsheet.

The only one on the market today, of course, is rival Microsoft Excel 3.0. Users have to wait until June at the latest for 1-2-3/W. "Is [Lotus] shooting themselves in the foot with that promotion? One really wonders if they thought this through," Holmes said. On that point, probably not, but what Lotus is clearly doing is seeding the Windows word processor market in hopes of gaining mind and market share — a tact that a few OS/2 users fervently wish IBM would take with OS/2.

We may be seeing the beginning of a wave of freebies or very low-cost offers designed to open a crack in key markets that have settled down into ironclad market shares distribution. We certainly seem to have entered

Continued on page 42

IBM's strategy for XGA excludes reseller deals

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

IBM senior engineer Al Basilico caused quite a stir at the Feb. 21 Video Electronics Standards Association (VESA) meeting in San Jose, Calif., simply by erroneously saying that IBM would become an OEM, selling the chip set for its new Extended Graphics Array (XGA) video controller to other manufacturers.

Third-party vendors and analysts alike were abuzz over the statement. Michel Castro, graphics analyst at Dataquest, Inc., initially predicted he would have to revise his forecast for the high-end (1,024- by 768-pixel resolution) graphics market, perhaps tripling his projections. Jim Anderson, chairman of VESA and director of strategic marketing at board maker Headland Technologies, Inc., said IBM "may just get the standard faster because of this."

However, the excitement was premature.

"Al Basilico chose OEM unfortunately: IBM is not getting into the business of manufacturing and distributing chip sets" to other companies, IBM spokeswoman Madeline Epstein said.

This is not to say IBM is washing its hands of cooperation with third-party graphics companies. Epstein said IBM is "interested in ... providing the technology to other companies and in addressing the development of chip sets."

In the meantime, confusion reigns at the high end of the graphics market. According to Jon Peddie Associates, an Oakland, Calif.-based graphics consultancy, there are 583 boards, both Video Graphics Array (VGA)- and non-VGA-compatible, that offer users 1,024- by 768-pixel resolution or better. Choices at the high end include Super VGA, the VESA standard, Texas Instruments, Inc.'s Graphics Architecture, XGA (although it is available only from IBM and only for the Micro Channel Architecture bus) and IBM's 8514/A technology.

But does the average user care about this technology? Castro said they will.

"We feel 1,024 by 768 is probably an optimal resolution for most PC users on their desks," Castro said.

However, at the moment, users have to wait out the struggle

Continued on page 43

FEATURE: PRESENTATION GRAPHICS

Razzle-dazzle, plain and simple or in between?

BY DEREK SLATER
CW STAFF

Ten minutes to sell your idea to the higher-ups: Do you dim the lights and dazzle them with a fast-paced, multicolor slide presentation? Do you hand over 12 black-and-white pages of statistics and hope for the best? Or is there a middle ground?

Presentation graphics software puts the first option within reach of the average corporate personal computer owner. However, more familiar office applications such as spreadsheets are no longer limited to sterile statistical output: Standbys such as Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Excel are adding powerful graphics facilities of their own. Now users face a choice between the panache of presentation graphics and the ease of using new graphical possibilities in old favorites.



John Ward

For many users, presentation software meets a very distinct need. "When you're up in front of fifty people, you don't necessarily know what you're doing," says Kathy Klein, laboratory director at Calumet Public Hospital in Laurium, Mich., who uses Microsoft's Powerpoint to create educational presentations for staff training and public discussions.

"One of the great things is being able to run the show just by tapping the mouse. If someone asks you to go back to the diagram two windows ago, you can just click back over there."

Organizing a discussion is just the tip of the iceberg for presentation software. Users can produce color slides with bar charts and pie charts from imported spreadsheet data, illus-

Continued on page 40

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These are just a few of the 50+ technical sessions scheduled for this year's Conference. But the Micro Focus Users Conference is more than three days of seminars; it's a unique opportunity for developers to meet the Micro Focus technical and support staffs and share solutions with other users through the Conference's Special Interest Groups.

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Std. plotter emulation	✓ Yes	No
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Robot works out on-line

BY J. A. SAVAGE
CW STAFF

FALMOUTH, Ky. — No-sweat design. That is what Hammer/Strength, Inc., which manufactures equipment to make people sweat, does by using three-dimensional graphics instead of perspiring humans.

Reggie, a 3-D, 232-pound, six-foot athlete, exists in the Hewlett-Packard Co. ME Series 30 engineering software on HP workstations. "We don't make something and test it. We have Reggie simulate it and build a machine around him," said Gary A. Jones, director of manufacturing and engineering at Hammer.

Jones started in the athletic equipment business with his father, who established Nautilus. He branched out with Hammer in 1988, although he began designing Reggie when he was with Nautilus. "Over time, he became quite sophisticated. He can do damn near all the things that $100,000 packages can do," he said.

Reggie allows Jones to analyze which muscles are stressed by movement on a machine. "You want to follow the most efficient pattern. It's not that complex, but it's hard to visualize."

For instance, Reggie's hand, a program in itself, can grasp the handlebars on some future Hammer machine in the design stages, and Jones can diagnose how pressure on the handles affects Reggie's grip or whether the handlebar puts Reggie's wrist in an awkward position.

With a staff of fewer than 20; an HP 9000 Model 375 Turbo SRX, HP's graphics workstation based on Motorola, Inc.'s 68030 processor; an HP 9000 Model 370 C, which is based on the Motorola 68020 processor; one Vectra personal computer; and an HP 3000 minicomputer with eight terminals, Hammer turns out more than one dozen new products per year.

Jones said he will stick to HP's engineering software despite the availability of specialized graphics and despite what he calls an "outrageously terrible job of marketing" by HP. "Other systems are fast, but I needed the software first," he said.



Reggie, *an on-screen, 3-D 'athlete,' tests physical fitness equipment for Hammer/Strength. Reggie resides on HP workstations*

PC system tackles Calif. drought

Networked remote units monitor rainfall, collect data for conservation

ON SITE

BY JAMES DALY
CW STAFF

LOS ANGELES — With California cracking under its worst drought in years and prayers for rain still going unanswered, civil engineers are scrambling to avert the waste of even one bucketful of the precious wet stuff.

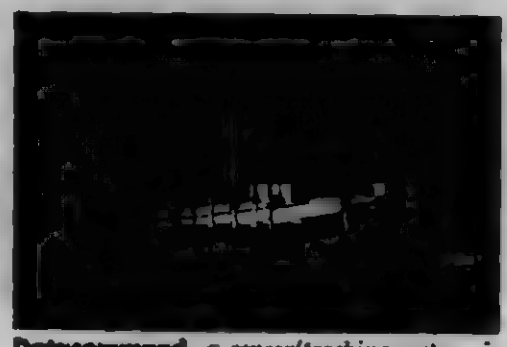
In parched Los Angeles County, where more than 8 million thirsty people consume nearly half a trillion gallons of water annually, the department of public works has turned to high technology to preserve the few cherished drops that occasionally fall from the sky. "We can't make it rain, but we try to hold onto it for as long as we can once it's down here," civil engineer Craig David said.

One important component of the hydrological management plan is the collection of storm water that would normally drain rapidly into the Pacific Ocean. Ironically, the quick drainage is intentional, the product of a different, wetter time.

A disastrous flood that swept out of the San Gabriel Mountains in 1910 led to the creation of concrete-lined channels that carry storm water from the mountains to the Pacific Ocean. The channels succeeded in protecting low-lying areas from torrents of fast-moving debris-laden flood water, but they also robbed the arid land of its chance to soak up the water enroute to the sea.

Modern urban design has worsened the situation. Rain splashing onto a paved street or parking lot is often siphoned directly into the channels, where it races to the Pacific.

Because of this double whammy, the county created a series of water spreading areas where storm runoff is collected in soft bottom basins and allowed to seep back into the earth and replenish underground water supplies. The basins must be carefully and continually watched to ensure maximum distribution efficiency.



Datacommand, *a sensor/tracking system, is helping California water tanks stay full*

At the heart of the basin management program is the Datacommand telemetry system, a software- and personal computer-based structure developed by Sierra-Misco Telemetry Systems in Sacramento, Calif. Datacommand will replace manual operations at two of the major spreading grounds: the 128-acre San Gabriel Coastal Basin Spreading Ground and the 570-acre Rio Hondo Coastal Basin Spreading Ground.

Field information

Networked remote sensor units collect and transmit water flows and levels gathered at the canals and spreading grounds. Their information is then run through an equation program and transmitted to a series of Compaq Computer Corp. computers at the head works in Rio Hondo and at headquarters in nearby Alhambra, Calif.

"It provides us with a critical real-time link to what's happening in the field," David said. "Once a drop hits the street, it's into a drain and on its way to us before you know it. We want to be able to take in as much water as we can as fast as we can."

If one spreading ground is approaching overflow, for instance, Datacommand alerts engineers who can remotely control cast-iron gates to divert the intermittent runoff and prevent the waste of precious liquid. An overfilled spreading ground could have potentially tragic consequences if it fractures a levee, damages a water outlet structure or sends torrents of water rushing down a dry channel where workmen are doing repairs.

The new system has also shortened the time it takes for newcomers to understand the workings of the spreading ground system, David added.

Datacommand not only helps produce maximum water recharge; it will also reduce manpower in the field. Where it now takes approximately seven county employees to monitor and run the older operations, the telemetry is expected to reduce the total work force to three.

"This system has come through at just the right time," David said. "Now if we can just get the rain clouds to help us out."

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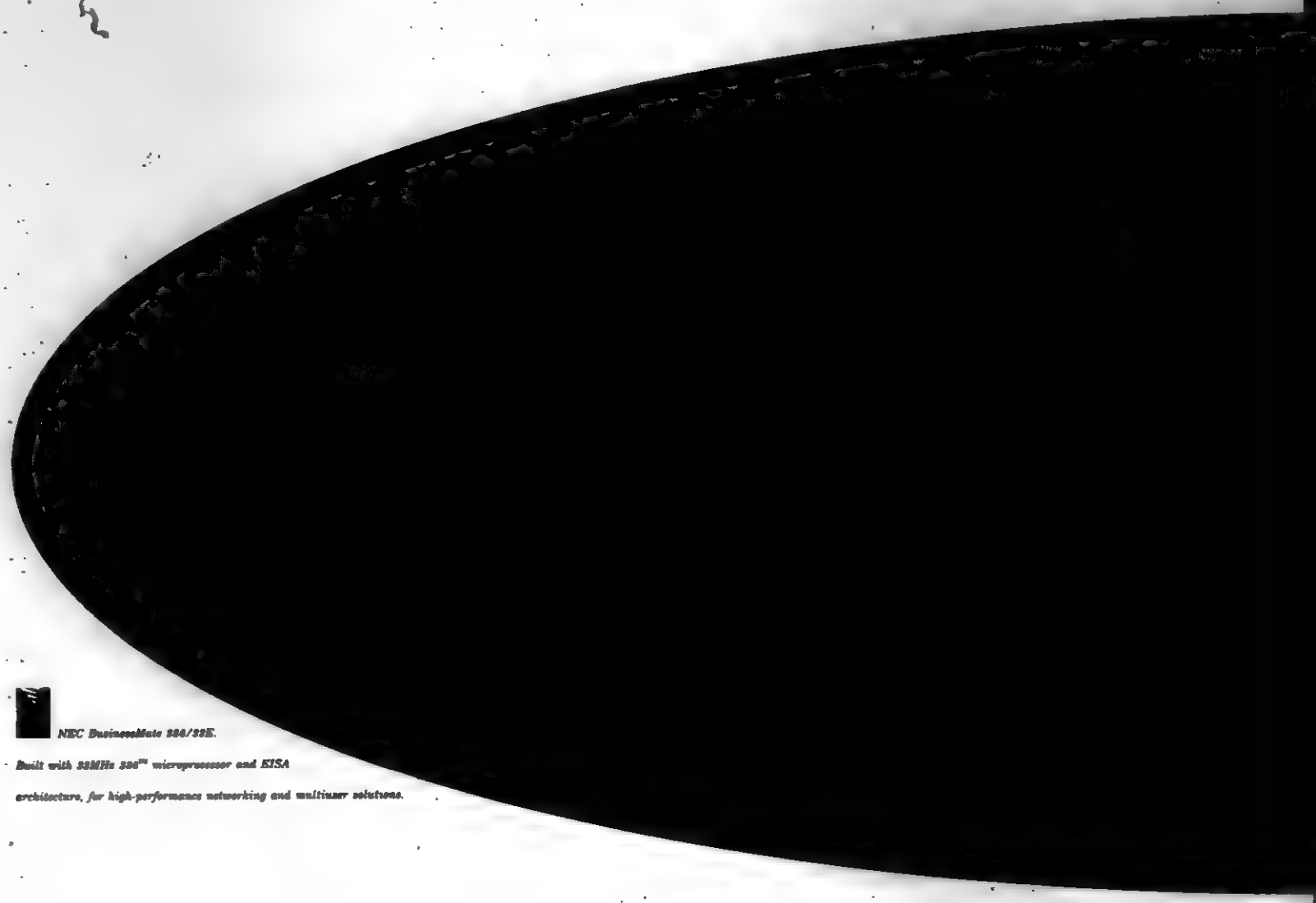
SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 even displays the same status indicators.

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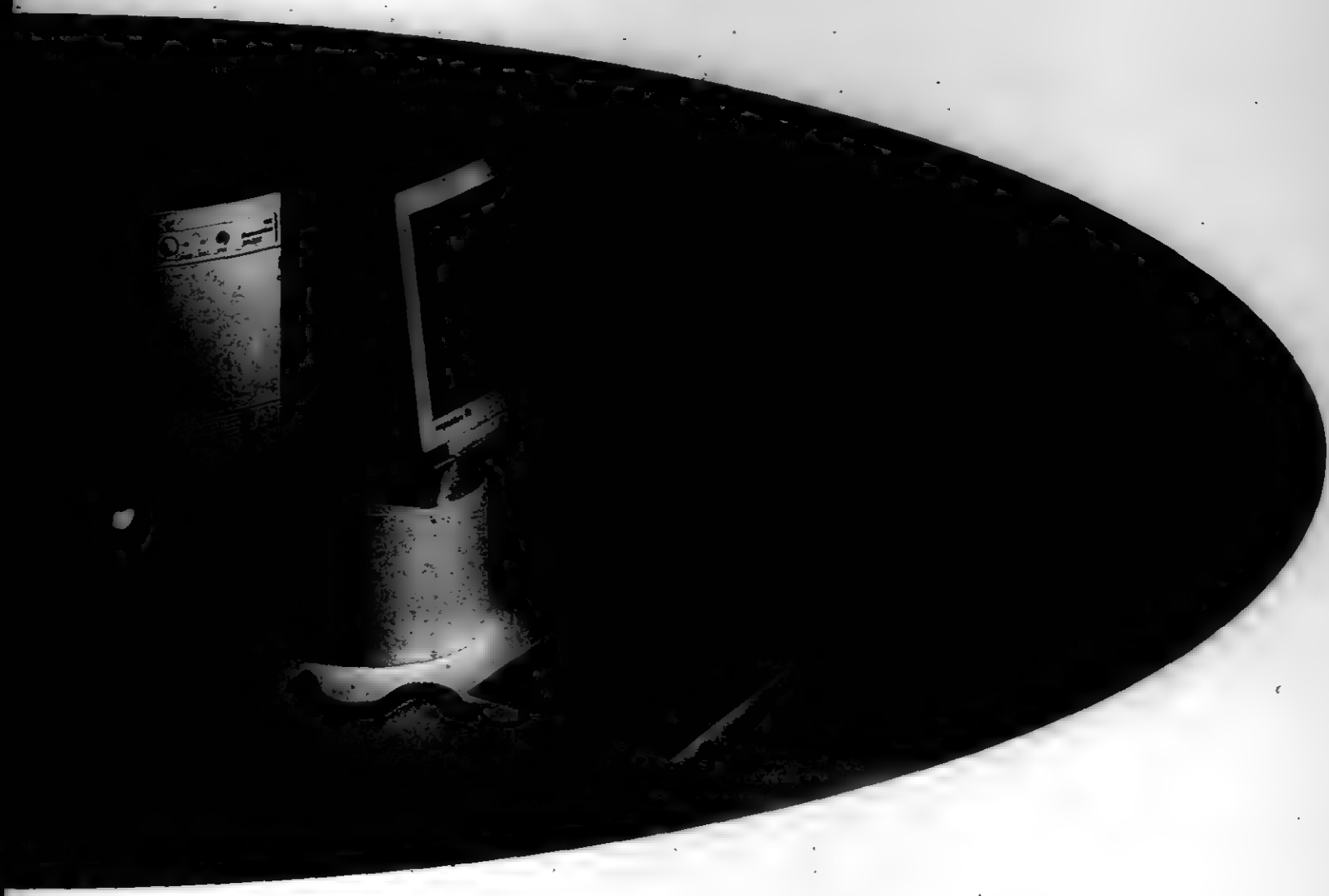
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PCs take command on campus

ON CAMPUS

BY RICHARD INSTONE
CW STAFF

BOWLING GREEN, Ohio — At Bowling Green State University, placing personal computers in residence hall rooms is the second phase of a computer facility decentralization process. It is also the first step toward a long-range goal to allow all 8,000 resident students to plow through library databases, check their tuition accounts and register for courses — all from their dormitory rooms.

By the time next year's classes start in late August, all 172 rooms in Bowling Green's Chapman residence hall will be equipped with an Apple Computer, Inc. Macintosh Classic or, if the student chooses, a Macintosh LC, Macintosh IISI or IBM Personal System/2 55SX.

Chapman Hall is a test case. If student evaluations prove it worthwhile, the program will be expanded to approximately 4,000 dormitory rooms on the square-mile campus. Reports show 97% of surveyed students favored having PCs in their rooms. Only 15% owned their own machines.

For the privilege, students will pay between $135 and $210 per semester, depending on the model selected. The nearly $300,000 Chapman investment will be fully funded by student payments over five years.

The Macintosh Classics will be configured with 2M bytes of memory and a 40M-byte hard disk. Microsoft Corp.'s Works will be the preinstalled software.

Computers to students

This installation is part of an evolutionary effort to bring the computer to the student. "Years ago, to use the computer, you had to go to the computer," said Richard Conrad, director of computer services. Eight years ago, the university supplemented central laboratories by adding small microcomputer laboratories in each residence hall. But even that was not efficient enough.

"The computers have been so popular, many times the students had to wait in line," said William Lanning, director of residence management/residential services. Space constraints made it impossible to expand the laboratories. So students who did not want to wait for a residence hall laboratory machine often had to walk across campus late at night to one of the central laboratories, something Lanning said he wants to eliminate.

With this program, the university also hopes to reduce drain on the campus' 3,500 laboratory PCs. As students gain use of in-room PCs, "I see the emphasis on our labs shifting from basic word processing to more specialized needs with more powerful computers," Conrad said.

The university chose the Macintosh Classic as the standard model because of its $1,000 price and because it is suited for the most common student applications. But the choice was not unanimous. "The College of Business doesn't agree with us; they favor the IBM," Lanning said. "So we're going to offer both sides just to be fair."

The PCs in the dormitory rooms — both Apple and IBM — will be linked via an Appletalk network to dot matrix and laser printers centrally located in the residence halls. The long-range scheme — perhaps two years away — is to tie the dormitory networks into the university's Transmission Control Protocol/Internet Protocol fiberoptic, connecting students to IBM and Digital Equipment Corp. mainframes as well as the library, the bursar and other offices.



As an experiment, Bowling Green State University will place 172 Apple and IBM PCs in its Chapman residence hall

The university will service the Macintoshes, while IBM will maintain the PS/2s. However, wear and tear is not the school's chief worry. "In the labs, we had kids beating on them all day. The utilization [in the rooms] will not be anywhere comparable," Conrad said. The real risk "is the computer growing legs and walking off."

The university originally considered a lockable cabinet to secure the computers. But the cabinets took up too much space in the small rooms, and the $400 to $500 cost was unworkable. Instead, the school will rely on wire cables to secure the machines to desks.

Lanning said he knows of only two other colleges with similar installations. However, with the the right budgeting and planning, any size campus could implement such a program, he said.

Razzle-dazzle

FROM PAGE 35

trate their work and wrap multiple text fonts around clip art images.

In fact, the plethora of powerful options could be the first stumbling block: State-of-the-art programs may offer more luxuries than the average business presenter needs. "If you don't know what you're doing, you make something that looks like it belongs on *'America's Funniest Home Videos,'*" says analyst Frances Mendelsohn at Information Strategies Group in Vienna, Va.

"The important thing isn't trying to have one more feature than the other programs," says Joe Sanchez, an applications specialist and Lotus Freelance user at Florida Power and Light Co. in Miami. More important is simplifying and speeding up the development of presentations. Another problem is that high-end packages may carry heavy systems requirements. "We have 650 286-based machines. We can't throw out good computers just because the software industry says so," says Jim Turner, a staff specialist at the South Coast Air Quality Management District in California.

For many, the answer is simpler business graphics programs. The runaway market share leader at 57% is still the relatively venerable Harvard Graphics from Software Publishing Corp., according to Information Strategies Group. However, while users generally applaud the program's ease of use, some acknowledge its shortcomings.

"Harvard Graphics isn't the least capable program on the market, but in your straight pie charts there's often some limitation — something you can't do," Turner says.



"IN THE AVERAGE business presentation, it's not like we miss the ability to do advanced Bezier curves."

Joe Sanchez
Applications Specialist
Florida Power and Light

Nevertheless, the low-end programs offer plenty of functionality for most users. "In the average business presentation, it's not like we miss the ability to do advanced Bezier curves," Sanchez says.

For others, the answer may lie outside the traditional avenues of graphics applications. Some say they believe the graphical capabilities already within spreadsheets such as Informix Software, Inc.'s Wingz and being added to 1-2-3 could challenge low-end dedicated graphics programs such as Harvard Graphics. "There's a blurring there," Mendelsohn says. New possibilities offered by spreadsheets include three-dimensional graphs, text wraps, icons and multiple fonts. Many word processors have also gained charting facilities.

At Contel ASC, a division of Contel Corp. in Rockville, Md., Bill Remmert oversees production of a monthly review, which is presented to company management — and executed without presentation software. "We use [Microsoft's] Excel and Word for Windows, and it looks very crisp, very sharp," says Remmert, the division's director of end-user computing.

Bob Martin, manager of executive support systems at Eaton Corp. in Cleveland, says the new graphics power in Release 3.1 of Lotus' 1-2-3 eliminates some of the need for his business graphics program.

Even as many other applications continue to add graphics features, however, analysts and users agree that some fundamental distinctions currently set presentation software apart.

Spreadsheets are presently unable to handle word charts, which comprise up to 75% of presentations, according to Bill Coggshall, president of New Media Research, Inc. in Los Altos, Calif. Technical charts may also stretch the abilities of spreadsheet graphics. Ronald Houck, senior systems designer at Marion Merrell Dow in Indianapolis, uses Zenographics' Mirage presentation program in addition to Excel. "We're in research and development and need more scientific graphs with standard deviation, for example," he says. "That's beyond what most spreadsheets can do."

Word processor woes

Similarly, word processors lack the ability to handle numeric charts and graphs. Standard applications also cannot walk the user through the process of developing a presentation, Coggshall notes. "A word processor doesn't know you're doing a presentation," he says.

Finally, presentation packages are not likely to stand still while other applications gradually overtake them in features. Coggshall speculates that presentation software will gradually migrate to hypermedia platforms. "Hypermedia can bring motion, which is important for keeping people awake and paying attention. Video clips that are funny or poignant are very memorable," he says. Executive information systems may also prove fertile ground for presentations, Mendelsohn says.

Sinton is a Computerworld staff member.

First Notes group founded

BY PATRICIA KEEFE
CW STAFF

NEW YORK — The first meeting of a Notes user group has already cemented a promise from Lotus Development Corp. to run a bulletin board tying the participants together for information exchange.

Notes users are already tied into Lotus via their Notes servers. The user group plans to replicate a bulletin board through the Lotus Notes server to all members.

Users can use the bulletin board to communicate between meetings; keep track of and register other Notes users and projects; and broadcast enhancement requests for comment, according to Mike Mandelbaum, a specialist with The Chase Manhattan Bank NA's Notes Applications Group.

There is even talk of establishing a library of notes applications, said Eric Sall, Lotus' director of application marketing for Notes. Users talked about approaches to deploying Notes, standardization of procedures and programs and application ideas, he said.

The Jan. 21 meeting attracted about 30 people representing eight companies. The next meeting will be held March 21 at Chase, Mandelbaum said.

Supercalc 5 short on speed but capable

Technology Analysis — a roundup of expert opinions about new products. Summary written by Computerworld staff member Derek Slater.

According to Computer Associates International, Inc., Supercalc 5 Revision D, last year's upgrade of Supercalc, is intended primarily to enhance performance. Surprisingly, personal computer publication tests found that it falls short in that very area while stacking up well in graphics and analysis as well as overall value.

Performance: Supercalc 5 users can manage multiple worksheet windows and refer cells to external data stored in memory or on disk. The program suffers from some limitations in working with nonactive multipage worksheets. In addition to a full range of standard number-crunching features, Supercalc 5 offers multiple regression analysis and can handle matrices. It also performs minimal recalculations on a user-defined range of cells. While this spreadsheet is missing a few advanced abilities found on high-end competitors, most reviewers found Supercalc 5 to be a very capable analysis tool.

Relative lack of speed is still the performance drawback for Supercalc 5. It finished toward the back of the pack in *Infoworld*'s benchmark testing.

Compatibility: Revision D is compatible with previous Supercalc versions and handles files from its mainframe sibling, also called Supercalc. Supercalc 5 works smoothly with Lotus Development Corp.'s 1-2-3 file formats. It also reads database files from Ashton-Tate Corp.'s Dbase III.

Graphics: Graphics features in Supercalc 5 are excellent, reviewers said. The package offers a variety of chart formats, including three-dimensional graphs, text charts and customization options. In fact, according to *PC Magazine*, the plethora of choices makes the menu confusing.

Database: Using external database files larger than random-access memory capacity requires a $149 add-in program.

Output: Revision D enhances printer support for Supercalc 5. While it delivers high-quality spreadsheet publishing, it offers no page-break preview.

Documentation: The documentation is generally clear and fairly thorough, although the explanation of multipage spreadsheet use is not that detailed, according to *Infoworld*.

Ease of use: The complicated menu is an obstacle for first-time users.

Support: CA's support is rated satisfactory although unspectacular, reviewers said.

Value: On Feb. 25, 1991, CA permanently lowered Supercalc 5's price from a longstanding $495 to $149 — lower than many competitors' regular prices. It is a solid, character-based choice, particularly for users with less sophisticated hardware. However, reviewers recommended expanded memory to take full advantage of all its features.



CA's Supercalc 5 Revision D *stacks up well in graphics and analysis but lacks speed*

Reviews Summary

Criteria			
Performance	Good	Fair	
Compatibility			
Graphics	Very good	Strong functions	Solid
Database			
Output	Good	Excellent	Good
Documentation			
Ease of use	Satisfactory	Like 1-2-3 with more options	More daunting for new users
Support			
Value	Satisfactory	Good	Competitive
Reviewer's score	8.5*		

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

What the experts say

• **Users: John Kelley, senior computer specialist, U.S. Library of Congress** (*overall performance of product:* 5.5, *cost to get product up and running:* 7.5)

"The internal mechanics of Supercalc are very good and sufficient for our needs. I love the product — until you get to paper. They've made some half-hearted stabs at printer support but haven't gotten anywhere," Kelley said.

Keith Dolan, personal computer specialist, Hussey Seating Co. (7.5, 5)

"Other than the memory problems, Supercalc is OK. It has super graphics, but it takes up so much memory that the average person is limited in the size spreadsheet," Dolan said.

Charles Miller, Hammond Lead Products, Inc. (10, 10)

"I like the ability to do what I'm trying to do simply with few keystrokes," Hammond said.

• **Analysts: Earl Rich, Faulkner Microcomputer Reports** (8, 7)

"Supercalc has a promising interface, but it doesn't compete that well as a cost-effective program," Rich said.

Marshall Moseley, Dataquest, Inc. (7.5, 8.5)

"Its strengths are that it is three-dimensional and has some good graphics capabilities. Considering the features out there on some of its competitors, though, I think it's primarily best for CA's installed base. Its interface is an extension of the original Supercalc interface, and I think it is quirky and overly complex," Moseley said.

• **Financials: Chris Shilakes, Alex. Brown and Sons, Inc.** (*overall financial performance of product and company:* 8)

"We have their stock rated a strong buy. They have a strong balance sheet, next to no long-term debt and a very nice cash position. We project 10% to 15% long-term growth for the company," Shilakes said.

Jim Stone, Ladenburg Thalmann (5)

"They ran into some trouble in June; now they're on the rebound, but they aren't very forthcoming with information, so it's hard to tell how strong the rebound is," Stone said.

Steve McClellan, Merrill Lynch Research (5)

"They have lots of cash and good cash generation. From an earnings standpoint, they've been depressed for over a year. There's evidence of weakness there. It's not that they're losing money. . . . They're just middle of the road," McClellan said.

Supercalc 5

Points (maximum)	Category
18 (30)	Published reviews
16 (20)	Analysts' ratings
11 (15)	Users' ratings
15 (20)	Cost evaluation
9 (15)	Vendor financials

(Maximum score: 100)

CA responds

Comments from marketing manager Bob Ralston:

Performance: We are working on increasing speed. Supercalc 4 was quick, but we stuffed a lot more features into Supercalc 5. We are coming out with a new version by the end of March that is primarily intended to improve speed and memory [redacted].

Graphics: [Microsoft Corp.'s] Windows opens up some new possibilities. We made a strategic acquisition of Manageware, Inc. in January. Their product is Compete, a hybrid multidimensional modeling/spreadsheet product for [redacted].

Output: The first concern for our customers is the lack of what-you-see-is-what-you-get page preview; we're addressing that right now. The second thing is output device support. We're working with Canon U.S.A., Inc., Hewlett-Packard Co. and others to provide better native printer support.

Value: The off-the-shelf price is now $149; that isn't just a competitive upgrade price.

NEXT WEEK

▶Local-area network monitors: Cheyenne Software, Inc.'s Monitrix 1.1 and Brightwork Development, Inc.'s Ensnitor+ are reviewed based on how well they find problems.

Methodology: *Published reviews: average of numeric scores from product reviews published by personal computer publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of financial analysts' ratings of vendor financials and ability to support product multiplied by 1.5.*

Keefe

FROM PAGE 35

a period of price cuts and heavy promotions for enhanced versions of existing packages.

That's not all, folks. What better follow-up to the recent Notes bash and announced plans to purchase CC:Mail than a rundown on upcoming Lotus announcements? Here we go:

On the Windows front, "Rockport," or 1-2-3 for Windows, is looking really good and should be on its way out to beta-test sites. June is still the scheduled date unless Lotus can ship it sooner. Reportedly, we may see a Windows version of Improv, the Lotus spreadsheet for the Next, Inc. platform. That's the first port on Lotus' list, another source says. As for Notes for the Apple Macintosh, well, still no sightings.

> "IS [LOTUS] SHOOTING themselves in the foot with that promotion? One really wonders if they thought this through."
>
> BOB HOLMES
> SOUTHERN
> CALIFORNIA GAS

But 1-2-3 for the Macintosh, also known as Houdini, is supposed to ship in October, complete with support for Apple's System 7.0. The graphics are supposed to be impressive, and users need not fear another Jazz interface debacle. Houdini will adhere to the Macintosh interface, and there will be a way for 1-2-3 PC users to quickly familiarize themselves with the Macintosh version.

One source tells us the product is "a little like Jazz," while another notes that Lotus will choke before it mentions Houdini and Jazz in the same sentence. A Lotus source maintains that Excel is too much like DOS and Windows and that 1-2-3 for the Macintosh is the true Macintosh spreadsheet (of course, Excel was developed on the Macintosh first).

Some work remains to be done on how the icons will be laid out, but we're told beta-test versions will go out shortly. The source also said that 1-2-3 for the Macintosh is the most requested product from Lotus users.

Yo! IBM raps. At least it plans to, possibly this month, in briefings to developers, users and analysts. A source familiar with the still-being-formulated announcement said IBM will primarily be addressing corporate developers. "You can expect them to promise a stable OS/2 2.0, making the point that if you want to work in a 32-bit environment, they'll be able to do it two years before Microsoft can with Windows," the source said, adding that IBM is "counting on the timing issue."

Also on tap is some AIX-oriented news. We're told by sources that IBM plans to have pieces of the unbundled Extended Edition certified to run on both third-party hardware and its own AIX systems.

Another source said users can also expect to hear a "rounding out" of the Officevision line, with IBM announcing support for OS/2, DOS and Windows clients. A Macintosh client could be 12 to 18 months down the road, a third source added. The Windows client was initially slated to ship in the first quarter, but as one analyst asked, "What difference does it make? Officevision LAN is a nonexistent product."

We just need a little patience. As the first quarter comes to a close, the first item in the November 1990 "Wordperfect Report" caught my eye. "For those eagerly awaiting a version of Wordperfect that supports the new graphical user interfaces including Windows, your patience is about to pay off. Wordperfect 5.1 for Windows is scheduled for release the first quarter of 1991." Uh, change that to second-quarter '91.

Keefe is Computerworld's senior editor, PCs and Workstations.

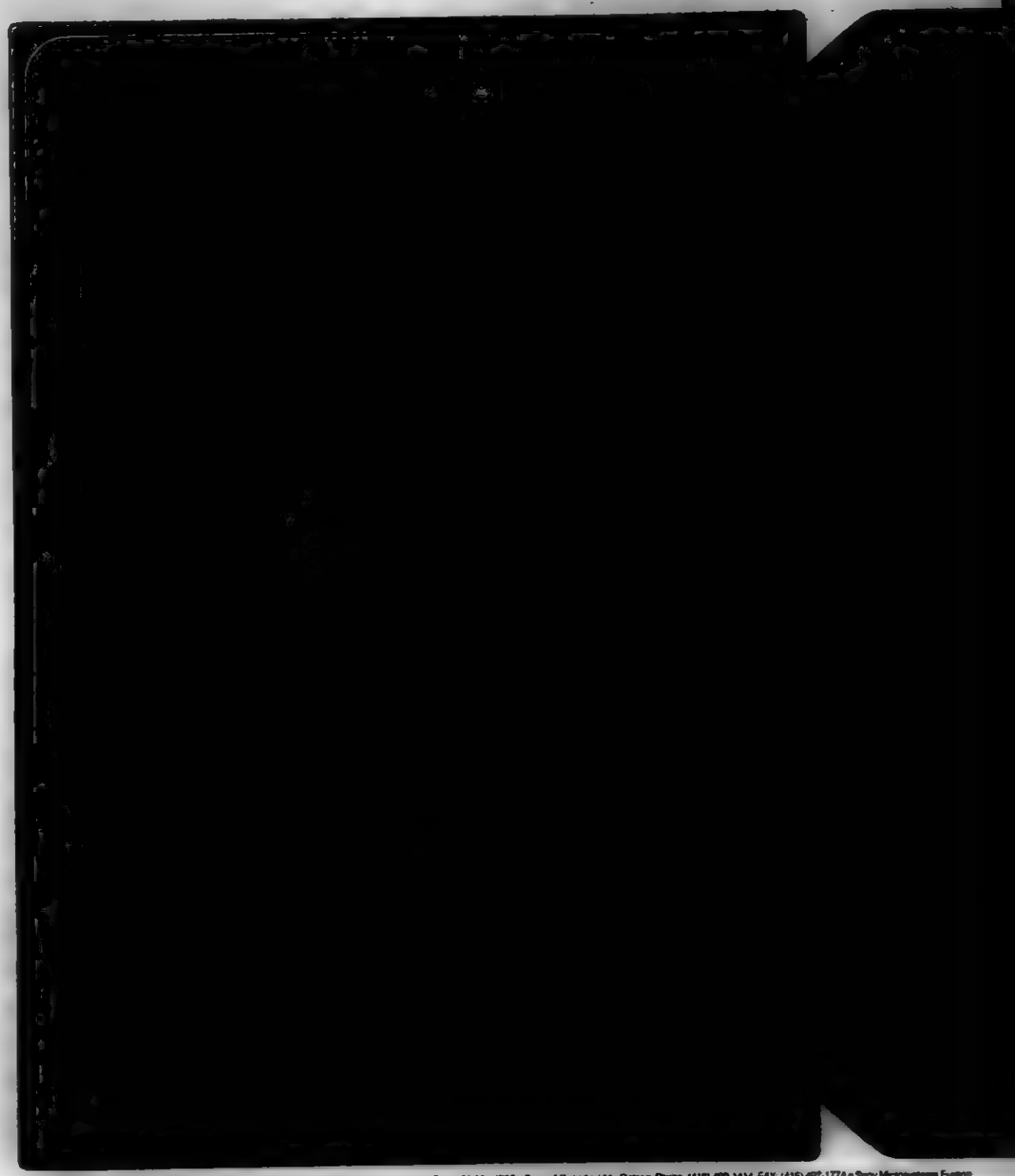
INTRODUCING THE SONY NEWS 3250

[redacted] LAPTOP. [redacted]

And well it should. At 17 MIPS and 1.8 MFLOPS, it's got enough power to panic the average workstation.

The NEWS™3250 laptop is powered by a 20 MHz MIPS™R3000 RISC processor, plus a floating-point processor. It runs UNIX™ V.4, X Windows™ and Motif™ software. Offers 8 to 36MB of RAM and a 240 or [redacted] internal hard drive. Delivers incredible 1120 x 780 resolution on an 11" backlit LCD monitor.

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XGA

FROM PAGE 35

for a standard, a standard that may not be developed for 1½ to two years if it is going to be XGA. One standard at the high end may not be developed, leaving users to continue wading through choices.

Some analysts who initially predicted that XGA would solve this confusion and become the next graphics standard on the desktop have changed their tune.

For instance, Jon Peddie, president of Jon Peddie Associates, said he originally thought XGA would establish itself as a high-end standard, but he is less sure now.

"What does XGA bring to the party that we don't already have?" Peddie asked. "Not much. It's a nice piece of technology, but it's not an order of magnitude better than anything else."

Peddie said the "real magic" of XGA is its basic architecture, which allows IBM to design much higher resolution controllers that run at much greater speeds. The problem with current XGA is that this architecture "is too far removed from being a direct benefit to the end user," he added.

"Right now, it's just kind of an expensive curiosity relative to VGA," Peddie said. In the meantime, the high end of the market will be confused for at least the next two years, according to Peddie.

"The XGA clearly has a better architecture for 1,024 by 768 than VGA. VGA boards are extendible to that," said Anderson, who works at a company that makes VGA boards. "We appear to be getting very good performance out of it, but XGA was truly designed for a windowing environment. I've got to say that it's a good architecture."

IBM will develop a version of XGA for the Industry Standard Architecture bus that could give it more leverage in the industry, Basilico said at the VESA meeting. IBM would not confirm these comments.

Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn., said he thinks XGA will succeed in becoming the next standard in just over the same two- to three-year time span VGA needed to establish itself.

On the other hand, Michnoff acknowledged previously unsubstantiated rumors that Compaq Computer Corp. may be planning to advance a different personal computer graphics standard.

"If Compaq and others get together to design their own graphics spec, clearly that would signal a greater bifurcation in the marketplace," Michnoff said. "The era of IBM compatible is over, and the era of IBM comparable is in."

Senior writer Richard Pastore contributed to this report.

As you may have guessed, this is no ordinary laptop. Like every machine in the Sony NEWS family, it's a full function desktop workstation. Only smaller.

So check it out. It may scare you at first, but you'll love it once you see it in action. Which you can do by calling 1-800-624-8999, Ext.96A.

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MICRO BITS

Courses offered

In exchange for a onetime licensing fee and the cost of student materials, companies that offer network training can give their customers training courses developed by Microsoft University. The three available course sets include LAN Manager, SQL Server or OS/2.

Now shipping, according to their vendors: Lotus Development Corp.'s Freelance Graphics for OS/2 ($400), Symantec Corp.'s upgraded Norton Editor Version 2.0 ($99), Wordperfect Corp.'s Wordperfect Executive for The Poquet Personal Computer ($250) and Erudite Corp.'s Sagacity assignment modeling program ($1,595).

Lotus and Next, Inc. are extending through March 31 a promotion that provides Lotus' Improv free to those who buy Next's newest Motorola, Inc. 68040-based computers.

NEW PRODUCTS

Systems

Tyan Computer Corp. has announced an Intel Corp. 1486-based workstation designed to run Unix- and MS-DOS-based applications.

Voyager features single-board architecture and a dual-computing platform design that enables users to run both Unix and MS-DOS operating systems. The system includes 256K bytes of second-level cache memory, 8M bytes of random-access memory and a 64-bit data bus.

A standard configuration is priced at $9,999.

Tyan Computer
612 N. Mary Ave.
Sunnyvale, Calif. 94086
(408) 720-1200

Topline Technologies, Inc. has announced an Intel Corp. 80386-based, 33-MHz system equipped with a 256K-byte cache and burst mode memory access.

The Topline 386/33 is certified for use as a personal workstation or file server under Novell, Inc. Netware. The unit supports 256K-, 1M- and 4M-byte dynamic random-access memory chips for up to 64M-byte configurations, according to the vendor.

A basic unit is priced at $4,295.

Topline Technologies
310 E. Orangethorpe Ave.
Placentia, Calif. 92670
(714) 524-6900

DFM Systems, Inc. has announced a 4½-pound, Intel Corp. 80286-based notebook computer equipped with a bar-code interface and a touch-screen overlay.

The Travelite 286 includes a 12-MHz, zero-wait-state portable system module designed to accommodate up to 4M bytes of random-access memory and a 20M- or 40M-byte hard drive.

Keyboard connectors and IBM Color Graphics Adapter and Enhanced Graphics Adapter video outputs are also included. An optional digitized speech feature for voice prompting or touch-response applications is also present.

A basic unit costs $2,495.

DFM Systems
1601 48th St.
West Des Moines, Iowa 50265
(515) 225-6744

Software utilities

Parsons Technology has announced Version 2.0 of Virucide, an antivirus program designed to detect and eliminate more than 240 virus strains from floppy disk, hard disk and network drives.

The product includes a virus reference file, an unattended operation feature and on-screen displays containing data about detected viral strains.

System requirements include an IBM Personal Computer XT, AT or compatible, 256K bytes of random-access memory and DOS Version 2.0 or higher. Virucide Version 2.0 is priced at $49.

Parsons Technology
375 Collins Road N.E.
Cedar Rapids, Iowa 52402
(319) 395-9626

Reference Software International has announced an upgrade to Grammatik IV, its grammar and spelling checker designed for IBM Personal Computer XTs, ATs, Personal System/2s and compatibles.

Grammatik IV Version 2.0 includes hundreds of grammar and style rules and supports mouse devices such as those designed by Microsoft Corp. and Logitech, Inc.

The product began shipping last month. A specialized version, Grammatik IV Version 2.0 Government Edition, which proofreads documents according to government-specified guidelines, started shipping last month.

Single-user and five-user business or government packs are priced at $99 and $245, respectively.

Reference Software International
330 Townsend St.
San Francisco, Calif. 94107
(415) 541-0222

Data storage

Storage Dimensions, Inc. has announced its 650 MB series of 5¼-in. erasable optical disc subsystems that features average seek times of 70 msec and 7.4M bit/sec. data transfer rates.

The 650 MB series includes 16-bit bus mastering adapter cards for IBM Personal Computer AT and Micro Channel Architecture-based platforms. Compatibility with most major operating systems, including DOS, Novell, Inc.'s Netware, Unix, Xenix and OS/2, is also featured, according to the vendor.

Pricing begins at $5,495.

Storage Dimensions
2145 Hamilton Ave.
San Jose, Calif. 95125
(408) 879-0300

Amkly Systems, Inc. has announced the Ampac-SLT line of memory expansion boards designed for Compaq Computer Corp.'s 20-MHz, Intel Corp. 80386SX-based SLT laptops.

Ampac-SLT includes 1M-, 2M- and 4M-byte models that are priced at $495, $895 and $1,495, respectively.

Amkly Systems
60 Technology Drive
Irvine, Calif. 92718
(714) 727-0788

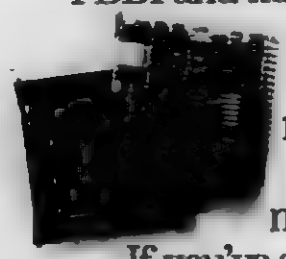


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Controllers limit LAN moves

BY ELISABETH HORWITT
CW STAFF

WHITE PLAINS, N.Y. — As IBM shops migrate from dumb 3270-to-host links to personal computer local-area networks, they are finding a stumbling block in the way: their old IBM cluster controllers.

IBM has periodically offered to buy back 3274s from users who agree to purchase the 3174s, a company spokesman said. Nevertheless, many users still use the old cluster controller — including some companies that want to move to LANs. In addition, they are finding ways to preserve their installed base of older cluster controllers during that migration without isolating a portion of their user population from its benefits.

Mellon Bank Corp. is one such company. Many of the bank's own branches, as well as client banks that use Mellon's data services, want to migrate from dumb terminals, bisynchronous connections and "obsolete controllers" to PC LANs, according to Dale Davin, Mellon Bank's systems vice president of telecommunications.

The benefits of such a move include potentially significant line cost savings, because it would permit all of a site's communications to Mellon over a single T1 link, Davin said. Right now, such sites send transmissions over low-speed links between individual cluster controllers and the bank's data center.

The problem is that many users want to "take advantage of the new PC applications while still preserving their current application base," which may run on the older equipment, Davin said.

Easing migration

Mellon Bank is looking at the Systems Network Architecture Network Access Controller for Token Ring (SNAC/TR) from Sync Research in Irvine, Calif., as a way to ease the SNA migration path for these sites. The device is said to convert transmissions of IBM 3274s, asynchronous and bisynchronous devices to SNA protocols that can run over a Token-Ring LAN and out over a remote bridge to an SNA host. This allows Mellon Bank's users to implement a single LAN and T1 bridge for both their older and newer IBM equipment, Davin said.

Without the $8,000 device or its equivalent, would-be Token-Ring implementors would have to get rid of their older equipment or set up two communications networks: one for SNA devices with built-in LAN support, the other for those without it.

Dollar-Dry Dock Savings Bank of New York is in the process of evaluating SNAC/TR, as well as similar products from other vendors, to provide Token-Ring connections for IBM 4702 and 4732 automated teller machine terminals at its branch offices, according to Robert Greenstein, vice president of telecommunications.

Dollar-Dry Dock hopes to migrate its SNA installation to LANs completely by next year, according to Steve de Maio, first vice president of systems. However, the time frame will be contingent on the bank's finding an acceptable product for interfacing all of its SNA devices to Token-Ring, he added.

The Travelers Corp. is another company that wants to protect its 3274 investment, which still makes up about 40% of its total cluster controller installation, while it migrates to LANs. The company is accomplishing this by implementing multiplexers and routers, which promise to amalgamate 3274 and LAN traffic over the same T1 links, according to Robin Layland, manager of SNA software engineering at the insurance firm. This will allow Travelers to keep its 3274s a while longer and still gain the economies of scale T1 lines offer for LAN interconnectivity, Layland added.

Split market

The IBM 3174 still trails the 3274 in popularity after almost five years on the market

Total U.S. sites surveyed: 8,804

3274	Model	3174
May 1977	Introduced	May 1986
36,160	Installations	33,027

Source: Computer Intelligence

Netware faces problems on Arcnet

BY JIM NASH
CW STAFF

Problems with a Novell, Inc. network driver are vexing some users of Netware Versions 3.0 and 3.1. Novell's Turbo RX Net driver appears to be shutting down networks on Arcnet and those running certain accounting packages.

One company, Azure Technology in San Jose, Calif., is battling both problems as it tries to keep its mail-order business on line. Bert Riley, Azure's systems director, said he has had crashes and near-crashes on an average of once per day since December.

Riley manages a 20-station Netware 3.1 network running on Datapoint Corp.'s Arcnet. He said Azure installed Netware 3.0 in July and had similar problems. Azure is a 3-year-old mail-order house for aviation-related hardware and software.

There are about 7,500 Netware 3.0 and 3.1 networks worldwide running on Arcnet, estimated Steve Meyer, president of Meyer & Associates, a consulting firm in San Ramon, Calif. Meyer said Michelin & Co. Italy and several other of his European clients have experienced similar problems.

"We're having problems with messages at workstations indicating a problem at the server," Riley said. When the server's use peaks between 25% and 40%, server-error messages flash. Riley said that during busy periods, this can happen seven times daily with the network seizing, and the server eventually shutting down.

He said that although the network seizes soon afterward, the server is unaware of the problem. Occasionally, Riley said, the server shuts down when its packet-received buffer count climbs until it reaches its limit for unexplained reasons. "I don't know what the relationship is between the two," he said.

On your own

Novell has "been unable to resolve the problem," Riley said. "They've been helpful, but I don't hear anything back from them. You kind of feel like you're on your own."

Riley said he loaded a new Turbo RX Net driver last week and the shutdowns ceased, but the network also stopped running applications by Great Plains Software, including order entry.

A source close to Novell who requested anonymity said most of the reported problems with Arcnet users have been caused by Turbo RX Net driver.

A spokeswoman for Great Plains Software in Fargo, N.D., said there appears to be a basic incompatibility between the Netware Btrieve record management system and the Turbo RX Net drivers. The incompatibility is corrupting Btrieve files and rendering Great Plains Software products inoperable.

Novell is looking at the relationship between the driver and client version of Btrieve, said Dwight Davis, Novell's director of marketing development products. Davis said driver problems in the past have been specific to individual networks, with no overriding trend. He said the number of reported instances of incompatibility between the two Novell products has been small.

Meyer said Michelin's problems began in December. "The system was crashing like clockwork at 4 p.m." Originally thought to be a faulty disk drive, he said he eventually swapped the Turbo RX Net driver for a third-party driver, and "the problem disappeared."

PC users gain part-time X terminal capabilities

BY JOANIE M. WEXLER
CW STAFF

The infiltration of X Window System-based networks into corporate computing does not necessarily mean that companies must swap out their personal computers for X terminals or full-blown Unix-based workstations.

X server software for PCs is emerging for cost-conscious users who run MS-DOS or Microsoft Corp.'s Windows 3.0 applications locally but who must also occasionally tap into an X-based network. "The software makes for cheap — but not better — X terminals," commented Mike Bassman, an assistant vice president at New York-based The First Boston Corp.

According to Bassman, he is currently replacing hundreds of mainframe terminals with either Unix workstations, X terminals or PC-based X servers. The X server software, he said, is going to PC users who need casual access to the company's internally developed financial applications.

X is a protocol that allows a single desktop device to pull applications from multiple networked computers and display them simultaneously on one screen. X terminals are intelligent, diskless desktop devices specifically designed to access X networks. X terminals also feature high-resolution displays; low-end prices start at about $2,000.

As an alternative, companies can upgrade their PCs with $300 to $500 X server software and integrate them into the X network. While there can be other expenses to the user, depending on what other networking protocols and type of display are already in use, X server software is creating a market that The X Business Group, Inc. in Fremont, Calif., anticipates will grow 300% this year.

"What will drive the market is companies' desire to protect their PC investments," commented Steve Auditore, president of the research company. "The user must decide what makes the most sense for accessing X."

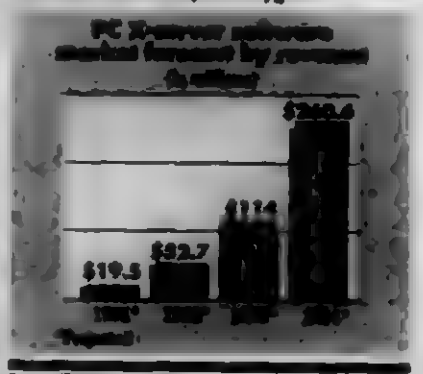
For example, Auditore said, X terminals fit into many places where dumb terminals are now used, such as for heavy database access and transaction processing applications.

However, Auditore said, "It's cheaper to upgrade an installed PC with X server software than buy a new X terminal if you're accessing the X network less than 25% of the time."

Continued on page 48

X-celerating

Many users needing occasional access to an X-based network will protect personal computer investments with a software upgrade



Source: The X Business Group — CW Chart: Paul Mock

Networked system gives Orange County new image

Probate court's use of optical storage speeds access to legal documents for judges, lawyers, public

ON SITE

BY JIM NASH
CW STAFF

SANTA ANA, Calif. — Trundling baskets of worn case folders may be retired when the Orange County Superior Court probate courts move to computer networks.

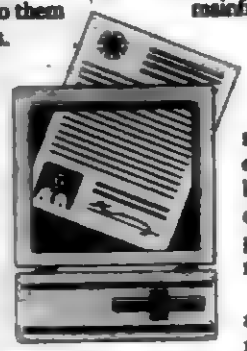
Computerization is coming in the form of a networked Filenet Corp. image management system. Lisa Brown, a systems consultant at Filenet, said a pilot project is under way to connect 44 Unix-based Filenet image terminals and 16 servers on a combination of fiber and twisted-pair cabling.

The contents of those folders — 180,000 legal documents — are being transferred to optical discs. When the approximately $1.2 million contract is completed this spring, the disc drives will be tied into the proprietary Filenet network.

The general public, court officials and even judges on the bench will use the oversized image terminals to call up, examine and copy public documents.

Today, said Jeannette Beberia, project manager for the court, a library system is used to distribute the files in turn to the six or more people who either check the files for compliance with the law or refer to them during the proceedings.

"There was a lot of obstinacy [about moving to computers] initially, especially on the judges' part," Brown said. "We were lucky to have a lot of champions in probate."



She explained that although this is not the first time terminals have been installed in the court, it will be the first time terminals will be issued to Orange County Superior judges at their benches. She said there are plans to expand computerization to other courts in Orange County, but she could not say exactly which departments will follow or when.

Beberia said the networked computer system holds many advantages over the old manual system, including multiple access. "Right now, only one person at a time can view files. Right there is a savings in efficiency." Filenet's system will integrate with IBM and Unisys Corp. mainframes already in use by court personnel, she said.

Just as important, though, will be speedier update and entry of files, Beberia said. "Our records will be less prone to misfiling or misplacing."

Rosa Holdeman, a systems programmer at the court and future manager of the image network, said plans now call for an additional 15 terminals in probate. With the added terminals, Holdeman said, all probate employees will have desktop access by the end of the year.

Beberia said the system will be remotely accessible to anyone who purchases Filenet equipment for asynchronous communications. She explained that this is aimed primarily at attorneys.

The network being set up now will have pods of either two or four image terminals linked via fiber-optic cable to a document-entry server.

Filenet requires terminals to use fiber to link with their servers, Holdeman said. Each pod will have a Filenet scanner and printer attached. Both the scanner and printer will have their own servers, Holdeman said.

Behind the scenes

All of this will be linked through Synoptics Communications, Inc.'s Lattisnet System 3000 smart hub to two primary Filenet servers. One server will combine image routing and image indexing services. The second box will house Filenet's Optical Storage and Retrieval (OSAR) Library document storage and retrieval server capable of handling 4 million to 5 million documents.

The routing server will support Filenet's Workflo fourth-generation language application. Among other duties, Workflo will customize document routing and keep an automatic log of documents and who has viewed them.

The index server will have database responsibilities such as tracking case numbers and types of documents. The OSAR server will order the retrieval of documents from Filenet's robotic disc library.

Holdeman said the system will use Lattisnet Model 508 concentrators in the court's telephone room to connect the primary and secondary servers with twisted-pair cabling.

"That allows communications between the two main servers as well as the secondary servers out there," she explained.

The OSAR and routing servers will access the Orange County General Service Agency's shared IBM 3090-200 mainframe primarily to trade information on its case scheduling application.

Each terminal will have Filenet's windowing application to display a host session, according to Holdeman. The probate computers will also communicate via twisted-pair cabling to the county's Unisys 2200/401 mainframe for office administration, word processing and electronic mail software.

BIT BLAST

Racal branches join forces

Racal Data Communications Co. seems to be putting its money where its mouth is regarding the synergy it touts among its five U.S. companies. The Racal firms, each of which is focused on different aspects of the communications market, have reportedly jointly created the Multifunction Communications System, slated for introduction in mid-April, according to a **Racal-Milgo** spokesman. The product is said to combine the expertise of all the Racal companies, including fast-packet, circuit and X.25 packet-switching technologies; cooperative processing; remote bridging; security and bandwidth management; and gateway functions.

The box will reportedly be sold by a common sales force. The spokesman said there is talk that the five companies will drop their individual names to fall under the Racal Data Communications umbrella. As fallout from the consolidation, internetworking company **Racal Interlan** acknowledged that it has reduced its work force by about 7%.

Electronic mail vendor CC:Mail, Inc. — recently acquired by **Lotus Development Corp.** — said it has made a technology acquisition of **Powercore, Inc.**'s Network Scheduler II mail calendaring program. According to CC:Mail, the acquisition is its first move to offer applications integrated with its E-mail product.

Osinet has announced that **IBM** and **Unisys Corp.** are the first computer companies to have successfully tested their Open Systems Interconnect file transfer products and officially registered them in the Osinet Test and Registration database. Osinet, a testing arm of the **Corporation for Open Systems International** in McLean, Va., said the test marked the first formal entry into the Osinet database.

Compex, Inc. has announced that **Computer Brokers of Canada**, reportedly Canada's largest microcomputer hardware distributor, will now distribute Compex's line of Ethernet and Arcnet network interface cards for IBM-compatible personal computers. The distributor will also sell Compex's Readylink entry-level peer-to-peer network operating system for IBM Personal Computer XTs, ATs and Personal System/2s.

Illinois Bell offers ties for alternative carriers

BY ELLIS BOOKER
CW STAFF

CHICAGO — Changing its formerly hostile tone toward the handful of alternative high-speed telecommunications carriers in this city, Ameritech subsidiary Illinois Bell proposed a service last month that would enable these "bypass" networks to interface with Illinois Bell's network.

The proposed Optical Interconnection Service calls for Illinois Bell to place appropriate optical/electrical gear in its central offices, which the alternative carriers would remotely monitor and control. For some time, Illinois Bell fought efforts by private fiber-networking companies for such access, fearing that these unregulated carriers could siphon off business customers.

The tariff proposal follows an agreement with Teleport Communications/Chicago, a unit of Merrill Lynch & Co., to allow the interconnections.

Teleport Communications is one of four fiber-optic network providers in Chicago.

If approved by the Illinois Commerce Commission, the tariff will only be available for interconnection of high-speed digital, nonswitched private line and special access service.

The proposal calls for Illinois Bell to install fiber-optic cables between alternative local carriers and Illinois Bell manholes near three central offices in downtown Chicago. The lines would terminate in the telephone company's central offices, where shared optical/electrical equipment would in turn be connected to Illinois Bell's nonswitched private line and special access tariffed services.

Illinois Bell will limit the opening of its network by specifically excluding the use of the interconnection for private branch exchange or Centrex traffic. The company also said it would not allow resale of switched services and voice-grade circuits. A portion of the charges for the interconnection service will go toward Illinois Bell's common overhead costs.

In an unrelated announcement, Illinois Bell filed a tariff last month for an Integrated Services Digital Network Primary Rate Interface service for customers in the Chicago area.

DG release links Aviion to Novell Netware

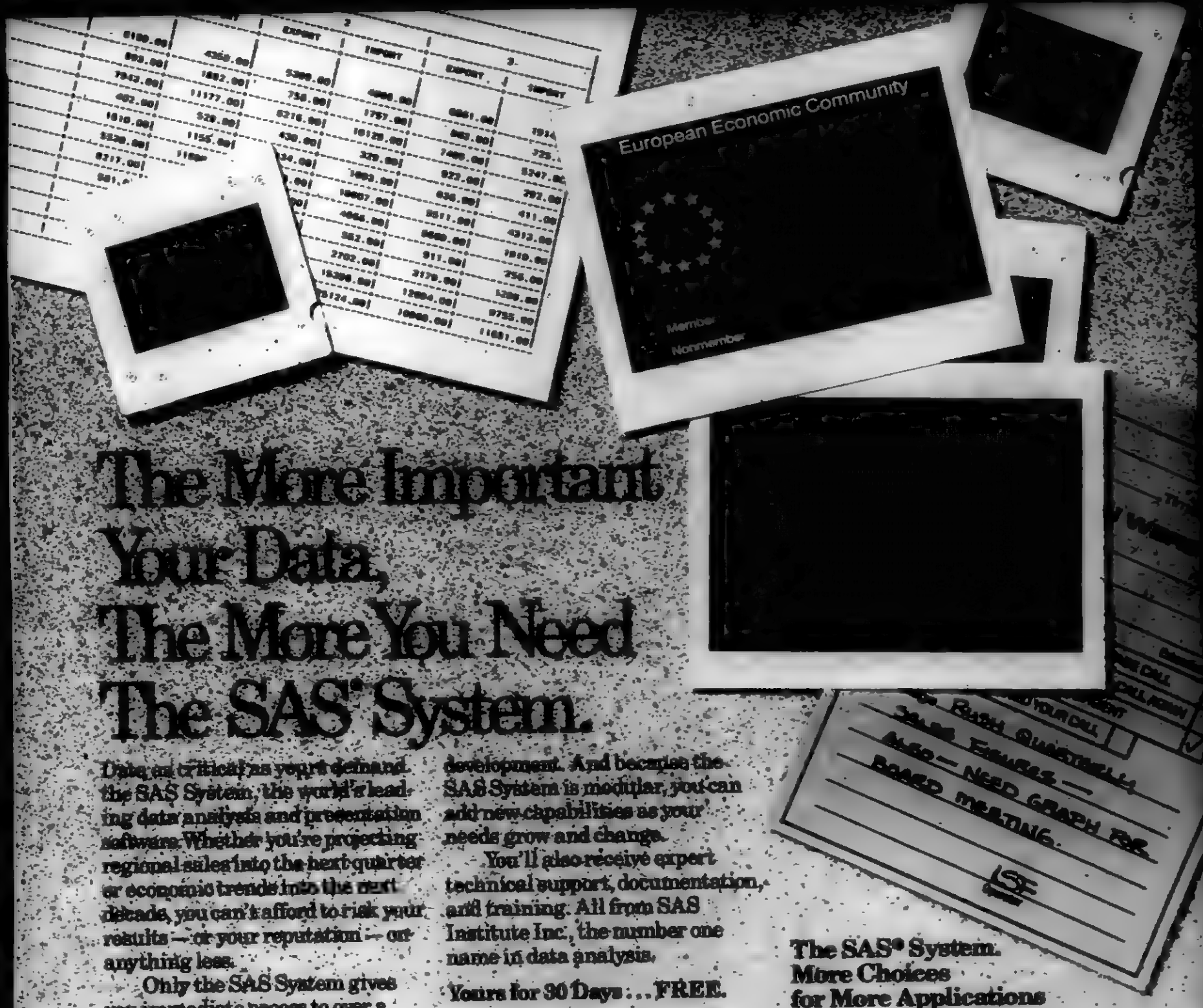
WESTBORO, Mass. — Hoping to better integrate personal computers with its Unix-based Aviion server platform, Data General Corp. has announced an open software environment designed to link Aviion servers and PCs across Novell, Inc.'s Netware local-area networks.

The software, designated Open Systems Office/pc.DAA (OSO/pc.DAA) is an MS-DOS package based on Microsoft Corp.'s Windows 3.0 and Hewlett-Packard Co.'s New Wave 3.0 graphical user interfaces.

The product allows PC users to access Unix applications residing on Aviion servers either through terminal emulation or client/server technology, the vendor said. In addition, data residing on Aviion servers can be downloaded for integration into PC productivity tools.

Ann Palermo, director of office systems research at International Data Corp., a Framingham, Mass.-based market research firm, defined the product as "more of an add-on to the Aviion line. The primary market is going to be people buying an Aviion for a specific application."

The company said OSO/pc.DAA will be available for volume shipment within 90 days. It can be purchased with or without Windows 3.0.



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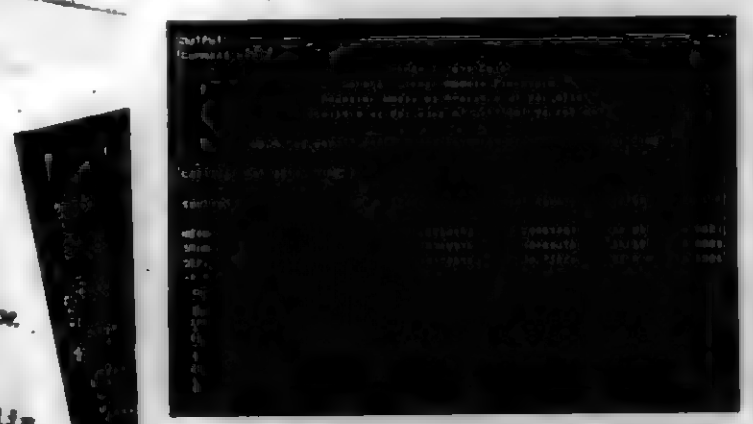
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PC WEEK "CORPORATE" SATISFACTION POLL

1991 digital review TARGET AWARDS WINNER



PC users

FROM PAGE 45

Boeing Computer Services, Inc. in Renton, Wash., has tens of thousands of PCs, according to Brian Corrington, a systems analyst at the firm.

"Boeing has chosen X as a strategic vehicle for interoperability among all our platforms," he explained, "so a lot of our PC users must now access X applications."

Corrington said that since Boeing's Intel Corp. 80286- and 80386-based PCs have not yet depreciated, for users with "pretty simplistic X applications, we just toss on a $300 X server."

He also explained that "if users are more X oriented and want to access a few DOS applications, we put them on an [IBM] RISC System/6000 with a PC Simulator."

Integration headaches

Cost savings with PC X server software, however, may be offset by some integration headaches on the part of the user. These can include having to buy a higher resolution display card and networking software that is compatible with that provided by the X server software vendor.

Tim Fisher, a project engineer at the National Aeronautics and Space Administration's Johnson Space Center in Houston, has been trying to get his PC server software running for about one year.

Fisher said that when he invested in his $500 X11/AT PC X server software from Integrated Inference Machines, Inc., he did not realize the software was limited in the number of Transmission Control Protocol/Internet Protocol implementations with which it would interoperate.

"So now I have to go spend $400 on software from FTP Software, Inc., though it still winds up cheaper than buying an X terminal," Fisher said. He added that he was fortunate his PC already contained a 1,024- by 768-pixel display card, or he would have had to foot the bill for a display upgrade.

"If your PC is not powerful, the PC X server upgrade is more dubious. You could get poor performance, and your display resolution might not be all that great," said Fisher, who runs a 25-MHz, Intel 80386-based PC.

As a designer of image processing hardware, he said, he is looking to access graphics output from Sun Microsystems, Inc., Cray Research, Inc. and Amdahl Corp. high-powered computers, which all run X.

X marks the spot

The major line of demarcation between the handful of PC X server vendors lies in whether they supply products designed for MS-DOS or for Microsoft Corp. Windows-based applications.

According to The X Business Group, a research firm in Fremont, Calif., the 1990 PC X server market was dominated 6 to 1 by DOS-based products from Locus Computing Corp., Graphics Systems Software, Inc. and Hummingbird Communications Ltd. The leading Windows product was Xvision from Visionware Ltd., X Business Group said.

However, X Business Group said it expects the DOS-Windows X server software ratio to shift to a 50/50 split in 1991.

Points to ponder when considering X server software, according to Steve Auditore, X Business Group president, include the following:

- Is the software compatible with your graphics package?
- If you upgrade to a higher resolution display, will you have to invest in new drivers?
- Dropping an X server on a user who is accustomed to using DOS can require the user to understand commands for other operating systems (usually Unix) and how the network works.
- Are your existing communications protocols (such as Transmission Control Protocol/Internet Protocol) interoperable with the server software vendor's implementation?

NANCY M. WEXLER

HP to introduce faster printer

Aiming at a networked office environment, Hewlett-Packard Co. is scheduled to introduce a high-speed laser printer today.

With the addition of a network interface card, the Laserjet IIISI can be placed anywhere in the office; the printer will not necessarily have to be placed directly next to the network server, according to Ormond Rankin, network printer marketing manager at the company.

High-speed printing

The Laserjet will print 17 page/min if the output is primarily text-based. With the interface card, it can also print that fast if the output is graphics, according to Rankin.

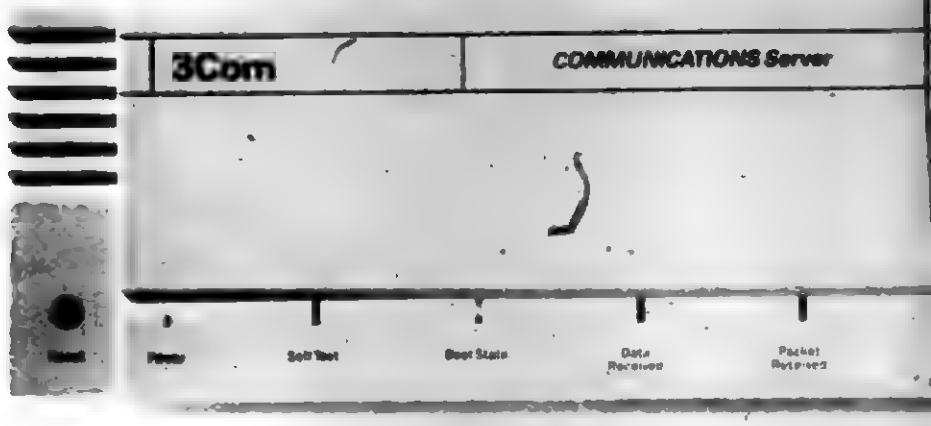
It is the first HP printer to be powered by a reduced instruction set computing processor, the Advanced Micro Devices, Inc. 2900.

The printer is directed at personal computer-based networks. However, according to Rankin, the printer will "generally" work on a Unix or workstation network.

The basic Laserjet printer is priced at $5,495, according to the vendor.

In addition, an Ethernet interface card is priced at $695, and a token-ring interface card is priced at $795.

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NEW PRODUCTS

Local-area networking hardware

Fibronics International, Inc. has introduced a line of interfaces that connects Ethernet and token-ring-based personal computers and workstations via unshielded or shielded twisted-pair wiring, coaxial cable or fiber-optic cable.

The interfaces were designed for networks that migrate from one type of architecture to another via diverse wiring and cabling protocols, the vendor said.

Pricing begins at $1,595.

Fibronics International
Communications Way
Independence Park
Hyannis, Mass. 02601
(508) 778-0700

Synoptics Communications, Inc. has announced a managed 10Base-T Ethernet concentrator designed for small or mid-range Ethernet networks.

The Model 2810 Managed 10Base-T Workgroup Concentrator features 12 unshielded twisted-pair ports for workstation connections and one attachment unit interface interconnect port. An optional local-load, or self-booting, feature enables the product to be controlled from a remote site.

The product is priced at $2,395, and a version with the local-load option costs $2,595.

Synoptics Communications
4401 Great America Pkwy.
Santa Clara, Calif. 95052
(408) 988-2400



Gigatrend, Inc.'s *Masterdat can store up to 4G bytes of network data*

Gigatrend, Inc. announced Masterdat, a digital audio tape drive designed to back up network file servers and local disk drives at 35M byte/min.

The drive, which is connected to a network node instead of a file server, can reportedly distribute file backups from all network nodes while retaining central control over backup resources.

Masterdat can also be configured with Novell, Inc. Netware 286, 386 and Portable Netware. The drive is available in 1G-, 2.5G- and 4G-byte models that are priced between $5,000 and $10,000.

Gigatrend
2234 Rutherford Road
Carlsbad, Calif. 92008
(619) 931-9122

Micro-to-host

Cleo Communications has unveiled the 3270 Linkix, a Unix-to-mainframe connectivity product that is available in coaxial and remote versions.

The product provides Unix systems users with IBM 3270 emulation via a coaxial board or allows up to 254 remote users to be simultaneously connected to a mainframe via Systems Network Architecture/Synchronous Data Link Control.

Pricing for the coaxial version ranges from $995 to $1,695, depending on mode of software purchased. The remote version costs $1,695.

Cleo Communications
3796 Plaza Drive
Ann Arbor, Mich. 48108
(313) 662-2002

Intersoft Systems, Inc. has announced Concourse, an IBM Personal System/2-based software system designed to connect an IBM mainframe or mid-range host with bar-code readers, radio frequency terminals and handheld computers.

The product includes an IBM Artic/2 Adapter, a communications coprocessor that enables up to 100 devices to be concurrently connected to a host.

Icons can be used to represent system processes and hardware devices to create an object-oriented environment for producing data collection software applications.

Pricing for Concourse begins at $10,000.

Intersoft Systems
3260 Pointe Pkwy.
Norcross, Ga. 30092
(404) 242-9562

Electronic mail

Beyond, Inc. has announced Beyond Mail, a rule-based electronic mail application designed to analyze the contents of incoming messages, refer them to co-workers or automatically store them in folders.

The product includes Novell, Inc. and Action Technologies' Message Handling System (MHS), a standard E-mail system for Novell's Netware- or Microsoft Corp. LAN Manager-based local-area networks, and features interoperability with other MHS-compatible E-mail products.

Pricing for single-user and eight-user versions is $250 and $1,395, respectively.

Beyond
38 Sidney St.
Cambridge, Mass. 02139
(617) 621-0095

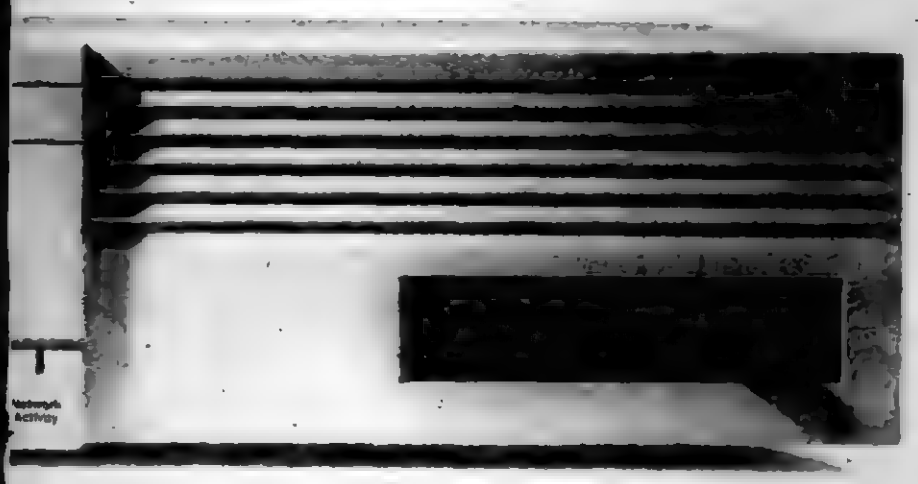
Microsoft Corp. has announced a version of its electronic mail system for Apple Computer, Inc. Appletalk networks.

Microsoft Mail Version 3.0 features multiple file attachments that enable users to send files through Microsoft Mail by attaching them to a mail message.

Pricing ranges from $395 for a Microsoft Mail server to $1,349 for a 20-pack Microsoft License Pak Package.

Microsoft
One Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

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well as tailor resource connection options for the user and offer them on a menu.

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MANAGER'S JOURNAL

EXECUTIVE TRACK



Helene Cavany was promoted to director of applications development at Summit Information Systems, the information technology subsidiary of Roadway Express, Inc. in Akron, Ohio.

Cavany was most recently manager of distributed systems support at Summit. In her new position, Cavany is responsible for managing the development, implementation and ongoing maintenance of information systems supporting business functions at Roadway.

Cavany joined Roadway in 1979 as a programmer. She teaches at Akron University and holds a degree in technical education from there.

.....

William R. Oakley has been promoted to manager at the IS division of the **Washington Suburban Sanitary Commission** serving Montgomery and Prince George Counties in Washington, D.C., suburb Hyattsville, Md.

Oakley is responsible for data processing, end-user computing and planning. He has more than 20 years of experience in IS.

Oakley holds a bachelor's degree in electrical engineering from Vanderbilt University and an MBA from Loyola College.

The commission also promoted **Jim Spain** to head of the applications software section. He is responsible for mainframe and personal computer applications. Before joining the commission in 1988, Spain was manager of computer applications at the Rouse Co. in Columbia, Md.

Spain has more than 14 years of IS experience. He holds a bachelor's and a master's degree as well as an MBA from the State University of New York at Albany.

.....

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

When Ray talks, people listen

SNET's IS head ensures state-of-the-art technology with low-key leadership

BY CAROL HILDEBRAND
CW STAFF

Raymond Fletcher is not what you would call a grandstander. At project demonstrations, he sits in the background like an off-shore fog. At lunch, he lets his lieutenants do much of the talking.

But for such a low-key person, he has managed to push an awful lot of state-of-the-art technology into the business divisions of Southern New England Telecommunications Corp. (SNET), the New Haven-based firm that provides telephone service to most of Connecticut.

Fletcher, general manager of information systems and technology, may not be a table pounder, but he is not shy about making sure his latest and greatest technologies — computer-aided software engineering (CASE), executive information systems (EIS), expert systems and electronic data interchange (EDI) — do more than sit on a back shelf.

Silent leader

His leadership is referred to in the company as the "Ray says" factor. If Fletcher has encouraged a particular project or technology direction, the words, "Ray says" are enough to keep the project on course, according to his managers.

"Sometimes people come in and say, 'Ray, did you say that?' " says James Pitchell, district manager of IS. "But if we didn't take that approach, we wouldn't have half a dozen projects going that now are."

Fletcher wants to make sure that the resources at SNET's Information Technology Center are used as widely as possible. His goal is simple and appropriate: He wants to make information technology "as easy to use as the telephone."

SNET, in business since 1878, has approximately 13,000 employees and posts approximately $1.7 billion in revenue annually. Although the company cannot grow beyond its regulated regional boundaries, that does not stop the IS organization from aiming to be "world class," Fletcher says.

"We're geographically limited, but we're not constrained by the way we do business in our territory," he says.

Fletcher, 59, joined SNET right out of college in what was then network engineering. After a brief stint in IS planning, he moved back to network operations on the customer side of the house and spent 10 years as its head. He switched back to IS as its chief at the end of 1987.

In addition to his traditional IS fiefdom, Fletcher, after a corporate consolidation, is responsible for two business divisions: corporate purchasing and operations budgets and results. The consolidation "made the ideal opportunity to exercise the IS part of the

Continued on page 57

PROFILE: Raymond Fletcher



Peterbilt Splegler

Position: *General manager of IS and technology, SNET*
Mission: *To help company wave tap the value of emerging technologies*

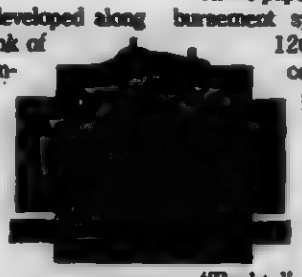
Bechtel loses the paper, wins the prize

BY MITCH BETTS
CW STAFF

It is easy to see why many companies have created sophisticated systems for accounts receivable. Every business wants to efficiently capture income. But San Francisco-based Bechtel Group, Inc. has developed an all-electronic system that makes it easier to pay the bills.

The manual processes involved in paying a corporation's bills are very expensive. So in 1989, Bechtel created what is believed to be the first full service electronic disbursements system.

Converting from paper to electronic funds transfer reduced the cost of making those payments by 80%, according to Bechtel. In recognition of such dramatic cost savings, the National Automated Clearing House Association selected Bechtel's Vice President and Controller V. Paul Unruh last month to receive the 1991 Payment Systems Excellence Award.



Bechtel's system, developed along with First National Bank of Chicago, allows the company to pay bills using any one of four formats: electronic data interchange, automated clearinghouse, Fedwire or check.

Cash advantage

One big financial advantage is that the information system gives Bechtel's treasury a clearer idea of how much cash will be needed to pay the bills each day so it can keep the rest of the company's cash in money-earning investment accounts. Furthermore, the direct-deposit system makes it possible for Bechtel to take advantage of any vendor cash discounts.

As for paperwork, the electronic disbursement system eliminates about 120,000 forms and 200,000 computer printout pages per year. It also eliminates company-produced checks by nearly 100% and reduces costs of issuing remaining checks by 50%.

"Bechtel's payment system approach . . . provides a model for corporations to remove themselves from the burdens of operating an assortment of electronic and paper disbursement systems," said David P. Smay, assistant treasurer at Chevron Corp., in his letter nominating Unruh for the award.

COMMENTARY

N. Dean Meyer

Conflict of responsibilities



Innovation and operations are like oil and water: They don't mix. But in too many information systems organizations, one unfortunate manager, whom we'll call George, is given responsibility for both.

Consider this scenario:

"George, you've really done a great job managing the development of our distributed information systems. I think you're going places around here."

"Thank you, sir!"

"In fact, I'm doing a little reorganizing, and I have a new assignment for you. You know we've been having a bit of trouble getting our minicomputer platforms under control. I'd like you to apply your superb management skills to our distributed systems operations."

"Great, boss! Sounds like a fun challenge. But tell me, who have you got in mind to take over my job?"

"At this point in your career, I think you ought to be able to handle both."

"Uh-hum . . ."

"With the proper head count, of course."

"Um, OK. Sure, boss."

Then, six months later, the following is likely to occur:

"George, can I talk to you?"

"Sure, boss."

"I'm really pleased to see the way the mini operations have stabilized . . ."

"Well, thanks, boss!"

"But I've been getting a number of calls from the other vice presidents complaining of unresponsiveness on the development side. You know how I hate calls like that. I'd like to politely ask: What is going on?"

"Well, sir, I've been working 70-hour weeks to document procedures, get the hot line up to speed and sort out the backup procedures. I've still got a ways to go on change control, disaster recovery and security administration, and I haven't started thinking about capacity planning or remote network management. Meanwhile, half the day seems to go into firefighting! The last thing I need right now is another major application!"

"George, George, George . . . You know we need to do more than keep existing systems running. We've got to get new applications out the door. We need innovation! You've been successful in both operations and development. You've got good people working for you on both sides of the house. Now, what's the problem?"

The problem isn't George. It's the organizational structure. By the nature of his position, George was told to go two ways at once.

An IS department operates a variety of service bureaus, selling computer time, network bandwidth, processed applications, telephone services and end-user computing services such as electronic mail. In each case, the IS function is expected to be the low-cost producer of a reliable, secure and responsive service.

The IS staff is also responsible for innovation in a wide range of technologies: applications development, process automation, platforms from the PC to the mainframe, end-user computing tools and software engineering methods. In each of these areas, the IS staff is expected to deliver world-class excellence.

However, if innovation functions report to operations groups, they find no time for major new projects. Significant innovations threaten the stability and efficiency of operations. If the operations boss is doing his job, he'll see to it that his people slow the pace of innovation.

On the other hand, if operations functions staff members report to an innovation group, the platform will never stabilize. Every new idea will find its way into production whether or not it can be supported.

In either situation, the structure hampers success. Good people may attempt to do what is right, despite their boss' best interests, but even such altruists cannot perform as well as they could in a healthy organization.

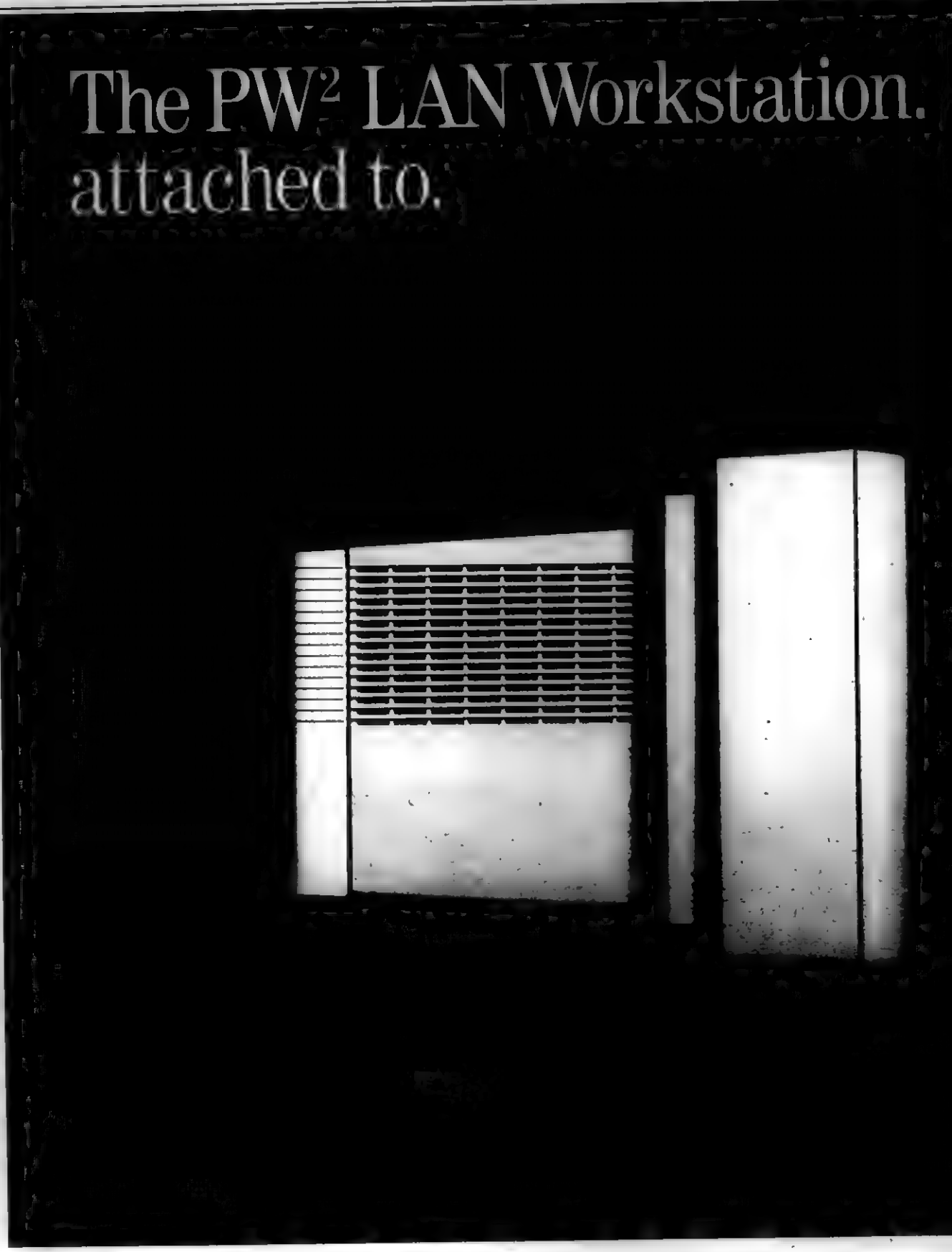
I have participated in the restructuring of a variety of IS departments using a systematic approach to identify and coalesce similar functions. In every case, I found instances of structurally created conflicts of interest.

Clearly, the IS department faces conflicting objectives, but that doesn't mean the managers within it must be pulled in paradoxical directions. A healthy structure defines jobs that are responsible for a deliverable product rather than a task without mixing responsibility for innovation and operations. Even in small organizations, responsibilities can be combined to avoid creating impossible jobs.

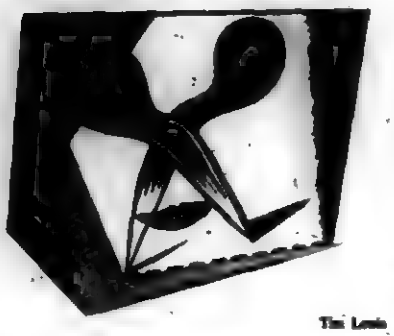
It is the IS executive's responsibility to build organizations in which people can succeed. The separation of innovation and operations is among a handful of straightforward principles that guide the systematic design of an IS department's organizational structure.

It is an understanding of principles like these that makes the role of chief information officer a job for a real IS professional.

Meyer is founder and president of NDMA, Inc., an IS management consultancy in Ridgefield, Conn.



CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"Of course the service was good. I did it myself!"

By J. Faye Horn, Jerry Kanter and Stephen J. Schiffman

Babson College Center for Information Management Studies Working paper, 1990

■ As the labor pool for retail clerks shrinks, companies will increasingly turn to technologies that allow the customers to perform some transactions by themselves.

A classic example of a "customer-activated transaction processing system" is the automated teller machine. Other examples include check-out kiosks for rental cars, home banking and home shopping on the Prodigy videotext service and point-of-sale systems in which the customer does the scanning.

Customers are willing to use these systems if they perceive benefits (such as faster service) that justify the do-it-yourself effort. Technologies spurring the popularity of these systems include multimedia simulations, smart cards, touch screens and devices that can read handwriting or respond to voice commands.

Expert systems, for one, can be deployed to help customers handle more complex buying decisions. The Otis Elevator Co., for example, provides its customers with software for selecting, ordering and scheduling the construction of elevators. — *Mitch Betts*

"Even closer to the customer"

By Rosabeth Kanter

Harvard Business Review January/February 1991

■ The twin peaks of customer service — meeting customer requirements and fixing problems — are being joined by a third element, innovation. Innovation is the way customers change the business.

Through the use of technology, customers are entering the internal business process in unprecedented ways. Customer choices direct production. Customer feedback drives product development. Customer communication creates membership groups.

By meeting the following challenges, businesses can get even closer to their customers, ensuring an innovative partnership:

- Understand who the customer is. A customer-oriented company understands and involves the whole "customer system" — from product user to product buyer — because each portion of that system influences the other.
- Turn customers into members. Involving customers in innovation requires forums such as user groups and clubs that foster communication with the company.
- Make customers real to all employees. Find ways to get employees in contact with customers.
- Use data to benefit customers. Technology-garnered customer information enables customization, supplier/consumer dialogues and feedback. Using this data, the most advanced customer companies find out what customers need before they realize they need it.
- Keep promises by championing change. Service guarantees work only if service and work are linked to other aspects of a company's strategy. If they are not, then your customer relationship is at risk. For example, a major computer company pledged to find the best system for a customer, regardless of vendor. Yet it continued to reward its sales force on whether it sold the company's products. This reinforced noncustomer-oriented behaviors. — *Lory Zottola*

"Commercial use of expert systems in the U.S."

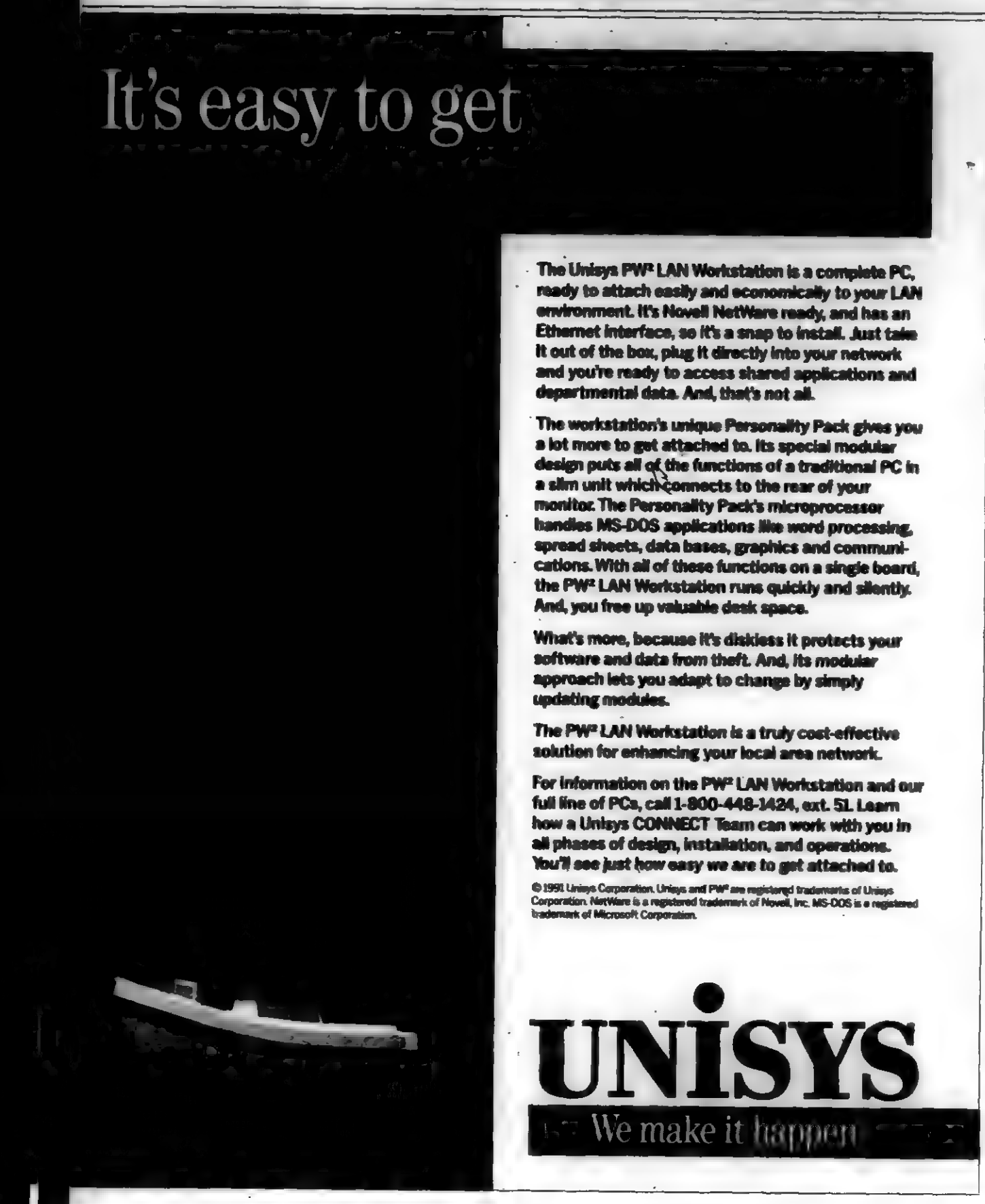
By A. Ansari and Batoul Modarress

Journal of Systems Management December 1990

■ A recent survey of 175 members of the Association for Systems Management found that 70% of responding companies have an expert system in place, and 30% are considering the possibility.

Expert systems benefits include better and faster decision-making by nonexperts, savings in operational costs and more readily available information sources for decision makers, the respondents said. Problems include a lack of qualified knowledge engineers and expert systems designers as well as high development costs and lack of top management commitment.

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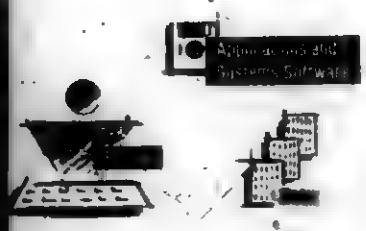
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With open systems users are free to choose from the offerings of a variety of vendors as long as the products conform to open standards. This vendor independence gives users a greater selection of products and solutions and faster access to new standards- based technology.

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Open Systems help end-user companies respond to market opportunities more quickly. Open systems lead to the Computer-Integrated Enterprise where information can flow easily between functional groups (e.g., engineering and manufacturing) reducing the time it takes new products to go from idea to reality.

Lower Costs

- In-house software development and maintenance costs are lower because the same software can run on multiple platforms without modification. Software costs are also lower through growing availability of purchased software packages.
- Training costs are reduced through consistency of software regardless of the underlying platform.
- Hardware costs are reduced through increased competition and improved price/performance.

Improved System Integration

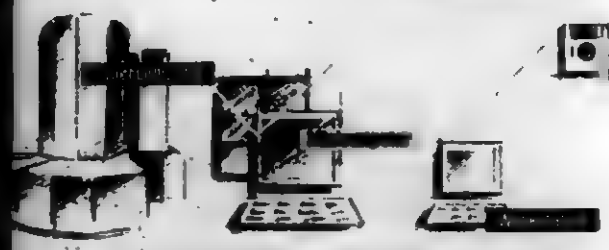
It is easier to integrate products from different vendors, and those developed by the user, when they conform to a common set of open standards. Open systems make it easier to connect products from different vendors so they can communicate and share data and resources.

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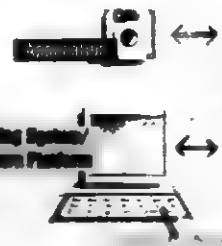
WHAT OPEN SYSTEMS ARE WHAT DO STANDARDS ...

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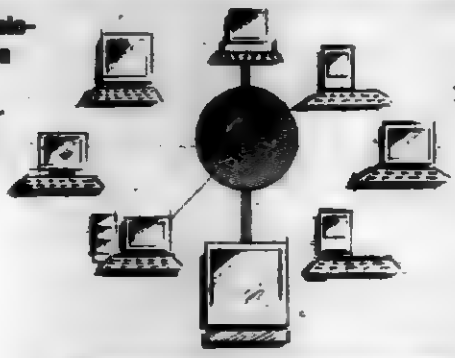
Scalability

The ability to use the same applications and systems software on all classes of computers from desktop workstations to supercomputers.



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Open systems are built on standards that define application and system interfaces in: networking, operating system, user interface, data management, graphics and software development.



Interoperability

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[illegible]

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CALENDAR

MARCH 24 - 30

Computers, Freedom and Privacy Conference. Burlingame, Calif., March 25-28 — Contact: CFSR, Palo Alto, Calif. (415) 323-3778.

Fiber Optics Conference. Lexington, March 25-29 — Contact: Jennifer Kelly, Information Gatekeepers, Boston, Mass. (617) 223-3111.

Making the Investment in Imaging. Marlboro, Mass., March 26 — Contact: Monica Palazzo, AGS, Wakefield, Mass. (617) 438-0880.

The Software Solution Show and Conference for Manufacturing and Distributing Businesses. Toronto, March 26-27 — Contact: Alwyn Mitchell, Software Matchmakers, Willowdale, Ont. (416) 756-3221.

Quick Response '91. Nashville, March 26-27 — Contact: Quick Response '91, Pittsburgh, Pa. (412) 963-8588.

SS/Expo '91. San Francisco, March 26-28 — Contact: Norm De Nardi Enterprises, Los Altos, Calif. (415) 941-8440.

MARCH 31 - APRIL 6

The Information Systems Security Association Conference. San Diego, April 1-5 — Contact: Richard Rush, Irvine, Calif. (714) 854-5500.

Network Analysis Users Group Meeting. Vail, Colo., April 1-5 — Contact: Sandy Moretto, NAUG, Menlo Park, Calif. (415) 688-2700.

The Global Economy: Implications for Telecommunications Policy and Management. Los Angeles, April 4-6 — Contact: Matthew Berndt, Center for Telecommunications Management, Los Angeles, Calif. (213) 740-0980.

APRIL 7 - 13

Corporate EFT/Financial EDI Conference. Chicago, April 7-10 — Contact: University of North Carolina Business School at Chapel Hill, Chapel Hill, N.C. (919) 962-9630.

Focus on Operations XI. Las Vegas, April 7-11 — Contact: Computer Operations Management, Orange, Calif. (714) 997-7966.

IEEE International Conference on Robotics and Automation. Sacramento, Calif., April 7-12 — Contact: Robotics and Automation, Boca Raton, Fla. (407) 483-3037.

Service Trends Conference. San Francisco, April 8-9 — Contact: Lori' Larsen, Ledgeway/Datapoint, Lexington, Mass. (617) 862-8500.

Information Security Managers Symposium. Chicago, April 8-10 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Loop Implementation: The Next Steps. Monterey, Calif., April 8-10 — Contact: Electronicast, San Mateo, Calif. (415) 572-1600.

Turning Audit Costs into Profits: Superstrategies for the Internal Audit Department of the 1990s. San Francisco, April 8-10 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Computers and Software for Manufacturing Expo. Chicago, April 8-11 — Contact: Doug Kunz, Cahners Exposition Group, Stamford, Conn. (203) 352-8202.

National Design Engineering Conference, Chicago, April 8-11 — Contact: National Design Engineering, Stamford, Conn. (203) 964-0000.

Business Re-engineering [redacted] bridge, Mass., April 8-12 — Contact: Margaret Murphy, Computer Sciences Corp. Exchange, Cambridge, Mass. (617) 499-1227.

The Conference Board Information Management Conference. New York, April 9-10 — Contact: Conference Board Registrar, New York, N.Y. (212) 339-0290.

Seybold Technology Forum. Cambridge, Mass., April 9-11 — Contact: Deborah Hay, Seybold Computing Group, Boston, Mass. (617) 742-5200.

The Software Development Management Conference. San Francisco, April 9-12 — Contact: Software Development Conferences, San Francisco, Calif. (415) 995-2471.

Supercomputer Conference. Newport, R.I., April 9-12 — Contact: John Miguel, Federal Information Processing Council, Middletown, R.I. (401) 841-4591.

Society for Information Management 1991 Instructional Member Conference. Tucson, Ariz., April 10-12 — Contact: SIM, Chicago, Ill. (312) 644-6610.

Unix Challenge 1991. Tyngsboro, Mass., April 10-12 — Contact: Andree Fontaine, Boston University, Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

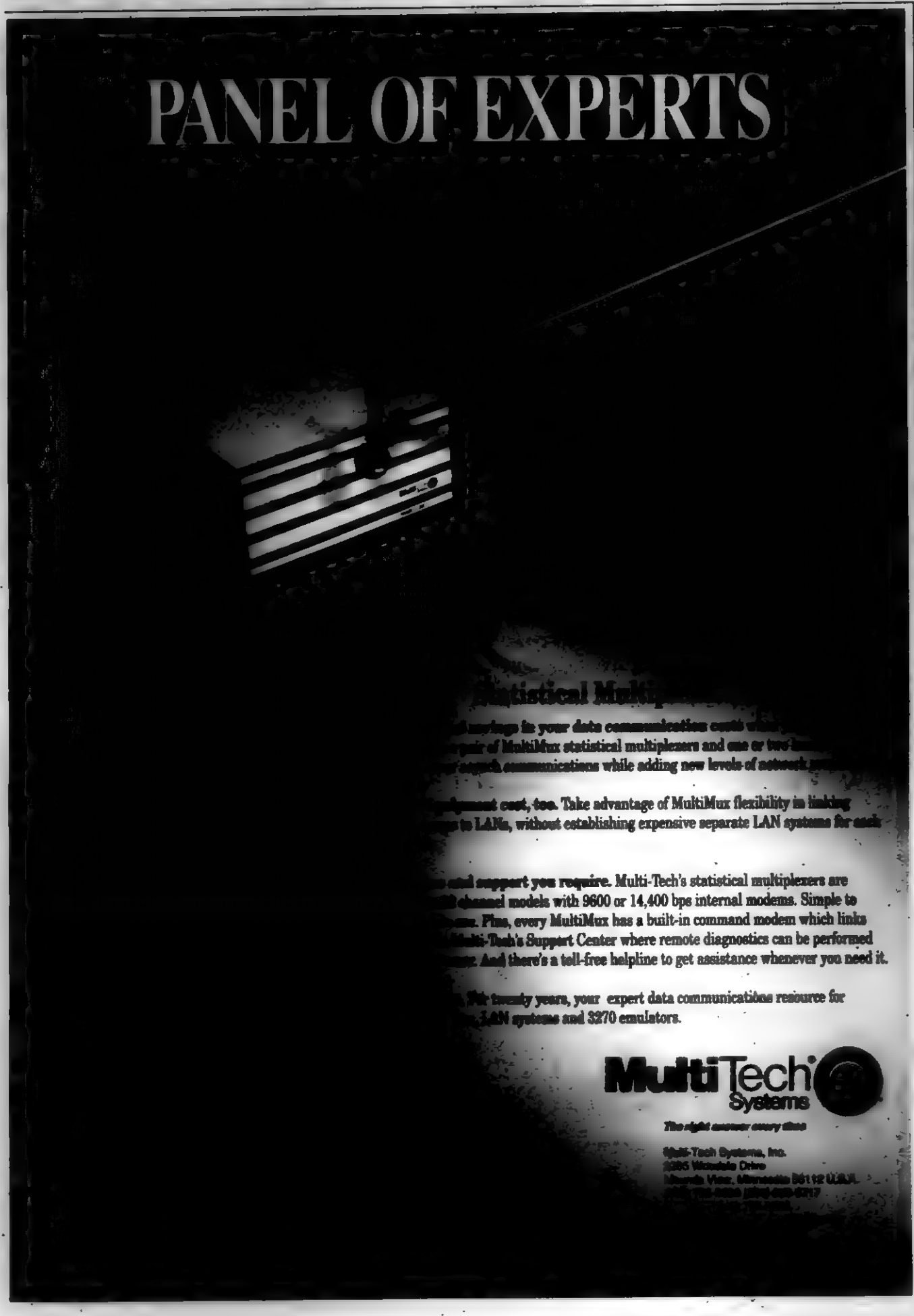
APRIL 14 - 20

Congress on CIM Databases. Cambridge, Mass., April 14-17 — Contact: Wilma A. Hurwitz, CAD/CIM Alert, Boston, Mass. (617) [redacted]-3080.

International Technical Communication Conference. New York, April 14-17 — Contact: ITCC, Thornwood, N.Y. (914) [redacted]

Information User Association: Architecting for the '90s. Salt Lake City, April 14-18 — Contact: IUA Headquarters, Chicago, Ill. (312) 644-6610.

Nextec 3.0. Atlanta, April 14-19 — Contact: Dave Cochrane, National System Programmers Association, Milwaukee, Wis. (414) 423-2420.



Ray talks

FROM PAGE 51

operation," he says.

Flexing IS muscle resulted in the implementation of EDI in the corporate purchasing department, where about 40% of invoices are now processed electronically.

The Budgets and Results Division went on-line with an EIS in 1988. Operations managers now get daily updates on critical indicators and operational performance.

> "Ray [Fletcher] has a way of challenging his people to expand their horizons. He encourages them to work in sort of a green-light mode."
>
> ROBERT F. NEAL
> SOUTHERN NEW ENGLAND TELECOMMUNICATIONS

"I use it every Monday morning automatically," says Robert F. Neal, senior vice president of operations. "It gives me a quick, top-down view of 15 critical measures. I also get the preliminary results much faster than I used to, by about a week and a half."

Once these systems got the green light, the Information Technology Center was aggressive about making sure they were used, putting together a development support center to help users over the hurdles.

In 1989, Fletcher required staff managers and technical lead analysts in his divisions to receive technical training in EDI, CASE and expert systems. "Every manager had it written in their objectives that they had to go take that training. That's the kind of approach we use when we want to make things happen," Fletcher says.

Fletcher also encourages IS employees to study the latest technology. If an idea is approved, he gives them a lot of autonomy to make it work.

"There are two ways to run a group like this," he says. "One is, you can motivate your talent. You can set stretch objectives and encourage them to follow through. The other way to run it is as if you had a flock of sheep. If a sheep runs off, you take that staff and bring him back. I'd say that we use the first style."

Neal agrees. "Ray has a way of challenging his people to expand their horizons," he says. "He encourages them to work in sort of a green-light mode."

Pitchell also likes Fletcher's style. "Ray has allowed us to go out and bring back ideas," he says. If Fletcher likes the idea, Pitchell says, he'll put considerable backing behind the project. Such was the situation with CASE. After a pilot program in 1989, the center has increasingly used the tools for systems development.

Fletcher says he gave the developers freedom to pick the tools they really wanted to work with, but what they picked was "going to become a standard, and we were going to use it." SNET uses Texas Instruments, Inc.'s Information Engineering Facility in conjunction with two relational databases, IBM's DB2 and Computer Corporation of America's Model 204.

CASE has produced real results for SNET. Thus far, several applications developed using these tools are already in use in marketing and business services. There was some initial reluctance, according to Pitchell, "but now we can put things together [quickly] that would normally take us weeks or months. Even the veteran programmers say 'God, how did I ever do it in the old Cobol way?' "

Staying in the technological vanguard has resulted in some mistakes, but Fletcher considers them part of the process. "I don't mind making mistakes. I just don't like stupid mistakes," he says.

For example, he thinks that buying IBM's expert systems shell was probably not the best decision. "We tend to be an IBM shop, and we like the support, so we purchased their shell," Fletcher says. "It might not have been the best available product." But Fletcher says he wanted his staff to get immediate experience with expert systems rather than spending time wavering about buying.

Information soapbox

SNET also campaigns heavily to let the typical user know what options are available. The IS group has designed an account manager system in which each of the four major groups in SNET — operations, finance, marketing/sales and human resources — has a team dedicated to it in the technology center. Each team is headed up by an IS division manager.

"I think as a result, the business managers see the center as more of a helpful support organization than as corporate overhead," Neal says.

To help showcase specific technologies, the group has put together a couple of projects. One is the technology display center, a room that has been fitted with an array of the hardware and software that SNET uses. Account managers can use the room to pitch different applications.

The center has also sponsored a series of expositions to broaden knowledge about computing. The shows feature technology from a specific vendor or from internally developed applications.

This style of well-researched decisions backed by full-speed implementation has paid off. "You can always say, 'Well, I'm going to wait six months for something new that will be a little better.' You can take that and just go forever," he says. "You have to be progressive but keep an eye on the world around you."

A silent boardroom?

The new darling at SNET's Information Technology Center is the decision support center — the first licensee of IBM's Teamkit/2.

Teamkit creates an electronic meeting in which all communication is done on-line and anonymously. The meetings are silent, speedy and brutally honest. "You generate more ideas in 10 minutes by everybody keeping quiet," says Raymond Fletcher, general manager of IS and technology.

The room is made up of a dozen or so personal computers placed on a horseshoe-shaped table and hooked via local-area network to a server. Meetings are run by a moderator, and ideas and responses are flashed on a large projection screen at the front of the room. Users can scroll through answers to a question and add their own comments to the ideas that have been generated.

The process cuts through the corporate politics that can frequently hamper meetings. For example, SNET has used Teamkit to reorganize its desktop publishing technology, which is spread throughout three divisions.

Fletcher says that after one day, a group of managers from several different levels of the company had come up with a set of goals and an action plan that was implemented within a month.

Without the electronic boardroom, "we probably could have been meeting for a month trying to get these people to break down turf thinking," Fletcher says. "On a keyboard, a [lower level] person can say 'That's a dumb idea' without being intimidated."

CAROL HILDEBRAND

MANAGEMENT BRIEFS

Index opens Chicago, San Francisco offices

Information technology consultancy **Index Group, Inc.** will open offices in Chicago and San Francisco next month. The Chicago office, to be headed by Index Vice President Robert A. Dantowitz, will initially have 16 consultants. The San Francisco office, opening with eight consultants, will be led by company Vice President Frank A. Petro.

In addition to its Cambridge, Mass., headquarters, Index currently has offices in Los Angeles and London. Both new centers will focus on business re-engineering consulting. A subsidiary of Computer Sciences Corp., Index has about 200 consultants worldwide and annual revenue of more than $50 million.

An association has been formed for professionals involved with electronic data interchange and electronic messaging technologies. The **Certified Electronic Trade Professionals Association** is accepting membership applications for full members, associate members and students. The association can be reached at P.O. Box 200906, Suite 809, 2410 Hollowridge Lane, Arlington, Texas 76006 or (817) 640-6059.

A recent survey of 88 midlevel managers at companies in the traffic-plagued San Francisco Bay area found that they expect telecommuting to grow significantly over the next two years. In the survey, 41% said they expect the number of telecommuting workers to grow by 10% to 15%; 20% predicted an even bigger increase of 20% to 25%. None expected a decrease.

The survey defined a telecommuter as an employee working at home two or more days per week. The survey was conducted last fall by the **Northern California Telecommuting Advisory Council** and was sponsored by the **University of San Francisco** and **Pilot Group**, a marketing firm in Novato, Calif.

The weak construction and building market has made architectural and engineering computers more important to operations, according to a majority of attendees at the recent **Architecture, Engineering and Construction Expo** in New York. Sixty percent of those surveyed said computer systems are more important in the current economic climate, 29% said there was no change, and only 1% said computers have become less important. The survey also revealed that architecture and construction firms plan to put an average of 15 more computer users on-line in 1991.

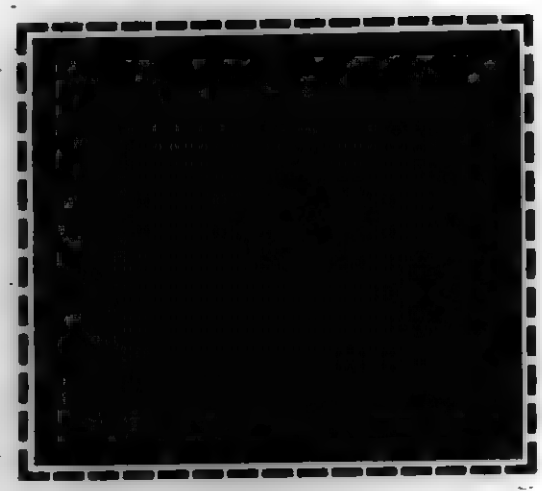
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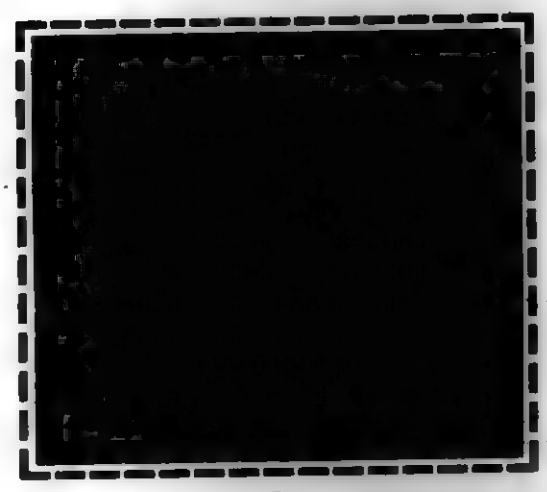
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Gambling on a promise

Exploring the real, and not so real, capabilities of the Windows interface



Richard A. Goldberg

BY PETER BARTOLIK

Windows and I became acquainted with the advent of Version 2.03. Running on a slow Intel Corp. 80286-based system with Color Graphics Adapter graphics, it held some novelty as an introductory DOS shell with rudimentary file management capabilities that made it quick and easy to maneuver around the hard drive.

With the release of Version 3.0, it was obvious that Windows had become more than just a DOS shell, even when used on a 286 machine with 1M byte of memory. It was just as obvious, however, that little improvement had been made to its file management capabilities. With the arrival of an 80386-based system with 4M bytes of memory, the world of limited multitasking and extended memory management opened up.

The faster machine was brought in for purposes other than using Windows, so any cost-benefit analysis would be faulty. On a subjective basis, once you've taken a shine to the graphical user interface Windows has become, it's not pleasant to imagine going back to a work life dominated by the C:> prompt.

But the impressions of a late-blooming personal computer enthusiast do not justify a business investment.

In this special report, we try to move beyond the hype and counter-hype of the Windows/non-Windows, Windows/Macintosh camps and explore the real benefits and costs of adopting Windows in user environments. We also detail the practical shortcomings of today's Windows and map out what Microsoft Corp. will do (and when) to provide features that are lacking.

Our reporting team interviewed managers responsible for evaluating and implementing Windows in their organizations. Experiences range from early evaluations by some firms to a law firm that has retired thousands of dollars of Wang Laboratories, Inc. minicomputers in favor of local-area networks serving Windows-equipped PCs (see story page SR/2).

Telephone interviews with 40 IS professionals (see story page SR/9) who were asked to rate Windows' performance on the job generated high marks for Microsoft's delivery of what it promised. Yet, users are quick to point out areas in which Microsoft needs to improve.

Windows has clearly made its mark across many vertical industries, and we've selected seven companies in various segments to find out how the product is paying off in the workplace.

And what about OS/2? The one-time successor to DOS seems, in the wake of user confusion over Microsoft's and IBM's intentions, to have been relegated to a niche role for in-house development of mission-critical applications. Even once staunch OS/2 advocates concede that Windows is likely to become the corporate computing standard.

But Windows, however, may not be the only standard. Graphical user interfaces for Unix are eroding some long-standing fears of the complexity of that operating system. Moreover, the Unix star seems to be rising in the server market, particularly as OS/2 wanes. And there are alternative DOS interfaces that users swear by, particularly for older systems.

Lastly, to provide more insight into what Windows may become, we've pulled together a recap from recent months of what independent software developers have introduced in a bid to improve on the features of Windows and create new applications that leverage the graphical user interface.

No argument can derail the fact that upgrading older machines to use the full capabilities of Windows is expensive. Tallying up $150 or more for memory plus $400 or so for an enhanced graphics card and monitor adds up to more than $55,000 for 100 machines, $500,000 for 1,000 PCs. But if you have to buy new machines anyway, the $2,000 to $2,500 cost of 386SX-based clones makes it easier to go with the flow.

Only you can make the decision whether the Windows investment is worthwhile. The examples, insights, criticisms and alternatives offered on the following pages are intended to help guide that decision. ●

Bartolik is *Computerworld*'s news editor.

A LOOK INSIDE

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Users give Windows high marks for increasing productivity and creating an easy-to-use interface
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Windows is winning over [illegible] those that once thought OS/2 was the way to go
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IS makes Windows work

Many users are finding room for the new interface in the workplace — warts and all

BY JAMES DALY

Down the hall from Katherine DeBruyn's office in the Seattle-based law firm of Perkins Coie is a data center containing tens of thousands of dollars worth of Wang Laboratories, Inc. VS minicomputers. A year ago, the machines pumped informational lifeblood to more than 600 terminal-equipped attorneys, paralegals and secretaries. Today, they are silent, enormous paperweights in a glass-walled tomb.

The execution order for the minis was written last May when DeBruyn, Perkins Coie's MIS director, opened a blue and white box no larger than a telephone book. Inside was Microsoft Corp.'s newly released Windows 3.0, the graphical environment that replaces the bland DOS command line with a mouse and on-screen icons offering point-and-click simplicity. "Once we got a peek at Windows 3.0, we knew we had to build a system around it," DeBruyn says.

DeBruyn, whose million dollar make-over will see the Wang machines replaced with a local-area network of personal computers running Windows, is not alone. Since its introduction last May, the graphical user interface has become more than just another pretty face — it has become an impetus for dramatic change. "We're shifting all our processing from the mainframe down to desktop PCs and using Windows to access that information," says Dale Smith, a program manager at General Electric Co. in Schenectady, N.Y.

Analysts say Windows' initial flush of success should continue and that within a few years, more than half of all DOS users will have it. Why has a 5-year-old package in its third incarnation suddenly become an overnight sensation? Users say that Windows 3.0 exorcised many of the problems of earlier versions, including the 640K-byte memory limitations, the antiquated command-line prompts and the chore of copying files from one directory to another. "The difference between the old and new is like night and day," says Laura Hill, vice president of product management at Information Science, Inc. in Montvale, N.J.

Despite their enthusiasm, many users also realize Windows is not glitch-free. George O'Blander, a systems analyst at Bank of America in San Francisco, says Windows is often very slow, particularly in compute-intensive programs. "It's geared for the entry-level user more than anything else," he says. "Sometimes it's so frustrating that I'll just go back and type in DOS prompts."

Many also still grumble about the extra horsepower the new platform needs to perform adequately: an Intel Corp. 80386-based PC with 4M bytes of random-access memory and an IBM Video Graphics Array monitor. Officially, Microsoft says, Windows can run on a lot less, but users know better. "Try running Windows on a 286 and it's like mud," Smith says.



Brady Lytton

"It winds up doing so much memory swapping to the disk that performance becomes unacceptable," another systems analyst says. "Every once in a while, we'll get an application that just freezes up, usually during multitasking or when we're switching between applications."

Windows enthusiasts claim such criticism is akin to carping about a Porsche because the cigarette lighter doesn't work. But there's another rub: You first have to be able to afford the Porsche. In recessionary times, many firms are hard-pressed to undertake a widespread upgrade that could end up costing $1,000 per Intel 80286-based PC user.

Widespread reports of Windows-based memory management and communications difficulties also have users doing some financial and psychological adjustments before they even break the shrink-wrap on the package.

"You need to implement Windows with the understanding that there are memory management problems. But if you address them properly, it can be a very smooth installation," says David Gusman, a systems officer at Society Corp., a $15 billion regional bank holding company in Cleveland.

When those rough edges are smoothed, the result will be that PC users can finally understand why Apple Computer, Inc. enthusiasts have raved about the screen appearance of the Macintosh for years. Windows has achieved that goal while still abiding by one of the information systems manager's central tenets: To be optimally productive, technology should be virtually invisible. "Windows has become a rallying point for us," says William Conley, manager of information technology service at Loral Aerospace Corp. in Newport Beach, Calif. "It's where we can go for consistency."

Because Windows allows DOS users to maintain the warm comfort of a familiar operating environment, it has also acted as a slow poison on the other heart that beats within the chest of Microsoft: OS/2. Windows has breathed new life into DOS, casting doubt on the role OS/2 and Presentation Manager will have on the desktop.

Some managers remain committed to OS/2 for high-end applications and as a server operating system, however.

> "The difference between the old and new is like night and day. It's sometimes hard to believe they're the same application."
>
> Laura Hill
> *Information Science, Inc.*

The allure of Windows has also seeped into Unix camps. "Before Windows 3.0, I would have to be dragged into the DOS world kicking and screaming to learn DOS commands," says Ralph Redfern, a senior technician and Unix user at AT&T in Denver.

Windows has also proven helpful in bridging DOS and Macintosh applications, which typically require plenty of personnel, careful network implementation and file conversion schemes. At Du Pont Co., for instance, thousands of IBM personal computers and Macintoshes interact — the result of a policy that allows many users to pick their own computer. Such an arrangement, however, can bring with it a Pandora's box of compatibility problems. Previously, Macintoshes and PCs were both tied to the host mainframe, and off-the-shelf file transfer utilities allowed users to move data between the two computer worlds.

Now Du Pont users are seriously looking at Windows versions of Macintosh applications. Transferring files between Microsoft's Word for Windows and Word for the Macintosh is easier than between the PC and Macintosh versions of Word. "With Windows, you get 90% of what you get on a Mac, so bridging the gap between the two is going to be a lot easier," says Robert McPhee, a senior engineer at Du Pont's imaging systems department.

Progress isn't cheap

Users on the migration path, however, warn that the cost of large-scale migration is not insignificant. Neither is the need for supplemental support resources to minimize temporary declines in user proficiency.

Although Windows 3.0 is still a freshman, many agree that it has affected the computer industry like few packages before it. Many users are well beyond the evaluation stage, and with the arrival of Windows versions of Lotus Development Corp.'s 1-2-3, Wordperfect Corp.'s Wordperfect and Ashton-Tate Corp.'s Dbase later this year, Windows will have built up a full head of steam. "Windows has fundamentally changed the way we do business," DeBruyn says. "I can't think of many products, let alone software applications, that can make me say that."●



Daly is a *Computerworld* West Coast senior correspondent.

Hard benefit tough to figure

BY MICHAEL L. SULLIVAN-TRAINOR

When Roy Wilsker decided to acquire Microsoft Corp.'s Windows 3.0, he knew it would cost him $1,000 to $2,000 per personal computer to add the memory and faster CPU required. What he didn't know was how much Windows would save — and he still doesn't.

"The costs are very hard, but the benefits are much softer," says Wilsker, manager of end-user services at Kendall Healthcare Products Co. "If you give users an extra 10 minutes for every hour they work, what are they going to do with that time?"

Approximately 15 Kendall users are experimenting with Windows now, and 50 to 75 of the company's 180 employees will eventually be brought on-line.

Implementation lags

Less than one year after Windows 3.0 was released, managers are struggling with ways to quantify the benefits. Their difficulty is not preventing Windows purchases, but it may be slowing implementation.

In an effort to generate hard cost/benefit figures, Microsoft and Corporate Software, Inc., a Windows systems integrator, conducted a 14-company pilot project. The companies found that Windows increased their PC support requirements 10% in the first year. In addition, they reported the need for 20 to 30 hours of initial training. The companies had assumed they would replace Intel Corp. 8088-based PCs with 80286-based machines. Instead, they are bringing in 80386s for Windows.

Martin Marietta, Inc., a beta-test site, has about 1,000 Windows users. The firm paid $100 per package and $50 for each additional 1M byte of memory. Training costs were not a significant factor, says Steve Birgfeld, manager of the product evaluation center, because users already run Apple Computer, Inc. Macintoshes, and the applications have been ported over.

The expected benefits of Windows include running multiple applications and turning out better presentations, Birgfeld says. Although he has identified a 30% increase in throughput, he says it's too early to tell what the hard benefits will be.

While much attention has been focused on increasing the productivity of individual users, Windows is also being used in networking applications. "We are front-ending a Novell, Inc. network with Windows. It's an arduous task," says Mark Petry, a network specialist at Price Waterhouse Technology Center.

Although Petry's group didn't perform a cost/benefit analysis because they act as a research and development facility, he estimates that the installation cost more than $5,000 per user, including network costs. There are about 50 users on the network.

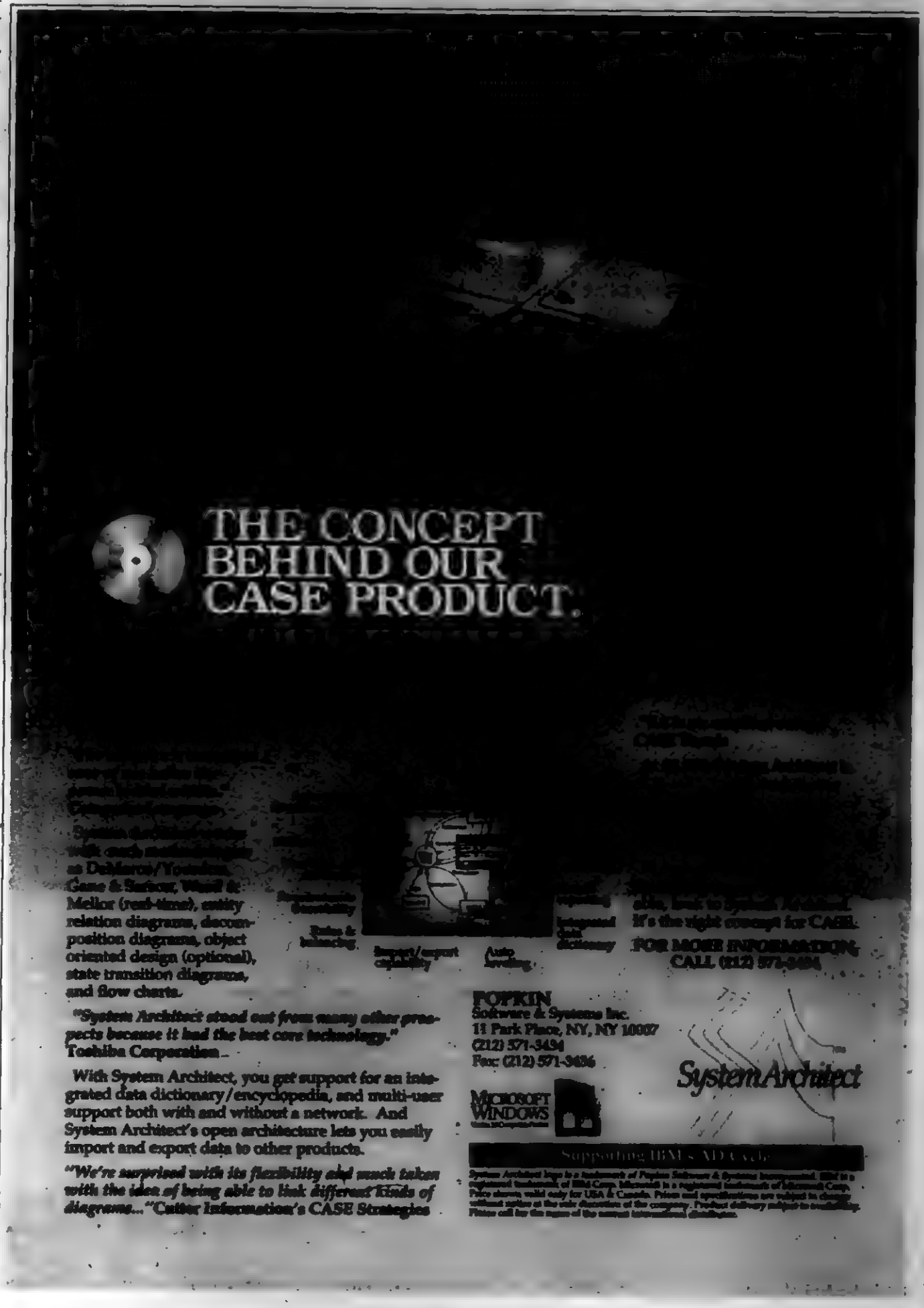
"There are definite payoffs," Petry says. "You're not running a third- or fourth-party menu system to front-end the LAN. The integration of subsequent applications from a graphics and memory management standpoint is much easier."

However, there is a price to be paid. Windows requires that users install its memory management on every machine in the network to support virtual memory features, Petry says. In addition, it took Petry's group a lot of time to set up a matrix combining the hardware configuration files with the users' needs.

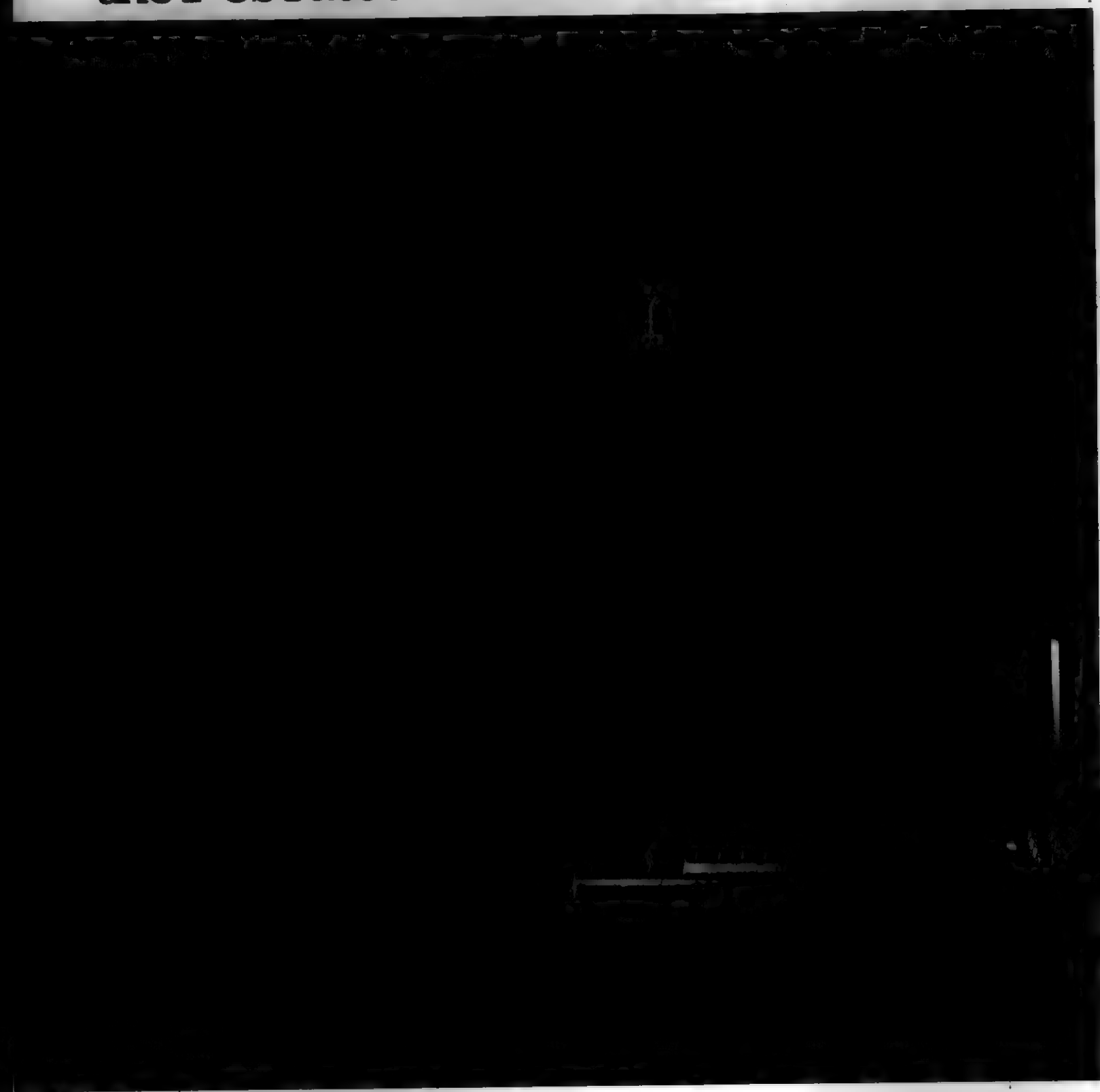
The key to success, Windows installers and researchers say, is to plan ahead. Pick an application that management strongly supports for Windows, then set realistic expectations. "Don't think you can install Windows for a total of $49.95," Petry says. "It's not a slam dunk." ●

Associate Editor Cathleen A. Duffy contributed to this report.

Sullivan-Trainor is a *Computerworld* senior editor, features.



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[1] PC Magazine, 9/25/90. [2] Warranty applies to HP Vectra 486/25T and 486/33T PCs. Warranty offer available only in U.S. and Canada. © 1991 Hewlett-Packard Company CPPC011

Current needs, future promises

Windows users' wish list of improvements includes faster speed and font technology

BY MICHAEL FITZGERALD

While some users think Windows is good as it exists now, others are not shy about saying how Microsoft Corp. might put a brighter shine on its graphical user interface.

Frank Reidelberger, manager of information systems development at Northern Telecom, Inc., says Microsoft needs to start by applying some Windex and elbow grease to what he calls "deficient areas" in the program's core.

"They need to improve font technology," Reidelberger says. "Right now, you've got to go to the third-party market [to get good type management], so if it's part of the system itself, that would be an improvement."

Reidelberger says he would also like to see the system contain better dynamic data exchange, as well as an integrated program and file manager. His final system add-in would be a built-in batch language, perhaps a Windows Basic.

Need for speed

A more immediate issue shared by Reidelberger as well as many other users is the need for a faster Windows. Reidelberger says Windows works "well enough" on his Intel Corp. 80386-based machine, but it slows noticeably on machines such as a 16-MHz 80386SX.

Steve Bosak, corporate communications manager at Palindrome Corp., uses Windows 3.0 with Corel Systems Corp.'s Coreldraw and Micrografx, Inc.'s Designer packages running on a 25-MHz 386DX with cashe memory and 8M bytes of random-access memory. He says Windows is "still slow."

"I can't imagine anyone running 3.0 with a serious application on a 286," Bosak says. His biggest wish: "Geoworks-like speed and functionality." He would like to see Microsoft attain performance demonstrated by Geoworks' Ensemble, saying that product's "speed is just blinding compared to Windows."

Some users think Microsoft includes too many nonproductive features in Windows, such as its Solitaire game and the Wallpaper function. Others want to see more features, particularly if they bring the product closer to OS/2.

Compatibility with OS/2 is a big priority for some users. Jim Wegmann, senior vice president of corporate electronic data processing and systems at Chicago's Talman Home Federal Savings and Loan Association, says that his institution intends to standardize on OS/2 because of its power and robustness.

Wegmann says he would like to see the work it is doing on Windows today have a "seamless interface" with OS/2 for productivity reasons.

Robert Harahman, president of Zeek Corp., a graphics consulting firm in Chicago, says he would "love to see" Windows have binary compatibility with OS/2. "It would lessen confusion in the industry and allow developers to target a platform."

"It would be nice to roll in some of the OS/2 features, such as true preemptive multitasking and multithreading," Reidelberger says.

Several users are grumbling about the difficulty of installing Windows.

"I've never been able to install Windows in one shot successfully on a PC," says Andrew Garsten, a microcomputer manager at Security Pacific National Bank. Windows does not seem to offer "very complete" support for the bank's Banyan Systems, Inc. network, Garsten adds, and it crashes far more frequently than the bank's Apple Computer, Inc. Macintoshes do, leading him to question how stable Windows is.

Still, Garsten makes it clear that "[Windows] looks like the direction we are taking for bringing new automation platforms up." ●

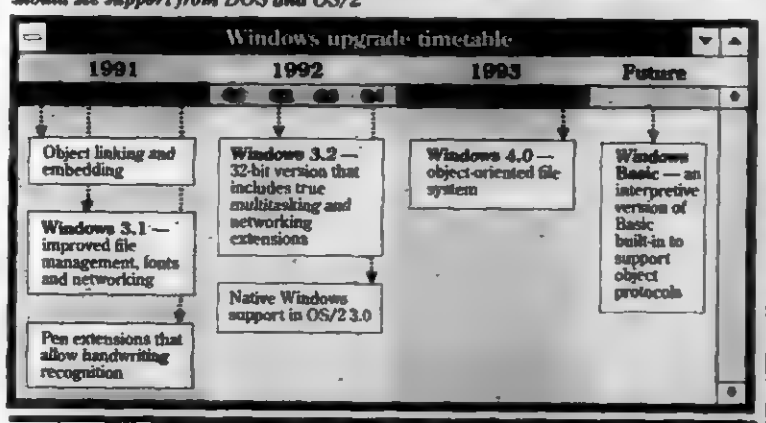
Fitzgerald is a Computerworld Midwest bureau correspondent.



Jamie Hayes

The march of time

Microsoft has already charted a path to the eventual release of Windows 4.0, which should see support from DOS and OS/2



Source: Microsoft Corp.

CW Chart: Doreen St. John

With a quantum leap years away, Microsoft schedules incremental changes for Windows

BY JAMES DALY

Any successful product inevitably begs the question, "What's next?" However, Microsoft Corp. Chairman Bill Gates says the next quantum leap in Windows won't come until the object-oriented Windows 4.0 — an arrival most analysts say is at least two years off — and a regular series of incremental advances are scheduled instead.

The first newly tweaked edition, Version 3.1, is expected midyear and is considered to be "a refinement" of Version 3.0, according to Brad Silverberg, vice president of the DOS/Windows group. It will feature Truetype outline fonts technology and improved file management.

After that, the Windows schedule includes the following:

- In the second half of the year, the release of Windows Libraries for OS/2, formerly called the Software Migration Kit or Binary Compatibility Layer, is due. Windows Library for OS/2 will enable Version 3.0 applications to run under OS/2 Version 2.0 — but at a 5% to 10% performance hit.

Also due this year for developers are multimedia extensions that will allow developers to incorporate audio, video, animation, music and new graphics elements into Windows programs and Microsoft's Pen Windows handwriting recognition system.

Pen Windows will allow users to select from menus and enter data with a penlike device, keyboard or mouse. The system will recognise handwritten characters and a handful of editing and system command symbols, according to Jeff Raikes, Microsoft's vice president of office systems.

- Version 3.2, expected in 1992, will support both the 16-bit Windows-16 and 32-bit Windows-32 application programming interface (API). Version 3.2 will position Windows for heavier local-area network use with easier network configuration and installation as well as a standard remote procedure call mechanism.
- Native Windows support will be included in OS/2 Version 3.0, which is reportedly scheduled for arrival in late 1992 or early 1993.
- Windows 4.0 is expected to be released in late 1993. Programs written for Windows 4.0's 32-bit API will run in a preemptive, multithreaded environment, offering an address space of 2G bytes per application. Network extensions will include peer-to-peer Named Pipes and mailslots. ●

Custom applications thrive

From order entry to finance, industries make use of Windows

UTILITIES: U.S. SPRINT



At U.S. Sprint Communications Co. in Kansas City, Mo., Microsoft Corp.'s Windows 3.0 is not *the* standard development platform: There are OS/2-based efforts as well. But since Windows' debut, "more OS/2 things have ended up on the shelf" while Windows use has escalated, according to senior strategist Michael Drips.

As evidence, Sprint's information systems group chose Windows as its platform for a new invoicing application. The system will allow Sprint salespeople to configure new and existing invoicing procedures to suit customer preference.

"We want to be able to structure invoice reporting the way the customer wants it to be," IS project leader Richard Schmidt says. Customizable features would include delivery of invoice copies to multiple locations within the customer's company.

Schmidt says Windows was chosen for its multitasking capability and graphical interface. While the Apple Computer, Inc. Macintosh offered some of the features Sprint was after, there was an economic factor. "You can save a lot of money going with the IBM personal computer clones over the Apple," Schmidt says.

Sprint programmers employed Microsoft Word for Windows, Design and Excel from Microsoft and wrote the code in C. Although Windows proved to be a good choice in retrospect, the developers found its learning curve a bit difficult, Schmidt says.

The application's users, on the other hand, were delighted with the prototype. "They didn't have any problem understanding what was going on with it," Schmidt says.



Bob Barrett

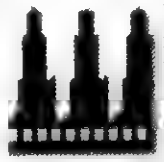
U.S. Sprint's Drips *says more OS/2 products remain on the shelf*

Although the software will be ready in March, the hardware rollout will take two years. New PCs must be ordered companywide, Schmidt says. He is recommending 25-MHz Intel Corp. 80386DX units with 4M bytes of memory, a minimum 80M-byte hard disk and an IBM Video Graphics Array adapter.

Initially a stand-alone system, the application will be networked via IBM 3270 emulation devices into the company's IBM mainframe, which handles billing processing. ●

RICHARD PASTORE

MANUFACTURING: OTIS ELEVATOR



Every month, financial managers at Otis Elevator Co. in Farmington, Conn., receive an 80-page book that includes 570 graphs depicting every major financial indicator in the company. The report, called Chartbook, is produced by a custom application based on Microsoft Corp.'s Windows 3.0.

Otis Elevator's primary business is the design, manufacturing and servicing of elevators and related products. Chartbook allows the company's financial group to gain a quick and concise overview of the entire company's bottom line.

The application is an "automated graphing book," says Gus Evans, a consultant at GWEA in Clearwater, Fla., who worked with the elevator manufacturer in developing the application. The only human involvement required in producing each Chartbook is putting paper in the printer, Evans says.

The application runs on an Intel Corp. 1486-based, 25-MHz personal computer under Windows 3.0 and uses 6M bytes of memory. To produce the physical Chartbook, reports from a financial database are mapped into a Microsoft Excel spreadsheet format, which arranges the numbers into an acceptable form for Charisma, a graphics program from Micrografx, Inc. that puts the files into the graphing template and rescales the charts before the report is printed.

Each report is generated in about two hours — only one-seventh the time it took when the application was first developed under Windows 2.0 in November 1989. The reports are distributed to 22 users, taking the place of cumbersome spreadsheets and unmanageable documents and charts.

The most important benefit of Chartbook, according to Evans, is having one central place in which to locate information. It frees up analysts' time, "allowing them to spot trends, locate areas that need extra attention and reinforce areas that are doing well."

Chartbook has capabilities that no other package has in the same price range, according to Evans. "Anything less than a million dollars for some equipment and software on the mainframe couldn't even come close to what we have developed." ●

JODIE NAZE

INSURANCE: NEW YORK LIFE



Unlike other products that you can see and feel, life insurance is an abstract — an intangible contract on a piece of paper filled with industry jargon. Soon, New York Life Insurance Co. hopes to change all that.

By using a combination of software supported by a Microsoft Corp. Windows 3.0 interface, the company will provide its clients with illustrated models of their life insurance plans.

People will more likely buy what "they can see and understand — and that's what pictures do," says Tom Casey, New York Life's Boston-based senior application project specialist.

Casey is overseeing installation of this graphical sales system in New York Life's general Boston office, which includes Charisma, a graphics program from Micrografx, Inc. in Richardson, Texas, and Microsoft's Excel For Windows spreadsheet. If it works well for the 150 agents there during a one-year trial period starting this summer, the 182 offices nationwide will implement the application, Casey says.

When using the system, the agent enters the client's financial and health-related specifics into either an Intel Corp. 80386-based IBM Personal Computer or an NEC Corp. laptop. After connecting to the bureau's Novell, Inc. Netware 386 local-area network, the agent creates bar, pie and fever graphs to show — rather than tell — the client such details as premium payment, value of the policy over time, death benefits and how each of these factors affects the others.

For New York Life, the key feature of Windows 3.0 is dynamic data exchange, which smoothes the flow of statistics between Excel and Charisma. Spreadsheet changes are automatically updated on the graphics end in the form of a new picture, Casey says.

New York Life developed this illustration scheme in 1987, when it expanded its desktop publishing facilities with Windows 2.1. Memory management troubles while working between Excel and Aldus Corp.'s Pagemaker prompted New York Life to dabble in OS/2. However, the firm scratched its OS/2 experiment in May 1990 when Windows 3.0 appeared.

New York Life already had the required 80386-based PCs, each with 4M to 6M bytes of memory, so switching to Windows 3.0 was a natural upgrade, Casey explains.

The one-year trial will begin when the firm finishes transferring graphics templates to Charisma from Software Publishing Corp.'s non-Windows-based Harvard Graphics, which New York Life previously used. ●

KIM S. NASH



Henry Hilliard

New York Life's Casey: *'People buy what they see and understand'*

DIVERSIFIED SERVICES: DUN & BRADSTREET



You might say Dun & Bradstreet Information Services — North America, based in Murray Hill, N.J., arrived at Microsoft Corp.'s Windows 3.0 through the back door. "We were looking for a database management program," recalls Roger Jambor, director of workstation technology. "We found Precision Software's Superbase 4 — and Superbase requires Windows."

Users work with the database management system to develop prototype financial reports. Windows provides the interface and facilitates connecting to the mainframe.

"Our business is collecting data and selling information," Jambor says. D&B loads other companies' financial statements into a database and generates vertical industry reports.

However, the diversified services company is gradually becoming a Windows booster. "We're quite satisfied with Windows. The improvement of 3.0 over previous versions is tremendous — it's stable, and it runs. A lot of divisions at Dun & Bradstreet are making the cultural change to Windows. It's slow, but it is happening," Jambor says.

Before Superbase 4 and Windows 3.0, developers had to elbow for mainframe processing time to produce a new style of report. Now, however, the mainframe is accessed only to pull down the raw data; all formatting and calculation takes place on personal computers.

"It's two leaps forward," says Ron Ens, senior project director of development at the firm. "It enables us to test a report prototype months faster. Plus, we can download live data for test marketing the report." With other graphical Windows applications, such as Microsoft's Excel, developers can present data in more attractive formats as well.

Because D&B users were already operating Intel Corp. 80386-based PCs, no hardware upgrades were needed. The PCs are networked with Microsoft's LAN Manager. The local-area networks are then connected to the mainframe through Netlogic, Inc.'s 3270 emulator software.



Dun & Bradstreet's Jambor: *'It enables us to test a report prototype months faster'*

Jambor says he is pleased with the new system. "The only problem we've had is speed," he reports.

This drawback is gradually being overcome through use of "codeable modules," which allow users to call up only the part of an application they need at that moment. "By rewriting parts of Superbase in C language," Jambor says, "we avoid incurring the whole overhead of Superbase." •

DEREK SLATER

HEALTH CARE: BAXTER



Baxter Healthcare Corp. is hoping that Microsoft Corp.'s Windows will open up a world of opportunity for its customer service representatives.

"We're standardizing on Windows to enable service representatives to have multiple applications accessible simultaneously," says Michael Purcell, a staff software engineer in corporate information resources.

His company manufactures and distributes products to health care providers. Consequently, a big part of the business success lies in the order-taking process.

About half of these orders go through American Hospital Supply's Asap system via a direct link. The Windows environment is for the customer service representatives on networks completely internal to the company. Called Advanced Data Entry PC Terminal, or Adept, the applications cover preliminary order entry, order status query, pricing information and available inventory.

Baxter started moving over to Windows two months ago.

The customer service application — which is DOS-based and internally built — actually consists of hundreds of pieces.

The company is actively looking at how to restructure that functionality to run as a native Windows application.

In the short term, the goal is to make the order-entry application clean enough to run under Windows' DOS box and stabilise the rest of the configuration, Purcell says.

Another advantage to using the Windows environment is that users can not only run their business line application, but they also have context switching between it and other 3270, DOS and Windows applications running at the same time.

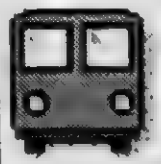
As part of the same project, Baxter completely rearchitected its network servers. IBM's PC LAN Program running on top of a Compaq Computer Corp. server was replaced with a recommendation to use LAN Manager 2.0 and the Microsoft/Digital Communications Associates, Inc. Select Communications Server running on a Compaq Systempro server on an IBM Token-Ring network.

Distributed Systems Technology Group also recommended that users use Compaq's 386N, a diskless Intel Corp. 80386SX box with 5M bytes of memory, IBM's Video Graphics Array, Windows 3.0 and DOS 3.3.1

Some users' sites don't require the functionality at this time, so Purcell says that he expects to have 30% to 40% of a target user base — which ranges from 500 to 1,000 users — switched over by this summer. •

PATRICIA KEEFE

TRANSPORTATION: AVIS



Once bogged down by hours of paperwork for each new fleet of cars rented, salespeople at Avis Car Leasing, a PHH Corp. company in Hunt Valley, Md., will soon be spending more time on the road talking to customers than they will spend in the office, thanks to a customized Microsoft Corp. Windows application.

The application, being developed by Avis senior management consultant Ron McCarty, uses Windows as a common interface for four in-house sales applications. Knowledge Garden, Inc.'s Knowledgepro Windows interface software running on Compaq Computer Corp. Systempro laptops is used to link the applications.

The company adapted the product by adding a customised software program that acts as a Help system to lead the user through each application. For example, when a user takes an order from a customer renting a fleet of cars, the program guides him to the next question, regardless of the chronology in which the questions were asked.

"Windows makes it easier for the salesperson to gather the necessary information to make a proposal," McCarty says.

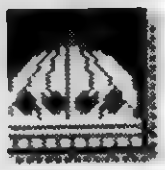
Six alpha-test users have been trained to run the new Windows-based sales application since January. Five more sales offices with at least five people each will be brought on-line this summer.

"Because this version of Windows is economical and easy to use, we were able to train our salespeople in half a day, and these people were not computer-literate at all," McCarty adds.

McCarty declined to say how much the company invested in the Windows project, but he did say the project is well worth the money. •

MAURA J. HARRINGTON

GOVERNMENT: USDA



Scholars pursuing research grants in the areas of drug addiction, treatment and prevention confront a myriad of confusing grants programs. They may now find it less taxing thanks to Hugo, a research-mentoring system built around Microsoft Corp.'s Windows 3.0.

Hugo was the brainchild of the National Institute on Drug Abuse (NIDA), which awards grants to scholars interested in drug-related research. NIDA, in Rockville, Md., commissioned Development Assistance Corp. in Washington, D.C.; to develop the software.

Hugo acts as a mentor for scholars filling out application forms, designing research programs and reviewing available grants, according to Catherine Bolek, associate director of special populations research at NIDA.

"Hugo pulls diverse technologies together under one umbrella, which is Windows 3.0," says Larry Bielawski, director of the Decker Center for Information Technology at Goucher College in Baltimore. Bielawski developed Hugo with his partner, Robert Lewand.

The cornerstone of Hugo is Knowledgepro Windows, an application generation tool from Knowledge Garden, Inc. in Nassau, N.Y. "Knowledgepro provides the executive system that controls all the modules, giving standard objects such as pull-down menus, slider bars and check boxes," Bielawski says. "It also allows the ability to construct expert systems and implement hypermedia."

Underneath Knowledgepro are other tools such as Microsoft's Excel and Lotus Development Corp.'s 1-2-3 spreadsheet. "One monumental step for the research environment using this software is, for example, the ability to change information within a budget in real time, view it on the screen to see if it's correct and, with one keystroke, print it out," Bielawski says. "Before Hugo, this procedure would have taken a great deal of time and manual work."

Hugo is a stand-alone system running on an Intel Corp. 80286-based personal computer at 12 MHz or higher. It is slated to be released May 31.

By reducing the cost and complexity that goes with preparing grant applications, Bolek says, Hugo will increase the number of potential grantees and bring a more diverse group of students to the program.

As for the future, Hugo looks promising, according to Bielawski. "Right now, Hugo is a generic product, and the important thing is to be able to customize it for institutions," he says. "The more customizable a product is, the more useful it will be." •

JODIE NAZE



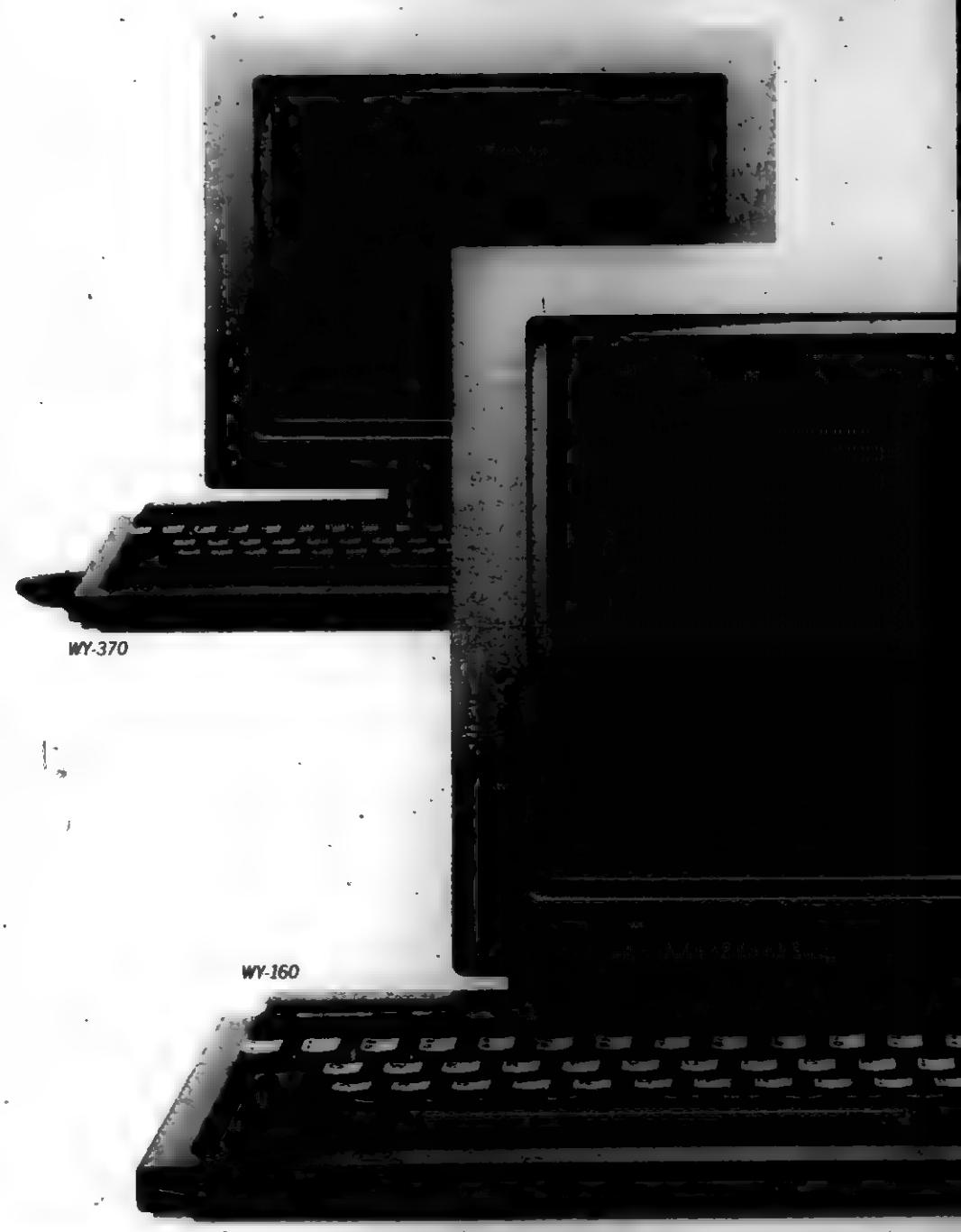
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Users give key features high marks

Computerworld's Windows 3.0 user survey is based on telephone interviews by Computerworld staff members with more than 40 information systems professionals in charge of implementing large Microsoft Corp. Windows 3.0 installations. Respondents were asked to grade each category on a scale of A through F. The grades were converted to numeric equivalents to find an average.

B+ Overall ease of use

Because of its graphical attributes, Windows 3.0 is seen by many users as more intuitive than the DOS character-based interface. The ability to view multiple windows and move through the system using a mouse is particularly appealing. However, users complain about the File Manager, which is an improvement over MS-DOS Executive but is an awkward mix of graphical and text-based operations.

"The only change I'd make right out of the box is to integrate the Program Manager and File Manager. You can do that now with third-party utilities, but Microsoft should do it," says Basil Mahoney, president of the Windows Presentation Manager Association.

"The File Manager is a weakness because it isn't fully icon-based," says Tom Adam, office systems analyst at Blue Cross.

B+ Ease of training end users

How easy is it for IS professionals to bring users up to speed on Windows 3.0? Well, a lot depends on the users. Survey respondents report that those with Apple Computer, Inc. Macintosh or other graphical interface exposure are easy to train. But if the users come from DOS-only environments, training time can exceed what would normally be expected for DOS.

"The up-front investment may take a little extra time, but that reduces time of learning for subsequent applications," says Bill Remmert, manager of end-user computing at Contel American Satellite Co.

"DOS end users are hard to retrain. People have underestimated the learning curve a bit," says Tom Casey, senior computer development consultant at New York Life Insurance Co.

C+ Memory requirements

While Windows takes advantage of the protected mode of Intel Corp. 80286-, 80386- and 1486-based personal computers, many users find they have to upgrade to an 80386 with 4M bytes of random-access memory to run the package efficiently. IS professionals report that time and care must be taken in planning memory management to coordinate the DOS environment with Windows and Windows applications. This is more important in networking situations where several PCs must be managed.

"We had to upgrade memory on some of the 80286s. Also, some of the programs that run in DOS interfere with Windows memory management, so you can't stay in Windows all the time; you have to switch in and out," says Ron Houck, senior systems designer at Marion Merrell Dow, Inc.

B+ Ability to enhance user productivity

Of all the reasons given for acquiring Windows, increasing user productivity is the one most companies are banking on. So far, IS professionals are optimistic about this point. Some managers report an initial decrease in productivity because users are still working their way around the environment.

"It's a brand new way of looking at things, and the windows and subwindows can be confusing," says Steve Palacioz, network manager at Lockheed Corp.

"Once the users are trained, they are very satisfied and spend more time on their computers. They are more creative on the job and are finding better ways to save time," says Jacque Silver, general manager of the information center at Bankamerica Systems Engineering.

B Compatibility with existing computing environment

Windows' great strength, compared with other graphical user interfaces such as OS/2, is its compatibility with DOS. However, initial forecasts that compatibility would be a snap are being tarnished a bit as users try to fit Windows into their own unique computing environments.

"One of the nicest features of Windows is the menuing, which allows users to go from one software application to another. But it doesn't have some of the functions I find very valuable, such as usage tracking. We have a corporate standard based on Direct Access, an automatic menuing program that logs usage. We use it to determine our return on investment for PCs," says Jacqueline Bynsdorp, PC coordinator at Jockey International, Inc.

B+ Overall value to your company

For many companies wrestling with an alternative to DOS, the availability of Windows has turned their software evaluation process on its head. Just when OS/2 or Macintosh or another alternative was looking better, an interface came along that provided many of the features of the other packages without the pain of switching wholesale to a non-DOS environment and at a more reasonable cost.

"In the past, we were working to catch up to user demands. Now we're working to bring users up to speed with Windows. There's more capability on their desks than they are using," Remmert says.

"We were preparing for a graphical user interface, and the Macintosh was beginning to win until Windows 3.0 came out," says a PC manager at a large financial services company.

B+ Cost vs. benefit, including hardware upgrade costs and installation

Similar to ease-of-training issues, whether Windows provides a favorable cost/benefit result depends a great deal on what's already in place. Users with previous versions of Windows and PCs with a lot of power report lower entry costs.

"To spend $150 per user for Windows 3.0 and then have to spend another $400 to $500 to manage the Windows on a network is crazy," Palacioz says.

"We already had Windows 2.0, so the upgrade was $49 per copy. Hardware upgrades for memory weren't expensive at all — about $90 per machine," says Brian Moura, finance director for the city of San Carlos, Calif.

B Ease of providing ongoing user support

Probably the most important issue for IS managers is whether Windows, once installed, will require more resources than DOS for continuing user support. Those supporting less complicated implementations find that costs actually go down once the learning curve is passed. But more sophisticated applications are requiring more in terms of ongoing support.

"Windows 3.0 gives users more rope to hang themselves with. The fact that it sits on top of DOS means that it has limitations. Any program can hose up the whole works by writing to the wrong piece of memory. Also, because it's so new, our technical people are new at it, too. It's a complex environment," says Lonnie Cordell, systems programmer at Texas Instruments, Inc.

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DOS seen through other windows

DOS-based Desqview offers multitasking capabilities minus the graphical interface

BY ALAN J. RYAN

Not every user needs Microsoft Corp.'s Windows 3.0, and some users want more features than it offers. For them, there are other user interface options and applications that either replace or add to the functionality of Windows.

However, comparing DOS and OS/2 "alternatives" to Windows directly is often like comparing peaches and nectarines. They may be very similar, but they have a slightly different look and feel.

One of the DOS alternatives is Quarterdeck Office Systems' Desqview 386, which sells for $219 (compared with the $149 retail price for Windows) and includes the built-in Quarterdeck Expanded Memory Manager-386.

Desqview offers multitasking capabilities within DOS but does not offer the graphical interface of Windows. The package excels when the user is running a mixture of DOS programs, while Windows works best when the programs running under it are designed specifically for Windows, users say.

"We are doing everything that OS/2 promised to do, but we're doing it with Desqview 386," says a user at a Houston-based petroleum firm. "Why would we want to waste megabytes of random-access memory on OS/2 when Desqview can do this using only a few thousand bytes?"

Satisfactory substitute

Jim Wiehl, analyst for end-user computing at General Electric Defense Systems Division, says Windows may someday become a standard platform. For now, "Desqview delivers on everything we need without purchasing new software. So for an individual or business that needs the flexibilty of running multiple applications and isn't necessarily ready to go out and purchase all new software, Desqview works very nicely," he says.

Another alternative is provided by Digital Research, Inc. (DRI), which sells a $49 product called Gem Desktop 3.1. Gem Desktop is a graphical user interface for DOS, but it does not offer true multitasking capabilities.

DRI also sells an operating system called DR DOS 5.0. DRI claims Windows will run better under DR DOS than under Microsoft's MS-DOS because it allows the user to load the operating system into a different level of memory, giving the user more room for running applications.

DR DOS, which costs $199, includes the Viewmax graphical user interface. Like Gem, Viewmax does not offer true multitasking but lets users work in a graphical environment using icons, graphical trees or text.

For users who have already moved to Windows, there are ways to add functionality without fear of winding up in a proprietary world. One path to follow is Hewlett-Packard Co.'s New Wave Version 3.0. New Wave requires an Intel Corp. 80286- or 80386-based personal computer configured with at least 2M bytes of extended memory, a 40M-byte hard disk and MS-DOS Version 3.2 or higher, as well as Windows 3.0.

HP takes New Wave beyond the built-in capabilities of Windows by allowing the users to create dynamic links that update data automatically. New Wave also provides New Wave Agents, which act as intelligent macros to automate PC tasks such as allowing users to share information with other users on their network by simply clicking on a mouse, says Richard Walker, HP's market development manager for New Wave. The product sells for $195.

> "We use New Wave as a protective device to isolate our users from the workings of Windows and DOS and networking."
>
> Mark Floyd
> *Computer Management Services, Inc.*

New Wave essentially frees the users from DOS, says user Mark Floyd, technical services manager at Computer Management Services, Inc. in Fairfield, Calif. The company, which has made New Wave a standard program to run on top of Windows, is a contracting firm that operates data processing for the county of Solano, Calif.

"We use [New Wave] as a protection device to isolate our users from the workings of Windows and DOS and networking," Floyd says.

Floyd adds he is not concerned that the future of New Wave might be limited if Microsoft eventually incorporates the New Wave-like capabilities in Windows. "HP is aggressive about the New Wave product, and I think they will always be a step or two in front of Microsoft," he says.

Neither does the relative lack of New Wave-specific applications worry Floyd, who says more applications are being written with New Wave capabilities.

Users who have migrated to the OS/2 operating system — and thus cannot use Windows — will find another alternative built into OS/2 Standard Edition Version 1.3., which retails for $340: IBM's and Microsoft's Presentation Manager.

Look-alikes

While Windows and Presentation Manager's graphical user interface look very much alike because they share the IBM Common User Access consistent windowing interface, there are internal differences between Windows and Presentation Manager. Applications written for Windows will not necessarily be able to migrate to Presentation Manager without some programming help.

Some differences between Windows 3.0 and OS/2 with Presentation Manager include the following:

- Windows allows for preemptive multitasking of DOS applications in the 386 enhanced mode, while OS/2 does not.
- Windows is configured to run preexisting applications, while OS/2 Presentation Manager is not.
- OS/2 has protection against overwriting system and application memory, while Windows is limited in that capacity.
- Windows offers extensive device support for printers, scanners and displays, while OS/2 does not.
- Windows offers network-specific functionality in its user interface, while OS/2 does not. •

Ryan is a *Computerworld* features senior writer.

Open Look, Motif enhance Unix

For companies that select Unix as the operating system of choice — most typically in fully distributed, networked environments — graphical user interfaces can help shield end users from the complexity of the operating system while still allowing windowing capabilities.

For example, at the National Aeronautics and Space Administration (NASA) Kennedy Space Center in Cape Canaveral, Fla., a work group uses Open Look from AT&T Unix System Laboratories, Inc. and Sun Microsystems, Inc. as its graphical user interface window manager for X Window System, both of which run on top of Unix, according to Dave Roberts, a software engineer at NASA.

One benefit of using Open Look with X Window rather than using X Window alone is that it reduces application development time, Roberts says. "The other benefit is that Open Look provides a lot more consistent user interface and, therefore, might reduce training time. The users may be more comfortable and productive," he adds.

The minimum memory requirement to effectively run X Window and Open Look is approximately 6M bytes, Roberts says, but he adds that at NASA, the typical machine running Open Look has 8M bytes.

Another prominent Unix graphical user interface is the Open Software Foundation's OSF/Motif. Motif also requires at least 6M bytes to run properly. The package consists of components from three vendors.

Essentially, says Craig Lamont, business area manager for Motif, the three-dimensional appearance and window manager in Motif comes from HP, the tool kit comes from Digital Equipment Corp.'s Decwindows, and Presentation Manager comes from Microsoft.

"We selected the Presentation Manager behavior to allow the estimated 15 million users who are using a Windows or menu-driven system, specifically MS-Windows, to be able to transition to the advanced technology easier," Lamont says.

However, Motif was not designed to compete with the windowing systems in the DOS and OS/2 worlds, Lamont adds. "Windows, Motif and Presentation Manager are actually complementary to each other. One of the side benefits has been that whether you are using Windows or Presentation Manager on a PC or Motif on a workstation, the behavioral model is the same."

There is also little difference in functionality between Motif and Open Look, both of which run on top of X Window. "Eventually, you will probably see Open Look and OSF/Motif merge into one product. They are so close now, I don't know if one could compete against the other," Roberts says, although each package has a distinct look, he adds.

ALAN J. RYAN

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Meeting OS/2 head-on

Success of the Windows interface has forced some OS/2 users to readdress their desktop needs

BY PATRICIA KEEFE

What a difference a year makes. Twelve months ago, corporate information systems managers would have placed OS/2 at the heart of their work group strategies for the '90s. Not so today.

The advent of Windows 3.0 coupled with Microsoft Corp.'s determination to bring that product to maturity has exacted a heavy toll. OS/2's star has dimmed significantly, say restless users who have pronounced it dead on the desktop.

"With the Microsoft/IBM rift, it's really solidifying our position ... not to stay with IBM [on the desktop]," says Jeffrey Kernan, a vice president at Lithonia Lighting, Inc. in Atlanta.

"I looked at OS/2 as a logical successor to DOS, but it hasn't lived up to its billing. Now, I'd hedge my bets," says Andrew Roehr, a systems consultant at Bank of Boston.

Even more critical is Dave Evans, vice president of IS at J. C. Penney Co. in Dallas. "Had IBM delivered a truly effective OS/2 18 months ago, it could have won a lot of the market," he says. Today, "OS/2 is no longer a strategic system for us."

Tightening the screws

The pressure is on, and IBM is feeling the pinch. Last month, reports circulated that IBM would hold a daylong seminar to articulate its plans for OS/2 more forcefully. Also, John Soyring, director of software development support, has taken on an active OS/2 evangelizing role.

This is precisely the kind of reaction that large accounts, such as the Royal Bank of Canada, which have invested "millions of bucks" in OS/2, are demanding to see.

The Royal Bank is both the third largest bank in North America and a charter member of IBM's OS/2 and Officevision user councils. It took Microsoft's recent statements of direction concerning Windows' future, including support under New Technology Portable OS/2, "very seriously," says George Oliver, manager of information delivery technology at Royal Bank.

Although he considers some of Microsoft's statements to be "irresponsible," he was awaiting a response from IBM at press time.

"For organizations like us that are taking an enterprisewide system approach, Windows 3.0 is not viable; it's too unstable in a network environment," he says. The way Oliver sees it, Microsoft is saying, "Trust us, and 18 months from now, maybe we'll [be able to meet] your needs."

Still, Oliver says, "It's time for IBM to move beyond behind-the-scenes assurances." If IBM doesn't do something soon, he claims, the bank will be forced to reopen its entire enterprise strategy even though it would set the bank back 18 months.

Other shops have already beaten the bank to the punch, particularly on the client, where many former supporters have trashed plans to go with OS/2. For these users, Windows is simply cheaper, easier and supported by many more applications.

"Windows 3.0 meets 90% of my needs today on the desktop," Evans says.

"A year ago, I'd have said OS/2," says a personal computer manager at a large national retailer. With the advent of Windows 3.0, his firm has changed direction "180 degrees." In fact, his group is using Microsoft's plans to merge Windows with the OS/2 kernel as ammunition to support a switch to Windows for most desktops. Subsequently, IBM has turned on "a lot of pressure," he says, but to no avail.

Even OS/2 advocate Bank of America is "actively looking" at Windows for production applications, Vice President George Cheng says: "We are using OS/2 in niche applications and on servers that specifically need its power and functionality."

Where OS/2 does hold sway and still has a chance is on the server, particularly among client/server, data repository and SQL Server advocates. "Windows lacks true preemptive multitasking and protection of programs from each other," says John Turbuck, a consultant at Canaan Analytics.

But even there, support is beginning to erode. It's hard to piece together a client/server strategy today with Windows desktops attached to OS/2 servers. For example, IBM's DOS requester and Windows reportedly do not work well together.

Evans complains about the lack of coordination between OS/2, OS/2 LAN Server and the Database Manager. He plans to devote his server efforts to AT&T's Unix System V. "It's gonna be the winner," he says.

Many users are now taking a second hard look at Unix. Where OS/2 does have merit — in communications-intensive applications — it runs smack into Unix, according to Roehr. For his money, Virtual Networking Software from Banyan Systems, Inc. "blows OS/2 out of the water" on larger networks.

The recent cloud over the future of LAN Manager is likely to exacerbate second-guessing among users. Where IBM and Microsoft once stood united on LAN Manager, there are hints that the rift may have widened.

Last month, Microsoft said networking capabilities would be built into New Technology Portable OS/2, begging the question of LAN Manager's future as a stand-alone application. As for IBM, last month's well-timed decision to formalize its long-rumored relationship with Microsoft rival Novell, Inc. only adds to the uncertainty. Suddenly, there are promises of Netware everywhere on IBM.

The final nail in the coffin for some uneasy users is the endless delays with Officevision LAN 2.0. "We've already decided not to go with Officevision," says one manager at a major financial institution that is looking to alternatives such as NCR Corp.'s Cooperation and Lotus Development Corp.'s Notes.

Lone supporters

About the only place that OS/2 seems to be holding its own is in those shops that have written their own production applications. In some cases, once ambitious corporatewide OS/2 plans have been pared down until only specific, mission-critical applications remain. These projects will likely proceed untouched by the Windows vs. OS/2 wars.

Because the users are building their own applications, they are not affected by independent developer decisions. Also, because these projects are not targeting the personal productivity/office automation arena, few incorporate a graphical user interface. Therefore, the uncertainty over the future of Presentation Manager has no impact.

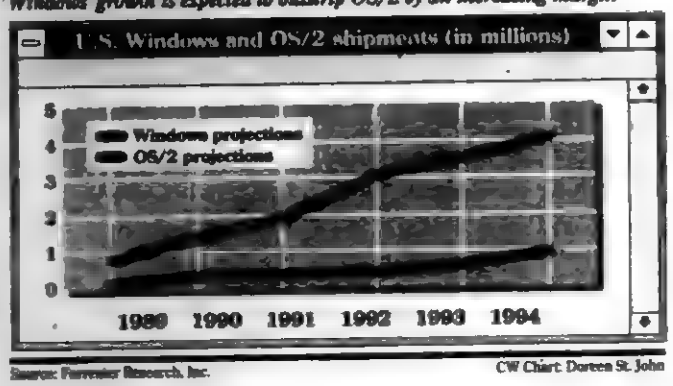
IBM is further hobbled by the strong feeling among many users that software just isn't its forte. "From an operating system point of view, Microsoft has some of the best technology available. I believe if anyone can pull all this together, they can," says Stephen Turner, a consultant to Chevron Canada.

Roehr agrees: "What I don't hear from people I know at IBM is any sense of direction internally. If their employees are confused, their clients are *totally* confused."

It's begun to look as though OS/2 may prove to be the final test for IBM's technical and marketing software expertise in the microcomputer market. Users' bottom line to IBM appears to be this: "You have a 12- to 18-month window in which you can acquit yourself on OS/2." If IBM fails to deliver, when and if a 32-bit Windows shows up, many OS/2 users say they won't hesitate to pick it up. ●

Widening sales gap

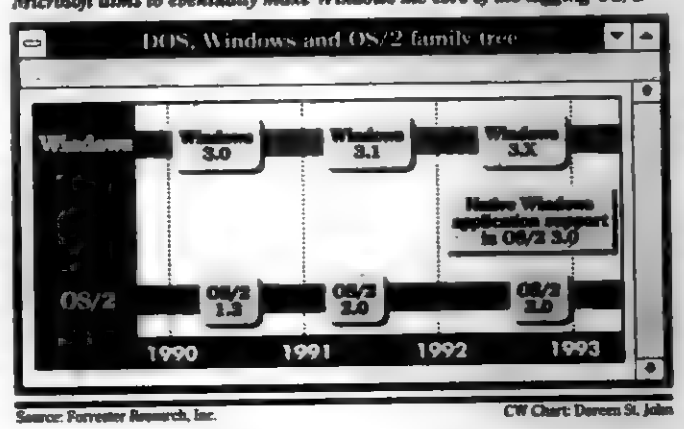
Windows' growth is expected to outstrip OS/2 by an increasing margin



Source: Forrester Research, Inc. CW Chart: Doreen St. John

Merging product lines

Microsoft aims to eventually make Windows the core of the lagging OS/2



Source: Forrester Research, Inc. CW Chart: Doreen St. John

Keefe is Computerworld's senior editor, PCs and workstations.

IBM forced into defensive role

BY PATRICIA KEEFE

"How goes the battle?" That question best describes the state of affairs between IBM and Microsoft Corp. and between their joint creation, OS/2, and Microsoft's upstart, Windows.

After almost a year and a half punctuated by bickering over the functionality and roles of Windows and OS/2 and subsequent follow-up exercises in damage control, the simmering dispute boiled over in January after a published report said Microsoft was dropping OS/2 [CW Feb. 4].

While IBM seethed at Microsoft, business line managers called information systems strategists on the carpet. As IS managers in turn grilled IBM account executives on the future of their OS/2 investments, Microsoft Chairman Bill Gates personally dashed off a press release denying any plans to dump OS/2.

Still, there is no denying that Microsoft favors a "Windows everywhere" strategy. Company executives acknowledge that the Windows graphical user interface is at the core of New Technology Portable OS/2. They also concede they have been telling developers for months to write to Windows, not OS/2. Furthermore, plans to provide binary compatibility between Windows and OS/2 applications have been shelved for now, if not dropped.

New name

According to Microsoft, what was once called binary compatibility has been renamed the Windows Library for OS/2. One developer accused Microsoft of playing a shell game, saying the library is actually the renamed software migration kit. As far as Lee Reiswig, IBM assistant general manager at the Programming of Entry Systems Division, is concerned, binary compatibility "bit the dust."

Microsoft will provide several modules — Windows 3.X, Windows-32, OS/2 Presentation Manager, Posix and DOS — with New Technology Portable OS/2, which is due out between mid-1992 and mid-1993. However, most observers say they expect Microsoft to continue focusing its efforts on the Windows portion, which means it could be up to IBM to ensure that the Presentation Manager graphical user interface receives equal promotional time and development dollars, developers say.

When pressed about the likelihood that Microsoft will push Windows to the virtual exclusion of all else, Reiswig said only that he is unaware of any plans by Microsoft to do so.

However, Reiswig also acknowledges the need for IBM to push its viewpoint separately from Microsoft and in a more public forum. He quips that would-be OS/2 developers have moved to Missouri, the "Show me" state. Consequently, Reiswig says, IBM will have to prove to these developers that OS/2 has a future. How it will accomplish this is not clear, however [CW, Feb. 25].

For now, he says, users and developers can expect the following in 1991:

- Delivery of OS/2 Version 2.0, a 32-bit operating system that briefed sources say will support DOS and Windows applications as well as provide simultaneous access to IBM's LAN Server, Novell, Inc.'s Netware and Microsoft's SQL Server. Sources expect a late fourth-quarter delivery.
- Delivery of a spate of IBM applications directed at a variety of vertical markets. It's expected that IBM will continue to push developers to produce graphical OS/2 applications; most OS/2 programs currently run in character mode.
- User transitioning from pilot projects to production systems running under OS/2.
- An interim release of Officevision this month, although no delivery date has been set for release of the next major upgrade, Release 2.0. ●



Macintosh still holds graphical edge

ANALYSIS

BY JOHN DUNKLE

For DOS users, Microsoft Corp.'s Windows 3.0 represents a quantum leap over previous interfaces in terms of ease of use. But how does it compare to the oft-proclaimed leader in user friendliness, Apple Computer, Inc.'s Macintosh?

The duplication of the Macintosh environment is the unstated goal of all interface software currently hitting the market. Whether it is Windows or the new Unix interfaces, the model being followed is the intuitive Macintosh system software with Finder feature.

The problem that all of these interface technologies confront is that, at best, these are shells over a very complex operating system. Even the best of the Unix interfaces, the Open Software Foundation's Open Look and Motif, require Unix command syntax to finish a command sequence.

Network management tools for these interface shells require the same confusing character command sequences. Intuitive interoperability for applications is still a sought-after goal.

Windows is no exception. Despite its advances as a graphical user interface-based environment, the software is a shell over DOS and therefore still requires users to understand DOS and use command sequences for some functions. Windows 3.0 also lacks the full set of interface conventions and applications consistency that are part of the Macintosh's claim to fame.

Despite those basic differences, the computer industry has been quick to make comparisons between the two graphical user interface environments. Much of the comparison assumes that Windows users are already familiar with DOS commands. Macintosh users would be less likely to be comfortable with Windows because they would have to learn DOS. For this reason, among others, firms that have invested in the Macintosh will not likely abandon their current Apple platforms and replace them with a Windows platform.

For example, at a major East Coast financial institution where applications are already developed for the Macintosh, a conversion to Windows would take "unprecedented man-years of development and extensive budgets," according to the company's vice president of information services.

At Martin Marietta Corp. in Chantilly, Va., where Macintosh and DOS-based systems both are used, Windows 3.0 is considered a "migration path to a graphical user environment" for DOS users, says Steve Birgfeld, manager of the company's product evaluation center. However, users accustomed to working on the Macintosh will not be forced to make the switch and learn DOS, he adds.

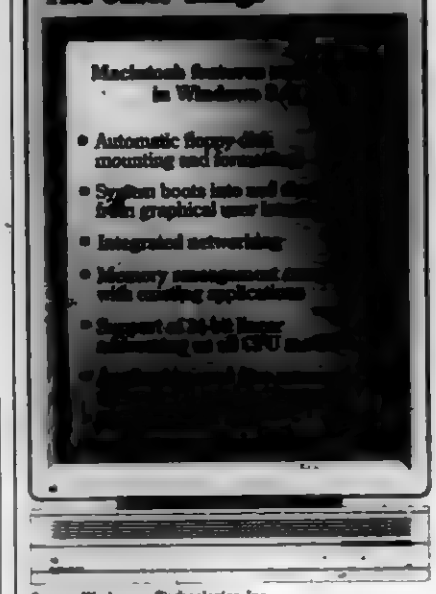
"The Macintosh represents a more stable environment than Windows/DOS. Windows is not as inviting, nor is the desktop as functional in Windows 3.0 as it is in the Macintosh," says Andrew Garsten, information systems supervisor at Security Pacific in Los Angeles.

These opinions are echoed by a large number of IS managers with significant investments in both Macintoshes and PCs who were interviewed on their views of Windows vs. the Macintosh.

A factor in the Macintosh's popularity is the number of readily available applications, combined with the consistency of their user interface. "Applications are more consistent on the Mac than they are under Windows 3.0," Garsten says.

Fewer than 5% of all DOS applications conform to the Windows operating environment, while all of the more than 3,500 Macintosh applications conform to the Macintosh interface. Although there are about 1,400 applications for the Windows family, not all have been rewritten for compatibility with Windows 3.0.

By the end of 1990, independent software vendors had developed almost 400 Windows 3.0 applications, but many of them are communications utilities or are



Source: Workgroup Technologies, Inc.
CW Chart: Doreen St. John

Dunkle is vice president at Workgroup Technologies, Inc. in Hampton, N.H.

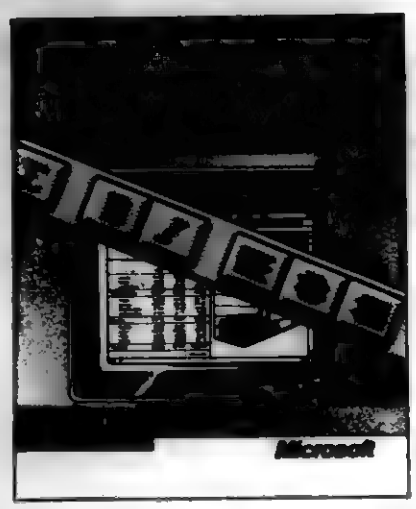
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corporate-specific. Therefore, there are far fewer broad-based commercial applications such as word processors, spreadsheets and graphics programs for Windows 3.0 than for the Macintosh.

Aside from the Macintosh's obvious upper hand in maturity, however, the key difference goes back to the fact that Windows 3.0 is a shell over DOS. This means that for many functions within Windows 3.0, the user must revert to the character-based DOS command syntax.

While Windows 3.0 makes most of DOS's complexity transparent, unlike the Macintosh, it doesn't keep system-level functions within its read-only memory (ROM).

This means that users cannot rely on interface conventions to transfer from application to application, and features such as dynamic live links are dependent on the software developers' methods of implementation. This is relevant in evaluating Windows 3.0 as an intuitive environment because the value of such a system lies in the speed with which a novice user can be productive and the ability for experienced users to readily use new applications.

Inconsistent application

Windows 3.0 does provide a seamless environment for running applications, but this ability applies specifically to Windows 3.0 applications only. One of the hindrances to applications consistency in Windows 3.0 is that Microsoft has specified three different ways to implement dynamic data exchange capability for sharing information.

Therefore, only Windows 3.0 applications that are written to the same convention can take advantage of dynamic data exchange, and the potential for uniform consistency among all applications is lost.

In addition, Microsoft has not specified a single set of conventions to use for adding features to applications, which again prevents consistency for users. This decreases user productivity because Windows 3.0 users need more training to learn software, and it is more difficult for users to learn a new application quickly.

The Macintosh, by contrast, was developed as a complete environment that includes the operating system, file and application conventions and an interface for access and manipulation. Unlike the user of Windows 3.0, a Macintosh user is always within the Macintosh's graphical environment. Furthermore, all of the methods used for direct manipulation of files and applications are consistent throughout the environment.

Users can, for example, copy and install applications or files — or make any other changes — with the same point-and-click techniques. There is no need to revert to command syntax for file or application manipulation at any place in the Macintosh environment. With Windows 3.0, by contrast, users have to revert to a command-based Program Manager for application storage and a File Manager for file storage.

Furthermore, Apple has been much more specific than Microsoft about the rules developers need to follow in writing applications. The Macintosh also includes all the tools and features needed to let an application interface with the underlying hardware. Tool kit enablers such as the Window Manager reside within the Macintosh system's ROM to help the developer write applications.

Applications that closely follow these guidelines function in the same manner on any Macintosh system, providing users with a familiar environment and method of direct manipulation.

Added features

The Macintosh graphical environment includes features for cooperative multitasking, calculations, printing, digital sound and, most importantly, networking.

All elements within the system — storage facilities, peripherals, files, directories (called folders) and applications — are represented by icons.

The modular design and device independence enhance the systems integration capabilities of the Macintosh. A user can add functionality through the same type of direct manipulation that allows an application to be installed by "dropping" the application icon onto the system folder. When a user wants to specify, for example, a different printer for a task, he uses the Chooser desktop accessory to highlight the desired printer with a point and click of the mouse. In Windows, by comparison, the user has to install a unique printer driver for each printer, and each printer has its own characteristics. •

Numerous options

Major Macintosh applications that have been or are being ported to Windows 3.0 include the following:

- Adobe Systems, Inc.'s Illustrator (February) and ATM, (available now)
- Aldus Corp.'s Pagemaker (February) and Persuasion (second-quarter 1991)
- Informix Software, Inc.'s Wingz (available now)
- Microsoft's Excel, Word and Powerpoint (all available now)
- Quark, Inc.'s Quark Express (sometime this year)
- Software Ventures Corp.'s Microphone II (available now)

INFOMART OnSite EVENTS

INSURANCE MAR 18-19

American Association of Managing General Agents will be looking at imaging, networking, computers and voice mail applications.

RELIGION APR 4-6

Join pastors, church staff, secretaries and laymen at the *National Christian Computing Expo & Convention.*

GOVERNMENT APR 16

Information systems professionals working in government can learn the benefits of computer-aided software engineering (CASE).

BANKING APR 23

Find out how image management can speed processing of checks, loan applications and credit card billing during *Image Processing in Banking* sponsored by INFOMART.

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The result is *significantly* faster output.

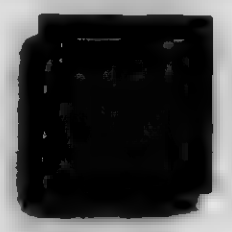
It is also significantly better.

Thanks to true Adobe PostScript—not a clone—the EPL-7500 is able to produce razor-sharp text in 35 scalable fonts, plus equally impeccable graphics. Blacks are blacker and lines are finer, courtesy of the printer's unique MicroArt Printing technology.

The EPL-7500 handles paper as well as it handles text and graphics. A 250-sheet tray comes standard, a second is optional. Also standard are serial, parallel and AppleTalk® interfaces, allowing the printer to work smoothly in both PC and Macintosh® environments. For even greater versatility, HP® LaserJet® Series II emulation is included.

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Windows of opportunity

Since Microsoft Corp.'s announcement of Windows Version 3.0 last May, the product has been draped with a myriad of add-on packages and products billed as Windows-compatible. The following are among the announcements made during the last nine months:

Desktop publishing

Aldus Corp.'s Pagemaker Version 4.0 — a desktop publishing package that began shipping last month — features a built-in word processor, text handling and professional typographic controls.

The product enables Windows 3.0 users to convert layout and text windows into easily accessible icons and to establish Dynamic Data Exchange links with Microsoft Corp.'s Excel 3.0, according to the company.

A DOS-compatible Intel Corp. 80386-based personal computer equipped with a 40M-byte hard disk and a minimum of 2M bytes of random-access memory is recommended.

Pagemaker 4.0 is priced at $795.

Aldus
411 First Ave. South
Seattle, Wash. 98104
(206) 628-2361

In July, Windows 3.0 users got their first glance at Ventura Software, Inc.'s Ventura Publisher desktop publishing package and Formbase Version 1.1, a database management program designed to automate the design, manipulation and management of forms and form-related data.

Ventura Publisher ($895) features a user interface redesigned for the Windows 3.0 environment, automatic mouse scrolling and support of the Windows Clipboard.

Formbase 1.1's transparently integrated forms drawing and relational database manager is said to enable users to create and change databases by drawing a form. The product is priced at $495.

Ventura Software
15175 Innovation Drive
San Diego, Calif. 92128
(619) 673-0172

Development tools

Arity Corp.'s Arity/Windows Tool Kit enables users of its Arity/Prolog Version 6.0 prolog environment to write applications for Windows 3.0 environments.

The product began shipping in January and is priced at $350.

Arity
29 Domino Drive
Concord, Mass. 01742
(508) 371-1243

Asymetrix Corp.'s Tool Book Version 1.0, a software construction set for the Microsoft Corp. Windows 3.0 environment, enables users of Intel Corp. 80286-based personal computers to build customized graphical applications by using an object-oriented programming language rather than traditional programming lan-

The software package includes color drawing tools and Openscript, its object-oriented programming language. Openscript includes reusable code and enables users to use objects that encapsulate data and code.

Tool Book 1.0 also features hypernavigation, animation and text formatting capabilities.

The product began shipping in May and is priced at $395.

Asymetrix
110 110th Ave. NE
Bellevue, Wash. 98004
(206) 637-1500

Version 2.0 of Manager Software Products, Inc.'s Manager View was designed to facilitate application development in a Windows 3.0 environment.

Manager View is a programmable, workstation-based graphical user interface to the company's Manager series of products that are driven off Manager Software's corporate repository.

Version 2.0 includes a context-sensitive Help facility that is integrated with the Windows 3.0 Help system and a Repository Diagram Generation feature that allows business and process function definitions stored in the corporate repository to be automatically converted into full-color diagrams.

Version 2.0 began shipping last month. Single-copy pricing is $7,200.

Manager Software Products
131 Hartwell Ave.
Lexington, Mass. 02173
(617) 863-5800

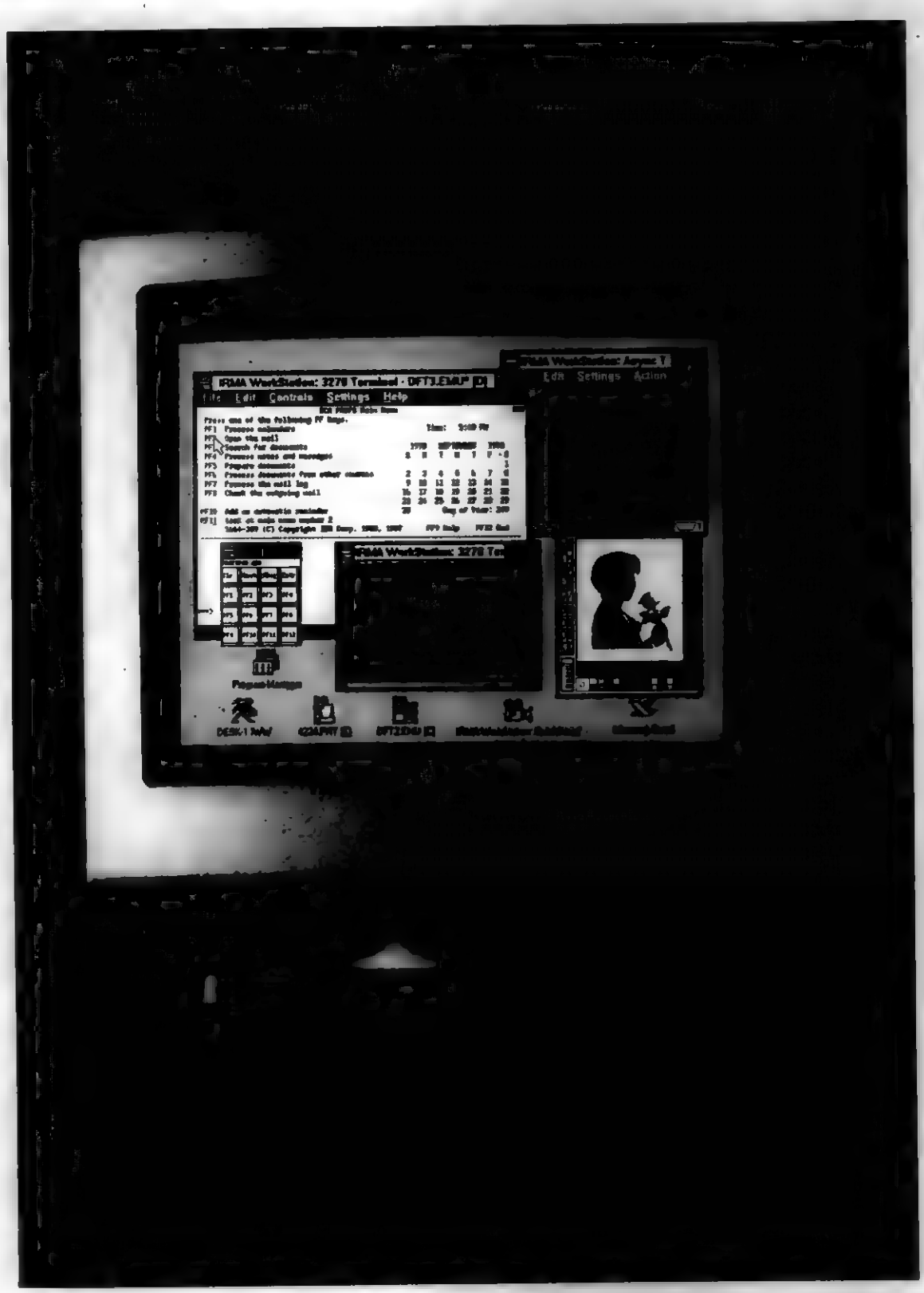
GUI Computer, Inc.'s 3-in-1 Prototyper allows users to generate executable C source code for screens and dialog boxes in a Microsoft Corp. Windows 3.0 environment.

The product comprises a screen designer equipped with 12 types of objects for screen arrangement and a code generator.

C code and C++ versions are priced at $99 and $159, respectively. The C version began shipping in November, and the C++ version began shipping last month.

GUI Computer
6604 Fernshaw Drive
Dallas, Texas 75248
(214) 250-3472

Version 1.3 of Gupta Technologies, Inc.'s SQLwindows was designed as an environment in which Windows 3.0 users can



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develop applications under client/server architectures.

The database management system application development product allows users to develop Windows applications by using point-and-click techniques instead of relying on the Windows Tool Kit or the C progamming language.

The product includes a single-user copy of Gupta Technologies' SQLbase engine and is priced at $1,295. The package began shipping in May.

Gupta Technologies
1040 Marsh Road
Menlo Park, Calif. 94025
(415) 321-9599

Kofax Image Products, Inc.'s KIPP Developers Toolkit Version 1.1 is now available for Microsoft Corp.'s Windows 3.0, DOS and OS/2 Presentation Manager users.

The product features image display rotation, simultaneous scanning and displaying and image rotation before printing.

The Windows version has been shipping since mid-October and is priced at $1,595.

Kofax Image Products
3 Jenner St.
Irvine, Calif. 92718
(714) 727-1733

Graphics

Version 2.0 of Corel Systems Corp.'s Coreldraw features a suite of special effects, 153 scalable outline typefaces and WFNBOSS, a utility designed to convert the product's typefaces into the Adobe Systems, Inc. Type 1 format.

The graphics program's special effects include an envelope feature that enables users to manipulate a bounding box to distort shapes, text or graphics; a perpective feature that gives objects a sense of depth; and an extruding function that makes objects three-dimensional.

The product began shipping in November and is priced at $695, according to the company.

Corel Systems
1600 Carling Ave.
Ottawa, Ont.
Canada, K1Z 8R7
(613) 728-8200

In June, Micrografx, Inc. began shipping a business graphics program that integrates word or business charts, desktop presentations, illustrations and more than 2,200 free clip art images into a single package.

Charisma ($495) allows users of Intel Corp. 80286- or 80386-based personal computers to create two- or three-dimensional pie, bar, column or line charts. It features Slideshow, an electronic slide utility that includes fade and wipe effects, predefined master pages, predefined word chart templates and predefined business charts.

Micrografx's other offerings for Microsoft Corp.'s Windows 3.0 include Designer Version 3.01 ($695), an illustration program that features outline font support and paragraph-oriented, on-screen text editing; Draw Plus Version 1.1 ($229), a vector-based drawing program equipped with six outline fonts and 2,200 clip art symbols; and Xport ($395), a graphics translation program designed to remedy file format incompatibility problems between applications.

Designer 3.01 began shipping in May. Draw Plus 1.1 initially began shipping as a special holiday version in October. Xport began shipping in January.

Micrografx
1303 Arapaho
Richardson, Texas 75081
(214) 234-1769

Mapping software

Mapviewer was designed by Golden Software, Inc. as a thematic mapping package that allows Microsoft Corp.'s Windows 3.0 users to interactively analyze and visualize geographic data.

The product creates various types of maps by linking worksheet data to areas or points on a map, the vendor said.

Mapviewer began shipping in December and is priced at $249.

Golden Software
809 14th St.
Golden, Colo. 80401
(303) 279-1021

Personal information management

IBM's Current Version 1.1 is a personal information manager that includes a Dynamic Data Exchange feature that enables users to exchange data between Current and other Microsoft Corp. Windows-based products. Other features include multiple data directories, additional font support and copy-to and paste-from functions designed to directly move data between files.

System requirements include IBM Personal Computer ATs, Personal System/2s or compatibles equipped with an Intel Corp. 80286 processor, a 20M-byte hard disk and 640K bytes of memory.

The product began shipping in June and is priced at $395.

IBM
1133 Westchester Ave.
White Plains, N.Y. 10604
(800) 426-7699

Polaris Software's Packrat Version 3.0 is a customized personal information manager that features an intuitive design that facilitates business and personal information management.

The product includes a telephone book for storing telephone numbers, addresses

Continued on page SR/22

For once, an announcement that will have businesspeople jumping into windows.

Until now, a lot of businesses have been hesitant to take the plunge into Windows. People have wondered, for instance, whether critical applications and viable communications would become available.

Well, if we may be so bold, we'd like to give you a little push – by introducing you to DCA®'s new IRMA™ WorkStation for Windows.

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In addition to its tremendous flexibility, IRMA WorkStation for Windows is quite simple to use, which helps boost productivity.

For instance, mainframe data can be directly embedded into a word processor or spreadsheet, using DCA's QuickScript™ and Windows Dynamic Data Exchange.

Only IRMA WorkStation for Windows supports APPC and supplies you with a user interface that conforms to IBM's SAA/CUA standard. It also provides you with a transparent migration path to OS/2,® using DCA/Microsoft® Select™ Communications Workstation.

TRADE UP TO THE MOST FEATURE-RICH SOLUTION FOR ONLY $149.

Best of all, from now until March 29, 1991, you can trade in your old 3270 communications software – regardless of who you bought it from – and receive IRMA WorkStation for Windows for just $149 (suggested retail price $495). If, within 60 days, you're not completely satisfied, return it for a full refund. For more information or to order, call **1-800-348-DCA1, ext. 66E.**

It's easy. Just take a deep breath. Close your eyes, if you feel like it.

And jump.



DCA

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Continued from page SR/21

or facsimile numbers; a meeting and appointment scheduler that can alert users to scheduled meetings; a time management feature; and document tracking and project management features.

Packrat has a list price of $395. A network server version costs $695, and additional nodes are priced at $150 each. The product began shipping in July 1990.

Polaris Software
1820 S. Escondido Blvd.
Escondido, Calif. 92025
(619) 743-7800

Presentation software

Microsoft Corp. began shipping its Powerpoint for Windows presentation tool at the same time as it rolled out Windows 3.0. The intuitive software package features drawing, text, charting and color schemes.

The product is priced at $495.

Microsoft
One Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Spreadsheets

Informix Software, Inc. began shipping Version 1.1 of Wingz for Windows 3.0, a spreadsheet designed for graphical desktop environments, in June.

The product reportedly enables users to combine text, numbers, three-dimensional graphs and imported images on a single page. It includes Hyperscript, a graphical language that enables users to maintain control of every aspect of their graphical interface, the vendor said.

A bundled package that includes Wingz for Windows and Wingz for OS/2 Presentation Manager began shipping in June and is priced at $499.

Informix Software
4100 Bohannon Drive
Menlo Park, Calif. 94025
(415) 926-6300

Microsoft Corp.'s most recent Windows 3.0 rollouts include Excel Version 3.0, a spreadsheet that includes a database and business graphics, and Office Version 1.5, a package consisting of Excel, Word for Windows and Powerpoint.

Excel enables users to display multiple worksheets and charts together, create summary reports and consolidate data. Other features include the ability to use files and macros created in Lotus Development Corp.'s 1-2-3 spreadsheet, single-keystroke chart creation and the ability to preview documents prior to printing.

Excel began shipping in January and is priced at $495.

Office Version 1.1, priced at $995, began shipping last month.

Microsoft
One Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Word processing

Microsoft Corp.'s Word for Windows was unveiled in August. The graphical interface-based word processing program allows users to combine text, graphics and numerical data in a single document.

It features what-you-see-is-what-you-get fonts and graphics and enables users to transfer numbers, text or pictures from another application into their documents.

The product is priced at $495.

Microsoft
One Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Samna Corp.'s Ami Version 1.2 and Ami Professional Version 1.2 allow Windows 3.0 users to employ Windows features such as three-dimensional push buttons and proportional system fonts.

Both word processors are compatible with Microsoft Corp.'s Word for Windows and Rich Text Format, thereby enabling users to transfer files between Apple Computer, Inc. Macintosh word processors and Ami Professional, the vendor said.

Ami Professional Version 1.2 ($495) began shipping in May, and Ami Version 1.2 ($199) started shipping in September.

Samna
5600 Glenridge Drive
Atlanta, Ga. 30342
(404) 851-0007

Developers confab

Microsoft Corp. plans to hold two Corporate Developer Tools Conference and Expositions. The two-day seminars will be held in New York on April 11-12 and in San Jose, Calif., on April 30-May 1.

Corporate developers will be able to learn about available personal computer-based development tools ranging from computer-aided software engineering tools to customizable applications to low-level languages. Case studies from corporate development projects will illustrate tools in action.

The conference will highlight tools for Windows, OS/2 and client/server environments. Registration costs $695. For more information, call Microsoft at (206) 882-8080.

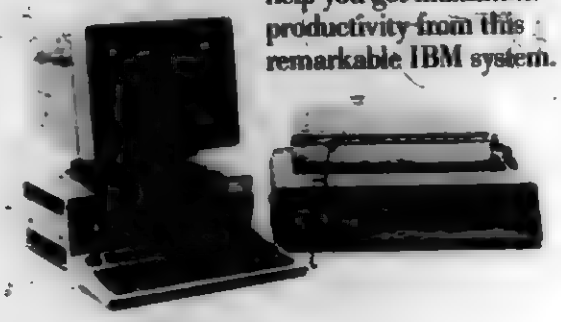
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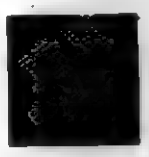
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Utilities fill the cracks in Windows

Probably the most common products released for Windows 3.0 are utility packages. Ranging from text searchers to virus detectors and image capturers, these products fill in gaps or enhance Windows' functionality. The following is a brief listing of some of the utility packages released for Windows 3.0 since its announcement last May:

Access Softek offers two programs for Windows 3.0: Dragnet Version 2.1, a text search-and-retrieval program, and Prompt Version 2.0, a hard disk file manager.

Dragnet Version 2.1 ($145) can reportedly search through a hard disk to find key words located in any type of file. Information from hard disk files can be displayed as it is found and stored in summary files or copied and pasted into other Windows applications.

Prompt Version 2.0 ($130) is a Windows program that allows users to view a file before working on it. Encryption and compression functions are featured, and viewers for files such as Wordperfect Corp.'s Wordperfect, Lotus Development Corp.'s 1-2-3 and Ashton-Tate Corp.'s Dbase are provided.

Dragnet Version 2.1. and Prompt Version 2.0 have been shipping since last May.

Access Softek
3204 Adeline St.
Berkeley, Calif. 94703
(415) 654-0116

Abacus Software, Inc. has released a software package that monitors the Windows 3.0 environment for viruses.

Virus Secure can identify more than 200 known viruses and protect against unauthorized changes to files, the vendor said.

The product is scheduled to begin shipping next month and is priced at $95.

Abacus
5370 52nd St. S.E.
Grand Rapids, Mich. 49512
(616) 698-0330

Anderson Consulting & Software's contribution to Windows 3.0 is an image capture tool designed to record an entire or partial Windows display by using 13 standard image file formats.

Tiffany Plus Version 2.0 ($89) features compatibility with Windows color, monochrome and gray-scale adapters and raster printers; a gray-scale spreading option that can be used to generate gray-scale images from color displays; and nine hot keys.

The product began shipping last month.

Anderson Consulting & Software
P.O. Box 40
N. Bonneville, Wash. 98639
(509) 427-5335

ATI Technologies, Inc. has unveiled a line of Microsoft Corp.-certified Windows 3.0 drivers that were designed for ATI's IBM Video Graphics Array (VGA)-compatible Wonder+ card.

The drivers, which began shipping last August, support 256 colors in 800- by 600-, 640- by 480- or 1,024- by 768- by 16-pixel modes and feature a 70-Hz refresh rate.

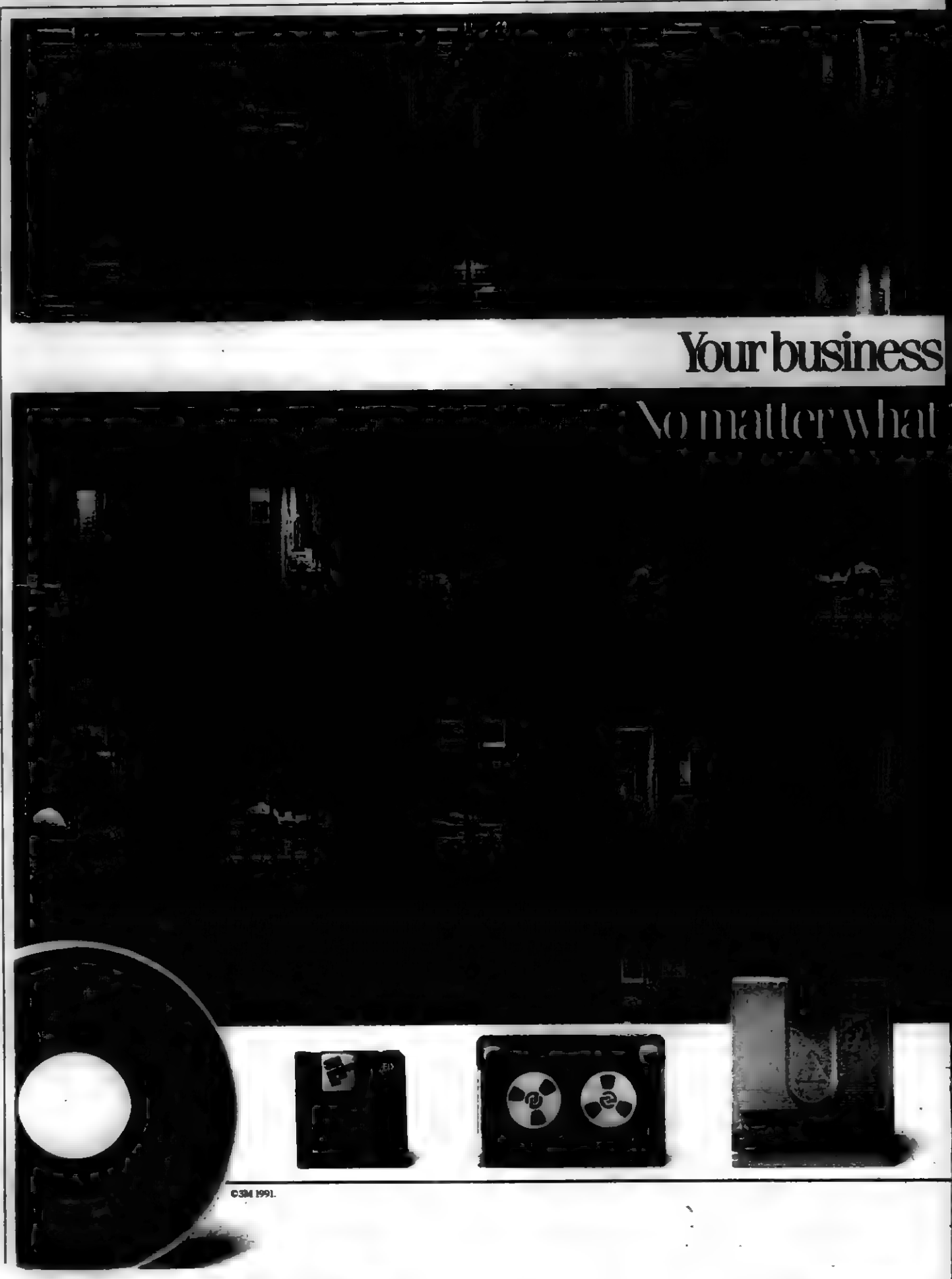
The products are being bundled with 256K- and 512K-byte versions of the VGA Wonder+ boards, which are priced at $299 and $349, respectively.

ATI Technologies
3761 Victoria Park Ave.
Scarborough, Ont.
Canada M1W 3S2
(416) 756-0718

EDCO Services, Inc.'s Letrtuck+ for Ventura Publisher 3.0 Windows Edition is a kerning utility that operates under Windows and enables users to alter character pair kerning by using a mouse and any graphics screen supported by Windows.

The product includes kerning data for the 24 most popular Adobe Systems, Inc. Postscript fonts. It began shipping in December and is priced at $99.

EDCO Services
12410 N. Dale Mabry Highway
Tampa, Fla. 33618
(813) 962-7800



KEA Systems Ltd.'s Keaterm 420 is a software emulation of a Digital Equipment Corp. VT420 terminal designed specifically for Windows 3.0 environments.

The software package is said to enable users to access all of their VAX or Unix text-based applications from within a Windows environment.

A shipping date has been scheduled for next month, and the product's introductory price is $195 until July 1.

KEA Systems
3738 N. Fraser Way
Burnaby, B.C.
Canada V5J 5G1
(604) 431-0727

Marketfield Software Development Corp.'s Winterm is a terminal emulation software package that supports multiple, virtual DEC VT220 and VT100 sessions on IBM Personal Computer ATs or compatibles running Windows.

The product is said to provide an interface to Windows applications and local and remote hosts via the Windows clipboard and Microsoft Corp.'s Dynamic Data Exchange protocol.

Winterm began shipping in December. A single-copy license is priced at $499.

Marketfield Software Development
20 Broad St.
New York, N.Y. 10004
(212) 344-5610

HDC Computer Corp. has enhanced its utilities set and corporate menuing system for the Windows 3.0 environment.

The products include HDC Fileapps, a set of five Microsoft-based pop-up utilities for file operations within Windows that is slated to begin shipping this month; HDC Firstapps, which is composed of nine pop-up utilities that can be used to customize and enhance the Windows environment; and HDC Windows Express, a corporate menuing system for use in creating standard Windows workstations on a local-area network.

Pricing ranges from $100 to $130, depending on type of product purchased. Firstapps and Windows Express have been shipping since last May.

HDC Computer
6742 185th Ave. N.E.
Redmond, Wash. 98052
(206) 885-5550

The Whitewater Group, Inc. has announced an updated version of its Whitewater Resource Toolkit, which was designed specifically for Windows 3.0 environments.

The interactive tool kit provides Windows 3.0 programmers or systems integrators with a visual way to create, edit and manage the look and feel of Windows applications, according to the vendor.

The product began shipping in November and costs $195.

The Whitewater Group
1800 Ridge Ave.
Evanston, Ill. 60201
(708) 328-3600

Version 1.1 of Saber Software Corp.'s Saber Menu for Windows started shipping last week.

The product is said to automatically create and manage Windows Program Information Files and Initialization files needed to operate the Windows environment and Windows applications. Both of these programs run from the workstation and hard drive where Windows is installed, the vendor said.

Saber Menu for Windows is priced at $495.

Saber Software
P.O. Box 9088
Dallas, Texas 75209
(214) 361-8086

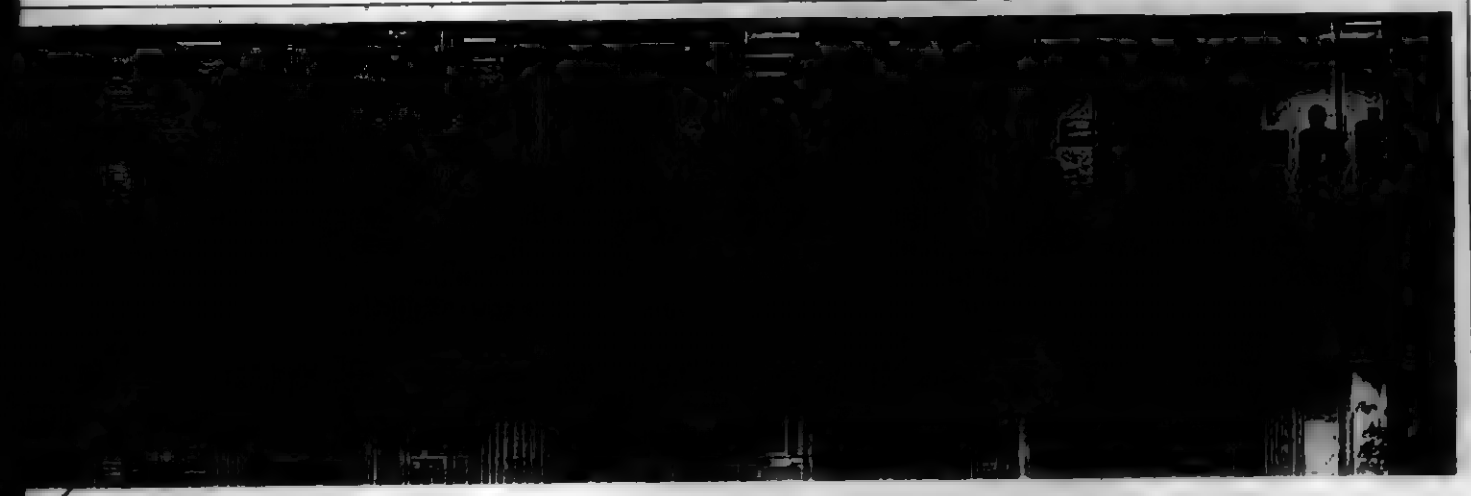
Collage Plus Version 3.1 is an image management and screen-capture software package developed by Inner Media, Inc.

The product contains a functional screen-capture program for Windows 3.0. This feature allows multiple Windows 3.0 screens to be captured in various industry-standard formats, the vendor said.

Collage Plus Version 3.1 began shipping in November and is priced at $129.

Inner Media
60 Plain Road
Hollis, N.H. 03049
(603) 465-3216

Windows product and utility files were compiled by Computerworld *New Products Writer Gary Byrne.*



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NOVELL

The Past, Present, and Future of Network Computing.

Programmers pick up paintbrushes

BY ALAN J. RYAN

While Microsoft Corp.'s Windows 3.0 is recognized as making systems easier to access for end users, information systems professionals report that it has the potential to make their lives easier as well — at least once all the pieces fall into place.

When programmers work in the graphical user interface of Windows, they can simply point and click on icons or objects that automatically set in motion tools generating code in the background. Essentially, programming in Windows can alleviate the need for the developer to write code, says Victor Ramos, project manager for commercial information services at Smithkline Beecham U.S. Pharmaceuticals in Philadelphia.

Programming tools designed for Windows can be used to "paint" applications objects (such as windows and menus) and allow graphical applications to be built graphically, Ramos says. Vendors are producing "painters" for windows, menus and even SQL. Ramos' company is currently experimenting with Powersoft Corp.'s recently released Powerbuilder product.

Martin Duffy, network end-user support coordinator at Arco Products Co. in Carson, Calif., says that at his company, Windows is being used in every department, including IS, and that developer productivity has increased.

Not every programmer with plans to use Windows for development is doing so, however.

For instance, while New Hampshire Insurance Group has more than 1,000 copies of Windows 3.0 being installed in its field offices, the firms's applications developers have not yet made the switch to Windows. It is not a lack of interest but a lack of development tools for the Windows environment that's holding them back.

While there are some exceptions, says Steve Thoeny, manager of research and development at New Hampshire Insurance, most of the 50 or so personal computer applications developers, most of whom develop for Windows, continue to develop using DOS tools while they await Windows versions of their favorite programming tools.

At Smithkline Beecham, the commercial information services department is currently using Windows for one project. It has defined two platforms for applications development: the IBM mainframe and the OS/2 LAN Manager client/server, Ramos says. For the client/server environment, he says, Windows 3.0 equipped with Microsoft Excel, Word for Windows and a 3270 emulation package are the software standards. The hardware platforms of choice are networked Intel Corp. 80386-based PCs.

Currently, Smithkline's IS group is in the process of using Windows 3.0 to complete the technical design of a work flow management system for the IS department. The system — designed to track work requests, time accounting, support call tracking and project management — will be developed and executed on the OS/2 LAN Manager platform; it will also take advantage of the capabilities of client/server technology components such as the Windows 3.0 and Microsoft/Sybase SQL Server database management systems, Ramos says.

On the lookout

At Arco Products, Windows is being used within the IS department in conjunction with products such as Gupta Technologies, Inc.'s SQL Windows and Precision Software's Superbase IV. Duffy says they are currently looking at other Windows-based programming tools.

The refinery is running Windows on 200 networked 20-MHz 80386-based PCs with 16-in. IBM Video Graphics Array monitors, Duffy says.

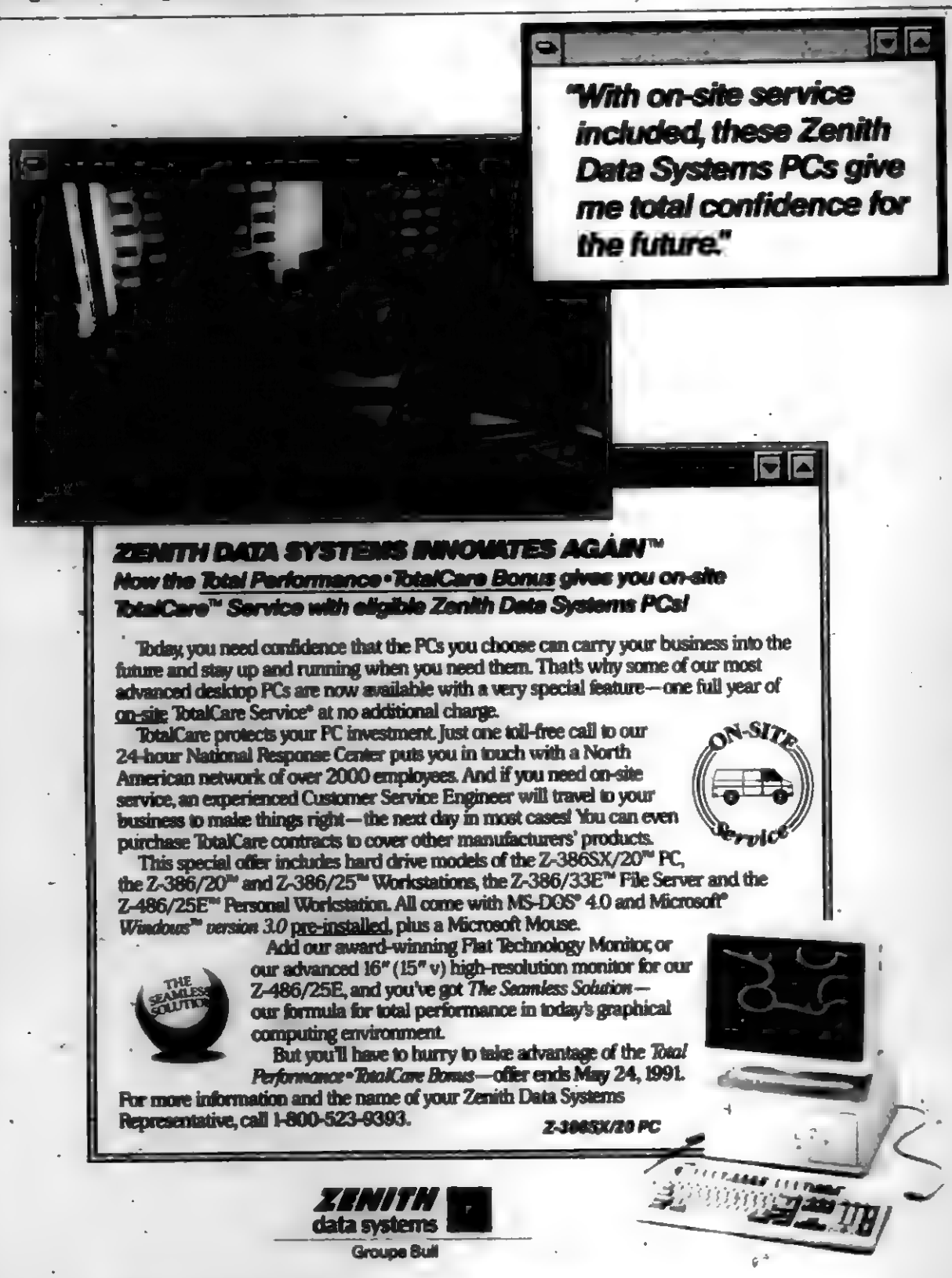
"Since we moved to Windows and a network at the same time, the pace of the development that we've done locally has increased quite a bit," Duffy adds.

John Robinson, director of corporate IS at Cox Enterprises, Inc. in Atlanta, says his company is currently evaluating Windows 3.0 but is also waiting to see what might happen with OS/2. Realistically, he adds, Cox will not be doing any development with Windows before next year.

Robinson says Cox will wait until it comes up with a small project to test the ease of developing with Windows 3.0.

For one national airline, OS/2 with Presentation Manager was more attractive than Windows. When Alaska Airlines IS executives in Seattle were deciding which graphical user interface to use for the airline's applications development, Windows 3.0 was not even available, says Bob Reeder, director of applications development at the $900 million airline.

However, Reeder adds, there are now some copies of Windows 3.0 in hand, and it has been compared with the OS/2 Presentation Manager. "We wondered if we should change our strategy and not buy OS/2, but it just came down to a dollars decision because OS2 Extended Edition was comparable in price to DOS plus Windows plus communication software, and you got all of that with OS/2 Extended Edition. We are running OS/2 on a server-based, token-ring network," Reeder says. •



Decision-making prowess

Follow these guidelines, and your executive information facility will pack a wallop

BY LOUIS FRIED

Executive information systems (EIS) are not what they used to be. Rather, they're now more feature rich. Not only can executives gain access to up-to-the-minute internal company information, but they can also tie into external data, such as the Dow Jones stock ticker. The EIS is broadening in business scope; it is becoming an executive information facility (EIF).

Designed to assist top management in strategic and tactical planning for a company, EIFs can provide the ability for executives to search through gigabytes of data from external information sources for mention of competitors' activities and products or for mention of their own activities and products.

Geographic and demographic information is available in an easily accessible graphical form. Furthermore, traditional database-access tools are being combined with modeling tools and spreadsheets to enhance planning capabilities.

In essence, the capability to create an executive workbench or the information driver for a corporate "executive planning center" is here. The challenge for IS managers is to match executives' needs with available functionality. In this way, they can avoid having their EIF become one of the estimated 50% of those projects that fail.

Fried is vice president of information technology consulting at SRI International in Menlo Park, Calif.

Finding a champion in the executive ranks and making the system easy to use continues to be tried-and-true advice for IS. Add to those golden rules the following guidelines, and you're on your way to a successful EIF setup:

• An IS manager should think like an executive; that is, he must be sensitive to the blend of information an executive needs for a complete decision-making picture.

Many EIF system implementations fail because they are based on the designer's misconception that corporate decisions are made on the basis of internal information only.

Providing information more quickly and in a more comprehensive form is one EIF goal but not the only one. High-level corporate decision-making requires external information such as the price of the corporation's stock, the price of the competitor's stock, sales trends for competitors and product or market trends.

Ultimately, the EIF must be able to display relationships between relevant external information and internal data to address the decision-making needs of the executive.

• IS should use repetitive prototyping to elicit the executive's information requirements for the EIF.



Rather than asking the user to define his needs, it is far more effective to obtain his reaction to demonstrations. In this way, the executive doesn't need to understand the technology underlying the EIF.

IS needs to provide prototype displays or demonstrations using prototypical information until the executive is satisfied.

It is much easier for the user to say, "I like this blend of stock information and internal sales data" or "Move this column over to the left" than it is for the busy executive to give paper drafts or mock-ups to IS.

• IS should enable an executive's EIF to communicate and share information among appropriate parties.

High-level information has little value unless it results in actions or is communicated to others to initiate actions. Sharing information for the busy executive means the ability to send information presentations developed through the EIF to the offices of concerned executives in real time. Such sharing tools may include output to facsimile, telephone, slow-scan video with videoconferencing or even printed outputs.

More advanced information sharing may require installing the capability to transmit a display and associated notes to the personal computer or workstation of selected executives and managers through electronic mail. Beyond that is multimedia cooperative processing in which executives at different locations may concurrently view and manipulate common displays and discuss these

Continued on page 60

Defining characteristics

What makes an executive information system an executive information facility?

EISs provide an easy-to-use, often object-driven access mechanism to corporate databases or abstracts from corporate databases for information relating to the firm's operations. They generally employ a graphical user interface to provide either touch-screen or mouse controls to eliminate use of the keyboard. In addition, information is often presented in a predefined graphics display form, with a sophisticated user able to access on-line databases directly.

EIS capabilities now include fourth-generation languages for support personnel and tools that aid in accessing databases on various database management systems.

The EIS becomes an EIF with the introduction of external information access. An EIF includes EIS capabilities but adds these features: external feeds; access to external database services; videoconferencing and telephone conferencing; slow-speed video for document transmission; multilocation screen sharing; facsimile transmission; electronic mail; handwriting input to the computer and large-screen video projection; mouse, keyboard or touch-screen controls; and laser printers. Voice-activated controls will soon be available on a commercial basis.

The purpose of constructing an EIF is to gain competitive advantage for the corporation by improving an executive's access to information and decision-making aids — no matter where they reside.

LOUIS FRIED

Continued from page 59

displays simultaneously.

• IS should enable the executive's operating and support staff to have access to the EIF.

For well-rounded information content, an EIF will often include input from various operating and staff executives. Support staff such as administrative assistants can be linked into the EIF through office automation tools. In this way, the business staff members can act as information suppliers to the EIF and can abstract information for analysis.

With this linkage, executives are not limited to operational transactions or accounting information. Their EIFs can include critical decision-making information such as special intelligence gained by corporate officers and information and trend analyses not usually available through access to corporate databases.

• IS should avoid hitting executives with information overload.

In the quest to offer executives the correct and best information, IS can use the EIF as an opportunity to eliminate unused reports or summarize extremely detailed ones, often in graphics form.

As IS staff members work out the prototype with the executive, they should ask questions such as, "Is this report still needed?".

If the answer is yes, then questioning should continue along the lines of: "With what frequency should it be generated? Is the presentation suitable, or should it be graphic, tabular or in another format? Is there information in other reports that should be combined with the information in this report? Is there information that you do not now receive that you would like to have? How current should the information be in this report?"

• IS must make a support person immediately and continually available to the executive.

A business executive will likely ask for information to be presented in a different sequence or fashion, request the combination of information that has been presented separately or request the display of new information that has not previously been anticipated. This is a natural part of running a business, and the typical executive is accustomed to making such requests of staff members daily.

The EIF must not impede the executive's ability to make such requests and, in fact, must respond more quickly than business staff members. Essentially, this means dedicating technical or research people to support the EIF as a high-priority function.

Further, data manipulation, complex functions and special requests will require support staff participation for an indefinite period into the future. The executive user must understand that current technology will not always be able to provide answers to all of his questions through direct interface with the EIF system.

Special requests will continue to require the assistance of support staff until EIF systems contain intelligence and knowledge equal to that of support staff.

In this way, the IS staff can avoid having another technical success become an implementation failure.

• IS should help executives understand that the EIF's capabilities will expand over time and should also make them aware of the continuing development and support costs associated with maintaining the EIF.

The development and implementation of an EIF can be divided into four phases in which increasingly complex capabilities are provided:

Phase One might consist of providing access to existing internal files to construct executive reports or displays.

Phase Two might add displays of external information, such as the stock ticker tape or news wire facilities, videoconferencing capability and multilocation screen sharing.

Phase Three might add the manipulative capability to perform "what if" calculations according to different scenarios, or it might combine information from various files into single displays of information for the executive.

Phase Four might introduce advanced technology such as voice control, artificial intelligence or multimedia capability.

Executives should be made aware of these phases so that they realize the incremental nature of the EIF.

Initial EIF implementations should be simple to establish the executives' confidence in their ability to manage the tools and objects. Simplicity will also keep the initial version's development costs within reason and permit the first implementation to take place within a schedule that works for the user.

Because of the EIF's evolutionary development process, planning and budgeting for an EIF project must take into account the system's multiyear development and ongoing operating and support costs. IS chiefs' failure to obtain executives' understanding and agreement on these costs before the EIF development project begins will result in an unhappy executive during the next budget cycle.

• IS must provide executives with private EIF training sessions.

Executives do not generally have the time or schedule to participate in a class. Nor do they wish to appear technologically ignorant to their peers and staff.

Private tutoring is not only more effective and a more efficient use of executives' time but also permits executives to focus attention on those functions they are most interested in performing.

• IS must ensure that an EIF's functions and facilities work the first time the executive uses them and that they work consistently thereafter.

Creating an EIF exposes the system's developers to the toughest client in the corporation. Rigorous quality assurance for EIF installation and upgrades is a key consideration. The system must be adequately tested before installation and before implementing changes or new displays as well as periodically when not in use by the executive staff.

In fact, it may be wise to adopt the technique used by some military systems integrators in which the system is first completely constructed and tested at a "manufacturing" site, then disassembled, shipped, reassembled and retested at its final destination.

IS should put a copy of the EIF in the development facility as long as doing so keeps to security measures. New or prototypical displays should be developed offline and out of view of the executive and then presented for successive evaluation and comment.

The bottom line is, don't expose the executive to your mistakes.

• IS must make executives comfortable with the security of the information contained in the EIF and with the communication of that information.

Executive-level strategic planning and critical tactical planning require the utmost confidentiality in this competitive world. Therefore, EIFs must be secure, or executives won't trust them. The system must have auditable controls to ensure that unauthorized internal or external persons cannot access it, that the information will be available when the executive needs it and that the internal and external information will not be corrupted.

• IS should set up two levels of ad hoc reporting tools and methods: one for the executive and one for support personnel.

Executives need ad hoc reporting tools and methods that can access EIF files in various combinations. These tools should be in the form of "objects" that are simple for the user to identify and will perform the required function with icons, pull-down menus, touch screens or voice activation rather than keystrokes.

Knowledge of the internal workings of the system should not be a prerequisite for use.

For their part, IS support personnel need tools and methods that enable them to follow up quickly on executive requests for detailed analyses they can't do themselves through objects. Rapid response to this need requires that support personnel have tools — such as database management systems, database query aids and spreadsheets — that can meet special needs or construct new objects with minimal effort and maximum accuracy.

An EIF can be of significant value to corporate planning and control, but it can realize its full potential only if the users understand the power of the tools and the limitations of the system.

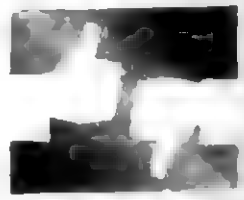
Overselling an EIF will cause unwarranted expectations and may result in the disappointment of a system developer's most important client.

You don't want to put in an expensive system that won't be used. •

Good experience

A large automobile and truck manufacturer installed an executive information facility in an executive planning center at its Japan headquarters in 1988.

Consistent with the usual Japanese corporate culture, the IS staff and company president's staff developed requirements and information displays for the custom-built system through progressive iterations and prototyping. The president reviewed and approved the prototypes and executive planning center layouts.



After approval, the company built the EIF and dedicated a number of staff members familiar with the system to support the executive's information needs.

Through his contact with the system, the president has become actively interested in developing and using the planning center and has made it a meeting place for executives.

Plans are currently in progress to add further communications facilities to the existing EIF.

Bad experience

In a major U.S. service industry corporation, a staff assistant to the president decided to acquire an executive information tool to assist in materials preparation for executive meetings.

After a brief consultation with the IS organization, the assistant purchased an executive information system. However, IS was unable to commit to developing suitable databases or to link the EIS to pertinent information, which would have turned it into an EIF. Its backlog was too big.

Instead, clerical workers entered executives' data for constructing reports into the executive system. None of the corporate executives used it directly.

To this day, management considers the system to be a costly way of preparing slides or graphics reports for distribution.

The EIS workstation is still located in the staff assistant's office and has yet to be linked to any other data resources or display facilities.

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NATIONAL BRIEFS

Welcome, neighbor

▶ Austin, Texas-based technology research consortium **Microelectronics and Computer Technology Corp. (MCC)** gained a new member late last month: **Texas Instruments, Inc.** Formerly an MCC associate member working in the consortium's computer-aided design framework laboratory, TI is now participating in the MCC Open Systems Project, an effort aimed at creating an industry infrastructure for multichip modules.

Beyond the profit center

▶ **Supermac Technology** came up with an offbeat way of rewarding its software group for a job well done: Last week, the Sunnyvale, Calif.-based Macintosh graphics firm announced that it is spinning the software group out as a separate firm. "The new company, as yet unnamed, is engaged in a search for a high-powered, top notch CEO," Supermac said.

Graphic venture

▶ Richardson, Texas-based personal computer graphics application developer **Micrografx, Inc.** is about to buy further into the Microsoft Corp. Windows graphics tools market it is determined to lead, according to Chief Executive Officer J. Paul Grayson. In a stock-swap transaction, Micrografx will acquire **Astral Development Corp.**, whose Windows-based Picture Publisher software lets users work in an "electronic darkroom" stocked with interactive color imaging and manipulation tools. The Astral technical team will continue to develop and support Picture Publisher after the deal closes.

And share alike

▶ Under an agreement that went into effect Feb. 20, **National Semiconductor Corp.** and Japan's **Fujitsu Ltd.** will be cross-licensing each other's semiconductor products for the next decade. The pact covers current patents as well as those applying to products developed by either firm while the agreement is in force — an arrangement expected not only to increase each partner's semiconductor strength, but also to ensure that at least two major manufacturers will not be seeing each other in court over semiconductor patent rights in the next 10 years.

CA looks to calm concerns

Vendor's No. 1 spot threatened by Microsoft, no major changes foreseen

BY JOHANNA AMBROSIO
CW STAFF

GARDEN CITY, N.Y. — The symptoms are similar to the last time Computer Associates International, Inc. suffered from depressed revenue and earnings, but this time the malady is quite different.

The last financial pratfall was caused by problems stemming from CA's acquisition of Cullinet Software, Inc. in 1989, which cost almost $1 billion. This time around, the issues are how CA can keep growing a $1.3 billion company and where that growth will come from.

Can the company keep its targeted pace by providing its traditional systems, applications and database software on new platforms such as Unix, or will it be forced to more aggressively target "hot" markets such as microcomputer software, analysts ask.

As the past three quarters of decidedly unstellar financial results has shown, these challenges may be far more difficult to resolve than were the issues surrounding the Cullinet deal.

Still, by most accounts, CA is a boisterously healthy company, and there are signs that its growth could begin to pick up by the end of the calendar year.

It will not be easy. CA's days as the world's largest independent software vendor are coming to a close. Microsoft Corp., which reported larger quarterly earnings and revenue than CA for the period ending Dec. 31, is expected to exceed CA on a yearly basis by the end of this year.

Microsoft's onslaught comes at a time when CA, which appeared virtually unassailable several years ago, is battling back from financial woes and Wall Street worries (see story page 64).

Nevertheless, few are counting CA out. The company continues to be extremely sound financially with an excellent cash position, according to analysts, and could even return to a 15% or 20% growth path.

"Even though it's having some problems, CA is a healthy company that's just not performing up to its potential," said James Mendelson, an analyst at Morgan Stanley & Co. "While the future is unclear about how fast they can grow, they have remained throughout their history, innovative, tenacious and aggressive. They will ultimately resolve their problems."

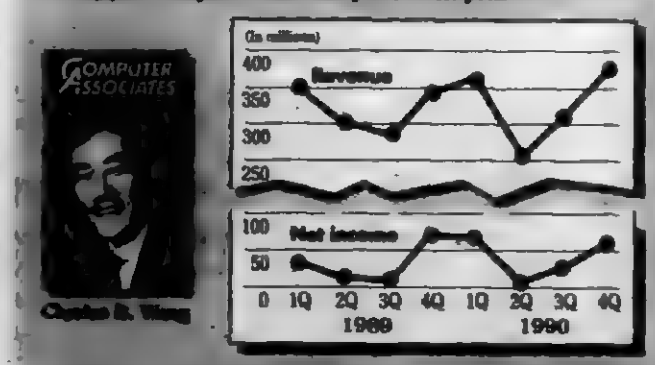
Terry Quinn, an analyst at Kidder, Peabody & Co., noted CA's continued growth at high rates despite the slowdown in mainframe sales that dates back at least eight years. "There's still a need for systems software because the hardware is 10 to 15 times more powerful than it was six years ago, and that requires new operating systems and software to manage it," he said.

Not everyone agrees that the future is so rosy. "They're not looking in the correct places for growth," said Charles Phillips, an analyst at Stamford, Conn.-based Soundview Financial Group. "They need new, hot products, and I don't see any on the horizon. And their older products need rejuvenation, but that can't be done very quickly."

Of course, CA has bounced back before. The company went through some rough quarters after it announced the Cullinet acquisition back in 1989 — although it remained profitable throughout the period. Customers put their purchase plans on hold until they were comfortable with CA's product development and support strategies. When sales rebounded, CA's growth returned to pre-Cullinet rates of 35% growth per quarter until June 1990.

Stumbling but not falling

Despite the past and valley ride of its cash flow, CA remains very healthy financially and is on its way to another peak



Source: Computer Associates International, Inc. CW Chart: Paul Mach

No major changes

For their part, CA executives said, no major strategy shifts are planned, and the company will continue to provide its diverse software lines on different hardware platforms. "I can't honestly say that we're putting anything on the back burner," Chairman Charles Wang said.

A major systems software announcement slated for August is still on target, he added.

CA has managed to diversify its revenue stream somewhat; Quinn estimated that some 70% of revenue is derived from systems software products. That number is down from 80% one year ago, he said. CA executives, while not releasing specific figures, said the database management system part of the business is growing, and CA is attracting new clients with those products.

Although CA will not become known as a personal computer software company anytime soon, it is devoting more time and energy to that side of the business. The Microcomputer Products Division was recently reorganized; although most of its employees will remain in San Jose, Calif., division headquarters are now in the corporate office here. The company also recently acquired a multidimensional spreadsheet called Compete, and CA executives hinted that Windows is central to their PC strategy.

Moreover, according to Wang, PCs already loom larger than it might appear in the CA

Continued on page 64

Far East isn't recession cure-all

ANALYSIS

BY ELLIS BOOKER
CW STAFF

CHICAGO — As the U.S. economy heads south, is it time to look east?

Facing a recession at home, is it feasible for domestic technology companies to seek opportunities elsewhere, specifically the Pacific Rim?

No, said John Wark, vice president of marketing in the Applications Software Division at software firm Pansophic Systems, Inc. Don't expect to play a Pacific Rim card to get yourself out of the stateside slowdown. "It's just too late," he said.

Wark and other computer company executives recently noted that the time — on the order of a couple of years — and expense of setting up such arrangements defeats the goal of using such a strategy tactically rather than strategically.

Export oriented

Nevertheless, cautioned one industry observer, neither should firms put global expansion on a back burner because it is not an overnight cure for recessionary woes. While today is not an optimal time to begin a foray internationally, "it's always wise to go into Asia because, in the long term, we need to be export oriented," said Sheridan M. Tatsuno, president of Neoconcepts, a consultancy in Fremont, Calif.



However, Asians are wary of attention from across the sea if it comes when the U.S. economy is gloomy, Tatsuno warned.

"The concern of Asian buyers is that you are trying to unload inventory . . . and that when there is a recovery they'll be cut off," he said.

A legitimate worry for these buyers, he said, is that because U.S. manufacturers run at fairly high capacity, they may run out of capacity during a domestic economic recovery and will cut their Asian business back to satisfy their domestic market.

"It leaves [Japanese customers] begging for parts," according to Tatsuno.

A final problem, analysts agreed, is a cultural one: Americans emphasize pragmatic "contractual obligations" in their business dealings, while the Japanese are more likely to focus on "social obligations" and long-term relationships be-

Continued on page 66



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Industrial espionage with U.S. runs rampant

BY MICHAEL ALEXANDER
CW STAFF

Glasnost may have occasioned a thaw in East-West relations, but many of the spies who have come in from the cold are as busy as ever. Instead of spying on each other, however, foreign intelligence agencies are focusing on industrial espionage, with U.S. technology one of the prime targets, according to several security experts.

Former foes are not the only worry, however. Longtime allies are also said to be prying into U.S. technological interests. In November, W. Douglas Gow, a Federal Bureau of Investigation assistant director who heads foreign counterintelligence operations, confirmed reports in a television interview that France's General Director of Exterior Security tried to hire employees in the European offices of IBM, Texas Instruments, Inc. and other U.S. electronics companies to provide information for pay.



The French agency was attempting to gather research and marketing information for Compagnie des Machines Bull, which is owned primarily by the French government. The scheme, which took place in 1987 and 1988, was uncovered by the Central Intelligence Agency and the FBI, Gow said.

The company viewed the incident as a "government-to-government thing" and refused to comment further on the snooping charge, according to a TI spokesman. The company also declined to talk about information security at any level, citing "internal reasons" and concern that it might encourage snooping by outsiders. IBM did not return calls seeking comment.

Such reluctance to comment on industrial spying is typical, said Dick Heffernan, president of R.J. Heffernan Associates, Inc., an information security firm in Branford, Conn. Heffernan is also chairman of the American Society for Industrial Security's committee on safeguarding proprietary information.

"Most companies do not want to talk about loss of information because people will think their competitive position has been damaged, and they don't want the value of their stock eroded," Heffernan said.

As more U.S. corporations expand their businesses worldwide, the problem of information theft by professional snoops will likely worsen, Heffernan said. The awareness of this potential risk is "not at a level we are pleased with," he added.

Industrial spying by foreign intelligence agencies, often at the request of their domestic corporations, is the tip of the iceberg, according to Stephen Bryden, president of Deltatech Corp. in Arlington, Va., and a former deputy undersecretary of defense for trade policy. Industrial espionage by foreign intelligence agencies is increasing and aimed squarely at U.S. computer and electronics industries, Bryden and other experts said. "Clearly the Western Europeans and Japanese have made up their minds where the real competition with us will take place."

U.S. intelligence agencies have reputedly refused to carry out industrial spying against their allies so far, but that may change. Senior officials at the CIA and the National Security Agency have publicly said the agencies are mulling over the prospect of putting more effort into gathering industrial information. But Bryden, among other security experts, said more effort should be put into assisting U.S. corporations in protecting their information.

"Spying on the Japanese is like spying on ourselves — most of the stuff originates here," Bryden said. "They really need to go out and protect U.S. companies internationally and externally to make us more competitive. They should be helping check their own facilities to see what the risks are."

Skyrocketing costs

The theft of information gleaned from computers and communications networks may be costing U.S. corporations billions of dollars per year, according to Noel Matchett, a former staff member at the National Security Agency and current president of Information Security, Inc. in Silver Spring, Md.

There may never be a way to find out exactly how much electronic snooping is costing U.S. businesses, however. The interception of communications or unauthorized access is rarely discovered, and there is no clear evidence of theft, according to Matchett.

Few companies are even aware that this sort of electronic eavesdropping is going on and are skeptical when alerted to possible security breaches, said Thomas Sobczak, vice president of Application Configured Computers, Inc., a security consulting and software publishing company in Baldwin, N.Y. The three-employee company also maintains a database of classified and sensitive information that has leaked out of federal agencies and large corporations.

Bond — James Bond

It apparently does not take the skills of James Bond to be an effective electronic snooper.

In the mid-1980s, Wim Van Eck, a Dutch engineer, proved how easy it is to pick up electromagnetic emissions from computers and peripherals by using a homemade electronic interception system at the Amsterdam Postal, Telegram & Telegraph office and tapping into its computers.

A "Van Eck listener," as the eavesdropping device is sometimes called, is effective up to several hundred yards and can be made "for $400 max," according to Ian Murphy, founder of IAM/Secure Data Systems, Inc., a Philadelphia-based security consulting firm.

Computers and communications networks are "wide open" to electronic eavesdropping, said Glenn Whidden, who served in the CIA for 28 years and is now a principal at Technical Services Agency, Inc. in Fort Washington, Md. His firm designs and markets equipment for detecting illicit listening devices. A telephone tapping device that is virtually impossible to detect can be assembled from $25 worth of parts from Radio Shack, Whidden said.

"Intercepting fax is a piece of cake; microwaves and satellite transmissions are free for the taking," said Stephen Bryden, president of Deltatech Corp. in Arlington, Va. Wireless local-area networks based on infared or spread-spectrum radio technologies, which have been introduced in recent years, may also be vulnerable to electronic snooping.

Wireless networks that use spread-spectrum frequency technology are in fact more secure than wired networks because intercepting the signal is more difficult, countered Scott Schafer, director of U.S. workstation marketing at NCR Corp. He oversees the marketing of NCR Wavelan, the company's new wireless LAN interface card for Novell, Inc. LANs. "The signal is spread over several frequencies, and unless you know the spreading code and are able to reassemble the signal the way it was transmitted, all you see is garbage," he said.

An intruder could acquire the spreading code by surreptitiously reading the switch settings on the Wavelan card, Schafer said. However, the snoop would still have to break through Novell's Netware security. NCR offers an optional data encryption standard chip set for the interface card as well.

MICHAEL ALEXANDER

To top it all off . . .

Adding to CA's problems is the lack of direction company executives have given Wall Street, according to several analysts — a shortcoming to which CA executives have publicly admitted but which the analysts said they have taken no real steps to resolve.

This, along with the usual difficulty of following a firm as large and diverse as CA, adds to the executives' confusion about where CA is heading and how fast it will get there, analysts said.

Many major securities firms continue to rate CA's stock a "hold," largely because of the uncertainty.

"They're hurting themselves because they're not talking to the Street as openly as they should," said analyst Terry Quinn at Kidder, Peabody & Co. "They're a tough animal to follow."

Charles Phillips, an analyst at Soundview Financial Group, agreed: "It's very difficult to recommend the stock when they're not talking at all," he said. One reason for this reticence, he suggested, is a still-pending stockholder suit filed in the wake of CA's disappointing June 1990 quarter. About one dozen such suits were originally filed.

Although such suits are not unusual when a company reports results that are much lower than expected, as was the case in June, it has made CA management very careful about what they say publicly about the company's finances.

JOHANNA AMBROSIO

CA

FROM PAGE 61

product mix. Many existing PC products, such as microcomputer versions of its database software, are not counted as such because they are not sold through the retail channel, he explained. "No one hears about them because they're categorized as part of the mainframe business."

Analysts said they expect revenue derived from other products to play a larger role one year or more down the road. CA's recently announced agreement with Hewlett-Packard Co. to jointly develop Unix software should start to yield products by the end of the year, several analysts said, and CA's share of the Digital Equipment Corp. systems software market should keep growing as well.

Another continuing issue at CA, according to Quinn, is sales force management. Within the past two years, CA has adopted an IBM-style account executive model, but it is still having some problems "upstreaming" the sales force, he said.

"There are some internal problems," Quinn said. "The account exec structure, while good, is still pretty new. They're trying to adjust to that, but it will take time.

"They're not holding salesmen to quota on a monthly basis, although on a yearly basis they are," he said.

Work to do

Moreover, CA still has work to do to wean its sales force away from the tendency to rely on a few large sales rather than concentrating on making smaller, more numerous ones, according to Quinn. "They need to motivate the sales force to avoid that hockey-stick curve and get back to a normalized level of growth," he said.

Wang maintained that the company's sales force issues are well in hand. "We think we're making good progress," he said.

Wang also confirmed that the company will continue to grow by acquisition complemented by internal development. There have been at least three acquisitions since Cullinet, although none as high profile, and more are in the works, he added.

Meanwhile, Wang said, being knocked out as the leading independent software company does not bother him.

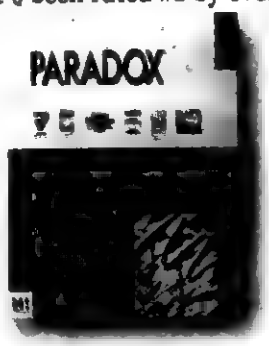
"We've never said we want to be the largest; we've always said we take greater pride in being the best," Wang said. "Whether Microsoft is bigger or smaller doesn't matter. We've always wanted to build the company, help build the industry, protect people's investments and maybe be a significant player. Ten years from now, we'll still be doing the same things — maybe just on more diverse platforms."



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INTERNATIONAL BRIEFS

Sharp thinking

▶ Japan's **Sharp Corp.**, a pioneer in LCD technology, is about to give the U.S. its first mass-production large-scale LCD plant. To be organized as an autonomous part of Camas, Wash.-based Sharp subsidiary **Sharp Microelectronics Technology, Inc.**, the plant, which is expected to open in December, will cost its parent nearly $30 million and should create some 250 new jobs in its first two operating years, according to Sharp Executive Vice President Atsushi Asada.

Piracy, part I: Watchers

▶ **Thailand, India, the People's Republic of China** and **Indonesia** led a list of 22 countries targeted by the Washington, D.C.-based **International Intellectual Property Alliance** as failing most notoriously to provide adequate copyright protection or fair market access to U.S. wares. In addition to the four leading offenders, seven more countries have been placed on the U.S. Trade Representative's "priority watch list."

Piracy, part II: No act, no pact

▶ The **Software Publishers Association (SPA)** and the **Business Software Alliance (BSA)** joined forces last month to urge the U.S. House Ways and Means Subcommittee on Trade that a free trade agreement with **Mexico** be signed only if Mexico first signs into action a copyright law that will protect U.S. intellectual property. Its provisions, according to SPA/BSA testimony, would cure three deficiencies of current Mexican copyright law: no explicit protection for computer software, virtually nonexistent infringement penalties and an exemption for so-called "private" copying.

No fair

▶ **Sicob 1991**, France's computer, telecommunications and office equipment trade fair scheduled for April 22-27 and October 2-5, will not be held this year, exhibition organizers in Paris announced last month. Organizers said that professional computer industry organizations pressured them to cancel the show. While mentioning the effects of the Persian Gulf war, they also noted that Sicob has been suffering a severe drop-off in attendees and exhibitors in recent years.

Japan may find closed doors in Europe

ANALYSIS

BY ELIZABETH DE BONT
IDG NEWS SERVICE

BRUSSELS — If European Roundtable Esprit's action early last month is any indication, Japanese firms that acquire European companies might be about to discover that they are sowing their global oats in something less than fertile soil.

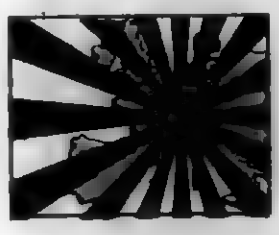
Esprit voted to exclude from membership UK-based International Computers Ltd. (ICL), a subsidiary of Japan's Fujitsu Ltd. since last summer. Within the next several weeks, the managing board of the Joint European Submicron Silicon Initiative (JESSI) project is expected to announce its decision about ICL's continued participation in research projects into the next generation of supersilicon conductors now afoot.

Europeans only

ICL was a founding member of the roundtable when it was launched in the late 1970s with a view to promoting the international competitiveness of European industry. The motivation for ICL's exclusion stems from the opinion that because the group's purpose lies in promoting Europe's competitive position vis-a-vis its Japanese and U.S. rivals, "it is important that the roundtable comprises companies that are truly European-owned," according to a statement issued by the group. Following Fujitsu's takeover of ICL, the statement said, "regrettably, therefore, ICL has to leave."

Although the roundtable started off with 12 members, it has now been whittled down to nine because of the GEC-Siemens AG takeover of UK-based Plessey PLC and Siemens' subsequent acquisition of Germany's Nixdorf Computer AG. In addition to Siemens/Nixdorf, the roundtable's members include, among others, Germany's AEG; France's Alcatel and Groupe Bull; Italy's Ing. C. Olivetti & Co. and STET; and Netherlands-based NV Philips and STS-Thomson. An ICL spokesman expressed the company's mild disappointment in the roundtable's decision, stressing that "ICL is still a European company by all the criteria set out by the EC, but the members of the roundtable took a different view." The firm will still participate in Esprit, the European Community's (EC) research program in information technologies, and any move to exclude it "would seem strange in view, for example, of IBM's participation," the spokesman said.

ICL is an active member or project leader in nine of Esprit's many programs. Participation in EC projects is subject to certain objective requirements that ICL continues to fulfill — notably regarding the obligation to carry out research in the EC and share projects with at least one other company from another member state.



Nevertheless, industry analysts said that despite these rules, the bottom line is whether partners in a project want to participate with a specific company in a new project or continue participating in an existing one. So, within Esprit, while there will never be a political decision to exclude ICL, in practice, the forecast for continued participation is less certain.

Some participation permitted

Analysts suggested, for example, that the other Esprit participants will continue to allow ICL's participation in projects regarding the development of new information technology standards but that the firm may be slowly edged out of others.

At JESSI, a spokesman confirmed that during its Jan. 30 meeting, the management board had been scheduled to discuss the issue of ICL's continued participation. In November, the board had asked all five project leaders in which ICL participated to make a report analyzing the company's role. But because one of the five had not produced the necessary report, the entire discussion was put off until March, the spokesman explained.

ICL has expressed some optimism for its continued participation in JESSI, pointing out that it is there as a user, not as a manufacturer of chips. Moreover, IBM has also been accepted for participation in the program, according to sources.

However, JESSI's management board of eight firms has many of the same members that sit on the information technology roundtable, including Alcatel, Siemens/Nixdorf, Philips, Olivetti and STS-Thomson.

Nevertheless, Europe's information technology leaders may decide to make a distinction between allowing quasi-Europeans to continue participating in technology programs and allowing them to share in top-level political discussions setting out strategies for the future. But in the end, as stated, participation depends on the other companies involved in a specific project.

Industry expert John Robinson, partner at the Brussels-based consulting firm Robinson Linton Associates, questioned the roundtable's continued influence over EC policies and projects. He explained that the EC's ongoing effort to develop trans-European networks for telecommunications has emphasized the need for input not only from the suppliers in the roundtable but from users as well.

As a result, although the roundtable may expel ICL, Robinson said that "the duration of the roundtable's monopoly on industry input into the EC's information technology policy may be short-lived."

De Bont is a Brussels-based correspondent for the IDG News Service.

Far East

CONTINUED FROM PAGE 61

tween parts suppliers, vendors and customers.

A bright spot may be the opportunities for relatively small U.S. companies to ship basic technology into Pacific Rim countries and elsewhere before the Pacific Rim and other competitors get their own products to market.

One approach, Tatsuno said, is to develop a base technology and license it before these larger competitors make the innovation a commodity product.

But the window is short. By some anecdotal accounts, Taiwanese firms are able to knock out a working prototype of a U.S. firm's computer board within three weeks and have a product to market within one month.

Pursuing patents

Energy Conversion Devices, Inc., an innovator in amorphous and synthetic materials technology since the 1960s, is one company following the patent pattern.

Early last month, the Troy, Mich.-based company announced that consumer electronics company Matsushita Electric Industrial Co. would license its "phase-change" technology for read-write optical discs. These discs will reportedly be sold in the U.S. under Matsushita's Panasonic Co. label.

Matsushita has already begun production of the 1G-byte, 5¼-in. direct overwritable optical disc, the first commercially available phase-change product in the world, according to the company.

The Pacific Rim already accounts for one-half to two-thirds of Energy Conversion's total $14 million to $20 million in annual revenue. Sources at Energy Conversion said last month that the company had signed a second $10 million joint venture agreement with the Soviet Union to develop new types of amorphous thin-film semiconductor computer memory devices.

Other goals

However, Energy Conversion is not just a research and development outfit satisfied with getting patents, selling licenses and receiving royalties, according to President and Chief Executive Officer Stanford R. Ovshinsky.

"We have a new technology with a large potential," Ovshinsky said, referring to the company's phase-change optical memory technology.

Energy Conversion is currently involved in a joint development project with a U.S. manufacturer of consumer electronic products for a noncomputer application of its optical memory system.

Foreigners still come to the source, Ovshinsky maintained. "Size and money," he added, "do not make up for invention."

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Trax Softworks, Inc.

PC chip set firm loses monopoly, maintains edge

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Chips & Technologies, Inc. has lost its monopolistic position in the personal computer logic chip set market. Nevertheless, the firm still holds the dominant market position despite some weaknesses and slowdowns during the past couple of years, according to various analysts.

"I think the company began to get a little bit too fat, dumb and happy a couple of years ago when their competitors came in and snuck up on them," said Rick Whittington, an analyst at Kidder, Peabody & Co.

Despite a loss in market share to new competitors such as Milpitas, Calif.-based LSI Logic Corp. and San Jose-based VLSI Technology, Inc., Chips & Technologies still dominates the very large-scale integration chips market, according to Dean McCarron, a semiconductor analyst at Instat, Inc., a market research firm in Scottsdale, Ariz.

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>
> RICK WHITTINGTON
> KIDDER, PEABODY

Moreover, McCarron said, Chips & Technologies has a chance to gain market share in the high-end peripheral PC chip set market with its new company focus and products aimed at the notebook and laptop arenas.

Dominant supplier

Michael Slater, president of Micro Design Resources, Inc., a market research firm in Sebastopol, Calif., agreed with McCarron.

"Certainly, Chips remains the dominant supplier in the chip set business, and I think they are also one of the only chip set vendors to have an active microprocessor plan in place," Slater said.

He added that this "is an important strategy for the future as peripherals and central processing units begin to mold into one."

Indeed, one of the company's major strategies to be implemented this year includes continued research and development on its "PC on a Chip" product as well as other shrunken chip sets with increased capabilities being worked on for the laptop and notebook market, according to Douglas Finke, strategic planning manager at Chips & Technologies.

"We are making a product transition across all of our product lines this year to target new business opportunities such as the multimedia market, software accelerators, flat-panel color graphics and multiprocessing," Finke said.

Nynex Australia out of race for the No. 2 telecom spot

Withdrawal could open up opportunities for other carriers

BY NOEL BENNETT
SPECIAL TO CW

SYDNEY — Nynex Australia PTY Ltd., considered to be one of the dark horses in the bidding to become Australia's second telecommunications carrier, has dropped out of the race.

The local operation is the offshoot of New York-based Nynex Corp., a regional Bell operating company that enjoyed revenue of $13.2 million in 1989.

The withdrawal followed closely on the heels of reported similar actions by British Telecom and U.S.-based GTE Corp.

In late January, Kim Beazley, Minister for Transport and Communications, said more than 30 expressions of interest had been received to establish a second carrier based on the purchase of Aussat, a satellite communications company.

In its announcement, Nynex Australia said Nynex Corp. had based its business decision on current strategic corporate assessments.

Industry sources said this could point to opportunities for investment available in other parts of the world, including Singapore and South America. Such alternatives and current unsettling factors pertaining to the bid, such as the purchase of Aussat and various interconnect and resale conditions, could well mean that the number of intending parties could fall even further, sources said.

Nynex Australia said it had participated positively in all of the processes undertaken to date in the second carrier selection program and added that it "hoped it had made some contribution" to the handling of this "demanding" task.

Still on the lookout

While Nynex Australia's staff will be withdrawn, Nynex will continue to monitor and evaluate telecommunications industry opportunities in the Australian market, the company said.

Beazley said expressions of interest were considered throughout February, and detailed proposals are now being sought from the consortia. A short list will be drawn up, and tenders will be invited. The sale of Aussat is scheduled to be completed by Dec. 31.

Meanwhile, traffic between the U.S. and Australia is set to increase after agreements made between OTC, Australia's international carrier, AT&T and other U.S.-based international telecommunications organizations for cuts in the telephone accounting rates between the two countries.

These cuts will lower the Australia/U.S. accounting rate by at least 12.5% from mid-1991, according to an OTC spokesman. This would be followed by a sequence of reductions during the next three years. Details of cuts in the U.S./Australia accounting rate were not available.

Accounting rates are the basis for payments from one international carrier to another for having calls connected at the distant end.

OTC Managing Director Steve Burdon said OTC had made tariff reductions, saving its customers a total of $41.8 million in fiscal 1989-1990 and an additional $16.5 million this financial year. Lower accounting rates were an important factor in these price cuts. The mid-1991 accounting rate reductions will be taken into account when OTC reviewed its tariffs in the second half of 1991, Burdon said.

Other ways of making further price cuts will be sought, including taking advantage of the new Pacific Rim fiber-optic cable networks and making better use of digitization of traffic now carried by traditional analog cables, the spokesman said.

In noting that the UK and the U.S. had recently foreshadowed major accounting rate reductions in trans-Atlantic routes, Burdon said similar rate reductions had also been planned with OTC's European counterparts.

Bennett writes for Computerworld Australia, *an IDG publication.*

EXECUTIVE CORNER

Ask Computer invites Sharpe

Robert N. Sharpe, vice president of business development at **Electronic Data Systems Corp. (EDS)** has joined **Ask Computer Systems, Inc.**'s board of directors, Ask announced last week. The selection of Sharpe, a 19-year EDS veteran, comes in the wake of EDS' $40 million purchase of a 20% stake in the Mountain View, Calif.-based business software firm last fall.

Jeff Bork, vice president of marketing at **Informix Software, Inc.** in Menlo Park, Calif., for the last two years, left the company Feb. 15, Informix announced. Bork's departure stems from a mid-January reorganization that reduced development of the Wingz graphical spreadsheet he had championed. Informix has split the marketing position, naming **Gilbert Wai** vice president of product marketing and **Bob Macdonald** vice president of corporate marketing.



Leo Nikora, until recently marketing manager at Redmond, Wash.-based integrated circuit programmer maker Data I/O, is the new president of Seattle-based word processing software developer **Quicksoft, Inc.** Not only did Nikora ascend to the presidency, but the 25-year industry veteran bought the company. **Bob Wallace**, Quicksoft's founder and former president, traded his management post to become a full-time software developer at the company.

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BY STEVE B. FOGLE,
MICHAEL R. HELFT
and W. RICHARD HOWARD
SPECIAL TO CW

Q I've spent the last four years in Europe performing systems integration/project management work for a U.S. corporation. Altogether, I have 14 years of experience in the computer industry ranging from software development to systems integration.

Is my experience in Europe something I should promote when I look for another job in the U.S.? How can I conduct an effective job search from such a long distance? I will need to give several months notice prior to leaving my current job.

A Your current European experience is a valuable asset, whether in the U.S. or abroad. Companies are putting a premium on overseas experience as international businesses begin to operate in global markets.

In terms of searching for a job in the U.S. while you are still in Europe, the best thing to do would be to set up a fact-finding trip to the U.S. before you leave your current employer. Send targeted letters and resumes to systems integrators, related computer consulting firms and recruiting firms informing them of your job, salary and geographic requirements. Once you have had your first round of U.S. meetings and you have determined some definite possibilities, then you will be in a good position to give several months notice to your employer.

Q I am currently vice president of data processing at a community bank. I have experience on IBM's System/36s and 34s. I program in RPG with self-taught structured code. In my position, I wear many hats: I budget, plan and perform other supervisory duties in addition to my technical obligations.

Recently, I've noticed that many technical and trade journals indicate that entry into the Application System/400 environment may be tough for a person in my position. Just how tough might it be?

A Entry into an AS/400 environment is not difficult. The demand for people who are capable of managing an AS/400 installation is very high, particularly from organizations that are upgrading from System/36s and companies that are downsizing from mainframes.

Becoming proficient in an AS/400 environment with a System/36 or 34 background is relatively easy. There are dozens of classes and self-study courses available that are specifically designed with this objective in mind. With your ability to handle technical and management tasks, you should find today's marketplace very responsive to your skills and capabilities.

Q I have bachelor's degrees in accounting, finance and computer science. I have more than four years of experience working strictly in a business setting, three years developing software and project orientation and two years working as a systems analyst in a production environment. I am currently employed by a well-known airline as a programmer analyst with a salary of $31,500.

I would like to gain experience in large-scale databases such as IMS and DB2, earn more money and get a better footing on a career path, but I feel I'm not getting anywhere.

A Investigating opportunities shouldn't be something you do only when making a job change. Continue your education, extend your network, go on an occasional interview and network with your peers on a regular basis. Throw yourself into the job market. Look back at the accomplishments you have made and leverage them. You have an excellent educational background and good job skills. Sell this experience.

Your compensation does seem to be a little below average, so you need to evaluate your current position and look at other opportunities. Considering your background, you should look at consulting organizations and other major IS environments and maybe even reintroduce yourself to your former employers.

Q I have been seeking a position in the computer field since I graduated from college last August. I have an associate's degree in computer information systems and no experience in the field. Many interviews I went to want someone with experience. I've sent out several resumes, but all I've received are rejections.

In the future, I plan to study for a bachelor's degree in computer science. My goals are to become a computer programmer and then a systems analyst. What would you advise me to do to get my first job?

A For now, explore every avenue available: Contact your college placement office, respond to every closely applicable job advertisement and contact every employment agency and search firm that specializes in your field. In addition, identify 25 companies you would like to work for, and make contact with the appropriate hiring manager or recruiter. Ask for courtesy interviews if they are not currently conducting a search. Never let someone say no to you without giving you a lead or someone else to contact. If possible, make at least five contacts each day by telephone or in person through interviews.

A job search can be a full-time job, so plan your day, make goals for yourself and stick to them.

Fogle, Helft and Howard are executives at Korn/Ferry International, a senior-level management search firm based in New York and Los Angeles.

We welcome your questions. Send them to Cathy Duffy, Careers Fast Track, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Your initials and town will be printed unless you request otherwise.

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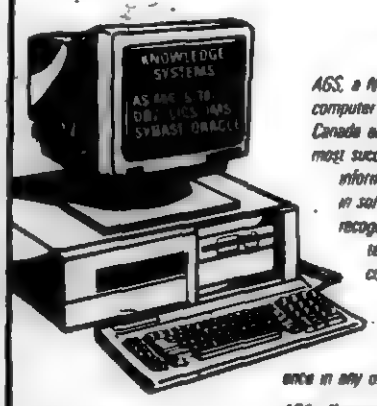
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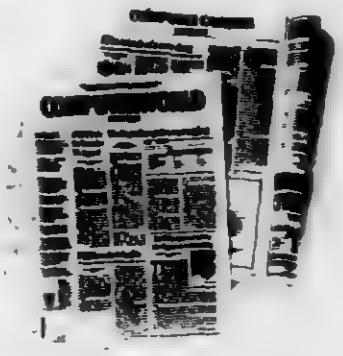
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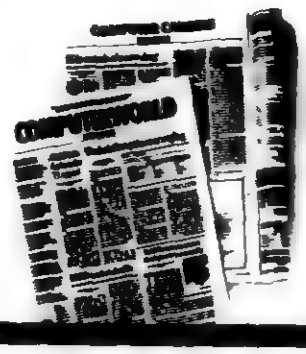
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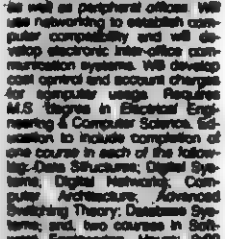


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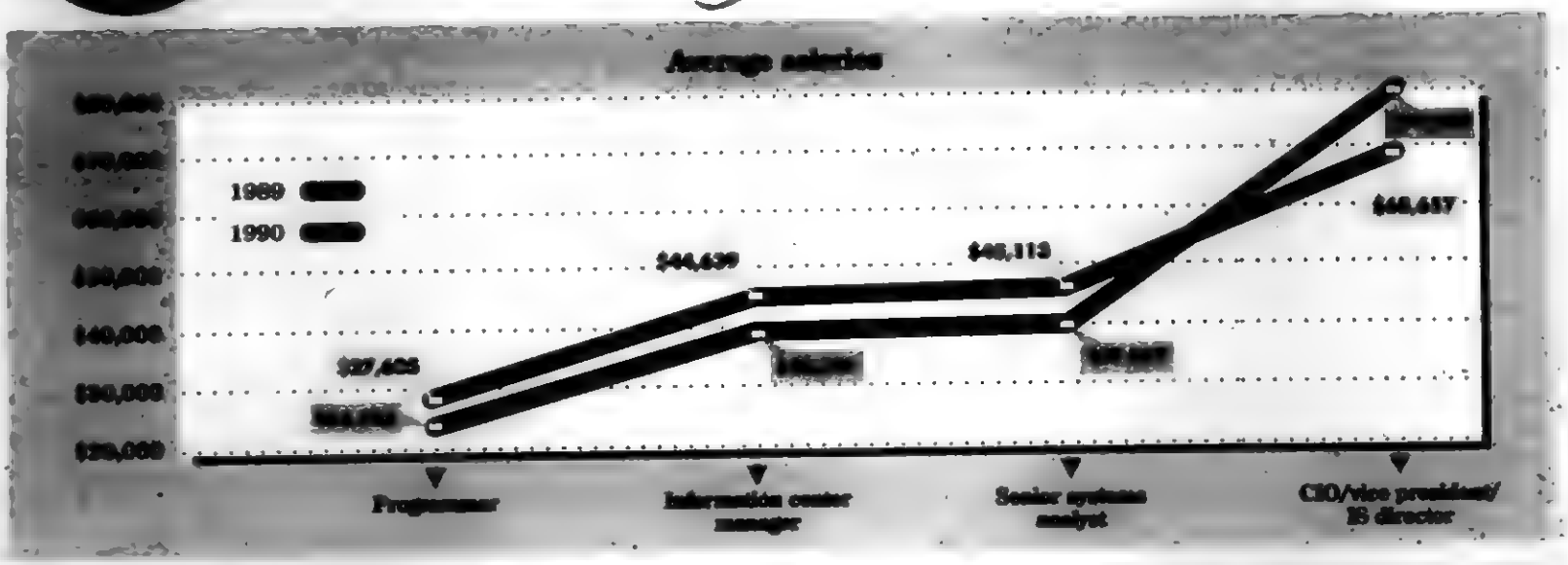
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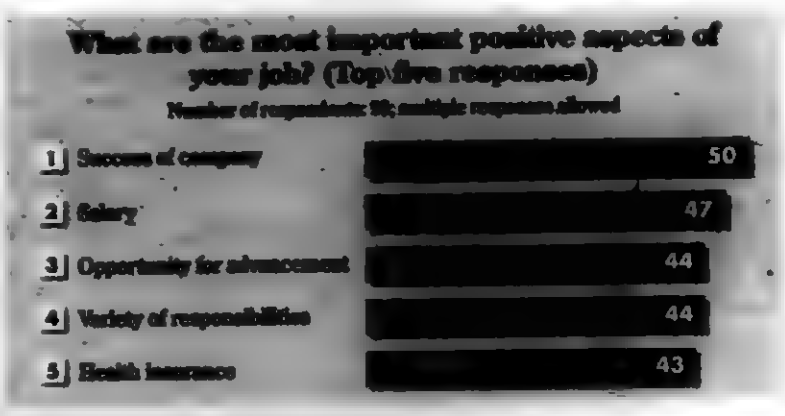
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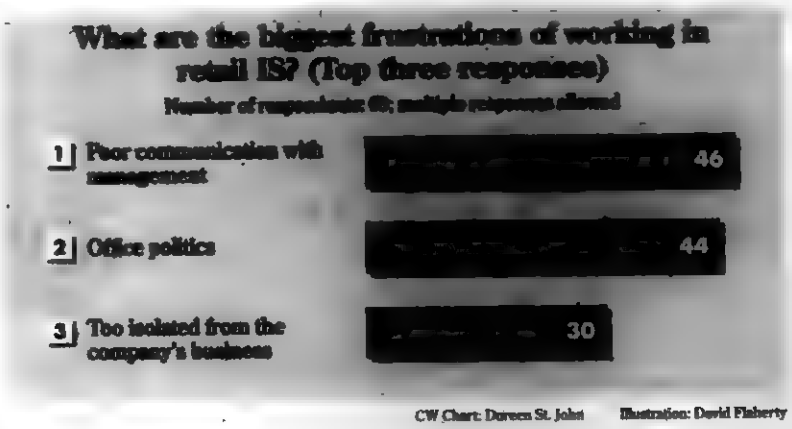
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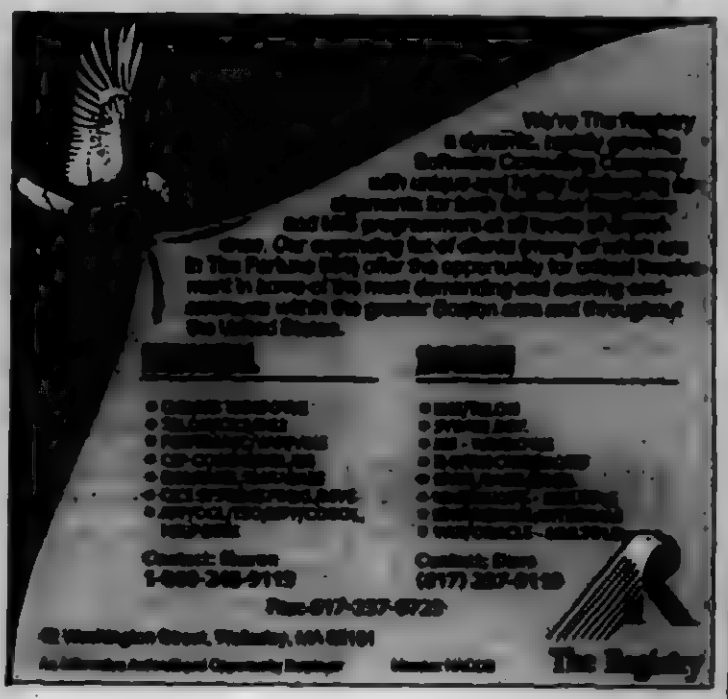
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How to pick a hot site haven before the going gets tough

BY ALAN RADDING
SPECIAL TO CW

No facility is absolutely fail-safe. No matter how carefully information systems managers build their data centers and no matter how much backup capacity they provide, any single facility is vulnerable. Even if the facility is not put out of commission in a disaster, IS operations will be effectively out of business anyway if the surrounding community is not functioning. That's why many companies are turning to hot sites to ensure continuing computer operation.

Hot sites offer varying degrees of disaster recovery services. To choose the right site, IS managers or disaster recovery planners must balance equipment needs with geography requirements, cost, support and service, telecommunications capacity, availability for testing and the vendor's myriad procedures and practices.

Leading the recovery site industry are Comdisco Disaster Recovery Services, Inc. in Rosemont, Ill., Sungard Recovery Services in Wayne, Pa., and IBM Business Recovery Services in Franklin Lakes, N.J.

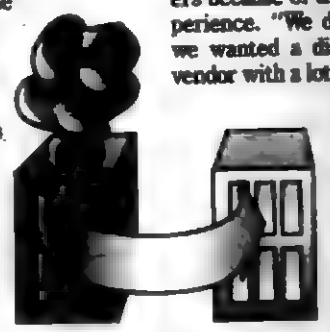
Despite its prominence in the computer industry, IBM is the new kid on the block, springing into the market in 1989. However, because of its size and capabilities, IBM immediately became a major player. Meanwhile, Comdisco and Sungard have been butting heads for more than a decade.

The rest of the hot site vendors are viewed as niche players that specialize in uncommon platforms or focus on a specific geographic region. Some of these vendors, such as National Datagaurd Technologies in Breckville, Ohio, are dedicated disaster recovery companies, while others are spin-offs from large diversified companies, such as Seattle-based Weyerhaeuser Recovery Services, the offspring of the giant forest products company.

The price you pay

Although users don't always want to admit it, the No. 1 issue in selecting a hot site is price, which can vary widely among vendors. For example, the United Mine Workers of America (UMWA) Health and Retirement Funds organization in Washington, D.C., found significant price differences between disaster recovery vendors when it started looking around. "Weyerhaeuser was significantly cheaper in overall cost," says Harvey Hodges, group manager of data processing services.

One major vendor wanted $60,000 just to develop the recovery plan while another quoted $35,000 for the same service. Hodges estimates he saved as much as 65% overall by going with Weyerhaeuser, which included planning consulting as part of its overall service.



The larger the company that is buying services, the better chance it has to negotiate hot site prices. "We found them all to be competitive, but there was an opportunity to tailor the contracts, to negotiate the price," says Emery Hill, executive officer at C&S/Sovran Bank in Norfolk, Va. Before selecting Sungard, the bank also looked at IBM and Comdisco.

IBM, at least at first, heavily discounted its fees to attract customers. "We were one of IBM's first customers, so they came in with a very aggressive price," says Jerry Scherkenbach, information services officer at Milwaukee-based Firstar Information Service Corp., the data processing division of Firstar Corp., a bank holding company.

For most companies, a high-ranking consideration in choosing a hot site is a sense of security. In some cases, disaster planners cling to the major players because of their size and experience. "We determined that we wanted a disaster recovery vendor with a lot of proven experience or that they be a major equipment supplier," says Scott Culbertson, manager of security systems at Shared Services Center in Harrisburg, Pa., the computer services arm for several Blue Cross/Blue Shield organizations.

However, others indicate that good things come in small packages. Hodges chose Weyerhaeuser for the comforts of a small operation: "We wanted exclusivity and confidentiality." In the event of a disaster in Washington, D.C. — a massive power outage, for instance — he didn't want to be one of a herd of data centers stampeding to the same recovery site.

Weyerhaeuser only accepts one data center from a designated territory, and UMWA has the Baltimore to Richmond, Va., territory. Comdisco and Sungard limit subscriber numbers at each site to approximately 100. IBM does not limit the number of subscribers.

Don't cry wolf

To assuage concerns about being locked out of a recovery site during a widespread emergency, the leading vendors tout multiple centers that can back up one another and pick up overflow. Typically, space is available on a first-to-declare basis. Steep declaration fees of $20,000 or more are meant to discourage customers from prematurely declaring a disaster.

Finally, support for a company's particular platform is a given, but the availability of additional equipment, especially for a growing company, is a major concern. "With IBM, if you need to change your equipment, you just call your representative, and within 30 days, the equipment is there," Scherkenbach says.

When Shared Services chose Comdisco, cost wasn't the determining factor. Culbertson was more concerned with the amount of equipment that would be available, the telecommunications capabilities, testing policies and the physical location.

Radding is a free-lance writer based in Newton, Mass.

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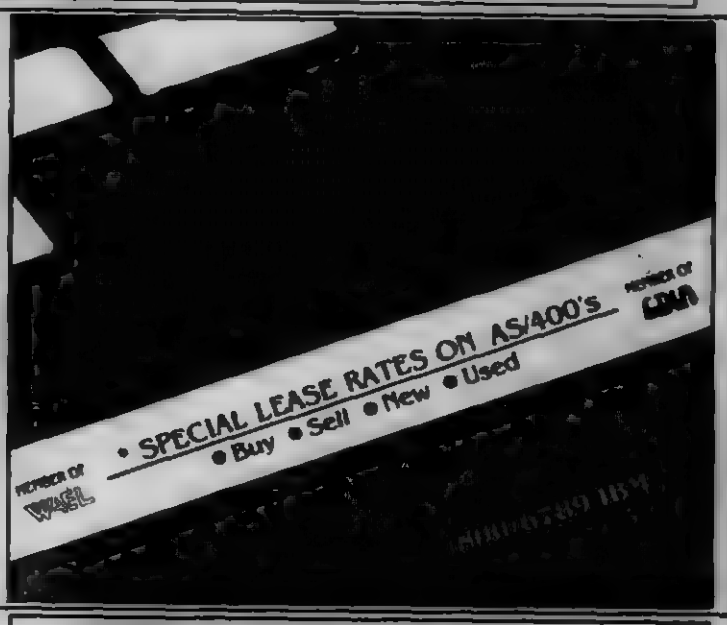
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Pizza chain delivers multimedia training entree to its managers

Head of the Class is a monthly column exploring innovative training approaches throughout corporate America.

BY RICHARD SMOLA
SPECIAL TO CW

Many companies cannot afford to have their key managers out of the office for long hours of classroom training. This situation is especially true in the restaurant business, where a manager's presence can make a difference in the daily performance of the staff.

Realizing this problem, information systems trainers at Pizza Hut, Inc. chose to serve up a training solution for a new labor management application to its restaurant managers by creating an on-site multimedia program.

The application, Automated Restaurant Management System (ARMS), runs on newly purchased Intel Corp. 80386-based AT&T personal computers along with Norand Corp. point-of-sale devices installed in all restaurants. ARMS, a Unix-based application, maintains an order history of everything that Pizza Hut sells in each restaurant. The benefits are threefold: ARMS helps managers project sales, it forecasts how much food and supplies to order for a given period of the year based on previous years, and it furnishes information that can help create efficient labor schedules.

However, ARMS is a complex system to learn and teach. As a result, the technical training team decided against its usual method of placing restaurant managers in a classroom for three days, lecturing them on everything they need to know about ARMS and expecting them to retain the information.

Cost conscious

One of the issues that led the training team to choose multimedia was the cost of training. The classroom approach would not work for ARMS training because travel and living expenses would be a continual financial drain: Pizza Hut restaurants are spread out across the country, so the costs of travel would mount quickly.

Also, while Pizza Hut's staff turnover is low, training new management staff to use ARMS via the classroom method would present a labor- and cost-intensive challenge. On the other hand, the costs of multimedia are expensive up-front but are justifiable because of the significant savings in ongoing training. Projections indicate that development costs of multimedia would break even in approximately 1½ years.



Another major consideration for Pizza Hut trainers was job interference. When managers are pulled away from their restaurants, productivity suffers. Furthermore, having managers out of the restaurant for training would mean lost sales. Multiply that factor by 3,000 Pizza Hut restaurants, and a troublesome financial figure unfolds.

After pinpointing all of the obstacles in the training path, the team decided to proceed with a store-based computer training program.

To create the training materials for this approach, Pizza Hut teamed up with Universal Training Systems Co. in Chicago. After 10 months of intense planning and several mid-project changes, Pizza Hut had its training solution ready to roll.

The program was built around a hands-on philosophy that involved video, computer-based training (CBT) and printed materials. The team used video displayed separately from the PCs to present overall concepts in an easy-to-digest manner, hardcopy materials to capture frequently updated information and CBT to capture complex topics such as analysis skills and how to make decisions. All materials are presented to the trainees in sequence.

After the training team completed the on-site multimedia training program, they compared the classroom method with the new method. Trainers looked at the training times, the number and types of questions and the accuracy of the required ARMS output for these two different scenarios.

Trainees who were tested on the new on-site approach completed their training on time, had almost no questions or problems and produced the required ARMS output without error.

The success of the program was even more surprising because 70% of the managers hadn't used a computer before they used ARMS. Overall, the managers' feedback was very positive.

Extra toppings

An added benefit to the multimedia approach is that Pizza Hut is now more equipped to determine training competency through an on-line certification process. Through the use of CBT, managers are presented with realistic scenarios that could happen at the restaurant, and they must respond by interacting with the computer. If managers don't achieve a certain level of competency, they're given remedial assignments and the certification must be repeated. This process ensures that the ARMS concepts have been learned and can be applied in real-life situations.

Multimedia is now a favored method in Pizza Hut's training program. Plans for the future include delivering other training topics such as management skills and basic operations testing on CBT. The training team is currently building the successor to ARMS CBT: a performance support system. This approach will combine an on-line advisory package with CBT and multilayered, on-line Help functions.

Smola is a manager of development and training at Pizza Hut corporate offices in Wichita, Kan.

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INDUSTRY ALMANAC

INITIAL PUBLIC OFFERINGS

The nation's current economic recession and role in the Persian Gulf war may be deterring some private computer firms from going public now, but not **Zilog, Inc.** After 17 years on the semiconductor circuit, the Campbell, Calif.-based firm went public Thursday, offering 2 million shares for $11 each. Its Z80 chip made Zilog a contender for IBM's business in the early days of personal computing, but Zilog retreated into the shadows after IBM chose **Intel Corp.** as its microprocessor supplier.

"Had IBM picked the Z80, Zilog might carry the same glamour that Intel does today," one analyst said. Instead, Zilog now gambles at a different table, tying its fortune to logic chips used in data communications products.

However, that may not be a bad place to be these days. Data communications and networking products are "a pretty good gamble because companies have to link with others in order to make it now," said John Rohal, communications analyst at Alex. Brown & Sons, Inc. in Baltimore.

Promise behind the danger

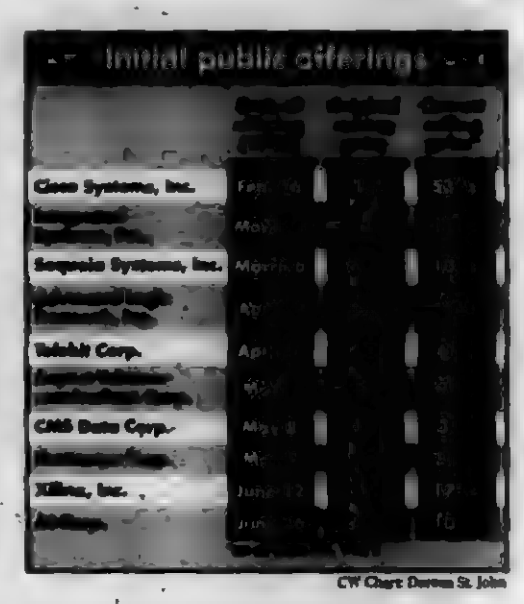
Rohal acknowledged that networking can be a "treacherous" industry to enter because connection standards and technologies change more quickly than those for other arenas, but he emphasized that the sector holds promise.

Indeed, networking firms dominated those entering public trading last year. Half of the 10 computer firms to hit the open market from January to June 1990 peddled some kind of networking product, according to IDD Information Services, Inc., a New York research firm (see chart below).

The timing was apparently right for **Cisco Systems, Inc.**, a bridge, router and server vendor based in Menlo Park, Calif. The firm opened at $18. One year later, Cisco stock has just about tripled, closing Wednesday at $53.88. Not all network firms have fared as well. Sunnyvale, Calif.-based **Telebit Corp.** opened at $10 but now trades at $6.88, down approximately 31%.

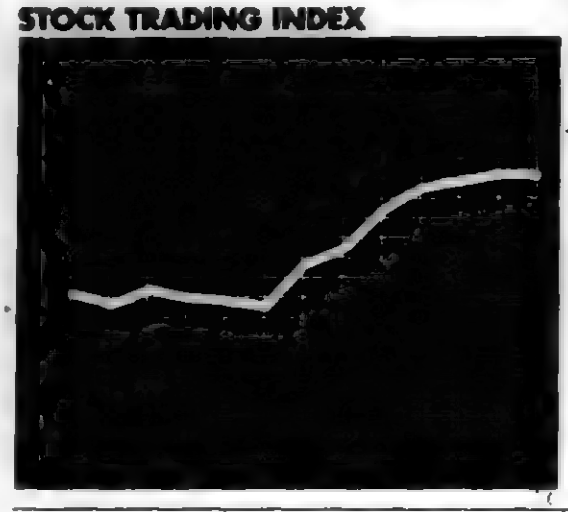
Elsewhere on last year's initial public offering list, IBM Personal Computer clone and add-in board makers such as Advanced Logic Research, Inc. (ALR) and Rasterops Corp. have seen mixed emotions from investors. Rasterops, based in Santa Clara, Calif., has jumped 75% in its nine months as a public firm, from $12 to $21.13. However, ALR, based in Irvine, Calif., closed Wednesday at $14, just a hair above its original asking price.

KIM S. NASH



CW Chart: Doreen St. John

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Novell, Inc. rose 3¼ points last week to close Thursday at 48⅜, after reporting that first-quarter profits doubled over last year's first-quarter total. Rival Microsoft Corp. was not outdone, however, gaining 3¾ points to 103¾.
- IBM took a major wallop last week, losing 6¾ points to close Thursday at 128¾. Stephen K. Smith, an analyst at Paine Webber, Inc., downgraded his investment rating for IBM from "buy" to "hold" early in the week.
- The market hit a lull after the announcement of the end of the Persian Gulf war, causing some shares to decline, including Digital Equipment Corp., which skidded 3⅜ points to 72⅝. Other hardware stocks also suffered losses. Compaq Computer Corp. slipped 2¾ points to 69¼ and Apple Computer, Inc. ended Thursday at 57¼ points, down 1¾ for the week.
- Among semiconductor makers, Intel Corp. lost 1¾ points to 47¾, and Motorola, Inc. stumbled 1⅜ points, closing Thursday at 59⅜.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, FEB. 28, 1991

TOP PERCENT GAINERS

Alloy Computer Prod.	46.47
General Datacomm Inds.	18.18
Micron Technology	18.10
Grid Systems Int'l	17.54
Intergraph	16.22

TOP PERCENT LOSERS

Micrografx	-22.36
Ultimate Corp.	-19.05
Phoenix Technologies	-11.11
EMC Corp.	-10.86
Data General Corp.	-10.53

TOP DOLLAR GAINERS

Microsoft Corp.	3.75
Novell Inc.	3.25
Altus Corp.	3.25
Intergraph	3.00
Autodesk Inc.	3.00

TOP DOLLAR LOSERS

IBM	-6.75
Micrografx	-6.63
Digital Equipment Corp.	-3.88
Compaq Computer Corp.	-2.38
Borland Int'l	-2.25

Exch	52-Week High	52-Week Low		Feb. 28 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Up 1.66%
OTC	19.00	5.38	3COM Corp.	9.00	0.13	1.41
NYS	69.75	52.50	American Info Techs Corp.	66.00	0.00	0.00
NYS	44.13	29.00	AT&T	33.38	0.13	0.38
OTC	9.63	0.88	Ariel Communications Corp.	3.00	0.13	4.35
NYS	58.25	39.50	Bell Atlantic Corp.	49.00	-0.38	-0.76
NYS	57.63	46.00	Bellsouth Corp.	51.75	-1.50	-2.82
OTC	16.50	8.25	Compression Labs Inc.	15.38	0.00	0.00
NYS	39.13	23.38	Comsat Corp.	39.13	0.13	0.32
OTC	4.50	1.75	Data Switch Corp.	4.00	-0.88	-1.56
NYS	28.75	8.88	Digital Comm. Assoc.	17.00	1.38	8.80
OTC	23.75	12.25	Dynatech Corp.	22.50	2.00	9.76
OTC	12.88	8.50	Fibronics Int'l Inc.	9.88	-0.25	-2.74
OTC	4.00	1.75	Glenayre Technologies Inc.	2.75	-0.06	-2.24
NYS	4.50	1.00	General Datacomm Inds.	3.25	0.50	18.18
NYS	34.13	23.50	GTE Corp.	31.13	0.00	0.00
OTC	0.75	0.75	Infotron Systems Corp.	0.88	0.00	0.00
NYS	60.88	40.25	ITT Corp.	55.88	-0.75	-1.32
OTC	44.13	17.88	MCI Communications Corp.	27.00	0.50	1.88
OTC	21.00	2.75	Microcom Inc.	6.00	0.75	14.29
NYS	34.38	4.50	Network Equipment Tech.	6.25	0.38	6.38
OTC	14.63	4.00	Network General	11.25	-0.25	-2.17
OTC	15.50	8.13	Network Systems Corp.	11.25	0.00	0.00
NYS	31.00	22.13	Northern Telecom Ltd.	28.38	-0.88	-2.99
OTC	51.25	17.25	Novell Inc.	48.88	3.25	7.12
NYS	88.50	67.00	Nynex Corp.	74.50	-1.50	-1.97
NYS	47.88	38.38	Pacific Telesis Group	42.25	0.38	0.90
ASE	12.38	4.75	Parvi Corp.	12.00	0.00	0.00
NYS	29.13	8.88	Scientific Atlanta Inc.	15.00	-0.38	-2.44
NYS	59.50	47.25	Southwestern Bell Corp.	53.75	-1.00	-1.83
NYS	48.38	30.63	United Telecom	34.50	0.00	0.00
NYS	40.75	32.38	US West Inc.	38.63	-0.50	-1.28
Computer Systems						Up 1.98%
OTC	8.75	0.56	Alliant Computer Sys.	1.00	0.00	0.00
ASE	16.88	10.00	Amdahl Corp.	14.75	-1.00	-6.35
OTC	62.25	24.25	Apple Computer Inc.	57.25	-1.75	-2.97
OTC	13.88	4.25	Archive Corp.	7.75	0.13	1.64
OTC	39.25	7.13	AST Research Inc.	24.50	1.56	6.81
NYS	7.00	3.88	Bolt, Beranek & Newman	6.63	0.00	0.00
NYS	16.88	4.50	Commodore Int'l	16.88	-1.00	-5.59
NYS	74.25	36.50	Compaq Computer Corp.	69.25	-2.38	-3.32
OTC	3.00	0.13	Computer Automation Inc.	1.16	0.03	2.76
NYS	21.63	9.75	Control Data Corp.	12.88	0.38	3.00
NYS	20.88	8.38	Convex Computer	17.13	-0.63	-3.52
NYS	51.25	20.00	Cray Research Inc.	41.25	0.38	0.61
NYS	13.25	3.50	Data General Corp.	8.50	-1.00	-10.53
NYS	3.88	0.75	Datapoint Corp.	2.38	0.00	0.00
OTC	38.88	5.63	Dell Computer Corp.	25.25	-1.38	-5.18
NYS	95.13	46.50	Digital Equipment Corp.	72.63	-3.88	-5.07
NYS	36.13	13.75	Harris Corp.	24.63	0.63	2.60
NYS	60.38	24.88	Hewlett Packard Co.	46.63	-0.63	-1.32
NYS	138.75	96.25	IBM	128.75	-6.75	-4.98
OTC	14.00	7.75	Information Int'l	9.00	-0.25	-2.70
OTC	23.50	10.50	Intergraph	21.50	3.00	16.22
NYS	3.13	0.50	M4I Systems Corp.	0.75	0.00	0.00
NYS	148.88	114.00	Massachusetts Electronics	137.25	1.13	0.83
OTC	25.00	9.00	Meridor Graphics Corp.	16.25	-0.75	-4.41
NYS	98.00	44.50	NCR Corp.	88.00	2.88	3.38
OTC	35.50	11.00	Pyramid Technology	20.00	-0.50	-2.44
OTC	34.00	9.75	Sequent Computer Sys.	15.50	0.75	5.08
NYS	42.50	16.00	Silicon Graphics	39.75	-0.38	-0.93
NYS	30.25	14.63	Stratus Computer Inc.	28.38	-0.25	-0.87
OTC	37.25	16.00	Sun Microsystems Inc.	32.13	1.50	4.90
NYS	20.13	8.88	Tandem Computers Inc.	13.38	-0.63	-4.48
NYS	38.50	23.50	Tandy Corp.	30.88	-1.00	-3.14
OTC	35.50	8.75	Teradata	15.00	1.25	9.09
NYS	7.88	1.38	Ultimate Corp.	4.25	-1.00	-19.05
NYS	17.13	1.75	Unisys Corp.	4.38	0.38	9.38
ASE	6.25	2.00	Wang Labs Inc. (b)	3.38	0.00	0.00
Software & OP Services						Up 1.93%
OTC	80.75	17.00	Adobe Systems Inc.	48.13	2.69	5.77
OTC	46.50	18.75	Altus Corp.	44.25	3.25	7.93
OTC	24.00	12.00	American Mgmt. Systems	22.88	1.88	8.95
OTC	16.25	7.50	American Software Inc.	13.00	0.00	0.00
NYS	3.63	1.38	Answering Inc.	2.63	0.13	5.00
OTC	29.50	18.00	Analysts Int'l	14.50	-0.25	-1.69
OTC	13.13	4.88	Ashton Tate	7.88	0.73	10.53
OTC	10.25	4.50	ASK Computer Sys.	6.38	0.00	0.00
Exch	52-Week High	52-Week Low		Feb. 28 Close	Wk Net Change	Wk Pct Change
NYS	65.25	45.25	Auto Data Processing	62.38	0.13	0.20
OTC	60.25	32.00	Autodesk Inc.	48.75	3.00	6.56
OTC	30.00	12.00	BGS Systems Inc.	23.75	0.75	2.59
OTC	42.50	17.75	BMC Software Inc.	36.25	0.50	1.32
OTC	21.50	11.00	Boole & Babbage Inc.	14.00	0.50	3.70
OTC	53.75	12.50	Borland Int'l	49.25	-2.25	-4.46
NYS	11.88	0.88	Businessland Inc.	2.38	0.00	0.00
OTC	18.50	4.38	Cognos Inc.	16.50	2.00	13.79
NYS	16.88	4.38	Computer Associates	9.13	-0.25	-2.67
OTC	17.75	7.75	Computer Horizons	13.75	-1.00	-6.78
NYS	80.75	36.75	Computer Sciences	60.25	1.63	2.77
NYS	12.25	6.63	Computer Task Group	10.25	0.63	6.49
OTC	25.25	13.00	Comshare Inc.	15.38	-1.63	-9.58
OTC	16.00	6.88	Corporate Software	11.50	0.50	4.55
NYS	47.00	37.88	General Motors E (EDS)	41.88	0.38	0.91
OTC	16.25	7.25	Grid Systems Int'l	16.75	2.50	17.54
OTC	4.75	1.88	Hogan Systems Inc.	3.50	-0.13	-3.45
OTC	9.75	5.00	Index Technology	9.13	0.13	1.39
OTC	16.88	7.75	Information Resources	10.75	0.13	0.80
OTC	17.50	6.88	Informix Corp.	9.88	0.38	6.82
OTC	7.88	1.38	Intelicorp Inc.	2.13	0.08	3.91
OTC	8.50	2.50	Interleaf Inc.	5.38	-0.38	-6.52
OTC	35.00	10.00	Knowledgeware Inc.	33.50	1.50	4.69
OTC	38.50	16.75	Legent Corp.	28.25	1.38	5.13
OTC	39.25	12.50	Lotus Development	22.00	0.25	1.15
OTC	32.00	18.88	Micrografx	23.00	-6.63	-22.36
OTC	109.00	50.75	Microsoft Corp.	103.75	3.75	3.75
NYS	9.88	4.00	On Line Software Int'l	5.38	0.38	4.89
OTC	28.38	4.88	Oracle Systems	9.00	0.00	0.00
NYS	17.88	7.00	Parasonic Systems	11.50	-0.50	-4.17
OTC	7.38	1.25	Phoenix Technologies	5.00	-0.63	-11.11
NYS	51.25	31.88	Policy Management Sys.	48.25	-0.63	-1.28
NYS	23.63	11.50	Reynolds & Reynolds	19.00	-0.38	-1.94
OTC	16.13	8.88	Sage Software Inc.	9.13	-0.13	-1.35
OTC	34.00	14.75	Sas Corp.	23.25	0.50	2.20
OTC	18.38	12.25	Shared Medical Systems	17.00	-0.13	-0.73
OTC	29.25	12.00	Software Publishing Corp.	29.25	2.75	10.39
NYS	11.25	5.50	Sterling Software	10.88	0.25	2.35
OTC	38.00	9.88	Sungard Data Sys.	13.00	-0.50	-3.70
OTC	44.50	17.88	Symantec Corp.	43.63	0.38	0.87
NYS	24.88	4.50	System Center Inc.	8.00	-0.38	-5.88
OTC	37.25	12.75	System Software Assoc.	19.38	0.13	0.65
OTC	27.38	4.75	Wang	12.38	-1.38	-10.00
S						
NYS	35.88	19.13	Advanced Micro Devices	22.25	0.50	2.30
NYS	19.13	5.50	Analog Devices Inc.	9.88	0.75	8.22
OTC	29.50	5.25	Chips & Technologies	11.25	-0.25	-2.17
OTC	52.00	38.88	Intel Corp.	47.75	-1.75	-3.54
NYS	13.00	5.13	LSI Logic Corp.	9.13	0.00	0.00
NYS	16.38	8.75	Micron Technology	15.50	2.38	18.10
NYS	69.38	45.75	Motorola Inc.	60.13	-1.13	-1.84
NYS	8.88	3.00	National Semiconductor	6.88	-0.38	-5.17
NYS	44.00	22.50	Texas Instruments	41.50	-0.50	-1.19
OTC	12.25	3.00	VLSI Technology	7.50	0.13	1.69
ASE	14.88	4.00	Western Digital Corp.	4.50	0.38	8.88
Peripherals & Subsystems						Up 1.09%
OTC	2.38	0.06	Alloy Computer Prod.	0.25	0.06	46.47
OTC	2.25	0.88	Apertus Technologies	1.88	-0.06	-3.25
OTC	24.00	7.50	Banctec Inc.	9.75	-0.50	-4.88
ASE	9.25	4.13	Cognitronics Corp.	9.25	0.75	8.82
NYS	31.25	14.88	Conner Peripherals	23.88	-2.25	-8.61
ASE	22.00	7.00	Datarem Corp.	10.75	0.00	0.00
NYS	10.88	4.25	EMC Corp.	8.13	-1.00	-10.96
NYS	47.25	33.75	Eastman Kodak Co.	43.75	-2.00	-4.37
OTC	9.88	4.38	Exabyte Corp.	8.00	0.13	1.41
OTC	34.50	14.00	Exabyte & Subsystems	20.25	0.75	3.85
OTC	6.50	3.38	Iomega Corp.	5.75	0.50	9.52
OTC	28.25	8.75	IPL Systems Inc.	27.00	-0.50	-1.82
OTC	2.06	0.13	Maxtor Systems	0.63	0.00	0.00
OTC	17.00	2.63	Maxtor Corp.	4.00	-0.13	-3.03
OTC	13.38	3.88	Micropolis Corp.	11.13	-0.50	-4.30
NYS	99.75	73.63	3M Corp.	98.50	0.88	1.00
OTC	14.50	6.00	Petrotrons Inc.	8.50	-0.25	-2.86
NYS	21.25	8.50	QMS Inc.	17.13	-1.13	-6.16
OTC	25.75	11.38	Quantum Corp.	22.38	-0.88	-3.81
NYS	6.88	4.38	Recognition Equipment	5.88	-0.13	-2.08
OTC	9.88	4.00	Reson Inc.	8.00	0.50	6.67
OTC	19.75	5.63	Seagate Technology	14.38	-0.63	-4.17
NYS	38.38	11.00	Storage Technology	27.88	0.88	3.24
OTC	4.00	1.06	Tandon Corp.	3.22	-0.22	-6.37
NYS	22.88	11.88	Tektronix Inc.	20.00	-1.13	-5.33
OTC	0.88	0.16	Television Systems	0.25	0.03	14.16
NYS	88.75	83.00	Xerox Corp.	88.75	2.38	4.13
Leasing Companies						Up 2.68%
OTC	15.00	6.88	Amplicon Inc.	14.50	1.75	13.73
OTC	4.38	0.31	Capital Associates	0.53	-0.09	-5.88
NYS	28.50	14.88	Comdisco Inc.	25.88	-1.38	-5.06
OTC	16.25	9.25	LDI Corporation	12.25	0.00	0.00
OTC	5.88	2.38	Sabastern Inc.	3.75	0.50	15.38

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IBM

CONTINUED FROM PAGE 1

said they had no interest. The figure could reflect the low number of outsourcing vendors offering processing services on non-IBM mainframes, Moschella said.

DEC shops indicated a relatively high interest in outsourcing, with 20.7% considering or pursuing the move. The survey defined outsourcing as an organization "deciding to turn over all or part of its IS operations to a third-party organization."

The client/server computing concept, however, received a lukewarm response. More than half (52%) of all respondents said they have no plans to adopt the model or said they agreed with the statement that client/server computing is "a buzzword of unclear meaning." Thirty-five percent said they have moved, are moving or are planning to move to a client/server model.

The IBM Application System/400 base proved to be the most resistant to downsizing. About two-thirds of AS/400 users said they are not pursuing any applications downsizing, which contrasts with a base majority (51.6%) that is doing some downsizing. Only 15% of AS/400 sites are looking at outsourcing, and a whopping 91% said they have no plans to move to a Unix-oriented open systems strategy.

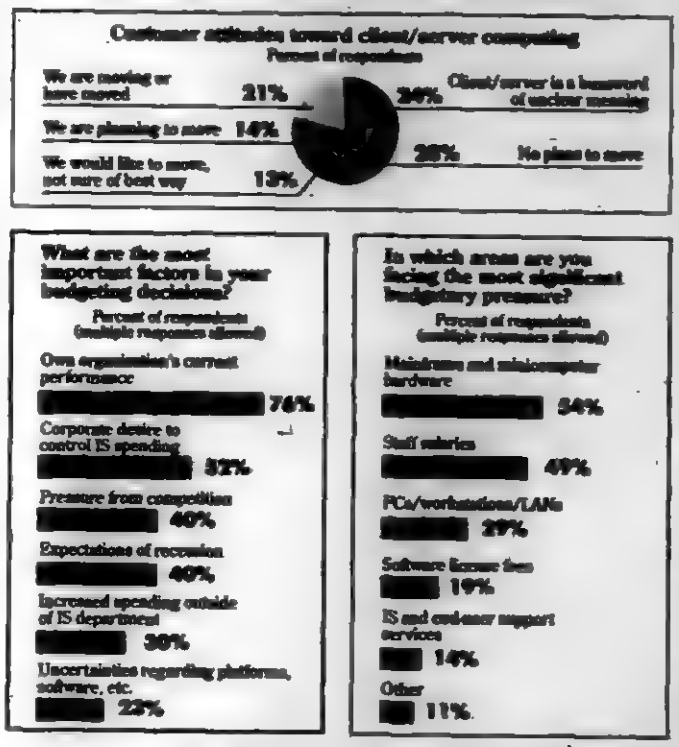
"The AS/400 base is the most isolated from all the trendy things," Moschella said. "IBM has always done a good job isolating that base from a competitive challenge. Vendors who think they're going to attack it never get anywhere."

As a reason for slowed IS spending, the oft-cited "user confusion" idea was contradicted by the survey results. When asked to rate the most important factors in budgeting decisions, only 23% cited "uncertainties regarding platforms or software" as a factor.

The overwhelming No. 1 factor was their own company's current financial performance, which was cited as a budgeting factor by 76% of respondents.

Under pressure

A survey of 1,500 IS professionals finds widespread budgetary pressures and an almost equal split in attitudes on client/server computing



Source: International Data Corp. CW Chart: Paul Mock

Interleaf announces active document tool

BY RICHARD PASTORE
CW STAFF

BOSTON — One year after it first demonstrated its active documents technology, Interleaf, Inc. will unveil a developers tool kit this week at the Seybold Seminar '91. The kit will allow users to add intelligent capabilities to their own Interleaf documents rather than contracting with Interleaf to do it.

Active documents generated a stir last year because of their unusual ability to embed intelligent activity into basic documents. For example, active documents can be programmed to automatically look up and plug in data from other databases, electronically mail themselves to appropriate persons at appropriate times and generally "behave" in a variety of ways based on programming or user input.

Although it has not taken the industry by storm, "this is a very significant technology, not in terms of the number of users, but in terms of what it does. It's the way the world is going to work eventually," said Esther Dyson, editor of the New York-based newsletter "Release 1.0."

Several other vendors have discussed the capability. Microsoft Corp. recently proposed similar object linking and embedding for the Windows 3.0 operating environment and Windows-based applications.

Vendors such as Microsoft "have correctly figured out that some of these capabilities are appealing for nearly any user," said Amy Wohl, president of Wohl Associates in Wynnewood, Pa., and editor of "The Wohl Report on End-User Computing."

Interleaf users said the technology is contributing to streamlined document management.

Amoco Production Co., for example, is using active documents to link on-line construction specification forms to standards guidelines stored on compact disc/read-only memory (CD-ROM). "With the intelligent ability, engineers filling out the forms can fire up the CD-ROM and reference the exact paragraph they need to answer any standards question," Amoco associate engineer Steven Warburton said.

The form is also programmed to skip over questions when it determines them to be inappropriate. For example, only certain metals can be used during construction in corrosive environments. If a user indicates the environment is corrosive, the document knows enough to list only suitable metals for the engineer's selection.

> "ENGINEERS FILLING OUT the forms can fire up the CD-ROM and reference the exact paragraph they need."
>
> STEVEN WARBURTON
> AMOCO

In the documentation department of oscilloscope maker Tektronix, Inc., active documents are performing repetitive tasks such as spell checking in background mode. The firm also said it plans to program its documentation to send itself to company officials on a preset review schedule, said Carolyn Strong, group documentation manager.

Interleaf users said they prefer customizing active documents in-house and are looking forward to obtaining the tool kit.

"We will do all the development in-house. We wouldn't want to do it any other way," said David Trebilcock, construction manager at Ontario Hydro, a Canadian utility company. The firm is moving paper-based regulatory documentation to the Interleaf environment.

Pirate boards a perplexing problem

BY MICHAEL ALEXANDER
CW STAFF

Electronic bulletin boards are to many computer enthusiasts what malls are to teenagers: places to swap gossip, buy goods and hang out when there is little else to do. Increasingly, some boards can also be places where users can traffic in pirated software, typically games, according to some experts and software manufacturers.

"They are all over the place," said Ian Murphy, a computer security consultant and president of IAM/Secure Data Systems, Inc. in Philadelphia. "In this area, you can join boards for $15, $20, $30 and get unlimited amounts of software. Some of these boards have 100M to 200M bytes of software."

For example, a *Computerworld* reporter who logged onto an "elite" section of an electronic bulletin board run by Microsystems Software, Inc., a software publisher based in Framingham, Mass., was given access to some 300M bytes of compressed games. A check with several of the publishers of those games — including Accolade and Sierra On-Line, Inc., most of whose catalogs were posted on the board — revealed that Microsystems was not authorized to copy and distribute game software published by those firms.

"We were going to delete that section anyway," said Richard Gorgens, president of Microsystems, when the *Computerworld* reporter called to inquire about the stockpile of what some publishers said were bootleg copies of their software. "There are a lot of files there using up space," Gorgens said.

> LAW ENFORCERS SAID the problem of software piracy is growing, both in this country and abroad, but noted that successful prosecution of board operators is rare.

When pressed as to whether he was aware that the software on the company's board was asserted to be pirated, Gorgens declined to acknowledge directly that it was there without authorization, although he said "he would get rid of it."

The entire game software section was removed from the board the next day. In its place was a message from Gorgens saying the game software had been deleted, along with an offer to give prorated refunds to elite subscribers.

Growing concern

Law enforcers said the problem of software piracy is growing, both in this country and abroad. However, they noted that successful prosecution of board operators is rare.

Last year, New York State Police arrested a 17-year-old student for unlawful duplication of computer-related material, among other crimes. Police said the youth was a member of an international software piracy group that ran a bulletin board in Chicago called Paradox. The "price of admission" to the board was a copy of a recently published program, according to Donald Delaney, supervisor of the major crime squad.

Not much can be done to shut down what amounts to electronic warehouses containing stolen goods, said Ken Wasch, executive director of the Software Publishers Association (SPA). The SPA actively investigates allegations of software piracy but has prosecuted only one bulletin board operator (two years ago), Wasch said.

"We have a hard time fighting piracy of computer games because to do so requires going after individuals in their homes," Wasch said. The SPA is currently working with the Federal Bureau of Investigation to gather evidence against several bulletin board operators, he said.

There is a pirate board in "every city and town," according to Jeff Hoff, director of marketing at Accolade, a San Jose, Calif.-based games software publisher. "It is a huge problem, particularly for Accolade" because of the popularity of the company's games, Hoff said.

The difficulty and expense of investigating and prosecuting individuals for software piracy outweigh the benefits, Hoff said. Accolade would not use "time, energy, effort, lawyers and money" to go after a pirate bulletin board operator "unless it is hugely obvious that he is trying to make a living at it."

NEWS SHORTS

NCR's ESOP heads for court

A federal district court judge in Ohio last week set March 11 and 12 as court dates for hearings on NCR Corp.'s newly created employee stock ownership plan (ESOP). The ESOP was set up recently to hold 8% of NCR's stock at a time when AT&T is bidding to take over the company. Separately, AT&T sent a letter to Federal Communications Commission Chairman Alfred Sikes arguing that there was no basis for NCR's request that the FCC review the takeover attempt.

Microsoft suit advances

Microsoft Corp. won a summary judgement last week in a suit against five parties accused of counterfeiting MS-DOS. The defendants admitted to manufacturing and selling at least 25,000 look-alike DOS packages through software dealers in the U.S. Microsoft claimed lost income of $1.8 million. Microsoft and Everex Systems, Inc. filed suit in federal court in San Francisco last year against J&S International, JIP Design, Joe Fok, Susan Chan and Norman Chan. Damages will be settled in court beginning in May. Microsoft said MS-DOS is the most widely counterfeited software in the world.

Panasonic adds to printer line

Panasonic Communications & Systems Co. introduced a replacement for its KX-1124 dot-matrix printer last week. With one million U.S. installed units, it is the largest selling dot-matrix printer in the DOS environment, according to BIS Strategic Decisions in Norwell, Mass. The new P1124I is a 24-pin machine that provides more fonts (seven) and faster speed than its predecessor. The machine features a front-panel LCD display and super letter quality mode at 360 by 360 dot/in.

Ask releases application generator

Ask Computer Systems, Inc. announced an application generator last week that brings fourth-generation language (4GL) programming to character-based terminals. Ingres/Vision replaces an older Ingres product, Query By Forms (QBF). Two key features that differentiate Ingres/Vision from QBF are the Frame Flow Diagram visual aid, which draws program elements on-screen as they are created, and the Visual Query Editor, which builds 4GL code based on user-defined parameters. Because the Vision generator is linked to an Ingres relational database management system, modules can be recalled from memory and reused, the firm said.

DEC's first OSF/1 version ready

Digital Equipment Corp. said it plans to begin shipping an early binary version of the Open Software Foundation's OSF/1 operating system software this week. The $1,040 developer's kit includes OSF/Motif Version 1.1, X Window System Version 11, Release 4, the Gnu C compiler and development tools. In another announcement at last week's Sun Expo in Boston, DEC demonstrated two of its own software products running on a Sun Microsystems, Inc. platform: Decwindows Motif and DEC Visual User Interface Tool. DEC officials said their development of "multiplatform software" will eventually extend to Hewlett-Packard Co. and IBM machines.

SPSS suit withdrawn

Former SPSS, Inc. President John Grillos withdrew his suit against the firm and its co-defendants last week. Grillos had filed suit on Oct. 12 in response to a private placement memorandum circulated by SPSS when it was negotiating a recapitalization plan with a group led by Morgan Stanley Venture Capital Fund, LP. The recapitalization went through, but Grillos said his shares were significantly undervalued at $4.04 per share (which SPSS later devalued to $2.06 per share) and asked for $37 per share. (Nonmanagement holders of Class B stock were compelled to sell under terms of the plan.) Two weeks ago, SPSS filed an appraisal action, which Illinois law requires in such situations. This action, coupled with three counterwrits filed by SPSS, prompted Grillos to drop his suit.

IBM cuts PC prices 5% to 20%

Makes competitive move in response to Compaq's and Dell's price slashes

BY RICHARD PASTORE
CW STAFF

WHITE PLAINS, N.Y. — Coming only a few weeks after competition price cuts, IBM's 5% to 20% personal computer price slashing last week shows it is trying hard to keep pace. The move has also created a price gap for impending Intel Corp. I486-based products to fill, observers said.

Compaq Computer Corp. cut high-end PC prices two weeks ago by 13% to 21%. One week earlier, Dell Computer Corp. reduced prices across its whole line by as much as $900.

"IBM is forced to respond; they have to remain competitive," said Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn.

IBM's 8% reduction on its Personal System/2 Model 30 prices reflects the weakening corporate position of Intel 80286-based systems, according to Ben Rose, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

IBM also cut 14% to 17% off the price of its popular Model 55SX and chopped prices for the first time on the Model 65SX. IBM's lack of a 20-MHz Intel 80386SX-based system has prompted it to make its 16-MHz 386SX boxes more attractive vis-a-vis the competition, Rose said.

Make way for intros

Cuts on the Model 80 pricing are potentially more strategic, analysts said. Not only are the 15% to 20% cuts intended to jump start slow sales, but they also make room for new introductions in the second quarter. Observers said they expect IBM to announce PS/2s based on the so-called Intel 486SX chip, a yet-to-be-announced 20-MHz version of the I486 that lacks a built-in math coprocessor.

A 486SX PS/2 would likely be priced at $11,000 to $14,000, depending on configuration, Rose said. This would fit snugly into the $2,000 price gap between the newly priced Model 80s and the I486-based Models 90 and 95.

Because of the modular design of the Model 90 and Model 95 motherboards, the machines can easily accept new processors. This has analysts expecting IBM to be one of the first with a 486SX box.

Intel has been sourcing the unannounced chips and is preparing for volume shipment, according to sources familiar with the chip maker's plans.

AT&T foe Carter dies; helped break Bell lock

BY JOANIE M. WEXLER
CW STAFF

Tom F. Carter, the man whose innovation and persistence spawned the telecommunications interconnect industry, died Feb. 23 at the age of 67.

Between 1959 and 1966, Carter sold thousands of his self-created Carterfones — simple couplers that connected two-way radios with telephones to allow direct conversation between a radio system caller and someone on the telephone network.

The telephone companies had objected to the interconnection on the grounds that foreign attachments were restricted by an AT&T tariff.

Carter filed an antitrust suit, resulting in the 1968 Federal Communications Commission decision to strike down AT&T's tariff and rule that AT&T must show that third-party equipment will cause harm to the public network before it can be prohibited from attaching. The "Carterfone decision" opened the gates for firms ready to sell what the phone companies would not.

Carter was also founder of the North American Telephone Association, renamed the North American Telecommunications Association (NATA) in 1982. The association united telecommunications equipment manufacturers and distributors from all over the world. Carter was chairman and president of NATA from 1970 to 1974 and was chairman emeritus at the time of his death.

Ditchfield

FROM PAGE 1

Progressive, based in suburban Mayfield Heights, Ohio, has outpaced the automobile insurance industry in profit growth for the past five years. The company credits much of its success to a large database that helps it analyze more risk categories than other firms, thus finding profitable business in seemingly high-risk drivers whom its competitors refuse to insure.

Ditchfield will head an IS staff of 550 — fewer than one-third the size of MCI's — and inherit an IS budget of about $75 million, compared with $400 million at MCI. "I don't see it as smaller; I see it as very challenging," Ditchfield said. "I will be one of 10 key executives instead of one of 30 at MCI, so [the size] has a positive aspect, too."

Ditchfield will report to Bruce Marlow, Progressive's chief operating officer, and will serve on the executive operating committee that has responsibility for customer service. "That's the best part — I'm a customer service nut," Ditchfield said.

"Things will continue much as they did under Ditchfield's leadership," Zucco said. "The biggest change will be our global expansion. I hope to expand global services as successfully as we expanded the domestic services under Ditchfield."

Alan Tottle, former vice president of systems engineering and operations at MCI, said Zucco will continue Ditchfield's IS strategies. "Allan did an enormous amount for MCI, but it's not just one man; it's a team," he said.

Ditchfield joined MCI after six years as director of IS at archrival AT&T. He earned high marks for integrating IS in MCI's business with innovations such as running MCI's network software on more flexible commercial computers, overhauling the customer billing system and developing Integrated Network Management Service, an on-line link to customers' workstations.

MCI has a well-deserved reputation as a hard-charging workplace in which feisty Chairman William McGowan contacts key executives at night and on weekends via cellular telephones and portable facsimile machines. "Five years at MCI is like 10 anywhere else," Tottle said.

Ditchfield, however, said he found the MCI pace "addictive" and considers the MCI door to be open in the future. "I believe in McGowan's culture, where people can go do what they want and still be invited back," he said. "There's no reason to think that in five or 10 years I couldn't come back to MCI."

Ditchfield fills a job at Progressive that has been vacant since the May 1990 resignation of former Senior Vice President Rex Wolf. Progressive is an MCI customer, and Ditchfield said he plans to stay in touch with his former colleagues via MCI Mail.

Despite progress, doubt still remains with ISDN

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — A fish-or-cut-bait pledge last week by ISDN architects to provide Integrated Services Digital Network (ISDN) connectivity between "millions" of nationwide users by year's end 1992 was met with tempered enthusiasm by an industry that has already waited more than a decade for the technology to fully kick in.

Because of ISDN's bandwidth limitations relative to other networking alternatives, users and analysts are taking some wind out of the sails of last week's milestone announcement that switch vendors AT&T, Northern Telecom, Inc. and Siemens Stromberg-Carlson have broken their interoperability stalemate to shake hands on a common implementation of key ISDN standards.

Lack of multivendor switch interoperability — fallout from AT&T's 1984 divestiture — has been a major ISDN glitch. While its resolution should help round out the "any-to-any" allure of ISDN, industry observers said ISDN still will not appeal to all.

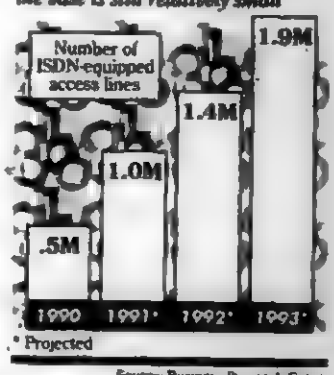
"We have an enormous requirement to connect to hundreds of thousands of people in this country alone, but current ISDN speeds [up to 1.5M bit/sec.] probably won't meet our bandwidth needs," said Howard Maynard, senior vice president and director of MIS at Young & Rubicam, Inc., an international advertising agency based in New York.

Maynard said he "very much likes the concept" of ISDN's dial-up bandwidth and volume-based pricing." However, he said, he plans to install 100M bit/sec. Fiber Distributed Data Interface local-area networks in the near future and is "concerned about the disparity between the data transfer speeds inside a building and those between buildings."

Maynard said he is worried that emerging higher speed wide-area technologies such as Synchronous Optical Network and Switched Multimegabit Data Service will not be available in time to meet his needs.

Access

ISDN-equipped access lines are projected to increase rapidly, but the base is still relatively small



Source: Business Research Group
CW Chart: Marie Haines

The switch vendor agreement was coupled with promises from several regional Bell operating companies (RBOC) to offer Primary Rate Interface ISDN service by year's end 1992. Currently, users wishing to access a long-distance carrier's Primary Rate network must hook into it via another mechanism, such as a dedicated T1 line. Paying for a dedicated line offsets some of the cost efficiencies inherent in ISDN's switched nature.

The switch vendor and RBOC announcements mean many more companies and residential users will have nationwide switched connectivity all the way through the public telephony network for voice, data, video and image services.

However, for Richard Babin, manager of information systems at the Rochester, N.Y., Police Department, "ISDN is a local issue. We will eventually use ISDN for scanning and storing reports from our local precinct offices onto optical discs. But the national connectivity doesn't help."

Dubbed National ISDN 1, 1992's ISDN will fall slightly short of the functionality specified in the CCITT ISDN standards.

Phase 1 will not allow on-demand packet switching on ISDN's "B" (64K bit/sec.) traffic-bearing channels, according to Richard T. Aloia, assistant vice president of network access technology at Bellcore, the RBOCs' research and engineering arm.

The first release, he said, will allow users to "nail up" — and thus continually pay for — a 64K bit/sec. channel for packet switching, perform on-demand circuit switching and use the "D" signaling channel for control or on-demand packet switching.

Phase 2, slated to roll out one year later, will allow the B channels to be used for packet switching and a portion of the D channel to be used as a virtual private network connection, he said.

Some industry observers were still expressing frustration that ISDN is too little, too late.

"This is all a last gasp for ISDN," said Kenneth G. Bosomworth, president of International Resource Development, Inc. in New Canaan, Conn. He said millions of users can already access ISDN, but "very few have chosen to take advantage of it. If you split the customer market into 20 segments, only two or three will have requirements that are sensibly met by narrowband ISDN. That will still be true two years from now."

And the good news . . .

While industry observers agreed that ISDN will not be the be-all, end-all communications vehicle, many said they see the technology as complementary to other networking alternatives and valuable for cost efficiencies in certain applications.

Eastman Kodak Co., for example, plans to run electronic data interchange applications over ISDN to its many suppliers, customers and distributors, according to Charles J. Gardner, director of information technology infrastructure. In addition, Gardner said, Kodak is banking the success of some of its future products on the technology.

"We're considering offering the option of converting a roll of film to images on [compact disc/read-only memory] instead of to photographs," Gardner explained. "This would allow our customers to pull up the images on their TV set and go call Grandma. They can then send the images across the wide-area [network] and have a conversation with her at the same time."

Jeff Fritz, a data communications analyst at West Virginia University, added, "For a lot of applications, 64K bit/sec. is just fine. For trading files, for example, ISDN lines are faster and much more reliable than modems and analog lines."

Fritz uses Basic Rate Interface (144K bit/sec.) ISDN to connect remote users to local-area networks, which he said saves him several hundred dollars per month in T1 fees. He added that he expects his connectivity needs to expand soon.

JOANIE M. WEXLER

IBM fixing midrange disk drive woes

BY MARYFRAN JOHNSON
CW STAFF

Widespread disk drive failures on IBM midrange computers have forced the computer giant to replace between 1,000 and 2,000 of its 9335 drives in the past year, while manufacturing delays are bogging down shipment of its successor, IBM officials confirmed last week.

IBM is about halfway through a massive "preventative maintenance" program, begun in February 1990, to replace certain 9335 disk drives. The flawed drives, which develop spindle vibration after extensive use, were produced from June 1988 to March 1989 at IBM's manufacturing facility in Havant, England.

Industry analysts said that same manufacturing facility is now struggling with supplier problems as it ramps up volume production of the 9336 disk drive, the long-awaited successor to the 9335. Announced in August, the 5¼-in., 857M-byte 9336 drive is 38% faster than its predecessor and runs in both the RISC System/6000 and Application System/400.

William Reedy, IBM director of storage systems, declined to comment on shipping problems of the 9336 but acknowledged that customer "demand is exceeding our original estimate."

In the meantime, IBM is furiously peddling its older midrange disk drives — the 9335s and 9332s — offering steep discounting and special incentive programs.

Introduced in late 1986, the 14-in. 9335 drives sold at a breakneck pace, with an installed based now numbering more than 200,000, according to International Data Corp. (IDC) in Framingham, Mass.

Customer patience

"It has not been one of the best performers in the world, but customers aren't upset with IBM about it because IBM dealt with the problems," said David Vellante, an IDC analyst.

"We've had failures of 9335s on a frequent basis," said Leroy McDaniel, manager of midrange technology at Reynolds Metals Co. in Richmond, Va. "But IBM knows the bug is there, and they're trying to prevent hard failures with preventative maintenance, which is admirable."

Out of 50 drives at Reynolds headquarters, five have been replaced so far, but Reynolds sites in other states are also reporting problems, McDaniel said.

In a recent user survey that included 926 disk drive units, Reliability Ratings, Inc. in Needham, Mass., found that one out of 10 installed 9335s fails annually. That 10% failure rate was also confirmed by other sources in the industry.

Reliability Ratings found that the mean time between failure for 9335 drives was 84,939 hours — considerably poorer performance than the industry average for 5¼-in. drives, which often go 150,000 to 200,000 hours without a failure, said Greg Stralcoch, president of Reliability Ratings.

Meta Group, Inc., a market research firm in Westport, Conn., recently published a warning to its customers, advising them against installing any more 9335 drives.

"The real problem for IBM is they don't have enough head disk assemblies to replace [the problem drives], and the 9336 is not shipping in full production yet," said Nili Young, an analyst at Meta Group.

Reedy called Meta Group's report "inaccurate" and said that IBM has enough disk assemblies to replace the flawed 9335s.

Despite the widespread nature of the problem, very few customers have reported any loss of data, in part because of the error detection mechanism located on the AS/400.

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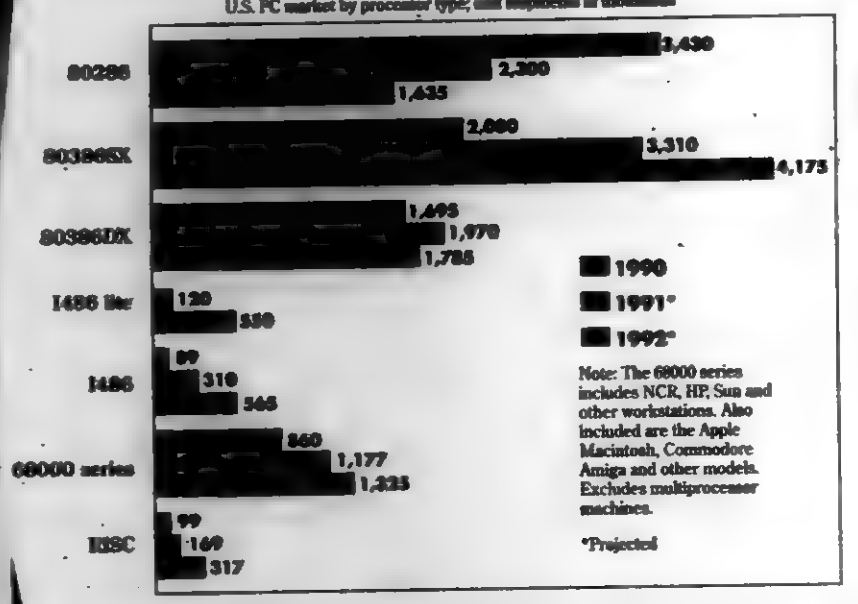
TRENDS

Personal Computer Market

As the U.S. PC market braces itself for a slowdown, price cuts and strategic product marketing in 1991 will make Intel Corp. 80386SX-based products one segment to watch

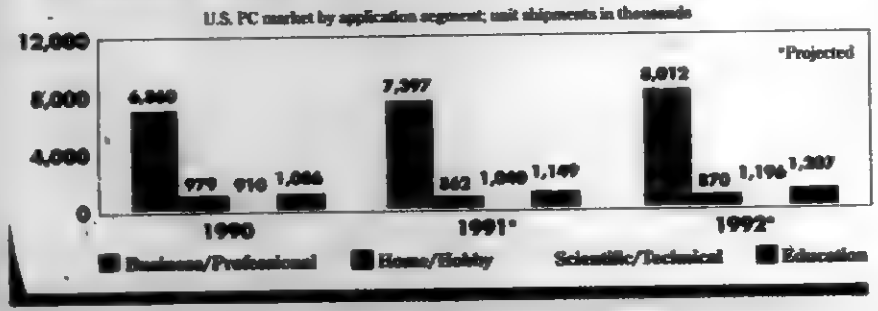
80386SX-based machines boast the most in 1991

Price drops will prompt buying in most areas, especially for 80386SX products, which are expected to drop in early 1991. 1486-based machines will also fare well after a slow start



Application hot spots

The business and professional segment gets a boost from telecommuters and home-based businesses. Microsoft's Windows 3.0 will also spur new sales in the coming year



Source: International Data Corp., Framingham, Mass.

CW Chart: Doreen St. John

NEXT WEEK

Change keeps things rolling for the IS staff at Nissan's U.S. headquarters in Southern California. Manager's Journal takes a look at how a recent IS reorganization orchestrated by **Sheleene Sendaba**, vice president of IS and finance (left), and **Evan Wride**, director of IS, fits in with the company's battle against Toyota and Honda for U.S. market share.



Alan Levenson

Why would IS managers be interested in fuzzy logic, a concept based on imprecise reasoning rather than the yes/no logic of traditional computers? Because fuzzy logic techniques can have a positive impact on business applications. In Depth will clarify the idea of fuzzy logic and reveal the real-life ways in which it can be used in business.

INSIDE LINES

Dreams of days gone by?

Despite NCR Chairman and CEO Charles Exley Jr.'s seeming hatred of AT&T's takeover efforts, one systems integrator who used to work for NCR says his former colleagues tell him they are "excited" by the prospect of working for AT&T. "The prestige factor is a big thing for them," says the value-added reseller, who still works closely with NCR.

Hall of Shame nominee

Logisticon's 1990 disabling of Revlon's computers when Revlon allegedly failed to pay its bills was cited as one of 11 "Gutsy Decisions" of the year in business by *Industry Week* magazine. The publication called the three-day shutdown "the shot heard round the software world" but noted that Logisticon faces the challenge of assuring future customers that they won't suffer the same enforcement action.

DOS 5.0 slow to go

DOS 5.0, which is supposed to ship this month, is getting yawns from some pretty large beta testers. Among its weak points, we're told, are the following: It won't run in high memory, you can't reinstall over it if you flub the initial installation, it still lacks a decent user interface and file handling is "poor" and "slow as a pig."

Compaq takes pen in hand

Since IBM has allied itself with Go Corp. in the looming pen-based PC operating system rivalry, Microsoft has found its own partner. Compaq is expected to announce support for Microsoft's upcoming pen recognition system next week, promising a laptop or notebook PC line that will run the operating system and read input from a pointing device. In another case of hardware preceding software, Microsoft will demonstrate its new "Ballpoint" pointing device next week.

Network contention

A Netware user is eagerly awaiting what he says are reports that Novell is considering coming up with its own client operating system. It just so happens that Novell has inked a pact to bundle DR DOS with its ELS Netware, and our source is fervently hoping this means DR DOS will be that client.

Nothing to Sniff about

Plugging perhaps the most notable hole in its product line, Network General plans to introduce an enterprisewide network analyzer this spring. The firm's much-acclaimed Sniffer analyzer is now limited to working on one network at a time. A network administrator briefed by Network General said he was told the new product would "reverse one of Sniffer's shortcomings: its inability to report anything more than traffic surges from one network to another."

Hopefully, just as ineffective . . .

A virus has shown up in a Montreal business school, Ecole des Hautes Etudes Commerciales. The computer analyst who discovered the intruder, which he labeled the "Scud" virus, says it modifies the boot sector of a hard disk so it can no longer be accessed.

Tacky, tasteless and out of touch

Demonstrating remarkably bad taste, the Semiconductor Industry Association penned a letter to President Bush purportedly to congratulate him on his leadership of the Gulf war but actually to lobby for further trade tariffs. The association noted the use of American semiconductors in U.S. high-tech weapons and went on to make a pitch for a new agreement to open up Japan's market to U.S. semiconductor vendors. The men and women in uniform who put their lives on the line were relegated to one measly sentence in this missive.

Assistant News Editor Jim Connolly is taking over the gatekeeper role this week. Tips and questions should be directed his way at (800) 343-6474; you can also check in via facsimile at (508) 875-8931 or send electronic mail to COMPUTERWORLD *on MCI Mail; MHTS78A on Prodigy; or 76537,2413 on Compuserve.*



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COMPUTERWORLD

Pay, adventure draw IS job seekers to Kuwait

BY MITCH BETTS
CW STAFF

The Kuwait gold rush is on. Adventurous programmers and frustrated information systems executives in the U.S. are clamoring to get what they hope will be high-paying IS jobs in Kuwait, which has embarked on a $50 billion effort to recover from the Persian Gulf war.



"I'd like to cash in on the money," said a Florida-based programmer/analyst, one of several IS professionals who placed anonymous calls to *Computerworld* last week seeking information about jobs in oil-rich Kuwait. He said he hopes to make $50,000 to $70,000 per year tax-free by landing a job in the devastated country.

A former vice president of IS at a Midwestern bank who was pushed out of his job by a merger said he wants to work in Kuwait because he is excited by the prospect of building information systems from scratch using the latest software and hardware. Besides "it would be a great way to spend the next 20 years before retirement," he said.

Several IS managers looking for work in Kuwait have called Shirley Bascom, a recruiter at Compusearch, a division of Management Recruiters International, Inc. in North Canton, Ohio. Some of the managers are unemployed because of corporate consolidations or mergers, while others have peaked at their present companies and are looking for new opportunities, she said.

The interest in Kuwait has been triggered by the current oversupply of IS managers in the U.S., Bascom said. "These are managers with grown children and the flexibility to move."

San Francisco-based Bechtel Corp., which will have a major role in rebuilding Kuwait's oil industry, has been so deluged by

Continued on page 8

SAA hits open systems track

BY JOHANNA AMBROSIO
CW STAFF

SOMERS, N.Y. — IBM will endow its Systems Application Architecture with more open systems features later this year and will continue a push to elevate its Unix-based AIX operating system to SAA-like status.

In an announcement planned for the second half of this year, IBM will build on its former statements of direction regarding interoperability between the two environments. Instead of providing only basic SAA-to-AIX links, IBM will mix and match elements between the two. IBM will also detail how it plans to interconnect with non-IBM equipment, company executives said in recent interviews.



"WE ARE DRIVING all our products into an open systems view."

Mike Saranga
Assistant General Manager
IBM's Systems Structure and Management Group

Included in the announcement will be statements of direction about IBM's plans to incorporate open systems elements — including the Posix interface, a distributed transaction processing monitor and the Open Software Foundation's Distributed Computing Environment — into both the SAA and AIX product lines.

Listen up

The new strategy is getting good reviews from users. "The users of the world have said, 'Look, guys, we want open systems, and we want to choose our players.' " said Dan Turner, president of the Petrotechnical Open Software Corp. user group in Houston. "For 30 years, IBM has asked but hasn't really listened. Now, maybe they're going to listen.

"I'd like to see how they're going to do all this," Turner added. "Connecting SAA to AIX could be an architectural nightmare, but it's fundamental that they're going to have to do it."

"We are driving all our products into an open systems view," said M. "Mike" Saranga, assistant general manager at IBM's Systems Structure and Management Group here and the person who oversees the company's open systems strategy. "Some of them are moving at different rates, but our thrust is to get

Continued on page 92

Give this programmer sun, surf and software

BY CAROL HILDEBRANDT
CW STAFF

You know the type. The neighbor who comes back from paradise and says, "Yeah, it's a nice place to visit, but I wouldn't want to live there."

"Hogwash," you think. "Bet you'd jump at the chance."

Just ask Jack Geis.



Nancy Reed

St. John: *Telecommuting in paradise*

Geis, 45, decided that his many years as a programmer in the San Diego area were enough. So he gave up the workaday IS life, sold everything he owned except his Jeep and headed for tropical St. John in the U.S. Virgin Islands.

"I got tired of the traffic and the routine and the accidents on the freeway," Geis said. "I basically came here to get away."

But before he left, he told his firm that if it got in a bind, he would help out. That paved the way to one of the sweetest telecommuting setups imaginable.

"I wasn't here but about two weeks when they called me to do some programming for them," he said. Geis set up a consulting shop under the moniker Island Programming and worked for his former employer, Machine Industries, Inc., on a part-time basis.

"Basically, I just get up when I want to and program when I

Continued on page 16

IBM seeks converts to peer-to-peer plan

BY ELISABETH HORWITT
CW STAFF

LONDON — IBM launched a major campaign last week to make its Systems Network Architecture-based peer-to-peer networking strategy more attractive to users — local-area network users in particular.

Leading the way is expansion of the company's Advanced Peer-to-Peer Networking, a platform that eliminates much of the dirty work involved in setting up and maintaining peer-to-peer networks.

APPN is being extended beyond its current Application System/400 niche to OS/2 Extended Edition, the IBM 3174 Establishment Controller and a variety of non-IBM systems.

IBM also secured endorsements from some major LAN players, including Apple Computer, Inc. and Novell, Inc., to add APPN nodes.

We are optimizing SNA for LAN environments and making it open to other systems," said Rick McGee, IBM's manager of communications systems architectures. As part of that optimization, the APPN software for OS/2 includes a new version of the LU6.2 peer-to-peer protocol, which is said to be twice as fast as the previous version.

APPN is essential for effective peer-to-peer SNA networking because it has dynamic routing, directory and configuration capabilities.

Eliminating waste

At Chemical Waste Management, for example, APPN "eliminates a lot of the complexity" of tracking resources across some 20 AS/400s as well as that of configuring systems at remote hazardous waste sites, according to Michael Hansen, the Waste

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Adobe typefaces to take shape in the hands of users as Type 1 is modified to give users more flexibility. Page 91.

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Product Spotlight — Not all project management software requires a hard hat or an engineering degree. Page 55.

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Quotable

"We have too much invested in our technological setup to get caught up in basing purchasing decisions on these courtroom squabbles."

BILL WALKER
PAN AM

On the Apple/Microsoft/HP courtroom saga. See story page 4.

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The 5th Wave



"WE SORT OF HAVE OUR OWN WAY OF PREDICTING NETWORK PROBLEMS."

EXECUTIVE BRIEFING

■ **Kuwait changes from a battle zone to a career opportunity zone** in the minds of some information systems professionals. U.S. technology executives and programmers are seeking IS-related work in the massive postwar rebuilding effort. Bechtel, which is expected to reap a windfall of construction projects, had to install an automated response system to handle the volume of calls from job seekers. **Page 1.**

■ **Kraft General Foods solves a manufacturing integration problem** by getting two vendors to link their systems together. After working with Kraft for a year, HP and Allen-Bradley announce links between factory controllers and the HP 9000 via Ethernet. The link is based on Transmission Control Protocol/Internet Protocol, but Allen-Bradley says it is still committed to Manufacturing Automation Protocol/Open Systems Interconnect. **Page 12.**

■ **IBM appears to boost open systems,** revealing plans to elevate the status of AIX and incorporate other Unix versions into SAA and AIX. Users praise the move but warn that IBM could face "an architectural nightmare" in solving the technology challenges. **Page 1.**

■ **The IS job market** has followed the rest of the economy in putting on the brakes. Hiring is down and becoming more selective, and chances for short-term improvement are slim. **Page 47.**

■ **Apple wins a round** of its controversial 1988 "look and feel" suit against Microsoft and HP. A federal judge disallows several defendants' motions, which could have undermined Apple's contentions. **Page 4.**

■ **IBM Credit Corp. settles out of court** with Cambex but says it will maintain an aggressive stance regarding the third-party leasing and parts markets. Cambex will continue to face gun-shy customers, whom IBM warns can be sued if they know they are using illegally distributed components. **Page 4.**

■ **A mouse for laptop users** is expected to be announced today by Microsoft — with a money-back guarantee if the clamp doesn't fit the keyboard. **Page 16.**

■ **Project management software** is increasingly being used for systems development work. As a result, software vendors are branching out from traditional aerospace and engineering applications. **Page 55.**

■ **Fuzzy logic technology** is gearing up for business. Likely targets are companies whose applications contain a large number of variables or decision-making input from experts. **Page 69.**

■ **The dreaded pink slip** can be turned into a positive experience. IS professionals can learn to read the signs and prepare themselves for the termination interview — and another job — before the fact. **Page 77.**

■ **The used computer market** can be a treasure trove of bargains, but let the buyer beware. Purchasers should research and test all systems thoroughly before purchasing and watch out for hot computers to avoid getting taken to the cleaners. **Page 84.**

■ **On-site this week:** One year into its major imaging project, Northwest Airlines in Minneapolis is reaping the benefits of more accurate and timely ticket processing. **Page 31.** Elsewhere in the skies, US Air sticks to tradition in networking, using only LANs within IBM's SNA scheme. **Page 43.** The Consumer Price Index economic yardstick compiles 85,000 price quotes each month with the help of SAS Institute statistical software at the U.S. Bureau of Labor Statistics. **Page 32.** Artkraft Strauss has been in business nearly 100 years lighting signs in Times Square and elsewhere, but it didn't join the computer age until the late 1980s. **Page 37.**

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ICC, Cambex settle parts suit

BY NELL MARGOLES
CW STAFF

BOSTON — What weeks ago appeared to be a building tidal wave of lawsuits by IBM Credit Corp. (ICC) against third-party computer leasing industry players receded last week as ICC and plug-compatible memory vendor Cambex Corp. settled their differences out of court.

However, certain terms of the settlement served as a reminder that customers as well as vendors could be sued by ICC.

In addition, one analyst said, Cambex's relief at being off the court docket may be short-lived and replaced by anxiety if the terms of the agreement cause customers to shy away from upgrading ICC-leased machines with third-party memory.

In a suit filed last month in Boston federal court, ICC accused Cambex of illegally stripping leased IBM equipment and reselling parts [CW, Feb. 11]. Last week's pact gave substantial benefits to both sides: for ICC, Cambex's pledge to refrain from any transfer of ICC property without the owner's written consent; for Cambex, ICC's promise not to pursue Cambex customers either legally or administratively with regard to the allegedly tainted transactions.

When ICC sued leading third-party lessor Comdisco, Inc. in January, industry observers noted that users as well as lessors could be seen as party to the allegedly illegal deals. At that time, the observers speculated that ICC could extend its legal onslaught to customers. Such speculation arose again one week later when ICC sued EMC Corp. and Cambex.

The countervailing argument was that while ICC might find it strategic to sue a competitor, the company would not sue its own users.

ICC, however, has consistently declined to back the extremity of either such premise. From President Harry Kavetas down, spokesmen have adamantly maintained that the firm is neither pursuing nor protecting any targeted group.

"These lawsuits are aimed at the initiators of illegal transactions," a spokesman reiterated last week. So far, he said, "we don't have any evidence that customers knew that parts were being dispersed in any illegal way." Does this mean that if such evidence arose, ICC might haul a customer into court? "We have never denied it," the spokesman said.

Under the settlement, Cambex's $5.9 million payment to ICC will defray the cost of ICC's replacing Cambex-labeled 3090 memory with IBM-made memory in user systems. Customer indemnification was critical to Cambex, said Chief Financial Officer Sheldon Schenkler. While still contending that his firm did no wrong, Schenkler conceded that seeing their supplier hauled into court made customers nervous about dealing with Cambex.

"The FUD factor — fear, uncertainty and doubt — was very large," he said. So were the estimates of what it might have cost to defend the suit, he added. A $30 million to $40 million firm with limited in-house legal clout, Cambex "could have lost even if we had won," he said.

Meanwhile, in light of both the ongoing suits and last week's settlement, "obviously, customers are going to be very shy about doing memory upgrades," said Thomas Donovan, president of Framingham, Mass.-based Technology Investment Strategies Corp.

One down ...

Highlights of last week's settlement agreement between ICC and Cambex:

- Cambex will not sell or sublease any ICC-owned computer or part without written permission from ICC
- Cambex will abide by the letter of ICC's leasing terms, including future subleasing amendments
- Cambex will pay $5.9M to ICC as the replacement cost for 3090 memory previously sold/subleased by Cambex
- ICC will drop all charges against Cambex and will not take action against the customers in any of the Cambex deals in question

... and two to go

- Comdisco's motion to dismiss ICC's Jan. 24 suit slated for April 24 hearing in Delaware Chancery Court
- EMC answered ICC's Feb. 1 suit with motion to dismiss. No hearing is scheduled as of yet

Source: IBM Credit Corp./Cambex agreement

CW Chart: Marie Haines

Apple wins key court round

BY JAMES DALY
CW STAFF

SAN FRANCISCO — Although it is likely to be months before the case is fully resolved, Apple Computer, Inc. won a round in its long-running copyright infringement suit against Microsoft Corp. and Hewlett-Packard Co. last week when a federal judge struck down several key defense motions that could have undermined Apple's charges.

U.S. District Court Judge Vaughn Walker upheld Apple's contention that the visual elements of the Macintosh screen display are original and were not part of the technology licensing agreement Apple inked with Microsoft in 1985. That pact was later used in the production of Microsoft's Windows 2.03 and HP's New Wave.

Apple sued Microsoft and HP in March 1988, charging that certain audio and visual elements of the Macintosh, including overlapping windows and the manipulation of icons, were not covered by the scope of the 1985 agreement. Microsoft and HP claimed the Macintosh interface is not entitled to protection because it was copied from earlier programs, including Xerox Corp.'s so-called Star interface.

Several analysts have said that the runaway success of Windows has come at the expense of Macintosh sales. If Apple prevails, however, it could draw large royalty payments out of Microsoft.

The ruling was important for Apple, analysts said. "It definitely removes a cloud that was hovering over the Apple front," said Benny Lorenzo, an analyst at Dillon, Read & Co. in New York.

Because Walker ruled that the few remaining questions of copyright infringement would be settled "in conjunction with an adjudication," Microsoft and HP also declared victory. "We are pleased that the court has further narrowed the issues," an HP statement read.

While the slow-moving legal drama packs great importance for the vendors, it is unlikely to affect user purchasing plans. "We have too much invested in our technological setup to get caught up in basing purchasing decisions on these courtroom squabbles," said Bill Walker, manager of decision support systems at Pan American World Airways in Rockleigh, N.J.

Others said they will wait for it to hit home before they are concerned. "Until I see a ruling that says Microsoft is going to recall Windows, I'm not worried," said Robert McPhee, a senior engineer in the imaging systems department at Du Pont Co.

Programmer overtime law clarified by Dept. of Labor

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Department of Labor has issued regulations effective March 29 that implement and attempt to clarify the 1990 law exempting thousands of programmers from mandatory overtime pay.

Signed into law Nov. 15, the legislation exempts many computer programmers, systems analysts, software engineers and similar occupations from the traditional labor rules requiring 150% overtime pay for hourly workers [CW, Nov. 5].

Industry groups have argued that the law is needed because many employers prohibited programmers from working overtime and customers balked at paying 150% overtime rates for highly paid programmers.

The department said the exemption covers computer professionals who are paid on an hourly basis and make more than 6½ times the minimum wage, which will rise to $4.25 per hour on April 1. That translates to a threshold of $27.63 per hour.

In addition, virtually all computer programmers and analysts who are paid a guaranteed weekly salary will be exempt from mandatory overtime pay because the new law classifies them as exempt "professionals," said Harvey Shulman, general counsel for the National Association of Computer Consultant Businesses (NACCB). In the past, salaried programmers were exempt only if they qualified as administrative and executive employees.

For computer professionals to qualify for the exemption, the regulations said, they must perform one or more of the following primary duties:

- Create or modify computer programs or software related to machine operating systems.
- Design computer systems based on user specifications.
- Apply systems analysis techniques, including consulting with users, to determine hardware and software functional specifications.

Shulman noted that firms may pay computer professionals premium rates for overtime work, but it is not mandatory.

He added that the regulations are generally well written but said the NACCB will urge the Labor Department to fine-tune the rules to ensure the exemption covers software engineers, as Congress intended.

COMPUTERWORLD

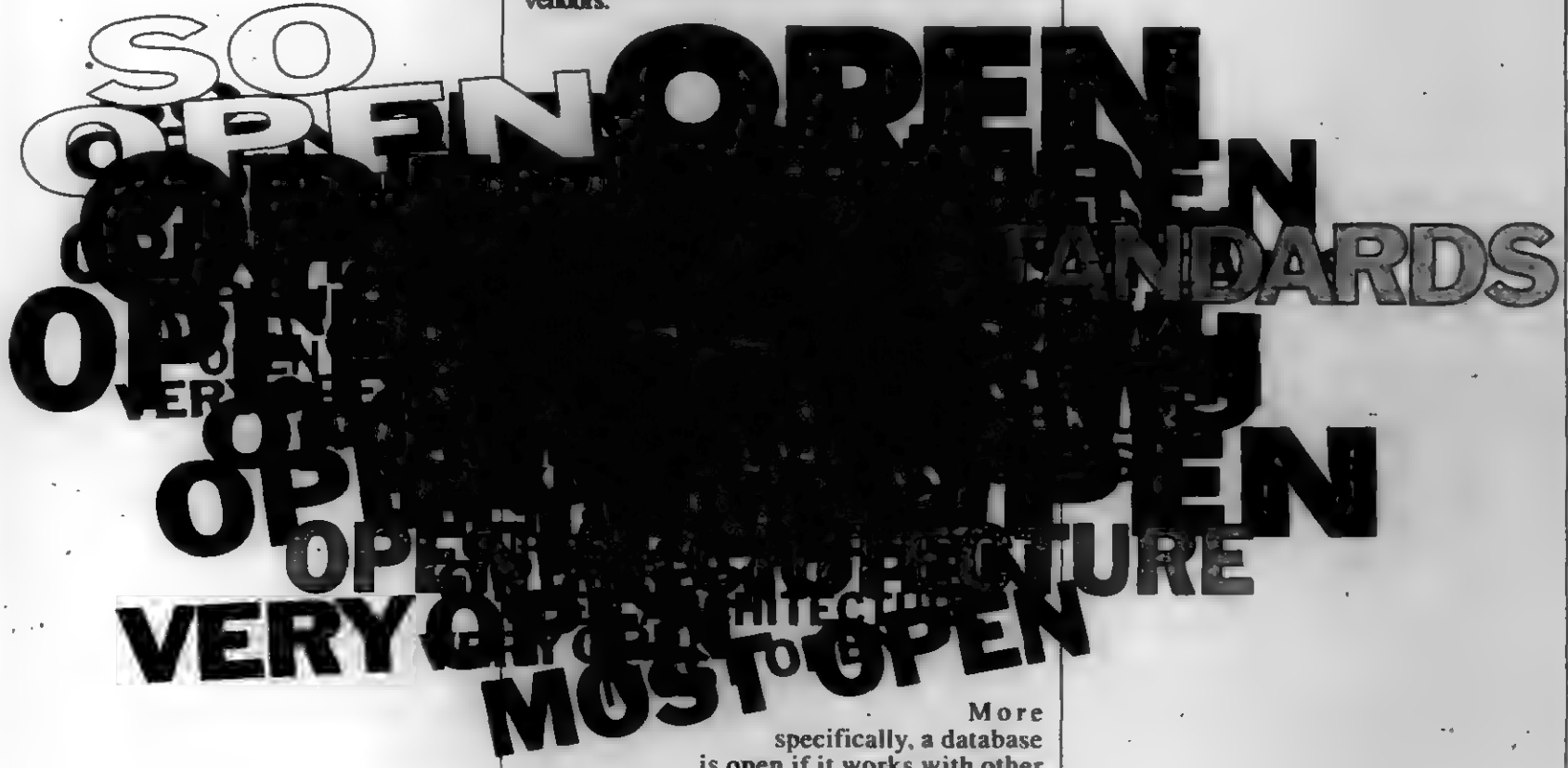
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Closing Arguments

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Today, some software companies claim that their software products are "open." They may even graft the word onto their product names. It is a confusing situation, but a clear definition of "open" is finally emerging.

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User gripes on OS/2 to spur IBM marketing blitz

BY PATRICIA KEEFE
CW STAFF

IBM will launch a flurry of OS/2 promotions and marketing deals within the next 30 to 60 days, according to sources who said the vendor is finally reacting to complaints about OS/2 packaging and pricing [CW, Feb 25].

There are also reports of what several people called a "big explosion-type" announcement in June similar to what Microsoft Corp. did for the Windows launch. Meanwhile, IBM will kick off OS/2 road shows.

It's about time, said observers, who noted that users are beginning to abandon the OS/2 Presentation Manager ship for Microsoft's Windows at a rapid rate. Developers have long since thrown in their lot with Windows (see story at right).

OS/2's fortunes have sunk so low that two weeks ago, attendees at a user group meeting in New York asked an IBM official not only whether the company was going to market Microsoft's Windows but also whether it had any plans to market OS/2. "That broke up the room," said Bill Zack, a consultant at Leveraged Technologies, Inc., the group's sponsor.

The speaker, John Soyring, IBM director of software development support for Personal Systems, told the New York users there will be "a lot of announcements" in the next few months, Zack said. Soyring acknowledged IBM has done a poor job of marketing OS/2.

Plugging OS/2

IBM is not going to market Windows, but it is exploring every avenue to ensure OS/2's future, Soyring said. This has included dispatching IBM executives to personally reassure wavering information systems managers and skeptical user groups.

In addition to providing financial incentives to developers, Soyring said IBM will "refresh" the OS/2 software developers kit so that it is smaller and faster.

Sources said IBM will also cut the price of both the kit and OS/2. "Three thousand dollars is a lot for a developer kit. At this point, they really should be giving it away," said Micrografx, Inc. Chairman Paul Grayson.

Sources said IBM is also preparing to bundle OS/2 with some or all of the Personal System/2 line, including new Intel Corp. 80386-based boxes that will reportedly "break the price point on the 386."

Burgeoning bundling

The bundling concept is expected to be extended to agreements with a number of compatible personal computer vendors and beyond the U.S.

On the software side, Soyring told the user group that IBM will port over the applications now packaged with Windows, including the clipboard and calendar.

Soyring also made it clear that IBM "stands ready to make good on OS/2 promises. If for some reason Microsoft won't, IBM will finish it," Zack said.

Frank Daubeck, a consultant at Communications Network Architects, said IBM may go even further by building hooks into OS/2 to provide support for non-IBM platforms and a wider girth of applications.

IBM is also counting heavily on the year-end formal release of OS/2 Version 2.0 to win over skeptics. Soyring told the user group IBM was "embarrassed" by OS/2 1.2. In comparison, IBM is working on a way to run Windows applications better than Windows itself, he said.

Users will find more usable memory in OS/2 Version 2.0's DOS box than they would have under DOS itself, Zack said. "IBM wants to make sure other vendors' virtual memory managers work in the compatibility box," he said.

No limelight for OS/2 at show

BY JAMES DALY
CW STAFF

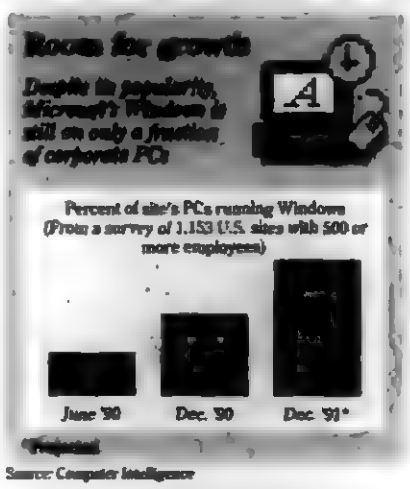
SAN JOSE, Calif. — Last week's Windows & OS/2 Conference offered the clearest indication yet that many users believe OS/2 and Presentation Manager are terminally ill, despite IBM and Microsoft Corp.'s insistence to the contrary.

"I'll be gentle and say the future of Presentation Manager is not bright," said Steve Morse, a senior technical officer at Manufacturers Hanover Trust Co. in New York. "No one is questioning OS/2's technological prowess, but the market momentum is simply not there."

Among the 15,000 attendees were some who came to see the latest and greatest offerings in the Presentation Manager world but discovered they were rare. Hundreds of firms proudly boasted about their Windows applications, while similar Presentation Manager packages were tougher to dig up.

Additionally, Windows was clearly the darling of many programmers who crowded a series of Windows workshops sponsored by the Software Entrepreneurs Forum and visited the nearly 50 firms exhibiting programming tools for the graphical user interface.

Several attendees noted that the success of Windows, coupled with Microsoft's influence in setting operating system standards, could deal a severe — perhaps mortal — blow to Presentation Manager. "OS/2's lack of developer support could be a potentially killer problem," said Mark Ryland, a software analyst at Washington, D.C.-based law firm Latham & Watkins and a self-confessed fan of OS/2 and Presentation Manager.



Source: Computer Intelligence

Such portentous rumblings have caused second thoughts for those once sold on OS/2 and Presentation Manager. "A few years ago, we believed that Windows was an immature system which would never amount to anything and [that] by 1991, 50% of the world would have OS/2," said Howard Dyckoff, a member of the Technical Services Division at Chevron Corp. "Now we're having a tough time convincing managers to move to OS/2 as a target platform."

While OS/2 may be technologically superior to DOS, tacking Windows onto existing DOS applications is a lot easier than committing the expense and manpower to get OS/2 running.

"Windows and Presentation Manager aren't dramatically different, but with Windows, all you have to do is slap down $80 for the program and away you go," said Walter Natzic, president of software development firm Aaron-Ross Corp. in Glendora, Calif.

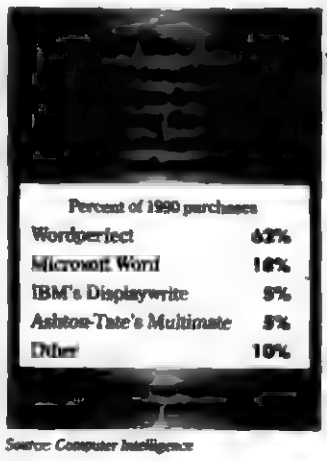
However, users are still not counting Presentation Manager out. "When we have multiprocessor-based PCs, then I think you'll see more interest in Presentation Manager — if it's around that long," said Richard Villa, a member of the IBM PC User Group in Huntington Beach, Calif.

Analysts said interest in Windows should increase this year when heavyweights such as Lotus Development Corp., Wordperfect Corp. and Borland International, Inc. release Windows versions of their most popular products.

Displaywrite, Xywrite on the way out

BY PATRICIA KEEFE
CW STAFF

IBM confirmed a joint development and exclusive marketing agreement with Xyquest, Inc. last week to develop a family of graphical word processors.



Source: Computer Intelligence

The pact signals the end of the line for future major releases of two character-based word processors: IBM's Displaywrite and Xyquest's Xywrite.

Users of these packages will be encouraged, possibly via low-priced promotions, to upgrade to the new product line, which is to be called Signature.

It may be too late for IBM. Brunswick Bowling & Billiards Corp. in Muskegon, Mich., has replaced Displaywrite with Wordperfect Corp.'s Wordperfect word processor. An East Coast power company that has several hundred Displaywrite users is moving to Wordperfect as well, according to the manager of end-user computing. "We know Displaywrite doesn't have a glowing future; IBM essentially said as much [to us]," he said.

IBM looked at moving Displaywrite into the graphical world but "didn't feel it could provide the appropriate solution for customers," said Tom Fornoff, manager of editor marketing at IBM. "Signature will be our strategic direction in word processing," he added.

IBM said it will continue to provide "minor upgrades," typically covering support for new printers, displays and desktop systems. Support for Displaywrite 4.2 will be extended to the end of 1992, when support for Displaywrite 5.0 is slated to end.

Signature is mostly under development at Xyquest. In fact, Xywrite IV will be repackaged as Signature, Xyquest marketing manager Judy Mintz said.

Xywrite users will be able to bypass the graphical aspects of the new package and return to character-based commands.

Big adjustment

Displaywrite users will face the biggest learning curve, she predicted. "They will not look the same," Fornoff agreed, adding, "We've spent a lot of time worrying about it."

He also claimed Displaywrite users told IBM that the only stringent requirement was file compatibility. Displaywrite document libraries will be fully supported, and Displaywrite files will be automatically converted. Users can also remap their keyboards to Displaywrite.

IBM and Xyquest plan to deliver Signature on three platforms: DOS, Microsoft Corp.'s Windows and OS/2. Displaywrite will not be ported to Windows. Signature is scheduled to ship next quarter.

Fornoff said the DOS version is in beta testing and the Windows version is in alpha testing. OS/2 will come later, Mintz said.

Compaq eyes Silicon Graphics

Compaq Computer Corp. is reportedly considering buying as much as 20% of workstation maker Silicon Graphics, Inc. Analysts who follow the companies said they are convinced the sale will take place and expect an announcement in early April.

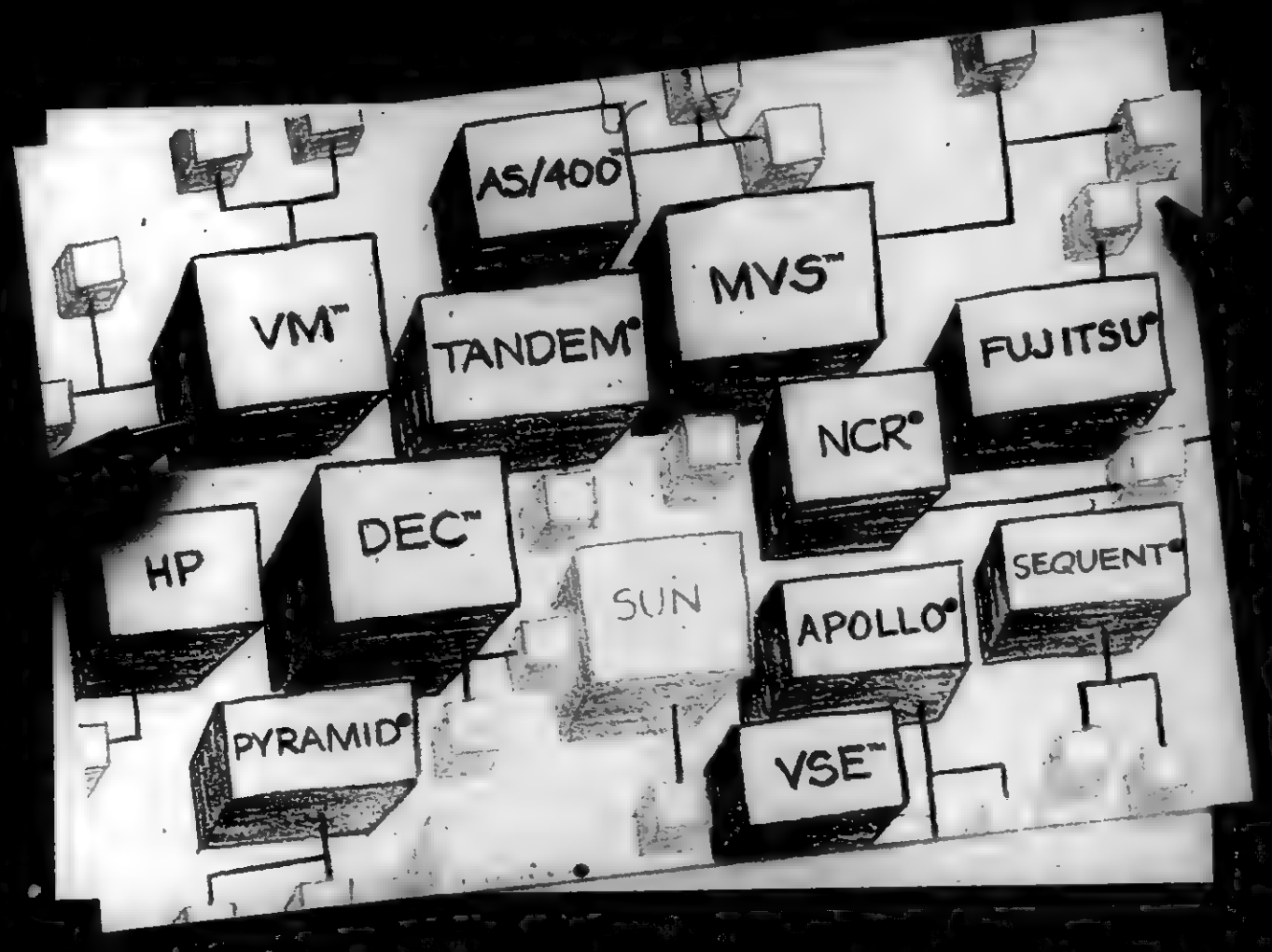
The synergy between the two firms is perfect, analysts said. Compaq, which acknowledged interest in the workstation market, does not have the skills and technology necessary to compete alone in that market, said Mark Stahlman, an analyst at Alex. Brown & Sons, Inc.

"Silicon Graphics is launching an effort to drop product prices by roughly 50%," Stahlman said. To do this, it needs expertise in volume manufacturing — an area in which Compaq excels, he said.

Silicon Graphics introduced a personal computer graphics board a few months ago.

Last month, the workstation vendor admitted to talks with Compaq and other companies on "strategic business relationships," but it denied involvement in merger talks.

RICHARD PASTORE


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NEWS SHORTS

Price cuts for IBM disks

IBM cut prices last week by up to 5% on 3990s and 3390s, its high-end mainframe disk controllers and drives. The cuts affect some associated Escon products as well. This move comes just weeks after a previously announced price increase went into effect. "This is independent of competitive pressures," which have been minimal, said David Vellante, vice president of storage research at International Data Corp.

SAP strikes deal with EDS

SAP America, Inc., a subsidiary of SAP AG, has entered a marketing agreement with Electronic Data Systems Corp. (EDS). EDS will provide consulting services and joint marketing for SAP's R/2 System. The R/2 System is an on-line, real-time mainframe software system for business applications.

Client/server package due

Cooperative Solutions, Inc. in San Jose, Calif., will announce a system software and multiuser applications development platform for client/server architectures this week at Esther Dyson's PC Forum. Called Ellipse, the product will run on OS/2 and is scheduled to ship in July. A Microsoft Corp. Windows-based version will be released later this year. Cooperative Solutions offers products for on-line transaction processing.

Compaq trims Deskpro price

Compaq Computer Corp. last week dropped the price of its Deskpro 386S Model 40 from $3,199 to $2,999. Sales of the 16-MHz Intel Corp. 80386SX box have fallen 50% from October to January, according to Storeboard/Computer Intelligence. Conversely, U.S. sales of the 20-MHz 386SX-based Deskpro 386S/20 have picked up 29% in the same period. This is a sign that users would rather pay extra for 20-MHz performance, observers said.

Ultimate blends Pick, Unix

Unable to decide between Pick and Unix? Now you may not have to. The Ultimate Corp. last week introduced Ultimate Plus, an operating system that combines Pick Systems' Pick and Unix features. The new system is primarily targeted at Ultimate's existing customer base, so they can migrate their Pick applications over to the newer Unix-based hardware.

Novell dims Lantern

Budget-bound managers of small networks seem to have made their voices heard at Novell, Inc. The network operating systems maker has introduced a low-end version of its Lantern monitor. Called Lantern LTD, it will monitor networks of up to 32 devices for $2,495, and it is shipping now, according to the Provo, Utah-based company. The original Lantern works on an unlimited number of workstations and is priced at $4,995.

Cadre reaches out to VAXs

Cadre Technologies, Inc. last week expanded the availability of its Teamwork/C Rev reverse-engineering product beyond the C language environment to Digital Equipment Corp. VAX/VMS users working with Fortran, Pascal, Basic, PL/1, Macro and Bliss. Teamwork/C Rev for VAX/VMS is available immediately and is priced at $7,500 for the Teamwork/C Rev processor and $1,000 per seat for browsing capability.

Toshiba ships delayed notebook

Toshiba America Information Systems said last week that it is shipping its Intel 80386SX-based notebook computer, the T2000SX. Toshiba had originally expected to ship SX notebooks in January. Prices are $4,999 for a model with a 20M-byte hard drive and $5,499 for one with a 40M-byte hard drive. Toshiba is also shipping the T1200XE, a new system based on a 12-MHz Intel 80286 chip. The T1200XE will weigh 8.1 pounds and will retail for $3,799.

More news shorts on page 91

NCR changes anti-AT&T tone

BY MICHAEL FITZGERALD
CW STAFF

DAYTON, Ohio — NCR Corp.'s latest defensive tactic against AT&T, the option of adding as many as eight new members to its board of directors, is unlikely to do more than slow AT&T's hostile takeover bid, analysts said last week.

AT&T may sweeten its offer because NCR stock, which reached a new high of 97⅜ Thursday, has been hovering above AT&T's $90-per-share tender offer for the better part of two weeks, the analysts said.

"The rise in the market has definitely made AT&T's offer look less interesting," said David J. Schofield, an analyst at Duff & Phelps Investment Research Co.

Other analysts agreed that AT&T's offer no longer looks as attractive and said NCR may be shifting its tone. Recent NCR advertisements have focused on issues of pricing, not the anti-AT&T ads that first appeared. NCR also sent its shareholders a letter that closed, "Don't hand over your investment in NCR for less than its full value!"

"There seem to be some qualitative changes in some of the stuff we're hearing out of NCR lately," Schofield said. That could be interpreted as NCR backing away from its earlier stance that the offer is unfair and instead pushing AT&T to boost its price, he said.

Charles Neuhauser, an analyst at Legg Mason Wood Walker, Inc., said that has been the case since NCR hired Goldman, Sachs & Co., known for its ability to squeeze top dollar from a potential acquisitor.

An NCR spokesman declined to comment but confirmed that NCR Chairman Charles E. Exley Jr. was in New York last week meeting with Wall Street analysts who have been recommending that their client sell to AT&T. He indicated Exley was attempting to convince analysts that NCR's stock would continue to outperform AT&T's offer if the company were left intact.

Under the laws of Maryland, where NCR is incorporated, NCR can expand its board from 12 to 20 members. If AT&T were to succeed in ousting part of NCR's board before the regular annual meeting, those members could rejoin the expanded board. This could create a situation in which Exley would be running the company despite having been voted out of office by shareholders.

Even with an expanded board and a reinstated Exley, Morrow said NCR's chances of remaining independent look dim. Adding board members "would just be another delaying tactic," he said.

Client/server craze driving growth in software market

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — Corporate zeal to distribute computing power across diverse hardware platforms is nourishing the software market, according to a recent Sentry Market Research study. Results indicated that the overall software market will grow 15% to $30 billion in 1991, according to the firm.

Sentry's November 1990 survey of more than 1,300 large corporate, government and university environments points to programming tools as the biggest software growth area. The reason, according to the company, is the exodus of applications from older hardware technologies to client/server configurations.

Users are voracious for software that will allow them to re-engineer their applications, said Suzanne Murphy, a survey project leader. "It is a lot of work to shift applications from a single-user environment to a client/server scenario," she explained. "That's going to keep the software industry healthy for some time."

While programming tools showed the highest growth potential, commercial applications still gobbled up the largest portion of the average respondent's software budget at 41%. Data center management software followed with 29%. Development tools and networking software were third, each grabbing an average of 13% of respondents' software budgets.

Survey results showed the mainframe portion of software budgets to be steeply declining while the personal computer portion is expected to more than double between 1989 and 1991.

However, "the mainframe is not a dinosaur," Murphy said. "Companies are just getting smarter about what we prefer to call 'right-sizing' rather than 'downsizing.' The mainframe still has its place for certain applications; it makes sense to run others on smaller machines within the departments that are using them."

One way to spend a million dollars

Software expenditures expected to grow while platform allocations shift

Average packaged software expenditures per site
(in thousands)

	1989	1990	1991*
Mainframe	$611	$576	$586
Midrange	$192	$228	$262
Workstation	$116	$134	$169
PC	$162	$396	$470
Total	$1,081	$1,334	$1,487

*Projected

Source: Sentry Market Research

CW Chart: Paul Mack

Kuwait

FROM PAGE 1

telephone calls from job seekers that it now intercepts them with an automated response system. Bechtel said it is accepting resumes in data processing, contract management and other administrative fields.

IBM has also fielded many calls from people seeking work in Kuwait, but spokesman Mac Jeffery said he does not expect any large-scale hiring program. IBM has been awarded a small contract to supply a mainframe and peripherals for the Kuwaiti recovery program and hopes to receive other computer contracts now that its Kuwaiti dealer, Khorafi Business Machines, is back in operation, according to Jeffery.

Computer Sciences Corp. said it received a $1.3 million contract to plan for rebuilding the Kuwaiti government's IS infrastructure.

Andersen Consulting won a contract to restore the facilities and systems at Kuwait Airways Corp. "Ultimately, computer systems will be part of the work, but the initial work is a six- to eight-week damage assessment," said Michael Gelhausen, director of Andersen Consulting's airline industry practice.

U.S. and Kuwaiti government agencies have been swamped with calls from U.S. firms seeking a piece of Kuwait's recovery business. The U.S. Department of Commerce last week opened the Gulf Reconstruction Center, an information clearinghouse in Washington, D.C., that U.S. companies can call for advice on winning contracts. A spokeswoman said the center has fielded more than 5,000 calls.

A recent study of over 4,000 Datamation Magazine subscribers named Oracle Financials as the accounting software they are most likely to buy this year.

Which isn't too surprising, when you consider everything they have to offer.

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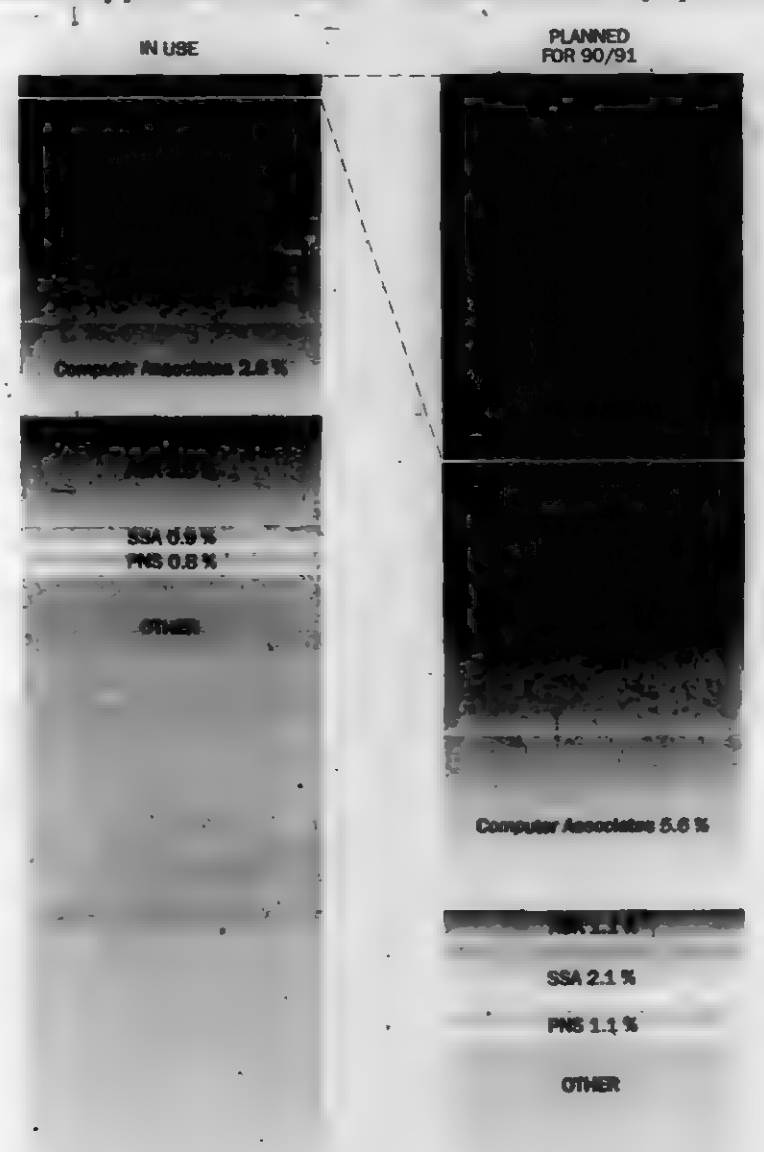
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IBM to offer octet of RS/6000 products

BY MARYFRAN JOHNSON
CW STAFF

IBM will deliver on its pledge to flesh out the RISC System/6000 workstation and server line with the announcement this week of eight new products for its premiere Unix-based computers.

IBM will release three additional systems: an upgraded X terminal, a new graphics accelerator and a trio of storage products, industry sources said.

Users will also reportedly be able to get upgrades that will boost the clock speed of the low-end Powerstation 320 from 20 to 25 MHz.

"I think [IBM] felt like Sun, while not quite up to the performance of the RS/6000, was getting awfully close, and they wanted to jump ahead a bit," said Steve Cross, systems administrator at Memphis-based Delta Metals Co., a steel processing firm that uses a Model 320 for accounting, inventory control and order entry tasks.

The new systems include a high-end rack-mounted server that is more powerful than the current top-of-the-line Powerstation 930 and low-end desktop systems in workstation and server configurations. The new server will reportedly run at 40 million instructions per second (MIPS) compared with 34.5 MIPS for the Powerserver 930.

The Xstation 130 terminal, upgraded with Texas Instruments, Inc.'s 34020 graphics chip, will double the speed of the Xstation 120 and cost less than $5,000, giving IBM a "competitive response" to Sun Microsystems, Inc., Digital Equipment Corp. and Hewlett-Packard Co., said John Dunkle, president of Workgroup Technologies, Inc.

"IBM is bringing to fruition the promises it made with the [February 1990] announcement of the RS/6000: to continue migration with faster performance and better price at both the low end and high end," Dunkle said.

Analysts said the new low-end desktop system will surpass the performance of the $14,000 Model 320, yet it is expected to cost several thousand dollars less.



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IBM Business Partner

Low-cost PBX under wraps

BY JOANIE M. WEXLER
CW STAFF

A purported upcoming announcement from Northern Telecom, Inc. could bring digital switching capabilities to small offices now equipped with nonprivate branch exchange (PBX) analog telephone systems.

Technology Investment Strategies Corp., a market research firm, said it has learned that Northern Telecom plans to unwrap an inexpensive, wall-mounted digital PBX in midsummer. Senior analyst Doreen D. Austin said such a product would "throw the key system market into a tailspin."

Switching traffic

A key system is a low-end analog PBX alternative used for switching voice traffic only.

The more costly PBX switches larger numbers of telephone calls than the key set, and both types of switching systems connect to outside communications lines. A digital PBX allows most switch operations to be controlled by software and can switch data in addition to voice.

"If the [new] PBX does what they say, it will give small offices access to Integrated Services Digital Networks, packet switching and RS-232 from their phones without investing in a heavy-duty PBX," Austin said.

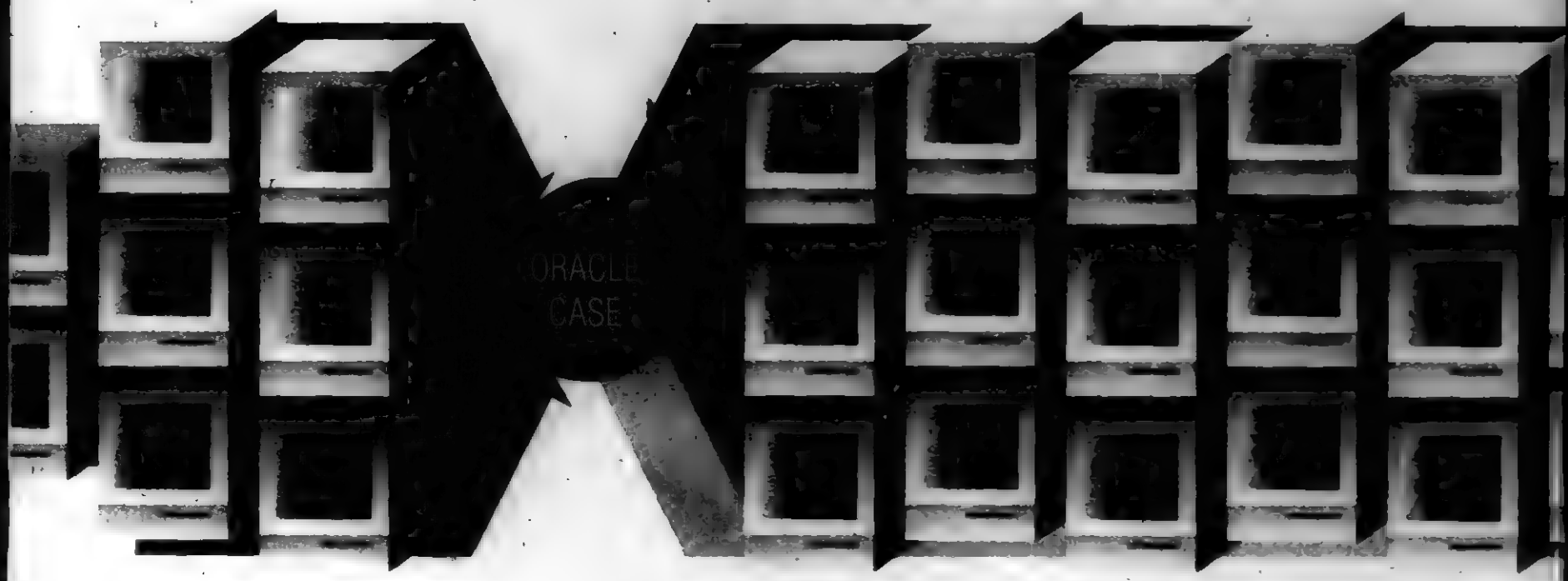
Austin said a wall-mount design would mean users would not have to "give away any real estate" for PBX functionality. She said she was told the PBX will include a T1 interface and compatibility with Northern Telecom's digital station equipment.

Austin said AT&T and TIE/Communications, Inc. would be most threatened by such a PBX.

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Kraft drives vendor integration efforts

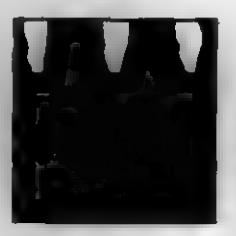
BY ELLEN RONKIN
CW STAFF

CLEVELAND — Sometimes the best way to cook up a computer-integrated manufacturing solution is to put two of your biggest vendors on the fire together.

That is what Kraft General Foods, Inc. did when it brought Allen-Bradley Co. and Hewlett-Packard Co. into a room last year and told them it wanted tighter integration between the Allen-Bradley controllers on its factory floors and the HP Unix processors in its data centers.

Last week, with Kraft officials on hand, Allen-Bradley and HP announced a strategic alliance and their first high-performance, tightly integrated manufacturing solution.

The product is a networked version of Allen-Bradley's Data Tape Library (DTL) application programming interface. Network DTL links Allen-Bradley's Pyramid Integrator with HP's 9000 series Unix host over an Ethernet network.



"In the old days, just to wire a plant would have cost a couple hundred thousand dollars," said Chris Jones, assistant director of engineering at Kraft in Chicago.

Kraft has had Allen-Bradley programmable controllers since 1975 and standardized on HP systems as department-level supervisory controllers in 1985.

"But the sort of projects we do now requires an integration that is much more complex," Jones said.

Network DTL uses an Ethernet backbone running Transmission Control Protocol/Internet Protocol (TCP/IP). This client/server approach is approximately 50 times faster than the traditional method of connecting its devices to host computers over RS-232 connections, according to Allen-Bradley.

Two versions of the software were announced last week: Network DTL HP-UX for HP computers running under Unix and Network DTL V for Digital Equipment Corp. VAX systems under VMS.

The customer comes first

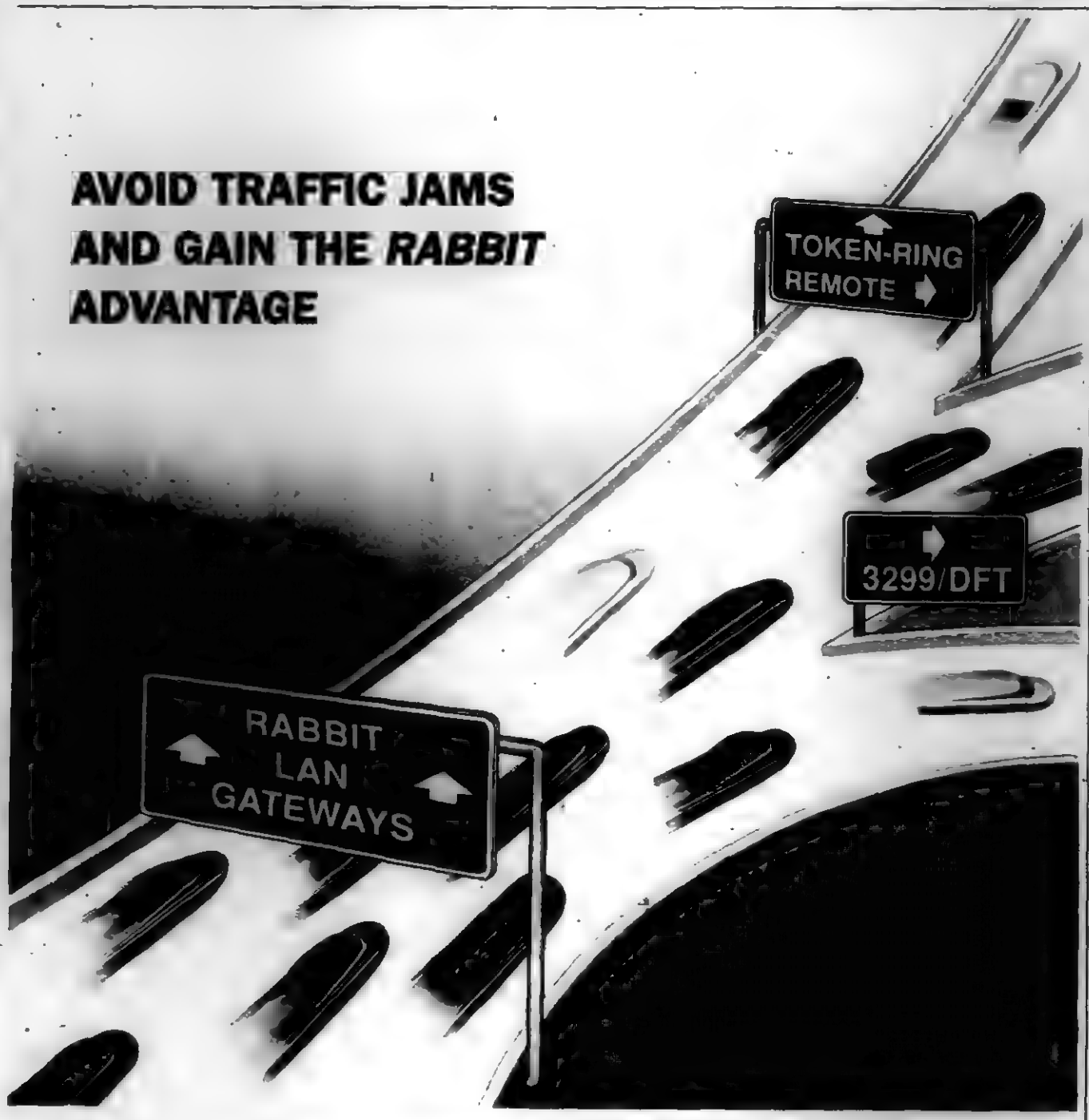
Allen-Bradley officials stressed that the choice of TCP/IP was "customer-driven" and that they were still fully committed to Manufacturing Automation Protocol/Open Systems Interconnect, which is the international protocol for factory environments.

The relationship with HP — which claims to have a 44.8% share of the market for Unix in manufacturing — is analogous to the one Allen-Bradley established with DEC in 1988.

That alliance resulted in the Pyramid Integrator, the single box containing a DEC Microvax and Allen-Bradley's real-time controller boards.

Allen-Bradley President Don Davis suggested last week that the company would continue to answer its users' calls for connectivity to leading computer platforms, including the IBM Application System/400.

But Martin Piszczalski, director of the Manufacturing Automation Planning Service of The Yankee Group in Boston, said the Allen-Bradley/IBM team is "not very warm and close" and that a more likely method of linking to the IBM world might involve a Microsoft Corp. OS/2 or IBM AIX interface.



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Sun, surf

FROM PAGE 1

want to. It's been quite a change," he said.

Geis, who is not married, did have an incentive to choose the island of St. John. His parents live in a mountaintop home with a panoramic view of Fish Bay — along with a convenient studio apartment.

Geis programs using an Intel Corp. 80386-based 20-MHz personal computer and a minicomputer from Scientific Micro Systems that he describes as "a takeoff from a [Digital Equipment Corp.] PDP 11/73." He uses that machine for the majority of his work.

Geis said that he installed a dedicated telephone line for his telecommuting, but he does not program on-line using Machine Industries' mainframe. Rather, he does the work and then uploads the data using a 9.6K bit/sec. modem.

The idea of being able to work with a keyboard at one hand and with a pina colada in the other is enticing, but such deals are certainly the exception.

"If the average programmer walked into the boss' office and said, 'I've had it. I want to move to Cancun,' they would be shown the door," according to Gil Gordon, the editor of "Telecommuting Review," a Monmouth Junction, N.J.-based newsletter.

Gordon said that such an exotic setup is feasible only if the employee is highly trained, can do virtually all of the job long distance and possesses a hard-to-find skill.



Nancy Rossi

"I JUST GOT TIRED of the traffic and the routine and the accidents on the freeway. Basically, I just get up when I want to and program when I want to. It's been quite a change."

JACK GEIS

A perfect match

Geis certainly fills the bill. Seventy-five percent to 80% of his work is done in a language called NCL/APT, for which he estimates there are 200 users.

APT is a language developed in the aerospace industry in the late '50s, and NCL/APT is a subset developed approximately six years ago.

Machine Industries, which is a direct supplier to such industry heavyweights as The Boeing Co. and McDonnell Douglas Corp., uses it extensively.

Although his lifestyle sounds too good to be true, Gordon said that he has mixed feelings about the idea of telecommuting from such a paradise.

"My concern is that if we focus on [these kinds of deals] too much, it takes away from mainline telecommuting. For the average office worker, [telecommuting] is more a dream than a reality."

Still, Geis is not arguing too hard with his particular reality. You may find him in his office pounding the keyboard of his computer.

Then again, that water does look mighty fine.

Technology addresses clash of mice and menus

Devices can also be used on desktop PCs

BY RICHARD PASTORE
CW STAFF

Tiny laptop computers and space-hungry mouse pointing devices have not typically gotten along. However, with portable personal computer power growing along with the popularity of graphical interfaces, some vendors are coming out with ways to help the two coexist.

Microsoft Corp. today will unveil its Ballpoint Mouse, a trackball/mouse hybrid that clamps onto the edge of many portable PC keyboards.

The mouse uses a two-pronged adjustable clamp that locks into the gap between the outermost keys and the keyboard's edge. The mouse, in turn, attaches to the clamp, which can pivot between 0 and 90 degrees, depending on user preference.



Microsoft's Ballpoint Mouse *attaches to laptops or stands alone on the desktop*

Fits several models

The Ballpoint Mouse was designed to fit on portable models marketed by Compaq Computer Corp., Toshiba Corp., Zenith Data Systems, NEC Technologies, Inc. and Grid Systems Corp. Microsoft said it will refund the $175 purchase price if the clamp does not fit a particular keyboard.

Compaq, in an unusual exclusive bundling move, will ship the Ballpoint Mouse free to users who buy Compaq LTE or SLT portables between today and June 30. The mouse will only be available through Compaq during this period. "The product fits hand and glove with laptops," said Compaq North America Vice President Ross Cooley. Use of mice is increasing among LTE owners, he noted.

Last month, joystick maker Suncom Technologies in Niles, Ill., announced its own answer to the portable pointing problem. The product is a mouse/joystick hybrid called Icontroller. The $100 device attaches to keyboards via a Velcro-like strip.

Both the Microsoft and Suncom devices can be detached from the keyboard for separate use on desktop PCs.

Another alternative is to buy a portable with an embedded pointer. Apple Computer, Inc. designed a trackball into its Macintosh portable keyboard. However, this option is not viable for smaller laptop and notebook-size models. For them, the Isopoint bar is offered. The sliding, spinning, pencil-thin bar has been incorporated into a number of portables, including the Macintosh-compatible laptop from Outbound Systems, Inc.

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Microsoft acquires E-mail vendor

BY JIM NASH
CW STAFF

Tighter integration of electronic mail with other applications via a standardized interface may be one fruit of Microsoft Corp.'s purchase of E-mail vendor Consumers Software, Inc. The acquisition, which was announced last week and is expected to be formalized this month, will give Microsoft its first personal computer-based E-mail package.

Specific terms of the agreement have not been released. Microsoft has said that it intends to market Microsoft Mail for PC Networks, based in part on Consumers Software's Network Courier E-mail software.

To date, Microsoft has only marketed a mail application for Apple Computer, Inc. Appletalk networks.

"I think all the networking companies have recognized that [network administrators] want tightly integrated applications for their networks," said Paul Flessner, manager of distributed systems technology at Baxter Healthcare Corp. in McGaw, Ill.

"The value [of the acquisition] is that a key applications maker used by many people is integrating E-mail," said Dave Taylor, an analyst at Gartner Group, Inc. in Stamford, Conn. Taylor said this may be the end of E-mail being perceived as a separate store-and-forward device. More concretely, it would bring Consumers Software's X.400 expertise together with Microsoft's application integration knowledge.

Steve Madigan, a senior programing manager at Microsoft's networking unit, said Consumers Software in Vancouver, B.C., will serve as a technology source and a ready-made E-mail installed base. But, Madigan added, the purchase is part of a larger project by Microsoft to develop standardized application interfaces under Windows Version 3.0.

A spokesman for Consumers Software said that the privately held company has 800,000 users worldwide.

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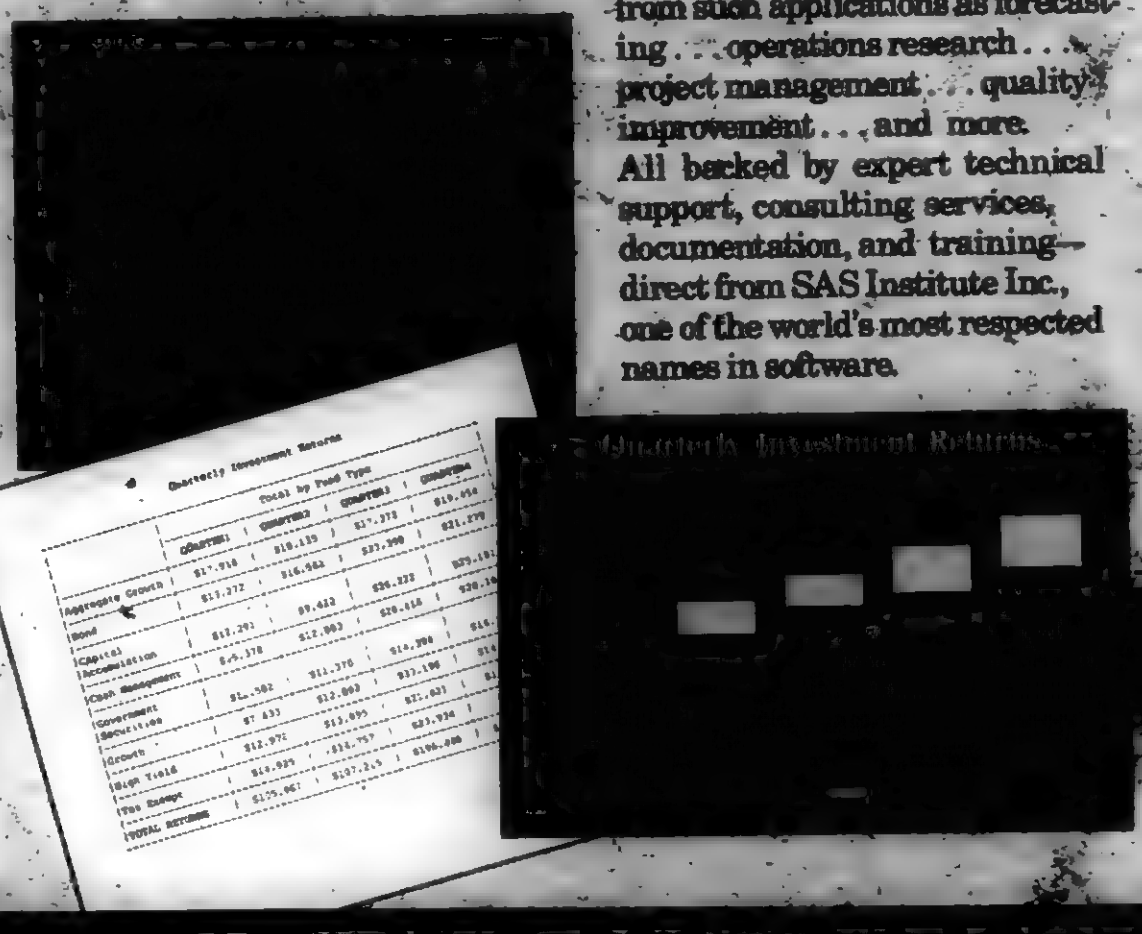
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Snappy neural nets

■ Adaptive Solutions, Inc., a Beaverton, Ore., neurocomputing technology company, introduced a neurocomputer system that it claimed will speed learning in neural networks 1,000-fold. The new system, called the Connected Network of Adaptive Processors (CNAPS), consists of a CNAPS server, a neurocomputer for a Unix network and Codenet, a software development environment. The server exceeds supercomputers in raw performance on neural networking applications, the company said. The server runs in a learning mode of more than 1-billion connection updates per second, allowing developers to train some neural networks in seconds rather than hours.

Little lasers

■ A visible-light laser diode with a wavelength of 650 nanometers (one nanometer equals 1 billionth of a meter) went on sale last week, according to Toshiba Corp., the laser diode's manufacturer. The shorter the wavelength, the brighter the light that the laser appears to emit. The new diode's perceived brightness is four times greater than that of other diodes currently available, Toshiba said. The firm said the laser diode is useful for handheld bar code readers or scanners on manufacturing lines. Other promising applications for the device include laser printer printing heads, measuring instruments and tape-top, bar code reader systems.

Light across the ocean

■ Engineers at AT&T Bell Laboratories have demonstrated that it is possible to transmit light wave signals across transoceanic distances without the costly electronic regenerators used in today's systems. The engineers reported a low-error-rate transmission of light wave signals at 5G bit/sec. over a distance of about 5,400 miles. They also demonstrated a 2.4G bit/sec. transmission over a distance of 12,600 miles.

Object databases within users' sight

New levels of productivity may be orchestrated with multimedia packages

BY MAURA J. HARRINGTON
CW STAFF



Scott Matthews

Think how productive computer users could be if each system was tailored to individual work habits and was able to pitch in with office chores even before the users began their morning commutes.

Personalized knowledge-based systems could automatically search databases during the night, sort video messages sent by electronic mail and verbally alert users to voice mail messages left after working hours, for example.

What may be the ultimate productivity tool is not yet available, but some vendors are closing in on ways to boost productivity with entertaining, easy-to-use multimedia-based applications.

Picture this

The applications are based on an emerging database language concept called object-oriented programming, a way of storing information using objects or icons as key identifiers. Each object represents an individual set of rules. Unlike relational databases, the code assigned to a rule can be easily changed, updated, reused or modified without affecting the database as a whole, according to experts.

Some information systems managers are already experimenting with object-oriented programming technology despite a lack of standards for multimedia hardware and software. Programmers who are familiar with object-oriented programming techniques are also rare, these managers said.

However, the potential of object-oriented programming and multimedia technology is too alluring to resist. "We can't afford to wait for the software and hardware companies to work out their standards problems. We have to move on and build our own system for tomorrow today," said Bill Bysinger, director of the IS department at Aldus Corp. The company is building an internal worldwide networking system on an object-oriented, client/server architecture even though there are no standards for tools or definitions of how to build an object, Bysinger said.

Bysinger said he hopes to complete within two years one application that would enable users to send and receive video and audio messages via E-mail. Also on tap is an "intelligent agent" that would sit on a file server and be used to personalise each desktop computer on the network. Object-oriented and artificial intelligence programs within a database would incorporate a user's work profile, habits, responsibilities and other information.

"An intelligent agent means that my server knows me; it knows my work patterns, and it uses what we call knowledge technology to help me be more productive," Bysinger explained.

Macromind, Inc., Farallon Computing, Inc., Itasca Systems, Inc., Servio Corp. and other software vendors have introduced applications written in object-oriented programming languages designed to allow users to incorporate sound, images, graphics and other forms of media into a database. The drawbacks are that the programs are expensive and lack standards needed to appeal to a wide audience, according to experts. Most of the packages are aimed at Apple Computer, Inc. Macintosh users.

"Until some standards are put in place, this technology will never really fly in the general market," said Nick Arnett, chief analyst at Santa Clara, Calif.-based Multimedia Computing Corp.

Software vendors agreed that the lack of multimedia and object-oriented programming language standards are to blame for a lack of off-the-shelf products, but they attributed the problem to the newness of the market.

Convincing argument

Users will also have to be convinced that the technology is worth investing in, according to Harvey Newquist, chief executive officer of Scottsdale, Ariz.-based Relayer Group, a market research firm and publisher of two multimedia trade publications.

"In order for this to really take off, corporate MIS is going to have to realize the kind of [database] language used in the past is not dynamic enough to manage the type of corporate document structure needed in business today," Newquist said.

"This is all very new technology, so I think it will be a couple of years before there are general object-oriented database applications available to MIS," said Bill Hoffman, president of Itasca Systems.

Currently, there are two standards committees working on defining standards for object-oriented database technology: the Object-Oriented Database Task Group, part of the American National Standards Institute, and the Object Management Group, an independent consortium of vendors and users. Both groups are working independently and together to devise the definition of an object and the definition of how objects talk to each other, Hoffman said.

Hardware standards that would allow different media to work together must also be developed, according to Dean McCarron, an analyst at In-Stat, Inc., a market research firm in Scottsdale.

"Multimedia is a combination of hardware and software; both have to work together in order for it to really fly," McCarron said.

Growing like a weed

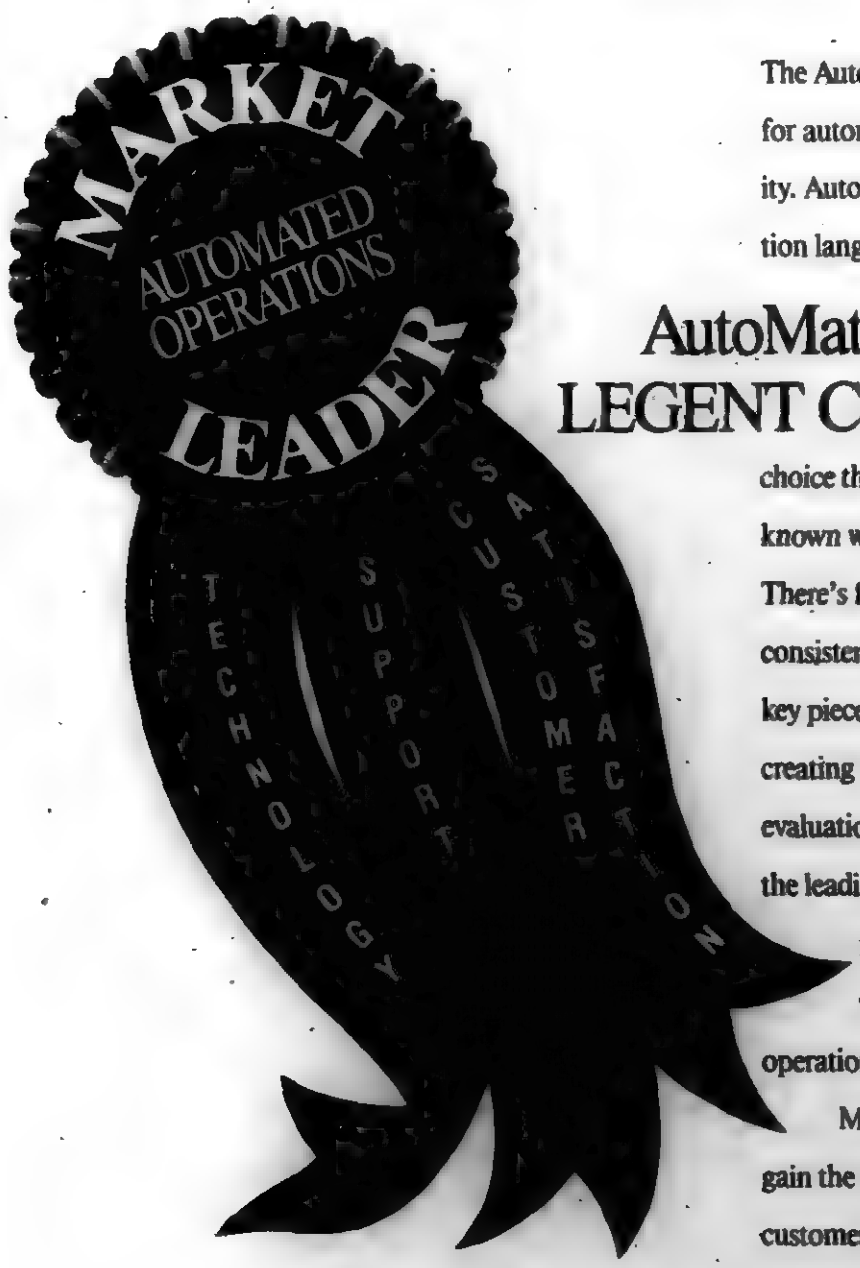
Meanwhile, the multimedia market is still expected to grow at a healthy rate from now through the end of the decade, according to a study published by In-Stat in December.

The study revealed that the interactive digital multimedia computing market will grow in three major stages during the next 10 years.

The first growth stage, expected to last through 1994, will be made up primarily of sales of specialized commercial and military multimedia databases and interactive programs incorporating sound, still- and full-motion video, graphics, animation and text. Revenue is expected to grow from $22 million by the end of 1991 to almost $200 million by 1994, analysts said.

The second and third growth stages are expected to focus on the office/desktop computing arena and the consumer products market, respectively, according to the report. If all goes according to In-Stat's predictions, the digital multimedia computing market will be worth at least $1.65 billion, according to the study.

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EDITORIAL

Rule of law

Quick, name the industry whose structure and form have been shaped to the greatest extent not by entrepreneurs but by judges.

If you said anything but the computer business, you're wrong.

A generation ago, the courts declared that IBM had to unbundle its hardware and software offerings, thereby spawning a business that today is the fastest growing economic segment in the country.

While the government tried very hard (and failed) to break up IBM through the courts, it did succeed in operating through the judiciary to fragment AT&T, thereby producing today's burgeoning networking and communications business segment.

At times, the legal process seems fairly straightforward. For example, IBM's dispute with Cambex, settled out of court last week in IBM's favor, appears to have turned easily on the issue of contract language interpretation.

However, the complexity of certain other suits settled recently and of others still pending will rest on highly subjective judgments rendered in the absence of precedents. Specifically, the look-and-feel copyright infringement suits present the courts with new dilemmas. And the outcome of the suits, most notably Apple's suit against Microsoft, or more precisely, the Macintosh interface vs. Windows, can have a large impact on millions of users.

There is no great body of contract interpretation to guide the judge. In a copyright infringement case decided in favor of Lotus last year, the judge ruled that the two defendants had simply lifted large quantities of Lotus' work and inserted it into their own programs. This clarity, based on usurpation of program code, is absent in the Apple/Microsoft case.

Eventually the judge will decide how to shoehorn concepts that are entirely novel to the courts, like look and feel, into copyright law that has centuries-old roots.

But what the judge will really decide is something that looks and feels more like the rights of the individual vs. what's right for the masses by way of standards promulgation.

Here's where the courts' actions in the past might provide, if not a precedent, at least a glimpse into the outcome of the Apple suit.

If you look at the really big court actions, such as IBM's unbundling and the breakup of AT&T, there can be no argument that the actions produced far more competition. And no one disagrees that more competition is good for all. And despite the rulings, both AT&T and IBM are not only still in business, but they are very sound and innovative companies as well.

So although the early indications in the Apple/Microsoft matter, as in the final judgment in the Lotus case, weigh in favor of the plaintiff, history has found the courts searching for the elusive win-win, with the preservation of a greater economic good heavily influencing the look and feel of the final decision.



LETTERS TO THE EDITOR

No driver

Your article about Lotus' 1-2-3 Release 3.1 [CW, Feb. 4] contained a statement by Paul McNulty at Lotus indicating that a Datalens driver is "available" for use with an Oracle database. I beg to differ.

The only Datalens driver that is available for use with an Oracle database is limited to 1-2-3 Release 3.0 on a VAX. There is no Datalens product that is compatible with 1-2-3 Release 3.1 and an Oracle database.

Phil Rice
President
Oracle/Lotus SIG
Englewood, Colo.

Interface overkill

Regarding comparisons of Apple, Windows and OS/2, I am the IS director in a shop with an OS/2 1.2 LAN Server local-area network having both DOS and OS/2 requestors. We are also a mainframe shop, with the LAN attached to an IBM 3090 running under MVS/XA. Soon we will migrate to Version 1.3 of the OS/2 Extended Edition product.

In the case of many business users — those who type a memo, then check a calendar, then go to lunch — OS/2, Windows or possibly even the Mac, are overkill. They don't need multitasking. They don't even really need a graphical interface.

Where OS/2 shines is in the mixed or multitiered environment. With OS/2, you can have access to on-site support from trained IBM systems engineers. Admittedly, except for power users, it has been difficult to justify the hardware investment needed for implementation of a stand-alone OS/2 machine, unless you also need multiple concurrent mainframe sessions and/or a database manager. But even this is becoming less of a factor with shrinkage in both memory prices and the memory hunger of OS/2.

Britt Hagen
Springfield, Ill.

Academic pressure

Alan Radding's article on information systems in education "Higher pay vs. higher education" [CW, Feb. 18] is too highly abstracted. There are at least two points worth noting that actually better characterize IS in education.

1. Particularly with administrative systems, the stresses and emphases are very closely equivalent to those in the corporate world. I don't detect that users are any less angry when systems don't perform or are not delivered as expected.

2. IS professionals in education feel strongly connected to the goals of the enterprise. We are part of a team that is doing everything it can to help individuals build toward their futures.

Albert L. LeDuc
Director, Computer Services
Miami-Dade
Community College
Miami, Fla.

Big Brother?

Mark Hall's "Purging information overload" [CW, Feb. 11], resembles a 1991 advocacy for Orwellian Newspeak and should be resisted at all costs.

How dare he use terms such as "landfills of our minds" and "clean up the muck in each of our heads"? Speak for yourself, Mr. Hall! His proclamation for the "need for conservation in the information industry" is a euphemism for censorship. His "truth" resembles a call for his version of politically correct thinking, which in itself is a recipe for tyranny.

Access to many sources of information *is* freedom. The last thing this country needs are self-serving elites such as Mr. Hall limiting that access. If there was only one dictionary, one book publisher and one computer magazine, he probably would not have had the opportunity to publish such trash in the first place! What's a synonym for hypocrite, Mr. Hall?

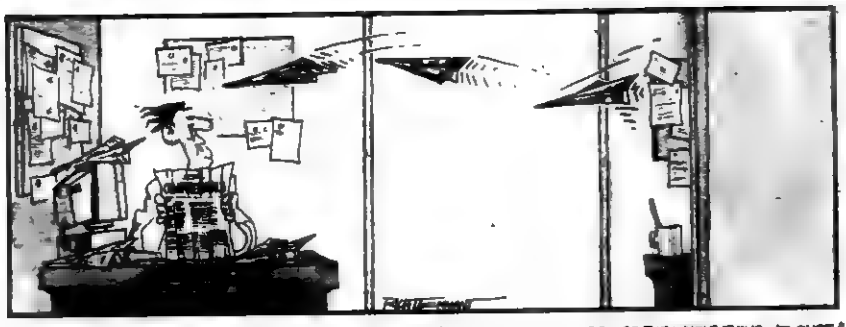
Gary W. Neidhardt
Software Advantage, Inc.
Nashua, N.H.

PC or not PC

Regarding your recent article "Mobile PCs weathering Desert Storm" [CW, Feb. 18], this article has a picture that depicts the "Unisys TACCS PCs." These are in fact not PCs at all, but Unisys B26 BTOS workstations with built-in networking and hardened for combat conditions! All micros are not PCs; this is much too limiting a label for BTOS/CTOS systems and describes a very specific hardware architecture.

David K. McClanahan
Oak Ridge, Tenn.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.



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   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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Research constricted by inadequate funding

LEON LEDERMAN



America's academic researchers are feeling the effects of limited federal funding, and the future of U.S. scientific achievement may be at stake. Researchers across the country report that a lack of adequate funding has slowed research and even altered the ways researchers pursue answers to the nation's scientific problems.

Concerns about support for U.S. academic research have been heard with increasing frequency during the past few years. When I became president-elect of the American Association for the Advancement of Science (AAAS) in February 1990, I decided to look more deeply into the situation. I felt it was important for the largest general scientific organization in the country to be part of the solution to this problem.

An informal survey of many of the "best and brightest" in 50 of our most prestigious research universities confirmed my expectations of trouble. The nearly 250 letters that poured in revealed a depth of despair and discouragement that I have not experienced in my 40 years in science.

The letters described scientists who cannot get funding for lauded research, who cannot afford to train gifted graduate students and who must use outdated equipment in inadequate facilities. Instead of the traditional optimism of researchers, the letters revealed a profession beset by flagging morale, diminishing expectations and constricting horizons.

These letters sent a message that needs to be heard broadly. If the mood persists, it will infect the graduate students and inevitably spread to frustrate the heroic endeavors so many of us are making to upgrade the nation's science education. That is why I wrote a comprehensive report to the board of directors of AAAS, urging that the organization lead the effort to improve the situation.

The principal source of the morale problem is no mystery. It appeared in letter after letter. It is essentially a lack of funding. For many scientists, the difficulties of obtaining research support are beginning to overshadow the rewards of actually doing research. However, the question remains as to why funding is inadequate when federal support has risen significantly during the past seven years.

Unfortunately, recent increases have not offset the earlier years (1968-1983) marked by decreasing or level funding. Neither have they accommodated to the increased sophistication needed to cope with as-yet-unsolved problems, burgeoning new fields such as high-temperature superconductors, molecular genetics, organometallic chemistry, neurobiology, artificial intelligence and so much more.

I focused on the universities because the bulk of basic research and a significant fraction of applied research is done there and because that is where all the research and application scientists and engineers receive their training.

Clearly, however, the industrial and national laboratories must be part of any new national science policy. The conclusions of the AAAS report include the following:

1. There is a distinct possibility that the infrastructure of academic research will actually begin to crumble as the very best professors retire early, concentrate wholly on teaching, change occupations or even emigrate. Whereas some of these changes can bring benefits to teaching and to industry, the effect on academic research can be calamitous.

The message to students is that a career in research can be frustrating to even the very best scientists in even the best universities.

2. The beneficial accomplishments of academic, basic *and*



Martin Hamilton

applied research have been tremendous — contributing to our culture, to the quality of life and to our economic prosperity. Equally important is the education of scientists who man the industrial and national laboratories as well as the colleges and science administrative positions in industry and government.

3. No matter how the government responds during the next decade, there will be a clear need for hard decisions and the setting of priorities as we deal with the awesome problems of this month, this year and the year after that.

Restoring the research capacity, vibrancy and optimism of the late 1960s would require a doubling of the current budget for academic research ($10 billion) plus at least one decade of real growth at the level of 8% to 10% per year.

Obviously, such a proposal, made in the face of the budget deficit, the savings and loan crisis, the gulf war and a recession, has prospects akin to the famous snowball in you know where. Intermediate situations are negotiable.

4. However, if one steps far away from the traditional Washington viewpoint to see the entire tapestry, one sees a nation with a $5 trillion gross national product and a $1.3 trillion federal budget. One sees a nation that can double the defense budget (to $300 billion); spend $100 billion, $200 billion, $300 billion — whatever it takes — to handle the savings and loan fiasco; and was willing to spend $1 billion per day, if necessary, to win the Persian Gulf war.

I cite these activities only to demonstrate that this nation can do *anything* that it is convinced must be done for its general well-being.

A study of recent history (the past 50 to 60 years) indicates that, as an investment, science pays. It is the only activity that can produce returns of 10-to-1, 1,000-to-1 or 10^6-to-1, as both the transistor and laser have demonstrated.

Science continues to be the best single way that we can provide the jobs and national wealth we must have in decades to come. It is the one frontier left to us: the frontier of the mind. The problem is that the benefits require a long-term perspective in a nation increasingly obsessed with short-term prospects.

The good news is that there is, within both branches of government, a strong commitment to science and a determination to do the best that can be done. The president's 1992 budget request to Congress illustrates this.

The scientifically literate community represented by *Computerworld* can help by reaching out to the general public, by making the case in thousands of places and hundreds of voices.

The AAAS is an organization uniquely suited to assist in this effort. We have proposed forming a commission that would have the following charge:

- Look at ways to improve the efficiency and strategic planning of research activities.
- Study the contentious issue of the balance between major facilities and individual scientific investigators.
- Suggest mechanisms whereby the products of research can be better connected to economic utility. The academic community must learn to interface more gracefully with such issues as technology transfers, patents, marketing, tax laws and so on.
- Investigate innovative ways of funding research; for example, establishing a trust fund based on special taxes earned on high-technology products or a trust corporation that might encourage the investment community to support academic research via special "research bonds."

The issue is not the unhappiness of the scientist; the issue is the health of science and its role in the future vitality of the nation.

To ensure these things — and because we face ecological/energy problems of ferocious difficulty — we must do what it takes to restore the exuberance and leadership of American science.

Lederman, president of the American Association for the Advancement of Science, was awarded a Nobel Prize in physics in 1988. He teaches physics at the University of Chicago and serves as science adviser to the governor of Illinois.

The truth about data

JAMES A. AUTRY



Here are two big lies of the technological age. Lie No. 1: Computers and computerized information sytems save on paperwork. Truth: They create paperwork. Lie No. 2: Computer-generated data makes decision-making easier. Truth: Data has very little to do with decision-making. (I refuse to use the word data as a plural noun.)

I once heard a very smart businessman say that, sooner or later, all business decisions get down to what your instincts tell you to do.

Another way to think of instincts is as wisdom, the accumulation of what we have learned, consciously and subconsciously, all of our lives — and if you believe the mystics, even before.

In the quest for "better information," we as managers have become almost enslaved by data processing and the ensuing endless analyses.

Computers have their place. My business would have great difficulty without them, but I refuse to sign on to the widespread statement: "Our business couldn't survive without them."

One of the managers I respect most has a question he asks when someone says something is impossible.

"Impossible, or merely inconvenient?" he asks.

Our business would be terribly inconvenienced without computers, but we couldn't *survive* without people who can make decisions based on their instincts. Computers can't make decisions based on anything. The weakest excuse in business today is, "According to the data, it should have worked."

I have a little litany I say whenever someone tries to blame it on the computer:

Data is not facts.
Facts are not information.
Information is not knowledge.
Knowledge is not truth.
Truth is not wisdom.

Any decision you make based on what is revealed by data and information is a decision that can be delegated.

Any decision requiring data and information plus knowledge is a decision you can train other knowledgeable people to make.

But it is in the realm of truth and wisdom that most critical decisions are made. And those are the ones that can only come from you after you have weighed all the data and information, applied your knowledge and then reached down deep into your gut, your instincts, your wisdom.

Understand that your ability to do this is your true value as an executive/manager/leader, a value not likely to be superceded by technology.

Autry is president of the magazine group at the Meredith Corp. This article is excerpted from his book, Love and Profit. Copyright (c) 1991 by James A. Autry. Reprinted with permission of William Morrow & Co.



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SOFTWARE AG

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COMMENTARY

Jean S. Bozman

Shifting psychology



The recent upheavals in the independent relational database management system industry have given DEC some much-needed daylight in its efforts to increase market share for its RDB relational database.

DEC, by rights, should have had the lead in its own VAX marketplace, but RDB was not known as a high-speed performer, and it was limited to running under VMS. That gave plenty of maneuvering room to Oracle and to the former Ingres, both of which grabbed more than 20% of the VAX RDBMS market in recent years.

Events conspired last fall to weaken user perception of these two RDB rivals: Oracle's Version 6.0 and Ask Computer's Ingres. Oracle began to stumble financially, turning in a first-ever quarterly loss. Ingres was acquired by Ask at roughly the same time, making some users wonder whether Ingres was a safe choice for database software anymore.

So, armed with a new and improved version, RDB 4.0, and the offer of a free runtime version of RDB, DEC's sales force launched a drive against the independent software competitors in late 1990.

The battle for the minds and hearts of VAX users is not over, but so far in the campaign, there are some signs that it's creating a shift in user psychology.

Continued on page 32

Users improvise on IMS, DB2 coexistence

ANALYSIS

BY ROSEMARY HAMILTON
CW STAFF

IBM is scheduled to release a guide for IMS and DB2 coexistence and migration soon, said Russ Donovan, an IBM database market support manager, in a recent interview.

However, this guide may be a little late for some users. For them, managing an IMS and DB2 environment is not a new problem, and they have relied on their own methods of coping for some time.

Users have taken a variety of approaches depending on which database is currently more critical to their operation and how soon they want to migrate over to DB2. There also appears to be no set formula to manage an IMS and DB2 shop but rather a mixed bag of techniques, consisting of user-developed methods, IBM tools and third-party products.

"There is no one solution," said Howard Foedick, president of Foedick Consulting, Inc. "Everyone's situation is a little different in terms of what they want."

IBM plans to release its guide in the second quarter, Donovan said. The requirement came about last year when IBM issued similar guides to help people migrate from both VSAM and non-IBM database management systems to DB2. "We kept getting requests for IMS," Donovan said. "There are a lot more issues here in a coexistence mode."

Donovan said the guide will address conversion and test issues as well as documentation on "tools and strategies from moving the database across."

In the meantime, some users have their own plans in mind. For example, Banc One Services Corp. maintains a clear dividing line between IMS and DB2 applications. Actual data is less clearly segregated, and the bank has implemented techniques to extract IMS data for DB2 users as needed, said Terry Lowder, vice president at Banc One.

IMS/DB2

Banc One Services

Clean separation between IMS and DB2 along application lines. IMS handles production, DB2 assigns administrative query jobs. Ability to extract IMS data and deliver to DB2 users

Mellon Bank

Maintain existing IMS environment, while DB2 handles all new mission-critical applications

CSX Technology

Two-pronged approach of selective migration of IMS data to DB2, while also assigning some application development to the newer database management system

CW Chart: Doreen St. John

IMS still popular choice

The older, hierarchical IMS has long been the workhorse and continues to handle critical production work, while the relational DB2 handles administrative-type applications, according to Lowder.

Working with Electronic Data Systems Corp., the bank developed a utility that serves as a layer between the databases. It can handle either SQL or DL/1 calls and assists when a DB2 application may need IMS data. The application talks to the utility, called Database I/O, which then retrieves the data.

"Our approach is to designate as of today that relational is for ad hoc and IMS is production," Lowder said. "We don't allow users to access production [data]

Continued on page 32

Another optical choice for DEC's VAX users

BY MARYFRAN JOHNSON
CW STAFF

MILPITAS, Calif. — System Industries recently introduced its first optical product for Digital Equipment Corp. computers with the Laser's Edge optical jukebox, providing yet another option for storage-hungry DEC users.

The mass storage device provides 30G bytes of on-line storage and connects to DEC's Standard Disk Interconnect controllers, including the hierarchical storage controller used with most VAX and Vaxcluster systems.

"This is a good opportunity for System Industries because DEC has been very slow to support optical," said Crawford Del Prete, an analyst at International Data Corp. in Framingham, Mass. "DEC does provide optical disc through OEM agreements, but optical continues to be an emerging market for mid-range systems."

Targeted at imaging and other "mass capacity" applications, the System Industries jukebox incorporates read/write disc drives that provide access to stored data through a Standard Disk Interconnect port.

Perfect fit

The jukebox fit well in a heterogeneous environment of DEC VAXs and Unix machines in the neuroimaging laboratory at the University of California at Los Angeles' School of Medicine.

"Among the things we do here is brain imaging, so we have huge data sets we collect and use heavily for a time," said Arthur W. Toga, the laboratory's director. "Then we need to archive them, so the removable aspect of optical cartridges was very attractive."

The jukebox not only serves Vaxcluster users but is also linked over the Network File System to 10 Unix workstations, including an IBM RISC System/6000, Decstation 5000s and machines from Hewlett-Packard Co.'s Apollo Division and Stardent Computer, Inc.

The larger Model LE56, priced at $92,000, holds up to 56 optical discs and contains a high-speed disc changer and removable disc packs. The Model LE32 holds up to 32 optical discs and costs $86,135.



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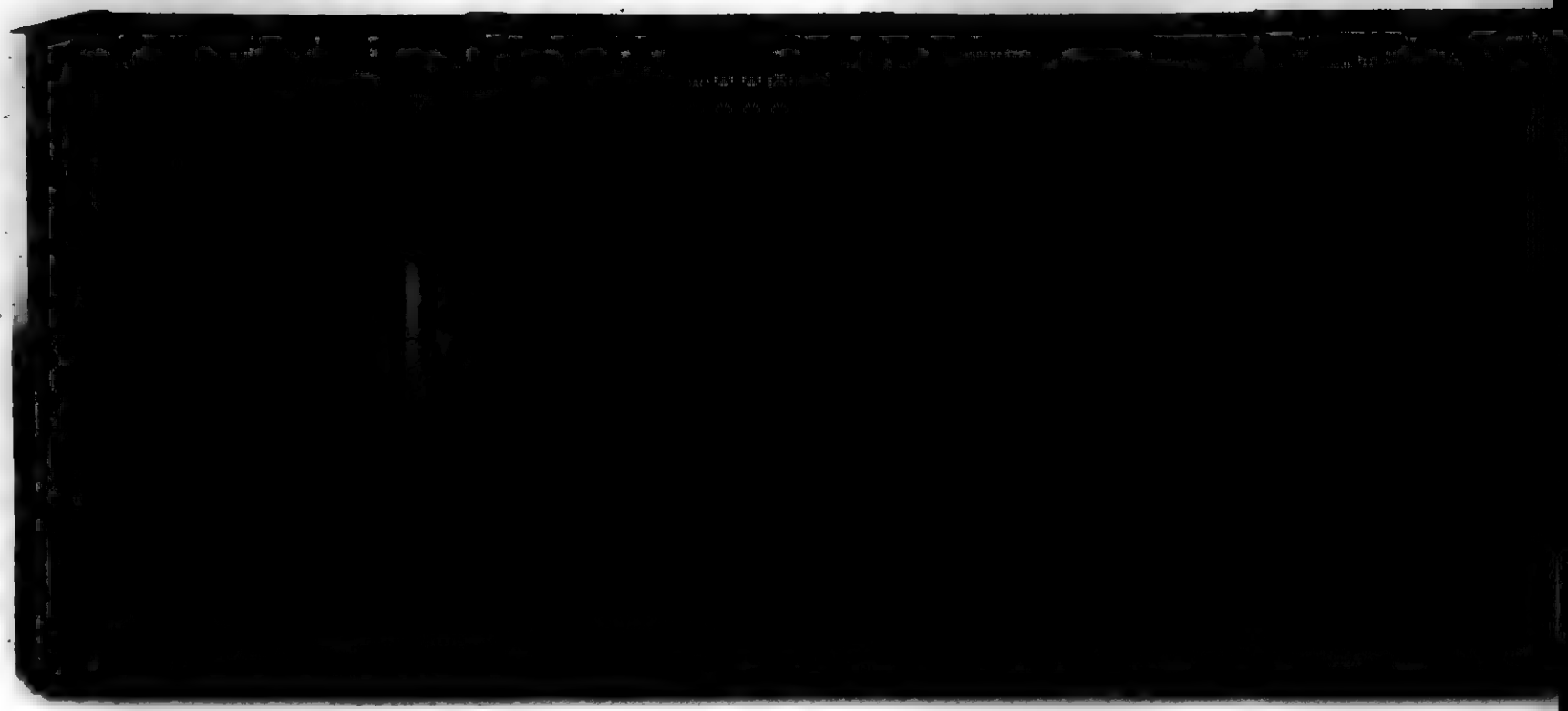
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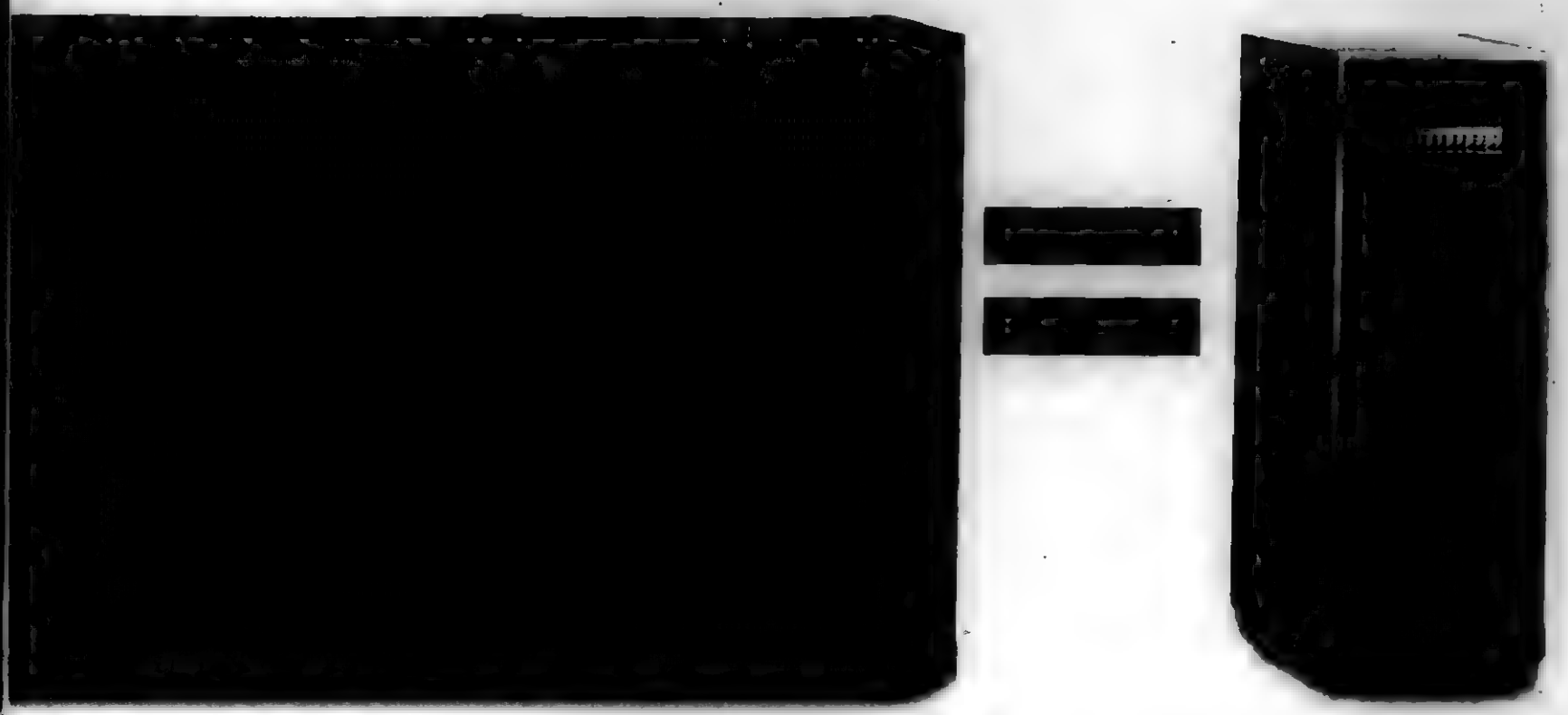
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Apr 2	Louisville	May 8	Los Angeles	Jun 11	Nashville
Apr 9	Salt Lake City		St. Louis	Jun 13	Ottawa
Apr 10	Oak Brook	May 9	Phoenix	Jun 14	New York
Apr 11	Chicago	May 10	Richmond		Toronto
	Portland	May 15	Grand Rapids	Jun 17	Winnipeg
Apr 16	New York		Orange Co. (CA)	Jun 18	Regina
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Northwest productivity takes off with imaging

Airline gets data out faster, with smaller staff

ON SITE

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — To be successful, a document imaging application must do more than store paper records in electronic form. It must change the quantity and caliber of the data available to a business, altering the way people and processes work.

Northwest Airlines is a prime example of an imaging user that planned for this change and is now reaping the benefits. One year ago, Northwest — the nation's fourth-largest carrier — began deploying a massive, 450-user imaging system to capture and process the ticket stubs printed by Northwest gate agents and independent travel agents and carried by Northwest passengers [CW, April 16, 1990].

"We can now do everything on a timely basis, with a slightly smaller staff and a larger airline," said Scott Grengs, project analyst of distributed services and one of the people closest to the passenger revenue accounting (PRA) system.

On-time processing

Although Northwest has not yet tallied the hard dollar savings that have accrued from the imaging system, Grengs said, one notable benefit has been to bring the processing load up to date. "When I started here four years ago," Grengs said, "we were, at times, as much as six months behind [in processing the ticket stubs]." Today, the system produces revenue or audit reports "accurately and on time," Grengs said.

Under the 20-year-old manual system, the revenue and marketing departments could only extrapolate their numbers, manually conducting a 5% audit of all the tickets. The problem was the volume of these ticket coupons: In peak months, Northwest processes 270,000 daily.

The 5% audit, while adequate for billing and revenue projections, fell far short of the needs of Northwest's marketing department, which wanted more timely and detailed information to monitor the effectiveness of its marketing campaigns.

"Marketing needs to know a lot more about what's happening, where and when people fly and which products they're using," said Mike Shields, project manager of the marketing analysis system at Northwest's Information Services Group.

"Now we capture 100%," said Shields, adding that several benefits have flowed from this change. For example, Northwest can now accurately monitor the fares and commissions charged by independent travel agents. An even greater value, he said, will be a not-yet-operational subsystem to track incentive and promotional programs.



Northwest Airlines' *imaging system can handle 270,000 ticket coupons daily*

For example, this will let Northwest monitor, for the first time, the effectiveness of short-term flight discounts or promotional tie-ins with hotel chains.

Shields emphasized that the data coming from the PRA system is being integrated with other sources, such as Northwest's flight schedules. "We're working now on bringing these data sources together so that they can be accessed by marketing and applications development," Shields said.

Shields said mainframe-based DB2 databases will continue to handle the marketing department's needs for the foreseeable future. "But as we move down road," he added, "we may look at distributed databases and taking more advantage of intelligent workstations."

Late last year, Northwest, which employed Chicago-based Andersen Consulting as the systems integrator on the project, added the last 100 users to its PRA system.

The 442 users, working on Sun Microsystems, Inc. SLC diskless workstations, are connected over a Sun local-area network, which is attached to a Filenet Corp. image server and image library. The libraries contain as many as 408 optical discs for a total on-line capacity of 40 million documents.

SIG pilots 'developers' environment'

Shearson spin-off puts together development, maintenance tool kit

BY JOHANNA AMBROSIO
CW STAFF

Securities Information Group (SIG) is addressing the "shoemaker's children" syndrome by providing its developers with a set of integrated tools for maintenance and new development.

Included in the tool kit are off-the-shelf packages for computer-aided software engineering (CASE) and reverse engineering, said Ira Morrow, vice president at SIG. The move is especially timely, he said, in light of SIG's recent spin-off from Shearson Lehman Hutton, Inc. Formerly Shearson's information systems unit, SIG is now owned and operated by American Express Co., Shearson's corporate parent, although Shearson remains SIG's only client to date [CW, Feb. 4].

"One of our major focuses this year will be on reverse engineering — to abstract an existing system to a high-level design and then forward engineer that," Morrow said. "With the spin-off, this is increasingly important so we can take what we develop and generalize it for the entire industry, not just for Shearson."

Because SIG will be targeting different clients with various technical needs, "there is a far greater need to do this kind of tailoring," Morrow said. "So there's increased motivation to get it in place."

Beta-testing Crysallis

This month, SIG will begin beta-testing Language Technology, Inc.'s Crysallis reverse-engineering package. If all goes well, Crysallis will be linked into the existing tool kit, which includes Knowledgeware, Inc.'s Information Engineering Workbench, Cadre Technologies, Inc.'s Teamwork and Bachman Information Systems, Inc.'s Data Analyst.

"Like the majority of shops, most of our resources are spent on modifying existing applications. It takes up a disproportionate amount of our time," Morrow said. "So about 1½ years ago, we sat down to modify how we do this. We brought in CASE tools and developed an integrated workbench."

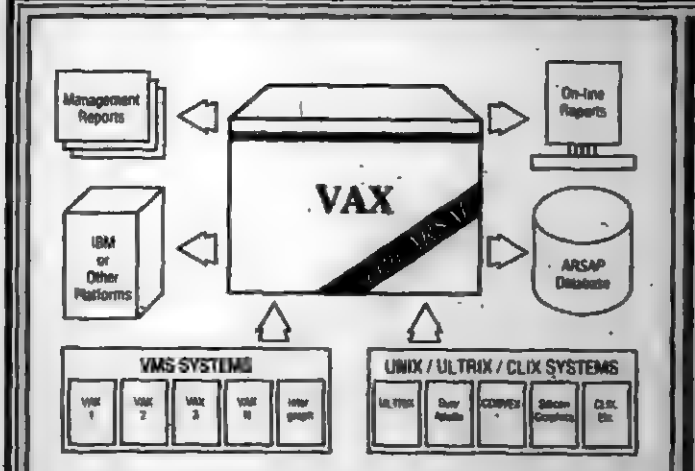
Just as Shearson did back then, SIG will do more than just bring in the new tools and expect programmers to use them. "We have an internal support group for marketing and training on these tools," including "Tool Days" when vendors make technical and marketing presentation, Morrow said. "If people aren't using something, you have to ask why. Maybe they need more training, or maybe there's a problem using a particular tool in their environment."

> INCLUDED IN the tool kit are off-the-shelf packages for computer-aided software engineering.

Morrow's group in SIG supports four Shearson programming units: trading, branch office/retail, operations and corporate systems. "They all have different needs. Corporate needs Cobol and DB2 on the mainframe, trading is mostly C and Unix on workstations, and retail is mostly PS/2 and OS/2 under Windows," he said.

Right now, the focus is on "proving the concept" of a developer's environment with its integrated tools. "Once we prove that we can tangibly measure an improvement — decreased time and cost and increased productivity — we'll select an actual architecture," Morrow said. "It helps that you no longer need to develop on the platform you're targeting for. You can use Unix boxes with X terminals even if your target is PS/2s or the mainframe. That gives me a lot of options."

What SIG is aiming for, he said, is "trying to make a real cycle out of AD/Cycle — to go forward, reverse or loop around. The biggest part of AD/Cycle is in maintenance and testing, but everyone's been concentrating on the front-end pieces. We're shifting our emphasis to back-end CASE."



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Index data collected on-line

ON SITE

BY SALLY CUSACK
CW STAFF

WASHINGTON, D.C. — One measure of the U.S. economy, the Consumer Price Index, has been churning out numbers on a regular basis since 1913, and to no one's surprise, the most consistent and stable numbers these days are found in relation to total amount of money spent on gasoline.

"More Americans buy gasoline than any other category we follow," observed Stephen G. Wright, chief of the Consumer Prices and Consumption Studies Division at the U.S. Bureau of Labor Statistics. "It's something that is hard to cut back on and almost impossible to do without."

Wright and his staff are responsible for developing and running all of the systems that produce the monthly index. For data collection, tabulation, formatting and transfer, the department uses programs created with the SAS Application System, an application development system from SAS Institute, Inc.

"We send out pricing forms to collect approximately 85,000 price quotes in 16,000 different retail outlets each month and also gather information on rental and home ownership costs nationwide," Wright said.

The completed forms, which are customized from previously compiled pricing information, are mailed back to Washington, where preliminary calculations are made to assist economists in reviewing the data.

The SAS Application System is used to retrieve the selected data that has been previously reported, allowing the department to customize and build the next month's price form, Wright said.

Off-site storage

Once respondent information is entered, necessary changes are uploaded to an off-site, Amdahl Corp. 3090-class mainframe. Locally, Wright's division uses more than 100 Intel Corp. 80386-based machines running MS-DOS and three Sharebase Corp. 700 database servers for compiling and producing the numbers.

The personal computers are linked to the database machines over a 3Com Corp. 3+ local-area network, and some communicate to the mainframe over 9.6K bit/sec. lines. "For our purposes, this is fast enough," Wright said. "We only send necessary changes to the mainframe."

According to Wright, the database machines are populated with built tapes from the Amdahl system. When uploading data, information from the database machine is put into a file transfer format that uses an SAS data set as a transaction file.

SAS Application System Version 5.18 now resides on the mainframe, as does Rapid, a database with relational properties from Statistics Canada.

The division uses several in-house software systems to produce the index, including a commodities and services system for computing price relatives from retail quotes and a housing system for compiling housing and rental data.

There is also a publication system that organizes the information into various formats for use in Lotus Development Corp. spreadsheets and even press announcements.

Most of the software systems, including printing of schedules, were written using the SAS Application System.

Old reliable

The bureau has been using SAS for over 10 years, Wright said, relying on it heavily in the early '80s when it began to build a system for a consumer survey. Wright is pleased with the software's logic and data handling abilities as well as the automated steps provided for data processing and file handling.

The software has also been used to develop an in-house interface to Rapid, which standardizes the interaction between the SAS Application System and the database management system Wright said. The department also uses the SAS macro facility to package code.

Wright added that the department is in the process of testing SAS Application System Version 6.06. "We submit everything to a lengthy and vigorous testing process before we put anything onto our production software."

Consumer Price Index

- The index is compiled monthly by the Division of Consumer Prices and Consumption Studies, which is a division of the U.S. Bureau of Labor Statistics.
- The Bureau of Labor Statistics is part of the Department of Labor.
- By definition, the index measures price change on a market basket of goods, reflecting the buying patterns of the population. It is often incorrectly referred to as the "cost of living index."
- The Bureau of Labor Statistics uses Boeing Computer Services in McLean, Va., for all mainframe computing needs. Currently, index information resides on an IBM 3090-class machine from Amdahl under MVS/XA.

Bozman

FROM PAGE 27

"Oracle's weakness has to be the price," said Ed Jakubas, information systems director at the Midwest Stock Exchange in Chicago, which is evaluating RDB as a replacement for Oracle. "Oracle has a solid product, but what is attracting us to RDB is the integration possibilities with the [VMS] operating system." The Midwest Stock Exchange has more than 24 VAX systems, including smaller Microvaxes.

Other sites that use Vaxclusters are also listening to DEC's call to re-evaluate RDB. That's because Oracle has had to re-architect a "parallel server option" that would allow multiple VAX nodes to update a single, shared copy of Oracle 6.0. Since the fall of 1989, Oracle 6.0 has not been recommended, even by Oracle, for use with Vaxclusters. A new version for Vaxclusters, Oracle 6.2, is due out this month (CW, Feb. 18).

Fear and uncertainty could be used by DEC in its marketing efforts to compare RDB with the Ingres product, but so far there is little sign that Ingres users are "going home" to DEC's bundled hardware and software.

Many users are waiting to see how the Ask/Ingres marriage works out. It's also worthy of note that Ingres provided an official DEC/Ultrix version of the Ingres DBMS, called Ultrix/SQL, for sale with VMS workstations last year.

Flexibility to run in varied software environments also gives the independents an edge. It's clear that users favor the way Oracle and Ingres run on Unix systems, something DEC's RDB cannot currently match. However, RDB can already play in "open" networks by accessing other DBMSs through "gateways" to IBM and Unix machines. In addition, industry analysts say, DEC will soon announce a version of RDB for Ultrix.

A January 1991 survey of 4,000 VAX sites by Computer Intelligence in La Jolla, Calif., found that the RDBMS market for VAX hardware shakes out this way: Oracle and RDB were each installed at 29% of the sites, while Ingres was installed at 21%. The remaining 21% of the sites employed a variety of RDBMS products, notably those from Sybase and Informix Software, which no longer markets a VAX version of its RDBMS. In other studies, Oracle and RDB scored about 22% market shares.

Will DEC's aggressive marketing push, coming years after the RDBMS independents gained footholds in the VAX market, pay off in 1992? To judge by appearances, market share won't shift radically, but shift it might. We'll just have to wait for that next VAX survey.

Bozman is *Computerworld*'s West Coast senior editor.

HARD BITS

'No' vote on minicomputer servers

Large companies are giving a big "thumbs down" to the idea of using minicomputers as servers, according to a recent report by Forrester Research, Inc. The study showed that although some large firms use minis in the server role, the majority rely on personal computers. When asked about future plans, a sample of the Fortune 1,000 said they would heavily favor PCs over minis in a server capacity.

Array Technology Corp., headquartered in Boulder, Colo., has announced an OEM agreement with NCR Corp. to supply disk array storage systems for high-end NCR computers. Under terms of the contract, Array will develop hardware and software storage systems to NCR specifications, based on redundant arrays of inexpensive disks technology.

In other NCR-related news, the Dayton, Ohio-based company has signed a preferred distribution contract with Modern Office Machines, under which the latter will resell NCR workstation products to businesses in Greenville-Spartanburg and Charleston, S.C.

Motorola, Inc. has inked a value-added reseller agreement with Datek, Inc., a software company in Concord, Mass. In its new alliance with Motorola, Datek will offer turnkey, Pick-based software to run on Motorola Computer Group's Unix-based Multipersonal Computer and Delta Series systems.

Promising to aid customers in maximizing systems productivity, Point 4 Data Corp. has begun distributing the Communicator to its 30,000 Point 4/Iris multiuser computer owners. The Communicator contains information on developments, field-installable enhancements and systems upgrade specials. Interested Point 4/Iris users can subscribe to the Communicator free of charge by contacting the company at its Tustin, Calif., headquarters.

IMS, DB2

FROM PAGE 27

for performance and integrity reasons, but we provide users with what they need from a relational database," he added.

Other users have taken different paths. Mellon Bank Corp., for example, is relying increasingly on DB2 for its critical production applications.

"We are charging full-speed ahead with DB2," said David Moore, a senior vice president at Mellon Bank.

However, that does not necessarily mean the end for IMS. Moore said there is no push to migrate his IMS environment, which contains "about three times as much data as DB2 at this point." Instead, the bank has designated all new development for "mission-critical applications" as DB2's domain.

CSX Technology, the information systems division of CSX Corp., has taken a few approaches rather than relying on one set plan, said Doug Underhill, assistant vice president of technical services.

Underhill said the company has assigned some new development to DB2 and has attempted some IMS data migration to the relational environment. The ultimate requirement, he said, is to have one database — DB2. CSX converted a few systems to DB2 recently, an effort that Underhill described as "pretty easy."

"I mean, we aren't rocket scientists. It's the same data — it's just a different structure," he said.

NEW PRODUCTS — SOFTWARE

Applications packages

Group 1 Software, Inc. has announced two software packages designed to assist users in coding and presorting mail in order to accelerate delivery and minimize the amount of undeliverables.

Code-1 ($42,000) was designed to add nine- or five-digit ZIP codes, carrier route codes and postal bar codes to address lists.

Mailstream Plus ($16,500) can be used to presort mail so maximum postal discounts are ensured for first-, second- and third-class mail.

A package that includes both products is priced at $49,500.

Group 1 Software
Washington Capital Office Park
6404 Ivy Lane
Greenbelt, Md. 20770
(301) 982-2000

Marcam Corp. has announced Prism Quality Management, a Prism-based module that automates the testing and sampling of raw materials and in-process or finished goods.

Prism is a business planning, control and cost accounting software system designed for the process manufacturing industry. The Quality Management version can also be used to control graded inventories or material being inspected or held because of defects, the vendor said.

The product is scheduled to begin shipping in July. Pricing begins at $18,000.

Marcam
95 Wells Ave.
Newton, Mass. 02159
(617) 965-0220

NEW PRODUCTS — HARDWARE

Processors

Altos Computer Systems has announced two open architecture, multiuser computers that feature an Intel Corp. I486 processor and an Extended Industry Standard Architecture bus.

The Model 5820 and the Altos Power Server Model 5000-33 — part of the company's System 5000 family — feature a proprietary operating system, the Altos Unix System V/386 for the 486 Release 2.0, which is based on The Santa Cruz Operation's Unix Version 3.2.2.

Pricing for the Model 5820 and Altos Power Server Model 5000-33 begins at $14,300 and $28,600, respectively.

Altos Computer Systems
2641 Orchard Pkwy.
San Jose, Calif. 95134
(408) 946-6700

Texas Instruments, Inc. has announced a Motorola, Inc. 68040-based computer designed to support up to 64 users.

Model 1507 of the company's 1500 computer family runs under TI System V Version 3.2, TI's version of the Unix operating system. The complex instruction set computing-based device can be configured with 4M or 16M bytes of memory and features 260M bytes of mass storage.

A basic configuration lists at $18,000.

Texas Instruments
Information Technology Group
P.O. Box 202230
Austin, Texas 78720
(512) 250-7111

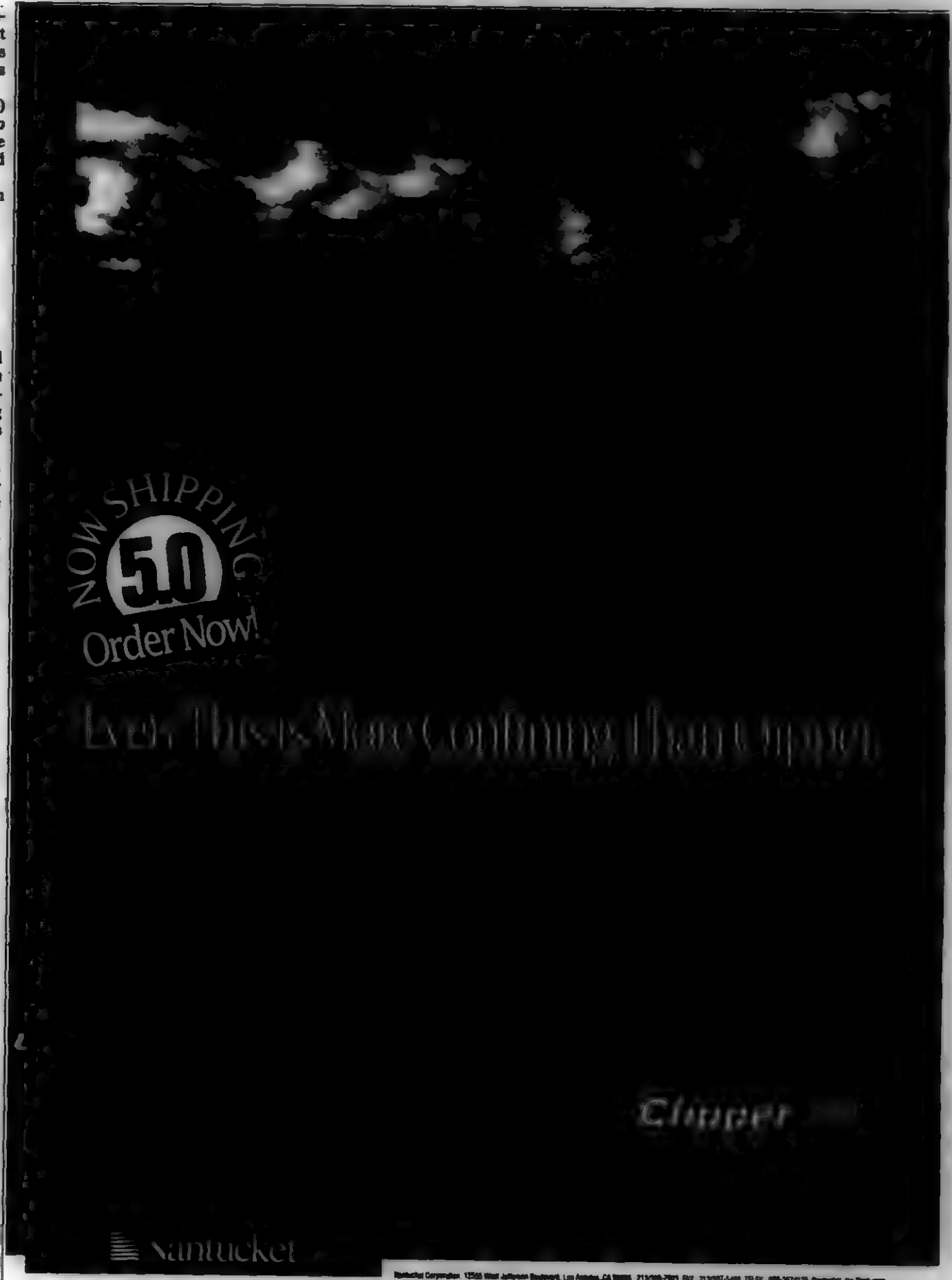
I/O devices

Industrial Electronic Engineers, Inc. has announced an interactive touch-screen terminal based on flat-panel technology.

Model 4286 of the company's PEP family of touch-screen terminals features a 256- by 128-dot display panel. The product's cathode coating allows the display to be visible in high ambient light conditions; the coating also permits the terminal to operate in temperatures ranging from -20 to 75 degrees C.

The unit is priced at $1,619.

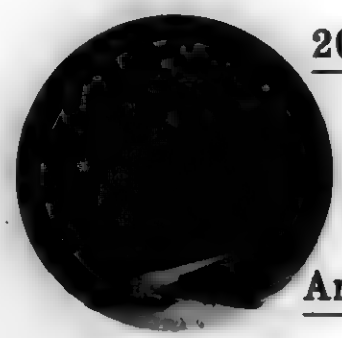
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PC MAGAZINE EDITORS' CHOICE November 27, 1990

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C&C Computers and Communications

NEC

Intel 386 tops buy lists

Study finds standardization among PC users

BY PATRICIA KEEFE
CW STAFF

Few will be surprised that a recent survey of personal computer purchase plans revealed that Intel Corp. 80386-based computers predominate.

Computer Intelligence's study focused on major metropolitan areas, where 61% of the respondents underscored the desktop statement of direction issued by many corporate microcomputer managers during the past year: standardization on the 386 family.

The twist comes from the fact that despite Intel's best efforts to persuade the populace otherwise, 8088- and 8086-based computers continue to find favor. Almost as many users — just over 6% — plan to buy these low-end Intel-based boxes as plan to buy Motorola, Inc. 68000-based computers, which is just over 9%, according to Computer Intelligence.

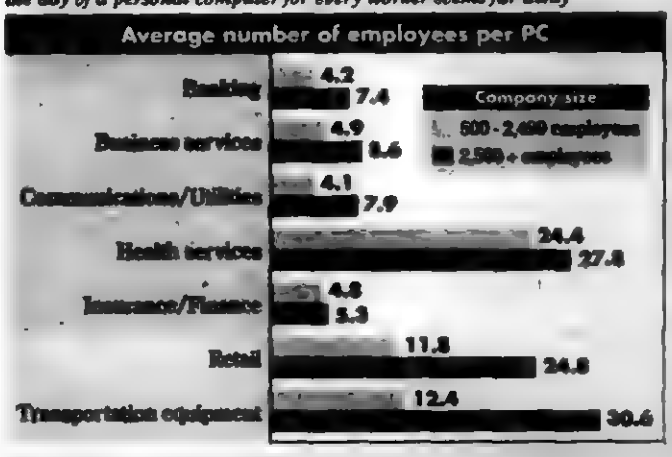
A solid 22% said they will bolster their installed bases of 80286-based computers. Conversely, the very high end barely elicits a yawn; only 1% of the respondents overall — 2% in Minneapolis — said they will buy 1486-based systems.

This breakdown jibes with a survey of The Sierra Group, Inc./First Boston Corp. MIS Executive Council, which takes a more specific look at what will be bought while noting that fewer systems overall will be purchased in 1991. Compared with 1990's growth in PC spending, which was 47.6%, the report

Continued on page 40

Open market

Even in the most computer-intensive industry sectors such as insurance, the day of a personal computer for every worker seems far away



Source: Installed Technology International — CW Chart: Doreen St. John

Compaq misses low-price mark

ANALYSIS

BY RICHARD PASTORE
CW STAFF

Compaq Computer Corp.'s first shot at low-end, budget-priced desktop computing seems to have gone slightly awry. Observers said Compaq's Deskpro 286N and 386N systems are as mechanically surefire as their higher end brethren, but pricing and marketing are off-target.

The 286N and 386N were introduced 10 months ago as Compaq's first network node machine and its new entry point stand-alone workstation. The Intel Corp. 80286 and 80386SX boxes could be configured with no disk drives or with a hard disk and/or floppy disk drive. They were designed with a smaller footprint, less expandability and more network security features than other Compaq desktops.

With its N systems, Compaq was hoping to slow customer erosion to the low-priced clones in the node and stand-alone markets. However, pricing and marketing problems have kept that goal elusive, analysts agreed.

"Everybody's full-blown 386SX machines are well below Compaq's price points on the N products," said Jim Poyner, market analyst at William K. Woodruff & Co. in Dallas.

"This is a tough environment right now. Compaq and IBM have the same problem: They're priced higher than everybody else," said Robert Goldberg, vice president at Old Stone Bank in Warwick, R.I. He is buying AST Research, Inc.'s Bravo personal computers for "considerably less" than the N's prices.

Even Compaq customers voiced concern about price. "Everybody who buys Compaq is willing to pay more" for the value perceived behind the brand name, said Marc Kustoff, director of microcomputing at Rhone Poulenc Rorer, Inc. in Fort Washington, Pa. The question is, how much more? "If the product's going to be successful, it's not cheap enough," he said.

Another problem confusing potential users is Compaq's unfocused N product positioning. At first, the models were slotted primarily as network nodes rather than as stand-alone systems.

"We did it to ourselves with the naming," said Lorie Strong, Compaq's vice president of product marketing. The "N" was most often translated as "node." She said the machines are now doing equally well as nodes and low-end workstations.

"Now, they're trying to get the best of both worlds and have it straddle two markets," Kustoff said. But as a node, it comes up short on size and price, and as a workstation, it lacks standard memory, speed and disk drive flexibility, he noted. Kustoff buys Compaq's 386S/20 as his stand-alone standard.



Less expensive than most Compaq systems, *the N models still cost more than competing computers while not including features such as Microsoft Corp.'s Windows or a monitor*

Despite the marketing confusion and pricing concerns, one thing seems clear: Compaq did not compromise on quality with the N products. Users said that despite their low prices relative to other Compaq products, the machines are just as sound.

At New York accounting firm Buchbinder Tunick & Co., the $2,000 N stations perform as solidly as the $30,000 Compaq Systempro server, partner Mitchell Weiss said.

Amoco Transport Co. chose the 286N for its durability. The shipboard machines have stood up well to weather conditions that pitch Amoco's ships as much as 45 degrees, said Walter Kristiansen, manager of operations coordination and support.

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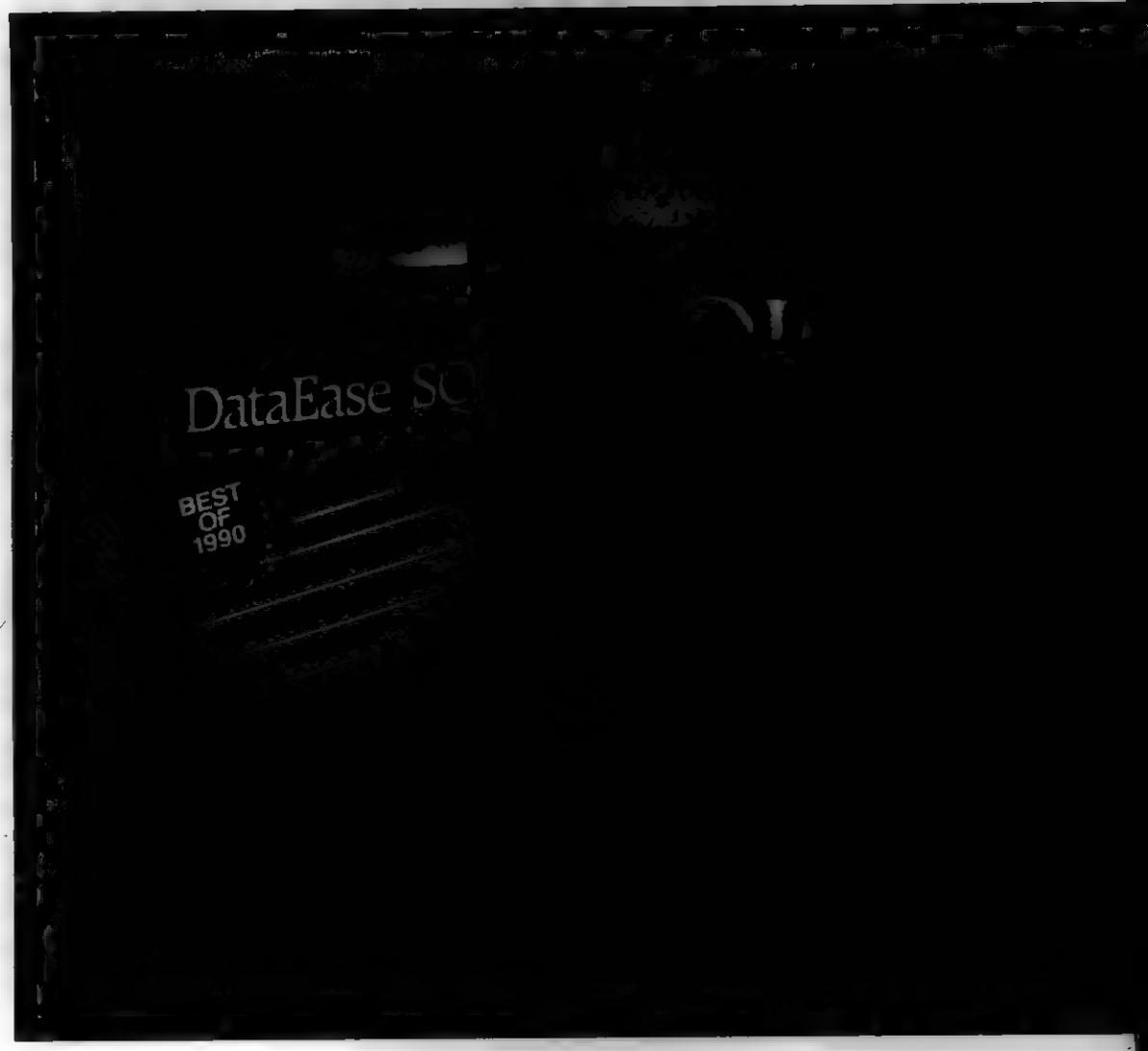
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Sign maker glitters with IS gear

ON SITE

BY CAROL HILDEBRAND
CW STAFF

If you have ever watched the ball drop in Times Square on New Year's Eve, you have seen Artkraft Strauss Sign Corp. at work. What is a little harder to see is how the company has used technology to redesign its business.

The family-owned company, in business since 1897, is one of the premier makers of large-scale outdoor advertising, employing almost 200 people. Times Square is Artkraft Strauss' private fiefdom in terms of sign-building, and it has been since the 1920s.

The firm has also left its mark on the Great White Way: Company founder Jacob Starr was known as the "lamplighter of Broadway." Starr managed his company by using the latest innovations. He was recognized in his field as being the first to use neon in outdoor advertising.

Behind the times

When his son Mel took over the firm, the emphasis on new technology lessened because Mel's interests laid more in the art of deal-making. By the time Mel's children, Jonathan and Tama, took over in 1988, Artkraft Strauss had fallen behind in technology. Computers played little role in the company.

"There was one IBM AT in the place, covered with dust, that everybody was scared of touching," said Jonathan Starr, company chairman. "Now, there probably isn't a desk in the place that doesn't have some kind of a system." Uses range from accounting to project cost estimating and computer-aided design and manufacturing (CAD/CAM).

Starr said a look at the rest of the market provided an impetus to jump in. "It was either do it or fade away," he said.

The first area that was targeted was estimating job costs. Starr wrote a Lotus Development Corp. 1-2-3 template that let his estimators plug in such factors as labor hours for painters and sign hangers and costs for aluminum and light bulbs. "It was rudimentary, but it was a start," he said.

Another process in need of automation was the method of controlling some of the big signs. For example, there is a supermarket sign in Brooklyn advertising specials that change several times per day. "We used to send someone up into the sign's control room to make programming changes. Now, we have telephone lines to the sign. We'll change the programming of the sign in-house and send it via modem."

The biggest target area was in the design and manufacturing area, however. Starr pulled his design people off a manual process and started them with Autodesk, Inc.'s Autocad CAD/CAM software on an NEC Technologies, Inc. personal computer based on the Intel Corp. 80386.



Scott Thurber

Times Square *has been home to many of Artkraft Strauss' signs*

At the same time it jumped into CAD, the company invested several hundred thousand dollars in an integrated manufacturing package from Cybermation, Inc. in Medford, Mass. The package comprises three pieces: front-end software, cutting machinery and a number of sub-packages specifically for sign designing. The package runs on an Intel 80386-based PC. For example, one program runs a process known as nesting, which computes the most efficient placement of letters that need to be cut from a sheet of aluminum.

Starr said he generally has approximately three people using The Santa Cruz Operation's Xenix-based manufacturing system. "People can be designing at the same time that others can be independently downloading files or cutting [letters]," he said.

Automation has led to a considerable improvement in manufacturing precision.

"Before, we would take a drawing and put it on an opaque projector with all the distortion, blow it up on the wall, and a guy would stand by the wall with a pencil and draw," he said, referring to how the company enlarged designs. "Now, we can take something tiny, make it any size and still be within a couple thousandths of an inch."

The cost savings are evident throughout the company. For example, an architectural change of one inch to a marquee design can mean the recalculation and redrawing of the entire set of blueprints, perhaps as many as 20 sheets' worth. "It would take someone weeks to redraw 20 sheets," Starr said. "Now, it's a very simple function of the plotter."

Panther tape line released

BY MAURA J. FARRINGTON
CW STAFF

WESTLAKE VILLAGE, Calif. — Tandberg Data, Inc. last week introduced its first line of tape backup subsystems to be marketed under the company name.

Designed for use on stand-alone personal computers and local-area networks, the Panther series includes ¼-in. tape backup subsystems ranging from 60M bytes to 525M bytes available in both external and internal models, according to Tandberg.

The products come bundled with software that provides connectivity to several platforms. Depending on the subsystem configuration, Tandberg supports DOS, OS/2, Unix/Xenix, Pick Systems' Pick, Novell, Inc.'s Netware and Microsoft Corp.'s LAN Manager platforms, among others.

Prior to the Panther series, Tandberg acted as an OEM to IBM, Digital Equipment Corp. and other companies by selling its high-end products for installation in midrange and mainframe systems.

Available now, the Panther series products range in price from $995 for a 60M-byte internal subsystem to $1,699 for a 525M-byte external subsystem, a spokesman said, adding that a 1G-byte Panther product is due out within four or five months.

Windows interface unveiled

BY JAMES DALY
CW STAFF

MOUNTAIN VIEW, Calif. — Parcplace Systems recently introduced an object-oriented programming environment for Microsoft Corp.'s Windows 3.0 that could go a long way toward streamlining the duties of Windows programmers.

Object-oriented programming involves creating a library of reusable data structures and procedures, thus allowing the software engineer to rapidly create prototypes and produce programs. The methodology is considered key in the development of graphical user interfaces, distributed applications and links to databases.

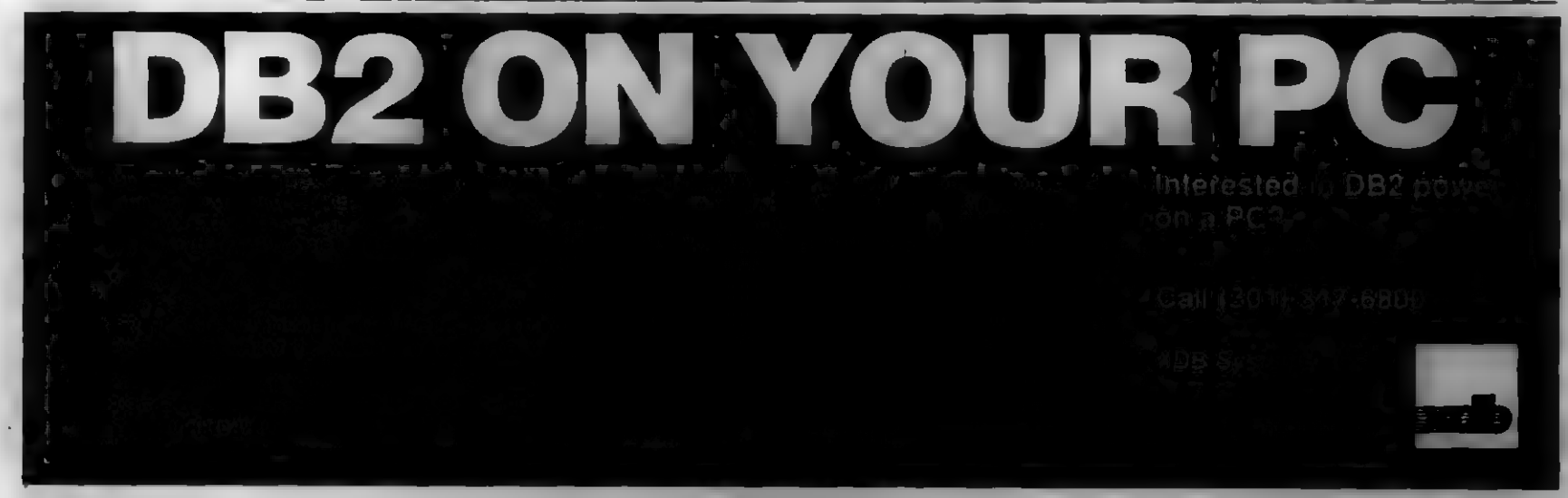
Objectworks/Smalltalk Release 4.0 lets developers call as many as 350 types of portable "objects," or the things that are manipulated in the program, and more than 7,400 "methods," which are the paths those objects travel, according to Parcplace officials.

The update, which is geared toward the corporate in-house applications developer, is also the first development environment to exploit the 32-bit linear mode of Windows 3.0, company officials said. Most Windows 3.0 applications are written for 16-bit segmented mode, which grinds down application performance because it requires breaking programs into 64K-byte parts. By contrast, 32-bit linear mode allows developers to ignore the 64K-byte chunks and write applications with no memory segment limitations.

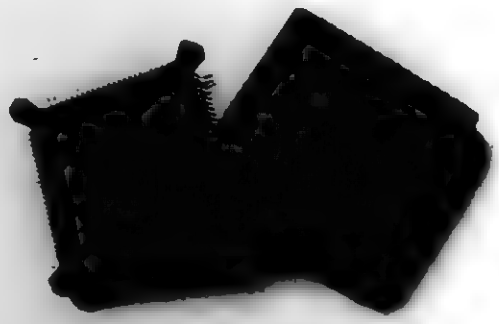
Overcoming the 64K-byte segment requirement eliminates a major performance bottleneck and allows programmers to run code as much as 50% faster than before, said Doug Pollack, vice president of marketing.

The performance of Windows applications is further enhanced with Objectworks/Smalltalk because it is a fully compiled system. Using a technology called dynamic compilation, Objectworks/Smalltalk executes native machine code and, unlike traditional compilers, handles the last stage of compilation at runtime.

Objectworks/Smalltalk Release 4.0 is priced at $3,500 and is scheduled to be available this month.



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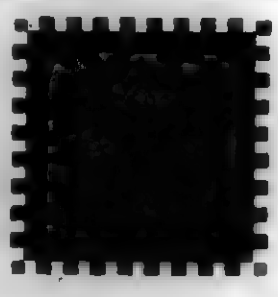
Multiprocessors promise speed

ANALYSIS

BY J. A. [illegible]
CW STAFF

As if a 50 million instruction per second (MIPS) processor is not fast enough, workstation vendors are lashing those processors together to create faster computers.

Most vendors of reduced instruction set computing (RISC) workstations are opting for "tightly coupled" or "symmetric" multiprocessing. Others, namely IBM, are aiming, at least in the near future, for "loosely coupled" multiprocessing.



Mainframe vendors have used tightly coupled multiprocessing for their massive systems since 1973 with IBM's dual-processor System/370 Model 168. But those are large and proprietary CPUs, and it took almost two decades for mainframe vendors to hook eight processors together.

For the same reason that mainframe vendors use multiprocessing — speed and throughput — workstation vendors are beginning to tightly couple CPUs. So far, those systems are used as servers. For desktop machines, vendors are relying on increasing the capacity of uniprocessors, but multiprocessing can be done through links between several desktop machines, ending up as loosely coupled multiprocessing.

Tightly coupled multiprocessing uses a single, shared memory and one copy of the operating system. Each processor can address the same peripherals. "It's like four workmen in the same room doing the same task," said Rajeev Jog, performance analyst for hardware systems at Hewlett-Packard Co.

While vendors who use other companies' RISC architecture — such as that from Mips Computer Systems, Inc. and Sun Microsystems, Inc. — are able to engineer multiprocessing systems, those architectures have yet to inherently support multiprocessing. However, Mips and Sun have said their RISC architecture will support symmetric multiprocessing in the future.

Loosely coupled multiprocessing uses available processing power in disparate computers to process tasks. Each CPU has its own memory and its own copy of the operating system. The user pays a performance penalty for its use. For instance, the system has to find which peripheral to use for which task. When it is finished crunching data, the data has to be synchronized on the original CPU.

"It's like you have workmen in four different rooms with the same equipment in each room, but they're running back and forth to communicate the job," Jog said.

IBM has said it will eventually implement symmetric multiprocessing, but for now, it is headed for loosely coupled technology in an attempt to leverage its installed base of networked uniprocessors. "Basically, the MIPS are free," said Phil Hester, director of IBM's engineering center, Advanced Workstations Division, in Austin, Texas. "The assumption is that people in an organization will have their own workstations. Throughout the day, there's a large amount of MIPS idle in those workstations. Loosely coupled multiprocessing can recycle or reuse those MIPS that would otherwise be wasted. You can run large jobs at only an incremental cost."

IBM is following this loosely coupled multiprocessor technology in its personal computer environment [CW, Feb. 25].

The other side of the coin

Both multiprocessing methods have their drawbacks. To avoid CPU tasks bashing into one another on the way to memory, vendors must increase bandwidth. "A VME bus just doesn't have the throughput," said Allan Snell, vice president of marketing at Solbourne Computer, Inc. in Longmont, Colo., which makes multiprocessor servers based on Sun's CPUs. "That's the weak link. You can put together a few CPUs now, but to expand, you need one big, wide, fast bus."

In loosely coupled multiprocessing, the drawback is the software overhead to coordinate and synchronize data. In homogeneous environments, that takes some overhead, Hester noted, but in heterogeneous environments, "there will certainly be problems trying to get it to work," he added.

As RISC processors become faster and more complex — like HP's 76 MIPS CPU due at the end of the month — it will become more difficult to tie them together in a tightly coupled technology, according to Tom Willmott, an analyst at Aberdeen Group in Boston. "Contention mounts as individual processors get more complex and they contend for space on the shared memory and operating system."

Legacy offers disk-array system for varied servers

BY RICHARD PASTORE
CW STAFF

The few disk array subsystems announced by file server manufacturers so far have been largely proprietary. Compaq Computer Corp., Dell Computer Corp. and Advanced Logic Research, Inc. have all developed or adapted proprietary designs. However, a Markham, Ontario-based firm last week unveiled a hardware-independent array that reportedly offers more efficient redundancy than its proprietary competitors.

Legacy Storage Systems, Inc.'s Legacy Multi-Additional SCSI Subsystem Hot Fix Device can hold up to eight hard disk, optical or tape drives and connects directly to small computer systems interface (SCSI) backplanes. It can be purchased with Legacy-labeled drives or will accept any manufacturer's SCSI drives, company officials said.

The system has a Level 5 fault-tolerant rating — space for redundancy takes up only 14% of total storage space. Level 4 devices like Compaq's and Dell's use 25% of space for redundancy, according to the redundant array of inexpensive drives rating pioneered by fault-tolerant software developer Pacstor, Inc.

The Legacy system also allows users to remove and replace defective drives without powering down the system and halting operations. The system then automatically initializes and rebuilds the new disk. Built-in software signals to the operator which drive is defective.

The system is compatible with Unix, OS/2 and Novell, Inc. Netware environments. Pricing is modular: A configuration with four 380M-byte disk drives lists for $13,799. It is slated to ship April 1, according to Legacy, formerly called Tense Lectronix Corp.

The Legacy machine uses array software from Santa Clara, Calif.-based Integra Technologies, Inc. The firm's Level 5 software has already been implemented on NCR Corp.'s System 3000 and has been licensed by IBM as well.

Intel 386

FROM PAGE 35

found projected growth for PC spending virtually cut in half, at 24.2%.

Dick Shaffer, editor and publisher of "Computerletter," is predicting single-digit growth in U.S. sales of PCs. Both Apple Computer, Inc. Chairman John Sculley and IBM Vice President William J. Filip have also suggested it might be hard for U.S. PC makers to break 10% growth this year.

Economic conditions are also impacting the vendor of choice. Of the 50 Fortune 500 companies surveyed, 76% said they are less willing to purchase PC clones from second-tier suppliers than from IBM or Compaq. IBM can expect to rake in 50% of these sales, the report said, followed by Compaq with 17%. The remaining 33% of purchases will be spread out over other vendors.

The overwhelming majority of respondents, 70%, plans to purchase 386-based computers; another 19% said they will buy 286-based PCs. Overall, 78% of PC purchases will be deployed on the desktop. Only 10% plan to purchase 1486-based systems, the same number that said they will use the new PCs as servers. Twelve percent of overall system purchases will be laptops.

La Jolla, Calif.-based Computer Intelligence looked at PC preferences in 32 major metropolitan areas, including what it said are the eight areas with the greatest commitment to PC technology: New York, Los Angeles, Washington, D.C., San Francisco, Chicago, Boston, Philadelphia and Houston.

Geographical breakdown

Most of the low-end purchases tend to be made in Baltimore, Cincinnati, Providence, R.I., and Buffalo, N.Y. By comparison, the major metropolitan areas with plans to buy a mix of higher systems — 386 and/or 486 — included Kansas City, Mo., Milwaukee, Houston and Portland, Ore. Yet these four represent less than 7% of the intended PC purchase plans.

The eight key metropolitan areas each tend to focus on a few industries. Computer Intelligence's study pointed to heavier PC purchasing in the discrete manufacturing, medical/education and process manufacturing segments. The banking/savings and loan industries appeared to be at the bottom of the list.

However, a separate study by bank automation consultant M. Arthur Gillis claimed that PC purchases will be a high priority at most banks in 1991. He said the PC's multidimensional personality makes it a "real banking hero." Not only can the PC be deployed in a stand-alone, distributed or shared mode, but it can function as a multifunctional terminal with a mainframe.

Banks of all sizes cited re-examinations of PC policies and procedures as "popular projects," whereas upgrades to or new purchases of main system hardware proved to be a low priority, Gillis said.

The study is based on a survey of more than 400 banks and thrifts of all sizes that was conducted in December 1990.

NEW PRODUCTS

Software utilities

Genesis Software Co. has released Version 2.0 of WS-Report, a personal computer-based tool for Cobol programmers.

The product's integrated modules facilitate the design, documentation and programming of Cobol-generated reports.

Version 2.0 ($115) runs on IBM Personal Computer XTs, ATs, Personal System/2s or compatibles.

Genesis Software
12318 Raven Street
Cypress, Texas 77429
(713) 469-1537

Board-level devices

Sigma Designs, Inc. has introduced a lossless compression add-in board designed for Apple Computer, Inc. Macintosh environments.

Double Up ($229) can compress all types of files — image, data or programs — by an average ratio of 2-to-1 and can operate eight times faster than software-based compression and decompression utilities, according to the vendor.

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Fremont, Calif. 94538
(415) 770-0100

New Media Graphics Corp. has announced an MS-DOS-based product designed to perform Joint Photographers Expert Group standard compression and decompression on still-frame color images.

The Super Still-Frame Compression Board ($995) incorporates C-Cube Microsystems Corp.'s CL550 image compression processor, which reportedly allows the board to yield ratios ranging from 8-to-1 to 75-to-1.

New Media Graphics
780 Boston Road
Billerica, Mass. 01821
(508) 663-0666

Monitrix's diagnostic capabilities first class

Technology Analysis — A roundup of expert opinions on new products. Summaries written by free-lancer Suzanne Weixel.

Cheyenne Software, Inc.'s, Monitrix 1.1, which monitors local-area networks running Novell, Inc.'s Netware operating system 2.1 or higher, offers first-class diagnostic capabilities, according to reviewers at personal computer and LAN publications.

Performance: The only monitor that can be loaded on the file server as a value-added process for Netware 286, Monitrix can also be used as a Netware loadable module for Netware 386. These features cause the package to require little random-access memory.

Diagnostics: Monitrix offers good, general-purpose diagnostic utilities and excellent background data-gathering. It can notify LAN managers about problems with disks, printers and individual workstations as well as about high-traffic conditions. However, it does not detect problems with cables.

Statistics: Users can track network activity over any time period to establish network performance trends. Node configuration and traffic statistics reports can be used in real time, printed in text and ASCII bar graphs or stored in ASCII files.

Ease of use: Monitrix uses Netware's menu interface to make users feel right at home.

Documentation: The manual includes explanations of installation and basic functionality.

Value: Monitrix costs from $795 to $995, depending on the version, and offers strong diagnostic features without diminishing performance. Reviewers recommend it be used in conjunction with a utility that supports configuration management.

Reviews Summary

Criteria			
Performance	NC	Sits quietly in background	4
Diagnostics			
Statistics	NC	An abundance of information	NC
Ease of use			
Documentation	7	Glossary helps interpret statistics	4
Reviewer's score			

Total review scores based on converting scores to 1-to-10 scale (see methodology). These are excerpts. Refer to actual articles for details: PC Week *7/2/90;* PC Magazine *10/3/90;* LAN Times *9/90. NC: no comment*

RATINGS

- Users: Steve Cobleigh, Winchester Hospital (*overall performance:* 8, *cost:* 10); Keith Hjelstrom, research and development facility (7, 8); Brian Simpson, Business Management Consulting (8, 10)
- Analysts: Roger Wood, Interconnect Network Consulting Group, Inc. (8, 8); Rudolph Elford, System Integrators, Inc. (6, 6)
- Financials: Second-quarter revenue for period ending in December: $43.9 million compared with $44.4 million for second-quarter 1990. Net profits: $239,000 for the period compared with a net loss of $322,000 in the prior period.

Monitrix 1.1
Maximum score: 85

Points (maximum)	Category
26 (30)	Published reviews*
14 (20)	Analysts' ratings
12 (15)	Users' ratings
17 (20)	Cost evaluation

* Based on *LAN Times* and *PC Week* scores
(See financial information below)

Cheyenne responds

Comments from Lisa Merkin, Cheyenne's marketing director:

Statistics: The next version, 2.0, includes a feature that analyzes statistics and suggests possible causes and solutions.

Ease of use: Use of Netware's front end cuts learning time. We are developing an optional [Microsoft Corp.] Windows front end.

Documentation: We are adding a section that lists error codes and explanations, and we are working on a supplement.

Emonitor+ affordable but tied to old cards

Emonitor+ 1.31
Maximum score: 85

Points (maximum)	Category
18 (30)	Published reviews*
15 (20)	Analysts' ratings
12 (15)	Users' ratings
18 (20)	Cost evaluation

* Based on *LAN Times* and *PC Week* scores
(See financial information below)

Brightworks responds

Comments from Trish Wood, Brightworks' sales/marketing department:

Performance: We do not plan to upgrade Emonitor+ to support newer cards. Emonitor+ is the product we offer for low-end diagnostics on Ethernet. We offer other LAN enhancement products for other needs.

Diagnostics and statistics: If you want solutions and sorting capabilities, you should purchase a more sophisticated, more expensive product.

Reviews Summary

Criteria	PC Week (10-point scale)		LAN Times (5-point scale)
Performance	NC	Restricted to old adapter cards	3
Diagnostics	8		
Statistics	8	NC	NC
Ease of use	9		
Documentation	5	Lacks illustrations	2
Reviewer's score	9		

Total review scores based on converting scores to 1-to-10 scale (see methodology). These are excerpts. Refer to actual articles for details: PC Week *8/20/90;* PC Magazine *7/26/90;* LAN Times *9/90. NC: no comment*

RATINGS

- Users: Steve Cobleigh, Winchester Hospital (*overall performance:* 8, *cost:* 10); Allen Breedlove, Kaiser Permanente (7, 8.5); Greg Cain, NVR (8, 10)

"Most mortals using a 40-node or smaller network can't afford a protocol analyzer. Emonitor+ can detect bad packets on a node-to-node basis, and it is very affordable," Cobleigh said.

- Analysts: Roger Wood, Interconnect Network Consulting Group, Inc. (8.5, 7.5); Ron Meechlio, Spectrafax Corp. (8, 8)
- Financials: Brightworks does not release financial information.

Brightworks Development, Inc.'s Emonitor+ 1.31 offers local-area network monitoring on a less ambitious scale than Monitrix. However, it is compatible with all Ethernet-specific LANs, including those running Novell's Netware 286.

Performance: The package requires DOS 3.1 or higher and uses 256K bytes of random-access memory. It comes bundled with a remote access software program for troubleshooting from off-site locations. The software's only major fault is that it supports only older, slower 8-bit Ethernet cards and is not compatible with Netware 386. According to *PC Week*, it is best suited for networks with a maximum of one server per segment.

Diagnostics: Emonitor+ is useful for identifying unterminated and broken cables, isolating faulty Ethernet cards, measuring the level of corrupted data in real time and measuring network utilization. What it does not do is recommend solutions.

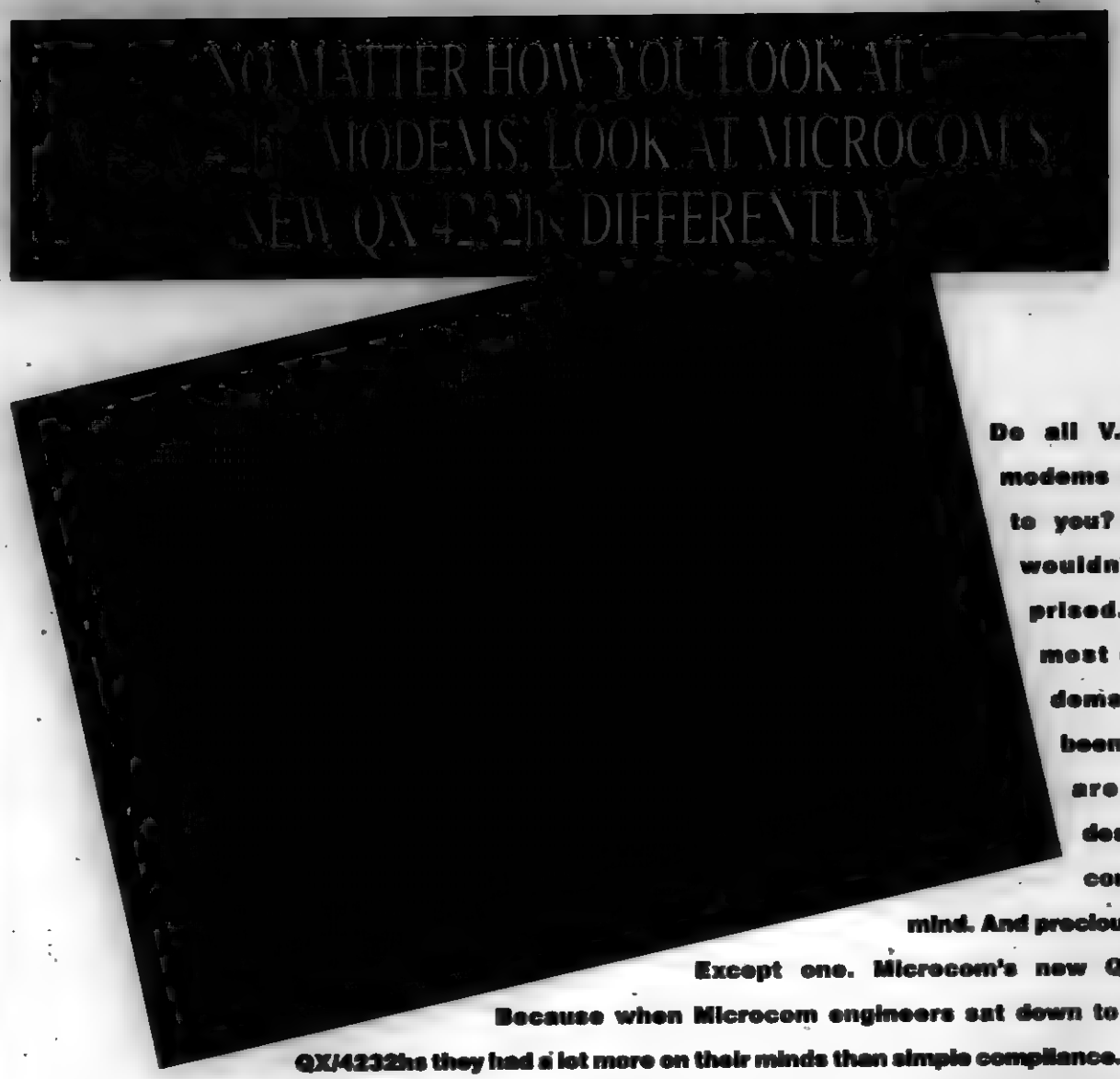
Statistics: Reports are provided on the good and bad packets of data that circulate on the LAN cable. This feature gives a good picture of LAN traffic over a period of time, and administrators can easily determine which workstation is responsible for the greatest amount of bad data. One drawback is the lack of capabilities for sorting good and bad packets or workstation IDs.

Ease of use: Emonitor+ is easy to install and easy to operate.

Documentation: Reviewers say the manual is easy to understand, although it lacks illustrations.

Value: Emonitor+ costs $295 per server, which, according to *LAN Times*, makes it worth installing even if you also have a $20,000 protocol analyzer.

Methodology: *Published reviews: average of* PC Week *and* LAN Times' *numeric scores multiplied by a weight of three.* LAN Times' *1-to-5 weighted ratings were converted to a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: total possible score was lowered from 100 to 85 because insufficient financial ratings were available for the products covered.*



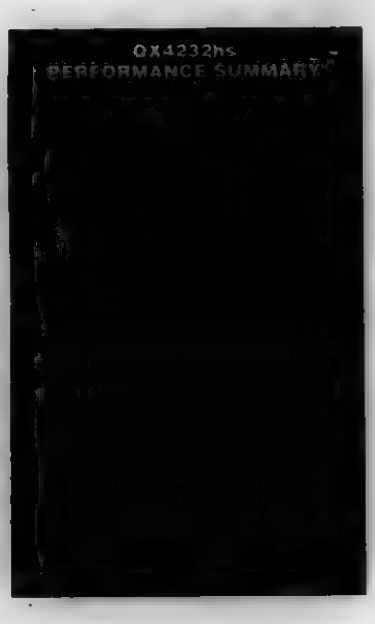
Do all V.42/V.42bis modems look alike to you? If so, we wouldn't be surprised. Because most of the modems you have been looking at are modems designed with compliance in mind. And precious little else.

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COMMENTARY

Tony Friscia

Still not on the MAP



About seven years after Manufacturing Automation Protocol (MAP) was conceived by General Motors and its allies, MAP products have still not achieved large-scale implementation in manufacturing environments.

The plant networking market grew 16% in 1990. Consistent with the last few years, DEC's Decnet leads with revenue of approximately $150 million, stemming from the sale of close to 40,000 network nodes within manufacturing plants. This is a 15% increase over 1989's $130 million. [Note: These numbers reflect revenue from actual nodes installed within production sites, not laboratory nodes or sales to OEMs.]

Despite Decnet's dominance, the fastest growing segment of the market continues to be PC networking. This includes a range of networks that connects PCs, including products from Novell and 3Com. [Note: Both Decnet and general-purpose Ethernet vendors also connect PCs. However, for the purposes of this analysis, this category only includes networking products that are targeted specifically at connecting PCs.] That $75 million market grew 20% to $90 million in 1990. In terms of number of nodes, PC networking is actually the largest segment of the market, with approximately 45,000 nodes installed in 1990.

The only other significant

Continued on page 44

Cellular modems put the office on the road

ANALYSIS

BY ELLIS BOOKER
CW STAFF

Traffic across the nation's cellular radio networks has been lopsidedly oriented toward voice communications since the first commercial system began operating in Chicago in 1983.

That could change, as these networks — like their terrestrial counterparts — make their inexorable transition from analog to digital technology.

However, a more important force in the market, according to observers, could be the gravitational effect of laptop computer vendors who are signing joint-development agreements with makers of cellular modems to bring forth integrated systems during the next 18 months.

"Right now, the numbers [of cellular modem users] are very small — say 1% to 2% of the installed base," said Bob Adair, executive vice president at Dallas-based Spectrum Information Technologies, Inc., which owns laptop reseller Data One.

Adair said he blames the low penetration of cellular data applications on the lack of a distribution channel. "The limitation on using cellular has been the inability to get the product into the customer's hands," he said.

Spectrum, Microcom, Inc. and laptop vendor Toshiba America Information Systems, Inc. plan to bring a multipurpose cellular/terrestrial modem to Toshiba's products.

While conventional land-line modems can be used on a cellular network, specialized cellular units are designed to accommodate peculiarities of the media. Specifically, they can deal with the signal "hand-off" that occurs when a vehicle moves through the coverage area of the antennas that honeycomb a cellular network.

Strengths of the competing cellular modem standards, as outlined by International Data Corp.

TDMA
- Twenty-year history.
- 1991 solution available.
- Less vulnerable to service disruption.

CDMA
- Potential 10- to 20-fold capacity gain.
- Incremental cost per subscriber only $250.
- Well-designed multipath traits.

Digital alternatives for cellular networks are intended to increase the capacity of these networks, which can now support about 60 simultaneous voice channels per analog cell and thus lead to data-oriented services.

Recently, a debate has erupted over which digital scheme will be used. Last year, the Telecommunications Industry Association voted for the Time Division Multiple Access (TDMA) method. TDMA is believed to provide 180 to 240 voice channels per cell, or three to four times the current capacity.

However, a latecomer coding scheme called Code Division Multiple Access (CDMA), which proponents think will increase the number of users per channel

Continued on page 44

Airline stays true to host-based system

BY ELISABETH HORWITT
CW STAFF

ARLINGTON, Va. — As local-area network installations grow, so does users' hunger for independence from information systems departments and their host-based systems. This scenario is increasingly typical at large companies — but not, apparently, at US Air.

The airline has, indeed, been moving its users to LANs at a steady rate — but strictly within the structure of IBM's Systems Network Architecture (SNA) and under the aegis of its IS managers, according to George Balog, US Air's vice president of communications.

For now, at least, communications will take place primarily among users on the same LAN and between LAN workstations and the mainframe, Balog said. "There is not a lot for us to gain in our current vision with LAN-to-LAN traffic."

The reason for this lies in the nature of US Air's business as well as in the choices it has made about which network configurations best support it, Balog said. For example, it is necessary to keep track of seat inventory for a given flight, particularly for a flight that may pick up passengers at an interim stop, to ensure that two different sites do not assign the same seat. "You could do this through a mainframe or by a LAN-to-LAN connection, but we believe the mainframe is the best place to do it," Balog said.

US Air is committed to IBM's SNA protocols for communications between both LANs and mainframes and among different workstations and servers within a LAN, Balog said. "We have come to the conclusion that we can do what we need to do with SNA" in terms of meeting users' application needs, he addded. Both IBM's peer-to-peer LU6.2 protocol and LU2 terminal protocols are being used.

Most of US Air's LAN architecture work is now being done on OS/2 workstations and makes use of IBM's LAN Server, Balog said.

Stepping carefully

The airline has "avoided the trap" of allowing other network systems, such as Novell, Inc.'s IPX, to proliferate on its LANs, Balog said. "So we don't have to retrofit a lot of alien protocols into our integrated corporate network."

Not that US Air thinks IBM's current SNA strategy is perfect as it is. The airline is "waiting patiently" for a number of LU6.2 enhancements, including wider implementation of Common Programming Interface for Communications (CPIC) across IBM's Systems Application Architecture main platforms, Balog said. CPIC will make it easier to develop applications on LU6.2 and will also ensure interoperability of those applications across the different IBM systems.

"We are finding very good use for LU6.2, for application-to-application interconnection between mainframes and departmental systems that require cooperative processing," Balog said. "Without LU6.2, we would have to invent the dialogue for addressing those systems."

USAir

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Smart-hub rollout race speeds up

Synoptics, Cabletron add series of enhanced modular products

BY JOANIE M. WEXLER
CW STAFF

Relentless in their endeavors to enrich their smart hubs, market leaders Synoptics Communications, Inc. and Cabletron Systems, Inc. continue to one-up each other in modular product rollouts.

The companies have recently bestowed users with added network management capabilities and the ability to integrate computing islands into the corporate network through their hubs.

Smart hubs are intelligent wiring centers used to interconnect each device on one or more local-area networks. The hub logically supports the LAN topology and access method.

Synoptics made significant enhancements to its Lattisnet hub last week, including integrated Ethernet and token-ring network management based on the Simple Network Management Protocol. Sample pricing, according to Synoptics, is $2,295 for an under-200-node network. With the announcement, Synoptics unwrapped a remote Ethernet router module option for Lattisnet.

Partnership expected

Cabletron, which announced network management enhancements for its Multi Media Access Center (MMAC) last month, said it will announce a partnership with Cayman Systems, Inc. today to allow Cayman's Localtalk-to-Ethernet gateway to be incorporated into the MMAC. Localtalk is the physical medium underlying an Apple Computer, Inc. Appletalk LAN.

The Synoptics development enables customers with mixed Ethernet and token-ring environments to manage both network types from a single management station.

"Customers now start out with two icons side by side on their screen: one for Ethernet and one for token-ring," Synoptics President Andrew K. Ludwick said. "Click twice on an icon," and the user can view deeper levels of the network.

The dual network management approach was closely tied to Synoptics' rollout of the Network Control Engine module for Lattisnet. The module is a Sun Microsystems, Inc. Sparcstation-based processor dedicated to network management.

"The new engine gives you the horsepower to manage your network at the physical levels and the higher levels at the same time," commented Jeff Marshall, managing director of communications at Bear Stearns & Co., an investment banking and brokerage firm in New York. Bear Stearns runs mixed token-ring/Ethernet environments totaling 5,000 Synoptics nodes.

"When you start getting into thousands of nodes and managing remote sites around the world as we do, the need for simultaneous management becomes more pressing," Marshall said. "The Synoptics approach closely parallels the structure of our organization: distributed."

> "IT'S AT THE building level that you need to physically integrate management of the disparate LANs."
>
> TODD DAGRES
> THE YANKEE GROUP

The Yankee Group, a research firm in Boston, estimates that 90% of Fortune 1,000 companies have mixed Ethernet and token-ring environments.

"It's at the building level that you need to physically integrate management of the disparate LANs," Yankee Group analyst Todd Dagres said. "Right now, only Synoptics and Cabletron can provide you with a hub that does that."

Dagres pointed out that the difference between the two vendors' approaches is that "Cabletron is spending its money on centralized management with its [artificial intelligence-based] Spectrum enterprise network manager," he said. "Synoptics is putting its money on driving downward and integrating local management with existing enterprise managers, such as [IBM's] Netview. I think the Synoptics' approach more closely fits the client/server computing model."

Synoptics, Cabletron and other suppliers are scurrying to differentiate themselves by continually dumping new functionality into their boxes, including bridging, routing, terminal serving and support of additional LANs.

Cellular

FROM PAGE 43

by up to 10 times over existing systems, is now supported by the carriers in three major U.S. cellular markets.

On the terminal side, a likely next step will be to put the cellular modem and cellular phone into a single device next year.

Even as cellular networks convert to digital signaling, they will stay with circuit-switching for the foreseeable future. While circuit-switching is a good medium for long connections and the transmission of bulk data, it is not considered optimal for applications characterised by short, bursty data traffic.

For that, packet networking is the answer. Both Ram Mobile Data, Inc., based in New York, and Ardis, the Motorola, Inc. and IBM joint venture, are in the process of deploying nationwide radio packet networks.

"With cellular there is a lot of setup time . . . and you're billed for that time," said George Dennis, the corporate communications manager at Ram.

During the time a customer is waiting for the first ring, "We can ship 10,000 characters or more," he said.

Ram, which made its name in the paging business, inaugurated its nationwide radio packet data network last month in 10 cities.

The battle between the two will involve competing and incompatible hardware and software standards. Ram uses Mobitex, an open architecture developed in the early 1980s by the Swedish telecommunications authority with Ericsson, Inc.; Ardis uses Motorola's proprietary scheme.

Wall Data adds PC-to-mainframe software

BY JIM NASH
CW STAFF

REDMOND, Wash. — Wall Data, Inc. has announced several personal computer-to-IBM mainframe software packages, all of them extensions of its Rumba product line. The new products are designed to get employees in virtually every corner of a company using mainframe-based applications.

Rumba Graphics accesses mainframe graphics applications and integrates mainframe data with PC-based graphics displays.

Rumba Gateway Manager organizes gateway traffic from IBM's Token-Ring, Novell, Inc.'s Netware and Microsoft Corp.'s LAN Manager networks.

The gateway spreads traffic among devices from Wall Data, IBM, Digital Communications Associates, Inc., Attachmate Corp. and others.

Wall Data also announced support for connections to the IBM Application System/400. All the new products are expected to ship this month, according to a company spokeswoman.

A tough job

Transferring data "is still relatively cumbersome," said Mike Jones, vice president of information systems at LaSalle Partners Ltd. in Chicago. Indeed, it is enough to cause him to move certain applications from the mainframe to local-area networks.

"It enables people who are stuck with mainframes, mainly IBMs, to make good use of applications that were not used very much before because of how difficult it was to access them on the mainframe," said Shmuel Halevi, vice president of The Technology Research Group, Inc. in Boston.

Rumba "is another one of the fancy terminal emulators that appeals to a certain group of users: those in an IBM environment that haven't made the commitment to client/server architecture," said Steve Wendler, an analyst at Gartner Group, Inc. in Stamford, Conn.

Products such as Wall Data's Rumba Graphics could have the same effect, albeit on a smaller scale, as spreadsheet software, Halevi said. Rumba, which is based on Microsoft's Windows, automates the process of holding a host session, he said, and with the new capability, makes it easier to use data stored on the mainframe.

Rumba should have some success as a front end to IBM's Officevision VM, Wendler said. "IBM's slowed — arrested, almost — introduction of Officevision to the desktop" can be used to Wall Data's advantage with this product, Halevi said.

Friscia

FROM PAGE 43

segment of the market is represented by the general-purpose Ethernet vendors, led by Ungermann-Bass. This group of vendors accounts for approximately $50 million in revenue and 13,000 nodes.

Rounding out the market are relatively small shares for 802.5 (token-ring) and 802.4-based MAP. The MAP market has remained flat for the last three years, after its peak in 1986, when revenues were approximately $25 million compared with less than $15 million this year. Large-scale MAP implementations have found primary appeal among U.S. and European automotive vendors. There has also been support from the Japanese for MAP, largely from Japanese factory automation vendors for incorporation into their products.

I do not expect these ratios to change significantly in the coming year. The one key trend, as indicated earlier, is an increasing demand within the market for Open Systems Interconnect (OSI) — more than 80% of users surveyed say they intend to migrate to OSI.

The question is, when will this demand translate into a significant market for products? Most users expect this evolution to OSI to be slow, and they plan to migrate at the pace of their primary systems vendor. For example, Decnet users plan to migrate to OSI through DEC's implementation of Decnet Phase V (delayed in 1990), which bridges DEC's proprietary protocols and OSI.

From the above numbers, it is easy to conclude that the MAP movement has been a bust. On the contrary, the MAP movement has accomplished several useful goals.

First, it has raised user awareness of plantwide backbone networks. Such networks are now responsible for the transfer of data throughout a plant and up to the data processing and plant management layer. They provide the foundation of plantwide integration.

Second, the movement has created a wide-scale user demand for standards-based networking within the manufacturing environment.

The third useful outcome of MAP's emergence is the development of the Manufacturing Messaging Standard (MMS), a standard means of communicating with plant floor devices. I believe that this standard will be the most widely accepted plant floor application layer communications standard in the 1990s. DEC and Hewlett-Packard have both announced support for MMS over their respective 802.3-based networks, and we expect IBM to announce a similar capability soon.

MAP has also spurred manufacturing user requirements for fully compliant OSI standard networking.

It could be said that MAP was the forerunner to OSI, the final stage of standard network development and represents a worldwide industry and standards convergence. With the basic transmission issue resolved, user attention has shifted to upper layer software issues. In the 1990s, the manufacturing communications market will be characterized by a slow transition to OSI networks.

Friscia is president of Advanced Manufacturing Research, Inc., a research and consulting firm in Cambridge, Mass.

NEW PRODUCTS

Gateways, bridges, routers

Fibronics International, Inc. has added lower priced nodes to its System Finex family of Fiber Distributed Data Interface (FDDI) products.

The products support the IEEE translation bridging standard for FDDI-to-Ethernet bridging and interoperate with Digital Equipment Corp.'s FDDI bridge and with directly attached workstations. A single port is priced at $14,990, and an additional Ethernet port can be purchased for $5,000.

Fibronics International
Communications Way
Independence Park
Hyannis, Mass. 02601
(508) 778-0700

Persoft, Inc. has introduced the Intersect Remote Bridge, a device that uses wireless technology to connect Ethernet local-area networks.

The product can be used instead of leased-line connections for several bridging applications; it can also link Ethernet LANs that are up to 800 feet apart, the vendor said.

The Intersect Remote Bridge runs on a dedicated IBM Personal Computer AT or compatible and is priced at $4,995.

Persoft
UW Research Park
465 Science Drive
Madison, Wis. 53711
(608) 273-6000

Retix's 4941 Remote Bridge/Router combines bridging and Transmission Control Protocol/Internet Protocol routing for use in complex network configurations and applications that demand routing and bridging.

The device ($6,250) is said to act as a point-to-point bridge/router or as a high-speed feeder for complex network topologies.

Retix
2644 30th St.
Santa Monica, Calif. 90405
(213) 399-2200

Network management

Stratacom, Inc. has announced an enhanced version of its Strataview network management system.

Strataview Plus ($12,000) runs on a Unix-based workstation and features color graphics with zoom-in capabilities, pull-down menus and mouse support. The product is targeted at users of networks equipped with more than 20 fast-packet nodes and is scheduled to be available next month.

Stratacom
3175 Winchester Blvd.
Campbell, Calif. 95008
(408) 370-2333

Fibermux Corp. has announced an integrated graphical network management platform that allows a Sun Microsystems, Inc. Sparcstation to act as a central control point for local-area networks such as Ethernet, token-ring and Apple Computer, Inc.'s Appletalk.

The company's Lightwatch Simple Network Management Protocol-based network management software package can work in tandem with Sun's SunNet Manager to enable users to manage a multiprotocol network of hubs, workstations, routers or bridges.

Lightwatch is priced at $4,500, and SunNet Manager costs $3,000.

Fibermux
9310 Topanga Canyon
Chatsworth, Calif. 91311
(818) 709-6000

Network Management, Inc. has announced I-Mind, a software package designed to facilitate the management of international networks.

The product enables network managers to automatically identify and map out economical routes for data communications traffic and to determine cost-effective methods of positioning communications devices in or throughout segments of a network. It features graphics that allow network managers to view how a network is being configured.

I-Mind is priced at $24,000.

Network Management
11243 Waples Mill Road
Fairfax, Va. 22030
(703) 359-8400

Modems

Codex Corp. has introduced the 326X series of V.32 bis/V.32 modems.

The series includes Model 3260, a stand-alone device that operates at asynchronous and synchronous rates of up to 14.4K bit/sec.; Model 3265, the international version of the 3260; Model 3262, a double-density nest-card unit; and Model 3267, the international version of the Model 3262.

Model 3260 costs $1,195, and pricing for nested models begins at $2,195.

Codex
20 Cabot Blvd.
Mansfield, Mass. 02048
(508) 261-4655

Memotec Data, Inc. has announced the DA 3214 and the IDM 19.2A, both scheduled to ship in the second quarter.

The DA 3214 is part of the company's Dialaccess product family. It features a basic data transfer rate of 14.4K bit/sec. and can operate in asynchronous or synchronous modes over two-wire dial-up or two- or four-wire leased-line interfaces.

The product is priced at $1,295 for a stand-alone version and $2,395 for a dual-modem rack card version.

The IDM 19.2A is a member of Memotec Data's IDM family of analog diagnostic modems. The device uses 64-state eight-dimensional trellis-coded modulation to deliver asynchronous or synchronous data transmissions across analog leased circuits in point-to-point applications.

The modem is priced at $4,995 for a stand-alone version and $4,895 for a rack-mount version.

Memotec Data
000 Rue McCaffrey
Montreal, Canada H4T 1N1
(514) 738-4781

If you want to sell to NTT, there's something you need to know...

Nippon Telegraph and Telephone Corporation, Japan's largest telecommunications service provider, invites computer industry manufacturers, software companies and users to attend two free seminars on the Multivendor Integration Architecture (MIA) it has developed with NTT Data Corp., IBM Corp., Digital Equipment Corp., NEC Corp., Hitachi Ltd. and Fujitsu, Ltd.

The seminars, which will be held at the Four Seasons Hotel, one block from the George R. Brown Convention Center, in Houston during Supercomm '91, will introduce the MIA concept and explain the benefits that it offers to computer vendors who wish to sell to NTT.

Session I, the MIA Overview, will present a two-hour summary of MIA and its objectives, and will briefly introduce specifications and interfaces. Speakers will include MIA development staff from NTT.

Session II, the Detailed Technical Presentation, will offer an in-depth, three-day introduction to all aspects of MIA, a detailed explanation of all interfaces and specifications and opportunities to ask questions and discuss. Speakers will include technical experts from NTT and its research partners.

MIA specifications will be a basic requirement for future purchases of general purpose computers and their software by NTT and NTT Data Corp. Since no other MIA seminars are planned, NTT especially urges companies in the U.S. computer industry to attend.

To register for either session, or to receive a detailed schedule, please call the NTT Seminar Hotline at (212) 546-1526 or send a fax message to Mr. Yukio Kikuta at (212) 286-8970. We look forward to seeing you in Houston.


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MIA Seminar Schedule

Session I MIA Overview	March 20, 1991 8:30-12 Noon	Salon A Four Seasons Hotel 1300 Lamar St., Houston
Session II Detailed Technical Presentation	March 20, 1991 1:30-5:00 p.m.	Salon A Four Seasons Hotel
	March 21, 1991 9:00 a.m.-5:00 p.m.	Conroe Room Four Seasons Hotel
	March 22, 1991 8:30-12 Noon	Conroe Room Four Seasons Hotel

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MANAGER'S JOURNAL

EXECUTIVE TRACK



C. S. "Jack" Schrodel, former director of network services at Sun Co., has joined **The Executive Insight Group, Inc.**, an information systems management consulting firm in Bryn Mawr, Pa.

A 29-year IS veteran, Schrodel will focus on outsourcing and network, data center and telecommunications management issues. At Sun, he was instrumental in the oil firm's recent outsourcing of its data center to Andersen Consulting. He also managed Sun's network utility as a profit center selling services to third parties.

Schrodel holds a bachelor's degree from Johns Hopkins University and a master's degree from the University of Pennsylvania. He participated in the Executive Development Program at Pennsylvania State University in 1986.

.....

Jerry Henshaw has been promoted to the position of senior vice president of technology and communications at **United Video Satellite Group**, a Tulsa, Okla.-based satellite carrier of CATV services nationwide.

Henshaw was most recently vice president of engineering, research and development. In his new post, he is responsible for corporate data processing, voice and data networks and engineering research and development for the firm's divisions.

Henshaw joined United Video in 1983. Before that, he was research manager at Seismograph Service Corp. in Tulsa. He also held research and design engineer positions at Amoco Production Co. and Telex Computer Products.

He holds a master's degree from the University of Tulsa.

.....

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Carmaker turns over career tracks

Rotating IS jobs is key in Nissan's plan for successful staff development

BY JEAN S. BOZMAN
CW STAFF

Change is no stranger at Nissan Motor Corp., the Carson, Calif.-based U.S. subsidiary of the Japanese automobile giant. So there was surprise but not shock when Nissan's Information Systems Division unveiled a major management reorganization one month ago.

"What we announced is rotational assignments for career development," explains Evan Wride, 42, director of IS. "Several of my direct reports are swapping jobs. Everybody needs to move into different functional areas if they want to have my job."

Wride's rotation plan is clearly in step with the management practices of parent company Nissan Motor Co., where functional rotation is a linchpin of career development. "If the person doesn't know anything about the area he's going into," Wride says, "it's probably the right thing to do."



Alan Levenson

Nissan's *Sendaba (left) and Wride say change can be beneficial for the career development of the carmaker's IS workers*

Culture shock

The motivation for change is clear: Nissan is fighting an uphill battle to push past Toyota Motor Corp. and Honda Motor Co. as the largest Japanese carmaker in the U.S. market. "The way to change the culture is to either bring in new people or to give the existing people a new culture," Wride says.

Wride's move to change responsibilities within the 350-person IS staff has the wholehearted support of Sheleme Sendaba, a former General Motors Corp. executive who was named Nissan's vice president of finance and IS six months ago. Wride reports to Sendaba, who plans the funding of IS projects and deals with Nissan's senior [redacted].

"I think it's very important that we reorganize as business needs," Sendaba says. "People who understand database management should understand about systems development, and people who run computer operations should, too."

Among the top managers, for example, one woman who had managed the applications group was moved into the database design group. Another woman, who managed IS supporting the parts and service division systems, was moved into more general applications development.

Change on such a large scale — in Nissan's case, announced at a divisional meeting on a Friday morning — causes ripples of anxiety throughout any organization. Although no jobs were threatened, the change caused many Nissan IS employees to whisper excitedly about it in the hallways.

"Change is both good news and bad news," Wride notes. "There's something built into people that treats most change as negative. But if you don't change, you become lethargic, like

Continued on page 50

Outlook turns cloudy, dreary for job hunters

BY ELLIS BOOKER
CW STAFF

Statisticians and people mailing out resumes have discovered the same thing: Information systems departments have slowed their hiring.



Job-seeking IS workers can take cold comfort in the fact that their industry is generally faring better than the rest of the economy, in which the employment outlook is dismal by most measures. However, IS hiring matches the regional pattern in the broader economy, in which some regions — notably the Northeast — have felt the recession more keenly than others.

In a slow market, firms are seeking "perfect fits," employees with everything called for in the job description, said Steve Joffe, vice president of Source EDP, a Dallas-based placement firm. What's more, because it is a buyer's market, some firms are trying to get superb workers at cut-rate prices.

Bob Hildreth, who owns two Minneapolis-based placement companies, Electronic Systems Personnel, Inc. and ESP Software Services, Inc., said he did not detect an uptick in hiring in the first quarter of this year.

An uptick traditionally occurs in the first part of the year, when budgets and major projects are allocated.

"In past years, we'd see a tremendous increase in the first quarter," he said. Last year, openings were up 15%, while this year, hiring has remained steady, he added. Other placement firms said the traditional first-quarter spike was delayed this year because of the war in the Persian Gulf.

The skills that are marketable right now, a number of placement firms said, include computer-aided software engineering and fourth-generation languages. Experience with IBM's mid-range Application System/400 is also helpful, they added.

Bleak forecast

The hiring outlook for all U.S. employment continues to look dismal, according to the most recent survey published by Manpower, Inc. The Milwaukee-based employment firm, which has measured quarterly changes in projected job hiring since 1976, projected the second quarter of this year will reach 1982 recession levels nationwide, with some areas falling below these levels.

Manpower's survey of more than 15,000 firms found that 18% will add to their work force, while 13% will reduce employment. This 5% net hiring strength compares with a plus 18% factor one year ago.

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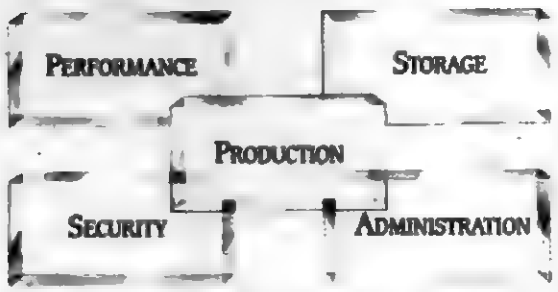
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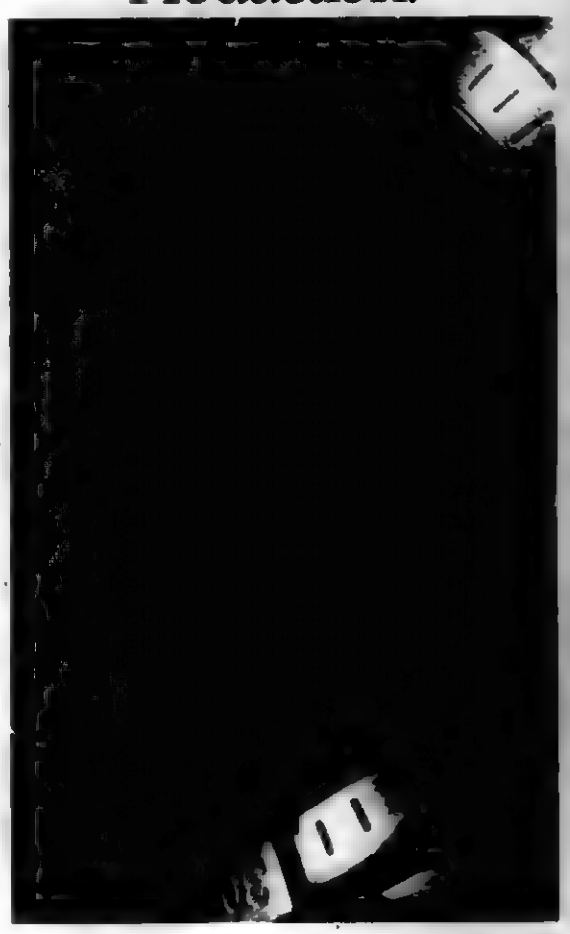
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Carmaker

CONTINUED FROM PAGE 47

a dinosaur, and you don't survive."

Many senior managers took the change in stride. "IS is probably the place to invest when there's an economic downturn," one says. "You have to do everything a lot better than your competitors. You have to target better and send the cars to the right places." He says the organizational changes were made by consensus after discussions with the affected personnel.

Two of Nissan's key corporate strategies announced last year are just beginning to play out. According to one strategy, each of Nissan's three global operations in Japan, Europe and North America will be run locally using local people, parts and materials as well as sales forces to give Nissan greater market share. The other related strategy pushes decision-making to the three global divisions — and then to the regions within those divisions.

Still, many IS functions, such as hardware purchasing and systems development, have remained centralized. "You cannot afford to have IS organizations in 14 regions [throughout the U.S.]," Sendaba says. "It doesn't make economic sense."

Nissan coordinates its hardware and software purchases from IBM on a worldwide basis, Sendaba says. This allows discounts for volume buying and maintains compatibility between the firm's computer systems on the three continents.

Nissan has one five-processor IBM 3090 mainframe at its Carson headquarters and more than 20 IBM Application System/400s at its distribution centers in major U.S. ports from Oakland, Calif., to Norfolk, Va. IS executives make annual trips to Japan to coordinate IS strategy, but those trips are supplemented by daily phone calls and facsimile messages to ensure Nissan's compliance with the specifications of the parent Nissan's global communications network. In addition, several Japanese executives have been assigned to work with Nissan IS staff members on a day-to-day basis in the U.S.

Favorable flexing

Wride's message is that the ability to change works in Nissan's favor. Flexibility will give Nissan, the sixth-largest player in the U.S. market, a chance to respond to changing American tastes in cars, he says. Just last year, Nissan launched its Infiniti division, which required a satellite network, a chain of more than 70 new dealerships and the information systems to support them (see story below).

"The business application is driving the whole thing," says Wride, who presided over similar reorganization plans at Los Angeles-based Denny's Restaurants in the mid-1980s. Another reorganization took place six months after Wride came to Nissan in 1989.

Rotation of responsibilities was a way of life at Denny's, where Wride alternately headed up systems development, ran computer operations and was assistant controller. One former colleague says Wride's philosophy worked there, too.

"It's a philosophy we adopted at Denny's that each of us on the management team would have several lateral moves as part of any ultimate upward mobility," says Rich Kislowski, who was vice president of IS at Denny's during much of the 1980s. "The lateral moves were planned moves, but they broadened the base of knowledge," he says. Kislowski is now vice president of information services at Pacificare Health Systems, Inc. in Cypress, Calif.

Wride says the IS director's task is to properly orchestrate the strengths of IS employees. "If you hire the right people, it pays off for you and your company forever," he says. "You have to set the vision and the direction. Then you have to get the right people in place, at the right levels, so they can execute the vision."

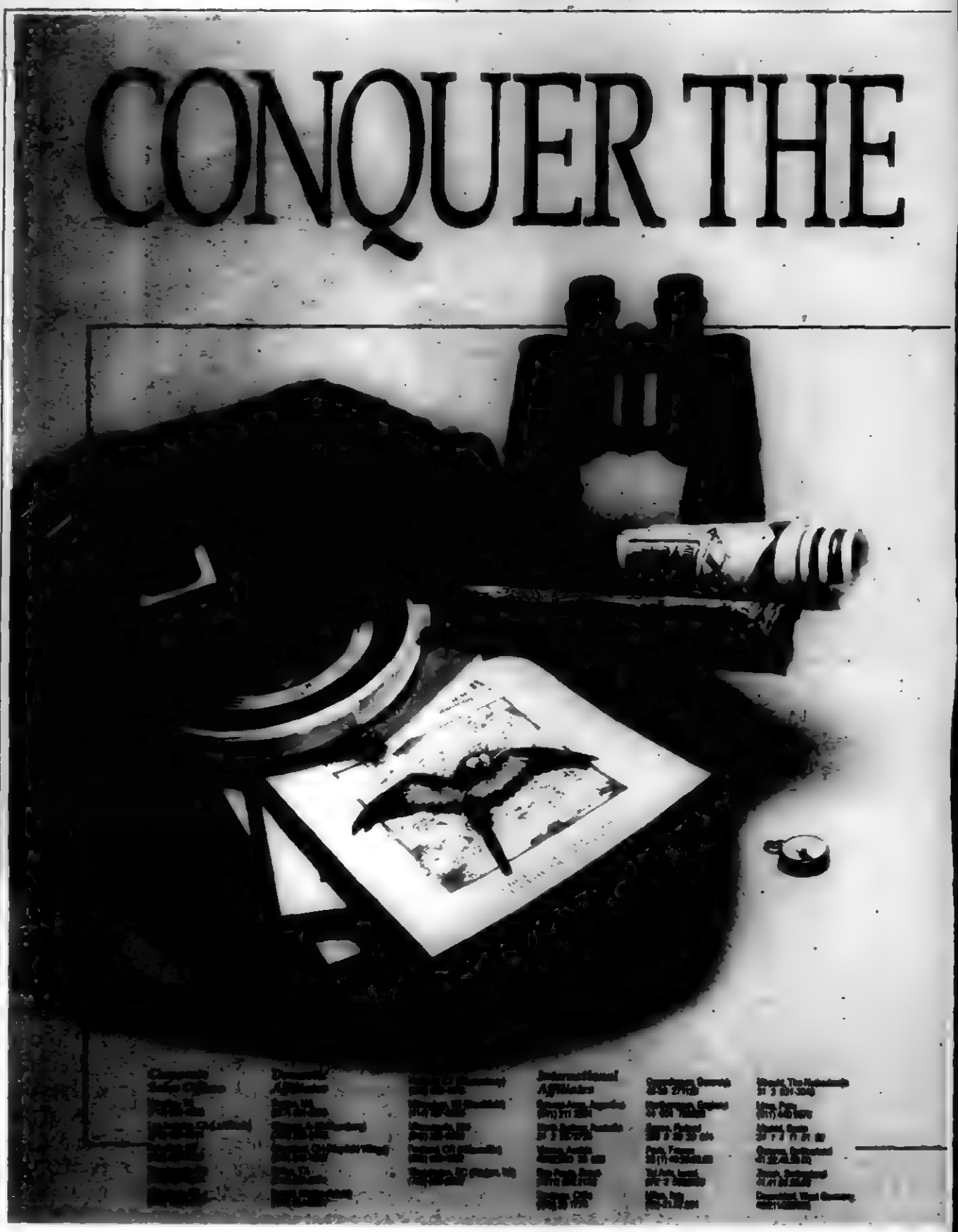
Luxury software

Nissan's much-heralded introduction of the Infiniti luxury automobile required a new set of TV commercials — complete with rainstorms and ripples in tranquil ponds — and a new set of software applications to support the emerging business.

Corporate databases showing preferences for car colors and customer profiles had to be built. As a new chain of more than 70 Infiniti dealerships popped up across the country last year, each showroom had to be linked by a satellite network with Nissan headquarters. Dubbed Infinitinet, the network allows individual dealerships to access Nissan's corporate databases.

The high price tag of the Infiniti, which ranges from approximately $20,000 to the mid-$40,000s, puts it in a special niche among Nissan models. Accordingly, the IS division is building automated order entry and the global parts locater systems to support the sales of all other Nissan cars. Another system under development will allow Nissan dealers to place orders from their car telephones or laptop computers.

JEAN S. BOZMAN



CALENDAR

APRIL 7-13

Corporate IBT/Rumbold IBM Conference. Chicago, April 7-10 — Contact: University of North Carolina Business School at Chapel Hill, Chapel Hill, N.C. (919) 962-9630.

Focus on Operations XI. Las Vegas, April 7-11 — Contact: Computer Operations Management, Orange, Calif. (714) 997-7966.

IEEE International Conference on Robotics and Automation. Sacramento, Calif., April 7-12 — Contact: Robotics and Automation, Boca Raton, Fla. (407) 483-3037.

Service Trends Conference. San Francisco, April 8-9 — Contact: Lori Larsen, Ledgeway/Datapoint, Lexington, Mass. (617) 862-8500.

Information Security Managers Symposium. Chicago, April 8-10 — Contact: Pamela Binnett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Loop Implementation: The Next Steps. Monterey, Calif., April 8-10 — Contact: Electronicast, San Mateo, Calif. (415) 572-1800.

Turning Audit Costs Into Profits: Superstrategies for the Internal Audit Department of the 1990s. San Francisco, April 8-10 — Contact: Pamela Binnett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Computers and Software for Manufacturing Expo. Chicago, April 8-11 — Contact: Doug Kunz, Cahners Exposition Group, Stamford, Conn. (203) 352-8202.

National Design Engineering Conference. Chicago, April 8-11 — Contact: National Design Engineering, Stamford, Conn. (203) 964-0000.

CDC Exchange. Cambridge, Mass., April 8-12 — Contact: Margaret Murphy, Computer Sciences Corporation Exchange, Cambridge, Mass. (617) 499-1227.

The Conference Board Information Management Conference. New York, April 9-10 — Contact: Conference Board Registrar, New York, N.Y. (212) 339-0290.

Seybold Technology Forum. Cambridge, Mass., April 9-11 — Contact: Deborah Hay, Seybold Computing Group, Boston, Mass. (617) 742-5200.

The Software Development Management Conference. San Francisco, April 9-12 — Contact: Software Development Conferences, San Francisco, Calif. (415) 905-2471.

Supercomputer Conference. Newport, R.I., April 9-12 — Contact: John Miguel, Federal Information Processing Council, Middletown, R.I. (401) 841-4591.

Society for Information Management 1991 Institutional Member Conference. Tucson, Ariz., April 10-12 — Contact: SIM, Chicago, Ill. (312) 644-6610.

Unix Challenge 1991. Tyngsboro, Mass., April 10-12 — Contact: Andrew Fontaine, Boston University, Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Voice '91. Anaheim, Calif., April 10-12 — Contact: Voice '91, Houston, Texas (713) 974-6637.

APRIL 14-20

Congress on CIM Databases. Cambridge, Mass., April 14-17 — Contact: Wilma A. Horwitz, CAD/CIM Alert, Boston, Mass. (617) 232-6060.

International Technical Communication Conference. New York, April 14-17 — Contact: ITCC, Thurmont, N.Y. (914) 742-5900.

Information User Association: Architecting for the '90s. Salt Lake City, April 14-16 — Contact: IUA Headquarters, Chicago, Ill. (312) 644-6610.

Mentor 3.0. Atlanta, April 14-19 — Contact: Dave Cochrane, National System Programmers Association, Milwaukee, Wis. (414) 423-2420.

Cautious Users' Exchange. Baltimore, April 15 — Contact: Jim Black, CUE, New York, N.Y. (212) 633-5600.

Cardtech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4250.

Knowledgeware International User Conference. Atlanta, April 15-17 — Contact: Knowledgeware, Atlanta, Ga. (404) 231-8575.

Securetech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4250.

Wireless Data Networks Conference. Washington, D.C., April 15-17 — Contact: Business Communications Review, Hinsdale, Ill. (800) 227-1234.

Lap & Palmtop '91. New York, April 16-17 — Contact: Peter O'Connor, Laptop Expositions, New York, N.Y., (212) 962-7900.

Downsizing Conference: Moving from Mainframes to PCs. Boston, April 16-17 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Electro/International. New York, April 16-18 — Contact: Alexa Rusnick, Electro/International, Los Angeles, Calif. (213) 216-3976.

IMSG User Group Europe Conference. Paris, April 17-19 — Contact: Karen G. Mueller (713) 783-6000.

Instore Systems: The Key to Better Customer Service. Orlando, Fla., April 17-19 — Contact: National Retail Federation, New York, N.Y. (212) 563-5113.

International Conference on the Application of Manufacturing Technologies. Alexandria, Va., April 17-19 — Contact: Lynn Rustan, The Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

World Computer Law Congress. Los Angeles, April 18-20 — Contact: Michael D. Scott, Center for Computer/Law, Manhattan Beach, Calif. (213) 680-5186.

APRIL 21-27

Ada/ed Management Conference. Miami, April 21-24 — Contact: Ada/ed Education Department, Arlington, Va. (703) 284-5302.

Electronic Funds Transfer Association Convention. Nashville, April 21-24 — Contact: EFTA, Alexandria, Va. (703) 548-5800.

Software Maintenance Annual Meeting & Conference. Philadelphia, April 21-24 — Contact: Robin Cross (707) 643-4422.

Computer Law Conference. Washington, D.C., April 22-23 — Contact: Barbara Fleser, Computer Law Association, Fairfax, Va. (703) 560-7747.

Decision Support and Executive Information Systems: A Managerial Perspective. Cambridge, Mass., April 22-23 — Contact: Decision Support Technology, Cambridge, Mass. (617) 354-6400.

APICS 1991 Manufacturing Principles and Practices Seminar. Orlando, Fla., April 23-24 — Contact: APICS, Falls Church, Va. (703) 237-8344.

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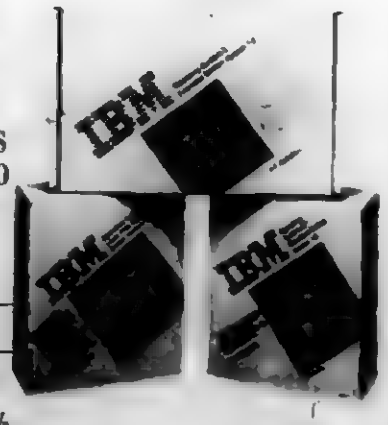


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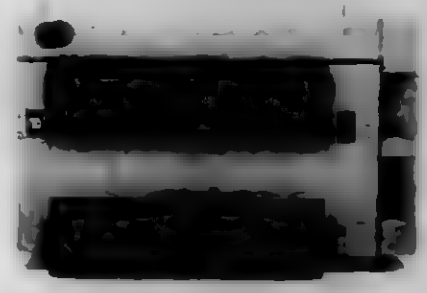
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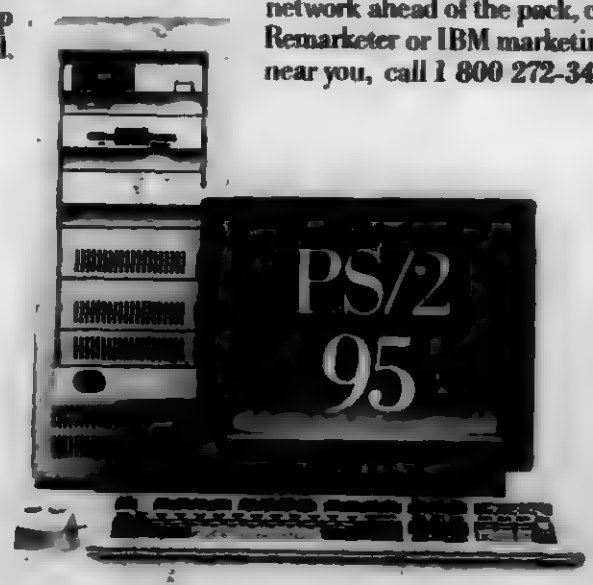
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BOOK REVIEW

Playing the game of international power in a new Europe

EUROPE 1992 & THE NEW WORLD POWER GAME
By Michael Silva and Bertil Sjogren
John Wiley & Sons, $22.95

In *Europe 1992 & the New World Power Game*, authors Michael Silva and Bertil Sjogren talk about the hazards of a world that sometimes seems set on fast forward: Technology is outdated in 18 months; books can be rendered obsolete by the time they come to market.

Unfortunately, *Europe 1992* suffers in some part from this problem. But although world events have conspired to make some of the predictions in this 300-page book outdated, the basic premise remains interesting, if somewhat speculative.

Silva, author and lecturer on global management, and Sjogren, a European-based management consultant, use 1992 as a reference point to track significant world events and explain where they think the world is headed. They have peppered the book with anecdotes and examples to bolster their points.

The authors create a scenario in which the opening of the Eastern Bloc countries leads the way to a gradual repudiation of communism and the embracing of capitalist methodologies worldwide. This will usher in the Age of Consumption, during which economic, rather than military, strength will be used to wage a trade war for superiority in the world market.



"The race toward 1992 promises to make technocompetition a harsh reality," the authors state.

When the European Community (EC) emerges in the 1990s as a unified economic bloc with a gross national product of $4 trillion, the potential of an instant new competitor will change the balance of power for the current economic stalwarts, the U.S. and Japan, according to the book.

What Silva and Sjogren see developing is a triad of powerhouses based on the EC's unification, a resurgent U.S. and a falling of Japanese trade barriers. "The role of the EC is that of a competing technocenter to the U.S. and Japan," the authors explain.

Spurred by Eastern Europe and the Soviet Union, which are counting on the unified EC to help them technologically, the authors see the need for the EC to create, not just ride, "the technowave of the '90s."

However, the authors' conclusions may be based on too many what-if scenarios to convince the reader.

For example, the authors predict that the Japanese, who export more than they import, will be forced to open their borders to foreign trade or bypass a potential EC market of 320 million consumers.

They envision the growth of worldwide consortia, sparked by a desire to become entrenched in as many countries as possible to avoid trading penalties imposed by reciprocity problems and to spread research and development and fixed costs across the broadest possible market. Consortia, the authors predict, will work in favor of the EC and the U.S., which are about 15 to 20 years ahead of the Japanese in the multinational buyout game.

The authors also postulate a cozier U.S./EC relationship on the basis of shared culture. One would think that in a truly global market, however, business decisions would not be affected by mutual ancestors.

However, the authors do make some interesting points: Our history with Europe goes back further than with Japan. What's more, while the Japanese have succeeded in dominating our markets for cameras, electronics and cars, they have not succeeded in importing their culture. American status symbols tend to be European: French wines, Swiss watches and Italian leathers.

Easier said than done

The prediction of a resurgent U.S. causes the most skepticism. The authors see the U.S. entering a period of "extroversion" — a prosperous phase of trading globally rather than concentrating on domestic turmoil.

However, this will happen only if the U.S. can "completely overhaul its education system and eliminate the federal deficit." A rather tall order, particularly when you consider that the cost of the Gulf war is just now being tabulated.

Of course, given the following paragraph from the book, this entire scene may never come to pass:

"How well a nation fares in the trade battle will determine how much it can afford to spend on defending its world position. It also poses the risk that a major country will play poorly and, in desperation or perhaps because of pride, resort to the old game of military power and make the notion of consumerism, not to mention the human race, obsolete."

Uncle Sam, I hope your ears are burning.

CAROL HILDEBRAND

Hildebrand is a *Computerworld* staff writer.





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PROJECT MANAGEMENT SOFTWARE

No hard hats or slide rules required

Products adapt to special needs of systems builders

BY ALLEN G. TAYLOR

What do information systems professionals have in common with construction supervisors and engineers? For one thing, they both plan and work on large, complex projects. This does not necessarily mean, however, that they have the same taste in project management software.

The roots of project management software are not embedded in IS but rather in the aerospace, engineering and construction fields. During the past couple of years, however, software development has become one of the largest portions of the project management software market.

For personal computer-based products alone, IS accounted for 15.7% of project management software shipped in 1989, according to International Data Corp. in Framingham, Mass., followed by construction at 12.5% and aerospace/defense at 12.3%.

One reason for this upswing in interest is pressure to curtail what is a high incidence of failed software projects, says Rich Julius, technical editor at the Center for Project Management in San Ramon, Calif.

Geared to IS

In response, many vendors have begun to market their packages or individual modules as catering to IS concerns.

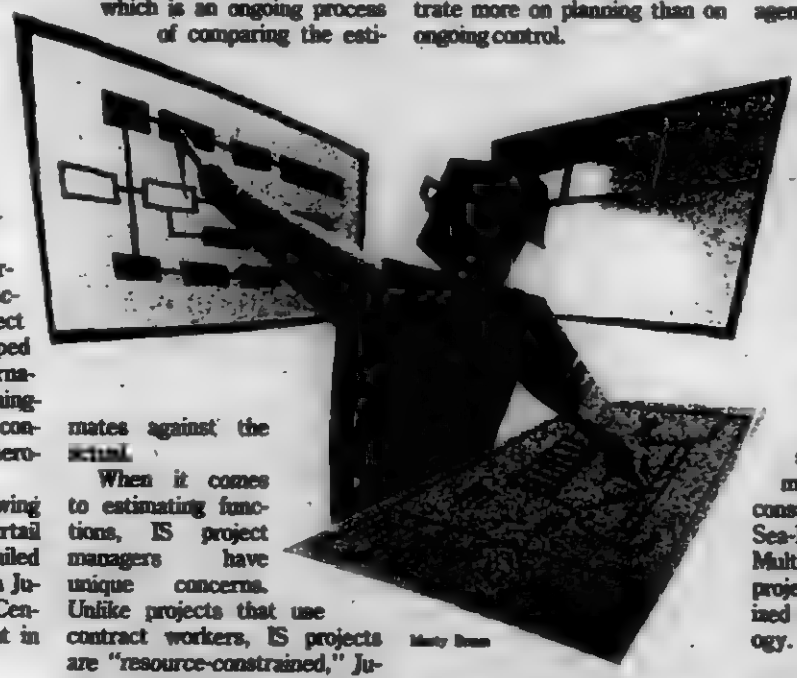
In some instances, the vendor simply provides training materials geared more toward programming concerns than building skyscrapers, for instance.

In others, vendors emphasize features in their general-purpose software that IS may find especially important.

"One of the major indications that a package is designed for IS users is how it can handle resources," says Daniel Yahdav, president of 1 Soft Decision, Inc., a project management consulting firm in San Rafael, Calif.

The typical project management package offers three basic functions:

- Estimating, including the effort required to complete the project as well as the project's duration and cost.
- Scheduling people and other resources, such as hardware and software, according to several calendars.
- Tracking, or project control, which is an ongoing process of comparing the estimates against the actual.



Marty Bean

When it comes to estimating functions, IS project managers have unique concerns. Unlike projects that use contract workers, IS projects are "resource-constrained," Julius says; that is, the programming team is finite. In addition, Yahdav continues, programmers are dedicated resources; it's not easy to "sub in" one for another.

Accordingly, many vendors have started to offer automatic resource-leveling, which reschedules activities to reflect known resource constraints.

Their very nature makes software development projects difficult to schedule accurately. There are fewer standards, such as in automotive repair, for example, for which a mechanic can check a book for a time estimate.

Rather than agonizing over the advance plan, many managers say they prefer to get started and adjust to events as they occur. Accordingly, control features are more valuable to them than scheduling. The problem is, most available project management software packages concentrate more on planning than on ongoing control.

Some IS-specific products, however, add a fourth function in hopes of overcoming that problem. These packages set up a methodology with standards such as programming tasks to be performed and how long they should take.

The Center for Project Management offers Projectbase, a PC-based front end that provides only the methodology and is intended to feed into many of the project management packages available today.

On the opposite end of the spectrum, Yahdav says, Applied Business Technology Corp.'s Project Workbench was designed for software development and is a full-function package with scheduling and tracking features. A separate module, Project Bridge, provides the methodology.

In the middle is Poc-It Management Services, Inc., which offers an off-line methodology to be used with Micro-Man II, its scheduling and tracking system.

These packages are more expensive than their generic counterparts. "Probably more people use [Computer Associates International, Inc.'s] Superproject and [Symantec Corp.'s] Timeline than something like Poc-It," Yahdav says.

Multitrak Software Development Corp. offers similar functionality on the mainframe. Rich DiTaranti, a consulting systems analyst at Sea-Land Service, Inc., says Multitrak gives him control over project planning with a standardized methodology and terminology.

Three targets

There are actually three main user groups of project management software in IS: senior managers, project managers and the development team.

Senior managers need to view the project from a global perspective, with high-level concerns about where the project is going and when it will get there.

The development team sees the smaller picture. "They need to be able to update the records of the tasks they are working on and add new tasks," says Ralph Stow, a consultant at Cleveland Consulting Associates in Dallas.

Project managers need to plan, control and report on the progress of several projects. Time-sheet capabilities, often missing from general-purpose

Continued on page 56

Taylor is a seminar speaker, writer and systems consultant based in Westminster, Calif.

INSIDE

Days not Spent
Time saved is one way to prove payback of PC packages. Page 56.

Word Tools
A glossary can provide a head start to training. Page 57.

Product Guide
A comprehensive listing of recently shipped PC software. Page 60.

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packages, can help in this role. Rather than simply reporting on whether an activity was completed, time-sheeting allows the project manager to see how many man-hours were required to complete each project task.

Future benefits

There is an additional benefit to time sheets, Yahdav says. When the project is over, the statistics can be fed into a historical database to establish estimates on future projects.

Timesheet$ from Software Partners, Inc. in Palo Alto, Calif., does just that. It interfaces with several project management packages, such as Superproject, Timeline and, shortly, Yahdav says, Microsoft Corp.'s MS Project for Windows.

Ease of use is another important consideration for development teams and project managers. A mouse-driven graphical user interface is preferred over a command-driven interface or a forms-based system.

If PC-based project management systems are to satisfy the needs of companies with multiple large projects, however, they must have more than a friendly user interface.

"Ease of use is tied very much to functionality," DiTaranti says. One desired function is the ability to share resources across project boundaries.

"The first thing the software must allow is for resources to be applied across projects," says Harvey Levine, a principal at The Project Knowledge Group in Clifton Park, N.Y.

Some of the low-cost, lower functionality systems do not offer resource sharing, says William Duncan, president of Duncan Associates, a project management consulting firm in Lexington, Mass. This has caused some shops to move to larger, shared systems on either a mainframe-, minicomputer- or PC-based local-area network.

With a mainframe, "you can look at all the projects on-line and do resource allocation as well as resource leveling," says Bob Lynn, systems analyst at American President Cos. "You can also get cross-functional reports a lot easier than you can on a microcomputer."

However, you don't need a mainframe to perform resource sharing. Many people contend that PCs are plenty powerful enough for the number of projects IS would have to contend with. "Except for those people who require tremendous computer power and connectivity, the better products are available for microcomputer platforms right now," Levine says.

Cost is usually one reason people cite for choosing PCs. An unlimited license for a typical mainframe project management software package such as Multitrak, Metier Management Systems, Inc.'s Artemis and Primavera Systems, Inc.'s Project/2 can cost several hundred thousand dollars, compared with several hundred dollars for a single-user license.

A PC LAN setup could approach the cost of a mainframe or minicomputer system, however. A four-user Project Software and Development, Inc.'s Quiknet license costs about $18,000 on a VAX or about $1,500 per seat, Duncan says.

Some functions can be performed only on a powerful, centralized platform. DiTaranti cites several facilities that are unavailable on PC-based packages, including centralized time reporting by resource, comments attached to activities and multilevel project planning.

Take two

One solution to the debate over whether PCs or mainframes make better hosts for project management software is to use both. Many traditional mainframe firms such as Metier, Multitrak and Primavera offer PC-based packages or interfaces to import information from ones already on the market.

The information from many projects can then be rolled up to the mainframe and consolidated there to give senior management the overview they need.

Whichever approach you choose, says David Shaw, president of Constell Group, a consulting firm in Tenafly, N.J., the most important consideration is to have a consistent management process across the whole organization.

The software needs to reflect, as much as possible, the customer's preexisting management process and take into account the requirements of all groups involved in the management of the project. ●

Peer groups

The following associations and consortiums offer publications, seminars and other project management support to their members:

• Boston University Center for Project Management
72 Tyng Road, Tyngsboro, Mass. 01879
Contact: Dennis Moriarty, Director of Corporate Relations
(508) 649-9731 or (800) 733-3593

The center holds monthly meetings, two annual conferences in Boston and San Francisco and an annual membership roundtable. Fifteen courses are offered, in addition to a nine-month Project Management Certification program. A software simulation package for training is also available. The center publishes a newsletter called "Critical Paths." The membership fee is $15,000 per year for corporations.

• The Center for Project Management
Suite 290, 18 Crow Canyon Court, San Ramon, Calif. 94583
Contact: Rich Julius, Technical Editor
(415) 837-0397

The center's activities include program and project management consulting, research, publications and training seminars. The center also publishes the Projectguide Resource Library (IS standards, procedures and guidelines) and specializes in custom-designed development methodologies and their implementation.

• Project Management Consortium
Sponsored by The Center for Project Management (see previous listing)

The consortium is part of an industrywide effort to share and refine a professional IS knowledge base. Member organizations receive access to Project Central (a tactical methodology office and IS information center), research archives, life cycle and task effort data, standards publications and project management training seminars.

Annual membership is available at three levels: Charter ($25,000 fee), Full ($20,000) and Associate ($4,000). Benefits vary according to membership level.

• Project Management Institute (PMI)
P.O. Box 43, Drexel Hill, Pa. 19026
Contact: Jeanna Flaherty, Marketing Manager
(215) 622-1796

The institute is a nonprofit professional association dedicated to raising the level of excellence in project management through research, monthly periodicals, local chapter membership in North America, Europe and Africa, handbooks and Project Management Professional certification.

The institute has established an Information Systems Special Interest Group and will be presenting a special meeting and technical track devoted to IS project management at the 1991 PMI Annual Seminar/Symposium in Dallas Sept. 28-Oct. 2.

PMI also has a listing of vendors and consultants involved in project management.

Early project delivery can justify initial cost

BY ROBB WARE

You would expect to see some return on investment from purchasing a personal computer, equipping it with project management software and training project leaders to use the software. But what if you could recover the total implementation cost with your first project?

Information systems departments that shorten delivery time by 1½ weeks with this software can do just that.

Typical cost for a PC-based project management system

Item	Cost
Software (average)	$700
PC*	$3,800
Software training	$1,000
Project management consulting/training	$3,000
Lost billing time for employee	$1,000
Total	$9,500

Source: Ware & Associates — CW Chart: Paul Mack

These conclusions are based on the assumption that the project management software is being used to solve a specific problem: late delivery of projects. In that case, the first step in doing a cost/benefit analysis is to figure the costs of implementation. Obvious costs are software and hardware, but another factor that is often overlooked is training (see chart).

Typically, IS project managers require two types of training: learning how to use the software and learning how to implement project management concepts such as task definition, dependency analysis, estimating techniques and effective use of Gantt and Program Evaluation and Review Technique charts.

Training in these important concepts takes about three days and can be offered by the vendor but is usually acquired from an independent consultant. The amount of time spent on training should also be included as a cost because that time can't be charged back to IS users. A typical amount of internal billing lost for training is 35 hours at $35 per hour, or $1,225.

You could write off these costs over several projects. For simplicity's sake, however, they are treated here as onetime costs.

Ware is president of Ware Associates, a consulting and project management training company in Groton, Conn.

The second step is to determine at what point project management software starts saving you money, relative to how early projects are delivered.

To do this, first calculate how much it costs to complete a typical project without project management software.

From our experience with many Fortune 1,000 companies, we conclude that an average IS project requires four people working on it for one year — four effort years.

Most companies calculate that the cost to the organization for an IS professional is approximately 2½ times the salary cost.

With a typical salary of $35,000 each, four effort years cost four times (2½ times $35,000), or $350,000. This is the average project cost. The daily cost of that project is $350,000 divided by 250 working days per year, or $1,400 per day.

If project management software can reduce delivery time, the benefit of any time reduction is equal to $1,400 per day, or $7,000 per week.

The break-even point

If you spend $9,435 on a PC-based project management system and your average project cost per week is $7,000, you can completely recoup your investment in the project management software if you deliver your first project 1½ weeks earlier than you would have without the software.

The effect of spending $9,425 for the software, hardware and training is offset by early project delivery. As the time savings moves beyond 1½ weeks, the cost savings grows even more.

The penalty for untimely delivery of mandatory projects is not included in this calculation because it's difficult to measure. For example, how do you explain to your state comptroller that your company will be unable to implement the state's new tax package on the mandatory date?

It is important to note that performing a cost/benefit analysis for mainframe project management systems is much more complex than doing one for a PC-based system. This is because mainframe packages typically perform a wide variety of functions, including scheduling, time tracking and accounting. ●

Glossary

- **Baseline:** The original plan, plus or minus changes made as a result of changes in scope. It is the standard against which project or program performance is measured.
- **Cost performance index:** The ratio of budgeted to actual costs, which is used to predict the magnitude of a possible cost overrun.
- **Critical path method:** A technique used in project scheduling to determine which activities are most likely to result in an overall project delay. The "critical path" consists of those activities that must be completed on time for the project as a whole to be completed on time. Critical path activities have zero float.



- **Earned value analysis:** A method of measuring project performance. It compares the amount of work that was planned with what was actually accomplished to determine if the project is on schedule and within budget.
- **Float:** The amount of time a task can be delayed before an entire project is delayed. A task with float means that a slight delay in starting will not jeopardize project deadlines.
- **Gantt chart:** A graphics display of activity durations. In the typical Gantt chart, activities are listed down the left side of the chart and dates across the top. The durations of individual activities are shown as horizontal bars.
- **Multiproject analysis:** The process of planning or scheduling more than one discrete project simultaneously from a single pool of resources.
- **Program Evaluation and Review Technique (PERT) chart:** A PERT chart graphically illustrates the relationships and interdependencies among tasks by means of boxes and adjoining lines.
- **Project linking:** The program can temporarily treat several projects like one large project. Multiple supervisors can maintain project files independently, while the manager can easily consolidate current information from all of the projects.
- **Resource leveling.** Scheduling or rescheduling project activities based on resource availability. Resource leveling can be time-constrained (reschedule activities to minimize resource use but not at the cost of delaying the schedule) or resource-constrained (reschedule activities to reflect known resource constraints).
- **Work breakdown structure:** A hierarchical method of scheduling that divides a project into sections consisting of related tasks, usually constructed in either an outline form or as a flow diagram. The purpose of the work breakdown structure is to provide reviewable input for the planning, scheduling and control phases of the project.

Definitions provided by Duncan Associates, Datapro Research Group and Software Digest.

Project hot line: Five most commonly asked questions



The following are some of the questions most frequently asked by potential users of project management software, according to William Duncan, head of Duncan Associates, an international project management consulting and training firm in Lexington, Mass. Duncan is a certified project management professional, co-chairman of the Standards Committee of the Project Management Institute and a member of the Editorial Review Board of the Project Management Journal.

Q How do we decide which product is right for us?

A The simple answer is to define your requirements and use those requirements to evaluate the hundreds of products available. If you have difficulty with that, you can either hire a consultant or buy a copy of a popular, modestly priced product and use it on a real project for several weeks.

If the software works adequately, you're all set. If not, you at least have a basis for evaluating other products without making a substantial investment.

If you choose this method, use a real copy of the software, not a demonstration. You need to use the product in a live environment to fully appreciate its strengths and weaknesses.

Q What are some important requirements often overlooked by people wanting to purchase project management software?

A One is multiple calendars. These allow you to handle vacations, holidays, sick days and different work styles simply and easily.

Another important feature is built-in planning vs. actual reporting. Without this feature, you have only a planning tool. This feature lets you manage your products through analyzing variances and taking corrective actions as well as just planning them.

Variable time periods are something else to consider. Look for a system that allows you to mix units on the same project so that you can plan in days and weeks and still report time hourly.

One last feature is interfaces. If you have a computer-aided software engineering tool, you'll want a product that will interface with it. Same if you have a local-area network. If you want a centralized system for your mainframe that will be fed by a personal computer-based product, get two that will work together without custom development.

Q What is the relationship between CASE and project management software?

A CASE tools support a project management methodology. Project management software helps to convert these strategies into an operational plan to guide the conduct of day-to-day project activities.

Q How much should we expect to pay?

A As a rule, you get what you pay for. The more expensive products generally have more and better features than the less expensive ones.

Be sure to comparison shop. Prices of products available through retail channels can vary by 20% to 30%. Most vendors will provide substantial discounts for bulk purchases.

Also, don't reject the mainframe- and minicomputer-based products just because of high per-copy costs, which can be $10,000 to $250,000 vs. $400 to $5,000 for PC products. On a per-seat basis, these products for mainframes and minicomputers are often quite competitive.

Q How long does new software take to get up and running?

A That is a function of how much time and energy you commit to training, but you should be able to use most systems within a few weeks. Final benefits will not likely be visible for several months. ●

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VENDOR	PRODUCT	HARDWARE PLATFORM/ OPERATING SYSTEMS SUPPORTED	MEMORY/DISK REQUIREMENTS (IN BYTES)	FUNCTIONS	SCHEDULING FEATURES	INCREMENTS OF SCHEDULING	AUTOMATIC RESCHEDULING	MONITORING, CONTROL FUNCTIONS SUPPORTED	AVAILABLE CHARTS	NUMBER OF TASKS PER PROJECT	FILE FORMATS SUPPORTED[2]	USER INTERFACES SUPPORTED	PERIPHERALS SUPPORTED	BASE PRICE/MULTIUSER VERSION
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Yes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ADR Management Systems, Inc. (516) 360-3000	Wand/PC Version 1.5.1	IBM PCs and compatibles/MS-DOS	450K - 640K/6M	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects	Backward scheduling, hammocking, multiple starts and finishes, loops identified and resolved interactively	Minutes, hours, days	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, time-scaled network diagram, histogram, earned value analysis, customized reports, cost tracking, bar charts, pie charts	2,000	ASCII	Menu-driven, command-driven	Color printer, Postscript, plotter, color displays	NA/$19,500 (four users)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Yes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Applied Microsystems, Inc. (604) 873-6000 (604) 873-1397	Proteus Release 4.4	IBM PCs and compatibles/MS-DOS	512K/Hard disk recommended	Project linking, scheduling	Scheduling done on individual projects	Days, weeks	Yes	Baseline comparisons, percent complete	Gantt, customized reports	2,000	ASCII (export only), Dbase (export only)	Menu-driven, dialog boxes	Color displays	$79.95
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Yes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Center for Project Management (415) 827-4500	Projectbase Version 4.0	IBM PCs and compatibles/DOS 2.10 or higher	320K - 704K/640K recommended	Critical path calculation, planning and estimating, life cycle management	Experts plans and estimates to scheduling software	NA	NA	Task effort baselines, resource profiling	Customized reports, potential PERT	512	ASCII, Dbase, Timeline, Superproject, Quattro, Project Workbench, Viewpoint, Microsoft Project (all export only)	Menu-driven, command-driven, dialog boxes	Color displays	$2,950 (for all four end-uses)/NA
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Yes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Computer Associates International, Inc. (800) 422-2727	Superproject Version 2.0	IBM PCs and compatibles/DOS	630K/3M, hard disk required	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects, leveling by priority, leveling using overtime	Backward scheduling, hammocking, multiple starts and finishes, loops identified and resolved interactively, split resource, roles actuals	Minutes, hours, days, weeks, months, years	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, time-scaled network diagram, histograms, earned value analysis, customized reports, cost tracking, work breakdown, calendars	Limited by RAM only	ASCII, Dbase, Lotus' 1-2-3, proprietary Supercalc 5, Excel	Menu-driven, dialog boxes	Color printer, Postscript, plotter, color displays, mouse, laser graphics	$695/$695 (three users)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	No	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	No	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Diversified Information Services, Inc. (818) 986-7266	Time Modeler	IBM PCs and compatibles/MS-DOS	640K/2M	Critical path calculation, scheduling, resource leveling, individual resource leveling	Backward scheduling, hammocking	Hours, days, weeks, months	No	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, time-scaled PERT, time-scaled network diagram, histograms, earned value analysis, customized reports, cost tracking	10,000	ASCII, Dbase, Lotus' 1-2-3	Menu-driven	Plotter, color displays	$4,500/NP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Yes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[1]Only products and new releases of older products that first shipped since January 1990 have been included in the survey. [2]Files are imported and exported unless otherwise noted.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE PLATFORM/ OPERATING SYSTEMS SUPPORTED	MEMORY/DISK REQUIREMENTS (IN BYTES)	FUNCTIONS	SCHEDULING FEATURES	INCREMENTS OF SCHEDULING	AUTOMATIC RESCHEDULING	MONITORING, CONTROL FUNCTIONS SUPPORTED	AVAILABLE CHARTS	NUMBER OF TASKS PER PROJECT	FILE FORMATS SUPPORTED*	USER INTERFACES SUPPORTED	PERIPHERALS SUPPORTED	BASE PRICE/MULTIUSER VERSION
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	No	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Metier Management Systems, Inc. (703) 222-1111	I/CSCS PC	IBM PCs and compatibles/DOS	512K/1M	Scheduling, project cost management, estimating	Integrates with scheduling software	Hours	No	Earned value analysis, baseline comparisons, cost tracking, percent complete, 11 methods of performance measurement	Histograms, earned value analysis, customized reports, cost tracking, structure drawings, government reports, responsibility assignment matrix, organization, cost breakdown structure	Limited by disk space only	ASCII, Dbase, Lotus' 1-2-3	Windows 2.11, 3.0, menu-driven, dialog boxes	Color printer, plotter, color displays, mouse	$3,750/NA
	Prestige Version 4	IBM PCs and compatibles, PC LANs, Sun/DOS, Sun OS, Unix	640K/8M	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects	Backward scheduling, hammocking, multiple starts and finishes	Hours, days, weeks	No	Earned value analysis, baseline comparisons, percent complete	Gantt, logic diagram (display only), time-scaled PERT (display only), time-scaled network diagram (display only), histograms, earned value analysis, customized reports, cost tracking	4,000, 30,000 (with extra memory)	ASCII, Lotus' 1-2-3, Artemis	Menu-driven	Postscript, plotter, color displays	$3,995/ $4,995 plus $3,995 per user
	Artemis Planner Version 2	IBM PCs and compatibles/DOS	512K/1M	Scheduling, rough cut planning, bar chart drawing	None, bar chart drawing system	Days, weeks, months	No	Baseline comparisons, percent complete	Gantt, logic diagram (display only), logical bar charts (display only)	Limited by disk space only	ASCII, Artemis	Proprietary graphical user interface, menu-driven	Color printer, plotter, color displays, mouse	$995/NA
	Artemis 7000-386	IBM PCs and compatibles, Unix platforms/DOS, Unix	1M/7M	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects	Hammocking, multiple starts and finishes	Minutes, hours, days, weeks, months, quarters, years	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, time-scaled PERT, time-scaled network diagram, histograms, earned value analysis, customized reports, cost tracking, work breakdown structure, organization breakdown structure, time-scaled bar charts, symbol drawings, logic bar charts	Limited by disk space only	ASCII, Dbase, Lotus' 1-2-3, Timeline, Artemis	Menu-driven, command-driven	Color printer, plotter, color displays, mouse	$6,000/ $22,000 (five users)
	Artemis Project Version 3.0	Intel 80386-based PCs, Unix platforms/DOS, Unix	1M/4M	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects	Backward scheduling, hammocking, multiple starts and finishes, bugs identified and resolved interactively	Hours, days, weeks, years	No	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, time-scaled network diagram, histograms, earned value analysis, customized reports, cost tracking	1M	ASCII, Lotus' 1-2-3, Timeline, IIF, Artemis	Menu-driven	Plotter, color displays, mouse	$3,200/ $2,880 per user
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Micro Research Systems Corp. (514) 487-3375	Project/I-80 Version 4	IBM PCs and compatibles/MS-DOS 3.3 and higher	512K/Hard disk required	Critical path calculation, scheduling, resource leveling, individual resource leveling, cost analysis, progress control	Hammocking, bugs identified and resolved interactively	Days, weeks	Yes	Baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, time-scaled PERT, cost tracking, histograms (display only), time-scaled network diagram (print only), balanced structure	2,000	ASCII	Proprietary graphical user interface, [illegible]	Color printer, plotter, color displays, mouse	$400/NA
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Monitor Systems, Inc. (415) 949-1888	Task Monitor	Macintosh, IBM PCs and compatibles/DOS, Macintosh operating system	640K/Hard disk required	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects	Backward scheduling, hammocking, bugs identified and resolved interactively	Days, weeks, years	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete, other performance measures	Gantt, logic diagram, time-scaled PERT, time-scaled network diagram, earned value analysis (print only), customized reports, cost tracking	Limited by disk space only	ASCII, Lotus' 1-2-3, Artemis, Project 2, Vision	Menu-driven, dialog boxes	Color printer, mouse (Macintosh only), plotter, color displays	$995/$995 (free to first user)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pathfinder, Inc. (800) 424-7180	StarWatch	IBM PCs and compatibles/DOS 3.1 or higher	516K/Hard disk and floppy configuration required	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects, work breakdown structure, forms and tracks technical work packages, supports purchase order and vendor tracking	Backward scheduling, hammocking, multiple starts and finishes, bugs identified and resolved interactively, ADM/PDM for charts on screen	Days, weeks; periods can also be defined by user	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, time-scaled PERT, time-scaled network diagram, earned value analysis, customized reports, cost tracking, logic diagram (print only)	1,000	ASCII, Lotus' 1-2-3	Menu-driven, command-driven, dialog boxes	Plotter, color displays	$3,500/ $30,000 (four stations with network; volume discounts available)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Introducing the Epson® EPL-7500 laser printer. One of the first true Adobe® PostScript® laser printers designed around a lightning-fast RISC processor.

The result is *significantly* faster output.

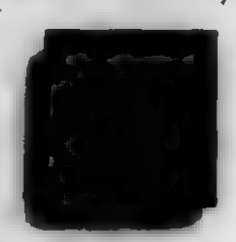
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Thanks to true Adobe PostScript—not a clone—the EPL-7500 is able to produce razor-sharp text in 35 scalable fonts, plus equally impeccable graphics. Blacks are blacker and lines are finer, courtesy of the printer's unique MicroArt Printing technology.

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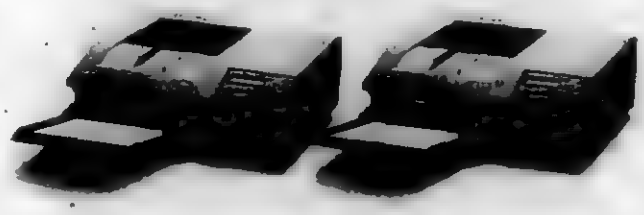
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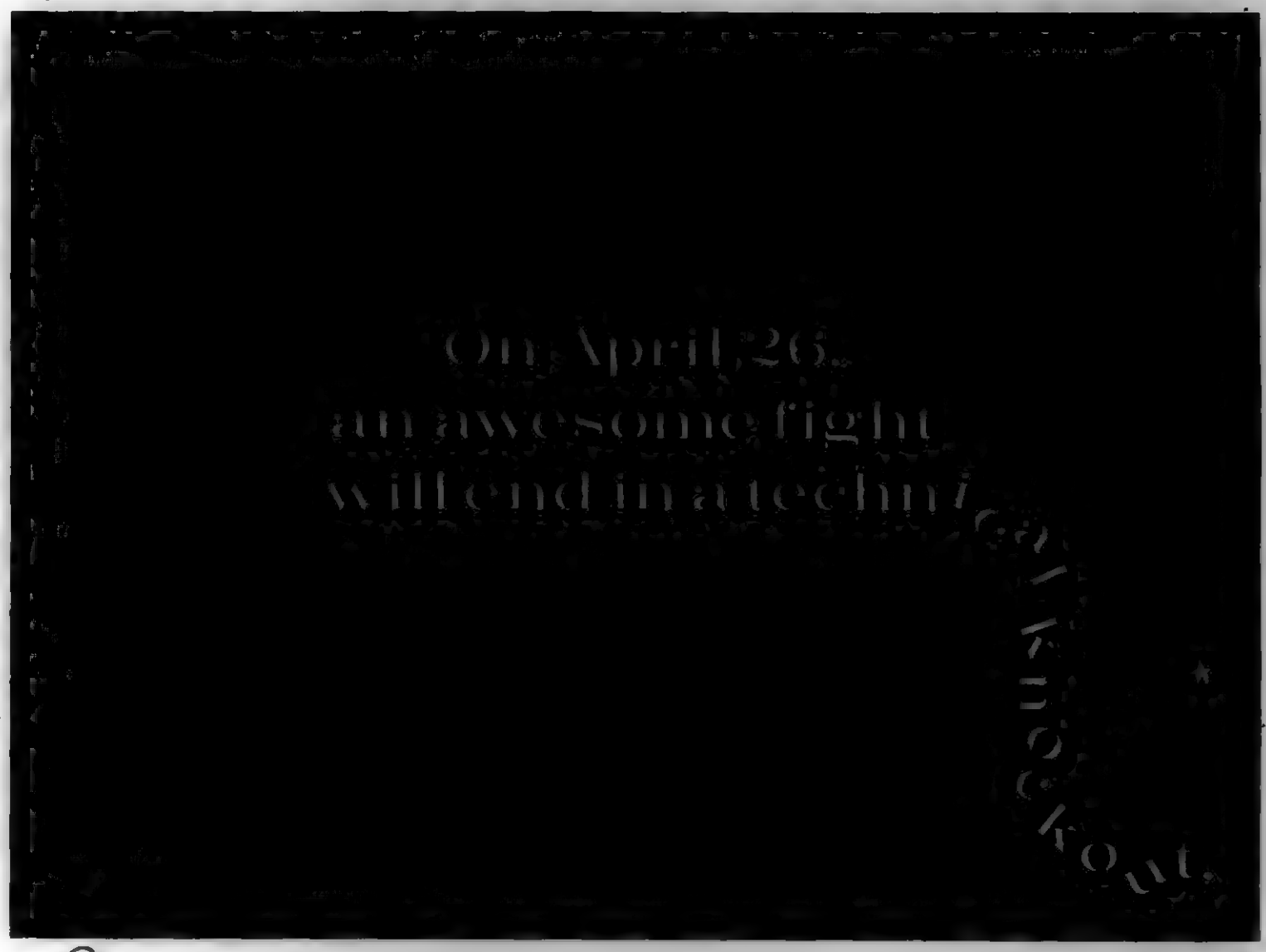
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VENDOR	PRODUCT	HARDWARE PLATFORM/ OPERATING SYSTEMS SUPPORTED	MEMORY/DISK REQUIREMENTS (IN BYTES)	FUNCTIONS	SCHEDULING FEATURES	INCREMENTS OF SCHEDULING	AUTOMATIC RESCHEDULING	MONITORING, CONTROL FUNCTIONS SUPPORTED	AVAILABLE CHARTS	NUMBER OF TASKS PER PROJECT	FILE FORMATS SUPPORTED[1]	USER INTERFACES SUPPORTED	PERIPHERALS SUPPORTED	BASE PRICE/MULTIUSER VERSION
[illegible]	[illegible]	[illegible]	[illegible]	Critical path calculation, [illegible]	[illegible]	Hours	Yes	[illegible]	Gantt, Histogram, earned value analysis, customized reports, cost tracking	[illegible]	ASCII, Dbase, Lotus' 1-2-3, Tymlin, [illegible]	[illegible]	Color printer	[illegible]
Power Up Software Corp. (415) 349-8900	Quick Schedule Plus Version 3.1	IBM PCs and compatibles/DOS 3.0 or higher	512K - 640K/Hard disk or floppy combination required	Scheduling	Multiple starts and finishes	Minutes, hours, days, weeks, years	No	None	Gantt	500	ASCII (export only)	Proprietary graphical user interface, dialog boxes	Color displays	$99.95/NA
[illegible]	[illegible]	[illegible]	[illegible]	Critical path calculation, scheduling	Backward scheduling, multiple starts and finishes, loops identified and resolved interactively	Days	Yes	Earned value analysis, cost tracking	Gantt, logic diagram, time-scaled network diagram, earned value analysis, customized reports, cost tracking	4,000	ASCII, Dbase, Lotus' 1-2-3, Project Planner	[illegible]	Color printer, Postscript, plotter, color displays, mouse	[illegible]
Project Software & Development, Inc. (617) 661-1444	Qwiknet Professional Release 2.0	IBM PCs and compatibles/PC-DOS, MS-DOS 3.0 or higher	640K/Hard disk required	Critical path calculation, project linking, scheduling, resource leveling, leveling over multiple jobs	Multiple starts and finishes, loops identified and resolved interactively	Minutes, hours, days, weeks, months	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete, estimate to complete, budget and variance to date, at completion variance, schedule and cost variance	Gantt, logic Gantt (display only), logic diagram, histograms, earned value analysis, customized reports, cost tracking, work breakdown structure plots (print only)	5,000 per project or multi-project	ASCII, Dbase (export only), Lotus' 1-2-3 (export only), Project/2	Proprietary graphical user interface, graphical drawing board, menu-driven, screens, windows	Color printer, Postscript, plotter, color displays, mouse	$2,500/ $8,500 (four users)
[illegible]	[illegible]	[illegible]	[illegible]	Scheduling, resource leveling, statistical resource control, adaptive forecasting	Backward scheduling, schedule/deadline conflict flagging	Minutes, hours, days, weeks, years	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, histograms, customized reports, style sensitivity	500	ASCII, Dbase, Lotus' 1-2-3	Menu-driven	Color printer, Postscript, plotter, color displays	[illegible]
SAS Institute, Inc. (919) 677-8000	The SAS Application System Release 6.04 (PC-DOS). Release 6.06 (OS/2)	IBM PCs and compatibles/PC-DOS, MS-DOS, OS/2	640K/20M	Critical path calculation, scheduling	Backward scheduling, hammocking, multiple starts and finishes	Seconds, minutes, hours, days, weeks, years	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, histograms, earned value analysis, customized reports, cost tracking	Limited by disk space only	ASCII	Proprietary graphical user interface, Presentation Manager, menu-driven, command driven, dialog boxes	Color printer, plotter, color displays, mouse	$1,070 (DOS), $1,450 (OS/2)
Scitor Corp. (415) 570-7700	Project Scheduler Version 5	IBM PCs and compatibles/DOS 3.0 or higher	512K - 640K/Hard disk required	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects	Backward scheduling, hammocking, multiple starts and finishes within project, loops identified and resolved interactively	Minutes, hours, days, weeks, months	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, histograms, earned value analysis, customized reports, cost tracking	2,000	ASCII, Dbase, Lotus' 1-2-3, Artemis	Proprietary graphical user interface, menu-driven, dialog boxes	Color printer, Postscript, plotter, color displays, mouse	[illegible]
	Project Scheduler Version 4 for the Macintosh. Project Scheduler Version 4 for the PC	IBM PCs and compatibles, Macintosh Plus, SE, Macintosh II series/DOS, Macintosh operating system 4.0 or higher	Hardware dependent	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects	Backward scheduling, multiple starts and finishes within project, loops identified and resolved interactively	Minutes, hours, days, weeks, months	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, histograms, earned value analysis, customized reports, cost tracking	2,000	Artemis, Project Scheduler Version 4 for the Macintosh interfaces with the PC version	Macintosh windows, menu-driven, dialog boxes	Color printer, Postscript, plotter, color displays, mouse	$495/NA
Software Publishing Corp. (415) 962-8910	Harvard Project Manager Release 3.00	IBM PCs and compatibles/DOS 2.1 or higher	640K/Hard disk required	Critical path calculation, scheduling, resource leveling, leveling over multiple projects	Backward scheduling, loops identified and resolved interactively	Minutes, hours, days, weeks, years	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, time-scaled PERT, time-scaled network diagram, histograms, earned value analysis (print only), customized reports, cost tracking (display only)	500	ASCII, Dbase, Lotus' 1-2-3, Timeline 2 (task information only)	Proprietary graphical user interface, menu-driven, dialog boxes	Color printer, plotter, color displays	$695/NA
[illegible]	Prosix Version 4.0	IBM PCs and compatibles	640K (1M recommended), Hard disk required	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects	Backward scheduling, hammocking, multiple starts and finishes, loops identified	Days	No	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, resource Gantt, logic diagram, time-scaled PERT, time-scaled network diagram, histograms, earned value analysis, customized reports, cost tracking	$2,000 per project, unlimited through subnet-working	ASCII, Dbase (DIF), Lotus' 1-2-3 (DIF)	Menu-driven, dialog boxes	Color printer, Postscript, plotter, color displays, mouse	$3,000/ $15,000 (five users), $30,000 (20 users)
	Project Outlook Version 2.0	IBM PCs and compatibles/Windows 3.0	640K/Hard disk required	Critical path calculation, project linking, scheduling	Backward scheduling, hammocking, multiple starts and finishes, loops identified and resolved interactively	Days	Yes	Baseline comparisons, percent complete	Gantt, time-scaled network diagram, customized reports	Limited by memory only	ASCII, Prosix	Windows 3.0, menu-driven, dialog boxes	Color printer, Postscript, plotter, color displays, mouse	$395/NA
Symantec Corp. (408) 253-9600	Timeline Version 4.0	IBM PCs and compatibles/PC-DOS, MS-DOS 3.0 or higher	640K/Hard disk required	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects when combined into one schedule, linking of schedules	Backward scheduling, hammocking, multiple starts and finishes, loops identified and resolved interactively, effort-driven tasks	Minutes, hours, days, weeks, months	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete	Gantt, logic diagram, time-scaled PERT (print only), time-scaled network diagram (print only), histograms, earned value analysis, customized reports, cost tracking, periodic PERT, outline PERT, Time chart (display only)	1,000 - 3,000, limited by memory only	ASCII, Dbase, Lotus' 1-2-3, Excel, Artemis	Proprietary graphical user interface, menu-driven, command-driven, dialog boxes	Color printer, Postscript, plotter, color displays, mouse, slide production device	$495/$595 per simultaneous user pack
[illegible]	Gant Gantt	Macintosh Plus, SE, SE30, Macintosh II [illegible]/System 6.0 or higher	[illegible]	Creates Gantt charts	NA	Hours, days, weeks, quarters, years	No	Cost tracking, percent complete	Gantt	Limited by disk space	ASCII	None	None	$195/NA
Welcom Software Technology (713) 560-0514	Open Plan 4.0	IBM PCs and compatibles, Unix platforms, Macintosh/DOS, SCO Unix, Macintosh operating system	640K/20M	Critical path calculation, project linking, scheduling, resource leveling, individual resource leveling, leveling over multiple projects	Backward scheduling, hammocking, multiple starts and finishes, loops identified and resolved interactively	Minutes, hours, days, weeks, months, quarters, years	Yes	Earned value analysis, baseline comparisons, cost tracking, percent complete, remaining and elapsed durations	Gantt, logic diagram, time-scaled PERT, time-scaled network diagram, histograms, customized reports, earned value analysis (print only), cost tracking	10,000 - 32,000	ASCII, Dbase, Timeline, Macproject	Menu-driven, command-driven	Color printer, Postscript, plotter, color displays, mouse	$4,200/ $14,000+ (four users)



Okay, so it won't exactly be Tyson-Holyfield, but The Computer Museum's 3rd Annual Computer Bowl still promises to be one of the most exciting quiz games you'll ever witness. Join us ringside for round after round of mind-boggling action as the finest minds in the East and West go head to head. See who ends up on the ropes first. See who beats whom to the punch. But, most important, see who's left standing when all is said and done. The place: The San Jose Convention Center, San Jose, CA. With live broadcast via satellite to The Computer Museum in Boston. Don King, eat your heart out.

Presented by
The Association for Computing Machinery

EAST COAST TEAM

Pamela McCorduck, Captain
Author

Dr. John A. Armstrong
International Business Machines Corporation

James E. Clark
AT&T Computer Systems

Samuel H. Fuller
Digital Equipment Corporation

John Markoff
The New York Times

WEST COAST TEAM

Heidi Roizen, Captain
T/Maker Company

Dave House
Intel Corporation

Ed Juge
Radio Shack

Philippe Kahn
Borland International Inc.

David E. Liddle
Metaphor Computer Systems

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Founders
Pat Collins Nelson and Dr. Dave Nelson

Underwriter
Apple Computer, Inc.

"The Examiner"
Bill Gates
Microsoft Corporation

Judges
L. John Doerr
Kleiner Perkins Caufield & Byers

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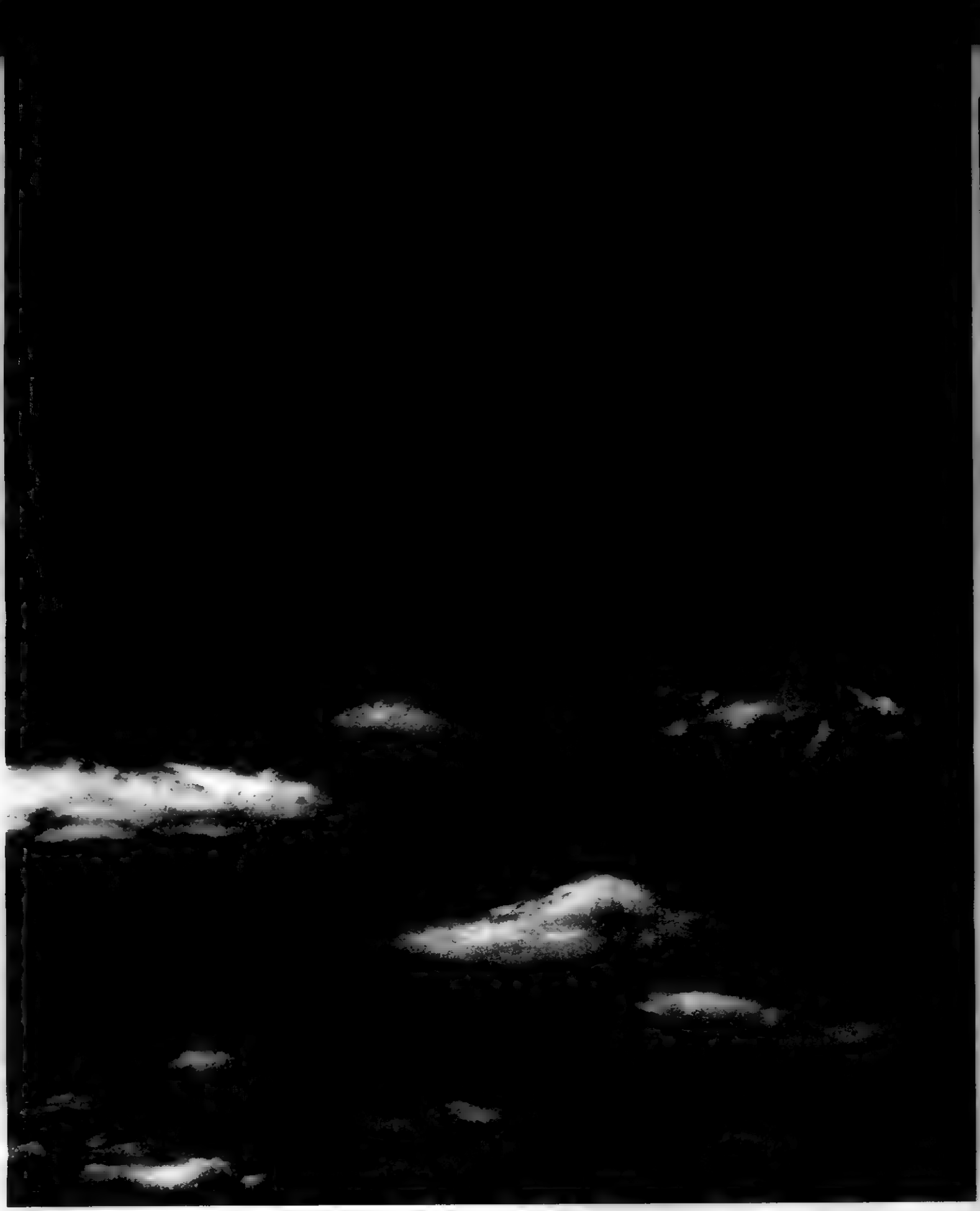
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The Computer Bowl



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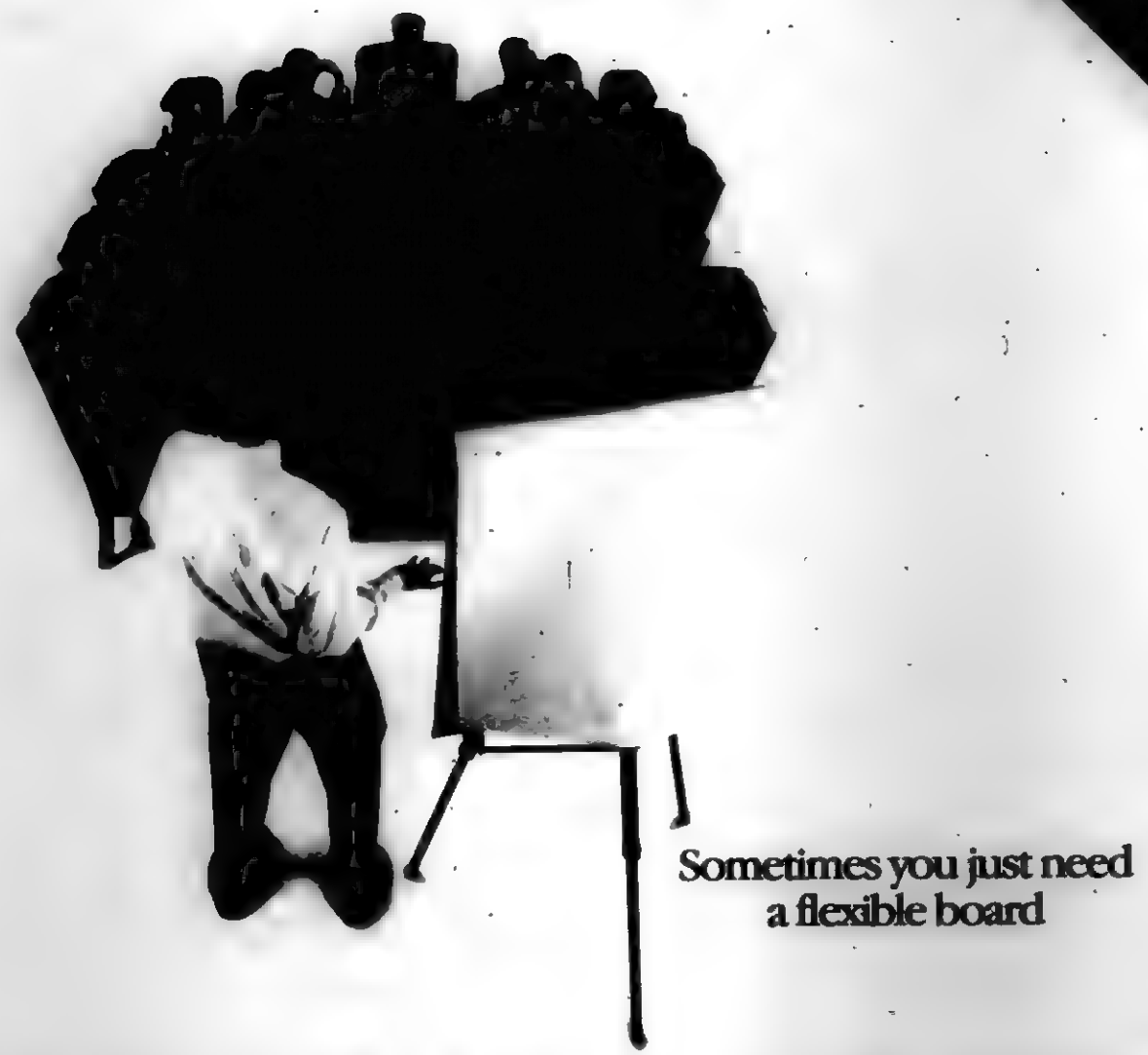
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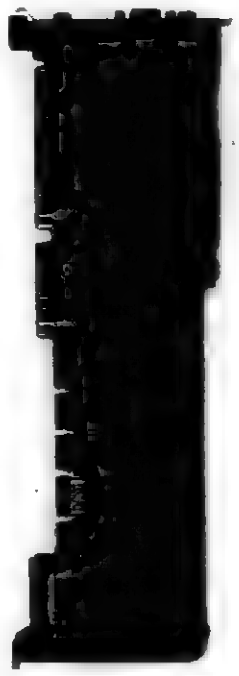
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Fuzzy logic clarified

Concept brings imprecise nature of human thought to business applications

BY EARL COX and
MARTIN GOETZ

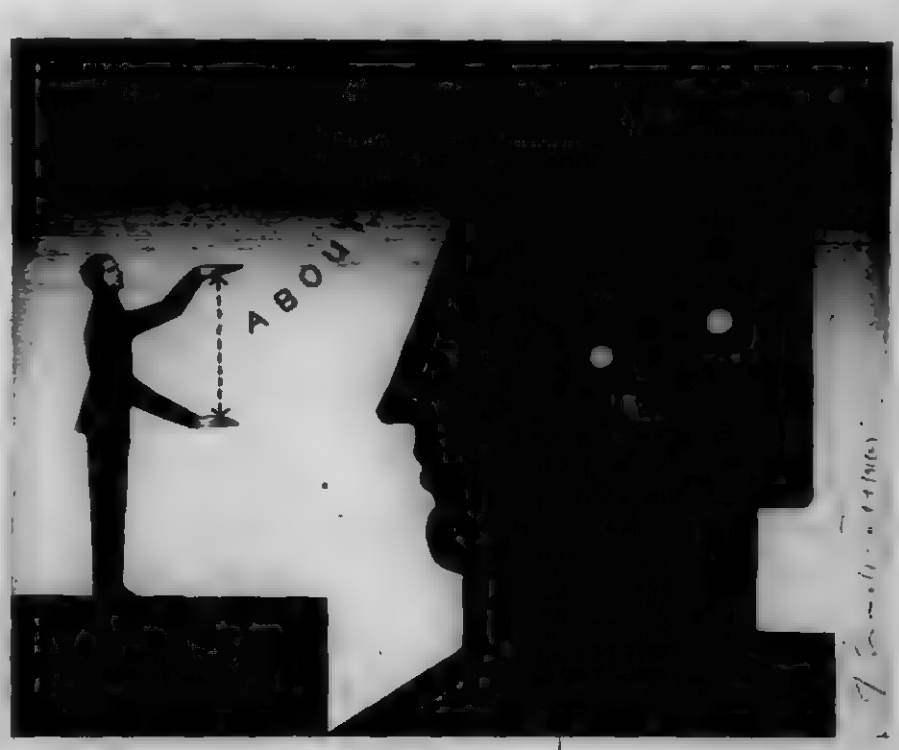
Fuzzy reasoning doesn't sound like something the information systems community should be striving to achieve. After all, bookstores and catalogs are full of tools to help us think more clearly, straightforwardly and objectively. We've spent our careers attempting to bring a high level of Boolean precision into our computerized applications.

Yet fuzzy, or imprecise, reasoning, a technology based on a form of mathematics called fuzzy logic, may offer a solution to applications development bugaboos. The incorporation of fuzzy logic into existing or new mission-critical applications enables them to be more quickly developed. Additionally, fuzzy logic enables IS to build a new class of applications previously deemed unfit for automation because of imprecise parameters.

Particularly good fuzzy logic candidates include insurance and financial risk assessment applications that contain a large number of variables and decision-making input from experts. With fuzzy logic, for example, IS can enable users to query "good" or "bad" insurance risks without having to provide the computer with a plethora of detailed conditional statements.

Fuzzy reasoning has the potential today to embed into computers software logic that more closely parallels how people and experts think.

Because fuzzy logic works on general-purpose machines, preparing for this technology doesn't require massive systems changes. Rather, the changes that need to occur must happen in the IS mind-set. We must examine and alter some basic applications development precepts.



James Endicott

We have always been taught that the computer was designed to make decisions based on specific values. "If A is greater than or less than five, do B." IS personnel have had to learn to think like computers to build effective systems.

However, in life, business included, most decisions are not based on "crisp" — or absolute — values. Rather, decisions are based on imprecise information, which limits the extent to which they can be supported through automation. Inexact terms such as "high," "low," "few" and "many" have until now had no place in IS applications; computers could not understand these concepts.

Fuzzy logic, first described in 1965 by Lotfi A. Zadeh, a professor at the University of California at Berkeley, has the potential to change all that by letting computers think like we do. It will enable general-purpose machines to process imprecise data through new, more human-like languages.

A look at fuzzy set theory

Because fuzzy logic is a recent concept, understanding its potential requires some introduction to fuzzy set theory — the mathematical notion that an element may have partial membership in a set (see story page 70).

For example, consider the concept of

Continued on page 70

Cox is founder and chief scientist at Knowledge Based Technologies, Inc. in White Plains, N.Y., an expert systems and fuzzy logic software company. Goetz is president of Goetz Associates, a management consulting company in Teaneck, N.J., and founder of Applied Data Research. In 1989, he was inducted into the Infomart Computer Hall of Fame.

Words & Terms

Approximate reasoning: A reasoning or inference process that incorporates fuzzy sets and hedges.

Crisp set: A mathematical set with sharp boundary points (e.g., 6 ft is TALL but 5 ft 11½ in. is NOT TALL); the traditional definition of a set in classical or symbolic logic.

Fuzzy logic: A generalization of the mathematical concept of set membership in which, unlike traditional Boolean logic that requires a yes/no type of response (see crisp set), an element may have only partial membership in the set.

Fuzzy set: A conceptual representation of a set that permits an element to have gradual degrees of (or partial) membership in a set.

Hedges: Transforming language that modifies the shape of a fuzzy set by intensifying ("very"), diluting ("somewhat") or reversing ("not") the membership profile.

Linguistic variables: Semantic concepts (such as "high" or "low") that lend perspective and give reference to a fuzzy set.

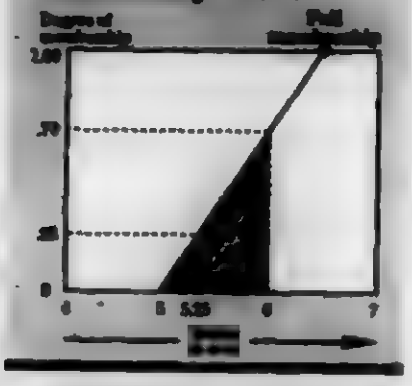
Membership in a fuzzy set: A value between 0 and 1 that indicates the degree to which an element has membership in the set. At 0, the element has no membership; at 1, it has full membership.

Continued from page 69

tall American males. What values of the variable "height" should be considered tall? Classical mathematical set theory would require an inclusive membership function. In other words, we might simply dictate that anyone over 6½ feet is tall.

However, in real life, the range of heights considered to be tall is not well-defined. While most of us recognize anyone over 7 feet as tall and someone under 5 feet as short, what about people who are 5 ft 11 in. or 6 ft 2 in. or 6 ft 6 in.? Our appreciation for tall increases as the value of height increases.

Diagram A: The degree of membership in a set



Therefore, we can say that tall is not "crisp" or sharply defined. This concept of tall is, in fact, a fuzzy set.

The degree or grade of membership in a fuzzy set is marked off on a graph between the values of 0 and 1. In our tall example, 0 would represent extremely short, 1 extremely tall.

Mapping a scalar value into the tall set's horizontal axis (see Diagram A above) produces the "truth" or "compatibility index value," a number between 0 and 1 showing the degree to which the object is part of the fuzzy set.

By looking at the diagram, we can see that a person who is 4 feet is not tall because the degree of membership, or truth, on the scale is 0.

But someone who is 5 ft 3 in. in height has a moderate degree of tall with a compatibility of 0.23, and someone who is 6 feet in height has a greater degree of tall with a compatibility of 0.70. Anyone over 6½ feet is absolutely tall.

The shape of a fuzzy set determines its membership characteristics. Take, for example, the concept of middle-age. This concept can be stated as: AGE IS AROUND 40.

Whereas in a crisp set, the definition of middle-age would be people over 30 and under 50, inclusive, fuzzy sets offer us a better method of describing middle-age by representing the surface as a symmetrical, bell-shaped curve (see Diagram B).

When the variable age is mapped to the fuzzy set middle-age, its membership increases as age approaches 40 years old — the absolute membership in the set.

As age increases beyond 40, the membership drops toward 0, indicating that while the individual may still be considered middle-aged, he is moving toward other fuzzy domains such as senior citizen or elderly.

Fuzzy logic also lets us take personal perceptions *into account*. For example, most people base their perception of the concept old on how old they are personally. To a 30-year-old, 30 is not very old, giving 30 a truth of about 0.25 when mapped out. With the same perspective, a 45-year-old is moderately old with a truth of about 0.55.

Personal semantics

When fuzzy sets such as tall and old are embedded in a sentence structure, we call them linguistic variables. We can use them, for example, to query a database to find people who are both tall and old. For example, one such query might be: SELECT EMPLOYEES WHERE HEIGHT IS TALL AND AGE IS OLD.

"Hedges" are used to modify linguistic variables. Hedges are words used to modify the shape of a fuzzy set's surface. They can approximate, intensify, dilute and reverse the membership profile. Approximate hedges, such as "about," "above" and "around," are used to transform crisp values into fuzzy sets. Intensify hedges, such as "very," and dilute hedges, such as "rather," shift the fuzzy set values to the left or right of the fuzzy set's surface. Reverse hedges, such as "not," change the fuzzy set values by reversing the shape of the curve.

So a linguistic variable modified by a hedge would appear as: SELECT EMPLOYEES WHERE HEIGHT IS RATHER TALL AND AGE IS NOT OLD.

Cut through partial set confusion



According to the English magazine *New Scientist*, mathematician and philosopher Bertrand Russell devised a tale about a barber to help clarify the idea of partial set membership, a key concept of fuzzy logic.

Russell tells of a village that tried to divide its people into two mutually exclusive categories — those who shave themselves (and are not shaved by the barber) and those who do not shave themselves (and are shaved by the barber). This seemed straightforward until the village tried to categorize the barber.

In fact, the barber is a complete member of neither category but a partial member of both.

Tell that one to classic logicians. It will drive them crazy.

Fuzzy logic uses these variations of fuzzy sets in natural language queries, rules and procedures integral to the development of IS applications.

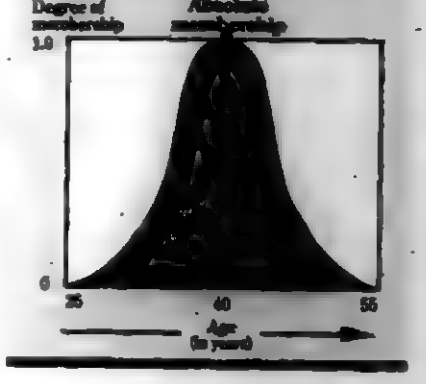
Fuzzy logic in IS

With fuzzy logic, it is now possible for IS to automate an entirely new realm of computer applications, such as the following:

- **Information retrieval.** Imagine how much easier information retrieval would be if IS, searching for potential acquisition candidates at the behest of business management, could use statements such as: SELECT ALL COMPANIES WHERE REVENUE IS GROWING RAPIDLY AND PROFITS-TO-EARNINGS RATIOS ARE VERY LOW instead of actual values (see story page 71).

Not only is it easier for users to think in such terms, but the ability to retrieve records using this criteria is also possible only with fuzzy reasoning techniques.

Diagram B: The middle-age fuzzy set



- **Expert systems construction.** The usual way to build expert systems is to have the knowledge engineer, together with the expert, write the "rules" that represent the expert's thought process. But human experts, like everyone else, don't think in terms of fixed values; they think in terms of real world values.

Fuzzy reasoning would enable a medical expert in a medical analysis application to state his rule thusly: IF PATIENT IS VERY OLD, DO NOT RECOMMEND STRENUOUS EXERCISES. Such rules that are not crisp are difficult, if not impossible, to state with most of today's expert systems.

- **Applications maintenance and development.** Today, more than half of the maintenance performed on business applications is because of the changing conditions within a company. That maintenance often involves changing actual values and tables.

Fuzzy logic can reduce maintenance as well as the amount of an application's initial programming by cutting down on the number of rules in an application and separating the variables that drive them.

By allowing computers to think more like people, an entirely new range of IS applications becomes feasible (see stories below and page 71). When we are able to incorporate the reality of imprecision into language that the computer can understand, we will also progress in our ability to build and maintain more robust, adaptable computer applications. ●

Wanted: Easy data retrieval

Fuzzy software lets users select data using inexact terms

BY EARL COX
and MARTIN GOETZ

Fuzzy logic can be used in building applications in which there is uncertainty about the exact characteristics of the data to be retrieved. A good example is the selection of records from a hypothetical criminal detection system: the Municipal Criminal Identification and Profile System (MCIPS). With fuzzy logic software, users of this system and its database can describe a suspect in general terms and retrieve a list of probable suspects.

MCIPS holds the current physical description of wanted criminals in the local area. For our purposes, we will look at just a few attributes: age, height and weight (or — as we call the fuzzy sets — old, tall and heavy).

The list of wanted persons is as follows:

Name	Age	Height	Weight
Jones	22	5'8"	182
Williams	50	5'1"	152
Smith	31	6'5"	192
Carlyle	43	6'2"	275
Brown	19	5'8"	198
Atkinson	37	6'4"	212
Lee	49	4'8"	128
Tosco	56	5'7"	200
Nguyen	61	5'9"	213
Purvey	66	6'7"	270
Vander	23	5'5"	178

Suppose that on the night of June 1, 18-year-old Susan Elliot is mugged and has her handbag stolen while returning from evening classes at a local community college. She has only a brief look at the thief.

At the precinct house, Susan tells the MCIPS officer what she remembers: The attacker was a man, tallish, rather thin and older.

From Susan's description, the MCIPS operator enters a rough outline into the terminal, making allowances for the imprecise nature of the description and for Susan's viewpoint: SELECT NAMES AND DIGITAL PHOTO FROM SUSPECT DATABASE WHERE HEIGHT IS MODERATELY TALL AND WEIGHT IS NOT VERY HEAVY AND AGE, ADJUSTED FOR A YOUNG PERSPECTIVE, IS OLD.



The MCIPS searches through the suspect list, applying the fuzzy set grades to each combination of attributes. Composite rankings that fall below a critical level in truth membership are excluded from this list.

The computer produces another list consisting of Williams (0.87 truth), Lee (0.55), Tosco (0.92) and Nguyen (0.42).

Meanwhile, back at the station, Susan waits as the MCIPS operator calls to the screen a digital image of Tosco, who has the highest truth membership.

Officer: Look at this suspect.

Susan (spilling her coffee): My God!

Officer: That's the man?

Susan: No, that's my Uncle Harry!

Officer: OK, let's take a look at the next highly ranked candidate. How about this one?

Susan (studying the image of Williams): Yes, that's him.

In this way, fuzzy logic provides a rich communications vehicle that allows us to specify a lot of general, nonspecific data in our application development vocabulary.

In everyday business applications, the use of fuzzy sets will have a profound influence. They will allow the formulation of problems, the selection of information and the creation of conceptual models by using an active natural language. ●

Querying massive databases using natural language concepts

BY EARL COX
and MARTIN GOETZ

Databases are great tools. They let us collect and maintain tons of information. But decision makers trying to sort through this weight of data can often be overwhelmed. Fuzzy logic can ease the process of sorting through public databases such as Value Line, Standard & Poors and the Facts Criminal Justice System database. It also helps qualify a company's central or distributed internal databases, such as personnel, marketing and manufacturing.

Today, selecting the precise set of data based on an almost bewildering population of fields requires a detailed knowledge of query language syntax, Boolean expressions and the underlying domain of each field.

Furthermore, every time a new AND or OR condition is added to the search criteria, it increases the search statement's complexity.

Fuzzy logic data queries will greatly simplify the ability to search and retrieve records from these masses of data. To illustrate this, let's consider a basic corporate acquisition application.

The subject database, patterned after Value Line and Standard & Poors, consists of a list of nine companies, their profit-to-earnings (P/E) ratios, revenue, retained profits, number of products and number of salespeople (see chart above).

Looking to buy a company
XYZ Corp.'s list of potential acquisition candidates

Company A	13.40	$500	7.40%	2	8
Company B	7.49	$570	4.72%	1	9
Company C	18.13	$597	10.22%	9	7
Company D	15.42	$650	6.59%	5	14
Company E	19.12	$800	10.90%	6	9
Company F	13.81	$900	2.80%	17	22
Company G	15.16	$1,000	7.92%	10	16
Company H	15.90	$1,200	8.70%	8	9
Company I	16.02	$1,280	9.00%	5	8

Using this financial database, company XYZ Corp. is searching for acquisition candidates that meet certain operating profiles. Initially, XYZ wants to focus on the companies' revenues and, more specifically, on all companies with at least $600 million in revenue. An XYZ information systems staff member makes the following request: SELECT COMPANY WHERE REVENUE > 600.

This statement, which will slice through the database using crisp boundary points, uses the standard rules of computer language that insist on arbitrary cutoff points. In this case, only companies D through I would appear as potential candidates.

Expressing the query in crisp terms implies that revenue of $600 million is acceptable but revenue of $599 million is not. It is more likely, however, that what was meant was that the closer the revenue of a company is to $600 million, the more interesting it is as an acquisition candidate.

Language building blocks

As we've seen, fuzzy sets offer a means to let us express that concept because they serve as building blocks of linguistic expression and allow us to define a conceptual, rather than precise, definition of our target data.

Suppose, then, we define a fuzzy set called high that is mapped to the revenue stream of the company. This fuzzy set is 0 below $550 million and 1 at $1,400 million (see chart at right). The truth number for each revenue is shown.

IS can use the term "high" to select a broad and imprecisely defined set of possible candidates for acquisition. Such a query can appear as: SELECT COMPANY WHERE REVENUE IS HIGH.

This database query would add companies B and C to the list of potential takeover targets because they are close to the original lower boundary of $600 million in revenue.

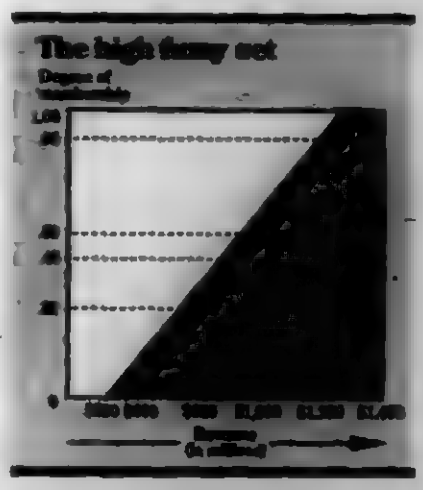
What did using fuzzy sets accomplish? Why couldn't IS just lower its selection criteria for revenue to $500 million, thus including a larger domain of companies?

The answer, of course, is that it could have done that. It could have established a mathematical surface for each of the selection points and adjusted these up and down to include companies that fall near the range.

However, employing such a technique can cause problems. As IS lowers or raises crisp boundary points, it can select too many or too few companies.

For a small set of instances, this is simply bothersome. For an on-line database of many thousands (or even millions) of records, the selected candidates could overwhelm the company's ability to distinguish the best candidates.

Using fuzzy logic, IS will expand the number or records retrieved when it enlarges the set, but these records will come back with truth values. These numbers enable IS to pick those records that come closest to meeting its objectives.



Retrieving a large number of records using traditional computing methods becomes even more troublesome when the selection criteria involves a complete set of expressions connected with AND as well as OR conditions. As an example, IS might say: SELECT COMPANIES WHERE REVENUE > 550 AND PE.-RATIO > 16.

We now have compound selection criteria that must determine which selected companies are valid candidates, chosen because they match two criteria.

But what if we make the selection criteria match only one of the two criteria, such as: SELECT COMPANIES WHERE REVENUE > 500 OR PE.RATIO > 16?

Here we have further complicated our ability to rank the selected companies according to their viability as candidates because the normal selection criteria operates at crisp boundary points using discrete Boolean algebra.

Again, we could lower the acceptable P/E ratio to encompass more companies, but this would simply expand our selected set of companies without grading or ranking them according to their viability as candidates.

Fast modification

By using fuzzy sets, linguistic variables help us to quantify our requirements in more general terms and allow us to quickly modify the selection in a vocabulary space rather than in an expression space.

Fuzzy logic offers us a method to reduce this decision complexity. Users can interrogate the underlying database through natural language concepts.

The computational logic that is involved in decision-making is dramatically simplified because a single fuzzy set can represent a rather large amount of arithmetic qualifications. •

Information central

Products

The U.S. has had a slow start in getting off the blocks with fuzzy logic-related products. For their part, the Japanese have already incorporated fuzzy logic techniques in microprocessors used in Camcorders, televisions, elevators, subway car control systems and other everyday devices.

However, the U.S. is not without its own fuzzy logic tool vendors:

- Cubicalc, Hyperlogic Corp. (Escondido, Calif.): Tool for fuzzy systems development that runs under Microsoft Corp.'s Windows.
- Guru, Micro Data Base Systems, Inc. (Lafayette, Ind.): Expert systems shell with fuzzy logic capabilities offering spreadsheet and database interfaces.
- Tabus, Knowledge Based Technologies, Inc. (White Plains, N.Y.): Originally developed as a full mainframe expert systems shell, it now offers fuzzy computational power.
- Tilshell, Tongai Infralogic, Inc. (Irvine, Calif.): Tool for creating fuzzy expert systems. Firm also supplies Fuzzy-C Development System, which enables creation of C runtimes of fuzzy set applications.

Contacts

Here is a contact list for more information or reading on fuzzy logic systems:

Fuzzy Sets and Systems
North-Holland Publishing
New York
(212) 989-5940

IEEE Neural Networks Council
First International Conference on Fuzzy Systems
March 1992, San Diego
Organizing Chair: Jim Bezdek
University of West Florida
Pensacola, Fla.
(904) 474-2784

International Journal of Approximate Reasoning
Elsevier Science Publishers Ltd.
New York
(212) 989-5800

North American Fuzzy Information Processing Society
Secretary: Brian Schott
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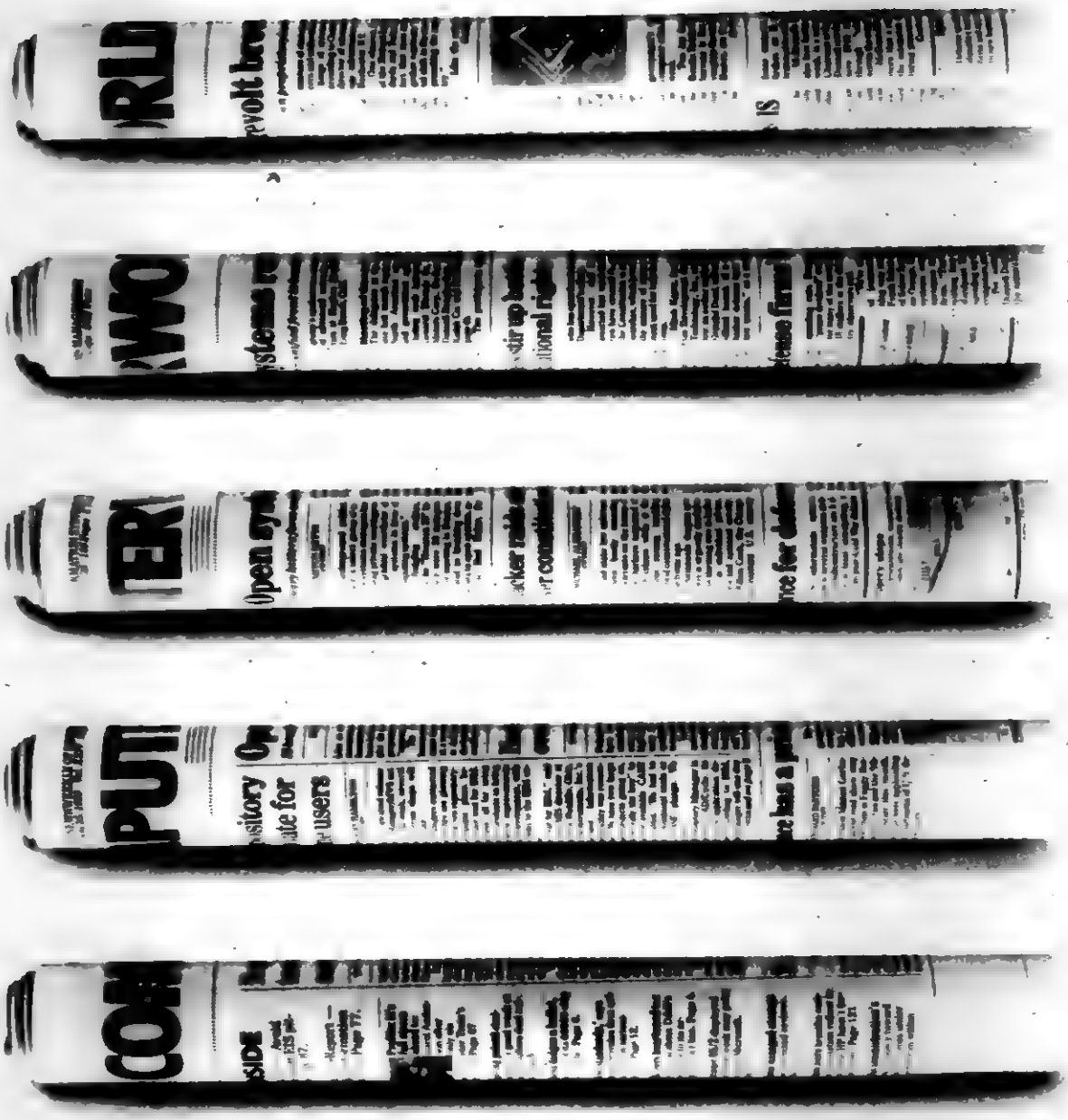
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   - 50. Business Service (except DP)
   - 60. Government - State/Federal/Local
   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Retailer
   - 75. User Other _____
   - 95. Vendor Other _____

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   - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt. Dir./Mgr. PC Resources
   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs. Supry. of Programming, Software Dev.
   - 32. Programmers, Software Developers
   - 60. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President, Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales & Mktg. Management

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NATIONAL BRIEFS

Count us back in

▶ "It has always been [our] objective to recapitalize outside of Chapter 11," **Concurrent Computer Corp.** Chief Executive Officer Denis Brown said. Last week, the struggling real-time systems vendor took a quantum leap toward that objective. The terms of a multipart debt restructuring plan that passed muster with the company, its bankers and its bondholders not only saves the firm a big chunk of money but triggers the bondholders' promise to withdraw the involuntary bankruptcy petition they filed earlier this year.

And while you're at it . . .

▶ **Datapoint Corp.** late last month reported a $1 million net profit for its second quarter, ended Jan. 26 — a striking contrast to the $9.4 million net loss posted by the network systems products vendor in last year's corresponding period. Revenue for the quarter increased 3% to $69 million. The black ink helps position Datapoint for a planned expansion into open systems, President John Harrison said.

Bagging a big E

▶ Shape up or ship out, says the old saw, but at **Octocom Systems, Inc.**, the idea seems to be ship out and shape up. Last week, the *Wilmington, Mass.*-based networking products vendor won the **President's "E" award** — an honor given by the president of the United States to firms that have distinguished themselves in exporting. According to Octocom CEO Ian Davison, the firm is no bandwagon rider. Rather, he said, it hopped on the global expansion trend seven years ago and is now doing more than 80% of its business in about 60 countries.

Closer to home

▶ **Unisys Corp.** Executive Vice President **Cyril Yansouni**, former president of the Unisys Computer Systems Products Group, cited personal reasons — including a wish to stop commuting between his Palo Alto, Calif., home and his office in Blue Bell, Pa. — for his departure from the firm, effective March 1. Yansouni, who was responsible for long-range product marketing plans, moves to the post of CEO of Milpitas, Calif.-based disk drive component maker **Read-Rite Corp.**

IPL snaps back from the brink

BY MARYFRAN JOHNSON
CW STAFF

WALTHAM, Mass. — IPL Systems, Inc. knows what it feels like to play David to IBM's Goliath but lose the game.

Yet during the past few years, the company has managed its reincarnation by shifting its core business from plug-compatible mainframes to a lucrative niche providing tape, memory and storage products for IBM midrange computers.

A company whose stock once spiraled down to ¾ of a point has rebounded into the high 20s on Wall Street, boasting a series of new distribution agreements and products, $16 million in back orders and plans to increase its staff of 118 by 50% this year.

"We understand the power of IBM, but we're not sufficiently big enough to be any disturbance to them," said Robert Norton, IPL's president and chief executive officer.

Found its niche

Today, IPL designs and does final parts assembly and testing on a range of data storage subsystems and add-in memory products for IBM System/36s, System/38s, Application System/400s and 4381s. Its latest products, introduced last fall, are the 7636 1.8G-byte disk array and the 6850 series of 8mm cartridge tape drives.

IPL nearly doubled its 1989 revenue of $14.7 million to $28.7 million this past year, reflecting in part its entrance into the midrange storage market with the 7636 disk array. The firm expects to ship more than 1,000 arrays this quarter, Norton said.

Founded in 1973, IPL built itself into a minor-league contender in the low end of the plug-compatible mainframe market. It sold about 400 of its 4400 series mainframes and shipped the last systems in 1988.

By 1985, however, the firm was hemorrhaging financially as fierce price wars between IBM and the major Japanese mainframe contenders squashed the smaller mainframe vendors. From a height of 270 employees and $17 million in sales, IPL plunged to 19 employees and losses of $11 million.

"We effected our turnaround by trimming the staff and using the last sales of [the 4400 series] as a cash cow to invest in storage technology," Norton explained. "We wanted to stay in the IBM marketplace because we understood that architecture."

Stephen Ippolito, company founder and chief engineer, said customers willing to risk IBM's ire by buying from third-party vendors are looking for three attributes: "super reliability, increased density and lower cost per megabyte.

"In tape systems, more and more users are going to unattended backup or lights-out operations," Ippolito said. "Automated tape libraries are another technology we're looking at."

To boost its service and support capabilities, IPL struck an agreement in December with Bull HN Information Systems, Inc. Although IPL equipment does not run on Bull machines, the Bull field representatives will be servicing those storage and tape subsystems. Industry analysts said such a move makes eminent sense for a company whose distribution network is crucial to its success.

Understanding what third-party distributors want was another key to IPL's hearty recovery, according to Norton. "We have no end-user sales organization to compete with their channels."

For IPL's biggest competitor, however, that lack of a direct sales force is seen more as a curse than a blessing.

"If you can't fix it, feature it," scoffed Mike Egan, vice president of EMC Corp. in Hopkinton, Mass., the market leader in third-party IBM storage vendors. "We sell through both our own sales force and through distributors, and we can price our products as effectively as IPL."

Future in storage

Yet Egan acknowledged that IPL has both a broader product line and a definite edge because its disk array products are built around IBM drives. "There is a certain percentage of customers who won't buy anything but IBM, and going in with a drive made by IBM increases your chances of getting them to buy from you," Egan said.

"IPL is a pretty focused company, but they are fairly small in the grand scheme of things," said Bill Sines, director of midrange systems at Technology Investment Strategies Corp. in Framingham, Mass.

Sines said the firm has rounded out its tape offerings with the first 8mm helical-scan tape products for the AS/400. "Their disk offering is still a little sparse, but the price/performance of the 7636 [disk array] is attracting a lot of attention," he added.

A natural next step for IPL, Sines said, would be a move into open systems products.

"The problem there is that IPL will be competing with some heavy-duty players in established technology. A move into open systems will reduce profit margins but opens up a larger market down the road," Sines said.

Recovering nicely

Shifting its emphasis from the mainframe business to peripheral equipment has helped IPL Systems climb out of the $2 million hole it was in five [illegible] ago.



	Revenue*	Net income (loss)*
[illegible]	$28,708	$5,501
[illegible]	$14,682	$2,341
[illegible]	$8,559	$1,604
[illegible]	$5,406	$1,739
[illegible]	$2,557	($883)
[illegible]	$2,446	($2,[illegible])

*In thousands

Source: IPL Systems CW Chart: Doreen St. John

Software group gets bitten by the quality bug

BY NELL MARGOLIS
CW STAFF

ARLINGTON, Va. — Software industry association Adapso planted its flag in the burgeoning total quality management movement late last month with the announcement of its first annual quality awards program.

Inspired by and based on the qualification procedures of the U.S. Department of Commerce's Malcolm Baldrige National Quality Award program, the Adapso awards will recognize top software and service performers not only in a "total quality" category but also in a more discrete "functional quality" category that rewards standout achievement in such frequently overlooked categories as customer support, documentation and training, according to Adapso.

"With all the attention that the Baldrige is getting and all the money that is being spent on it, we feel that fewer and fewer software and service companies will take it on — it's just too formidable," said Triad Systems Corp. Chief Executive Officer Jim Porter, chairman of Adapso's Quality Management Committee.



Baldrige competition, said Porter — whose company has been through it — offers entrants the benefits of rigorous quality management audits. The judges' anonymous written critiques alone, he said, made the experience well worthwhile.

Such discipline, Porter said, could benefit the software industry and the users who need reliable software products and services. Owing to an artisan-like mystique that has traditionally characterized the field, he said, "software development may be one of the last frontiers of quality. That has to change."

The Adapso awards, he said, are being offered as an equally rigorous but more broadly defined alternative. They are aimed at spurring firms toward improved products and processes and recognizing superior achievement without making the entrants "feel that they have to compete with Cadillac and IBM to win," he added. General Motors Corp.'s Cadillac division and IBM's Rochester, Minn., manufacturing operation are recent Baldrige winners.

To encourage more companies to take part, said consultant and Adapso committee member Burton Grad, who was active in spearheading the effort, separate awards will be made to large ($20 million or more in annual revenue) and small firms.

Because of budgetary constraints, Porter said, competition for the first Adapso awards, which will be presented the first week in November, is limited to members of Adapso's Software Industry and Vertical Application & Remarketers divisions; in subsequent years, all Adapso members will be eligible.

Will an entry restriction to dues-paying members invite cynics to speculate that Adapso is trying to raise revenue as well as standards? "Yes," Grad conceded. However, he said, the restriction was created to inspire team spirit in the software sector. "We want to preclude lone wolf developers."

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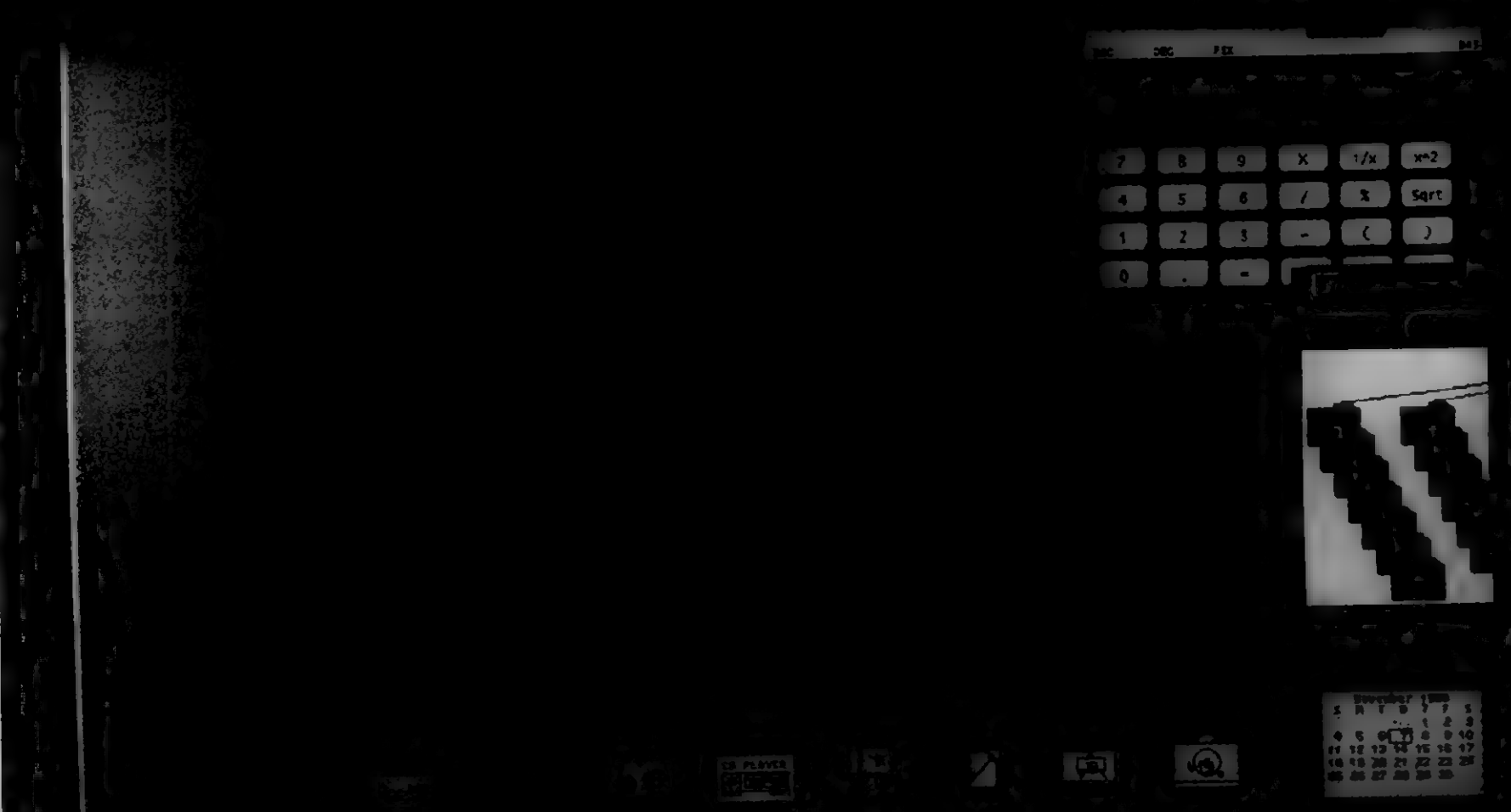
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INTERNATIONAL BRIEFS

And so it goes

▶ The European Community ministers approved a $646 million research and development program last week for future communication technologies. Slated to run through 1994, the program will divide spending among eight research areas — but not evenly. Winning almost one quarter each of the funds are experiments in advanced communications ($162 million) and research into integrated broadband communications ($148 million).

Let's get closer

▶ Advanced Logic Research, Inc. (ALR) has come up with a straightforward strategy for moving closer to its European customers: It is moving closer to its European customers. Next month, the Irvine, Calif.-based personal computer maker will open a wholly owned subsidiary in Frankfurt — a move aimed at immediately upping ALR's service and eventually boosting the firm to first-tier status in the European market, an ALR executive said.

State of alliance

▶ What do the state of Israel and the state of Massachusetts have in common? Plenty, according to the business and government leaders who put together the recently announced New England-Israel Joint Business Alliance Project. Pivoted on a database of companies actively seeking international joint venture partners, the Alliance Project will promote commercial cooperation between the Middle Eastern region and the New England region, led by Massachusetts — which, like Israel, can leverage a strong technology base and a proliferation of prestigious educational institutions. Just for starters, Israel has pledged to cut through red tape for its New England partners, offering government approval within 12 days to joint ventures emerging from the alliance.

Better safe than sorry

▶ Taiwan is in the chips — but apparently not as far in as it would like to be. According to a recent report in the Taiwanese press, Minister of Economic Affairs Vincent Siew will visit Intel Corp.'s Santa Clara, Calif.-based headquarters next month to ask for larger supplies of the firm's 80386 and 80386SX chip sets. Taiwan is one of Intel's top customers for the 386 and 386SX processor, but bottlenecks have created a scarcity of the chips in Taiwan in the past.

Tech focus wins big at small firm

Task forces devote time to technology areas important to business

BY GARY H. ANTHES
CW STAFF

SILVER SPRING, Md. — Every week, newspapers in the Washington, D.C., area print a list of companies that have won government contracts for computer systems work. The list is a familiar one, filled with names such as IBM, Electronic Data Systems Corp., Computer Sciences Corp. and Orkand Corp.

Orkand Corp.?

Privately held Orkand, with revenue this year nearing $38 million, is not yet in a league with the systems integration behemoths, but the company has managed to sidestep both the recession and the federal government's budget cuts. During the past six months, the information systems and consulting firm wrote $90 million in new orders, bringing its backlog to $100 million.

The company's success is not a recent phenomenon; Orkand's sales have been growing steadily, more than tripling since 1987, when it sold $12 million in professional services.

What's the secret?

If you ask President and founder Donald S. Orkand the secret of his success, you will get an answer that could come from the annual report of any firm in the land. He will tell you about cost-conscious management, putting the customer first and treating employees well.

However, a closer look reveals that Orkand has put in place two unusual mechanisms for ensuring that the small company gets the most out of worthwhile new technologies while avoiding the fads he said sometimes distract his competitors.

First, at any given time, the firm has from eight to 12 task forces devoted to areas of technology that are, or may be, important to Orkand's business. Anywhere from three to 15 employees serve on each task force, devoting eight to 10 man-years each year to topics such as database technology, operating systems, computer-aided software engineering (CASE), geographic IS, image management and internetworking.

Survival tactic

The task forces led to the company's early and profitable entry into desktop publishing, Unix and microcomputing, which Orkand said was deemed a "survival issue." On the other hand, task force efforts have led Orkand to conclude that it is too early to make major investments in artificial intelligence, parallel processing and the Ada programming language. "We revisit those [alternatives] each year," he said.

The groups were established to advise management about which technologies are needed to support existing and future clients. However, they have evolved into internal think tanks — pockets of expertise that help out with training, marketing and project work, Orkand said. They also have direct input into the company's five-year plan, which is built around an annually updated matrix that relates potential clients and technologies.

"My sense is that some companies focus too much on fads. We're trying to get underneath all the hand waving. Some say CASE is a panacea; some say it's just hype," Orkand said. "Some [CASE tools] are useful, and some are not. We want to see what works and what doesn't and see how to use it."

High-tech ideas

Orkand complements the task forces with a five-person advisory board made up of senior technology managers from outside the company. Like a board of directors, the technology board is paid for its services, but according to Orkand, the members serve more for the satisfaction of seeing their ideas implemented and out of a sense of loyalty to Uncle Sam, for whom most have worked.

The technology board meets quarterly and has frequent informal contact with Orkand managers and the task forces, Orkand said.

He added that he hopes to take the firm public within four or five years. If he does, however, he will not combine the board of directors and the technology advisory board. "You don't want people like this reviewing pension plans," Orkand said.

Orkand recently held its Second Annual Technology Fair, an all-day Saturday program of short presentations given by each of the task forces, bisected by a buffet lunch and a keynote address by one of the technology board members.

No small potatoes

Orkand's unorthodox means are leading to some rewarding ends, as this sampler of recent contract wins demonstrates:

- **U.S. Department of Energy, Energy Administration:** $27 million for systems support services to support activities in the Persian Gulf.
- **The National Cancer Institute:** $4.5 million to provide data processing support for collection of clinical trials data.
- **U.S. Postal Service:** $13 million to support address management systems at the Memphis National Address Information Center.
- **U.S. Department of Housing and Urban Development:** $6 million to support new and existing systems to track housing discrimination complaints.



Orkand's Orkand gets the most out of new technologies

Zenith sells shares, contests proxy

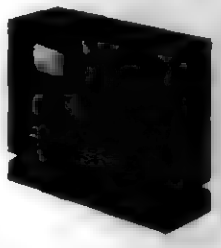
BY ELLIS BOOKER
CW STAFF

GLENVIEW, Ill. — Zenith Electronics Corp. established a strategic partnership with Goldstar Co. late last month, selling 1.45 million shares of company stock to the Korean electronics giant for $15 million.

Zenith officials called the deal a "strong endorsement" of the company's high-definition television (HDTV) strategy, in which it has invested heavily, and said additional licensing and technology arrangements with Goldstar would be a vehicle for overseas business.

However, Zenith's largest shareholder, Nycor, Inc., blasted the stock sale as a defensive tactic designed to dilute its own position in Zenith and block its effort to replace three members of Zenith's 10-person board.

Peapack, N.J.-based Nycor, which holds an approximate 7.6% stake in Zenith with 2.2 million shares, has waged the proxy battle for the board seats since late last year. It has asked shareholders not to vote for Zenith Chairman Jerry Pearlman and two other incumbents at the upcoming annual meeting next month.



"I completely agree with Zenith that there are plenty of good business reasons for the Goldstar agreement," said David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago.

Still, the timing and details of the deal conveniently serve to weaken Nycor's hand, Schofield said. Nycor, he added, will have a tough fight to elect its candidates to the Zenith board, given that its stake in Zenith has slipped to 7.6% and its proxy fight does not include a cash tender offer.

Meanwhile, Zenith fights its balance sheet. The company recently reported a fourth-quarter loss of $25.5 million, for an overall loss of $52.3 million in 1990. Zenith has lost money in five of the last six years. In 1989, it sold its Data Systems unit to France's Groupe Bull for $511.4 million.

In addition to the stock sale, Zenith and Goldstar signed licensing and technology agreements for Zenith's flat tension monitor color picture tube. The agreement does not include flat tension monitor technology for computer displays, however. A separate agreement calls for Goldstar to promote the adoption of an HDTV broadcast standard that supports Zenith's Digital Spectrum Compatible approach.

Both the stock and technology agreements are being reviewed by the Korean government, Zenith said, adding that Goldstar had indicated that this regulatory approval should be completed in the spring.

Turning bad news into a good job

Being prepared for a layoff can make all the difference when the ax falls

BY ALICE LAPLANTE
SPECIAL TO CW

When it became apparent that there would be layoffs at Balcor Co., a Chicago real estate management firm, Stuart Bard, then-vice president for office automation, immediately began contacting his network of friends, former employees and information systems colleagues at other organizations to find out about prospective jobs at other area firms.

"My wife and I were expecting a baby, so I didn't want to make a sudden change," says Bard, who is now a director of the consulting division of Blackman Kallick, a Chicago accounting firm.

Bard waited and planned, and when the expected layoff came, he was prepared. He negotiated a termination package that included severance pay, continued insurance for a limited time and outplacement services provided by a third-party firm. He then began his search for a job, a process that took him two and a half months.

Bard used that time to re-evaluate his past accomplishments and to think about where he wanted to take his career. The result? He is now a consultant specializing in work re-engineering — an exciting new twist to his career. He advises organizations about how they can use technology as an "agent of change."

"What was a negative circumstance turned out to be positive for my career," Bard says.

Be prepared

Turning a bad situation into a good one often takes extra research and preparation. In times of layoffs, it can mean the difference between suddenly being out of a job without any prospects or being ready for the next career step.



Experts say there usually are signs when a layoff is imminent:

- Sales are decreasing, and target revenues for the month, quarter and year have not been met.
- Plans are made to consolidate operations and to close remote data centers, warehouses or branch offices.
- A hiring freeze is imposed on new positions, and jobs that become vacant through attrition remain unfilled.
- Managers appear worried and spend a lot of time in closed-door meetings with superiors.

There are things an IS professional can — and should — do if these signs appear. Indeed, many people believe a continuous "reality check" into the job market is something all IS employees should do no matter how secure their jobs appear to be.

"The occasional interview should go on all the time," says Pete Bradshaw, president of Organization Consultants, Inc. in Charlotte, N.C., a consulting firm specializing in human resources and personnel issues. "You need to keep your interviewing skills sharp and maintain an accurate assessment of the current market. There is no way to do that except practice."

During a downturn, the jobs at stake tend to be outside the mainstream of a firm's business, experts say. "Support jobs, staff roles or administrative positions tend to go first," says Andrew G. Spohn, president of A. G. Spohn and Associates, a management consulting firm in Summit, N.J. But this kind of thinking can be shortsighted: If things get really bad, core business positions will also get eliminated. Moreover, even if you survive an initial cut, the first wave of layoffs is often not the last. "You can survive one only to get caught the next time around," Bradshaw says.

The best thing to do in troubled times, experts say — even if you are quietly looking elsewhere for opportunities — is to appear committed to your job and your organization. "This is clearly not a time to go raising issues or complaints," Bradshaw says. "It is a time to demonstrate commitment, loyalty and productivity."

Important moment

If the worst happens and you are laid off, it is important to stay calm and ask right then and there for the best possible termination package.

> "FRANKLY, THE BEST TIME to negotiate is often the hardest time: the very moment when you are being laid off."
>
> SUSAN GOULD
> GOULD AND ASSOCIATES

"Frankly, the best time to negotiate is often the hardest time: the very moment when you are being laid off," says Susan Gould, president of Gould and Associates, a Palo Alto, Calif.-based outplacement firm. "That is the time to remind your employer what you've done for the company and what they should do for you."

The following are some questions to ask during a termination interview:

- How much will my severance pay be?
- Will I still receive health benefits? If so, how long will they be continued?
- What happens to pension, stock options, profit sharing and other nonsalary compensation accumulated during years of employment?
- Will outplacement or counseling services be provided free?
- Is my boss willing to write a letter of recommendation or provide contacts for my job search?

"These [severance benefits] are not etched in stone and very often can be improved with negotiation," Bradshaw says. "And get that recommendation before you walk out the door." There is nothing wrong with asking colleagues remaining at the firm for help in your job search, Bradshaw adds.

Asking for a longer period of insurance coverage, a higher amount of settlement cash or the help of an outplacement firm are just a few of the things that can be negotiated.

Above all, get the termination agreement in writing, Spohn and others say. "The termination interview is a very emotional and poignant conversation, and no one remembers exactly what they said or heard," he says.

LaPlante is a free-lance writer based in Palo Alto, Calif.

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ITHACA COLLEGE

Director: Office of Information Technology

The Office of Information Technology (OIT) provides computing and communications services to the entire campus community comprised of 1300 faculty and staff, and a student population of approximately 6,400. The Office currently operates a Unisys mainframe for administrative computing with plans to migrate all applications to a Digital Equipment Corporation VAX cluster over the next few years. Several VAX computers are already in use providing computing services for administrative development, office automation and central academic computing. OIT provides campus data communications services through a variety of media, including an ethernet extended LAN, as well as providing all campus telephone service through an AT&T System 85 PBX.

The Director, Office of Information Technology reports to the Vice President for Business and Administration Affairs. The Director has overall responsibility for academic and non academic computing and communication services and directly supervises the offices of Academic Computing Services, Administrative Systems Development, Technical Support Services and Operations.

While a Master's degree is preferred, candidates must have a Bachelor's degree and at least ten years of progressive management experience in computing and communications, preferably in an academic setting. Applicants must demonstrate a broad based knowledge of computers, their application, and their support requirements, as well as a working knowledge of state-of-the-art telephone systems and service offerings. Strong interpersonal skills and the ability to communicate well, both verbally and in writing, are essential.

Position is available mid to late summer 1991. A letter of application including salary requirements and a current resume should be addressed to:

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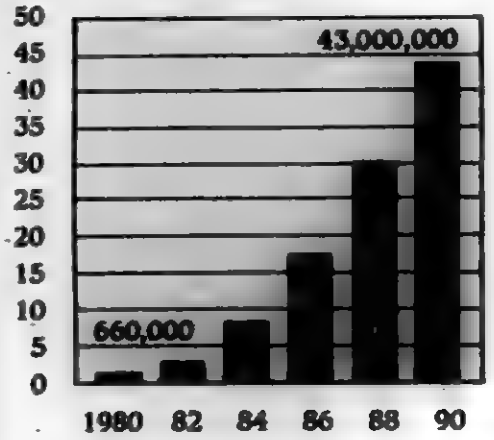
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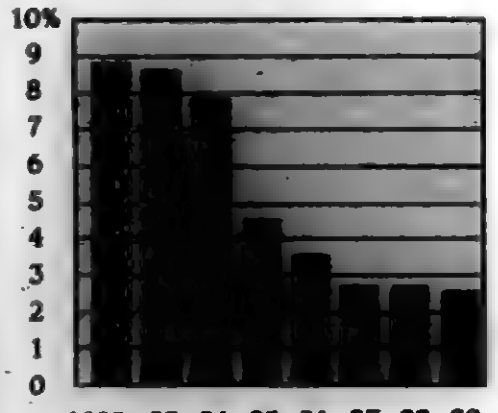
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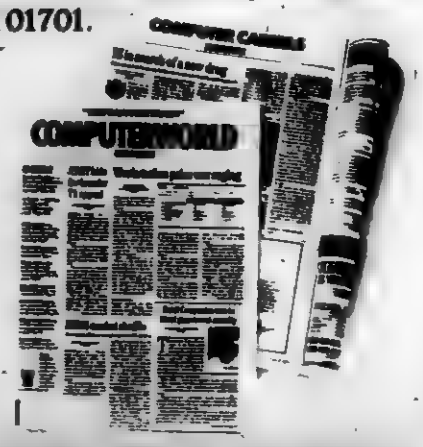
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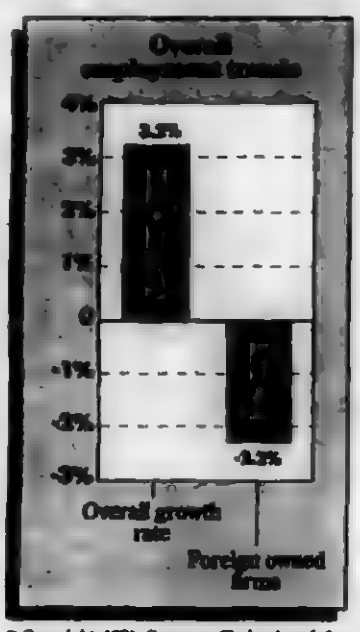
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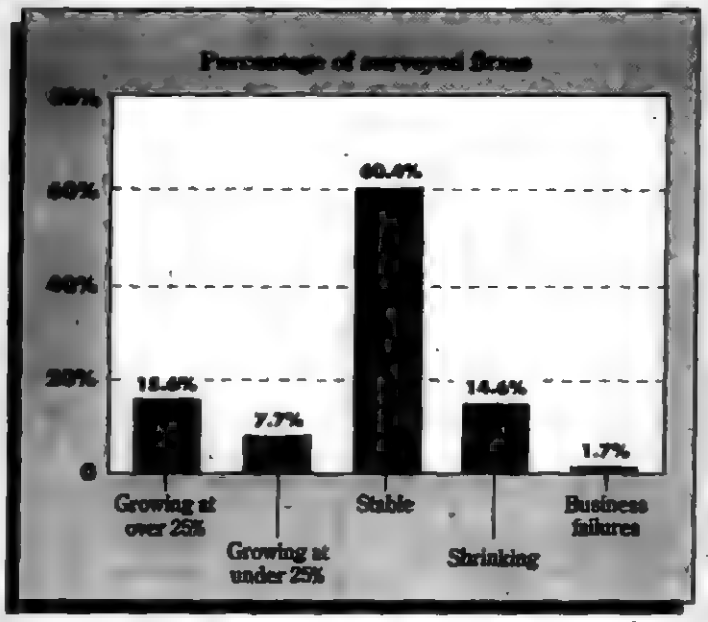
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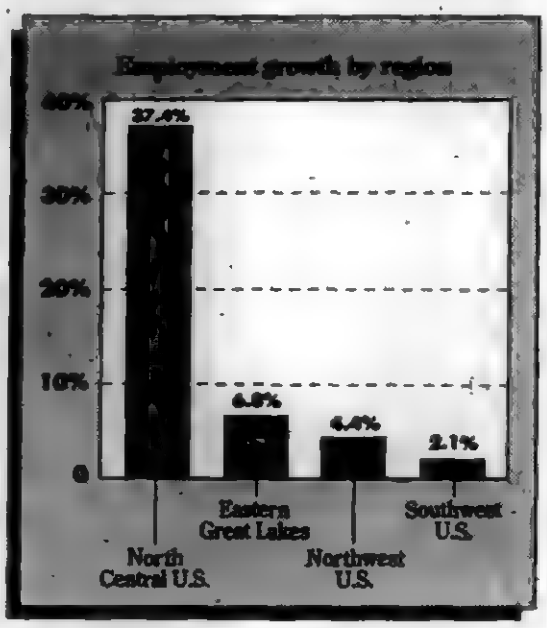
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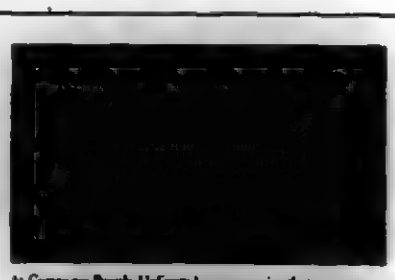
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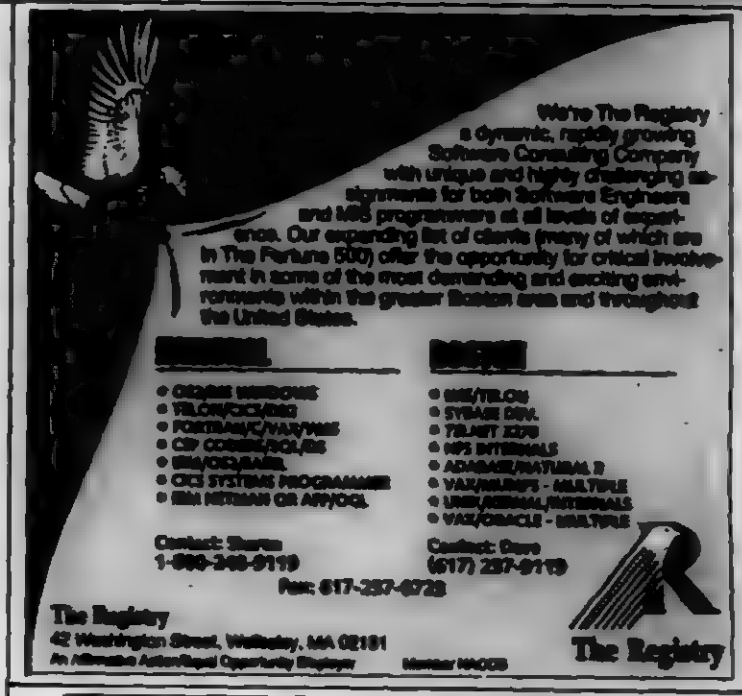
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How to buy used PCs without getting ripped off

BY ALICE RANDALL
SPECIAL TO CW

Information systems buyers eyeing new personal computers and engineering workstations shouldn't overlook the used computer market. With hundreds of rungs on the computing ladder, chances are good that the systems of their dreams are someone else's throwaways.

Hunting in the used market holds distinct advantages, not the least of which is money in the bank: New computers lose as much as 40% of their purchase price once buyers open the box.

Used computers are also an attractive option because they're tested tools. If they've been through their warranty, then questionable components have most likely already failed and been fixed.

Furthermore, used computer buyers get the *first owner's* labor for free: The first-time owner spends a lot of time configuring the systems, preparing the hard disks, buying necessary peripherals and getting the systems working — a real advantage for the second buyer.

But make no mistake: IS buyers must proceed with caution to avoid the worst dangers in the used computer market.

• **Know what you want before you shop.** *If buyers don't* have specific systems and configurations in mind, they can easily purchase the wrong system. The variety of the new computer market is amplified one hundredfold in the used market. Not only are there *fairly new models for* sale, there are also discontinued models and relics of earlier eras.

• **Conduct thorough research.** Used computer buyers are frequently guilty of insufficient price research. Buyers shouldn't rely on quick perusals of newspaper want ads or industry magazine advertisements; they'll only end up paying more. Instead, they should check a variety of sources, such as retail computer vendors that take trade-ins and computer brokers, before making purchases.

Furthermore, while the wrong system can be a pitfall, the right system at the wrong price can be worse. *No used system* should sell for more than its equivalent new system.

Staying on top of prices is a big job, so every buyer should have the systems they intend to buy professionally appraised before the purchase is sealed. An appraiser can also give buyers a firm idea of the value of their current equipment, making it easier to decide whether to keep or sell.

• **Test all systems prior to purchase.** *Buyers should never* make a purchase without some financial recourse. The best way to do this is through the services of a used computer broker or by purchasing from a used computer store. A professional broker will hold a buyer's funds in escrow until the systems are tested.



Buyers should also check the reliability of their used computer source, and they should make sure that an inoperable system can be returned.

• **Watch for "reconditioned" equipment.** If a buyer is purchasing reconditioned equipment, he should find out what the vendor actually did to recondition the machines. All too often, reconditioned means the machines only had their exteriors wiped clean. Full reconditioning means key caps have been removed and cleaned, hard drives have been reformatted, floppies have been realigned and cleaned, interior components have been cleaned and tested and marginal components have been replaced.

• **Don't be fooled by warranties on used systems.** Most computer equipment that works when it arrives will operate without a problem for many more months than a warranty covers. A test on arrival is worth more than a 30-day warranty. Moreover, most warranties on used gear are depot warranties rather than *on-site* service contracts. This means that if a buyer's machine goes down, it will be out of service longer than if it was fixed on-site. If your used computer is performing a critical task, you should maintain redundant systems and keep a service contract on them for the long term. This is the best place to spend the money saved by purchasing used systems: Buy additional used systems beyond what is needed to give the IS department 100% backup.

• **Guard against certain system purchases.** For example, avoid systems that are no longer attracting software developers' interest. Antiques from the early 1970s with old operating systems are not desirable. Buyers can snap them up for small change, but they will find very few new pieces of software for these machines, and they will not save any money in the long run.

Also, buyers should avoid selecting a system that has been used in a smoke-filled environment or an industrial setting. *Dust and smoke are hard on computers*, and if the systems were not "ruggedized," they may have been damaged by the exposure. The same is true for computers that have been used in high temperatures or damp settings.

• **Beware of "hot" computers.** When buyers purchase computers in volume or from reputable computer traders, they run little risk of receiving computers with deficient titles. However, if a buyer is purchasing only one or two or is buying through newspaper want ads, he may unwittingly receive a stolen machine: Computers are small, valuable and easily moved: ideal material for petty criminals.

• **Think long term.** *Computers* are like baby clothes — companies will outgrow them before they wear out. Buyers should select quality goods with well-known brand names that will hold their value, and they should keep all boxes, pieces and manuals. When it's time to sell, the next owner will pay more for a complete system than a system that's missing the details.

Randall is the author of Alice Randall's Used Computer Handbook and is president of the Boston Computer Exchange.

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The BoCoEx index on used computers
Closing prices report for the week ending March 1, 1991

	Closing price	Recent high	Recent low
IBM PC Model 176	$300	$450	$200
XT Model 086	$500	$550	$450
XT Model 089	$500	$625	$400
AT Model 099	$650	$775	$500
AT Model 239	$750	$925	$700
AT Model 339	$925	$1,000	$900
PS/2 Model 30-286	$1,200	$1,300	$1,000
PS/2 Model 60	$1,400	$1,700	$1,300
PS/2 Model 70P	$3,300	$3,500	$2,500
Compaq Portable II	$900	$1,060	$675
Portable 286	$1,100	$1,350	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$2,200	$2,500	$1,900
Deskpro 286	$900	$1,000	$700
Deskpro 386/20	$2,850	$3,000	$2,300
Apple Macintosh Plus	$750	$975	$700
SE	$1,150	$1,350	$1,100
II	$2,600	$2,800	$2,400
IIFX	$6,300	$6,500	$6,200

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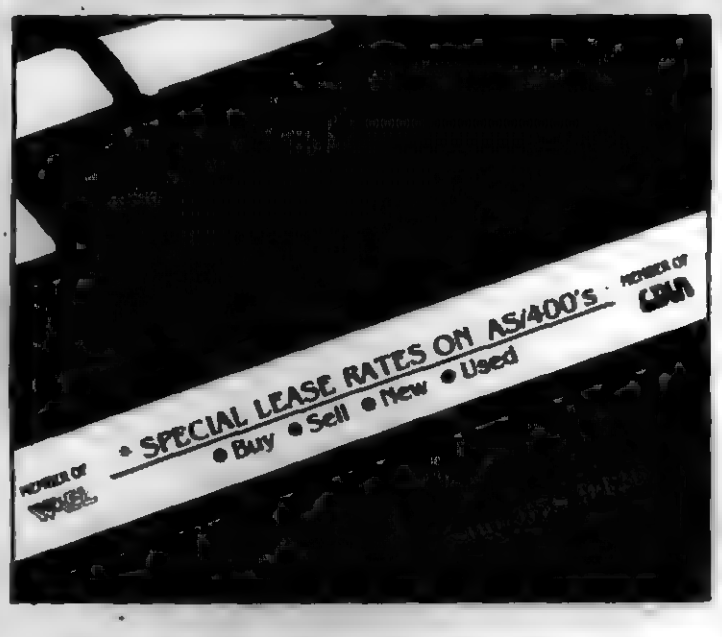
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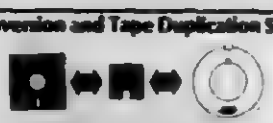
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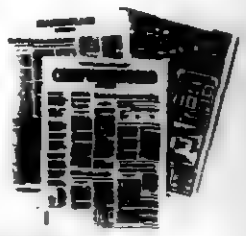
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Getting your education at vendor 'universities'

BY KATIE CRANE
SPECIAL TO CW

In the 1980s, Roger Angell, director of technical support and end-user computing at Hawaiian Electric Co., felt isolated and alone in his quest for quality training. He could rarely authorize travel to the mainland for training because of the costs, and the chances were just as slim that he could find local technical training companies for his systems and applications programmers.

Today, Angell's problem is shared by many information systems managers. Companies that once didn't blink an eye at sending someone far away for training are cutting travel and training budgets. Budget limitations are also causing managers to demand more for their training dollar: greater flexibility, increased frequency, broader course offerings and classes closer to home.

Some of the most accessible training courses to meet these requirements are being offered by product vendors. While there are pros and cons to relying on vendor-sponsored training, many managers view the programs favorably because of their content and flexibility.

Companies such as IBM, Microsoft Corp., On-Line Software International and Amdahl Corp. not only offer a full range of courses through their traditional brick and mortar "universities" — separate locations designated for education and training — but they are extending the university concept: adding regional training centers, increasing the frequency of in-house course offerings and creating alliances with key users and local colleges, using them as host sites for public courses.



For example, this year, Hawaiian Electric will host seven public courses, mostly in CICS, offered by On-Line Software, which provides training for both IBM and On-Line Software products. Angell speculates that vendors are intensifying and broadening their training offerings. "They're re-examining the relationship between training as a marketing tool and training as a revenue producer in its own right," he says.

"It's a fine line," acknowledges Tina Podlodowski, general manager at Microsoft University in Bellevue, Wash. Because Microsoft University is a separate profit center, Podlodowski says, "Our training supports the sale of systems products, but it also needs to stand alone as a viable training company." At Amdahl, IBM and On-Line Software, training is also a separate business.

However, vendors say their commitment to training goes deeper than revenue-building: They have to support their users, and right now, users want their vendors to be flexible and accommodating.

Whatever the reason, hundreds of thousands of students cycle through vendor training each year. While many users acknowledge that such training could be a sales platform for vendors, most agree that this has not been the case. Because of the arm's length relationship between training groups and salespeople, sales pitches are less likely to interfere with instruction.

There are few alternatives to vendor-sponsored training. For many users, developing such courses in-house would be prohibitively expensive, especially if there are only a few people to train each year. In addition, skills-specific technical courses in local colleges have always been difficult to find. Even where such courses do exist, few offer the most current (sometimes not yet public) information about new releases and technology.

All of the major vendors offer courses delivered in-house or customized courses designed to meet a company's specific needs. Many license their most popular courses to other trainers, resellers or directly to their users. Some, such as IBM, will go so far as to help their users develop their own course curriculum.

User-friendly

Convenience was the driving force behind Felix Santella's decision to pick software vendor On-Line Software to conduct his company's training. Santella, a senior systems manager of data management at Commerce Clearing House-Legal Information Services in New York, hired On-Line Software to customize several of its standard offerings for his company. He had reviewed several information engineering training programs provided by other vendors, but in the end, he opted to ask On-Line Software to customize their courses so he wouldn't need to send his people to several different classes at different times.

Santella also liked the fact that On-Line Software didn't push any products. In addition, it offered the best price and reacted quickly to his training needs.

Others take a more guarded view of vendor offerings. While Angell is pleased that vendors are now making training more convenient to users, he makes a clear distinction between "vendor" and "third-party" training. Vendor training, such as that from IBM, in which the product developer offers the training, is most effective when a class featuring a new product or new release is taught by someone on the development team who can give insights not yet available through user experience. He specifically remembers attending one such class where the developer/trainer "shared all sorts of stuff that wasn't documented" but was vital to the product's successful implementation.

Angell would be more likely to select third-party training, like most of the IBM training available from Amdahl and On-Line Software, for a product that's been out for a while. He figures that there would be less sales talk and more content, and "we'd hear more about any negative aspects of the product."

Meeting user needs appears to be the impetus that drives vendor training programs today. Vendors find themselves — at their users' requests — continuing to offer more traditional skills training for programmers and support engineers, expanding their offerings to include executive education and end-user training and seeking more innovative ways to serve a varied menu of training and related services to hungry users.

Crane is a free-lance writer based in Norwich, Vt.

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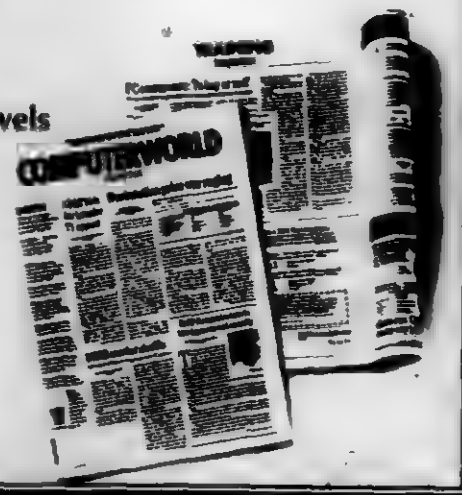
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

UPGRADED FROM HOLD TO BUY: Silicon Graphics, Inc. (Bear, Stearns & Co.). Reason: Strong long-term stock performance despite slight slowdown in U.S. workstation demand.

DOWNGRADED FROM BUY TO HOLD: IBM (Prudential Securities, Inc.). Reason: Entering seasonally weak period when 10% share price drops are not uncommon; flat first-quarter financials predicted.

DOWNGRADED FROM BUY TO ATTRACTIVE: IBM (Paine Webber, Inc.). Reason: Shift in market demand from high-cost mainframes to lower margin microcomputers and workstations will cut into 1991 profits.

DOWNGRADED FROM BUY TO HOLD: Advanced Logic Research, Inc. (Prudential). Reason: Current-quarter profits will likely increase, but earnings per share will slide as U.S. computer market weakens, even in high-growth personal computer sector.

DOWNGRADED FROM BUY TO HOLD: Dell Computer Corp. (Prudential). Reason: Stock is expensive compared with competition; expect price correction to be between $22 and $24.

DOWNGRADED FROM BUY TO HOLD: Compaq Computer Corp. (Prudential). Reason: Softening European market — a big revenue source for the firm — will erode profits during next few quarters.

ANALYSIS IN BRIEF

Although Northern California faces its fifth year of drought, chip production at Silicon Valley firms will likely be unaffected by water rationing programs now in place.

Semiconductor fabrication plants use between 5% and 10% of the entire water supply in the Silicon Valley area, but only one-third of it actually goes toward making chips.

During the past year, individual and industrial Valley residents have been forced to cut water consumption by 20% from 1987's peak levels. Early this month, the Santa Clara Valley Water District will vote on whether to mandate a more stringent water-use reduction plan calling for consumption drops of 30% to 35% from 1987 levels. — *Semiconductor, Prudential, Feb. 26, 1991.*

If February's industry announcements foreshadow events to come, then 1991 could be the year of the alliance.

Last month's most significant event was IBM's teaming up with Novell, Inc. The companies signed a broad licensing and marketing agreement that allows IBM to start reselling almost the entire Novell product line under its own name beginning this month.

Sun Microsystems, Inc. and Hewlett-Packard Co. allied themselves with a pact that could affect Microsoft Corp. Sun and HP will work together to lay down workstation standards in response to the graphical user interface fury caused by Microsoft's Windows 3.0. Also notable, Lotus Development Corp. bought CC:Mail, Inc., the market share leader among electronic mail software makers. — *Computer Software and Services: The Year of the Alliance, Bear, Stearns, March 1, 1991.*

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Major exchanges again pushed higher last week, partly propelled by hyperactive technology stocks. Digital Equipment Corp. shot up 9⅛ points, closing Thursday at $124.
- Apple Computer, Inc. roared 10 points higher to a new apex of 67¼. Late last week, a federal judge threw out two counterclaims asserted by Microsoft Corp. and Hewlett-Packard Co. against Apple in its 3-year-old operating system "look and feel" copyright suit. Microsoft inched up ¼ of a point to 104; HP gained 3⅛ points to 49¾.
- Intel Corp. climbed 4 points to 51¾, while Advanced Micro Devices, Inc. advanced 1⅜ points to 9⅛. Litigation over ownership of the "386" name ended with a ruling that Intel has no exclusive rights to the designation.
- The few losers among computer firms included Cisco Systems, Inc., which dropped 1¼ points to 54¾, and Zilog, Inc., which dipped ¼ of a point to 13⅛.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, MARCH 7, 1991

TOP PERCENT GAINERS

Televideo Systems	100.00
Infotron Systems Corp.	92.97
Allant Computer Sys.	75.00
ASK Computer Sys.	27.45
Unisys Corp.	25.71

TOP PERCENT LOSERS

Microgrid	-16.30
Computer Automation Inc.	-13.49
IPL Systems Inc.	-12.96
General Datacomm Inds.	-11.54
Intrega Corp.	-4.35

TOP DOLLAR GAINERS

Apple Computer Inc.	10.00
Digital Equipment Corp.	9.13
Altus Corp.	8.50
Adobe Systems Inc.	4.88
Knowledgeware Inc.	4.75

TOP DOLLAR LOSERS

Microgrid	-2.75
IPL Systems Inc.	-3.50
Bell Atlantic Corp.	-1.38
American Info Techs Corp.	-1.25
US West Inc.	-0.75

Exch	52-Week High	52-Week Range		March 7 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 6.73**			
OTC	19.00	5.38	3COM Corp.	9.38	0.38	4.17
NYS	66.75	52.50	American Info Techs Corp.	64.75	-1.25	-1.89
NYS	44.13	35.00	AT&T	39.38	0.00	0.00
OTC	0.63	0.06	Ariel Communications Corp.	2.88	-0.13	-4.17
NYS	68.25	39.50	Bell Atlantic Corp.	47.63	-1.38	-2.81
NYS	57.63	46.00	Bellsouth Corp.	52.13	0.38	0.72
OTC	16.25	8.25	Compression Labs Inc.	10.25	2.88	18.70
NYS	40.25	23.38	Comsat Corp.	40.25	1.13	2.88
OTC	4.50	1.75	Data Switch Corp.	4.38	0.38	9.38
NYS	26.75	6.88	Digital Comm. Assoc.	16.38	1.38	8.08
OTC	24.75	12.25	Dynatech Corp.	24.75	2.25	10.00
OTC	12.88	5.50	Fibronics Int'l Inc.	8.13	0.25	3.82
OTC	4.00	1.75	Gandalf Technologies Inc.	2.88	0.13	4.55
NYS	4.50	1.63	General Datacomm Inds.	2.88	-0.38	-11.54
NYS	54.13	33.50	GTE Corp.	52.13	1.00	3.21
OTC	0.75	0.75	Infotron Systems Corp.	1.88	0.81	92.97
NYS	60.88	40.25	ITT Corp.	57.25	1.38	2.46
OTC	44.13	17.88	MCI Communications Corp.	27.50	0.50	1.85
OTC	21.00	2.75	Microcom Inc.	6.00	0.00	0.00
NYS	34.38	4.00	Network Equipment Tech.	7.00	0.75	12.00
OTC	14.63	4.00	Network General	12.75	1.50	13.33
OTC	16.50	8.13	Network Systems Corp.	12.00	0.75	6.67
NYS	31.63	23.13	Northern Telecom Ltd.	31.63	2.25	7.66
OTC	62.00	17.25	Novell Inc.	52.50	3.13	6.38
NYS	69.50	57.00	Nynex Corp.	78.25	1.75	2.35
NYS	47.88	38.25	Pacific Telesis Group	41.88	-0.63	-1.48
ASE	12.75	4.75	Paradyne Corp.	12.63	0.88	5.21
NYS	29.13	8.88	Scientific Atlanta Inc.	15.75	0.75	5.00
NYS	59.50	47.25	Southwestern Bell Corp.	54.13	0.38	0.70
NYS	46.38	30.63	United Telecom	35.63	1.13	4.39
NYS	40.75	32.38	US West Inc.	37.88	-0.75	-1.94
Computer Systems			**Up 10.94**			
OTC	8.75	0.88	Allant Computer Sys.	1.75	0.75	75.00
ASE	18.88	10.00	Amdahl Corp.	16.00	1.25	8.47
OTC	67.25	24.25	Apple Computer Inc.	67.25	10.50	17.47
OTC	13.88	4.25	Archive Corp.	8.75	1.00	12.90
OTC	29.25	7.13	AST Research Inc.	28.00	3.50	14.29
NYS	7.38	3.88	Bolt, Beranek & Newman	8.75	0.13	1.69
NYS	18.88	4.50	Commodore Int'l	17.25	0.38	2.22
NYS	74.25	26.50	Compaq Computer Corp.	71.00	1.75	2.53
OTC	2.63	0.13	Computer Automation Inc.	1.00	-0.13	-13.48
NYS	21.63	8.75	Control Data Corp.	12.75	0.13	0.99
NYS	20.88	8.38	Convex Computer	17.38	0.25	1.46
NYS	51.25	20.00	Cray Research Inc.	42.38	1.13	2.73
NYS	13.38	3.50	Data General Corp.	10.00	1.50	17.65
NYS	3.88	0.75	Datapoint Corp.	2.75	0.38	15.79
OTC	28.88	8.75	Dell Computer Corp.	28.63	1.38	5.46
NYS	86.13	45.50	Digital Equipment Corp.	81.75	9.13	12.58
NYS	26.13	13.75	Harris Corp.	26.25	1.63	6.60
NYS	60.38	24.88	Hewlett Packard Co.	49.75	3.13	6.70
NYS	130.75	99.25	IBM	122.50	3.75	2.91
OTC	14.00	7.75	Information Int'l	8.75	-0.25	-2.78
OTC	25.00	10.38	Intergraph	25.00	2.50	16.28
NYS	3.13	0.00	MAI Systems Corp.	0.94	0.19	25.07
NYS	149.88	114.00	Mitsubishi Electronics	137.50	0.25	0.18
OTC	26.00	9.00	Mentor Graphics Corp.	19.75	0.50	3.00
NYS	98.63	44.50	NCR Corp.	88.00	2.00	2.08
OTC	35.50	11.00	Pyramid Technology	23.13	3.13	15.63
OTC	34.00	8.75	Sequent Computer Sys.	18.75	3.25	20.97
NYS	44.50	18.00	Silicon Graphics	44.50	4.75	11.95
NYS	32.25	14.63	Stratus Computer Inc.	32.25	3.88	13.68
OTC	37.25	15.00	Sun Microsystems Inc.	34.63	2.88	7.72
NYS	30.13	8.88	Tandem Computers Inc.	14.63	1.25	9.35
NYS	38.50	23.50	Tandy Corp.	32.50	2.50	8.33
OTC	25.50	8.75	Teradata	18.25	3.25	21.67
NYS	7.88	1.38	Ultimate Corp.	5.13	0.88	20.59
NYS	17.13	7.75	Unisys Corp.	8.50	1.13	25.71
ASE	6.13	2.00	Wang Labs Inc. (b)	3.38	0.00	0.00
Software and EDP Services			**Up 6.[illegible]**			
OTC	53.00	17.00	Adobe Systems Inc.	53.00	4.88	10.13
OTC	30.75	16.75	Altus Corp.	30.75	8.50	14.89
OTC	24.88	12.00	American Mgmt. Systems	23.88	1.00	4.37
OTC	16.25	7.50	American Software Inc.	13.25	0.25	1.92
NYS	3.88	1.38	Answorp Inc.	3.00	0.38	14.29
OTC	23.50	10.50	Analysts Int'l	16.25	1.75	12.07
OTC	15.13	4.88	Ashton Tate	8.88	1.00	12.70
OTC	10.25	4.00	ASK Computer Sys.	8.13	1.75	27.45
			Auto Data Processing	86.25	2.88	4.81
OTC	60.25	32.00	Autodesk Inc.	53.00	4.25	8.72
OTC	30.50	12.00	BGS Systems Inc.	30.25	0.50	1.68
OTC	42.75	17.75	BMC Software Inc.	42.75	4.50	11.76
OTC	21.50	11.00	Boole & Babbage Inc.	15.00	1.00	7.14
OTC	65.25	13.13	Borland Int'l	51.75	3.50	7.25
NYS	11.88	0.88	Businessland Inc.	2.50	0.13	5.30
OTC	18.00	4.50	Cognos Inc.	17.63	1.13	6.82
NYS	18.88	4.38	Computer Associates	9.13	0.00	0.00
OTC	17.75	7.75	Computer Horizons	13.25	-0.50	-3.64
NYS	66.25	26.75	Computer Sciences	63.25	3.00	4.98
NYS	12.25	6.63	Computer Task Group	11.00	0.75	7.32
OTC	26.25	10.00	Comshare Inc.	18.75	1.38	8.94
OTC	18.00	3.75	Corporate Software	16.75	0.25	2.17
NYS	47.00	27.38	General Motors E (EDS)	45.88	1.63	3.69
OTC	18.75	7.25	Gist Systems Int'l	17.75	1.00	5.97
OTC	4.75	1.88	Hogan Systems Inc.	4.00	0.50	14.29
OTC	11.88	5.00	Index Technology	11.38	2.25	24.66
OTC	19.13	7.75	Information Resources	19.13	3.38	21.43
OTC	17.50	2.63	Informix Corp.	5.88	-0.25	-4.08
OTC	7.88	1.38	Intellicorp Inc.	2.25	0.13	5.88
OTC	6.00	2.50	Interleaf Inc.	5.50	0.13	2.33
OTC	39.50	10.00	Knowledgeware Inc.	38.25	4.75	14.18
OTC	42.38	16.75	Legent Corp.	42.38	4.13	10.78
OTC	39.25	12.50	Lotus Development	38.00	4.00	10.16
OTC	32.00	13.63	Microgrid	10.25	-3.75	-16.30
OTC	112.50	50.75	Microsoft Corp.	104.00	0.25	0.24
NYS	8.88	4.00	On Line Software Int'l	8.25	0.88	10.45
OTC	26.38	4.50	Oracle Systems	9.13	0.13	1.39
NYS	17.88	7.88	Parasitic Systems	11.38	-0.13	-1.09
OTC	7.38	1.38	Phoenix Technologies	6.25	1.25	25.00
NYS	51.25	31.63	Policy Management Sys.	50.25	1.00	2.03
NYS	23.63	11.50	Reynolds & Reynolds	20.00	1.00	5.26
OTC	16.13	6.88	Sage Software Inc.	11.00	1.88	20.55
OTC	24.00	14.75	SAS Corp.	24.00	0.75	3.23
OTC	19.13	12.25	Shared Medical Systems	17.00	0.00	0.00
OTC	33.00	12.00	Software Publishing Corp.	33.00	3.75	12.82
NYS	12.88	5.50	Sterling Software	12.88	2.00	18.39
OTC	26.00	9.50	Sungard Data Sys.	13.13	0.13	0.96
OTC	46.50	17.75	Symantec Corp.	44.25	0.63	1.43
NYS	24.00	4.50	System Center Inc.	7.25	1.25	20.83
OTC	37.25	12.75	System Software Assoc.	22.75	3.38	17.42
OTC	27.38	4.75	Wellfleet	18.25	2.88	23.23
Semiconductors			**Up 8.21**			
NYS	26.88	18.13	Advanced Micro Devices	22.63	0.38	1.69
NYS	11.63	6.50	Analog Devices Inc.	11.50	1.63	16.46
OTC	23.25	5.25	Chips & Technologies	12.50	1.25	11.11
OTC	52.00	29.00	Intel Corp.	51.75	4.00	8.38
NYS	13.00	5.13	LSI Logic Corp.	8.75	0.63	7.69
NYS	19.38	8.75	Micron Technology	19.63	0.13	0.61
NYS	68.38	45.75	Motorola Inc.	64.88	4.50	7.46
NYS	8.88	3.00	National Semiconductor	7.88	0.13	1.62
NYS	46.75	22.50	Texas Instruments	46.75	4.25	10.24
OTC	12.25	3.00	VLSI Technology	8.13	0.63	8.33
ASE	14.88	4.88	Western Digital Corp.	5.25	0.75	16.67
Peripherals & Subsystems			**Up 19.31**			
OTC	2.38	0.09	Alloy Computer Prod.	0.31	0.03	11.39
OTC	2.25	0.88	Apertus Technologies	1.94	0.00	0.00
OTC	34.00	7.50	Banctec Inc.	11.50	1.75	17.95
ASE	10.00	4.13	Cognitronics Corp.	6.75	0.50	8.41
NYS	31.25	14.88	Conner Peripherals	28.25	2.38	9.20
ASE	22.00	7.00	Datacom Corp.	12.50	1.75	16.28
NYS	10.88	4.25	EMC Corp.	8.25	0.13	1.54
NYS	47.25	33.75	Eastman Kodak Co.	46.50	1.75	4.00
OTC	9.88	4.38	Emulex Corp.	9.00	0.00	0.00
OTC	34.00	14.00	Evans & Sutherland	22.25	2.00	9.88
OTC	8.50	3.44	Iomega Corp.	5.50	-0.25	-4.35
OTC	28.25	8.75	IPL Systems Inc.	22.50	-3.50	-12.96
OTC	2.00	0.13	Maxstor Systems	0.88	0.06	10.09
OTC	17.00	2.63	Maxtor Corp.	4.94	0.94	23.46
OTC	13.38	3.88	Micropolis Corp.	12.00	0.88	7.87
NYS	82.75	73.63	3M Corp.	80.75	2.25	2.54
OTC	14.50	6.00	Prinetronix Inc.	9.00	0.50	5.88
NYS	21.25	8.50	QMS Inc.	18.75	1.50	9.49
OTC	28.25	12.38	Quantum Corp.	26.25	2.88	12.30
NYS	8.75	4.38	Recognition Equipment	5.75	-0.13	-2.13
OTC	6.88	4.00	Reson Inc.	8.88	0.50	6.25
OTC	19.38	5.88	Seagate Technology	15.50	1.13	7.86
NYS	35.25	11.00	Storage Technology	30.88	3.00	10.76
OTC	4.00	1.25	Tandon Corp.	3.75	0.63	16.50
NYS	22.88	11.63	Tektronix Inc.	22.63	2.63	13.13
OTC	0.63	0.16	Televideo Systems	0.50	0.25	100.00
NYS	66.25	38.00	Xerox Corp.	58.00	1.25	2.20
Leasing Companies			**Up 4.15**			
OTC	16.00	6.88	Amplicon Inc.	15.00	0.50	3.45
OTC	4.38	0.21	Capital Associates	0.38	0.03	8.69
NYS	38.50	14.63	Comdisco Inc.	28.13	2.25	8.70
OTC	16.25	6.25	LDI Corporation	12.75	0.50	4.08
OTC	5.88	2.25	Telecomm Inc.	3.75	0.00	0.00

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NEWS SHORTS

Perot: Hire a vet

H. Ross Perot, founder of Electronic Data Systems Corp. (EDS) and chairman of Perot Systems Corp., urged computer industry executives last week to give soldiers returning from the Persian Gulf top priority for obtaining jobs in the industry. In the keynote speech at the Federal Office Systems Expo in Washington, D.C., Perot said giving jobs to veterans, including the disabled and minorities, and providing financial aid to soldiers' families are some of the tangible ways to thank the soldiers for their sacrifices. According to Perot, EDS hired thousands of Vietnam veterans who were hardworking, mature employees.

DEC acknowledges EMA delay

Digital Equipment Corp. confirmed last week the schedule slippage of several of its Enterprise Management Architecture components, which were announced last July. Decmcc Director for VMS/Basic Management System Version 1.1, originally slated for February shipment, will ship next month, DEC said. The Decmcc Management Station for Ultrix Software, designed to manage Transmission Control Protocol/Internet Protocol networks via the Simple Network Management Protocol (SNMP), shipped this month instead of last November as planned. On the other hand, an SNMP Access Module for the VMS-based Decmcc Director, originally slated to ship last month, did ship in November. The Decnet Diagnosis application, due in February, is delayed at least until April, according to DEC.

Word processor aimed at Windows

Software Publishing Corp. last week announced Professional Write Plus, a high-end word processor for the Microsoft Corp. Windows platform. The $249 package includes a variety of text editing features as well as an implementation of Windows' Dynamic Data Exchange and an integrated front end to electronic mail that allows users to send or receive mail messages without exiting the program.

Fields promoted at MCC

Craig Fields has been named president and chief executive officer of Microelectronics and Computer Technology Corp. (MCC), succeeding Grant Dove, who will continue to serve as chairman of the board at the Austin, Texas-based research consortium. Fields joined MCC as president, chief technical officer and chief operating officer in July 1990. He is a former director of the Defense Advanced Research Projects Agency.

Sun adds NFS products

Sun Microsystems, Inc. announced networking products last week for integrating personal computers into heterogeneous corporate networks. For example, the firm's $395 PC-NFS 3.5 is now Microsoft Windows 3.0-compatible and supports the widespread SNMP. The SNMP support allows PC-NFS-equipped PCs to be managed in a Unix environment. In addition, new terminal emulation products open up multivendor host access to customers who are not Sun Open Network Computing (ONC) licensees. ONC is Sun's modular set of networking protocols and services that allows distributed computing across mixed-vendor networks. Network File System is Sun's network service.

Thieves grab AMD, HP chips

A gun-wielding bandit stole more than 800 of Advanced Micro Devices, Inc.'s (AMD) new AM386 microprocessors during a truck hijacking in Penang, Malaysia, last week. The robber tied up an AMD truck driver and made off with $170,000 worth of chips that were being shipped to the U.S., an AMD spokesman said. AMD's AM386 is expected to be introduced this month. Each chip was worth more than $200. Meanwhile, more than $1 million in computer chips was stolen from a Hewlett-Packard Co. plant in Roseville, Calif., last week. Investigators said they fear the 3,000 microprocessors may have hit the black market within hours.

Adobe flexes typeface muscle

BY RICHARD PASTORE
CW STAFF

BOSTON — Adobe Systems, Inc. unveiled a set of malleable typefaces last week that will bring new versatility and document integrity to desktop publishers. At the same time, it keeps the company one step ahead of competition from the likes of Microsoft Corp. and Apple Computer, Inc.



Adobe's Type 1 Multiple Master typefaces, which was announced here at Seybold Seminars '91, allow users to modify type weight, width, scale and style. In the past, such font variations were available only in separately sold packages.

Currently, users can only change the size of Adobe and other vendors' outline fonts, but this manipulation changes all elements of a piece of type equally. Thus, as letter stems get fatter, letter holes will also "fill in," making the type distorted, hard to read and rather odd looking. With the new fonts, different elements of the letter can be adjusted independently.

The capability will be "very valuable" and most significant for users who work with type professionally and need to continually vary the size and weight of type, said William Gott, an analyst at Gartner Group/Infocorp in Santa Clara, Calif. These users include advertisers, designers, layout artists and production houses.

Users applauded the increased flexibility and creative leeway the product proposes to deliver. "Presumably, it will make the type look better at extremely small sizes," noted Steve Messner, desktop publishing specialist at Imaging International, Inc. in New York.

Adobe also took steps to ensure the integrity of typefaces used in portable documents. Previously, if a designer sent a document electronically to a colleague to be viewed or printed, for example, the colleague had to have the same typeface on his system to ensure that the reproduction was accurate. With the new flexible fonts, designers and receivers can mold their type to mimic the transmitted fonts more closely.

"You don't have to have the [document originator's] typeface necessarily, and still your client gets the integrity of their fonts," said Immeke Graffigna, founder of the New York Professional Postscript User Group and executive vice president at New York graphics service bureau JCH Group.

The new typefaces are compatible with existing Adobe Type 1 technology, the company said. They will be available for Microsoft Windows and Apple Macintosh environments later this year. The company did not announce pricing.

In addition, Adobe announced a font licensing agreement with Digital Equipment Corp. that will allow networked DEC Ultrix and VMS users to send documents to each other for viewing and printing, regardless of font availability. These Decfonts are scheduled to begin shipping in approximately one month.

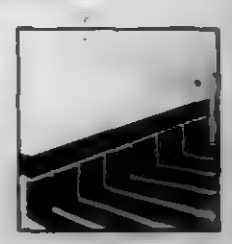
With the introduction, Adobe is attempting to keep its technology one step ahead of competing products on tap from Microsoft and Apple, according to several industry observers.

U.S. judge rules '386' not Intel's alone

SANTA CLARA, Calif. — A district court judge ruled recently that Intel Corp. does not have exclusive trademark rights to the number 386, which it uses to identify its 80386 microprocessor.

The decision gives Intel competitor Advanced Micro Devices, Inc. (AMD) in Sunnyvale, Calif., the green light to designate its compatible alternative to Intel's 80386 microprocessor the AM386, according to AMD.

However, AMD is restrained from selling the new product until it settles a lawsuit with Intel over its right to use Intel's microcode to manufacture the 386 clone chip.



AMD decided to incorporate the number in its new product name to help its customers identify the clone product as an alternative to Intel's chip.

After Intel learned of AMD's plans last fall, it filed suit against AMD, claiming use of the number infringed on its trademark. However, U.S. District Judge William Ingram ruled that within the computer industry, 386 is used as a generic term and cannot be used exclusively to identify a particular firm's product.

Wordperfect lays down law over alleged license abuse

BY RICHARD PASTORE
CW STAFF

Wordperfect Corp. last week tried to hammer home its network software licensing policy, which it said is widely misunderstood and abused by users. It also announced plans to stop selling discounted single-network copies of Wordperfect Version 5.1.

Wordperfect does not offer concurrent-use network licenses, although it said last week that many users think it does. Instead, customers need a separate license for every copy of Wordperfect software on a network server or node hard disk, according to the company.

Network users tend to copy the product to local hard disks to speed it up and provide a backup in case of network crashes, according to R. Duff Thompson, company vice president and general counsel.

However, several information systems managers refuted that charge. Network users are more likely to download copies of I/O-intensive packages such as Autodesk, Inc.'s Autocad than the relatively light I/O word processor, the managers said.

Managers said they were more concerned with Wordperfect's decision to discontinue as of April 1 its Network Additional Station offering, which sells for $295 compared with the standalone copy's $495 price. Users can still buy the software in five- and 20-copy increments at a discount, though not as cheaply as before.

"That sounds greedy to me," said James Lindermer, director of MIS at Hillier Group, Inc. in Princeton, N.J. "I hope [others] don't follow that lead."

In addition, Wordperfect has recently begun discouraging its academic customers from ordering products directly from the manufacturer, according to some university IS directors.

Network sales of Wordperfect account for 40% to 45% of total sales. The company said it expects that percentage to grow to 65% to 70% by 1995.

Users no longer focus on SAA

Platform still plays a role, but only as part of a bigger IS strategy, they say

BY ROSEMARY HAMILTON
CW STAFF

When IBM presented its Systems Application Architecture (SAA) four years ago this week, customers welcomed it as a long-awaited map that made sense of a disparate product line and pointed users toward future computing paths.

Since then, they have seen a slow rollout of SAA products, some visible IBM stumbles with key SAA pieces and sometimes confusing extensions to the basic architecture. Now, many users say that while they are still supporting SAA, they are no longer counting on it as the final word for their computing strategies.

While SAA will play a role, many users said they now see it as part of their own broader computing strategies that include their own plans, other vendors' options and open systems.

"SAA is pretty basic and fundamental stuff, so it would be hard not to accept it," said John Wood, vice president of computer network services at the Royal Bank of Canada, where third-party office solutions have been installed instead of IBM's Officevision.

"If anyone is just hanging their hat on it, they are in a lot of trouble," Wood said. "It is an important thing, but if you need anything in the short term ... you either look to other vendors' products or develop your own."

Other users contacted recently said they support SAA but are willing to look to non-IBM sources to plug gaps in their computing strategy that SAA cannot currently fill.

"We intend to use IBM hardware, and we intend to use IBM software as the mainline operating systems," said George Sekely, vice president of computers and communications at Canadian Pacific. As far as other software is concerned, "it's a wide open world," Sekely said. "If IBM's is best, we will use it."

Take an aggressive stance

Some users suggested the key is to try to influence IBM's direction rather than wait for IBM to guide them. Dick Stromberg, an information systems consultant at Du Pont Co., said he works with user groups such as Guide to present ideas and get IBM responses on such issues as computer-aided software engineering.

"We feel it's necessary to put our own thinking out there," Stromberg said. "We are really looking to move toward open — I mean standards-based — defined solutions," Stromberg said. "Some people in IBM are coming to understand that."

IBM defends its SAA track record and argues that it has done a good job of delivering SAA architectures and associated products. On the most basic level, users with any of the SAA-sanctioned products, including the four SAA operating systems, are considered SAA users, said Earl Wheeler, IBM's senior vice president and head of its Programming Systems Division, which handles all SAA efforts.



***Wheeler** says IBM has met SAA shipment deadlines*

In fact, there are several IBM sites that have implemented basic SAA pieces, including mainframe-based applications with OS/2 front ends, and that consider themselves SAA shops as a result.

Wheeler further measures his success in two- to three-year windows from the time a given SAA initiative such as AD/Cycle is announced. Using that framework, Wheeler said IBM has met nearly all product shipment deadlines.

However, there are many other sites that look to SAA to provide them with a truly consistent computing platform, and on that level, SAA has not yet come through for them.

"As a vision, it is great, but it just hasn't happened yet," said Charles Walton, a senior consultant and team leader of IS at Covia Partnership. "The promise is fantastic — portability across platforms. But getting there? Just telling me MVS is SAA does not empower me."

Michael Satejnberg, vice president of technical services at Manufacturers Hanover Trust Co., said he views SAA as "very worthwhile" but does not feel he can currently exploit it.

SAA is "things like Officevision or other things like CICS having the same touch and feel as PC products interfacing with mainframe products," Satejnberg said. "Basically, it's a more integrated environment than what I see as a set of products now."

The Putnam Cos. in Boston applaud SAA, but the company does not see it as the only direction. Although Gavin Taylor, managing director of IS at Putnam, said, "We've been reasonably successful with SAA," he is also currently planning an evaluation of both IBM and Digital Equipment Corp. repository products.

"Our approach to SAA here is that it is a philosophical approach; that's how we use it," Taylor said.

"We are an SAA-compliant shop — but not 100%."

SAA milestones

March 1987:	IBM introduces SAA, its framework for developing portable applications across the System/370, System/34, System/36, System/38 and PC environments
April 1987:	OS/2 Extended Edition debuts with support for SAA's interface, database and communications specifications
June 1988:	The AS/400 replaces the System/34, System/36 and System/38 as an SAA platform
May 1989:	IBM announces Officevision, its first SAA application
September 1989:	IBM introduces AD/Cycle, the first of several SAA-related blueprints for customers
March 1990:	Second release of Officevision is delayed amid indications that IBM is struggling to deliver SAA software
June 1990:	IBM meets the shipment date for AD/Cycle's Repository Manager, releasing a bare-bones version to a few users and software developers
September 1990:	IBM introduces Systemview, its architecture for systems management across SAA platforms
October 1990:	An IBM executive indicates Officevision will recognize Windows and Unix, neither of which is part of SAA
January 1991:	IBM admits more problems with Officevision. It will not provide a new date for Release 2
March 1991:	IBM executive Earl Wheeler reveals plans for an as-yet-unnamed enterprise architecture governing data access

CW Chart: Doreen St. John

Open systems

FROM PAGE 1

them into a position to support the industry standards."

IBM has been moving toward closer ties between AIX and SAA since February 1990, when it said that the two environments will share key elements such as database management systems, networking and network management schemes, languages and user interfaces.

The company formed Saranga's group in November 1990 to develop an overall architectural plan of how this will occur.

Saranga said IBM's open systems effort includes connecting to non-IBM gear. "This has evolved over the past year or two," he said, "and you might consider it a different direction than what IBM has had."

He said customers made it clear that interoperating between SAA and AIX "only goes half the way. We are looking at it as IBM's responsibility to be able to connect and interoperate with what the customer has installed, so we're going to have to talk Decnet Transmission Control Protocol/Internet Protocol, Open Systems Interconnect. And SQL data has to move through the installation."

Second it

Saranga's comments were echoed by Earl Wheeler, IBM's senior vice president and head of its Programming Systems Division, which handles all SAA efforts. Wheeler said SAA and AIX will eventually exist under one common superstructure. "Give us a couple of years, and they'll look precisely the same," he said. He added that IBM is working to bring together what he called "the three views" of SAA and AIX, including the user interface, application programming interface and common communications services.

Saranga said the specific planks of IBM's open systems strategy include the following:

- A native version of AIX for the System/390, which will be a "vanilla" version of the OSF's OSF/1 operating system and will be available in one to two years.
- A port of the database from OS/2 Extended Edition to AIX so that "requestors can find data anywhere in the network," of IBM and non-IBM equipment, Saranga said. IBM will provide a "complete range" of distributed database functions during the next year or two, he added.
- AIX versions of AD/Cycle computer-aided software engineering tools and the ability to define a repository object in one environment and then use that object to create an application in the other environment.

Senior Editor Rosemary Hamilton contributed to this report.

Afloat in indifferent waters

IBM's SAA is like a shark. If it stops moving, it will die. That is according to Earl Wheeler, senior vice president in charge of all SAA initiatives.

He offered the following look at what is ahead in the SAA world:

- **AD/Cycle.** Wheeler said a Repository Manager offering will be available for all three SAA hosts — MVS, VM and OS/400 — by September 1992. Third-party developers are currently working to integrate tools with the existing MVS-based Repository Manager and its Information Model. He said this level of integration should be completed in June 1992.
- **SAA front end.** An improved Common User Access (CUA) will likely be announced this year. "We will probably be kicking up that interface again, probably toward the end of this year, so CUA '91 is on the way," Wheeler said.
- **Officevision.** The troubled strategic office platform will soon get the Wheeler touch. Expect IBM to form strategic partnerships with third-party vendors for future Officevision development. The relationships will be akin to the AD/Cycle inner circle, Wheeler said.

Wheeler said he is committed to delivering the previously stated Officevision functions — and more. No time frame was provided, but Wheeler's intent is to "AD/Cycle-ize" Officevision. "The higher level thought is as we move through time, we will begin to see Officevision take on the blocks of granite as a solution not unlike AD/Cycle and Systemview," Wheeler said.

- **The SQL interface to IMS.** Wheeler promised this one in April 1990 and then recently confirmed that the project has been held up. This one is up for grabs. "If we can have that kind of interface into IMS with acceptable performance, then we will move forward," he said. "Inside, the work continues as we try to make the decision. What I refuse to let happen is an endless debate along the terms of how many angels are on the head of a pin."

ROSEMARY HAMILTON

Unisys mainframe praised but success questioned

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Unisys Corp. topped its mainframe line last week with a line of machines that impressed analysts but are unlikely to win Unisys many new customers, they said.

The air-cooled A19 line succeeds the A17 line and consists of six machines with between one and six processors and a peak performance of 51 million instructions per second.

Unisys said the single-processor A19 model runs 1.8 times faster than the current intermediate mainframe, the A16 Model 61E, which processes 272.5 transaction/sec., under an audited Transaction Processing Council's TPC-A benchmark.

Users and analysts gave the machines good marks but said cost-conscious customers will be slow to upgrade.

Jim Cassell, vice president at Gartner Group, Inc. in Stamford, Conn., noted, "It's a very competitive offering, but there are not a lot of Unisys customers that need this kind of capability. Its most immediate effect may be to stem possible defections to IBM because customers now see a migration path."

"It's an awesome machine; particularly impressive is the input/output handling," said Tom Hind, president of the Cube Unisys user group. However, he said, his employer, Spartan Mills in Spartanburg, S.C., will not be buying one anytime soon. "We'll probably do an evaluation this year," he said. "But for now, we're fine."

"It's a competitive product offering for a select portion of the Unisys customer base," said Michael Geran, an independent analyst in New York. He estimated that about 15% of the Unisys A series base would be candidates for the new computers.

Robert H. Dever III, vice president at Liberty Travel, Inc. in Ramsey, N.J., said, "The travel business is, to put it charitably, in a malaise because of the economy and the war. As conditions ease, we'll look at the A19. But the A15L is meeting my needs at this time."

Beating the competition

Unisys trumpeted that its A series of computers now has a performance range of 480 times, compared with 174 for Digital Equipment Corp.'s VAX line and 100 for IBM's Enterprise System/9000, said Frank Brandenberg, vice president at Unisys.

Also, the A19 computers require one-fourth the floor space of an IBM ES/9021 and do not have the overhead involved in water cooling.

The A19 computers are field-upgradable from the A16 processors, introduced in July 1990, and run all A series software. The A19 line will range in price from $5.38 million to $26 million and are slated to ship in the third quarter.

The new computers implement what Unisys called Super Scalar Architecture, based on technology jointly developed with Motorola, Inc. The architecture improves performance by handling instructions based on the resources within the processor instead of the more traditional method based on the order of the instructions submitted.

The A16 "exceeded our expectations," said John Rioux, general manager of the Computer Systems Group, but he would not provide specific numbers. He also said that in 1990, revenue from the entire A series — including maintenance and professional services — grew 5% to 6% during the previous year.

Full extension

Billed as a replacement for the Unisys A17, the firm's new line starts out with 80% better performance than the intermediate Unisys A16

SYSTEM	PROCESSORS	MAXIMUM MEMORY	TRANSACTIONS PER SECOND	PRICE
A19 Model 611	One	1.1G bytes	490.5*	$5.4M
A19 Model 664	Six	2.5G bytes	2,180*	$26M
A19 Model 612	One	1.1G bytes	272.5	$5.38M

*Estimated

Source: Unisys Corp. CW Chart: Marie Hinton

Bull offering to combine DOS, Unix with Windows

BY SALLY CUSACK
CW STAFF

BILLERICA, Mass. — Bull HN Information Systems, Inc. will introduce an open systems-oriented, distributed computing model this week at the Cebit Fair in Hannover, Germany, according to several analysts.

The model will reportedly open up Bull's proprietary GCOS architecture via a Unix server environment and a micro-to-mainframe software product designed to unify several operating systems under a common graphical user interface.

"Bull has come out with a very user-centered architecture to open their proprietary operating systems to the Unix environment," said Bob Tasker, vice president of software research at International Data Corp., a market research firm in Framingham, Mass.

Called Affinity, the micro-to-mainframe link component of the model will combine DOS, GCOS, Unix and other operating systems under a common graphical user interface with Microsoft Corp. Windows-like features.

Bull's model will offer components for desktop, communications and transaction processing functions, and all architectures will comply with Open Software Foundation standards, according to industry sources.

In related news, Bull SA in France and its U.S. counterpart, Bull HN, will resell a family of eight high-end mainframes manufactured by NEC Technologies, Inc.

NEC's System 3900 is an upgrade to the 4-year-old System 2000 series. The addressing structure of the new system could lead to a theoretical limit of 700 million instructions per second and a storage capacity of 4 quadrillion bytes of data.

The system uses NEC's ACOS operating system and can be configured with as many as eight processors. It is scheduled for release by year's end 1992. Monthly rental fees will start at $484,615, NEC said.

IBM

FROM PAGE 1

Management, Inc. subsidiary's director of information systems.

However, even the lure of APPN is unlikely to convince most users to migrate existing NetBios and Novell, Inc. applications to LU6.2, Ernst & Young partner David Passmore said.

For example, the city of New York is eyeing APPN's dynamic network topology, congestion control and routing capabilities as a way of better controlling a diverse LAN installation, noted Joseph Giannotti, commissioner of the city's computer services. However, implementing LU6.2 as a user protocol "is not a high priority," he added.

Taking an "if you can't beat 'em, join 'em" attitude, IBM announced last week that it will publish specifications that would enable other vendors' systems to participate in an APPN network as end nodes. End nodes can dynamically register their resources on the nearest APPN network node but cannot support dynamic directory and routing services provided by such network nodes.

Novell, Apple and Siemens AG said last week they are already implementing APPN on their systems. Systems Strategies, Inc. announced plans to implement APPN on a variety of Unix systems, including IBM's RISC System/6000. The firm plans to ship APPN software for Digital Equipment Corp. VAX/VMS systems by the first quarter of next year.

SNA compatibility

Apple users equipped with APPN should be able to automatically call up an SNA resource via the Macintosh "chooser" function, Apple product manager Bill Brown said. Users should also be able to use an SNA backbone as a "funnel between two Appletalk networks." Apple will support APPN in its SNA-based software by the third quarter of 1991.

Novell said it expects to fit into SNA as a "gearbox" that extends APPN capabilities to Netware clients such as Macintosh workstations and Ethernet and Arcnet LANs.

The opening of APPN is good news to companies that want to keep their non-IBM LAN systems but also want optimal access to SNA resources. Chemical Waste, for example, would like its Novell Netware 386 applications to "participate in a cooperative fashion" with its AS/400s, Hansen said.

IBM has yet to announce an APPN product for the IBM VTAM Network Control Program.

IBM's APPN implementation on OS/2 Extended Edition, called Networking Services/2, includes the following features:

- The ability to send LAN alerts to a Netview host directly or via an AS/400 Netview focal point.
- The ability to configure an OS/2 LAN workstation with only three parameters.
- Common Programming Interface for Communications, a simplified application programming interface for LU6.2.

IBM also announced Netview Distribution Manager/2 for OS/2, which is said to allow users to download centrally archived software to DOS and OS/2 LAN clients via an OS/2 server.

What APPN brings to the table

While it has been technically possible to set up a peer-to-peer network over SNA, users are emphatic that it has not been worth the trouble without APPN. Here are some of the reasons:

Without APPN:

1. Keeping track of the location of network applications, users and other resources requires repeated manual updates to SNA directories
2. In many cases, network must be taken down while a change is implemented
3. Users and applications must specify the exact address of a network resource in order to access it
4. Routing tables, to determine the best path between two network nodes, must be calculated and manually updated

With APPN:

1. Network nodes maintain their own tables and automatically notify each other of changes to their attached end nodes' resources
2. Changes can be made without disruption to network operations
3. The system eliminates much of the effort of addressing queries
4. APPN dynamically calculates routes and works to control network congestion

CW Chart: Paul Mock

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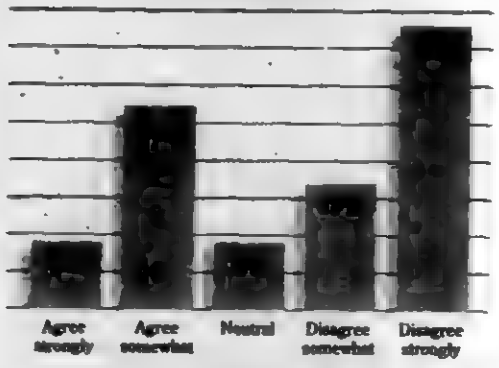
OUTSOURCING

The outsourcing trend continues to solidify. The overall percentage of companies considering outsourcing went from 23% one year ago to 32% today

"Our organization is currently outsourcing some IS activities"

Percent of respondents (base: 394)

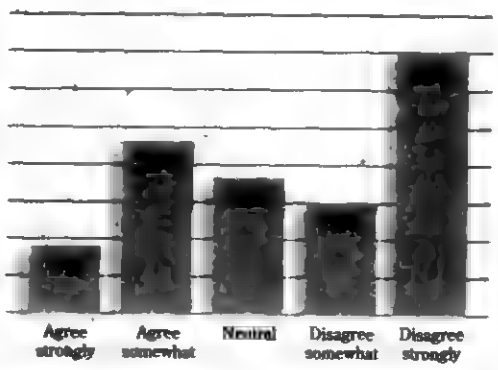
More than one-third of the companies surveyed have turned over some portion of IS responsibility to outside vendors



"Our organization is currently considering outsourcing in the next year"

Percent of respondents (base: 394)

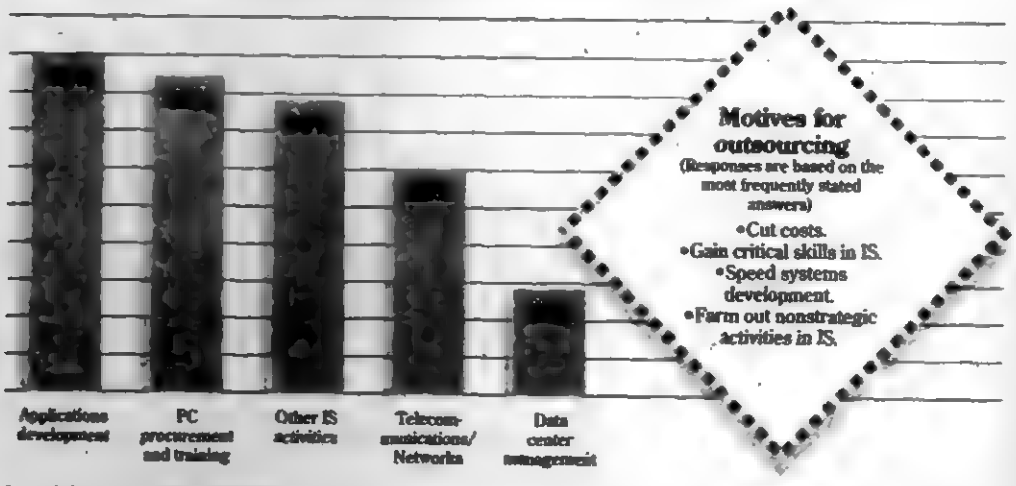
Opposition to outsourcing is not as strong as last year, dropping from 66% to 50% this year



Preferred functions to outsource

Percent of respondents (base: 142)

At companies that are outsourcing, a variety of IS tasks are left for third-party vendors, with 45% turning over control of applications development and most personal computer matters



Motives for outsourcing

(Responses are based on the most frequently stated answers)

- Cut costs.
- Gain critical skills in IS.
- Speed systems development.
- Farm out nonstrategic activities in IS.

Source: Index Group, Inc., Cambridge, Mass.

CW Chart: Tom Monahan

NEXT WEEK

Raymond Kurzweil wrote his first software program at age 12, and he hasn't slowed down since. In recent years, this computer scientist has done breakthrough work in the areas of speech and pattern recognition. In a recent interview with *Computerworld*, Kurzweil talked about intelligent technology and its impact on people's lives.



Bill Gradwell/The Kurzweil Foundation

Sluggish economic times haven't stopped many organizations from exploring ways to exploit emerging technologies such as multimedia and expert systems. Analysts say advanced technology groups are enjoying great popularity, despite the recession. Executive Report looks at how some organizations are turning new ideas into real, usable systems.

INSIDE LINES

Mail-order misery

Financially strapped Northgate Computer Systems has apparently been unable to convince bankers to lend it money, despite the efforts of Gary Held, who was named president in December. Northgate is now negotiating with an investment firm that specializes in lending money to high-risk companies, according to a source close to the negotiations.

Patriot missive

On March 19, Patriot Partners, the joint development partnership owned by IBM and Metaphor, will host a reception for software vendors to launch the "Constellation Project" and "present the Patriot vision." Patriot is working on application systems software that will operate under OS/2, AIX and other Unix versions as well as non-IBM 32-bit operating systems. Application programming interfaces are slated to be shipped this fall, followed by a developers' tool kit in 1992.

Sun still shines in Arizona

Despite some reports to the contrary, the Operation Sundevil hacker case is not "mired," as reported in *Computerworld* [CW, Feb. 11], but rather is struggling under the weight of its own success, according to Gail Thackeray, the former Arizona assistant attorney general. "If anything, we are bogged down in evidence." Thackeray said that one or more indictments will be issued later this month in Arizona.

E is for Error

Novell is telling its users to abandon its Revision E shells for Netware 3.1. Network administrators have been told to go back to Revision D. The networking company updates the trouble-prone shells, which act as links between Netware's Internet Packet Exchange protocol and DOS, about every three months. With a little luck, Revision S — as in Safe — will be here before long.

Callers turn deaf ear to Compaq

Compaq opened up its toll-free lines last week and, for the first time, offered free direct technical support. However, the company was not overwhelmed with calls. The volume was "less than we anticipated," said Compaq North America Vice President Ross Cooley. No one counted, but there may have been more operators on duty than callers. "Let's just say we were very well staffed," Cooley said.

DOS: What is it good for?

Sun Microsystems co-founder and chief wizard William Joy said last week that DOS-based personal computers are only good for four applications: "word processing, spreadsheets, word processing and spreadsheets." Joy added, "These things aren't very interesting to me." Speaking to an appreciative group of Sun users at the National Air and Space Museum in Washington, D.C., the acerbic Joy also said Intel microprocessors are the worst possible engines for desktop systems.

Peer-to-peer squabbling

IBM is reportedly in the midst of yet another internal feud, this time on the issue of whether to allow users to wrap their 3270 transmissions inside the LU6.2 peer-to-peer Systems Network Architecture protocol. Doing this could finally break down users' resistance to migrating to LU6.2 because it would eliminate the need to rewrite all of their 3270 host applications. However, an internal political logjam makes it unlikely that we will see such a product, our source told us.

Fuzzy logic technology is another U.S. development finding success elsewhere. The Japanese have already embedded fuzzy logic microprocessors in washing machines, air conditioners and other everyday devices. However, there are signs that the U.S. is not walking away from the technology. The IEEE Neural Networks Council, for example, is sponsoring the First International Conference on Fuzzy Systems in March 1992. No matter what your logic, News Editor Pete Bartolik wants to hear from you. Catch him by telephone at (800) 343-6474, by facsimile at (508) 875-8931, or send electronic mail to COMPUTERWORLD on MCI Mail; MHTS78A on Prodigy or 76537,2413 on Compuserve.



AT&T introduces the biggest thing to hit contact lens sales since shag carpeting.

AT&T Integrated Services Digital Network (ISDN) gave Bausch & Lomb the capability to take 1,000 more orders per week.

Ask most people what AT&T ISDN has to do with the contact lens business and they'll probably tell you it's the first line on the eye chart. But if you ask the people at Bausch & Lomb, they'll tell you about a digital technology so innovative, it lets them answer a lot more calls using the same number of live operators they had before.

Not too long ago, Bausch & Lomb's customer service center was getting a lot more calls than they could handle. Realizing that lost calls can turn into lost customers, they called AT&T for help.

Through AT&T ISDN, Bausch & Lomb got a feature called Automatic Number Identification (ANI). With ANI, their computers can automatically capture each caller's phone number and match it to the customer's record. The end result? Call handling time has been cut by an average of four seconds per call. Which means Bausch & Lomb's customer service representatives can now handle about 1,000 more weekly calls than they could before.

So if you've been looking for a way to boost sales without taking on more overhead, call off the search. AT&T's contact lens solution could be the answer for your business, too.

Innovation. Another AT&T advantage.

For more information about AT&T ISDN, call your AT&T Account Executive or 1 800 247-1212, Ext. 144.

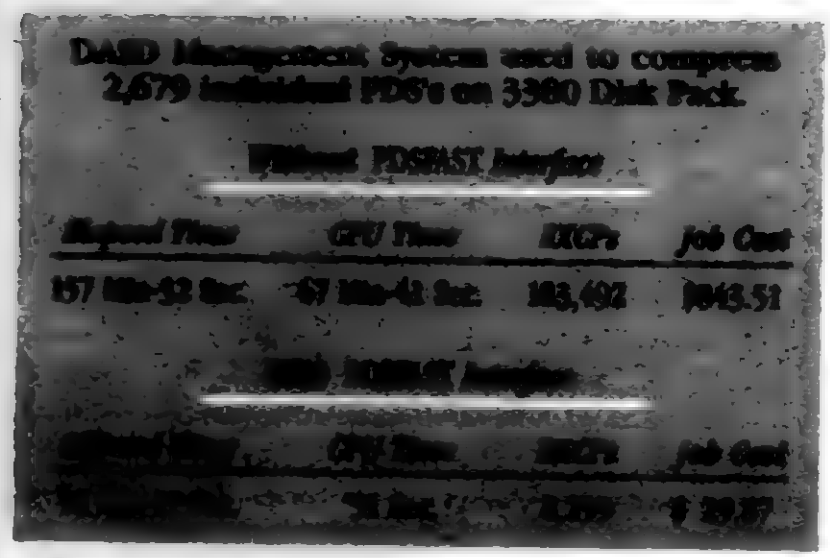
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COMPUTERWORLD

IBM notebook on Harvard MBA track

BY RICHARD PASTORE
CW STAFF

BOSTON — While pundits have been debating the release date of IBM's notebook personal computer, the first-year class at Harvard Business School has been using more than 700 of the units since early last month. The students have found some fault with the devices, but in general, they said, the Personal System/2 L40SX makes the grade.

The Intel Corp. 20-MHz 80386SX-based unit includes a 60M-byte hard disk, 2M to 18M bytes of memory, a floppy disk drive and a modem that can send and receive data and

Continued on page 4



Stella Johnson

Harvard Business School *student John Pollock taps away on the full-size keyboard of IBM's yet-to-be announced 386SX-based notebook PC. The PC is being used by 700 Harvard students*

Microsoft feels heat of FTC investigation

Angst of rivals, antitrust issues boil to surface

BY PATRICIA KEEFE
CW STAFF

Last week's disclosure of a Federal Trade Commission investigation into possible antitrust activities on the part of Microsoft Corp. fueled the flames of resentment that applications vendors have toward the company, but few observers expected much to come of the probe.

Microsoft confirmed the investigation following a report on it released by Goldman, Sachs & Co. analyst Rick Sherlund.

Microsoft said the probe was triggered by a November 1989 press release that outlined the future of Windows and OS/2. At the time, Microsoft and IBM positioned OS/2 as the platform of choice, with Windows relegated as a low-end graphical system.

Published statements attributed to Microsoft Chairman Bill Gates indicated that IBM was also a subject of the investigation. An IBM spokesman would only say that IBM is aware of the investigation and is cooperating with requests for information. The FTC does not comment on "nonpublic" investigations.

Although the probe has been under way for more than a year, observers close to the company said Gates is taken aback by the attention being given to the investigation.

Leading software developers have long railed against Microsoft's alleged control over the personal computer software industry and conflicting statements of direction on Windows

Continued on page 101

DIRECTION OR DECEPTION?

November 1989 announcement on future directions for Windows and OS/2:

- "The 'platform for the '90's' [are] hardware systems with Intel 80386 or 1486 ... with OS/2 and Presentation Manager"
- "Beginning in the second half of 1990, IBM and Microsoft plan to make their graphical applications available first on OS/2"
- "DOS and Windows are recommended for systems with 1M to 2M bytes of memory or fixed disk drives smaller than 30M bytes"

DG delivers its RISC-hot Unix server

BY SALLY CUSACK
CW STAFF

NEW YORK — The soul of Data General Corp.'s latest machine is no larger than a pizza box. With four processors generating 117 million instructions per second, the Unix server represents a bid by the ailing minicomputer maker to reclaim its tradition of being able to deliver the hottest engine on the market.

DG is hoping that the next billion dollars' worth of revenue will come from the machine, which is based on Motorola, Inc.'s 88100 reduced instruction set computing technology. Designated the 7000 and 8000 series, all models are currently available.

The key question, according to Jay P. Stevens, an analyst at Dean Witter Reynolds, is whether DG can market and sell the product. He noted that although the company has a tradition of high-performance products with

Continued on page 8

Oracle for Vaxcluster, Take 2

Performance boost ends 18-month rewrite effort

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Systems Corp. has taken a lemon — the flawed Version 6.0 of its Oracle relational database management system for Digital Equipment Corp. Vaxclusters — and tried to make lemonade.

In providing a fix designed to make Oracle Version 6.0 work well in Vaxclusters, Oracle suggested last week that the same procedure be applied to loosely coupled configurations of Unix computers and even mainframes linked by IBM's Sysplex.

Parallel Server, the new software in Oracle Version 6.2, will be applied to Unix computers made by Pyramid Technology Corp. and Sequent Computer Systems, Inc. That is only if Pyramid and Sequent can come up with their own equivalent of the Vaxcluster's DEC Lock

Continued on page 100

Few flaws in postwar weapons check

BY MITCH BETTS
CW STAFF

President Bush called the allies' stunning success in the Persian Gulf war "a triumph of American technology." Military experts raved about how the computer-coordinated air strikes and computer-guided weapons quickly overpowered the Iraqi military.

Even so, military analysts noted in their postwar assessments that some of the battlefield technology showed its limitations, and there is room for improvement. For example:

- Satellites provided six minutes of warning before a Scud missile hit, but four minutes were eaten up by the data transmissions relayed to the U.S. and then to the Middle East, according to Tom Baranauskas, an analyst at

Continued on page 99

Honor roll grades for high-tech weapons

Military analysts say computerized systems worked exceptionally well in Operation Desert Storm

REPORT CARD

Smart bombs	A
Cruise missiles	A
Patriot missiles	B+
Electronic countermeasures	A
Command and control	A+
Satellites	B+

Graders: Richard Thomas (Center for Strategic Technology), Ron Hermanstein and Tom Baranauskas (Forecast International), Jeffery Stuffler (Center for Strategic and International Studies) and John Pike (Federation of American Scientists)



Patriot missile earned high marks in Gulf action

CW Chart: Marie Haines

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INSIDE

VDTs don't boost miscarriage rate, according to a federal health study. Activists fault the study's methodology. Page 100.

DEB Software's downsizing slices another 300 people from the payroll. Page 12.

Tandy to break CD-ROM price barrier with $400 unit. Page 101.

Morris loses appeal, mulls over asking Supreme Court to overturn his Internet worm conviction. Page 6.

In Depth — A Q&A with scientist and inventor Raymond Kurzweil. Page 75.

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6 Rockwell International Chief Donald R. Beall is this year's recipient of Gartner Group's Excellence in Technology Award.

7 NCR machines are still in demand, as evidenced by Wal-Mart's $20 million purchase of the firm's 3000 series processors.

8 Now is the time to buy Decstations, as DEC drops prices on its line of Unix-based RISC systems.

10 Daimler-Benz races ahead of the European pack by implementing fast-packet multiplexers to link LANs.

12 Restructuring continues at D&B Software, but 300 employees will not.

16 In a move toward outsourcing, GTE Directories fires 5% of its systems development staff and reorganizes the IS department.

99 High-tech shipments to Iraq in the five years before the invasion of Kuwait raise questions as to whether the [illegible] tal in aiding Saddam Hussein.

100 A study by the National Institute of Occupational Safety and Health claims that pregnant women working at VDTs are no more at risk of miscarriages than women who aren't.

Quotable

"Knowing Saddam Hussein now, we don't want to sell him anything. But at the time, it made sense."

PAUL FREEDENBERG
WASHINGTON ATTORNEY

Regarding U.S. high-tech exports to Iraq before it invaded Kuwait. See story page 99.

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PCs & WORKSTATIONS

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The 5th Wave



EXECUTIVE BRIEFING

■ **The U.S. military industrial complex earned honor roll grades** for the high-tech weapons it sent into the war with Iraq, even though some of the computers and other sophisticated machines sometimes fell short of perfection. But far from final is the report card for the U.S. high-tech equipment deployed by Iraq. More than $500 million worth of U.S. computers and other gear was exported to Iraq during the five years before the war, but it's unclear how Iraq used the equipment. **Pages 1 and 99.**

■ **The eyes of Washington are on Microsoft,** which confirmed last week that the Federal Trade Commission is investigating it for possible antitrust violations relating to some of its positioning of OS/2 and Windows. While observers said they do not see the probe as likely to turn up gross wrongdoing, they are watching to see if the investigation attracts more complaints about Microsoft's business practices. **Page 1.**

■ **The wait for the report on pregnancy and VDTs** ended last week when the National Institute for Occupational Safety and Health said it had found no evidence that women working with VDTs are more likey to suffer miscarriages. However, observers questioned the research methodology used. **Page 100.**

■ **On the technology front,** faster and smaller was the order of the day last week. Data General said it has packed a four-processor system capable of 117 MIPS into an Aviion computer smaller than a pizza box. **Page 1.**

■ **Interest in advanced technology** continues to grow in many organizations, despite a gloomy economy. **Page 65.**

■ **Donald R. Beall,** chairman and chief executive officer of Rockwell International Corp., wins Gartner Group's Excellence in Technology Award. **Page 6.**

■ **Staff cuts are in the works** at GTE Directories and Goodyear. The systems development staff is being cut at GTE, while at Goodyear, IS executives are unsure how a 1,100-person reduction in force will impact IS. **Page 16.**

■ **Bridging the gap between technology and business** has been a topic of conversation for years. However, not enough people are doing anything about it. A few consultants claim they have plans for closing that gap. **Page 59.**

■ **How important is your IS operation** in the eyes of Wall Street analysts? "Not very" may be the answer. One researcher says securities analysts have started looking at IS' impact on a firm's bottom line. **Page 59.**

■ **Mail-order companies are relying more heavily on IS** to create innovative marketing and inventory applications. For IS executives, this translates into more jobs and higher pay. **Page 83.**

■ **An ounce of prevention can save an IS buyer a** pound of cure if his software vendor files for Chapter 11 bankruptcy. One issue of concern is the license agreement and what it provides for when a vendor files for bankruptcy protection. **Page 91.**

■ **On-site this week:** In what is being called a "Blue Flush" based on price/performance, the city of Houston erases IBM hardware from its computer room and replaces it with an Amdahl system. **Page 29.** A multimedia application is taking its place in the new-employee recruiting process at a New York Life Insurance group. **Page 39.** Giving managers time to think about business rather than pounding calculators is the idea behind an automation project at the Au Bon Pain restaurant chain. **Page 43.** A satellite-based tracking system is helping North American Van Lines speed pickups at customer sites. **Page 47.**

"To get SQL, they said I'd have to walk away from 20 years, millions of dollars and start all over again.
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ICL pioneers ISDN for Windows 3.0 environment

BY ELISABETH HORWITT
CW STAFF

STAMFORD, Conn. — ICL, Inc.'s North American Division announced last week what is said to be the first Integrated Services Digital Network (ISDN) desktop conferencing system for the Microsoft Corp. Windows 3.0 environment. The announcement of real, live ISDN applications for the popular Windows environment could give a much-needed kick in the pants to a still-sluggish ISDN market.

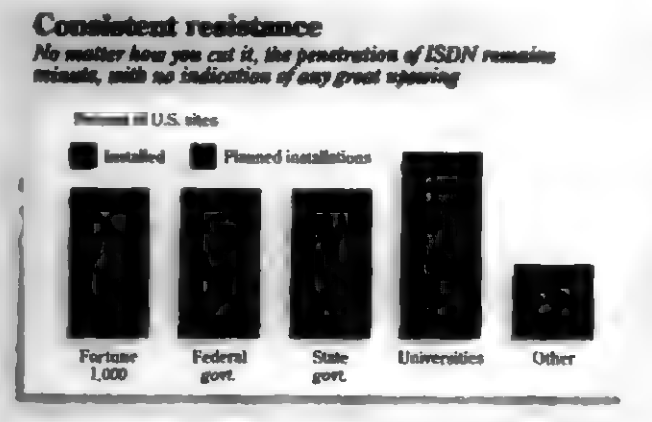
Originally developed for Microsoft OS/2-based systems, ICL's I³ Desktop Conferencing Package is said to allow geographically separated users to simultaneously view and mark up an application on their Windows screens. Users, meanwhile, can be talking over the telephone via the same ISDN link, according to ICL.

ICL "finally got smart" with its move from OS/2 to Windows, said Price Craddock, a telecommunications analyst at Hardee's Foods Systems, Inc. Hardee's, now in the midst of an ISDN point-of-sale network implementation, uses DOS, not OS/2 workstations, he added.

The Rocky Mount, N.C.-based food chain is less interested in desktop conferencing than in providing ISDN's 64K bit/sec. switched links for inexpensive bulk data transfer between remote sites, Craddock said.

However, the company is not ready to pay $2,195 per personal computer to provide its users with ICL's ISDN hardware and software, Craddock said. ICL's product would be more suitable to the company's needs if it could act as an ISDN gateway for multiple users on a local-area network system such as Microsoft's MS-Net, he added. ICL has no announced plans for a LAN version of its product.

ICL's exclusive claim to Windows-based ISDN will be challenged shortly by rival Teleos Communications, Inc. in Eaton, N.J. Several third-party vendors are writing Windows applications to Teleos' ISDN adapters and servers, with formal announcements expected by year's end, Teleos spokesman Reggie Best said.



Imposed limits

One limitation of current ISDN technology is that existing Windows applications that are not written to a specific ISDN hardware platform like Teleos' cannot make use of the full 64K bit/sec. ISDN link, vendor sources said. Instead, they are limited to the typical PC rate of 19.2K bit/sec.

The North American ISDN Users Forum hopes to address this problem by midyear with the release of specifications for a common interface between applications and various vendors' ISDN boards, Best said. If the interface generates widespread industry support, software applications written to it will be able to take advantage of ISDN speeds on a wide variety of ISDN adapters, he added. This development may finally encourage leading PC software vendors to develop packages specifically for ISDN. Both Teleos and ICL said they intended to support the workshop's application interface.

ICL's Desktop Conferencing Package for Windows 3.0 requires the vendor's I³ ISDN software and hardware. The $2,195 price tag includes both products as well as Windows-based file folder and phone book applications. The products support IBM Personal Computer AT, Extended Industry Standard Architecture and Micro Channel Architecture buses. Availability of the I³ Desktop Conferencing Package for Windows 3.0 is scheduled for May.

Harvard

FROM PAGE 1

facsimiles. At the earliest, the L40SX will debut next week for $6,000, industry observers said. IBM arranged a special deal with Harvard to deliver the PCs for about $2,800 each.

IBM spokesman Kevin Clark confirmed that students are using a laptop that will be marketed by IBM "when we can manufacture sufficient quantities to satisfy anticipated demand."

By most student accounts, the notebook is a solid but not vastly innovative piece of equipment.

Despite being the first notebooks ever to come off of an IBM assembly line, the Harvard L40SXs have experienced only a few scattered bugs, students reported. Indeed, the school newspaper recently likened the two on-site IBM service agents to Maytag repairmen.

The L40SX is wider (10.7 by 12.8 by 2.1 in.) and heftier (7.6 pounds) than some of its notebook predecessors. These dimensions, however, are needed to house the nearly full-size keyboard that some observers called the best in the notebook business.


Stella Johnson

IBM's PS/2 L40SX *is the laptop of choice for first-year students at Harvard Business School in Boston*

IBM touch

Its 84 full-size, standard-spaced keys are arrayed in a five-degree slope and match the desktop PS/2 key layout. Although each key is half-height, "it still has the distinctive IBM touch and travel," first-year student John Pollock said.

Compaq Computer Corp.'s LTE keyboard suffered in comparison. The LTE relocates and shrinks its peripheral keys. "If you're a good typist, Compaq is a pain in the neck to deal with," MBA candidate John Richter said. "I'd take [IBM] over the LTE anytime."

According to Compaq Vice President of Product Marketing Lorie Strong, the larger overall size required for a full-size keyboard is a trade-off Compaq users do not want to make. The additional inches make it less likely the unit will fit in a briefcase, she said.

Standard LCD

Unlike the keyboard, the IBM Video Graphics Array LCD side-lit screen is standard fare, according to most students.

Others, however, were disappointed. "The screen is difficult to read at times; a lot of bleeding occurs," student Steve Petrow said.

Even at a substantial discount, some students said the machine is overpowered and overpriced for their needs. John Labine said he opted for a $1,600 Intel 80C86-based Toshiba T-1000LE instead.

The fact that the IBM notebooks are beta-test units also worried Labine. "You've got the support of the school while you're here, but what happens when you graduate?" he asked.

So far, the biggest problem with the campus machines is disappointing battery life. Because exams last three hours, the school was counting on a minimum three-hour life.

"We tried it under simulated exam conditions, and it wasn't giving us the required three hours," said Richard Hespos, assistant dean and director of information technology.

To put students at ease and avoid embarrassment for the school and IBM, Hespos said, he arranged for IBM to deliver a truckload of spare batteries in time for the semester's first exams late last week.

CLARIFICATION

A section of two articles on Computer Associates International, Inc.'s VSE line of products [CW, Feb. 4, Feb. 25] stated that the company is imposing charges on users upgrading from VSE to VSE/ESA Version 1.1. Those charges are levied only on those users who choose optional modules operating within the VSE/ESA environment, modules available on about 18 of CA's 100-plus VSE products. CA said all of its VSE products can be run in the VSE/ESA environment without any extra fees levied by CA (see letter page 24). Also in the Feb. 4 story, a source stated that he had spoken with "between six and 12 CA VSE customers" who were upset about pricing policies. At the time the story was written, *Computerworld* had not checked with the source to verify those numbers or the names of those other customers. The source subsequently has revealed names numbering in that range, but many of them were not necessarily for attribution.

COMPUTERWORLD

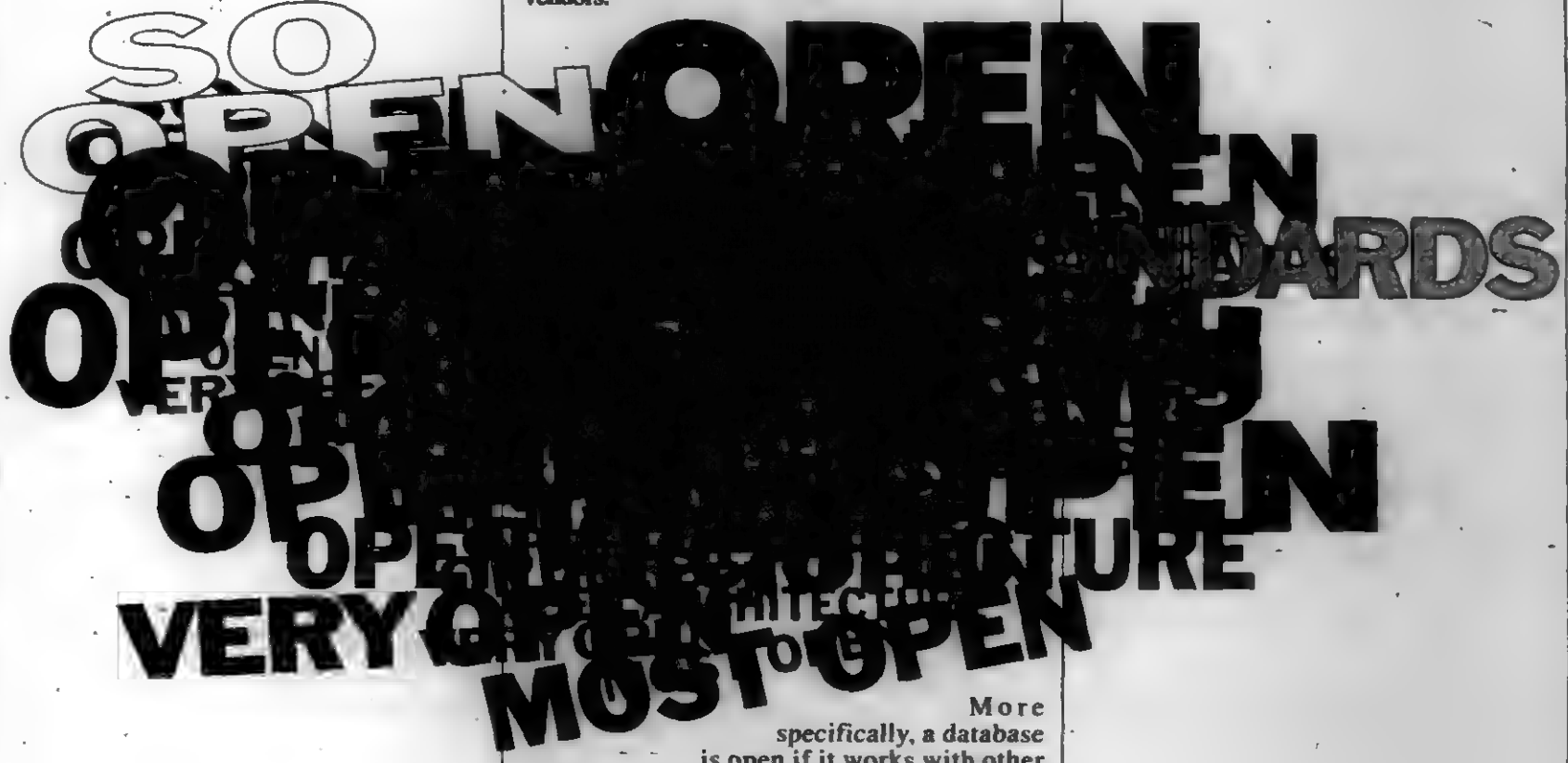
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Closing Arguments

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Today, some software companies claim that their software products are "open." They may even graft the word onto their product names. It is a confusing situation, but a clear definition of "open" is finally emerging.

Software is "open" only if it adheres to industry standards and works with products from other vendors.


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NEWS SHORTS

OSF runs distributed computing test

Last week, five leading computer vendors participated in what is said to be the first demonstration of the ability of the Open Software Foundation's (OSF) Distributed Computing Environment to distribute applications across multivendor systems. During the demonstration, which took place at the Cebit '91 conference in Hannover, Germany, networked Hewlett-Packard Co., Digital Equipment Corp., Groupe Bull, Siemens-Nixdorf and IBM computers cooperatively processed different subtasks of a financial application. The application involved accessing and processing data from the New York Stock Exchange and displaying the retrieved data using the OSF's Motif graphical user interface.

IBM shows OSF/1 on mainframe

In another Cebit demonstration, IBM ran the OSF's operating system, OSF/1, in native mode on a System/390 mainframe. IBM, which had previously run the OSF/1 demonstration at a closed-door Share user group meeting, also showed graphics-based software including Motif, X Window System and three-dimensional graphics applications on the System/390.

Institute aims to serve Third World

The United Nations University, a scholarly unit of the United Nations based in Tokyo, established a software institute last week that will train people in developing countries to build microcomputer applications software that meets the special needs of developing countries. The $30 million International Institute for Software Technology will be located in the Portuguese colony of Macau, near Hong Kong.

Informix suffers new loss

Following several months of accounting effort, Informix Software, Inc. said last week that it tallied $46.4 million in losses on 1990 sales of $146.1 million, and it does not expect to have a profit for the first quarter ending March 31. The redoubled accounting effort came after a January decision to restate all Informix revenue since the firm's founding in 1980. The accumulated adjustments were taken as a onetime charge in the first quarter of 1990, Informix said. However, slowed sales growth resulted in losses for the balance of the year as well.

IBM signs marketing deal

IBM and product information management software player Sherpa Corp. said last week they will co-market Sherpa's Unix-based wares on IBM's RISC System/6000 platform. For San Jose, Calif.-based Sherpa, the pact marks a key step in its plan to forge an interoperable product information management ring for manufacturing and engineering environments. Its roster of marketing partners already includes DEC, Sun Microsystems, Inc. and HP.

No trial yet in Lotus vs. Borland

At a pretrial conference with Lotus Development Corp. and Borland International, Inc. last week, U.S. District Judge Robert Keeton declined to end discovery or set a trial date in Lotus' copyright suit. He did say that the trial should be phased, much as it was in Lotus' suits against Paperback Software International, Inc. and Mosaic Software. Lotus wanted to go to trial in early summer. The next pretrial hearing is slated for June 18.

3Com switches to Du Pont cleaner

3Com Corp. claimed that it is the first Silicon Valley manufacturer to replace chlorofluorocarbon (CFC) solvents with Du Pont Electronics' Axarel 36, an alternative to CFC-113, which is commonly used to clean printed circuit boards. Axarel 36 does not emit harmful ozone-depleting substances. According to 3Com, its production facility will be CFC-free by June 1993, in compliance with international protocols on environmental protection.

More news elsewhere, page 105

Groupe Bull unveils OSF/DCE framework

BY SALLY CUSACK
CW STAFF

Groupe Bull unveiled its Distributed Computing Model last week — a combination of products and prototypes designed to take Bull users to open systems while attracting independent software vendors to the fold.

The framework, announced at the Cebit conference in Hannover, Germany, is based around the Open Software Foundation's Distributed Computing Environment (OSF/DCE) standards. Components announced included the following:

- Affinity, a line of micro-to-mainframe links for integrating Microsoft Corp.'s Windows-based personal computers with Bull GCOS 6, 7 and 8 operating environments, formerly available in Europe and now offered in the U.S.
- Open 8, which provides interoperability between GCOS 7, GCOS 8 and Unix environments and is scheduled for release in the second quarter.
- The previously announced Bull DPX/Prostation, a Unix-based workstation.
- The Open Team server environment, which allows customers to run Microsoft's LAN Manager in a Unix environment.

William McCusker, a Bull mainframe user at Citrus College in Glendora, Calif., said he was encouraged by Bull's move toward open architecture and the world of distributed computing. A former officer of the Bull Users Group, McCusker said users have seen a decided increase in both commitment and activity from the vendor during the past year.

"It's nice to see this come along; customers have been looking for it. But it would have been nicer had it come along about a year ago," said Wayne Kernochan, a senior analyst at The Yankee Group, a Boston-based research and consulting firm.

In addition to reassuring customers, Kernochan added, the announcement shows the European community that Bull is indeed serious about standards.

Roy McRee, assistant general manager of information systems at Graybar Electric Co., a Bull 9000 mainframe shop, said that while the model was not something he could implement at the present time, he would not rule it out for the future.

The model could win Bull new business in the public sector and federal government markets, according to Bob Tasker, vice president of software research at International Data Corp., a Framingham, Mass.-based research and consulting firm.

"This is a model, not a cookbook," emphasized Stephen P. Gardner, vice president of U.S. marketing at Bull HN Information Systems, Inc. "It can be implemented piecemeal by users as needed and can be used to plan future open specifications."

Rockwell CEO wins technology award

STAMFORD, Conn. — For the second straight year, Gartner Group, Inc. has chosen the head of a manufacturing company as the winner of its annual Excellence in Technology Award.

Donald R. Beall, chairman and chief executive officer at Rockwell International Corp., was selected by a group of nine information systems executives and one computer vendor executive. Xerox Corp. Chairman David Kearns was honored last year.

Beall was selected for promoting an IS strategy that has helped Rockwell make aerospace technology advances, communicate better with customers and improve product quality. El Segundo, Calif.-based Rockwell is the U.S.' fourth largest aerospace company, with 1990 revenue of $12.4 billion.

Beall will receive the award April 10 at The Conference Board's information management conference in New York.



Rockwell's Beall *earned Gartner Group's Excellence in Technology Award*

Morris contemplates Supreme Court option

BY MICHAEL ALEXANDER
[illegible]

The attorney for Robert T. Morris, convicted of releasing a worm program that shut down computers on the Internet network in 1988, said last week that Morris may take his case to the U.S. Supreme Court.

Morris received word last week that his appeal to the U.S. Court of Appeals for the Second Circuit was denied. Thomas Guidoboni, the Washington, D.C., attorney representing Morris, said three judges unanimously upheld Morris' conviction under the Computer Fraud and Abuse Act of 1988 in a 19-page decision released last week.

The appellate judges agreed with the trial court finding that the government was not required under the federal statute to prove Morris intended to cause harm and that he clearly lacked the authorization to access the computers on Internet that the worm program invaded.

"Naturally, both Robert and I are real disappointed with the result," Guidoboni said. "We are considering going further, but no decision has been made yet."

Morris is currently employed as a programmer at a software development company in Cambridge, Mass. Guidoboni declined to identify the firm.

Two options

Two legal options remain open to Morris. The first is to return to the U.S. Court of Appeals within one week and ask to have the case reconsidered. The second is to petition the Supreme Court within 90 days to hear the case, either directly or after having asked the Appeals Court to reconsider.

Asking the Supreme Court to hear the case would be an expensive gamble for Morris. If the Supreme Court agrees to hear the case, the cost of preparing and presenting the case would be considerable, Guidoboni said. He declined to say what Morris' legal costs have been thus far, but some legals experts have estimated that they are well in excess of $150,000.

Morris created the worm program and launched it on the Internet the evening of Nov. 2, 1988. A programming error caused the worm to replicate uncontrollably and within hours caused an estimated 6,200 computers to shut down.

In January 1990, a jury in a federal district court in Syracuse, N.Y., found him guilty under a provision of the federal computer crime statute. In May, a federal district judge sentenced Morris to three years' probation, 400 hours of community service and ordered him to pay a fine of $10,000 and about $90 per month toward the cost of his supervision while on probation.

NCR says no to latest AT&T takeover proposal

Analysts say NCR will accept eventual takeover but is delaying to gain better deal

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — NCR Corp. scorned a new, $100-per-share bid from hostile suitor AT&T last week.

While NCR's curt rejection caused AT&T to withdraw the bid, leaving the original $90-per-share bid on the table, analysts continued to note a marked shift from Chairman and Chief Executive Officer Charles E. Exley Jr.'s initial hostility to a posture of maneuvering for the highest price NCR can extract from AT&T.

"It's all coming down to strategy. How do you outflank your opponent when it's all going to come down to the shareholders' meeting as the battleground?" asked David J. Schofield, a research analyst at Duff & Phelps Investment Research Co. in Chicago.

"AT&T has got some interesting decisions ahead of it: Do you try to be preemptive, or do you lie back and let the votes go to see what happens after you get into the board?" Schofield added.

Analysts continue to say NCR's maneuvers will not help it escape AT&T, but they will probably get the company a better price.

"I don't think the chances of AT&T's ultimate success have lessened any, but I think the timing and cost have become more uncertain," said Maria Lewis, telecommunications analyst and senior vice president of the Lehman Brothers division of Shearson Lehman Brothers, Inc., a wholly owned subsidiary of American Express Co.

Lewis added she thought the timetable was now being dictated by Exley instead of by AT&T Chairman Robert Allen.

Analysts agreed that AT&T has damaged its own Computer Systems Division (CSD) enough to make it imperative that it acquire NCR as quickly as it can. The division gave more employees pink slips last week as part of its previously announced efforts to control costs, which it said came before the takeover was launched. The total is now more than 500, many of whom may stay with the company because of a hiring freeze on outsiders by AT&T. According to AT&T's CSD, 73 of those let go have had to leave the firm involuntarily.

The picture may become more clear after tomorrow's Federal District Court decision on whether NCR's recently established employee stock ownership plan is legal.

Wal-Mart opts for Unix gear

BY MICHAEL FITZGERALD
CW STAFF

BENTONVILLE, Ark. — Despite AT&T's hostile takeover effort, NCR Corp. has landed a major sale of its System 3000 series with Wal-Mart Stores, Inc., which has agreed to buy an estimated $20 million worth of NCR 3445 Unix processors for use in its stores.

The 3445 is an expandable uniprocessor server based on Intel Corp. I486 chips running at 33 MHz. It predates NCR's System 3000 announcement [CW, Sept. 24, 1990]. These systems will be installed in approximately half of Wal-Mart's 800 stores, replacing IBM Series/1 machines.

The store systems will be used primarily for inventory management, supporting merchandise planning and taking information from point-of-sale terminals. Wal-Mart ported its own applications software to several Unix systems in a test last year.

Hewlett-Packard Co. systems were installed last year in Wal-Mart's other stores. The HP and NCR machines will run the same software and perform the same functions. Wal-Mart purchased from both vendors as part of its effort to keep costs down.

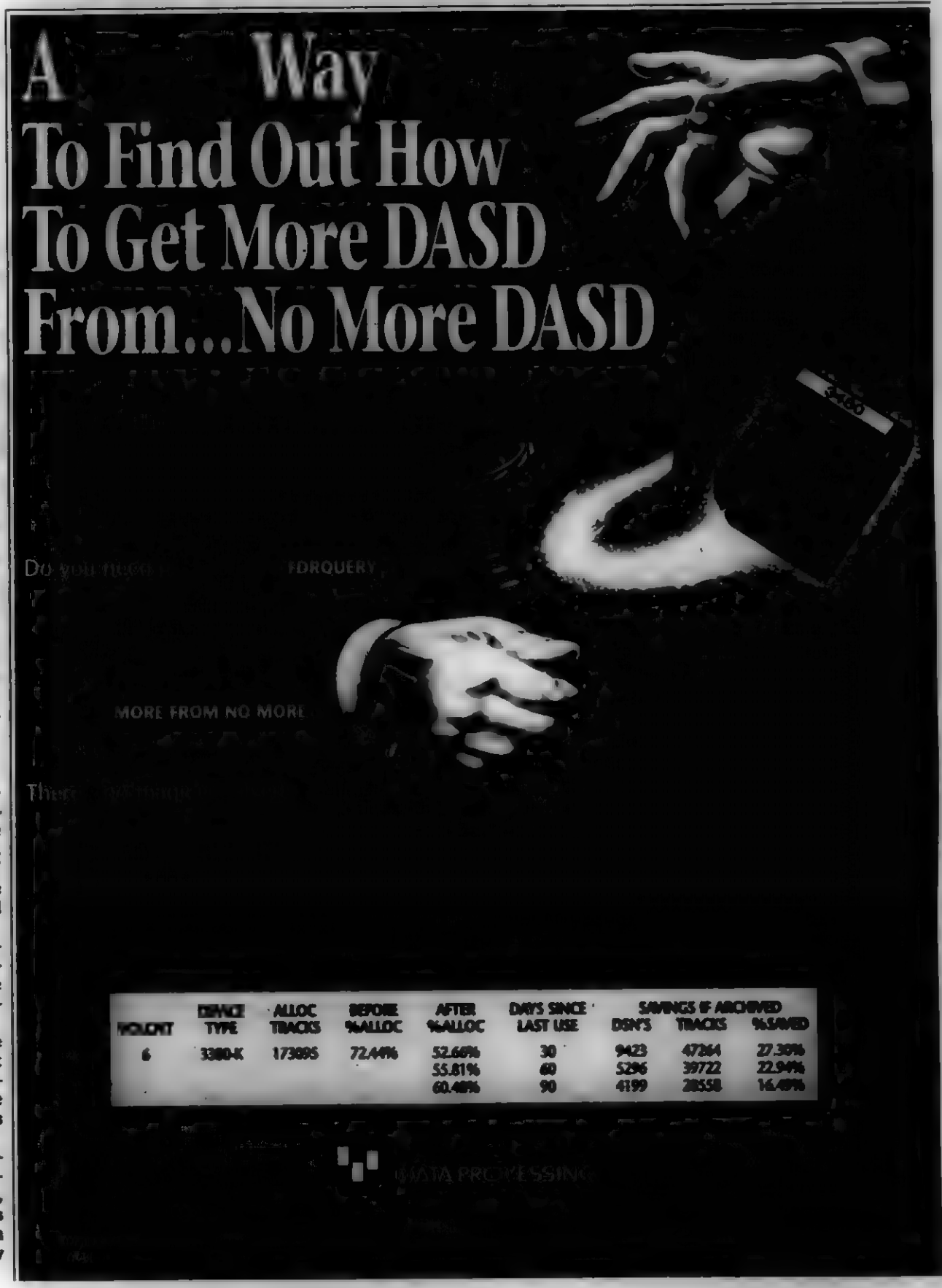
Adding flexibility

Bob Martin, senior vice president of corporate MIS at Wal-Mart, told *Computerworld* that "the key thing for us is we're on a technology platform that we can bend and flex a tremendous amount on." He added that NCR's "open architecture gives us a lot of flexibility to move and change as we need to."

Martin said he expected these machines to give Wal-Mart its in-store platform for the 1990s and allow it to do more with cooperative processing and interoperability.

Martin cited the scalability of both the NCR and HP machines, which won out over IBM's RISC System/6000, as another factor in the Wal-Mart decision. He said the company also looked at machines from AT&T and Digital Equipment Corp.

AT&T's bid for NCR complicated matters only slightly, Martin said. "We obviously crawled through the impact of that, but we do a significant amount of business with both companies, and we gained a comfort level that regardless of how things would go, we'd be OK."



IBM extends RS/6000 reach

BY PATRICIA KEEFE
CW STAFF

NEW YORK — IBM last week pumped up the performance and storage volume with additions to its RISC System/6000 family of workstations while also turning down memory and disk drive prices.

Missing, however, was a low-cost, entry-level Powerstation. IBM executives said a separate team is working in parallel on a low-end RS/6000 priced at less than $13,000. It will ship in the second half of this year, according to Phil Hester, IBM director of the Advanced Workstation Division's Engineering Center.

Such a computer is not perceived as a threat to the high end of the Personal System/2 family, said Jeff Mason, IBM director of advanced workstations and AIX systems. Besides the fact that most PS/2 users have a heavy investment in DOS, which will not run on the RS/6000, Mason said, the two product families are built to serve different purposes.

Overall, RS/6000 users are more likely to be new or non-IBM workstation users than power DOS users or IBM accounts, he added.

IBM is coming off of a good first year with the RS/6000, having shipped 25,000 units worldwide in 1990. Sixty percent of those sales went into non-IBM departments, while 30% went into non-IBM shops, according to IBM.

Price slicing

The additions to the RS/6000 family coincide with several promotions. Through September, IBM will slice $1,500 off the Powerstation/Powerserver 320, offer a 10% discount for configured deskside or rack-mounted systems and provide memory upgrade pricing incentives.

The new models included the Powerstation/Powerserver 320H, the Powerserver 950 and the Xstation 130. Available March 29, the Model 320H is a beefed-up version of the RS/6000's low-end 320. Improvements include a faster processor with a clock rate of 25 MHz, 16M bytes of memory and 160M bytes of fixed disk storage. Pricing starts at $20,501.

The Model 950 server shifts the 41.6-MHz processor found in IBM's Powerserver 550 into a rack configuration. The Model 950 will be available in June starting at $164,335.

The Xstation 130 terminal features higher performance graphics and I/O processors as well as more memory options than the Xstation 120. An entry-level monochrome system comes equipped with a 12-in. display, 2.4M bytes of memory and 1M byte of video memory for less than $3,000. A similar system with a 14-in. display costs $3,325. It is slated to begin shipping April 26.

The Powergraphics GTO is an external subsystem said to deliver graphics performance comparable to that of the Supergraphics Powerstation 730. It supports accelerated two- and three-dimensional line drawings, shading and other image viewing tasks. It is set to be available in August and costs $19,500 for an 8-bit color model and $29,500 for a 24-bit color model.

Also included in the announcement were the following:

- Increased data storage capacity across all models: The Model 500 Deskside Expansion Unit provides up to 3.4G bytes of additional storage. Pricing starts at $10,400. The Model 010 Drawer Expansion Unit (starting at $9,900) and the Expansion Rack ($5,500) allow the Powerserver 930 and 950 to support up to 22.2G bytes of disk storage.
- Memory price cuts: Add-on memory prices were reduced by 24% to 74%, depending on memory module size. Incremental memory, factory-installed by IBM, was cut by 44% to 66%. IBM also cut prices on two 5¼-in. fixed disk drives: the 355M-byte drive (by 26%) and the 670M-byte drive (by 32%).

Power tuneup

IBM's latest RISC System/6000 includes more powerful desktop and rack-mounted models



Model	Clock speed	Performance: Linpack DP	Specmark	Memory	Price*
Powerstation 320H	25 MHz	11.7 MFLOPS	32.4	[illegible] bytes	$20,501
Powerserver 950	41 MHz	25.3 MFLOPS	56.3	[illegible] bytes	$164,335

* 320H configured with 16M bytes of memory, 160M-byte hard drive, display and [illegible] software

* 950 configured with 32M bytes of memory, 857M-byte hard drive, CD-ROM drive and system software

CW Chart: Marie Haines

RISC

FROM PAGE 1

good prices, sales and marketing have never been a DG strength.

Washington Medical Center, a user of DG's proprietary MV midrange computers, evaluated systems from Sun Microsystems, Inc., IBM, Silicon Graphics, Inc. and Hewlett-Packard Co. "We found that even within the university discount framework, the Aviion offered a very good price/performance," said Thomas Lewellen, professor of radiology.

The university is using an Aviion 7000 machine to support an imaging device that displays metabolism in human beings.

Despite Aviion sales to Washington Medical, the Odessa Shipyard in Denmark and the New York Power Authority, several industry analysts expressed concern over the lack of support for the Motorola 88000 chip. DG is the only hardware vendor to commit to the architecture.

DG countered those perceptions by pointing to software support for the Aviion from developers such as Oracle Systems Corp., Informix Software, Inc. and Progress Software Corp.

The systems have an entry price of $96,000, which includes a deskside system with 16M bytes of memory and 662M bytes of disk storage. The high-end, rack-mount 8000 models offer 128M bytes of memory and 5G bytes of disk storage and are priced at $249,520.

"If you're going to be aggressive in standards-based systems, the basic delivery mechanism has to be small," said Tom West, DG's senior vice president of Advanced Systems Development, referring to the size of the quad-processor.

The symmetric multiprocessing systems run under the DG/UX 5.4 operating system and offer a VME interface for industry standard I/O functions.

DG's longstanding financial problems, including several rounds of layoffs and a string of losses, were alleviated somewhat when it showed a profit in its most recent quarter.

Lewellen said he is optimistic about DG's long-term viability. "We have not seen any erosion in support and service, even during the hard times," he said.

DG has a considerable lead in dollars per MIPS, but not necessarily in dollars per specmark, according to Chris Christianson, an analyst at Meta Group, Inc., a market research firm in Westport, Conn.

For commercial integer-based applications, DG has a decided advantage because of the speed. For floating point, scientific applications, the RISC System/6000 and upcoming HP machines are formidable challengers, Christianson said.

RISC factor

Aviion sales represented almost one-fifth of DG's product revenue last year

Percent of 1990 product revenue
Total: $785M



MV systems $588.75M

Aviion systems $133.45M

PCs $62.8M

Service revenue: $432M for all systems sold

Source: International Data Corp. CW Chart: Paul Moch

DEC slashes RISC prices

MAYNARD, Mass. — Digital Equipment Corp. last week announced price reductions and new configurations for its Decstation line of Unix-based reduced instruction set computing (RISC) systems.

The Decstation 3100 workstation dropped in price from $6,995 to $4,995, effectively replacing the Decstation 2100 system as DEC's entry-level RISC workstation. DEC also knocked $2,000 off the color versions of the Decstation 3100, which now start at $7,495 and $8,995 for 16- and 19-in. configurations.

Prices for all models of the Decstation 5000 family have been reduced by $1,500, and the company introduced a new monochrome version of the Decstation 5000 Model 200 MX for $12,495. The Decstation 5000 also received a memory boost to a maximum of 480M bytes.

Sun heralds speedier chip architecture

BY J. A. SAVAGE
CW STAFF

MENLO PARK, Calif. — Sun Microsystems, Inc. is scheduled to announce a chip architecture today that promises to allow for a faster chip with more conservative technology than the leading-edge reduced instruction set computing (RISC) technology announced last month by archrival Mips Computer Systems, Inc.

Despite its more conservative design, it will be able to run at up to 1 billion instructions per second, according to Phil Hueison, vice president and director of technology at Sparc International.

Menlo Park-based Sparc International is an independent organization responsible for testing Sun compatibles to ensure that they will run all Sun software.

Instead of focusing on large addressing space and arithmetic logic, Sparc Version 8 is focusing on the ability to string processors together in symmetric multiprocessing to increase computer speed, Hueison said.

The 32-bit Version 8 is a set of specifications that will be implemented differently by the nine semiconductor vendors that license it. Mips' specifications are not open to interpretation by semiconductor makers.

Sparc International is in no hurry to go to a 64-bit architecture because it would be far ahead of any software to take advantage of it. "There may not be [64-bit] software until the mid- to late 1990s," Hueison said.

Version 8 will have some 64-bit blocks, however. Its path to cache and main memory will be 64 bit, but its addressing will remain 32 bit. Its arithmetic logic unit is 32 bit, but its floating point unit can be 64 bit. Mips' R4000 will be 64 bit throughout. Version 8 is expected to be available this year. Mips has not set a date for delivering the R4000 but said it expects the chip to be in systems by late 1992.

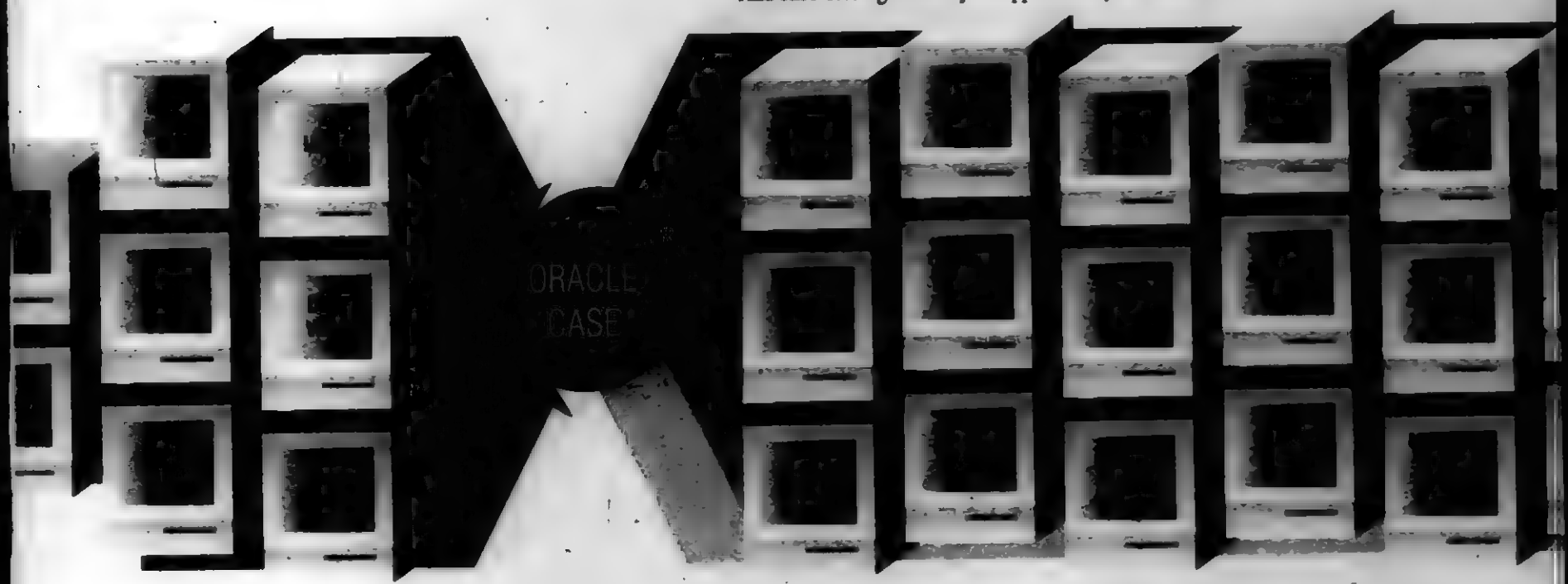
Also expected to be announced will be the Sun Mbus, a set of specifications that will allow a Sparc chip daughter card to simply be plugged into a motherboard rather than redesigning the board each time new chips come out. This will shorten time to market, according to Bill Keating, director of corporate technology marketing at Sun.

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Daimler-Benz races fast-packet loop

BY JOANIE M. WEXLER
CW STAFF

STUTTGART, Germany — The largest industrial firm in Europe is embarking on the installation of a $6 million, new-generation backbone this week to conserve vast amounts of expensive bandwidth and fuse its potpourri of incompatible networks.

Daimler-Benz, a $56 billion firm that European industry considers conservative in its implementation of new technology, will likely lead the fast-packet brigade in Europe by taking a pioneering plunge with the technology. The firm plans to install 14 fast-packet multiplexers — efficient packet-switching devices that are infiltrating companies that need to interconnect local-area networks and transmit other bandwidth-hungry traffic.

Daimler-Benz will use fast-packet IPX T1 multiplexers from Campbell, Calif.-based Stratacom, Inc., the only multiplexer vendor to date with an installed base of fast-packet equipment.

"The main impetus behind going with fast-packet is the money we'll save in bandwidth conservation," explained Claus Weier, network engineering planner at Debis Systemhaus GmbH, the computing and network services arm of Daimler-Benz. Weier said a three-node IPX beta test he has been running since July has shown the technology can reduce the bandwidth needed for existing applications by up to 40%.

In Germany, 2M bit/sec. E1 lines (the European version of the U.S.' 1.5M bit/sec. T1 lines) are two to three times the price of T1 links in the U.S., according to Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C. In other European countries, he said, leased E1 lines are often even more expensive, a situation that has thwarted many traditional circuit-switched T1 equipment sales in Europe.

"Daimler is putting in this network as a precursor to 1992, when the European Economic Community will open up and competition will drive rates down," Dzubeck commented. "Daimler justified the cost savings based on cost/performance ratios on today's dollar; they'll save even more money when the rates fall."

The wise choice

Fast-packet technology, the latest generation of packet switching, makes more efficient use of bandwidth by eliminating network overhead for error detection and correction on every network node. This is made possible by today's highly reliable digital communications lines.

The Daimler companies' myriad equipment embraces a variety of protocols — such as IBM's Systems Network Architecture, Digital Equipment Corp.'s Decnet and X.25 packet switching — linked via wide-area leased communications lines of varying speeds.

"Another goal with the IPX backbone is to merge all those separate networks onto a new corporate network for which the Stratacom multiplexing equipment will be the common denominator," Weier explained.

The initial 14-node network will link several thousand employees in the five Daimler-Benz firms in Germany, the largest of which is automaker Mercedes-Benz. The network is slated to ultimately support Daimler employees and third-party customers both inside and outside of Germany.

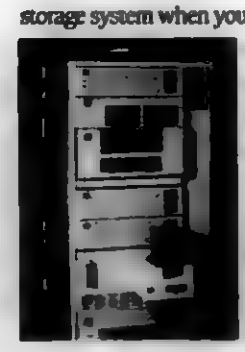
Fast-packet technology will support emerging videoconferencing, LAN interconnection and computer-aided design file transfer applications, Weier said. While he is hoping to someday fold voice traffic onto the backbone for additional bandwidth efficiencies, Weier said, the German Postal Telephone and Telegraph monopoly on voice traffic currently precludes him from doing so.

Full network implementation should be complete by midsummer, according to Weier.



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D&B Software still downsizing

U.S. work force hit hardest as firm trims 300 staff members

BY SALLY CUSACK
CW STAFF

FRAMINGHAM, Mass. — Dun & Bradstreet Software laid off 300 employees last week as part of a worldwide internal restructuring, company officials said.

The biggest hits came here in the U.S., where approximately 240 people were told they no longer had jobs.

According to company spokesman George Cohen, 75 employees were dismissed from the Atlanta offices and 75 from the Framingham headquarters. Another 40 were affected when the Southeast and Southwest operations were consolidated into one regional entity, and the remainder were drawn from various field offices.

D&B Software trimmed its international work force from 4,100 to 3,700 employees last year, when the company restructured itself following its birth in the merger of Natick, Mass.-based McCormack & Dodge and Atlanta-based Management Science America, Inc.

According to Cohen, one-third of last week's departures were because of redundant middle management and administrative functions; one-third were drawn from development, support and education; and the remaining third came from the marketing and field operations staff.

"We started planning the restructure last fall, and when we put the financial plan against the strategic plan in January, it was obvious we had to refocus resources to meet the changing market," said Hank Holland, D&B Software's president and chief operating officer.

More user attention

Part of the company's refocusing plan, according to Holland, is to place emphasis on account management sales, as opposed to the traditional new account sales. That could mean more attention for D&B Software's existing user base.

Holland denied internal rumors that more cutbacks would be implemented this summer and speculated that as the company restructures itself, there will be additional hiring this year, most likely in the professional services area.

Employees were given two weeks notice in addition to a severance package, and the vendor has contracted an outplacement firm to assist with interviews and resume writing.

Unisys to unload finance portfolio

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Struggling to reduce $3.7 billion in corporate debt, Unisys Corp. officials last week said the company would liquidate most of its finance subsidiary's portfolio by this summer.

The finance unit had approximately $750 million in outstanding debt owed to it at the end of last year, said a Unisys spokesman, who could not say if Unisys had found a buyer for these receivables.

"It was an obvious move because the finance sub wasn't getting new business," said David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago. Since last fall, when Duff & Phelps and other investment houses downgraded Unisys' investment grade, the finance group has found the cost of obtaining capital prohibitively expensive, Schofield said.

Unisys said the finance unit will continue to function as a marketing tool, helping customers arrange funding for Unisys equipment from other sources.

Minimal customer impact

The impact on customers should be minimal, leasing analysts said.

"In some captive leasing companies, it is standard practice to write a lease with an end user and then sell it off to investors," said Thomas J. Donovan, director at Technology Investment Strategies Corp. in Framingham, Mass.

During a liquidation of this scope, Donovan added, some users with special needs might experience some "confusion and bumps." He said the buyer of a portfolio of this size would probably be a large financial services company rather than a computer leasing company.

Although it has not specified which assets it has on the block, Unisys has publicly indicated it has about $1 billion in assets up for sale. Rick Martin, a Prudential Securities, Inc. analyst in New York, said he has been told privately by Unisys that it still hopes to sell $500 million in assets by the end of the year — a target he thinks the company will reach.

As a wholly owned subsidiary, the group will now have its own financial statement. Unisys could also decide to spin the company off as an independent, as Honeywell, Inc. did several months ago, Martin said.

A third possibility, Martin said, is that Unisys will smooth the way for the acquisition of some or all of its commercial business by a foreign buyer. Previously, many industry analysts had noted that because of the defense unit, Unisys would run afoul of U.S. government regulations if it was bought by a foreign firm.



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GTE Directories looks to outsourcing

Phone book producer cuts 35 IS staff members, prepares to farm out much of its work

BY JOHANNA AMTSCHEID
CW STAFF

DALLAS — GTE Directories Corp. last week fired a portion of its systems development personnel and reorganized its information systems group in a step toward greater reliance on outsourcing.

A producer of Yellow Pages phone books, GTE Directories fired 35 people in the database administration group, among others, out of a systems development staff of 183. An additional 100 or so other IS people work in areas such as operations and telecommunications. GTE Directories is a subsidiary of GTE Corp. in Stamford, Conn.

The reorganization split the IS staff into project teams. Previously, the IS group was aligned around the user organizations and took their direction in an "unscheduled, unplanned fashion," according to a GTE Directories spokesman. He said no further IS personnel cutbacks are planned.

"We are not going to be a company that builds applications," said Doug LaVelle, vice president of production and information management. "We are going to buy packaged software, customize it and integrate it into our overall systems plan. This is our strategic direction."

LaVelle said the company is "aggressively looking at" replacing its current directory publishing system, which consists of homegrown software for page layout and other functions, with a series of packages from a company called Amdocs in St. Louis. The Amdocs software is used by other directory companies, including Southwestern Bell Telephone Co., which owns a stake in Amdocs and competes with GTE in the Dallas area.

The old system, called Ramp, runs on IBM mainframes. The Amdocs software runs on Digital Equipment Corp. machines and is based on a proprietary database management system. GTE Directories already has one Amdocs package in production for pagination, with another for telephone sales in development. Others are to be implemented within two years.

The total cost of the project — hardware and software — is said to be $70 million, a figure that LaVelle would neither confirm nor deny.

Differing opinions

Observers differ in their views of GTE Directories' new strategy. "I totally agree with the direction," said Don Cotton, former vice president of GTE Directories' Information Management Group, who is now retired. "They're going with a decentralized mode of computing rather than a centralized one. It may even result in more processing power, just more spread out."

Perhaps understandably, one of the fired IS staff members does not see it quite that way. "Management didn't feel that our in-house MIS staff could develop this type of functionality within two years, and I agree with them. But at the same time, I'd continue to train and develop the IS staff to take over when the Amdocs development is done. You don't want to entirely trust the business to outsiders, especially when they are partly owned by a competitor," the staff member said.

Goodyear cuts IS work force

AKRON, Ohio — Goodyear Tire and Rubber Co. announced last week it will slash 1,100 white-collar jobs from its work force and cut capital expenditures 39% from 1990 levels. However, the effect this restructuring will have on the information systems department was not clear to company IS officials last week.

"We don't know how the [reductions] will happen . . . by attrition or what," said Nick Guistino, manager of information services at the tire company.

Goodyear has said the job reductions and other cost containment measures will amount to a savings of $165 million annually by 1992. In addition to announcing the staff cuts, Goodyear said last week its capital expenditure budget will be reduced to $350 million, down from the approximately $450 million it had planned to spend this year.

Since January 1989, 12,000 positions, or more than 10% of the work force, have been eliminated at Goodyear. Of these, 6,700 were white-collar jobs. Guistino said these earlier cuts had meant only a handful of attrition reductions in the centralized operations and systems support staff, which today has about 225 people.

Goodyear's programming staff reports directly to Goodyear's eight business units (five for tire and three for general products) and reflects the decentralization of the function that occurred several years ago.



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ADVANCED TECHNOLOGY

Fighting your battles in a world of the future

Battletech uses technology once limited to military flight simulators in a war game arena for the populace

BY ELLIS BOOKER
CW STAFF

"Left! Go left! They're on your tail!" Sure enough, my radar screen plainly shows an enemy Battlemech with its hideous array of weaponry — ranging from machine guns to particle projection cannons — trained on my back.

Instinctively, I try to use the joystick in my right hand to swing around to confront my attackers, even as the sound of explosions engulfs my "pod." My pod is a closed compartment containing a "radar" screen, a second color monitor displaying the battlefield as well as numerous lights and buttons for controlling advanced features.

Opened last August, the Battletech Center in Chicago is as close as most citizens are likely to get to experiencing a military flight simulator. For $7 for 10 minutes of play, up to eight people — or two teams of four — enter a compelling virtual reality set in the year 3028. Once shut into individual pods, players find themselves on a 100-sq-mile desert plain spotted with boulders and some leafless trees — an ideal locale in which to blast any opponent.

You and your opponents are in command of Battlemechs, not so much a tank as an H.G. Wellsian nightmare: a 30-foot-tall, walking robot containing a human driver.

Each cockpit is equipped with a Motorola, Inc. 68020 CPU, a memory board with 32M bytes of random-access memory, a scaling board for geometric computations, a sound board featuring a number of processors for both sythesized and sampled sound, and a Commodore Business Machines, Inc. Amiga 500 computer. A Datapoint Corp. Arcnet network, with a few 25-MHz Intel Corp. 80386-class computers attached, ties it all together.

But won't home computers, equipped with next-generation graphics and sound soon be able to duplicate the Battletech experience?

"At some point in the future what we offer here will be repeatable in the home environment," acknowledged Ross Babcock III, who created the game along with Jordan Weisman. "We'll be ahead by then. We see ourselves in the three- to five-year gap between the time this technology leaves the military simulators and ends up on the home market."



The Battletech *simulator brings you face-to-face with a variety of well-armed foes*

Like all good magic, the Battletech Center prompts a willing suspension of disbelief from the moment its audience arrives. While players wait their turn, for example, they can walk around a 4,000-sq-ft space to an "observation deck" where screens show what each player views from inside his Battlemech. Meanwhile, screens feature canned news reports with descriptions of recent battles or political events from the Battletech universe.



Connected 'pods' *let teams compete inside a virtual universe set in the distant future*

Even the architecture of the Battletech center — heavy on metallic-looking walls and bulkheads with radiation danger signs — works to support the illusion.

The two creators emphasize the importance of having programmers who understand the goals and "feel" of the simulated world. The game's programming was done by a local freelance firm, but a three-person, in-house software department will gradually take over coding.

How's the game? At close quarters, incoming Battlemechs can jerk about and disappear briefly from the screen, an artifact that next-generation software should address.

The game requires you to toss out your experience with arcade-style joystick controls. My own mistake was to depend on the joystick for movement control. In this simulation, two-foot peddles govern direction; a throttle under the left hand controls the speed of the tank.

Weisman and Babcock said they hope to open four more "virtual world" centers by the end of the year and another eight centers next year. They plan to link centers using telephone lines, allowing players in different cities to conduct tournaments.

Future centers will move into other types of simulations, including a flight simulation due next summer.

After the assault on my back, I discover that my forward view is shifting hesitantly up and down. An instructor leans in over my shoulder and deftly hits a couple of keys, bringing up a schematic diagram of my damaged unit. "Yup," he says knowingly. "They hit your servo motors."

Bellcore database could make phone numbers last a lifetime

BY GARY H. ANTHES
CW STAFF

"Normally you send transactions to the database. We send the database to the transactions," said Gary Herman, a network systems researcher at Bell Communications Research, Inc., or Bellcore, in Morristown, N.J.

It is an elegant but simple explanation for a new database architecture developed by Bellcore, the research arm of the regional Bell holding companies. Called Datacycle, it may someday be used by telephone companies to assign unique, lifetime identifiers to millions of telephone subscribers. Calls could be made to a person's ordinary telephone number or addressed to his lifetime identifier or to a "vanity" number such as "BEST-CPA-IN-TOWN."

Datacycle sends all of a database multiple times per second past an array of independent processors, each equipped with smart filters that pluck from the torrent of data just what is needed by that processor at that instant.

Because all data is read every cycle, the database does not have to be indexed or organized to support access to any particular attribute and hence can be application independent. The method also allows concurrent, read-only access to the database by any number of processors without interference among them.

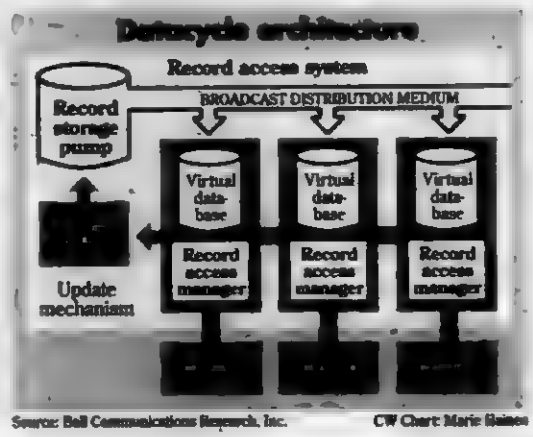
Customers expect telephone companies to process large streams of telephone calls against huge databases in real time. One way to handle the work load is to add multiple processors to a system, but communications among processors limits overall performance. "The processors spend more time talking to each other than doing real work," Herman said.

However, with Datacycle, all processors see the entire database and they see the same snapshot of it at any time, so interprocessor communication is unnecessary. By adding more processors, performance can be boosted essentially without limit to give subsecond access to any data element. "Once you pay the price of a fast, full database scan, the queries are free," Herman said.

In a Bellcore prototype, a centralized "record storage pump" broadcasts a 32M-byte database two times per second. Processors that read and filter the data are decentralized, but writing to the database is performed centrally by a conventional processor.

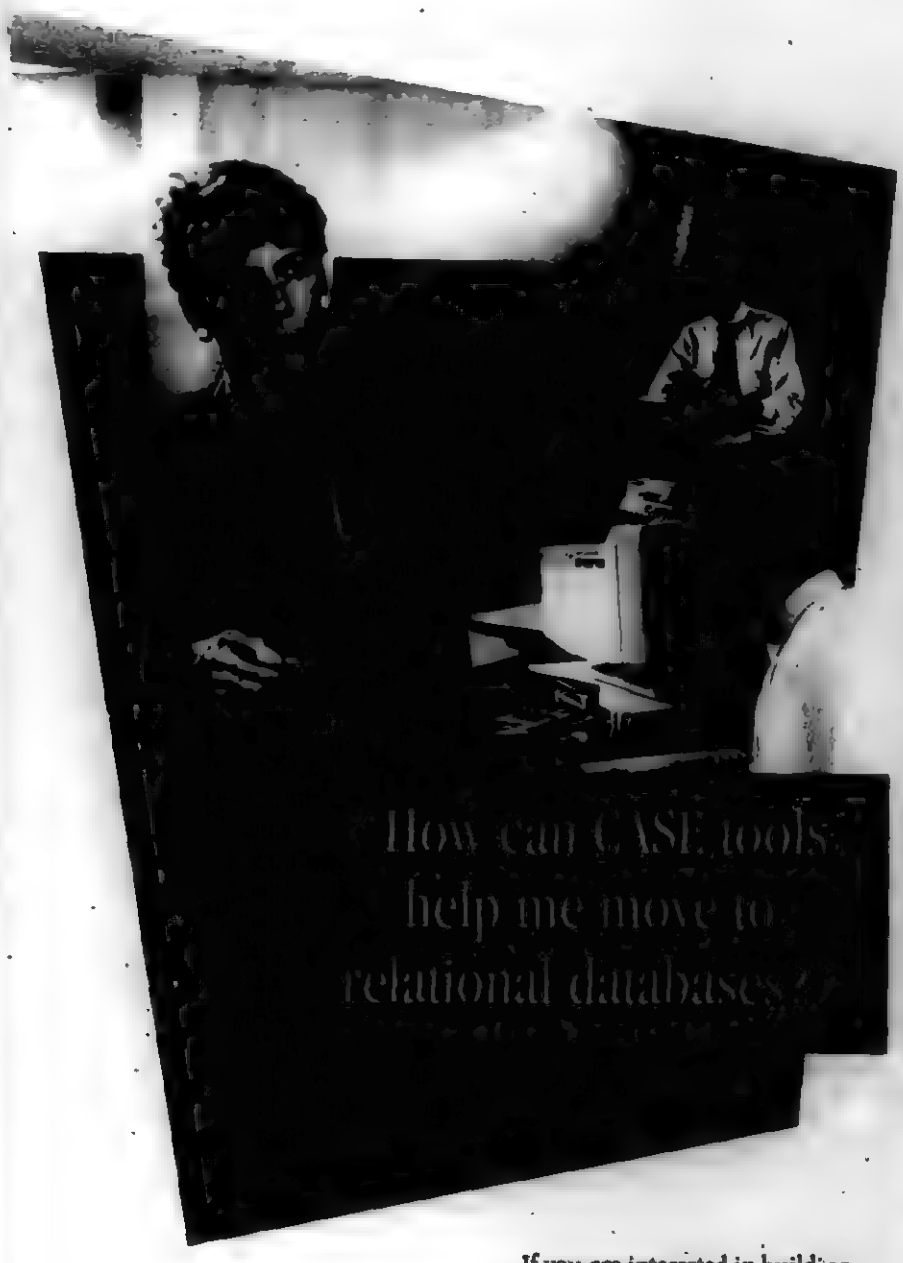
The key to the approach lies in the data filters, Herman said. They are custom-built, very large-scale integration circuits that can apply Boolean selection logic to as many as 28 data fields at one time.

Telephone companies could use Datacycle to move large amounts of data quickly over fiber-optic cables from a central database to processors at switching offices many miles away.



Source: Bell Communications Research, Inc. CW Chart: Marie Haines

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EDITORIAL

Under heavy fire

ON THE VIEWPOINT page three weeks ago, 3Com founder and Ethernet inventor Bob Metcalfe — with tongue planted firmly in cheek — suggested that Microsoft be investigated for violating any number of federal anticompetitive rules.

Few at the time knew that the Federal Trade Commission was doing exactly that — and had been since last summer. Some software companies last week reported they were first contacted about six weeks ago by the FTC in connection with the investigation Microsoft confirmed last week (see story page 1).

To date, the inquiry has reportedly been confined to a November 1989 press release from IBM and Microsoft in which the companies tried to make a case for customers' buying OS/2 while placing limits on the scope of Windows.

The genesis of the investigation may never be known, but there's no shortage of Microsoft competitors dancing on the ceiling at the prospect of what such an inquiry might yield.

The grudges harbored against Microsoft run deep and center on strongly held beliefs that Microsoft:

- is too powerful (it is, but that's not necessarily illegal).
- willfully misled applications developers down an OS/2 dead end (good luck proving the willful part).
- maintains a proprietary lock over the desktop computing standard — MS-DOS — at a time when customers are demanding "open systems," and much of the industry is rushing to line up under such a banner.
- restrains fair trade by making vaporous product announcements about everything from applications to desktop publishing software to pen-based operating systems just to cheese off its competitors and create fear, uncertainty and doubt.

The last allegation was used in the past against IBM, and successfully so, as Metcalfe noted.

Whatever the outcome of the current investigation, we are sure to get at least a kangaroo court-style hearing on one key question: Should Microsoft's burgeoning business be split into two, if not more, distinct businesses?

Microsoft could greatly reduce the likelihood that this debate will ever develop by essentially imposing on itself, and convincing the software development community that it adheres to, the same ilk of rules the feds imposed on IBM to stop its bundling practices. That is, treat the applications and systems software businesses as though they really are separate.

Microsoft has long claimed such a separation exists, but few competitors have ever taken that assurance at face value. The company obviously has to go further to embrace outsiders in the development of MS-DOS and Windows, in other words offering some of the input and access that an official standards body provides. Failing in this type of active appeasement just might prompt discussions that would soon point to a most inappropriate action, and that is punishing a company for the very success it has earned.



LETTERS TO THE EDITOR

Mixed blessings

I read the article titled "CA users fume over new fees" [CW, Feb. 4] with mixed feelings. While I would rather not spend my company's money to move to VSE/ESA, I think the technological ramifications of VSE/ESA were glossed over in the article.

Users have waited for VSE to become "strategic" again for a long time. Now IBM has done this, stating quite clearly that VSE/ESA is entirely new. To quote IBM documentation, "VSE/ESA is a replacement for VSE/SP."

The most important issue here is that IBM has delivered this long-awaited and well-received operating system, and my CA software exploits its capabilities today and in the future. Additionally, some of the restrictions that VSE/ESA has in what can run in the new dynamic partitions have been removed by the use of CA products.

George Rodriguez
AVP, Technical Support
Capital Bank
North Bay Village, Fla.

CA responds

In response to recent references in *Computerworld* [CW, Feb. 4, 11, 25] to the Computer Associates policy with respect to the operation of our VSE software products under the new VSE/ESA operating system, allow me to clarify the following:

- All of our VSE software products already support VSE/ESA.
- All of our VSE products can be run under VSE/ESA without payment of any additional license or maintenance fees.
- We have developed for certain of our VSE products chargeable but optional ESA modules that exploit the substantial increase in functionality offered by VSE/ESA.

CA regrets any confusion created by mistaken reports of our policy given our record of software achievements enhancing the VSE environment, our commitment to our VSE clients and our enthusiasm over the advanced capabilities presented by this computing environment.

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Chief Executive Officer
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Garden City, N.Y.

People power

With the phrase ". . . people are our most important asset" ringing in my head, I read with great interest how the six surveyed directors of information systems would spend an extra million dollars [CW, Dec. 24/Jan. 1].

As H. Ross Perot said recently, "Developing people exceeds the value of capital expenditure 10 times out of 10."

Richard Hammond
Consultant
Hammond, Glandon & Associates, Inc.
Baltimore, Md.

Unix endorsed

Myth four, "Unix programmers are flaky, scarce and expensive," in Mr. Ozsvath's article in your Feb. 11 issue is very amusing.

Our firm has specialized in Unix software services since 1983. We believe there are about 250,000 Unix programmers out there, of whom we have about 60,000 in our database. Based on personal experience, these are highly professional, creative people.

I heartily endorse Mr. Ozsvath's statements regarding the cost savings realized by developing applications under Unix.

Jonathan Wallace
Vice President
Pencom Systems, Inc.
New York, N.Y.

Are we blushing?

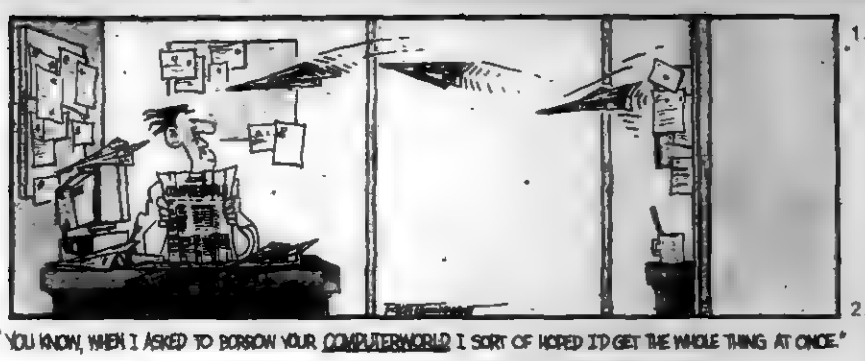
The training article "Business as usual for disabled" [CW, Feb. 11] leads off with, "At first blush, training disabled people to become productive information systems professionals may seem to pose unique challenges."

You must have lost most of your audience from the "git go" I'm afraid. As a nondisabled professional, on behalf of my challenged colleagues, I must take exception to the format chosen to begin what turned out to be a reasonable, informing article.

At first blush! Is that some esoteric, new-age term with which I am unfamiliar, or are you insinuating it may be *embarrassing* for your reader to be associated with, coordinate training for or look at the disabled IS professional? I hope to heaven the latter was not meant.

Karen Lee Cocks
Programmer/Analyst
South Portland, Maine

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*



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Down with yuppie marketing!

It's time for facts, not fluff, and teamwork instead of ego padding

DENNIS COLEMAN



Something *stinks in the U.S.* technology marketing culture. It grows in the detritus of the 1980s and is called yuppie marketing. Eventually, natural selection will replace self-serving yuppie marketing with team-serving real marketing, but we should accelerate the process.

Having caught some obvious waves during the go-go '80s, yuppie marketers feel they have "the touch." When the surf is down, however, these folks are not a pretty sight. They don't know what to do, except complain about recession, push perfunctory standards, try to avoid layoffs and hope for the best.

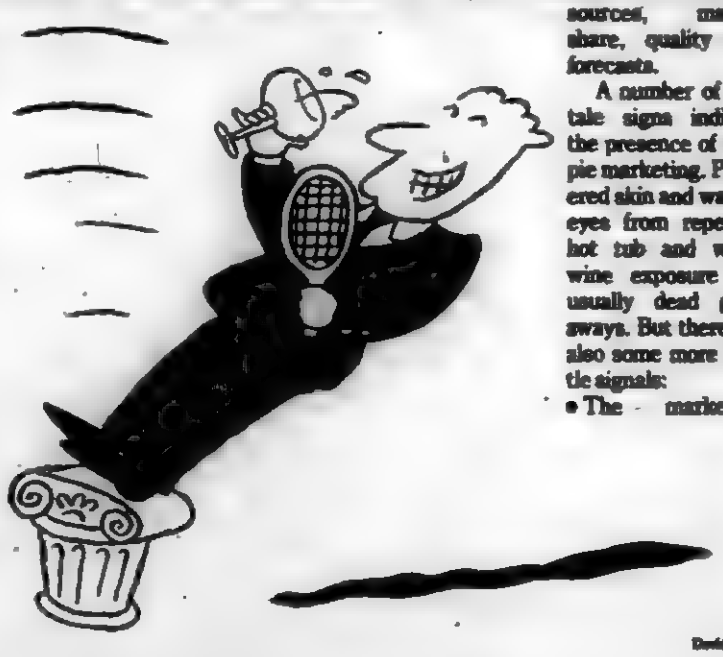
Yuppie marketers won't be able to hold onto their grandiose job titles for much longer. Their philosophy of mindless consumption is simply incompatible with the competitive and even hostile landscape of technology business development in the 1990s.

Foreign competition prays that the U.S. marketing machine remains stuck in its current rut, because our malaise effectively allows them to eat our lunch. But we don't have to answer these prayers. We don't have to be perfect to win, either. We just have to recognize the need to cleanse ourselves of certain bad marketing habits such as groundless optimism, hype reflex, tendencies to blame the other guy and avoid risk and a shallow preoccupation with personal wealth, status and early retirement.

Through applied marketing science, self-denial and mental conditioning, U.S. technology marketers can stop, and maybe even start to reverse, the erosion in our competitive position.

Real marketing is macho. It relishes teamwork and increasing value for both client and shareholder. It seeks position, not short-term revenue. It is brutally honest and brings bad news as reliably as good news. It reports the real business situation, justifies the product direction, clarifies uncertainties and calls for sacrifices to meet market requirements. It is objective enough to cancel a losing effort (even to the point of laying itself off) and leave a winning one alone.

Real marketing has nothing to do with ownership of upscale cars with phones and custom license plates or with compensation, titles and office sizes. Its actions are not fluff-based. They concern real things such as strategies, products, tactics, resources, market share, quality and forecasts.



David Bohn

A number of telltale signs indicate the presence of yuppie marketing. Puckered skin and watery eyes from repeated hot tub and white wine exposure are usually dead giveaways. But there are also some more subtle signals:

- The marketers don't know who the clients are or what they are doing with the products.
- The marketing plan has no downside other than sales not trying hard enough.
- Marketing is afraid to pull the trigger, track progress against plan, take profit and loss responsibility or participate in postmortems of lost opportunities.
- Marketing avoids messy issues such as irate user groups, product damage control and quality assurance.
- There are more consensus-building meetings on a given marketing question than relevant attendees.
- The marketing plan needs more than 10 pages to document or three dimensions to present.

Second-generation technology purchasers won't be fooled again by the chorus line approach of yuppie marketing. Businesses will avoid suppliers whose strategy only seeks maximum payment for minimum value. Buyers will gravitate to products from companies that understand and practice real marketing.

Real marketing is America's secret weapon. Let's use it before it's too late.

Coleman is a technology marketing consultant based in Half Moon Bay, Calif.

Belt getting tight? Try these exercises

MICHAEL COHN



Times are hard. Money's tight. Chief financial officers are brutally slashing information systems expenses. You've probably been asked to do more with less — less MIPS, less DASD, less bodies and less sleep.

All is not lost. With a little creativity, you can find ways out of this mess. Here are some ideas on how to get by on a microscopic budget:

- **Teach your folks to share.**

Quit spoiling your staff. In the old days, we all stood in line at one card punch machine. You can get by with just one terminal for every three programmers. No one will complain; they'll be too busy fighting over the department's only keyboard.

Too drastic? Okay, try this. Monitor idle terminals. If one sits quiet for half an hour, remove it. You'll be amazed how often no one touches a terminal for 30 minutes — especially because response time is usually about 40 minutes.

- **Make your users do more.**

Look, most users are already trained to fetch reports from bins outside the computer room. So why not let them in to burst and sort the stuff themselves? What's wrong with that? And as long as they're back there, is there any harm in asking them to mount a tape or two? I'll bet a few could even pick up Pascal, with a little encouragement. Pretty soon you'll be able to cut back on coders.

- **Manage smarter.**

Small budgets can still get big results, if you manage your people right. Make them more productive. Stroke them. Support them. Show them you're behind them 100%. Better yet, show them you're behind them 100% holding a very pointed stick.

- **Make IS a profit center.**

Too many executives see IS as an expense. You can change that. Deploy technology in your enterprise so that it not only saves money but makes money.

Push competitive advantage. Create a strategic IS plan. But just to be on the safe side, toss in an IS bake sale, and send your staff around desk to desk with some of those big candy bars for a buck.

- **Buy used.**

Why insist on new equipment? Why pay top dollar? In hard times, find hard bargains — buy used.

A lot of used equipment is as good as new. Of course, a lot of used equipment is also junk. The main thing to remember is, if you buy used computers that don't work, you should also make sure to buy used beepers that don't work.

- **Streamline.**

Cut the fat out of IS. It's time to run lean and mean. Reduce your staff to the minimum mix of essential IS professionals.

This might panic the whole department, so be fair. Give each employee careful thought, evaluation and consideration. Then break the news gently. Call everybody into a big room, line up a handful of chairs in the middle, and start the music. Everyone will get the idea.

- **Prioritize.**

Everyone can't have everything anymore. Sit down with your users and prioritize projects and fixes. Divide everything into the nice-to-haves vs. the must-haves. Then prioritize the must-haves into the need-it-nows vs. the needed-it-yesterdays. Separate the needed-it-yesterdays into the somehow-got-by-without-its vs. the I-can't-wait-anymores. Finally, split the I-can't-wait-anymores into the skip-it-it's-too-lates vs. the forgot-what-it-was-in-the-first-places.

By the time you've finished, no one will be looking for anything — so you can send everyone home early.

Cohn is trying to be a computer salesman in Atlanta.

Always bringing up the rear

READER'S PLATFORM

HELMAR B. HERMAN

Like the famous comedian, "I don't get no respect."

Twenty-two years ago, I started out as a systems programmer on an IBM 360 Model 30 using DOS Release 16 in an assembler language shop. For a few years, I was in unenlightened bliss.

My feelings of inadequacy began when I found out that our sister company ran OS, a "real" operating system, on a Model 50! I saw all of the "neat stuff" (that's how we talked back then) that OS could do and began to be a little ashamed of my beloved DOS (never mind that I could run three partitions using only 8K of core for the supervisor!)

Then, my PSR (Remember those? Back then, IBM had guys who would come out, roll up their sleeves and really *help* you!) told me that PL/1 was the language of the future. Assembler seemed to lose its luster. Even Cobol seemed somehow more glamorous.

Things progressed in this manner from year to year. VM was coveted and finally acquired. We even managed to be one of the first in some things. DOS/VS and VSAM were installed and used heavily as soon as they were available, so I felt right on top of the world for a while. Never mind that VSAM under OS/MFT allowed things such as user catalogs.

Even in recent years, when I finally got to work on OS (now called MVS), it was only the SP version. I sure wanted to try that XA version! Deep in my heart, however, I still preferred working on our VSE system. It fit like a warm comfortable sweater. It didn't have the tendency to do things for, or to, you.

Now I work for a fun new company, on a personal computer, developing programs for our desktop Magnetic Ink Character Recognition laser printer. I still find myself defending my "archaic" language (I use Microsoft Quickbasic) against our hotshot C programmers. "No, it's *not* just a beginners language." "No I *don't* use GOTO's and single-character variable names!"

I've even come full circle on my operating system. Yes, I'm back to using DOS. No, we haven't yet converted to OS/2, AIX or even Microsoft Windows.

When am I going to pick a component to use that will place me, even briefly, at the leading edge of my art, to the envy and admiration of all my peers?

By the way, my car isn't so bad either. Have you ever really *tried* driving a Yugo?

Herman is director of product development at Buttonline Technologies in Exeter, N.H.

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COMMENTARY

J. A. Savage

Open system reality check



There's hope: The recession won't hit the company and you'll still have those nifty bonuses and a big fat expense account. Then there's reality.

There's hope: Unix-based computers are cheap. Unix International and the Open Software Foundation (OSF) promise to narrow down the myriad flavors of that standard operating system to two so you can run most applications between cheap computers without having to port them.

Then there's reality — or shades of reality.

Sure, in the mid-1990s there may be only two dominant flavors of Unix. But between now and then, vendors such as Hewlett-Packard, Sun and NCR are working furiously to write layers of software — many, many layers of software — to add to the Unix equation.

Consumers won't be picking between the OSF and Unix International. Go ahead, pick one or the other, but then you'll be faced with an avalanche of acronyms — layers of software — from which you must also choose.

The acronyms are not applications but lower levels of software that allow the Unix operating system to do such things as share files, manage objects and seek out free MIPS, among other operations. By the time the OSF and Unix International have their vanilla operating systems,

Continued on page 32

RS/6000 grabs attention of S/36 users

BY MARYFRAN JOHNSON
CW STAFF

As IBM's System/36 lumbers down the road to extinction, the search for alternative computing power is pulling some users in a direction IBM may not have anticipated.

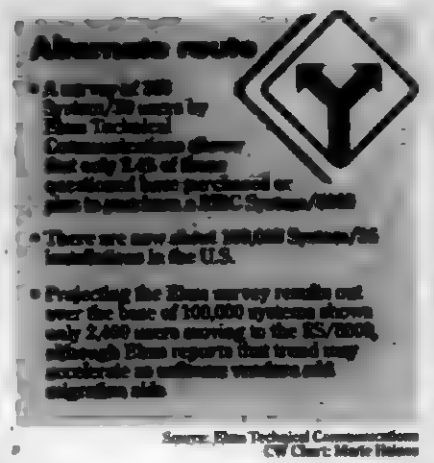
These customers are rejecting IBM's push toward its proprietary Application System/400 and shifting their gaze to the Unix-based RISC System/6000 instead.

One prominent example is the Marriott Corp. hotel chain, which last week moved its first RS/6000 into the accounting department at the Marriott in Greenbelt, Md.

"We are pleased with what we see so far. If somebody is looking for speed, this is it," said Michael Klein, information systems manager for hotel accounting systems.

Marriott has clocked in performance gains seven to 10 times greater with the RS/6000, while a move to an AS/400 would have only doubled the performance of the System/36 at a much greater cost, Klein noted. "If the performance works out the way we expect, there is no reason we couldn't go to more of them."

The hotel chain still has 130 System/36s running an internally developed accounting application written in RPG-II. To move that application from the System/36 to the RS/6000, Marriot used Unibol/RPG-II, a bridge language compiler from Software Ireland Ltd. in Belfast, Northern Ireland. The compiler is distributed in the U.S. by Arccom Support Group, Inc. in Marietta, Ga.



Source: Elms Technical Communications
CW Chart: Marie Hulsey

The "bridge" refers to Unibol's ability to allow applications software developed in a non-Unix environment to be migrated to Unix platforms with a minimum of disruption for users.

"The Unibol product let us keep the System/36 operating system, SSP, and emulate it in the way we were used to it," Klein explained. "Unix is effectively masked from my users. Eventually, we will rewrite the whole package under AIX [IBM's brand of Unix], but in the meantime, the Unibol gives us a nice bridge."

Applications specific

Users finding such a move attractive seem to be those with single applications in industries such as health care, retail, professional services or manufacturing, said Teresa Elms, president of market research firm Elms Technical Communications in San Diego.

In a recent survey of 368 System/36 users, Elms found 2.4% had purchased or were planning to purchase an RS/6000. While the numbers are far from overwhelming — out of 100,000 System/36 owners nationwide, 2.4% tallies to only 2,400 users

Continued on page 32

Users not quite ready for Ultimate upgrade path

BY JOHANNA AMBROSIO
CW STAFF

EAST HANOVER, N.J. — Pick may be the operating system's name, but Unix is now the game for users who said they are looking forward to blending Pick with Unix, only not right away.

Users said that merging the two environments allows them to keep their applications written in the Pick database environment but add communications and other Unix features. It also allows users to adopt newer Unix-based hardware and forsake the proprietary Pick computers they have been using.

One way to do this is with a new operating system from The Ultimate Corp. in East Hanover, N.J. Called Ultimate Plus, it allows users to run their Pick applications on top of AT&T's System V Release 3 operating system as well as IBM's AIX. Ultimate Plus will be generally available next month for the Hewlett-Packard Co. 9000 series, with other implementations to follow. Users need to license the hardware vendor's Unix implementation and then put Ultimate Plus on top of that.

Ultimate Plus joins the half-dozen or so other Unix/Pick blends on the market, among them Advanced Pick from Pick Systems in Irvine, Calif., and Universe from Vmark Software, Inc. in Natick, Mass.

Michael J. O'Donnell, chairman of Ultimate, said his company's Unix/Pick blend does not require any conversion effort from current Ultimate users, but it may require one week or so of conversion for non-Ultimate customers. Also, he said, some of the other Unix/Pick implementations "look more like Unix than they look like Pick — they don't have the functionality of native Pick, and ours does."

Users, for their part, said that while they welcome another upgrade path, some may not take advantage of it for quite some time. Diane Cowley, a senior systems analyst at Bar-S Foods Co. in Phoenix, said, "It's something we're looking at. In about two years, when we need a new machine, we'll look into it."

"It is difficult to connect Pick systems with other computers, and Unix will help solve this," said Victor Roa, a systems analyst at L. V. Myles, Inc., an apparel manufacturing company in New York. "A lot of people are looking forward to this."

Still, according to Roa, his firm is not quite ready to make the move. "We're still in a wait-and-see stage," he said. "We have no plans to modify our hardware; when we do, we will hope there will be more choices, and what's out there will be fully tested."

O'Donnell said, "We don't expect everyone to move today. Over the next couple of years, though, they'll have to move."

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NEW DEALS

CA wins customs contract

The U.S. Customs Service has awarded a software services support contract to Computer Associates International, Inc. based in Garden City, N.Y. The contract is potentially worth as much as $27 million to the software vendor during a five-year period. Under the terms of the agreement, CA's Professional Services Group would support the U.S. Customs Data Center in several areas.

Japan Air System, an international airline carrier, recently signed a $70 million contract with Blue Bell, Pa.-based Unisys Corp. A longtime Unisys customer, Japan Air will purchase two Unisys 2200/633 mainframes, seven 2200/400 mainframes and 18 DCP/50 distributed communications processors. In addition, the contract provides for the Unisys USAS 2000 system of passenger services software, which is used for seat inventory and airport check-in as well as hotel and reservation support activities.

ITA Inverse Theory & Applications, Inc. has installed a Convex Computer Corp. C220 supercomputer for research and development of seismic data processing software. ITA, located in Calgary, Alberta, has also announced an OEM agreement with Convex whereby ITA will market its seismic processing software on the Convex supercomputer to ITA customers on a worldwide basis.

Coin, Inc., an Atlanta-based automotive computer company, has signed an agreement with Universal Underwriters Insurance Co. in Overland Park, Kan., to develop an electronic information system for transferring data directly from automobile dealerships to Universal. The interface is slated for delivery by 1992, according to a Coin spokesman.

Houston switches from IBM

Amdahl replaces Big Blue as main hardware vendor in city's IS group

ON SITE

BY JEAN S. BOZMAN
CW STAFF

HOUSTON — In an almost clean sweep of IBM equipment, the city of Houston removed nearly all traces of IBM's five-year stint as the city's primary provider of computer equipment.

Late last month, Houston replaced an IBM 3090 Model 180 E, which it had outgrown, with a new Amdahl Corp. 5995 Model 350. The city also replaced 52G bytes of IBM disk drive capacity and an IBM 3725 communications controller.

"IBM had questions about our evaluation process. They said the city was sacrificing an excellent business relationship with IBM," said Zanna Stepanek, head of Houston's 170-employee Information Services Division and assistant director of the General Services Department.

"However, IBM's bid was substantially more expensive [than Amdahl's]," she said. One key in the $3 million deal was Amdahl's acceptance of the IBM 3090 180E as a trade-in item.

"Some static came with the decision," Stepanek admitted, "but competition is healthy." Houston made the move after conferring with information systems managers in the Texas cities of Austin and San Antonio, which are Amdahl shops.

IBM appealed the division's recommendations to the 14-member city council, which approved the Amdahl bid. IBM declined to comment.

"Our decision was based on price and performance," said John Regus, manager of technical support at the Information Services Division.

Little IBM gear remains

The Houston computer room change left only four IBM 3420 tape drives and a few IBM terminals as reminders of the five years in which IBM equipment dominated the city's primary computer shop, Regus said.

IBM bid an air-cooled IBM Enterprise System/9000 rated at about 30 million instructions per second (MIPS), sources said. Amdahl's 5995 machine has about 35 MIPS, the sources said.

The installation of the Amdahl mainframe and 90G bytes of disk storage was part of a broader move to update Houston's computer systems, Stepanek said. "This will give us great flexibility in the future," she said. "We have a clear upgrade path to a [5995] Model 500 or 700, which we could do with a series of board swaps." The city had been frustrated with a more difficult upgrade path from its 3090 to high-end IBM ES/9000s, Stepanek said.

Currently, the city is working to consolidate a variety of inherited systems, including aging Bull HN Information Systems, Inc. DPS 6 machines used by the fire department, a DPS 8 at the Amdahl site and a Unisys Corp. 1100 mainframe used by the police department. Programmers are converting data from a Bull HN payroll system for use on the new Amdahl machine.

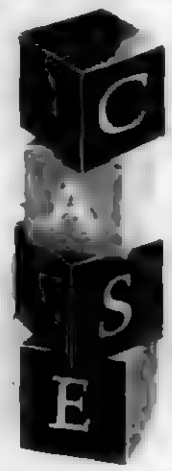
By building on a single database structure based on Software AG of North America, Inc.'s Adabas, Stepanek said she hopes to have programmers write new applications once and then launch them on multiple hardware platforms. Later, Houston may buy Amdahl's Unix operating system, UTS, to anchor Unix-based applications used in city agencies, she said.

Stepanek's next planned purchase is Amdahl's Multiple Domain Feature option, which will partition mainframe resources under IBM MVS into separate test and production machines.

CASE use draws questions

BY MAURA J. HARRINGTON
CW STAFF

LOS ANGELES — Information systems managers remain interested in computer-aided software engineering (CASE), as proven by the turnout of between 2,000 and 3,000 people at the recent CASE World Conference & Exposition, but buying into the technology is another matter.



On the showroom floor, IS managers and industry experts expressed doubts as to whether a full CASE strategy is a cost-effective solution for them at this time. They attributed their uncertainty to the lack of industry-wide CASE standards and their inadequate knowledge of the technology.

Gary Jensen, a systems manager at Coors Ceramics Co. in Golden, Colo., said he has been looking unsuccessfully for more than three years to implement "the perfect CASE tool that will generate my code from start to finish" into the company's Digital Equipment Corp. VMS system.

"I'm not sure that there is any one [vendor] that really has a handle on CASE yet, so we are now evaluating whether to build our own CASE tools or modify off-the-shelf products," Jensen said.

It takes three years from the initial investment to fully implement CASE into an information architecture, according to industry analysts. The managerial and executive-level commitment to the project is also necessary for success, experts said.

Mark Royer, president of Futuresoft, Inc., a San Diego-based consultancy specializing in CASE technology, said although IS managers often know what they want in CASE tools or designs, they do not know how to fit the technology to their tools.

Glorie Bryant, a staff analyst at the California Department of Water Resources in Sacramento, agreed. She said that being new to the field of CASE, the water department was unaware of the investment and methodology strategies needed to implement CASE.

"We are definitely going to implement CASE into our Unix system, but it's a matter of what solution to choose," Bryant said.

D&B's Viewbuilder satisfies beta-test user

BY SALLY CUSACK
CW STAFF

FRAMINGHAM, Mass. — When Dun & Bradstreet Software rolled out its IBM workstation-based development tool, Frontline Viewbuilder, last October, interested users and analysts took a wait-and-see approach.

"We were a beta tester for the product, and we received the controlled release about three weeks ago," says Michael Cothead, vice president of MIS at JMB Properties Urban Co. in Chicago.

The largest real estate syndicator in the country, JMB has used the Frontline tool to create 10 applications, three of which are used for production.

Frontline Viewbuilder is a personal computer-based tool designed to build stand-alone or cooperative processing applications. It can communicate with any host hardware using a 3270 communications environment as well as Digital Equipment Corp. VAX machines.

Cothead, who runs the package on an IBM Personal System/2 Model 80, characterized the product as "one of the most powerful tools" he has ever worked with, adding that he also explored Microsoft Corp.'s Windows-based technology as a possible development solution.

JMB, a Dun & Bradstreet Software Millenium shop for seven years, used Frontline to develop a conversational security application to operate in conjunction with the company's IBM 4381 under the IBM VM operating system.

The security application maintains and updates security files on Millenium products and the operating system and links to the mainframe via an Irma card, Cothead said.

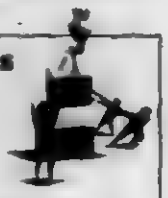
There are approximately 150 to 200 registered users on the mainframe, which uses DOS guest machines under VSE, and all communications are over direct and dial-up 9.6K bit/sec. lines.

The company has also used Frontline to downsize the mainframe property management application to run in a PC stand-alone environment and relies on the product in several other applications development areas.

One of the product's biggest advantages lies in its ease of use, Cothead said. He estimated that the average programmer or analyst can use the software effectively within one week.

Frontline, which is written in C, provides a common user access as well as pull-down menus, pop-up windows with choice lists and Help facilities.

D&B Software's Frontline Viewbuilder



- First installed in 1990
- A workstation-based development tool that allows users to build stand-alone or cooperative processing applications
- Runs on any IBM Personal System/2 or compatible
- Source language is C
- Priced from $30,000, which includes first-year maintenance

CW Chart: Paul Mach



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HP to continue MPE V support

Group formed to concentrate on older operating system

Hewlett-Packard Co. said last week that it will not only continue to support its decade-old proprietary minicomputer operating system, MPE V, but it has also placed support under a new organization centered on enhancing the old operating system for maneuvers such as interfacing to new peripherals.

"Customer support under the Applications Engineering Organization is solely focused on our installed base," said Ann Livermore, application support division marketing manager at the Palo Alto, Calif.-based company.

Before the support switch, engineers for MPE V were also working on the newer operating system for the company's reduced instruction set computing computers, MPE/XL, according to Livermore.

HP officials are promising better, but not necessarily cheaper, support for the operating system because engineers will not be dividing their attention among different products.

HP estimates that over 40,000 users have MPE V.

J. A. SAVAGE

RS/6000

CONTINUED FROM PAGE 27

— the trend may accelerate as software vendors come up with migration aids to ease the process, she added.

"We are hearing about more midrange vendors paying to have research done because of their interest in the RS/6000," Elms said. "Most of these vendors would never have considered Unix of any kind until IBM legitimized Unix for the RS/6000. From the customer point of view, the machine is less expensive and a better performer than the AS/400."

One Canadian firm, Universal Software, Inc., has an unannounced product in beta testing now — an object-code-compatible System/36 emulator — that would execute System/36 binary code on the RS/6000, Elms noted. Another migration aid, offering conversion from RPG II to native C language, is available from The Parkside Organization in Dallas.

"People are basically going to make these decisions based on cost and available software," said Gene Gellman, president of Common, the midrange IBM user group.

Gellman's firm, Cyro Industries, is now examining the RS/6000 for a computer-aided design application.

Suitable replacement

"There are a lot of big companies with System/36s installed, and they are very much a candidate for an RS/6000," Gellman said. "They could keep an AS/400 or mainframe in the data center and replace all those [System/] 36s running manufacturing applications with an RS/6000 as an engineering workstation."

John Dunkle, president of Workgroup Technologies, Inc. in Hampton, N.H., said migration from a System/36 to the RS/6000 is "natural fallout" from the power of the Unix-based workstations and servers as well as the networking capabilities of AIX.

"Where the machine is being used for a single application only, the RS/6000 makes a real attractive platform for System/36 users," Dunkle said.

Savage

CONTINUED FROM PAGE 27

users will have more to choose from than the dozens of Unix operating systems available today, which bundle in all the underlying extras.

Vendors will eventually bundle in those extra layers of software so buyers won't have to pick and choose as if from a multi-entree menu. But unless all vendors agree to include hooks for the acronyms, such as distributed computing environment, in their bundles, then one Unix application will still not work on or take advantage of all Unix-based systems. And wasn't that the point?

Until the lower levels of software are bundled into unified Unixes, the two Unixes still have many of the same problems that the old Unix had. Users will still have to work hard to get cheap hardware to easily share applications. And when they are bundled into "value-added" packages, how different will that be from today's proprietary packages?

And it will probably only get worse. Vendors are determined to make money off of their software technology. So as hardware becomes more of a commodity, they are putting enormous effort into writing these software layers to make Unix sit up, speak and roll over — in addition to running programs. HP has offered Openview as a capacity monitor, task broker and visual user environment, among others. Those will eventually run under OSF/1. Sun has thrown out similar but different packages to run on its version of Unix and eventually Unix International. Other companies, such as NCR, have big Unix software teams.

There's hope: Open systems will make IS life easier.

Then there's reality.

Savage is a *Computerworld* West Coast senior correspondent.

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ATLANTA, GEORGIA USA

Oracle users consider SQL*Forms alternatives

BY JEAN S. BOZMAN
CW STAFF

WASHINGTON, D.C. — Frustrated by the lack of user-friendly features in SQL*Forms, Oracle Systems Corp.'s premier tool for developing database query reports, many users are investigating personal computer applications that speed report development and feature easy-to-use graphical user interfaces.

The East Coast Oracle Users Group meeting earlier this month drew more than 500 users and showcased a number of SQL*Forms alternatives, including Oracle's Oraclecard interface for Apple Computer, Inc. Macintoshes and IBM Personal Computer compatibles. Many of the options, such as Oraclecard, run under Microsoft Corp.'s Windows 3.0.

Because the front-end query applications are based on the industry-standard SQL language, the same packages can also be used to access non-Oracle corporate databases.

"You're seeing an explosion of front-end tools," said Warren Cappa, president of the Mid-Atlantic Oracle Users Group based here. "People are losing the fear of being tied to a particular vendor because, in many cases, these tools are threaded to multiple database architectures," Cappa said. Many large corporations already have Oracle and non-Oracle relational database management systems installed at the same sites, he added.

Too many users

The performance of a minicomputer-based SQL*Forms RDBMS application can suffer when too many users log onto the system. "Many data networks get killed because users are passing lots of data back and forth between the database server and the workstations," said David Kreines, a project manager at Educational Testing Service in Princeton, N.J., and past president of the International Oracle Users Group.

"Now you can use very good front-end tools to work with a limited amount of data requested from the database server," Kreines added.

Mounting resource contention and increasing traffic on the local-area networks slows down response times in minicomputer-based RDBMSs. With client/server designs, the computing work load is more evenly divided, and performance improves. "You're downloading the processing to the PC so that your [Digital Equipment Corp.] VAX can be a database server instead of a screen painter," a user in Denver explained.

The Oraclecard interface, introduced in late January, gives users a screen that looks similar to that of Apple's Hypercard for the Macintosh. Oraclecard allows end users to build database query reports without a working knowledge of the SQL programming language.

"Oracle has a great database, and it also has hard-to-use front-end tools," one longtime user of SQL*Forms complained.

The Oraclecard interface automatically translates screen selections into working SQL code, Oracle said. Built on top of a program Oracle licensed from Spinnaker Software, Inc., Oraclecard runs on Macintoshes and PCs running Windows and MS-DOS.

Other front-end tools shown included Borland International, Inc.'s Paradox SQL Link, JYACC, Inc.'s JAM development system and Gupta Technologies, Inc.'s SQL*Windows. There were also conversion programs to translate SQL*Forms Version 2.3 code to the 1-year-old SQL*Forms 3.0 format, including ACE*Converter from Performance Technologies, Inc.

Another conversion product, Window*Port from LAN Design, Inc., moves SQL*Forms Version 2.3 programs into Gupta's SQL*Windows interface.

Two supercomputers debut

Models round out Cray Research's Y-MP line

BY ELLIS BOOKER
CW STAFF

EGAN, Minn. — Cray Research, Inc. recently unveiled two new supercomputers in its Y-MP line.

The new models, which have been designated Y-MP8E and Y-MP8I, feature the following:

- A new I/O subsystem for high-speed communications between the computer's central member and disk drives, networks and other peripherals.
- An enhanced solid-state storage device to speed access to large amounts of frequently used data.
- A reduction of semiconductor chips through increased systems integration.

The Y-MP, first introduced by Cray Research in 1988, is now installed in almost 80 sites, a company spokeswoman said.

The single-chassis Y-MP8I, which can be configured with up to eight CPUs, requires less floor space and support equipment and has lower operating costs than previous Y-MP models, the company said. It costs between $9.8 million and $16.3 million, the vendor said.

Cray Research claimed last week that the dual-chassis Y-MP8E, with four to eight CPUs, is the most powerful, general-purpose supercomputer available. It is priced between $15.3 million and $23.7 million, according to the vendor.

Both Model Y-MP8E and Model Y-MP8I run Cray Research's Unix implementation, Unicos, and are scheduled to begin shipping in June.

Business software for Unix unveiled

MINNEAPOLIS — Commercial software vendor Lawson, Inc. recently unveiled its first line of applications for Unix platforms from IBM, Digital Equipment Corp., Hewlett-Packard Co. and Unisys Corp.

Lawson, which markets commercial software for midsize businesses, also announced a new product licensing program that allows customers to migrate their systems to different hardware platforms without additional fees.

The company's financial, human resources and distribution applications as well as its Universe/CASE and Universe/Report Writer tools are now available.

The products can be purchased for the following Unix-based operating systems: IBM's AIX; DEC's Ultrix Release 4.0; HP's HP/UX Release 7.0, AT&T's Unix System V Release 3.2 and CTIX Release 6.1-2 for Unisys S series machines, according to the vendor.

Unisys groups plan joint meeting

Former Burroughs and Sperry users hope conference will lead to merger

BY ELLIS BOOKER
CW STAFF

Unisys Corp.'s two domestic user groups said recently that they will hold a joint conference in Denver this fall. Officials of the two user groups, Uee, Inc. and Cube, said they hope this is a first step toward an eventual merger of the two bodies.

The groups have served different user bases since before 1986, when a merger of Burroughs Corp. and Sperry Corp. formed Blue Bell, Pa.-based Unisys. Uee members are from the Sperry side of the house; Cube represents the former Burroughs side of Unisys. Each group claims approximately 4,000 members.

According to Uee and Cube, discussions about a joint meeting have taken place for about one year and have been prompted by vendor members looking for ways to control the cost of each group's annual conferences.

"We are also the only place in the world where the groups have not merged," Uee President Alfred T. Hind said.

At the international meeting of Unisys user groups last year in Japan, both Uee and Cube were challenged to look into consolidating their operations, according to Hind, who is manager of technical development at South Carolina-based textile company Spartan Mills.

Hind said a committee of six, which will begin meeting at Uee and Cube's spring conferences, will explore the idea of merging the two user groups. "We would like to have a merger down the line, but we'll leave it to the committee to sort out," he said. A combined group would obviously have a stronger voice in dealing with Unisys, he added.

Uee plans to hold its Spring '91 conference in Chicago, April 22-26; Cube's next meeting will be in Anaheim, Calif., April 2-5.

NEW PRODUCTS — HARDWARE

Processors

Sony Microsystems Co. has introduced a dual-processor, high-end model of its News series of workstations.

The News 3870 is a workstation server that runs AT&T's Unix System V Release 4. It features a 25-MHz Mips Computer Systems, Inc. reduced instruction set computing microprocessor that can reportedly yield 25 million instructions per second (MIPS). The system also incorporates a Motorola, Inc. MC68030 I/O processor that features speeds approaching 5 MIPS.

The workstation includes a set of X Window System protocols and can run the Open Software Foundation's Motif graphical user interface.

The product is priced at $35,000 or $40,000, depending on configuration.

Sony Microsystems
645 River Oaks Pkwy.
San Jose, Calif. 95134
(408) 434-6644

Cedar Technology, Inc. has introduced a ruggedized computer that conforms to military specifications.

Model 700VME, part of Cedar's Mil-Rel series, can be used as a shared-resource, multiprocessing environment that combines a Sun Microsystems, Inc. Sparcstation workstation with a VME system.

Prices range from $40,000 to $85,000, depending on system configuration and options purchased.

Cedar Technology
2405 Trade Centre Ave.
Longmont, Colo. 80503
(303) 776-6472

Power supplies

The Emerson Computer Power division of Liebert Corp. has announced a line of three-phase uninterruptible power supplies designed for midrange systems such as the IBM Application System/400.

The Resource line includes four models that provide 10, 15, 20 or 30 kVA of power.

Pricing ranges from $17,800 to $24,300.

Liebert
1050 Dearborn Drive
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NEW PRODUCTS — SOFTWARE

Applications packages

Information Access Systems, Inc. has announced a software product designed to operate in tandem with news wire services to form a real-time natural language news storage and retrieval service.

The Intelligent News System includes two modules: INS/Retrieve, which automatically categorizes and stores data for conceptual retrieval by untrained users, and INS/Distribute, which summarily distributes news stories to appropriate users and departments.

The software runs on Digital Equipment Corp. VAX/VMS and Unix System V-based machines. Prices range from $15,000 for a single workstation version to $95,000 for a shared system.

Information Access Systems
3340 Mitchell Lane
Boulder, Colo. 80301
(303) 442-6224

J. D. Edwards and Co. has introduced a wholesale distribution software package designed to function as a single information management system on an IBM Application System/400.

Distribution Resource Planning and Execution enables a wholesale distributor to perform integrated financial computing tasks while using one software program instead of relying on several programs.

The product costs between $125,000 and $245,000, depending on the number of modules purchased.

J. D. Edwards
4949 S. Syracuse St.
Denver, Colo. 80237
(303) 843-1106

Utilities

Advanced Software Products Group, Inc. has unveiled Version 4.0 of Dasdtrack, a direct-access storage device (DASD) allocation product designed to monitor, control and account for the amount of DASD being used by any system at any given time.

The software runs on MVS-based platforms and is priced between $12,900 and $19,900, depending on CPU size.

Advanced Software Products
2335 N. Tamiami Trail
Naples, Fla. 33940
(813) 649-1548

Version 1 Release 4.0 of Xamap, Velocity Software, Inc.'s VM/XA and VM/ESA monitor analysis program, can be used to produce reports that analyze previously collected system performance monitor data, according to the vendor.

The product is said to allow direct-access storage device performance analysis reports from multiple systems to be combined to create a shared report. All irrelevant reports are automatically eliminated to assist users in focusing on key performance monitor information, the vendor said.

The program has an annual fee of $3,000.

Velocity Software
1242 Wasatch Drive
Mountain View, Calif. 94040
(415) 964-8867

Development tools

Compuware Corp. has introduced an interactive testing and debugging tool for programming on IBM mainframes.

Xpediter/TSO and Xpediter/IMS 5.1 include flashback, a reverse execution facility that enables a developer to logically review a program's execution path by reversing directions as relevant data values are redisplayed.

The product is said to allow programmers to interactively control program execution at the source level. A quick-start feature provides programmers with the quickest possible entry into source code, according to the vendor.

Pricing ranges from $20,000 to $45,000, depending on CPU size.

Compuware
31440 Northwestern Highway
Farmington Hills, Mich. 48333
(313) 737-7300

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MICRO BITS

Microsoft joins group

Microsoft Corp. last week joined more than 100 vendors and users as a member of the Framingham, Mass.-based Object Management Group. The group develops specifications for implementing object-oriented systems and programming. Other members include Digital Equipment Corp., AT&T and Apple Computer, Inc.

The Object Management Group last week also began soliciting information for an Object Model — a formal description of the behavior and characteristics of objects in an object-oriented environment. Object-oriented software facilitates applications development, maintenance and reusable software code.

Ventura Software, Inc., makers of Ventura Publisher, has made several pricing changes. Ventura cut the price of all IBM Personal Computer versions from $895 to $795. It announced user group evaluation copy pricing of $75 for Ventura Publisher and Formbase 1.1. The firm also extended its $75 rebate offer on all its product purchases made through April 15.

Desktop capacities packed into laptop disks

Portable personal computer users finally see signs of storage demands being met

BY MICHAEL FITZGERALD
CW STAFF

It is one of those dreams in which everything seems so real: A fast-talking sales guy with too-wide lapels on his double-breasted jacket is spewing the praises of his selection of portables. He pulls out a slender model and starts the spiel, with words and phrases such as "under six pounds," "SX" and "supertwist" getting heavy emphasis. Then he pauses, runs his hand lovingly along the side of the machine and beams as he drops his voice and says "and it's got a 60-meg hard drive."

In general, 2½-in., 60M-byte hard drives have been only a dream, although several vendors had announced Intel Corp. 80386SX notebooks with them, and Compaq Computer Corp. was actually shipping a few — very few.

Users eager

Most users have been stuck with an anxious wait as problems with the new small drives troubled vendors such as Conner Peripherals, Inc. and Prairietek Corp. Now, however, the drives are starting to ship, and analysts said users are eager for the high-capacity, small form-factor drives.

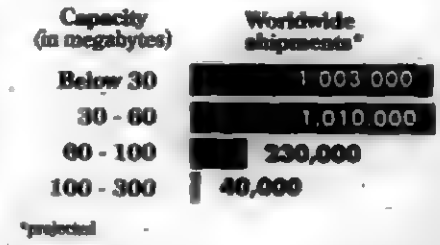
"A sophisticated user is probably using the laptops the most, and those guys probably have 100M-byte drives on their desktop," said Jim Porter, president of Disk/Trend, Inc. in Mountain View, Calif. Porter said that with today's increasingly powerful laptops, users now expect to be able to have the same information on their portables as they have on their desktop personal computers.

While the installed base of portable computers relies largely on hard drives with 40M bytes of capacity or less, Porter said, the trend toward larger drives has been accelerating during the past several years. Porter and Robert Abraham, vice president of Freeman Associates, Inc., a

Continued on page 45

Overdrive

Shipments of 2½-in. disk drives are expected to nearly triple from 789,000 in 1990 to almost 2.3 million in 1991



*projected

Source: Disk/Trend, Inc.

CW Chart: Paul Mock

Lotus adds features, price cuts for Freelance

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. introduced a revamped Freelance Graphics for DOS Version 4.0 last week. It promised speed, ease of use and greater automation.

Taking a marketing lesson from spreadsheet rival Borland International, Inc., Lotus will offer a special $99 promotion to existing Freelance and Graphwriter II users and users of products — such as Software Publishing Corp.'s Hardware Graphics and Wordperfect Corp.'s Drawperfect — through Sept. 30. The upgrade price will then increase to $119.

Key improvements to the package, which retails for $495, are said to include a new graphical environment with graphical what-you-see-is-what-you-get colors and fonts while you work, including support for the Bitstream Speedo technology; direct manipulation of charts and graphics (using mouse and graphical user interface-style "handles"); presentation management improvements including more than 90 different background options; and new charting capabilities.

New charting features include three-dimensional XYZ charts, Smart Chart Update, autocharting, automatic data tables, expanded table charts and chart gallery symbols.

The Smart Chart Update automatically updates and redraws all charts, even those linked to outside data or with annotations.

Added features

Also provided is a customized version of Symantec Corp.'s Grandview LT program, which provides outlining and spell checking as well the ability to create automatic text charts. It is included in the box and runs as a companion program.

Freelance for DOS is Microsoft Corp. Windows 3.0-compliant, and it will run from an icon in the Windows environment. Freelance Graphics for Windows will be available later this year.

Server and Node editions, priced at $695 and $395, respectively, will also be available.

Lotus also pumped up support for popular printers. Drivers for key devices, including Hewlett-Packard Co.'s Laserjet III and Apple Computer, Inc.'s Laserwriter, have been re-engineered to deliver substantial performance enhancements, the vendor said. The number of printers supported has also been increased.



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NY Life gives recruits a multimedia look inside

ON SITE

BY RICHARD PASTORE
CW STAFF

WALTHAM, Mass. — "It's like nothing I've ever seen," bubbled applicant Frank Giovinello last week after sampling New York Life Insurance Co.'s new multimedia recruitment program here. Such responses are gratifying to the team that spent one year grappling with the relatively untried technology.

Indeed, New York Life is one of the first companies, if not the first, to develop an application on Intel Corp.'s DVI multimedia platform completely in-house, an Intel spokeswoman said. Intel invited New York Life to show off its accomplishment this week at Intel's booth at the Sixth International Conference and Exposition on Multimedia and CD-ROM in San Jose, Calif.

The recruitment application presents users with menus of information describing the company in general and the Boston office in particular. An applicant can click on various topic boxes and see video clips of agents and managers talking about how they came to work there and what it is like to be part of the company and office.



NY Life's Gordon runs slips pictures of his kids on video

The Boston office staff members, who scripted and filmed their parts themselves, went out of their way to make the application personal. In one video, general manager George Gordon tells how his wife has been an integral part of the business and shows off pictures of his kids. There are even "blooper" clips in which applicants' potential bosses flub their lines.

The application runs on an Intel 80386-based personal computer equipped with DVI full-motion video boards. The system is configured with a 720M-byte hard disk, which holds all the images, and a 150M-byte tape backup.

"It's fairly expensive for one application, but we feel strongly that it's going to be worth hundreds of thousands of dollars in time and labor savings," Gordon said. He said he expects the application to equal the duties of one to two full-time employees in the long run. It will also lend the office and company a leading-edge air in the eyes of potential recruits, he noted.

Uncharted waters

About seven months in the making, the system is basically a test for what New York Life executives said may become a companywide approach to development a few years down the road. At the outset of development, however, the company found itself up to its chin in relatively uncharted waters.

"Not all the tools were working right when we first started," said Angel Garcia, chief of the company's Emerging Technologies Group. Software bugs and limited outside support lent a beta-test feeling to much of the procedure, he said.

However, the obstacles proved "more challenging than discouraging," said John Malachek, assistant vice president and training division manager. Garcia and Malachek headed up a small team of New York- and New Jersey-based developers, including development specialist Carol Rutt. This group later brought the Boston office staff into the project. They all learned some lessons along the way.

First, they discovered a picture is worth a thousand words. Only a prototype demonstration could sell company executives on the technology's possibilities, according to Malachek.

They also learned that costs are high for first-time multimedia development relative to other applications. The company spent about $40,000 for the development hardware, software, training and video and audio equipment. The Boston general office spent another $11,000 for the hardware platform to run it.

However, this outlay was considerably less than contracting for outside development. Outsiders quoted figures as high as $300,000 to develop an application that would run one hour, on this same team.

With the help of reusable code and the experience it has acquired, the same in-house team could knock out a similar multimedia application in one-third the time and at half the cost, Malachek estimated.

Staffing also has to be approached differently. "You don't need people with heavy programming background," Malachek said. "You need graphics and film experience and someone with a good voice." The firm happened to have an amateur disc jockey on staff.

A PICTURE IS worth a thousand words. Only a prototype demonstration could sell company executives on the technology's possibilities.

A stand-alone, single-station application now, the recruitment program will become much more powerful when it can be networked, said Tom Casey, senior applications project specialist in the Boston office. Intel is expected to announce this capability this week at the multimedia conference.

New York Life is already looking forward to its next applications, which will likely be in the area of employee benefits, agent training and marketing presentations for prospective customers. The recruitment program will also be tweaked, adding more options and flexibility to exit presentations before they have run their course.

Apple offers low-cost printers, cuts PC prices

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. continued to make its product line more affordable recently with the rollout of a pair of low-cost laser-quality printers and broad price cuts across its Macintosh personal computer line.

Apple announced that it will decrease prices on midrange and high-end Macintosh models by as much as 31%. Apple will immediately lower prices on all models of the Macintosh IIFX, IICI and SE/30. A Macintosh IIFX with 4M bytes of random-access memory and a 160M-byte hard drive, for instance, will be cut $2,300 to $8,669. Similarly, a Macintosh IICI with 5M bytes of RAM and an 80M-byte hard drive will be reduced $700 to $5,969, and a Macintosh SE/30 with 4M bytes of RAM and an 80M-byte hard drive will be lowered $1,000 to $4,999.

Seeks Classic success

The move seeks to duplicate the runaway success of the 5-month-old Macintosh Classic by applying a similar cost-cutting strategy to its low-end printers. Like the Macintosh Classic, the new printers were designed for small business and home users.

The Personal Laserwriter LS will be Apple's least expensive laser printer and will bear a list price of $1,299, although retailers are expected to sell it for less than $1,000. The Personal Stylewriter is a compact thermal ink-jet printer weighing just 7.5 pounds. It will list for $599 but will probably cost under $500 when it hits retailers' shelves.

The machines will be made in Japan by Canon Ltd. and will be the first printers on the market to take advantage of Apple's new Truetype outline font technology. Truetype will be widely available later this year as part of System 7, Apple's next major release of the Macintosh operating system.

In addition, Apple also announced the immediate availability of A/UX 2.0.1, its latest version of the Unix operating system.

The update will be priced at $995 for a floppy disk version and $795 for a compact disc/read-only memory version.

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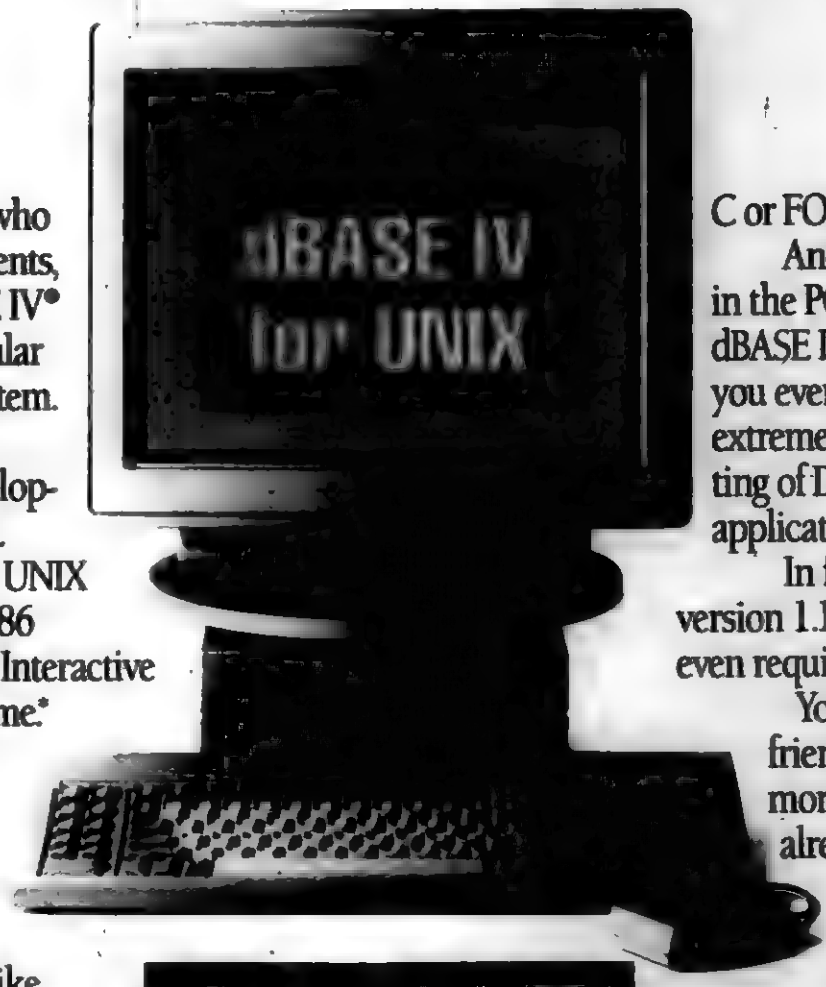
SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 even displays the same status indicators.

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Complexity lurks for Windows programmers

ANALYSIS

BY JAMES DALY
CW STAFF

There is no denying that slapping on Microsoft Corp.'s 3.0 Windows radically smoothes the process of navigating your way through DOS waters. But if you are hoping to program the next whizbang application for Windows and try to use that same simplistic overlay approach, watch out. Software programmers say that applying old solutions to new problems is asking for trouble.

"Windows 3.0's strengths are also the origin of its weaknesses," said Jef Knutson, consulting editor for software testing at "Software Maintenance News" in Staten Island, N.Y. "Windows is the best thing yet to come along for PC users, but if you employ it improperly, it only winds up creating a new level of fluff and static."

Slow starts

First off, consider a mental shifting of gears. Windows faces the same problem that bedevils anything unique: "It takes a little while to get your bearings straight," confessed Jack Baumann, who helped to create a data entry application as manager of microcomputing at Hughes Aircraft Co. in Long Beach, Calif.

Not everything works with Windows 3.0. Incompatible motherboards, cards and peripherals will be a fact of life. This is a serious concern, Knutson said, because many of these products were produced in such bulk that they will occupy shelf space in large distribution warehouses for a while.

Programmers have also found Windows to be a hungry customer when it comes to memory. "The memory management issues have caused us some grief," said Mary Crist, an engineer at Software Publishing Corp. who worked on its newly released Professional Write Plus word processor for Windows.

Handling memory constraints is a problem that continually pops up among users developing in-house applications as well. "It's a lot of work," said Charles Reamy, an internal consultant at Pacific First Bank in Seattle. "It's a rich environment, but any large-scale project chews up a lot of memory and the response time becomes very slow."

Additionally, the very objects that make Windows so easy to use, on-screen icons, can also be tricky to master. Condensing a string of separate commands into a single icon can be a tough creative process, especially if the software command is abstract. For instance, what icon would be used to depict a Search/Replace edit function? "I've looked at some icons and can't for the life of me tell what's going on," Knutson said. When checking an application, it is important to make sure an icon is easy to interpret — an imposing icon can be as intimidating as any DOS command sequence.

Once the program is complete, it is time to fix the bugs. Do not breathe easy yet. Knutson said there is currently no clear-cut, cost-effective way of debugging malfunctions arising from Windows 3.0 applications faults or Windows 3.0 real-time management of memory. However, various Windows-based testing tools have been promised for this year.

Technical torture can also be lessened in the long run by using one of the most sophisticated instruments of all: the human voice. "Get on the phone and start making friends with other software developers, testers, supporters — the more the better," said Doug Benson, assistant product manager of the word processing division at Lotus Development Corp.

Mix and match

Benson suggested arranging product swaps in which you place your software into the test department of 15 or 20 other companies also doing Windows 3.0 development. Because they are also in the testing business, they know a bug when they see one.

This strategy also helps out with compatibility testing. The graphics cards, memory boards, scanners and pointing devices used in other software testing departments can help make sure your software is compatible with as wide a variety of other products as possible. Consider sharing with hardware vendors for that added cushion of assurance.

Developers also warn that of the many variables that affect software testing, one of the most significant is the operating environment. The object-oriented, multitasking design of Windows 3.0 can significantly restrict developer control over the code environment in which their software will run. New system files and device drivers will crowd the landscape. While most of these will be well-written programs, Benson warned that nobody is perfect. "There will be bugs in every program," he said.

The road to Windows programming may not be easy, but most developers said that if you are properly armed, you have a much better chance of surviving once the shooting starts.

Oxygen brihgs DOS up for air

BY PATRICIA KEEFE
CW STAFF

NATICK, Mass. — Microsoft Corp.'s Windows Software Developer's Kit comes bundled with some sample programs. However, developers said that when they try to compile those programs while they have Windows running, they quickly find they cannot because they have run out of memory. Others are forced to cope with time lost because of rebooting and/or moving Windows off of and onto the system.

One developer who ran up against that barrier did something about it, and the result is a little breathing room under DOS.

Rational Systems, Inc. last week introduced Oxygen, a $199 utility that binds its DOS extender technology to Microsoft's C compilers and linker Versions 5.1 and 6.0. This reportedly allows programmers to compile and link large applications from within Windows, their editor or the Programmers Workbench.

Using both Windows and DOS, Microsoft C developers are hitting the 640K-byte DOS memory barrier, said Anthony Goechalk, Rational Systems' vice president of marketing. As a result, they are often forced to remove network drivers, terminate-and-stay-resident programs and other tools from their environments.

Developers may also find themselves working with two computers — a potentially expensive and awkward proposition. "It slows you down by half, maybe more," Goechalk said. "You wind up writing in each environment longer than you normally would because it's a pain to switch [machines]," he added.

Breathing room

With Oxygen installed, the Microsoft compiler and linker take up less than 50K of the first 640K bytes, and the remaining portions of the program run in extended memory, added Terrence Colligan, president and co-founder of Rational Systems. Ordinarily, developers need at least 350K to 400K bytes to compile source code, Goechalk said.

While memory extenders such as Quarterdeck Office Systems' QEMM "push up against" the 640K-byte barrier, Oxygen jumps over it to provide developers with potentially up to 16M bytes of added memory, Goechalk said. However, he added that the biggest compiles typically require no more than 2M bytes.

In addition, Rational Systems claimed that by adding access to extended memory, Oxygen also reduces time-intensive disk accesses and enables large files to link up in up to half the time.

Goechalk said he expects Microsoft to address this issue in Release 7.0 of its compiler, which is expected to ship either at year's end or in the first quarter of 1992. As such, he sees a limited, albeit strong, market opportunity. There are about 1 million C programmers and approximately 300,000 users of Microsoft's C compiler, he said.

Oxygen conforms to the DOS Protected Mode Interface, Virtual Control Program Interface and Extended Memory Specification interface standards. It operates either stand-alone or with Windows 3.0, QEMM, Qualitas, Inc.'s 386-To-The-Max and numerous other extended and expanded memory managers.

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Restaurant chain cooks up time-saving IS strategy

ON SITE

BY JAMES CONNOLLY
CW STAFF

BOSTON — The premise seems simple. If you have a chain of restaurants captained by a team of carefully chosen managers, you want them making decisions that lead to profits rather than spending their time filling out forms.

That basic idea is behind a personal computer-based systems strategy through which Au Bon Pain — a 100-site chain of cafes and express food stands — is reducing the time managers spend on daily reports and administrative tasks.

The company recently completed a three-month, 50-site rollout of store management and point-of-sale systems. The information gathered by this system may also provide a foundation for the growing 10-year-old chain's first efforts to implement a companywide IS strategy.

"We want to have the managers spending less time calculating and more time analyzing results," said Mark Factor, director of MIS at Au Bon Pain.

When the former Coopers & Lybrand consultant joined Au Bon Pain two years ago, he discovered that store managers had at most only a few hours per week to study their results, plan staffing and production and identify cost problems. "We hired good managers and then buried them in paperwork," he said.

The heart of Au Bon Pain's business is its cafes, which serve croissants, sandwiches and muffins baked on premises using dough that is prepared and frozen at headquarters.

Until recently, managers at those sites did their planning and cost analysis the way fast-food chains have done for two decades: by taking raw numbers from cash registers and plugging them into paper forms. Even at headquarters, there were only a handful of PCs and an NCR Corp. Tower-based accounting system. In most cases, information moved from one location or department to another on paper.

Factor drew on the IS strategies of other chains, including Mrs. Fields Cookies, in designing the Au Bon Pain system — called Amigo, for Assisting Managers in Getting Out.

Running on Intel Corp. 80386SX-based NCR PCs, the core back office management software was provided by Management Information Support, Inc. in Lakewood, Colo. Those PCs gather sales information from the six to 15 NCR cash registers in each store.

A store PC acts as the manager's system and uploads data to headquarters when polled by a 80386-based PC each day. The host also manages downloading of software, troubleshooting and communications with nine laptop computers used by district managers.

Factor reported that Au Bon



Linda Bluck

Pain has selected an architecture for a headquarters system that will be put in place during the course of a year. That system, drawing information originating at the stores and supporting all management and operational needs, will be based on a relational database management system and either an Intel 1486 or 80386 server.

Amigo lets the manager react to sales by increasing or decreasing staff and food preparation. The latter can be crucial because it takes two hours for raw goods to become finished products. Cooking too many eats up profits. Cooking too few means lost business.

To help achieve a balance, Amigo automates what previously was a rough, manual system. Drawing on information such as sales patterns for previous months and even the day's weather, the system suggests what is likely to be sold throughout the day.

Alan Camuso, manager of one of Au Bon Pain's Boston cafes, has been using the system since it was in beta testing in June 1990. He said the production planning aspects have saved him $50 to $60 per day in the cost of leftovers.

In addition to projecting sales, Amigo helps to identify areas of waste by, in effect, assigning dollar values to ingredients and tying those figures to Au Bon Pain's recipes. This helps a manager to determine, for example, whether a sandwich preparer is regularly applying a few cheese slices too many.

An expert system-based labor scheduler that examines sales figures and suggests staffing levels is now being phased in. Au Bon Pain has eliminated some data entry and saved wage expenses by replacing time cards with automated employee punch-in through Amigo. Not only do employee time records go electronically to a payroll service, but the system prevents an employee from punching in too early. "If you cut even five minutes per shift by eliminating early punch-ins, that can mean $200,000 on the company's bottom line," Factor said.

The time stamps on the automated system provide a more precise audit trail as managers handle cash throughout the day.

However, Amigo is giving managers the most relief by reducing paperwork. "I was doing eight hours of paperwork every day. That's now four hours, and I can do other things," Camuso said. "Now, when I get my weekend numbers, I can sit down and look at them. In the past, by the time you were done with the paperwork, all you wanted to do was go home."

Wang takes on 486 market, presents its first EISA PC

BY SALLY CUSACK
CW STAFF

WASHINGTON, D.C. — Wang Laboratories, Inc. unwrapped its first Intel Corp. 1486-based, Extended Industry Standard Architecture (EISA) personal computer at the Federal Office Systems Exposition two weeks ago.

"It looks interesting to us; it's a very powerful machine with a very high-speed bus," said Matthew J. Gillman, president of the United States Society of Wang Users (USSWU). "Most importantly, it can be configured as a high-end server, and it appears to be positioned to support faster LAN-based imaging systems," Gillman said.

The PC, designated the EC 480/33C, is priced from $8,995 and is scheduled for delivery late this month. It supports as much as 64M bytes of memory on the motherboard and can accommodate an optional 128K-byte direct-mapped secondary cache module.

Jack Karp, vice president of desktop computing strategies at the Meta Group, Inc., a Westport, Conn.-based market research firm, said the announcement is "a good step for Wang, and the product is priced competitively for the IBM and Compaq Computer Corp. market. However, I'm not so sure that is really Wang's competition in this arena." However, he added, "They are not a first-tier vendor and not a second-tier player [in the PC market]."

Karp speculated Wang may expect some competition in price points from companies such as AST Research, Inc.

Status questioned

In related news, user sources questioned the status of Wang's Upword, a Microsoft Corp. Windows 3.0-based word processing program that Wang began demonstrating last year.

Users said the product may not be generally available until the fall, while the company adds what-you-see-is-what-you-get editor capabilities.

However, Wang officials said they will be meeting this week to decide when Upword will be rolled out.

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Compaq offers speed for near 386 price

Technology Analysis — A roundup of expert opinions on new products. Summaries written by free-lance writer Suzanne Weixel.

For anyone who thinks a 386SX-based system is just a poor man's 386, Compaq Computer Corp. offers the Deskpro 386S/20. According to reviewers, this product not only rivals some 386-based systems in terms of performance, but it also comes close in terms of price.

Performance: Compaq makes sure you get what you pay for, reviewers said. The 386S/20 is fast. Random-access memory can be expanded from a standard 2M bytes to 16M bytes by adding standard single LU line memory module chips to the motherboard. The 386S/20 also comes with 4K bytes of cache RAM that reportedly responds to 93% of all processor requests with no wait states.

Design: Compaq's construction is sturdy and clean. The motherboard has only one bank of switches and no jumpers, and disk drives are easily removed for maintenance and setup. On the downside, the standard Deskpro case has no reset or speed buttons.

Expandability: With three half-height 5¼-in. drive bays opening from the front of the case plus space for two 3½-in. hard drives, the 386S/20 offers good expansion possibilities. It has four open 16-bit expansion slots.

Support: Compaq has direct telephone technical support for users with common operating systems. It also has a toll-free product information line.

Value: The 386S/20 is well-made, fast and expensive. For 2M bytes of RAM, a 60M-byte hard disk, DOS and a color IBM Video Graphics Array display, you will pay $5,318.

Reviews Summary

Criteria	[illegible]	[illegible]	[illegible]
Performance	Excellent	Very fast	Can match 386 machines
Design	[illegible]	[illegible]	[illegible]
Expandability	Good	Good	Good
Documentation	[illegible]	[illegible]	[illegible]
Support	Good	NC	NC
Value	[illegible]	[illegible]	[illegible]
Reviewer's score	7.7	Best buy	Top of the list

Published reviews score represents Infoworld *rating only. NC: No comment. These are excerpts. Refer to actual reviews for details.*

RATINGS

- **Users:** Jim Schmeltzer, Grauer Boyle & Quillen (*overall performance:* 8, *cost:* 5); Charline Avey, Indianapolis Water Co. (8, 9) "Performance is excellent, but the price is not where it should be," Schmeltzer said.
- **Analysts:** George Thompson, Datapro Research Corp. (8.5, 5); Jerry Caron, Faulkner Microcomputer Reports (10, 6)

"Because of video integration and drive options, they're the fastest in SX systems," Caron said.
- **Financials:** Eric Zimits, Rauscher Pierce Refsnes (*overall rating:* 9); Jerry Fleming, Palmestock & Co. (9); Jim Poyner, William E. Wordruff & Co. (6)

Compaq Deskpro 386SX/20

score!

[illegible] (maximum)	Category
23 (30)	Published reviews
19 (20)	Analysts' ratings
12 (15)	Users' ratings
13 (20)	Cost evaluation
12 (15)	[illegible]

(Maximum score: 100)

Compaq responds

Comments from Hedy Baker, Compaq spokeswoman:

Value: Comparing the price of a 386S/20 with a mail-order system is not fair. The street price is competitive, and our products are the highest quality.

Support: We can't guarantee that third-party products we haven't tested will work correctly.

Design: Our customers have indicated no problems with the lack of a reset button.

NCR: Good performance, limited growth

NCR PC386SX20

score!

[illegible]	Category
22 (30)	Published reviews
13 (20)	Analysts' ratings
14 (20)	Users' ratings
13 (20)	Cost evaluation
13 (15)	[illegible]

(Maximum score: 100)

NCR responds

Comments from Bruce Langos, director of product line management:

Design: Keyboards are a subjective feature. Although this one does not give you an "IBM keyclick," it does provide tactical feedback.

Expandability: 3½-in. drives are currently available with up to 340M bytes capacity. It's hard to imagine an SX needing more than that.

Reviews Summary

Criteria	[illegible]	[illegible]	[illegible]
Performance	Very good	Fast	Fast
Design	[illegible]	[illegible]	[illegible]
Expandability	Satisfactory	Limited space	Costly
Documentation	[illegible]	[illegible]	[illegible]
Support	Good	Good	Good
Value	[illegible]	[illegible]	[illegible]
Reviewer's score	7.2	Best buy	One of NCR's best PCs to date

Published reviews score represents Infoworld *rating only. NC: No comment. These are excerpts. Refer to actual reviews for details.*

RATINGS

- **Users:** Alan Herman, Jacobson Stores, Inc. (*overall performance:* 10, *cost:* 8); Ray Nixon, Thiele Kaolin Co. (8, —)

"We have six of them; one is on my desk. They work as advertised, and we are very pleased," Herman said.

"It costs too much money. It cannot be expanded at all, and the price for NCR parts is outrageous," Nixon said.
- **Analysts:** George Thompson, Datapro Research Corp. (7, 6); Jerry Caron, Faulkner Microcomputer Reports (6, 5)
- **Financials:** William O'Connor Jr., Fourteen Research (*overall rating:* 9); William Baker, McDonald & Co. Securities, Inc. (8)

NCR's PC386SX20 offers above-average performance at an above-average price. Extras such as built-in Super VGA more than balance out drawbacks such as limited expandability, making the product worthy of serious consideration, according to reviewers.

Performance: Reviewers agreed the PC386SX20 is fast. It comes with 2M bytes of random-access memory expandable to 8M bytes on the motherboard. Performance is boosted by a 16K-byte RAM cache. Reviewers also liked the quality and speed of the Super VGA video subsystem.

Design: NCR keeps things simple inside and out. Inside the small footprint case, the video, disk, parallel and serial functions are all on the motherboard, leaving four 16-bit slots open. Except for the keyboard, which *PC World* says is too quiet and soft, the system is well-built.

Expandability: Reviewers and users agreed the PC386SX20 falls short in expandability. With only three 3½-in. drive bays, there is not much room to grow. There is, however, a built-in external floppy port. Memory can be expanded beyond 8M bytes via NCR's currently available memory boards.

Support: NCR supplies direct buyers with technical support including a one-year on-site warranty. If the system is purchased through a dealer, the user may rely on dealer service or buy NCR support.

Value: The basic PC386SX20 costs about $3,445. The price goes up fast, however. Add a 100M byte hard disk and you are up to $5,195, and 2M byte memory upgrades cost about $750 each. Still, unless you need four or more drive bays, reviewers said this system will earn its keep.

Methodology: *Published reviews: average of numeric scores from product reviews published by personal computer publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of financial analysts' ratings of vendor financials and ability to support product multiplied by 1.5.*

COMMENTARY

Christopher Lindquist

Applications made easier



I must confess, when I was first given a prerelease copy of Borland's Objectvision application development system for Microsoft's Windows 3.0, I was a bit disturbed. There was only one high-density disk and a pair of relatively thin — by Borland standards — manuals. Exactly how comprehensive an application development environment could fit in that amount of space? A lot — as I soon found out.

Borland claims that any experienced personal computer user will quickly be able to create applications with Objectvision. I'm not sure that is the case; developing decision trees for complex processes may be more of a task than some users will want to approach. However, any IS programmer or user familiar with creating spreadsheet templates or database applications will be able to quickly and easily create Windows-compatible forms-based applications for a wide variety of uses.

I spent a couple of hours working my way through the tutorial. Forms creation with Objectvision is a snap; it could even be described as enjoyable. About the only time a user ever has to touch the keyboard is when he first types in field names. After that, lists of commands, field types and fields are a mouse click or two away.

Multiple forms can be linked together in any application, allowing businesses that use multipart or multiple forms for a procedure to duplicate the process on the screen.

Forms can include all the standard alphanumeric, date, time and currency fields found in most databases. Multiple fonts, clip art and shaded boxes can be added to enhance the visual appearance of a form or to make it an exact replica of a paper version. Check-off boxes that pop up to prompt the user for input can also be created, as can buttons to control such necessities as clearing the screen and saving data.

Once the form is finished, a "decision tree" has to be created for the application. A decision tree is a graphical representation of the IF-THEN-ELSE loops so familiar to programmers. At this point, the developer decides how the application is going to manipulate any data that is input by the user, such as totaling sales figures or calculating discounts.

For the decision tree stage, I definitely recommend taking Borland's advice and sitting down and thinking through the decision process before simply jumping into tree creation. The trees can get complex quickly, and while Objectvision lets the developer zoom in and out to get an overview of the tree, it would be easy to get lost in a jungle of branches without some previous planning.

After the tree is created, the form can be tested without linking it to a database. This allows the developer to debug the application without going through the process of making database links only to find out that the data manipulation is faulty. My only real complaint with the program came at this point. It would be beneficial to have some sort of integrated debugging in Objectvision.

MULTIPLE FORMS CAN be linked together in any application, allowing businesses that use multipart or multiple forms for a procedure to duplicate the process on the screen.

For example, with a simple tree, it is quite easy to find errors, but finding small errors in complex applications could be a tedious hit-and-miss process. Being able to step through each branch of a decision process while watching both the form and the tree would help isolate errors and be a great help in testing the applications.

Once the form and decision tree are complete, the developer can make links to whatever database he plans on using. Objectvision supports links with Borland's Paradox, Ashton-Tate's Dbase III, Novell's Btrieve, ASCII and read-only links with Windows' Dynamic Data Exchange. Creating links with Paradox is a breeze. Objectvision lets the developer simply type in link and table names. The Paradox table is automatically created without developer intervention.

The whole application development process is very — to use an overused term — intuitive. Forms can be created quickly and require no programming ability. Information systems developers could easily train any end users to create forms to suit their needs. More advanced users may find that application development actually can be fun.

Lindquist is a Computerworld copy editor.

Desktop

FROM PAGE 37

data storage consulting company in Santa Barbara, Calif., said they think that will continue.

"There is a need [for higher-capacity hard drives on portables]. The need is driven by new applications that are memory-intensive, such as imaging, graphics, even voice," Abraham said. "So we have these same new application areas being utilized even in the laptops and notebooks."

Obvious needs

The need is clear at Coors Brewing Co. in Golden, Colo. Coors last year outfitted its sales force with Compaq LTE 286 machines, which have 40M-byte hard drives, and has found that some of its users have outgrown the drives. Coors will give 10 of its 35 area managers Compaq SLTs with 100M-byte hard drives so these power users can run more programs.

Coors also purchased a couple of the new LTE 386S/20s with 60M-byte drives, according to Donna Whitley, laptop project manager, who said the rest of the managers needed the extra capacity on the SLTs.

Another user who wants more capacity before moving to lighter weight SX notebooks is Dick Nelson, vice president of systems at New York Life Insurance Co. Nelson has repeatedly said he would move his 10,000 agents to SX notebooks as soon as the machines get hard drives with 100M bytes of capacity.

Nelson and other information systems managers whose users need high-capacity portables could find this year a happy one. Areal Technology, Inc. said it will have 2½-in., 120M-byte drives by May, and Maxtor Corp. has announced plans for such a drive. IBM is also reputed to be working on 120M-byte drives in a 2½-in. form factor.

THE TREND toward larger drives has been accelerating.

Abraham said the larger hard drives will be timely for the market. "Programs are large, but more importantly, the data set is larger," he said. "The classic example is imaging. You can consume up to 20M bytes of disk space with one application if it has several images."

NEW PRODUCTS

Board-level devices

Microway, Inc. has announced Fastcache-SX/Plus, an IBM Personal Computer AT expansion card designed to convert an AT or compatible into an Intel Corp. 80386SX-based system equipped with up to 8M bytes of extended memory.

The product includes an optional Intel 80387SX processor that reportedly enables the board to yield up to 1.7 Megawhetstones. It can also be used to backfill a 512K-byte motherboard to 640K bytes, according to the vendor.

The card also allows AT users to run multiple tasks under operating environments such as Microsoft Corp.'s Windows 3.0.

A 16-MHz version costs $595, and a 20-MHz model is $695.

An installation/cable kit for AT compatibles is priced at $95, and an interconnect board for the 6-MHz AT is $50.

Microway
P.O. Box 79
Kingston, Mass. 02364
(508) 746-7341

Continued on page 46

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NEW PRODUCTS

Software applications packages

Frame Technology Corp. has announced the latest version of its workstation publishing software package.

Framemaker Version 3.0 includes intelligent tables that can be used to integrate statistical data, price lists, schedules and spreadsheet and database information in an easily readable format. Conditional text capabilities allow users to create multiple variations of documents from one base document.

Framemaker Version 3.0 costs $995 for a fixed license for Apple Computer, Inc. Macintosh systems or Next, Inc. Next computers. A floating license for Unix-based workstations is priced at $2,500.

Versions for Macintosh and Sun Microsystems, Inc. Sun-3 and Sun-4, and Intel Corp. 80386-based workstations running under Sun View are scheduled to begin shipping in the second quarter. A package for the Open Software Foundation Motif-based workstations and versions for Next systems are slated for a third-quarter release.

Frame Technology
1010 Rincon Circle
San Jose, Calif. 95131
(408) 433-3311

Version 2.5 of Atex, Inc.'s Atex PC Page Makeup software package was designed to operate on IBM Personal System/2s.

The product can run under Microsoft Corp.'s Windows 3.0 environment. Features include spot-color capability, rotation of elements, free text scaling and cropping and scaling of graphics.

The software package is priced at $1,995 and has been shipping since mid-February.

Atex
165 Lexington Road
Billerica, Mass. 01821
(508) 670-3000

KD Systems, Inc. has begun shipping Organon, a personal computer program designed to automatically generate typeset-quality organizational charts from a database.

The product operates with any database that can prepare a text file of employee data. It reportedly can read the text file and generate a chart in seconds.

Organon is priced at $495.

KD Systems
P.O. Box 97024
Raleigh, N.C. 27624
(919) 847-3838

Software utilities

Atech Software, Inc. has introduced a universal typeface converter that enables users to convert typefaces from nearly any format to another.

Alltype supports outline typeface formats such as Adobe Systems, Inc.'s Postscript Type I and Postscript Type III and Bitstream, Inc.'s Fontware and Speedo. The product is scheduled to begin shipping next month and costs $80.

Atech Software
5964 La Place Court
Carlsbad, Calif. 92008
(619) 438-8883

Funk Software, Inc. has begun shipping a version of its Sideways printing utility that features support for Lotus Development Corp.'s 1-2-3 spreadsheet Releases 3 and 3.1.

Version 3.3 of Sideways was designed to rotate text 90 degrees as it prints, thereby enabling wide spreadsheets to be printed on narrow-carriage dot matrix printers, the vendor said. Users of Lotus 1-2-3 Release 3 or 3.1 can load Sideways as an add-in application.

Sideways 3.3 is priced at $90.

Funk Software
222 Third St.
Cambridge, Mass. 02142
(617) 497-6339

Data storage

Microtech International, Inc. has begun shipping its Eclipse series of internal and external drives designed for Next, Inc. Next computer platforms.

The series includes the Eclipse 50R, which is equipped with 50M-byte removable cartridges; the Eclipse CD, a compact disc, read-only memory drive that features a 350-msec access time; and 1M- and 4M-byte memory upgrade kits for system memory expansion. The series also includes external drives that feature storage capacities ranging from 200M bytes to 1G byte, according to the vendor.

Pricing ranges from $1,099 to $5,399, depending on type of drive purchased.

Microtech International
158 Commerce St.
East Haven, Conn. 06512
(203) 468-6223

Peripherals

Rasterops Corp.'s Colorboard 1024MC is a 24-bit, 1,024- by 768-pixel display adapter designed for IBM Personal System/2s and Micro Channel Architecture-based compatible machines.

The adapter ($3,995) is said to allow users to simultaneously access up to 16.8 million colors.

Rasterops
2500 Walsh Ave.
Santa Clara, Calif. 95051
(408) 562-4200

Bitstream, Inc. has announced an open-ended, expandable font cartridge designed for Hewlett-Packard Co.'s Laserjet Series II printers.

Type City ($379) enables users to add typefaces, logos or symbols to business documents. It includes a supercartridge equipped with text and headline typefaces.

Screen fonts for Microsoft Corp.'s Windows and a guidebook are bundled with the system, and Deli, an add-on card equipped with typefaces and symbols, is included free with a basic package. Type City started shipping last month.

Bitstream
215 First St.
Cambridge, Mass. 02142
(617) 497-6222

Systems

Commodore Business Machines, Inc. recently cut the suggested retail price of its Amiga 2000 and Amiga 3000 personal computers between 6% and 26%.

The company pared the prices of several peripherals between 10% and 54%. Commodore also said it had launched a service program called Commodore Express Gold Service. The service gives customers a 24-hour toll-free help line and next day on-site service at no charge for one year from the date of purchasing Commodore's consumer products.

Commodore Business Machines
1200 Wilson Drive
West Chester, Pa. 19380
(215) 431-9100

RDI Computer Corp. began shipping its 13-pound Britelite portable based on Sun Microsystems, Inc.'s Scalable Processor Architecture chip. RDI claims that the Britelite, which retails for $10,800, is the only computer on the market compatible with Sun's Sun OS flavor of Unix, Microsoft Corp.'s DOS and Apple Computer, Inc.'s Macintosh. The machine offers an optional 1,152- by 900-pixel resolution screen but also comes standard with 640- by 480-pixel resolution.

RDI Computer
Building A
6696 Mesa Ridge Road
San Diego, Calif. 92121
(619) 558-6985

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COMMENTARY

Elisabeth Horwitt

Victim of success?



Sometimes too much success can backfire.

Right now, IBM is struggling to overcome the inertia represented by a huge installed base at Fortune 500 companies that, during the past decade or so, bought IBM's systems strategy of hosts and dumb terminals and then hosts and IBM Personal Computers.

That strategy made IBM king of the computer market for years. Now, it is making it very difficult for IBM to migrate its users to a distributed, peer-to-peer networking strategy that is slowly but surely becoming the next phase of business computing.

Since last year, IBM has been going all out to revamp its Systems Network Architecture (SNA) platform to support peer-to-peer computing. This month's announcement of Advanced Peer-to-Peer Networking for OS/2 is IBM's bid to bring peer-to-peer SNA onto the local-area network. And the vendor has made significant progress toward enabling its SNA backbone products, such as the 3745 front end, to support peer-to-peer networking.

IBM has also been aggressively enhancing Netview to manage distributed peer-to-peer networks. Earlier this

Continued on page 52

IBM expands European telecom line

BY JOANIE M. WEXLER
CW STAFF

LONDON — Building on its strategy to interface its proprietary Systems Network Architecture (SNA) environment to the "open" world of standards, IBM recently extended support of its Callpath Services Architecture to telephone switches based on European standards. Initial European switch support will include the Siemens Stromberg-Carlson Hicom 300 and IBM Com300.

IBM has also added Callpath capability to its 370- and 390-class mainframes in Europe and said it will begin selling its Integrated Services Digital Network (ISDN) adapter cards overseas.



IBM's Callpath software links computer databases and telephone systems, allowing users to display caller data on their screens as calls come in. Callpath support for the Application System/400 midrange computer, announced last May, is slated to ship "later this month," according to IBM.

"Since Callpath is aimed at business applications requiring coordinated voice and data, it's important that IBM has made it available for its big machines," said H. Paris Burstyn, vice president of telecommunications at Business Research Group, a consultancy in Newton, Mass. "This is because companies store most of their records on computers of that size."

In January, the company announced ISDN basic-rate adapter cards for the Micro Channel Architecture models of its Personal System/2 and its 3174 Establishment Controller. IBM said it intends to offer a basic-rate ISDN card for the AS/400 both in the U.S. and Europe within two years.

Basic-rate ISDN offers 144K bit/sec. of switched bandwidth channelized in two 64K bit/sec. circuits and one 16K bit/sec. circuit. Burstyn said an adapter to the 1.5M bit/sec. primary-rate ISDN network would be more appropriate for the powerful 3174 and AS/400.

However, "even though basic-rate ISDN seems slow, it is still far faster than most lines connecting terminals or PCs to hosts today," he said.

Burstyn said his firm recently conducted an interconnectivity survey, and "far and away the most common speed was 19.2K bit/sec. over analog voice-grade lines" using modems.

Burstyn conceded, however, that basic-rate ISDN adapters have limited appeal today in the U.S. because of the lack of ISDN service offerings from the local telephone companies.

The research firm estimates that the nearly half-million basic-rate lines deployed by the RBOCs in 1990 represented just .5% of the 106 million RBOC access lines in use. Burstyn said he expects the number of RBOC Basic Rate ISDN lines to double in 1991.

ISDN aims to give users ubiquitous dial-up digital voice, data, image and video services between desktops in the same manner users get telephone and facsimile service today.

FEATURE: ELECTRONIC MAIL

Setting ground rules for privacy

BY CHRISTINE CASATELLI
SPECIAL TO CW

With its potential for instantaneous communications, electronic mail has changed the way America works and opened up a whole new arena for employer/employee conflict in the process. Some companies have already been taken to court over E-mail privacy issues, and experts say more cases may soon crowd the dockets if employers continue to ignore the need for written policy statements on E-mail use and administration.

Without established policies in place, employers and employees can find themselves at odds over different interpretations of E-mail privileges. "At the very least, [the lack of a clear policy] will cause ill will at a company," says Walter Ulrich, an E-mail specialist at Arthur D. Little, Inc. in Los Angeles. "At most, it can result in a lawsuit."

Increasing use is making the issue more pressing: Today, more than 12 million employees in the U.S. routinely send messages back and forth electronically, according to Michael Cavanagh, executive director of the Electronic Mail Association in Arlington, Va. However, only a small number of companies are taking steps to

Continued on page 50



Paul Tocque

Satellites help trucking firm keep tabs on fleet

BY ELLIS BOOKER
CW STAFF

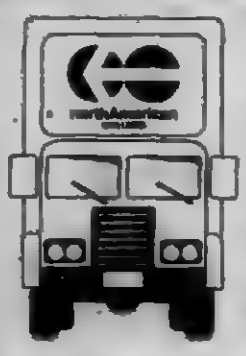
FORT WAYNE, Ind. — Can you misplace a 16-ton truck? No, but you can lose track of it for a few hours, and that — at the very least — can mean anxious customers every day.

For North American Van Lines, Inc., the *fifth* largest trucking company in the U.S., the routine of waiting for its drivers to call in and report their positions made it impossible to pinpoint a truck's location in answer to a customer inquiry. What was more, a half-full truck might have rolled past a pickup spot, never knowing until later there was a customer a few miles away.

A new satellite system, currently installed on 200 trucks and planned for the entire North American fleet of 3,700 trucks by sometime next year, provides location information on each vehicle to an accuracy of within 1,000 feet.

"There wasn't a predetermined policy about drivers calling in from the road," said Mike Gunkel, vice president of corporate marketing.

After two years of study, North American issued a request for proposals last year. In January, North American signed a $12 million contract with Qualcomm, Inc. to supply its Omnitracs two-way communication system.



Currently, about 10 to 15 personal computers here track the trucks. It takes about three minutes between the time an operator requests the position of a vehicle for a map to be displayed showing the truck's direction and distance from the nearest town. The Qualcomm system contains maps of 10,000 cities.

However, North American said it will abandon the map display because the directional and distance data — calculated on the trucking firm's Amdahl Corp. mainframe — is the more valuable source of information.

There are currently Omnitracs systems deployed across the continental U.S., according to a spokesman at San Diego-based Qualcomm.

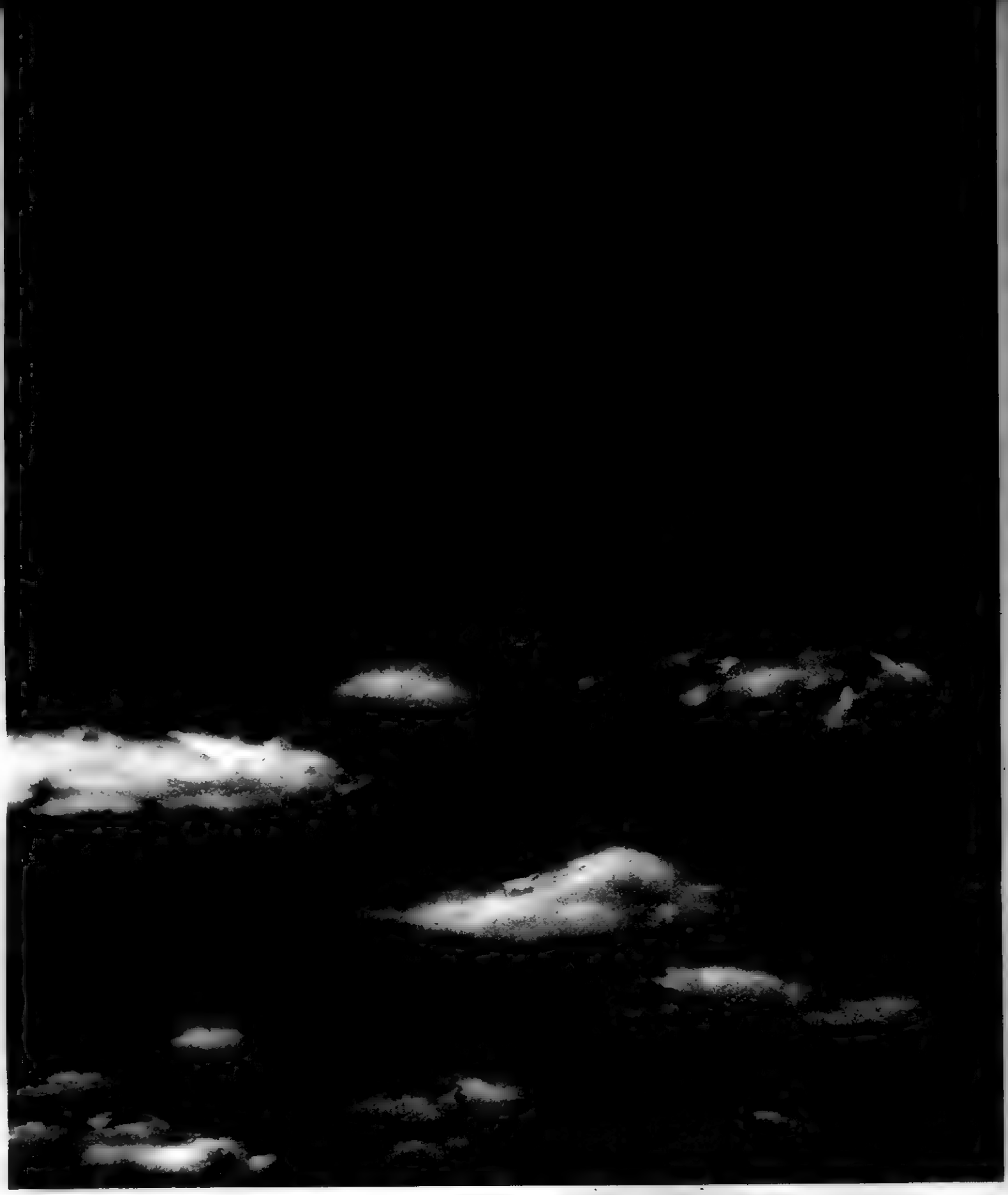
Satellite path

In addition to the telemetry feature, the Qualcomm satellite system provides a communications path between the home office and the mobile unit. In North American's case, each truck cab is equipped with a keyboard and an LED display.

The display, using alphanumeric codes, can send various requests for information such as the status of pickups, drop-offs and available hours.

If providing up-to-the-minute information to customers was the driving force behind the satellite system, will North American be providing its customers with on-line access?

Absolutely, according to Gunkel, who said this has always been the plan. He added that some North American customers already have on-line access to the company's traditional databases. He said customer access to the satellite tracking system would probably be offered sometime next year.



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Rules have limits

Entertainment giant Warner Bros., Inc. expects to add an amendment on electronic messaging to its corporate computer guidelines by year's end. A draft version is now circulating for approval.

One thing that is already certain, says Bill Cotter, vice president of international information systems, is that "all data that flows through the computer is considered to be confidential, and for no reason will it be divulged to a third party." Cotter says a criminal investigation is about the only way someone other than the sender or the recipient would be made privy to E-mail messages.

The Warner Bros. policy will also state the terms for E-mail use, Cotter says. "We're clarifying that electronic mail is to be used only for company business," he adds. The provision may be difficult to enforce because there are no plans to monitor messages that go over the network; if someone were to be detected using the E-mail for personal matters, however, Cotter says it would be passed along to the human resources department.

But even written policy cannot prevent every problem. Warner Bros. integrates E-mail systems from Hewlett-Packard Co., Wang Laboratories, Inc., Digital Equipment Corp., IBM and others into a single network, which poses a unique set of problems for users of incompatible systems who want to encode their messages.

"We offer the highest level of encryption within each user's system," Cotter says.

CHRISTINE CASATELLI

Privacy

FROM PAGE 47

set down any policy on E-mail use, leaving most of those users in the dark as to where they stand.

One major point of contention is the technology's potential for workplace monitoring, Cavanagh says. "This is a new aspect of how we look at workplace policies," he says. The spotlight cast on E-mail may stir up an even larger debate over how technology is used to manage employees, he says.

The electronic messaging dilemma came to a head last August when a class-action suit was filed in Los Angeles against Epson America, Inc., which fired an E-mail system administrator who alleged that the company's interception of E-mail messages violated the privacy of employees. The case was dismissed in January on the grounds that E-mail does not fall within the state's wiretapping law; that decision has been appealed.

Similar case

In January, Nissan Motor Corp. became the subject of a similar suit when two former employees charged that their E-mail messages, which they believed to be confidential, were seized and used against them. That case is also pending.

Jerry Berman, director of the Information Technology Project for the American Civil Liberties Union, says it will take more than a few lawsuits to sort out the complex privacy and property issues surrounding E-mail. "They're going to be decided partly by the courts, partly by the Congress and partly by the institutions developing a culture around these technologies," he says.

There is currently no federal law that addresses the rights of E-mail users and owners, but congressional sources say it is likely that the Electronics Communications Privacy Act will be revised this year to include electronic messaging technology. A Senate subcommittee on technology and the law has appointed a task force to investigate issues surrounding corporate E-mail and other high-tech devices such as Caller ID. The task force is expected to give its recommendations to the subcommittee chairman, Sen. Patrick Leahy (D-Vt.), next month.

In the meantime, employers can help prevent legal bouts by taking the time to develop straightforward policies that outline company rules and responsibilities for E-mail users, says Ron Plesser, former general counsel of the U.S. Privacy Protection Study Commission and partner at Piper & Marbury, a law firm in Washington, D.C.

"The most important thing in any kind of internal policy where management is looking at E-mail communications is to make sure the ground rules are explicitly clear," Plesser says. If a company's goal is to monitor electronic messages as needed, then it is critical that employees are notified of that intention from the start, he says.

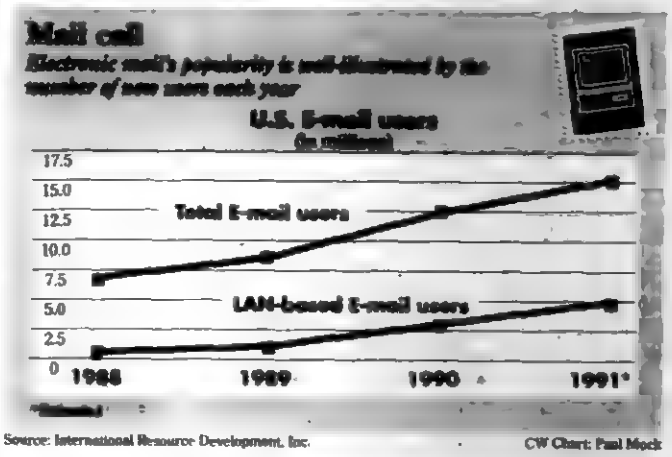
Just adding a page to the corporate computer manual or human resources handbook is not enough, Plesser says. Companies should also consider adding policy messages to screen menus, placing stickers on equipment or even requiring employees to sign affidavits noting that they understand the rights and responsibilities of using corporate E-mail systems, he says.

Some companies take the view that employees who are concerned about their privacy should assume that E-mail messages generated from company computers and stored on company hard disks are company property, says Jerry Sands, senior security consultant at Advanced Information Management, Inc. in Woodbridge, Va.

This is a reasonable viewpoint, Sands says, given that workers who use E-mail to send frivolous messages or to run their own businesses are eating up company resources and processing power. "E-mail systems are hogs, and I don't think many people are cognizant of that fact," he says.

If a policy exists, then management should do its best to enforce that policy lest it lose credibility, Sands says.

On the privacy side, follow-through is equally important to prevent litigation. "You've got to make sure the policy is enforced," Plesser says. Whatever its view, management should be paying more attention to E-mail issues, says Arthur D. Little's Ulrich. "Now that there have been suits, people are aware of the problem and should be developing policies," he says. "If you don't develop a policy over the next 12 months, then you are not being diligent."



Source: International Resource Development, Inc. CW Chart: Paul Mock

Written or simply understood?

Not having a written policy on E-mail does not necessarily mean a firm has no position on the issue or has simply ignored it. At Hallmark Cards Co. in Kansas City, Mo., the E-mail network serves roughly 4,500 subscribers. John Collins, vice president of IS, says user privacy is the top priority for the greeting card maker's E-mail system. "Our view is that people corresponding on E-mail have the right to privacy like in any other type of correspondence," he says.

Although Hallmark's policy is not written down, Collins says it has never been questioned by workers or managers. "We've never argued it on moral grounds. We just think it's a good company practice."

Hallmark

Hughes Aircraft Co. in Long Beach, Calif., has never formulated an official policy, but, according to Steve York, manager of the information exchange technologies group, the firm has explored E-mail issues several times. Now, York says, Hughes is the closest it has ever been to writing down a corporate directive. "Our technical people have talked with our legal people and our human resources people to see if we should develop a policy," he says.

Traffic volume is one motivating factor. Hughes employees send tens of thousands of E-mail messages each day over a company network linking 30,000 users. Most of the communications are internal notes and memos, but suppliers and other aerospace firms are also part of the E-mail hookup. Another source of motivation has been the two recent lawsuits relating to E-mail, both filed in Hughes' home state. York says those cases spurred company executives to focus more attention on the problem.

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NEW DEALS

NASA to award contract for Planet Earth

The National Aeronautics and Space Administration is expected to award a contract by year's end to build an Earth Observing System Data and Information System Core System as part of its Mission to Planet Earth program to collect and disseminate information on global environmental problems.

The system will process, store and distribute data collected by U.S. Earth Observing System platforms, which will be working with European and Japanese space platforms to provide environmental data to scientists worldwide. A team led by TRW, Inc.'s Systems Integration Group will bid on the 10-year contract, the company said.

The Pittsburgh Supercomputing Center has implemented what it claims is the first direct high-speed data transfer between a Connection Machine System from Thinking Machines Corp. and a Cray Research, Inc. Y-MP supercomputer. The link was made in collaboration with both vendors as part of a program to implement applications across heterogeneous supercomputers, the center said.

Acquisitions bring promise of E-mail integration

ANALYSIS

BY JIM NASH
CW STAFF

Electronic mail becomes less of a peripheral software gadget with every acquisition and marketing agreement between personal computer software companies and E-mail vendors.

Networking and distributed processing vendors, by and large, have been accused of taking a cavalier attitude toward lowly E-mail. "You can say *that* again," said John Ryan, a member of the Networking Applications Consortium. "They typically don't have the expertise to come up with a first-class E-mail program."

Network managers have grown frustrated with nonstandard and disparate E-mail packages. Users are taking heart now, as they watch the software giants cry "uncle" and look to E-mail pioneers themselves for a development boost.

Among the benefits expected from collaboration are new applications for E-mail and tighter integration of E-mail with the products of software industry leaders.

NETWORK MANAGERS have grown frustrated with nonstandard and disparate E-mail packages.

Most recently, Microsoft Corp. announced an agreement to buy Consumers Software, Inc., a Vancouver, B.C., company that makes Network Courier E-mail software and several gateways. The move gives Microsoft its first PC E-mail package. It already sells Microsoft Mail 3.0 for Apple Computer, Inc.'s Appletalk network.

Disagreement ends

In February, Novell, Inc. ended years of bickering with Action Technologies, Inc. over its jointly developed Message Handling Service E-mail engine. Users said they hope the peace treaty will free resources for new Action products.

Novell already owns a stake in E-mail firm Da Vinci Systems Corp. Also last month, Lotus Development Corp. bought CC:Mail, Inc., Consumers' chief E-mail competitor.

To Ryan, director of systems engineering at Compaq Computer Corp.'s communications technology department in Dallas, all of this sounds pretty much on target. The applications consortium, he said, comprises Banyan Systems, Inc. users who are "tired of the batteries-not-included attitude" exhibited by network vendors who market platforms without key integrated services.

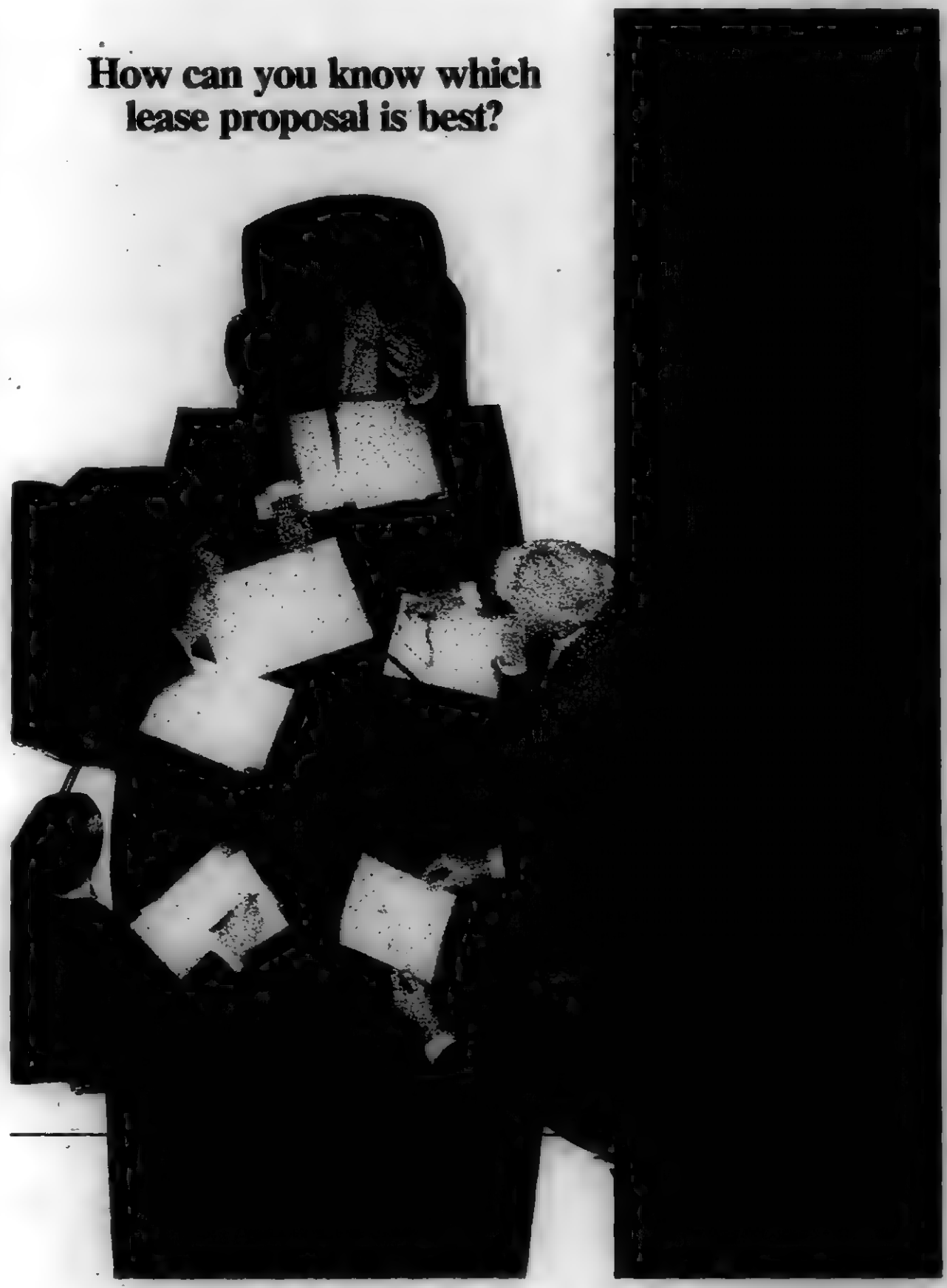
"The giants in the [networking] industry are finally recognizing that E-mail is essential," said Larry Quinlan, manager of local-area network services at Deloitte and Touche in Nashville.

That recognition could mean a dramatic rise in the number of E-mail users, said Winston Leong, a communications consultant at Avon Products, Inc. in Pasadena, Calif. E-mail, Leong said, should be as common and integrated in networks as dictionary services are in word processing applications. "E-mail will only be a medium in delivering messages then," he said.

Quinlan said he hopes to see electronic routing of forms become a reality. He would like to see standard purchase orders and personnel forms become part of E-mail packages, not unlike an electronic data interchange system for internal use, [illegible].

Quinlan also said greater involvement by large software developers could also result in bulletin-board services set up exclusively for individual companies.

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ISDN on-line services added

The first two commercial on-line information services to be available through an Integrated Services Digital Network (ISDN) connection were announced earlier this month by **Mead Data Central, Inc.**, which will offer Lexis and Nexis via **Illinois Bell Telephone Co.**'s Basic Rate Interface ISDN service. Illinois Bell ISDN customers will be able to access the databases at 9.6K bit/sec., conduct research faster and lower their on-line charges, Mead Data Central said.

Nine new electronic mail systems have been brought into the **Softswitch, Inc.** interconnection fold. The vendor has added Open Systems Interconnect X.400 interoperability between its gateways and **IBM**'s Information Network. Intercommunication support between local-area network E-mail packages has also been added for systems from **Da Vinci Systems Corp., CE Software, Inc.** and **Sitka, Inc.** Mainframe- and minicomputer-based E-mail packages now interconnected through the Softswitch gateway include those from **ICL, Inc., Computer Associates International, Inc.** and **NBS Systems, Inc.**

A Switched Multimegabit Data Service (SMDS) interface for linking LANs over wide-area communications lines will reportedly be bundled into **Cisco Systems, Inc.**'s multiprotocol routers come June. SMDS is a switched high-speed data interconnection service rolling out from the regional Bell operating companies.

A group has formed to quickly provide companies with custom graphical user interfaces for existing character-based and proprietary interfaces now running on Unix, Digital Equipment Corp.'s VMS and other workstations. **Sunrise Software International's Rapid GUI Conversion and Integration Group** said it will complete interfaces in 30 to 90 days.

More than 60% of 200 telephone company customers recently surveyed by **Andersen Consulting** said they would like to see competitive alternatives in the local-exchange market.

Horwitt

FROM PAGE 47

month, it announced a Netview Distribution Manager product that will allow companies to centrally store and generate software, operating system images and configurations on the host and then download the code to remote users by way of OS/2 LAN servers. In addition, OS/2 servers running APPN will be able to send LAN alerts up to a Netview host, either directly or via an Application System/400 intermediary.

The problem is that IBM's peer-to-peer strategy is based on two offerings that so far have failed to catch on with users: OS/2 and LU6.2.

Users are not entirely averse to IBM's concept of OS/2 Extended Edition servers, equipped with peer-to-peer SNA protocols, acting as gateways between LAN clients and SNA resources. When APPN software for OS/2 becomes available next fall, OS/2 servers will be able to act as liaisons between OS/2 and DOS clients on the LAN and other resources on the SNA backbone. They will be able to route LAN transmissions — including those generated by popular Netbios and eventually Novell IPX/SPX applications as well — over SNA links.

What users resist, however, is the idea of an OS/2-based LAN workstation, and that contributes to their resistance to using LU6.2. The peer-to-peer protocol takes up far too much memory on a DOS machine and is also notoriously difficult to write applications for.

Users seem perfectly happy to use Netbios and Novell applications on their LANs and implement a dumb terminal SNA gateway for LAN users to get to hosts. Yes, there are some companies that have found LU6.2 a much more efficient way to interconnect users with host applications. And yes, many users are very interested in the dynamic routing and directory services offered by APPN.

But the majority of firms has no immediate plans to migrate to IBM's peer-to-peer protocols except in a limited fashion. The problem is the huge installed base of 3270 applications that users would have to rewrite, according to David Passmore, a partner at Ernst & Young.

IBM is obviously aware of all of the above problems. The vendor is working on a more streamlined version of LU6.2 for DOS and is considering hitching LU6.2 to Microsoft's Windows, a spokesman tells us.

IBM is also said to have looked at, but shelved, providing LU6.2 transport for 3270 applications, which would enable users to take advantage of all the efficiencies and dynamic routing capabilities of peer-to-peer SNA without having to rewrite their 3270 applications.

There is yet another IBM success story that is getting in the way of the vendor's current efforts to sell peer-to-peer SNA. IBM has managed to convince analysts and users alike that it is really serious about Open Systems Interconnect (OSI) as a way to connect its own systems with those of other vendors, Passmore says. However, IBM has also begun pushing its APPN as the "open" transport mechanism to tie SNA and non-SNA worlds together.

This leaves the vendor's customers with a tough call: Should they base their multivendor networking strategies on peer-to-peer SNA strategy or on OSI? IBM has trumpeted its commitment to both strategies and is still far from providing a full-function platform to support either.

Anybody got a coin to flip?

Horwitt is a *Computerworld* senior editor, networking.

Ch



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UK telecom duopoly loosening, U.S. gains

BY ELISABETH HORWITT
CW STAFF

LONDON — Great Britain's government made several policy decisions earlier this month that will foster greater competition in the country's long-distance and local communications service markets. The loosening up of the current market duopoly of British Telecom PLC and Mercury Communications Ltd. paves the way to cost savings for U.S. companies that use the UK as a hub for their international networks.

In a prepared statement, Bryan Carsberg, the UK's director general of telecommunications, praised the government's moves toward competition as encouraging greater efficiency as well as promoting "the provision of better quality of service and of variety of services." The decisions were the culmination of a multimonth review process of the UK's telecommunications policies, called the "duopoly review."

Britain has led Europe and, according to some sources, even the U.S. in its denationalization and deregulation of the telecommunications market, according to Todd Dagres, a director at The Yankee Group in Boston.

The recent decisions would expand the current two-carrier system to additional providers that could provision their own switches and resell the primary carriers' bandwidth — presumably at a lower price than is now offered, Dagres said. "Now, AT&T can set up its own hub and provision its own services" instead of having to go through British Telecom, he added.

Good news for all

The additional competition will be "good news to users both in the UK and internationally, driving down prices there," Dagres said. "This is particularly important in the data market, which is less mature and growing more quickly" than voice services, he added.

In addition, Britain's move is likely to bring about similar deregulation on the part of countries such as Belgium, France and Germany, which compete with the UK for European hub traffic, Dagres said.

United Parcel Services, Inc. (UPS) stands to benefit greatly from more competitive prices in the UK because "we have a private-line network that switches through London to Germany," said Douglas Fields, the package handler's manager of telecommunications for information services.

In addition, UPS is looking at reselling some of the bandwidth on its own dedicated international lines to customers so they can connect with their business partners and users overseas without having to set up their own private-line network, Fields said. "It's an added value to our package handling service," he said.

The government's decision also paves the way toward more competition on the local loop. Several U.S. regional operating companies have been setting up joint ventures with British cable companies in hopes of entering the local networking market in certain regions of the UK [CW, Jan. 7].

Bell operating company spokesmen said their companies' launching of such services depended on whether the review resulted in a more favorable regulatory climate for such services.

Video travels the globe

BY JOANIE M. WEXLER
CW STAFF

TORONTO — Determined to extend videoconferencing beyond the boardroom, Northern Telecom, Inc. recently said it is building a global, dial-up, full-motion video network to link 49,000 employees.

Don Sproule, Northern Telecom's director of network planning, said the firm has been beta-testing Peabody, Mass.-based Picturetel Corp.'s System 4000 since December and has contracted to purchase up to $2.5 million worth of the equipment.

Previously, the firm had been using another manufacturer's gear in six videoconferencing rooms to transmit video traffic over dedicated communications lines. Until now, Sproule said, equipment and dedicated line costs have prevented the firm from expanding the network beyond its major sites.

"The cost of videoconferencing equipment has been cut in half over the last two years; we can get good quality over a switched network, and the tariffs have dropped to give us switched connectivity cheaper than dedicated lines," Sproule explained.

Transmission costs using the System 4000 and switched facilities have dropped from $400 to $30 per hour, he said. However, the biggest value of videoconferencing to the firm is the time saved on corporate decision-making and turning around projects, Sproule said.

"If I cut 10 weeks off a project with a total [research and development] investment of $100 million, the savings on the interest of that money alone could be $2.4 million," he explained.

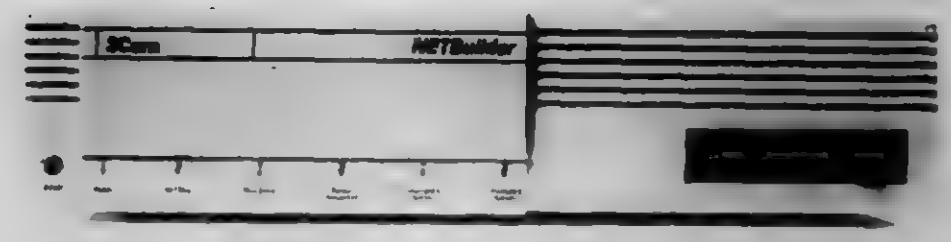
Cost cuts in travel and living expenses rank second, Sproule said. He said he figures that on a per-system basis, "if we have two to three conferences a month that would have otherwise resulted in travel, then we'll be at a break-even point with the System 4000."

Picturetel introduced its System 4000 product family in January. The system, which is priced from $39,500, integrates formerly separate components into one module.

Sproule said a key factor in the decision was a $5,000 echo-canceling option that permits a person to wander anywhere in the room while speaking without audio degradation.

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Continued from page 53

Local-area networking hardware

Cnet Technology, Inc. has announced a line of portable network interface adapters designed for Ethernet, Arcnet and token-ring networks.

The family includes the CN50ET, a 10Base-T Ethernet model that supports unshielded twisted-pair cabling; the CN50E coaxial Ethernet adapter; the CN50A, an Arcnet adapter designed to support star and bus topologies as well as coaxial and unshielded twisted-pair cabling; and the CN50TR, a token-ring adapter that supports IBM Type One and Type Three cabling.

All models are scheduled to begin shipping this month except for the CN50TR, which is slated to ship in July. Prices range from $259 to $699, depending on type of model.

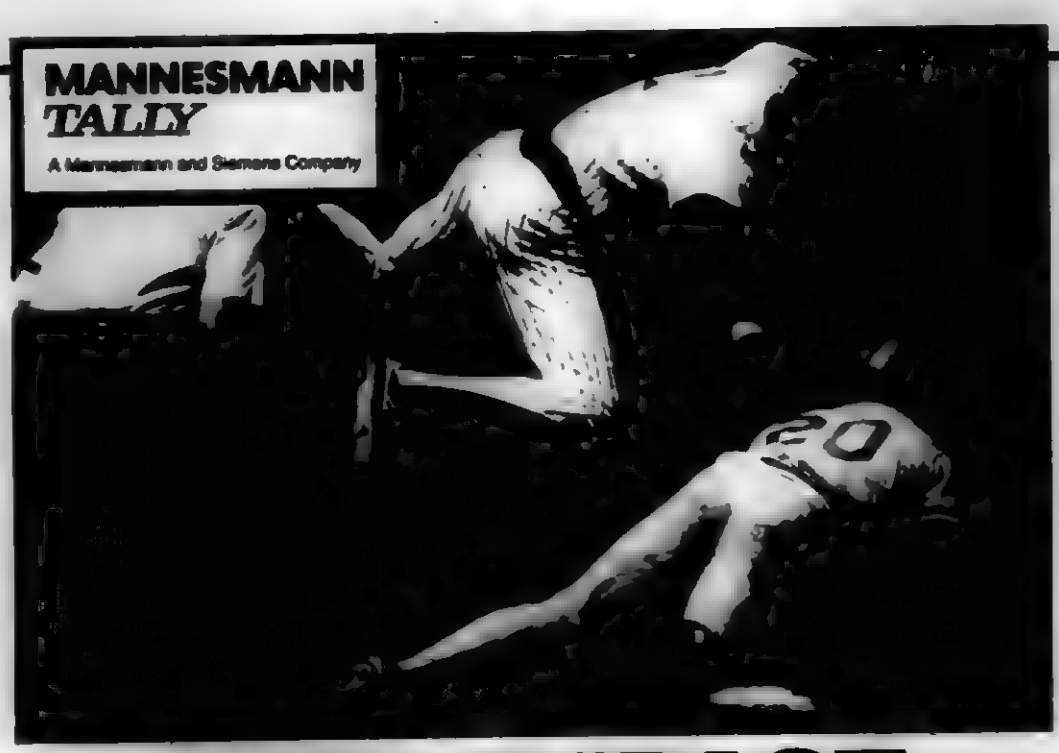
Cnet Technology
2199 Zanker Road
San Jose, Calif. 95131
(408) 954-8000

Bravo Communications, Inc. has announced a series of devices designed to protect local-area network components from power spikes or surges.

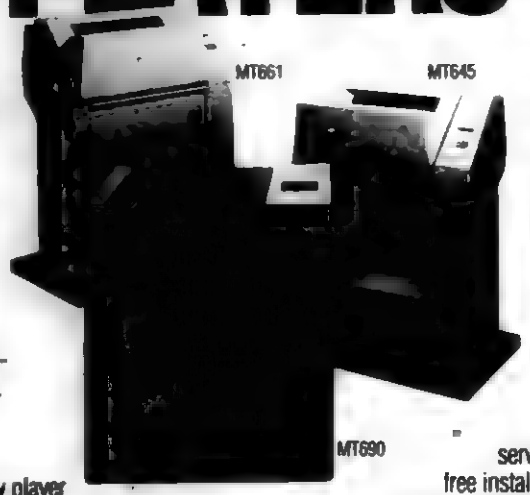
The Sure/Fire LAN Protectors series can reportedly protect components such as network adapter cards, transceivers, multiplexers, hubs and concentrators from in-line cable transients. The series includes Model BNC/LAN, a Bayonet Neill Concelman male/female port protector for Ethernet/Thinnet Arcnet and token-ring ports, and Model RJ45/LAN, a device designed to protect twisted-pair Ethernet and Arcnet ports against transients greater than or less than 8 V.

Each model costs $59.

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Visual Technology, Inc. has announced an imaging display station that supports thick or thin Ethernet local-area network connections via Transmission Control Protocol/Internet Protocol or Decnet protocols.

The X-19PQD is equipped with 2M bytes of memory. Its eight video planes feature 256 gray-scale levels. The product also includes a 19-in. monitor that features 1,280- by 1,024-pixel resolution at a 72-Hz refresh rate.

Pricing begins at $4,495.

Visual Technology
120 Flanders Road
Westboro, Mass. 01581
(508) 836-4400

Network management

Blue Lance, Inc. has introduced a program designed to provide a complete audit trail for Novell, Inc. Netware-based local-area networks, including Netware 386-based LANs.

LT Auditor 386 ($695) can reportedly be used to maintain security for programs or data within a network. It can also facilitate network troubleshooting and planning. The product can track users' log-ins and log-outs, file activities and files that were copied from local drives to network drives or vice versa.

Blue Lance
1700 W. Loop South
Houston, Texas 77027
(713) 680-1187

Gateways, bridges, routers

Fel Computing, a division of Fel Industries, Inc., has announced Lanlink-Decnet, a personal computer-based local-area network gateway that allows PC-LAN users to run Digital Equipment Corp. network applications.

The product provides users with complete protocol translation by converting any IBM Personal Computer AT, XT, Personal System/2 or compatible on a LAN into a dedicated high-speed gateway that connects directly to the Decnet Ethernet cabling.

Pricing begins at $1,495 for a five-user kit. Ten-, 25- and 50-user versions or a site license can also be purchased.

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- DECmessageQ V1.0, an addition to the NAS Communication and Control Services that enables applications to communicate utilizing an innovative "message" queue
- The NAS Application Control Architecture (ACA) that allows developers to use object-oriented technology to link and distribute applications and information.

What It All Means to You: Optimizing System Resources

What do these new NAS extensions mean for you?

With DECmessageQ, an implementation of NAS Interprocess Queuing Services, developers can optimize system resources by building modularized applications split into separate programs to run on different systems. DECmessageQ also lets people work more productively. For instance, by using DECmessageQ, you could integrate information from an order entry application with an inventory application written for a completely different computer system.

With Digital's Application Control Services implemented on ACA, rather than creating information in individual, separate applications, all with their own different commands and features, you'll be able to create information as one task. As an example, you'll be able to click on a "monthly report" icon built with Application Control Services that links all the applications needed to build a report. Digital will implement the NAS Application Control Services over the next year. The NAS ACA specification is available from Digital at a nominal charge.



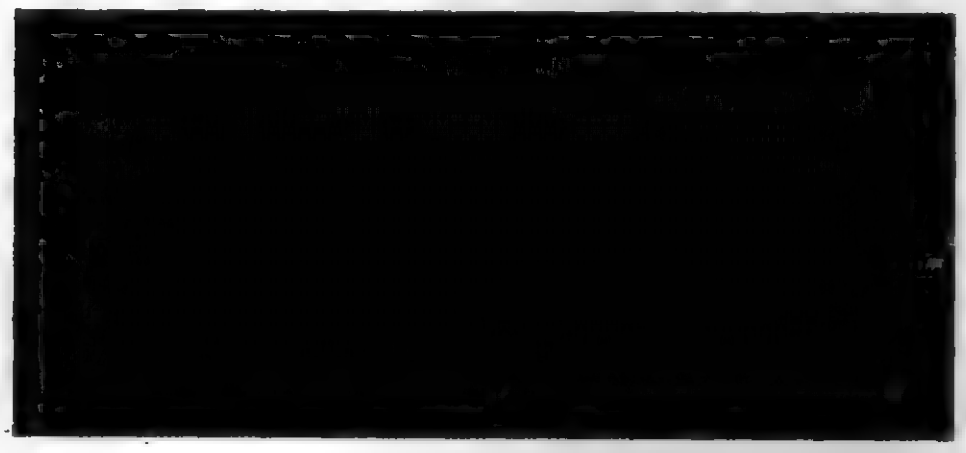
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- -Forms Services
- - Graphics Services
- -Terminal Services

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- - Distributed Computing Services
- - Portable Operating System Interface

▲ **Network Application Support (NAS) services have been extended to allow developers to more easily build applications for distribution across multivendor networks.**



For More Details

The following information should be helpful in planning your implementation of DECmessageQ. For more complete details on the new NAS extensions, please contact your Digital sales representative.

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Part # QL-GKPA9-J; $12,000

DECmessageQ for VMS/Run-Time
Part # QL-GHVA9-J; $4,000

DECmessageQ for VMS/LU6.2 Services
Part # QL-GKQA9-J; $9,000

Two ULTRIX licenses are available:

DECmessageQ for VAX ULTRIX
Part # QL-GHUA-AA; $9,000

DECmessageQ for RISC ULTRIX
Part # QL-GHTA-AA; $4,000

Other available licenses:

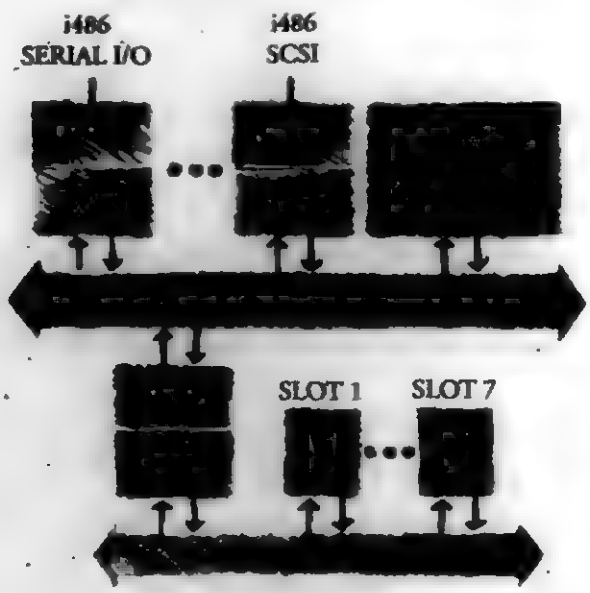
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The applicationDEC family of products is fully supported by Digital's customer services organization, offering the choices and levels of service provided with other Digital products. Digital also supports the SCO UNIX operating system and selected layered software with both telephone and on-site service around the world.

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DEC FUSE: New UNIX-Based CASE Tool

Digital recently extended its COHESION software development environment by adding DEC FUSE to its family of UNIX-based CASE tools for RISC systems. As a visual CASE tool set for DECstation and DECsystem platforms, DEC FUSE for ULTRIX provides an interactive, graphically-oriented UNIX programming

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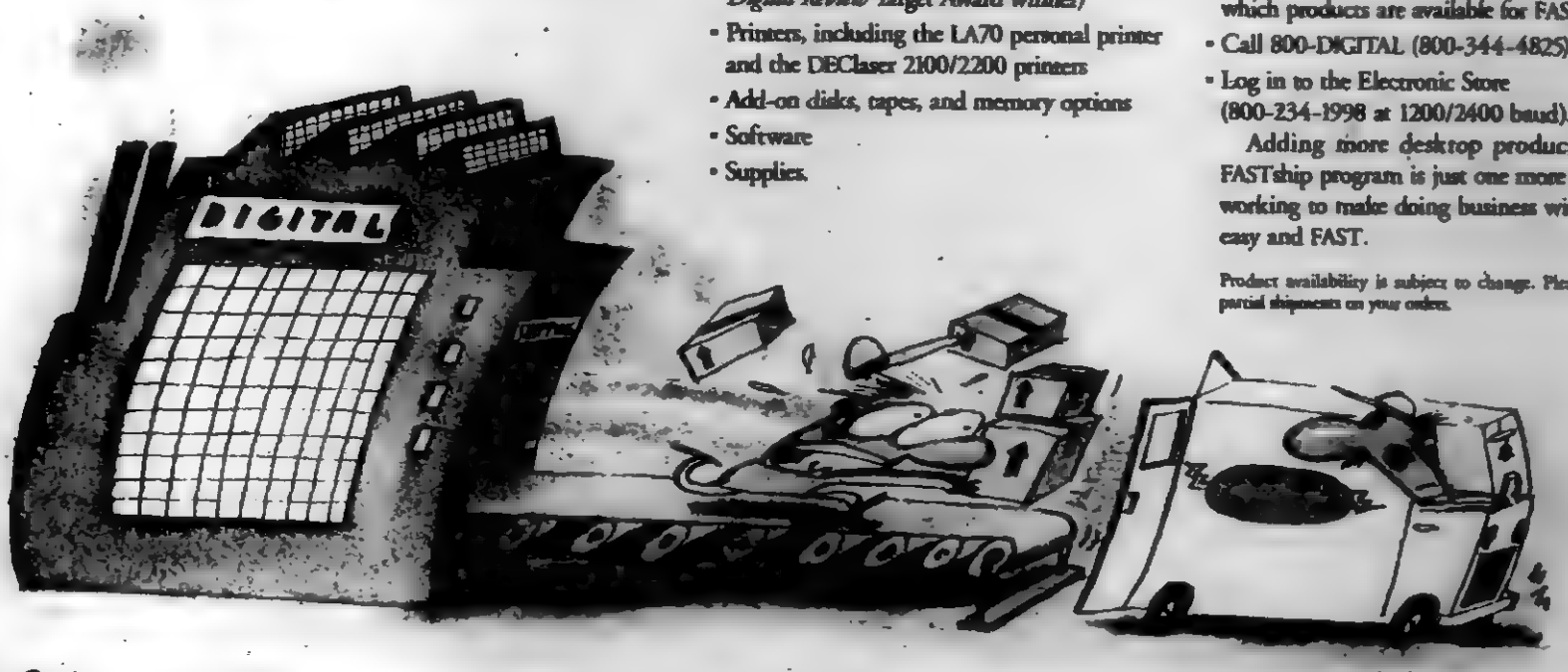
In addition, the basic monthly charge on the RZ57 has been reduced by almost 30 percent.

DECluster 2100/2200 and the new DECluster 2150/2250. (If you're using the DECluster 2100/2200 ANSI models, ask your Digital salesperson about the ASSETS program package for ANSI Setup Modules that makes this letter and envelope process happen even faster.)

For fast, easy ordering and information on these and other Digital products and services, call 800-DIGITAL (800-344-4825). For answers to your technical questions, call our Technical Consulting Center at 800-343-4040.

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Adding more desktop products to our FASTship program is just one more way we're working to make doing business with Digital easy and FAST.

Product availability is subject to change. Please allow for partial shipments on your orders.

InfoServer 100

Right Data, Right Place, Right Time

The recently announced CD-ROM-based InfoServer 100 is a dedicated server that attaches directly to thick or ThinWire Ethernet, giving direct data access to any client connected in a local area network.

The InfoServer 100 CD-ROM server is the first in a family of Digital products designed to provide an outstandingly simplified software and information delivery system. It is compatible with all VAX VMS platforms, and is cluster independent. It offers local area network access to libraries of software and documentation, as well as training on CD-ROM. Users can easily take advantage of Digital's comprehensive VMS Consolidated Distribution Software, VMS Online Documentation Library, company databases, the DECUS software library, and more.

The InfoServer 100 makes it easy to distribute information, and to do VMS and layered product installations and upgrades. Because there are so many products on a disk, there's no need to load and unload media. Installation time is reduced, and everyone is kept up-to-date on the latest revisions. Systems managers can keep a handle on critical information while at the same time letting users access it with ease. Central control, local freedom — an ideal solution.

Product Information:

InfoServer 100 with 1 RRD40 drive
Part # SEABB-AA; $8,300

InfoServer 100 with 2 RRD40 drives
Part # SEABC-AA; $9,300

Each of the above packages includes the InfoServer system with InfoServer software and license, four client licenses, the current editions of Online Documentation on CD media, Consolidated Distribution on CD media, and DECIearn on CD media. There are also two coupons included — one for $500 off the price of the yearly subscription to Online Documentation and one for $500 off the price of the yearly subscription to Consolidated Distribution. To order, or for more detailed information on the InfoServer 100, call 800-DIGITAL (800-344-4825).

As a Matter of Fact

Here are the latest statistics on Digital's worldwide network customer installed base.

Through December 1990, Digital has shipped:

- 777,000 DECnet licenses
  Cluster and site licenses counted as one unit.
- 998,000 total Ethernet nodes
  Sum of all Ethernet controllers plus communications servers; all devices attached to cable plant.
- 4,246,000 Ethernet terminal ports to 78,000 Ethernet customer ship-to locations worldwide

Numbers are worldwide revenue shipments to Digital customers and do not include Digital's internal networks. Data source is PPR database. All data reflects cumulative unit shipments.

The applicationDEC 433MP System

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Digital's applicationDEC 433MP Intel-based SCO UNIX system.

Designed and built by Digital, the applicationDEC 433MP system offers leadership in industry-standard multiprocessing.

Supporting one to 100 users, the applicationDEC 433MP system provides an open system platform for running some of the most popular and extensive business applications and database software on the market. It is the newest, most powerful member of a family that includes the applicationDEC 316, 325, and 333 models — all uniprocessing systems designed to meet the personal productivity needs of one to 32 users.

At Home Almost Anywhere

Equally effective in the client/server environment or in more conventional multiuser timesharing implementations, the applicationDEC 433MP system is ideal for commercial applications, general purpose computing, transaction processing, PC integration, and more.

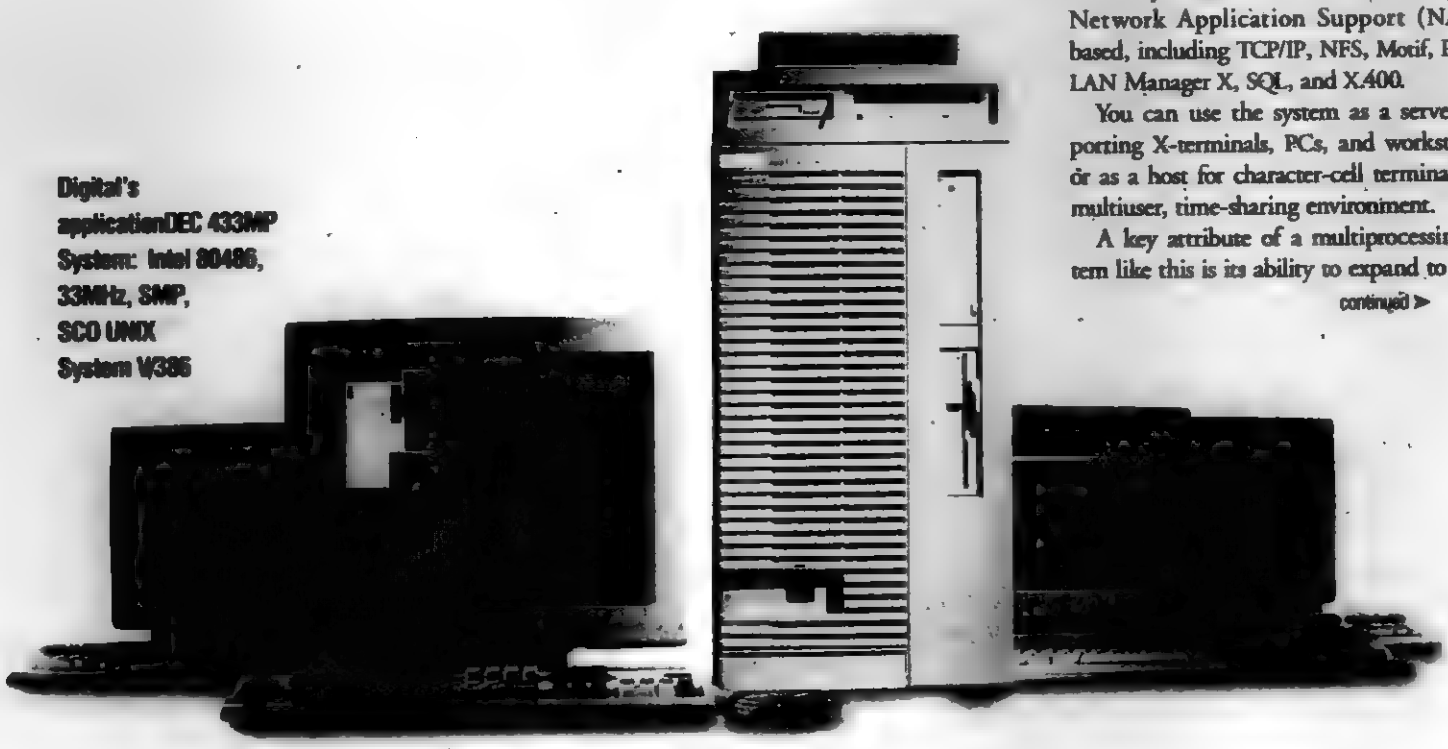
The applicationDEC 433MP system combines the power of Intel microprocessors and the flexibility of SCO UNIX System V/386, with multiprocessor enhancements by Corollary, Inc. This industry-standard, open operating system gives you ready access to thousands of applications, including over 4,000 SCO UNIX applications, 1,200 PICK, and 15,000 MS-DOS applications. In addition, the system can run applications under these operating systems concurrently.

Geared toward the needs of small and mid-sized businesses, the applicationDEC 433MP system supports many of the same industry standards on which Digital's Network Application Support (NAS) is based, including TCP/IP, NFS, Motif, POSIX, LAN Manager X, SQL, and X.400.

You can use the system as a server supporting X-terminals, PCs, and workstations, or as a host for character-cell terminals in a multiuser, time-sharing environment.

A key attribute of a multiprocessing system like this is its ability to expand to match

continued ➤



Digital's applicationDEC 433MP System: Intel 80486, 33MHz, SMP, SCO UNIX System V/386

MANAGER'S JOURNAL

EXECUTIVE TRACK



Martin A. Morris Jr. has been promoted to assistant vice president of the information systems department at **Amsouth Bank NA** in Birmingham, Ala.

Morris joined Amsouth in 1989 as a systems engineer. He previously held positions at El Paso Natural Gas Co. in El Paso, Texas, and Aramco in Dhahran, Saudi Arabia.

.....

Irad "Terry" Hardy has been promoted to corporate vice president of operations systems at Minneapolis-based **National Car Rental System, Inc.**

His new position will focus on the evaluation of physical plant and operating processes, with emphasis on improving operational efficiencies. Most recently, Hardy had overseen the implementation of National's enhanced technology in its Rochester, Minn., license operation, including its Smart Key Machine computer-based self-service rental service.

Hardy joined National in 1987 as northeast regional manager. He had previously worked for Avis, Inc.

.....

Priscilla Tate has been named the first executive director of the **Microcomputer Managers Association**, a New York-based group of about 1,000 professionals involved in personal computer technology management.

Tate is president of Tate-Austin Associates, a strategic planning and market research firm she founded in 1982. She has held IS positions at the former E.F. Hutton & Co. and at Manufacturers Hanover Trust Co.

She holds a bachelor's degree and a master's degree from Duke University.

.....

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Recasting IS for the 1990s

Consultants preach technology/business linkage, but are executives ready to listen?

BY NELL MARGOLIS
CW STAFF

From its headquarters in an 18th century townhouse on Boston's historic Beacon Hill, a 3-month-old corps of "consultants' consultants" is eyeing the information systems function of the future — and attempting to mold business/information leaders flexible enough to supply it.

"Everybody talks about 'informating' business, about bridging the gap between information technology and business culture, but nobody is really doing it," says Alan Stanford, national director of IS consulting at accounting and consulting firm Ernst & Young.

Two years ago, Ernst & Young's management committee decided to try to be the one to "really do it." As its vehicle, the committee carved out an autonomous consultancy-to-the-consultancy aimed at toppling the barriers between business and technology.

In December, doors opened at the Ernst & Young Center for Information Technology and Strategy, a blue-ribbon consulting boutique. A separate compensation scheme that removes competition with other Ernst & Young colleagues ties center partners' successes to their ability to aid their nationwide colleagues with the fruits of high-level, multidisciplinary strategising.

The center's 40-person lineup includes among others Managing Director Bernard F. (Bud) Mathaisal, fresh from his stint as turnaround chief information officer at Walt Disney Co.; former McKinsey & Co. banking technology consultant Diogo Teixeira; former Index Group Research Director Thomas' Davenport; and computer-aided software engineering (CASE) maven Vaughan Merlyn, who became an Ernst & Young partner in January when he merged his CASE research firm into the center.

The center's goals are simple to state but accomplishing them could prove to be far from easy. Not least among the barriers facing the fledgling outfit is the reality that the IS world might not be ready to be recast.

"Most IS people still have a very narrow view of their responsibilities," concedes center partner Philip Pyburn. "The client for most of the work we've done in the past 10 months isn't the IS person; it's the CEO."

To help him and his clients through what could be a bumpy ride from status quo to status desirea, Pyburn says he is relying heavily on three attributes he learned during his days as a software company entrepreneur: "Patience, patience and more patience."

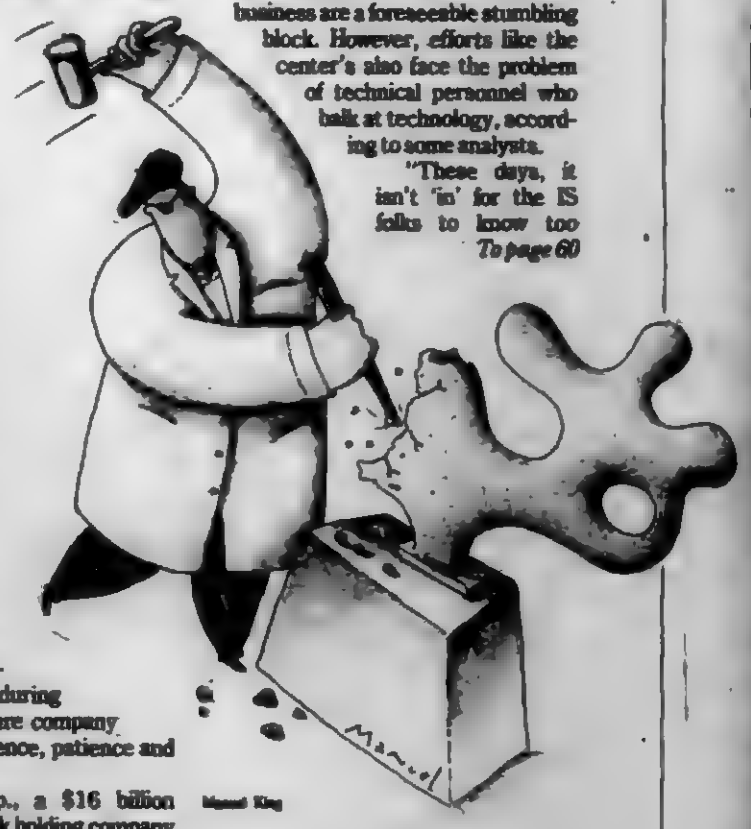
At Society Corp., a $16 billion Cleveland-based bank holding company that inadvertently became a beta-test site of sorts for the center's services, the top IS executive admits that much of the world may not be ready for the center's view, but he is.

"There's still a lot of 'not invented here' attitude in some IS shops," says Alan Gula, executive vice president of information technology. "But I don't care where it's invented. If I can leverage it, bring it on."

Technical personnel who balk at business are a foreseeable stumbling block. However, efforts like the center's also face the problem of technical personnel who balk at technology, according to some analysts.

"These days, it isn't 'in' for the IS folks to know too

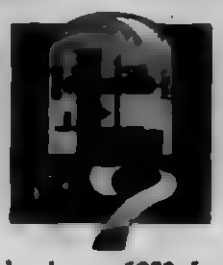
To page 60



Wall Street: IS 'not a big deal' to bottom line

BY CLINTON WILDER
CW STAFF

Senior business executives' understanding and awareness of information technology continues to rank among the top concerns of information systems managers. But what about Wall Street security analysts, whose opinions and earnings projections can send company stock prices soaring or plummeting?



Michael Norwich, a senior manager in the New York office of IS consulting firm Nolan, Norton & Co., has been pondering that question. He got curious about security analysts' perceptions of IS while researching the topic of outsourcing for William Kelvie, a former Nolan, Norton consultant who is now the head of IS at the Federal National Mortgage Association.

In researching the outsourcing moves of large organizations such as Eastman Kodak Co. and H. J. Heinz Co., Norwich interviewed several analysts who follow the companies. Although opinions varied, the general consensus was that IS was "not a big deal" to the bottom line.

"I would say they are starting to realise its importance, but it's an intangible," Norwich noted. "It's not something they can value in cents per share."

Kodak's landmark outsourcing announcement in 1989, for example, was huge news in the IS world, but it did not cause even a ripple in Kodak's stock price. Placing a specific value on IS has so far proven to be as elusive for Wall Street analysts as it has for chief financial officers and business executives.

Therein lies a chicken-before-the-egg dilemma, according to Norwich. Security analysts deal with executives at that level; if the executives are not well-versed in the IS activities at their companies, or if they are not big believers in technology, the analysts will not raise the issue with that organization.

By the same token, Wall Street's IS awareness level will probably rise as efforts to quantify IS benefits (or lack thereof) proliferate. Nolan, Norton, for example, recently completed a one-year project working with a dozen companies to develop new metrics for corporate performance, including IS. As those types of metrics become perfected, security analysts' interest in IS should increase.

"They have a sense that it's important," Norwich said, "but they can't quite get their arms around it. It's still an early point in time" on the measurement curve.

Recasting

CONTINUED FROM PAGE 59

much technology or to hang around with the techies," notes Bruce Rogow, executive vice president of worldwide analytic resources at Stamford, Conn.-based market research firm Gartner Group, Inc. His own propensity to "wallow with the techies," Rogow says, causes raised eyebrows among CIO friends.

A recent Gartner Group survey of CIOs, he says, showed the respondents spending 30% of their time on "the business of the business" and 40% practicing "management by walking around."

While the remaining 30% was "spent with the technology team," Rogow notes, the lion's share of that portion was devoted to administrative and managerial matters within the IS department. A mere 3% to 5% of total time per CIO was spent learning new technology.

Growing competition

While the center's market may not be ripe, the competition for that market is budding. Across the Charles River from the Ernst & Young Center, for instance, management consultancy Arthur D. Little, Inc. in Cambridge is also preaching the gospel of a new information-informed corporate order built on principles of business/IS linkage. In fact, the linkage concept is more likely to emerge as one of the dreaded buzzwords of the early 1990s than to offer any of its proponents a claim to consulting distinction.

Meanwhile, however, the technologically savvy executives and businesswise IS heads whom the center sees as joining to write tomorrow's corporate success stories are out there — if not yet in profusion — to be found and fostered by the center's approach, Gula says.

Society sought the services of Ernst & Young's IS consulting division back in 1988 when a homegrown attempt to create an IS strategy for the firm's corporate banking unit went awry. The business unit "wanted a narrow focus," Gula says, "while IS wanted the big picture. It was a marriage made in hell."



Pyburn *preaches patience as the key for IS success*

Society turned to Stanford — then pioneering the concepts that would later be embodied in the center — to help bridge the gap. Stanford's approach was based on the assumption that information means and business ends must inextricably serve each other from the start and must be implemented by professionals who understand and embrace not one or the other but both. That turned thinking on its head in Society's corporate banking and IS groups, Gula said.

Fired up by new understanding of the people who used to be written off by the technical personnel as "suits," Gula says he told his IS department, "You work for a bank: I want you to look, act and talk like bankers. That alone, he says, "opens more doors than you might guess."

The learning process went both ways. "The first surprise [for the bankers] was that they thought they really understood everything about their business priorities — but they learned there was more," Gula says. "They came in with a good tactical view, but by the time you implement a tactical plan, the business has changed."

Knocking down the cultural walls helped the bankers and technical people discover that Society already had most of the information capability it was poised to buy, Gula says. Instead of "spending millions to update or replace our core systems," Society was able to plan a project that would make information from five core systems available to bankers using IBM OS/2-based workstations with Easel Corp. touch-screen interfaces.

The process saved "years and seven figures worth" of development effort, Gula says. "We found that 80% of the information [the bankers] needed already existed; we just weren't delivering it."

Luxuries of home?

Ernst & Young's Center for Information Technology and Strategy is attempting to seed the IS/business infrastructure of the future from a Charles Bulfinch-designed townhouse planted firmly in the past.

However, consultants said the center's physical plant — if such a phrase can be used to describe several floors of serpentine staircases, oriental carpets, brocaded settees and burnished antique accoutrements — is strategic.

"We wanted an atmosphere that would both attract and be comfortable for the senior-level corporate executives we expect as our clients," says Bud Mathaisel, managing director. That meant an intellectual climate conducive to contemplation and exploration, luxurious but with roots, redolent of power through innovation. When it comes to the building, the medium is the message.

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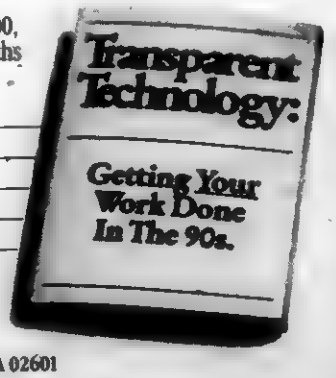
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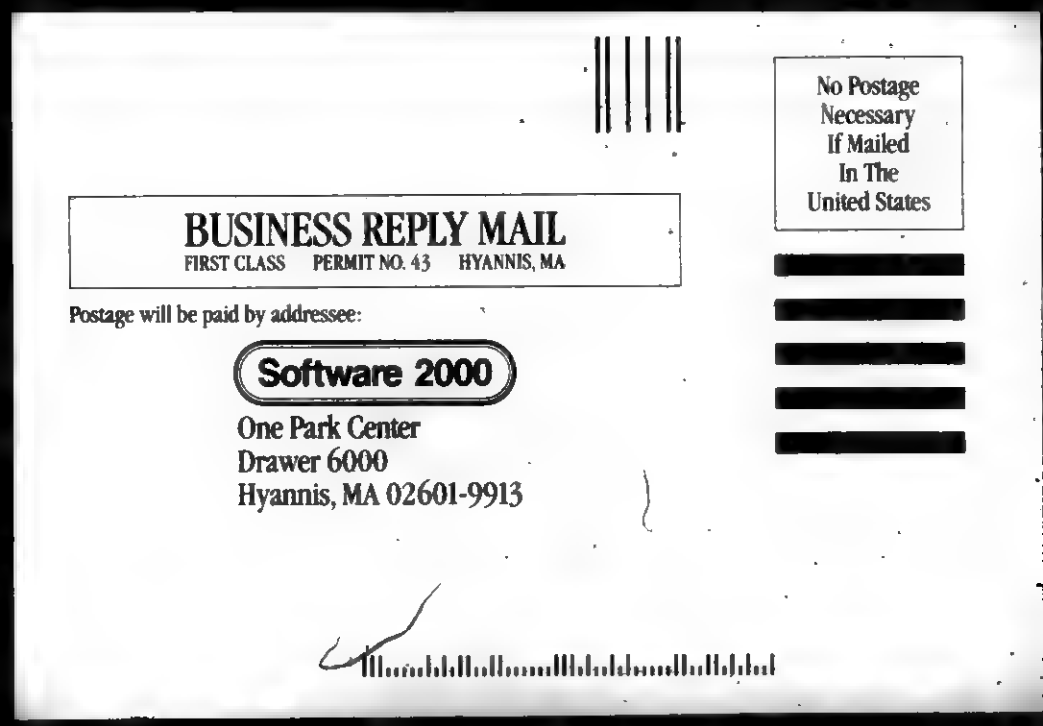
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Survey: Medical IS lags behind other industries

BY CAROL HILDEBRAND
CW STAFF

Although information systems is bulking up its profile in hospitals nationwide, the overall effect is more likely to get you your bill faster rather than send you home more quickly.

According to a survey conducted by Hewlett-Packard Co. and the Healthcare Information and Management System Society (HIMSS), the driving factor behind increased use of computers in 43% of surveyed hospitals is improving operational efficiency rather than improving patient care, which was second at 26%.

The survey, which polled more than 400 IS executives at the HIMSS conference last month, tracked general opinion on the state of technology in the health care industry.

Most said they thought health care IS managers were playing catch-up when it came to technology: More than 80% considered hospitals either somewhat or significantly behind other industries in applying computer automation. However, budgets were slated to meet that process. Sixty-two percent predicted that their budgets would increase either somewhat or substantially.

Fifty-four percent of those polled chose integrating departmental systems as the most important problem facing them in the next two years; 86% tapped the issue as being either imperative or very important; with 56% planning to use in-house staff to get the job done.

Although they are counting on open systems to help make this job easier — 70% expect open systems to have a positive impact on their departments in the next five years — 84% said the computer industry has failed to explain potential benefits. Moreover, 74% said they did not have a firm grasp on the impact emerging standards such as Systems Network Architecture and Open Systems Interconnect will have on their departments.

HIMSS members said they saw hospital efficiency increasing through the use of on-line medical records for patients, which 77% predicted would have great potential. The advance in technology that would bring more computers into hospitals was a friendlier user interface (50%), with 24% opting for voice recognition.

Greater ease of use could have an effect on the attitudes of hospital personnel toward IS: Physicians currently do not have an open mind about using computers. On a scale of one to five, 41% of doctors were rated in the bottom two tiers when it came to willingness to try new technology. High scorers were administrators: Sixty percent were rated as being open-minded.

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MANAGEMENT BRIEFS

Skeptical view of outsourcing

The concept of outsourcing may be having an identity crisis. A survey released last week found that many information technology executives who have not outsourced their operations view outsourcing as a management failure.

The survey, conducted by University of North Carolina at Greensboro researchers on behalf of outsourcing provider The Genix Group, drew responses from 30 senior technology executives at large companies.

More than half of the respondents cited lack of flexibility as one of outsourcing's biggest drawbacks and lack of control as a major drawback. One-third said they lacked confidence in their vendors.

The researchers also said new roles are emerging for information systems executives. They cited as existing roles what they called the "traditional" role, in which an executive is responsible for operations and systems development and maintenance, and "strategic," in which executives are primarily involved in business strategy. The emerging roles are "transitional," in which an executive is trying to move toward a strategic position, and "strategic equilibrium," in which an executive and the company are reaping the benefits of strategic systems.

A division of the American Society for Quality Control (ASQC) recently announced that it is developing guidelines for computer-integrated quality information management systems. The society's Computer Applications Committee hopes to help companies plan, develop or select, and implement computerized quality information systems, which were designed to manage quality in manufacturing environments. A symposium is planned for October. For more information, contact Camille Spampinato, ASQC Computer Applications Committee, 575 Ewing St., Princeton, N.J. 08540.

COMMENTARY

Robert Zawacki

Microwave management



Thoughts on information systems management are not often sparked by the food at a dinner party, but you never know.

On a recent trip east, a client invited my wife and me to have dinner with her and her husband. As we started our salads, she got up from the table and placed a small loaf of frozen bread in the microwave oven.

My thoughts immediately went back 45 years to my early childhood on a small dairy farm in northern Wisconsin. Every Wednesday, my mother started making bread for the next week. She lovingly kneaded the dough, placed it in pans to rise to the correct height, then placed the loaves in the wood stove.

On my walk home from school, I could smell the freshly baked bread when I passed through a small creek valley about a quarter of a mile from home. When I entered the house, the entire kitchen table was covered with golden loaves. To this day I can still smell and taste that bread.

My mother took no shortcuts. I didn't want to tell our hostess, but her microwaved bread was not the same.

GOOD LEADERSHIP, like good bread baking, requires attention, patience and care all day long.

My point is that IS managers are looking for quick fixes to today's complex problems. They turn to fads such as one-minute management, quality circles, entrepreneurial management or management by objectives.

Unfortunately, many IS managers are trained and rewarded based on quick fixes, and microwave management appeals to them. But we don't need one-minute managers. We need full-time managers who will work with their individual contributors in the 1990s to increase motivation, productivity, service and quality.

In the 1990s, we will continue to have the engineering and scientific talent to develop leading-edge technologies in America. Although I am concerned about America's low personal savings rate and the low investment in research and development compared with the Far East and European countries, we need to concentrate on our people.

What America must do to maximize the impact of our technology in the 1990s is to manage its human resources better. The human costs in a typical IS organization make up about 50% of the total budget. Many of these firms will spend millions of dollars for computers and software, yet they will not invest $25,000 in a good selection or training system.

Why this incongruency? In most IS organizations, we take the best IS staff member and make him the leader. The skills of an effective technician are different from the skills of a leader, yet in many organizations, we let new leaders learn on the job at the expense of their individual contributors.

Further compounding this selection process, IS people have a high need for things and not people. They come from a binary world with finite solutions and fixes to complex technical problems — a world of certainty. Placed in a leadership role, they are looking for the latest quick fix because that is their mental set and training.

What must an all-day leader do? My research indicates that leaders can hit 80% of the human needs by concentrating on five key behaviors.

First, the leader should attempt to match people and jobs. Between 50% and 60% of a person's motivation is the matchup between the person and the job. The vast majority of people want to work and will make a major contribution to the organization if they have challenging work to do.

Second, set goals that are challenging but reachable in a reasonable period of time. Third, give good feedback on goal accomplishment. Fourth, give workers the autonomy to perform and follow up with good feedback. Fifth, after feedback, the workers expect rewards to follow good performances. It is not only the absolute amount of the reward that workers look at but also the fairness of the reward. They compare what they received to what others received for their level of performance.

Good leadership, like good bread baking, requires attention, patience and care all day long. IS has the talent to succeed in the 1990s, but it needs leaders who understand how to motivate employees and how to create a culture in which people contribute their best effort because they believe the system rewards excellence fairly. Those IS organizations that manage their human resources better in the 1990s — and eschew the quick fix — will have a strategic competitive advantage.

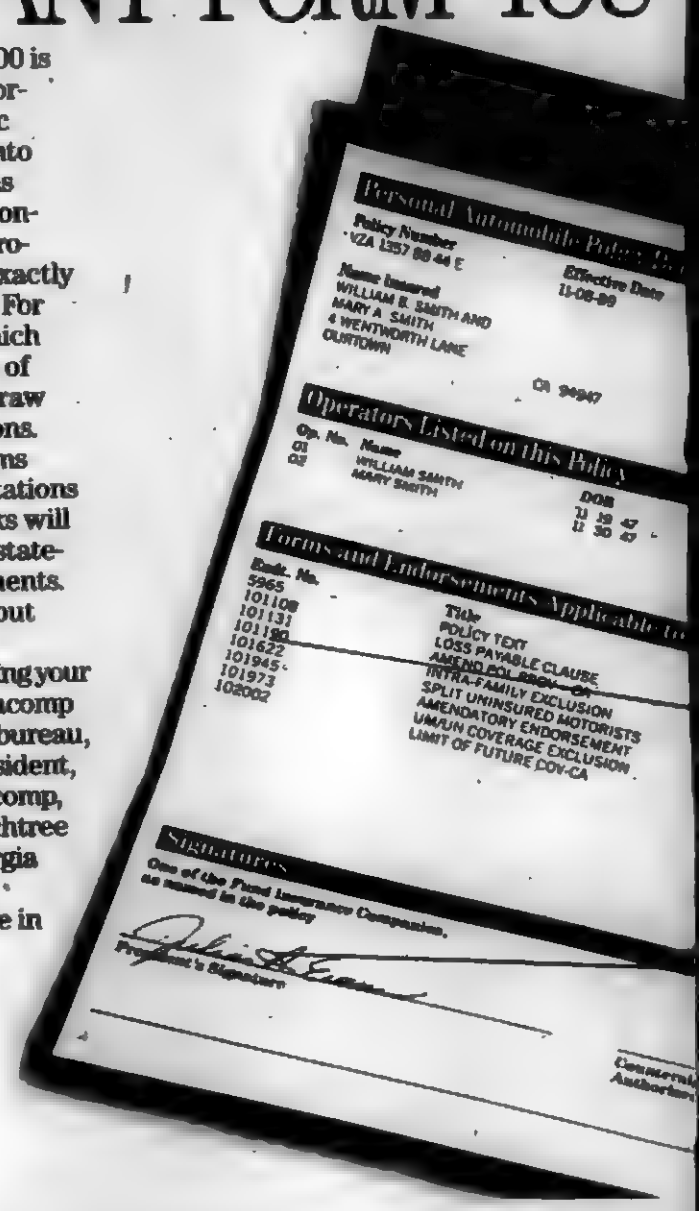
Zawacki is a professor of management and international business at the University of Colorado.

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CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"Strategic alignment: A model for organizational transformation via information technology"

By John Henderson and N. Venkatraman

MIT Center for Information Systems Research Working paper 1990

■ Obtaining a competitive advantage through the use of information systems requires management attention to four areas of the business: external strategy, the IS strategy, the internal IS operation and the business' internal structures and processes.

It is important to distinguish between the externally focused IS strategy, such as American Express Co.'s decision to use imaging technology to enhance its monthly statements, and one focused on the internal IS infrastructure, such as Eastman Kodak Co.'s decision to outsource data center operations.

Concentrating only on blending strategic-level business and IS issues and overlooking infrastructure concerns, such as a technical migration problem, may doom that hot new IS project.

A full-fledged "strategic alignment" of business and technology requires the concurrent attention to all four domains on a continuing, dynamic basis. — *Mitch Betts*

"Where does prototyping fit in IS development?"

By Stuart Gansvin

ACM Journal of Systems Management February 1991

■ Although the concept of prototyping has been around for decades, only recently has it been used in the design of information systems. The more traditional methodology of system design are the steps known as the Systems Development Life Cycle — feasibility, analysis, definition, design, development, implementation, evaluation and maintenance.

For its part, prototyping enables developers to construct a skeletal model of the system, going through the life cycle's first five steps more quickly.

Prototyping is most effective in gathering systems requirements. Users gain an understanding of the system through the prototype, enabling them to communicate their requirements to developers.

What prototyping does not do is provide a structured approach to systems design, making it easy to neglect documentation. It may be hard to convince users who become familiar with the prototype version not to adopt this early system because it lacks functionality.

When should you use prototyping? Prototyping is useless in the case of batch transaction processing systems, which have a high degree of structure and activity and do not have any user interface requirements. On-line systems are good candidates for prototyping because they need interfaces, such as screens, to help users effectively use them.

The best approach is to use prototyping in conjunction with Systems Development Life Cycle. The life cycle can provide control for system development, while prototyping can concentrate on system design. Benefits of this blend include improved communication between users and developers as well as better control over producing a usable system. — *Jodie Naze*

"End-user computing in a CASE environment"

By Chang-Yang Lin and Chen-Hua Chung

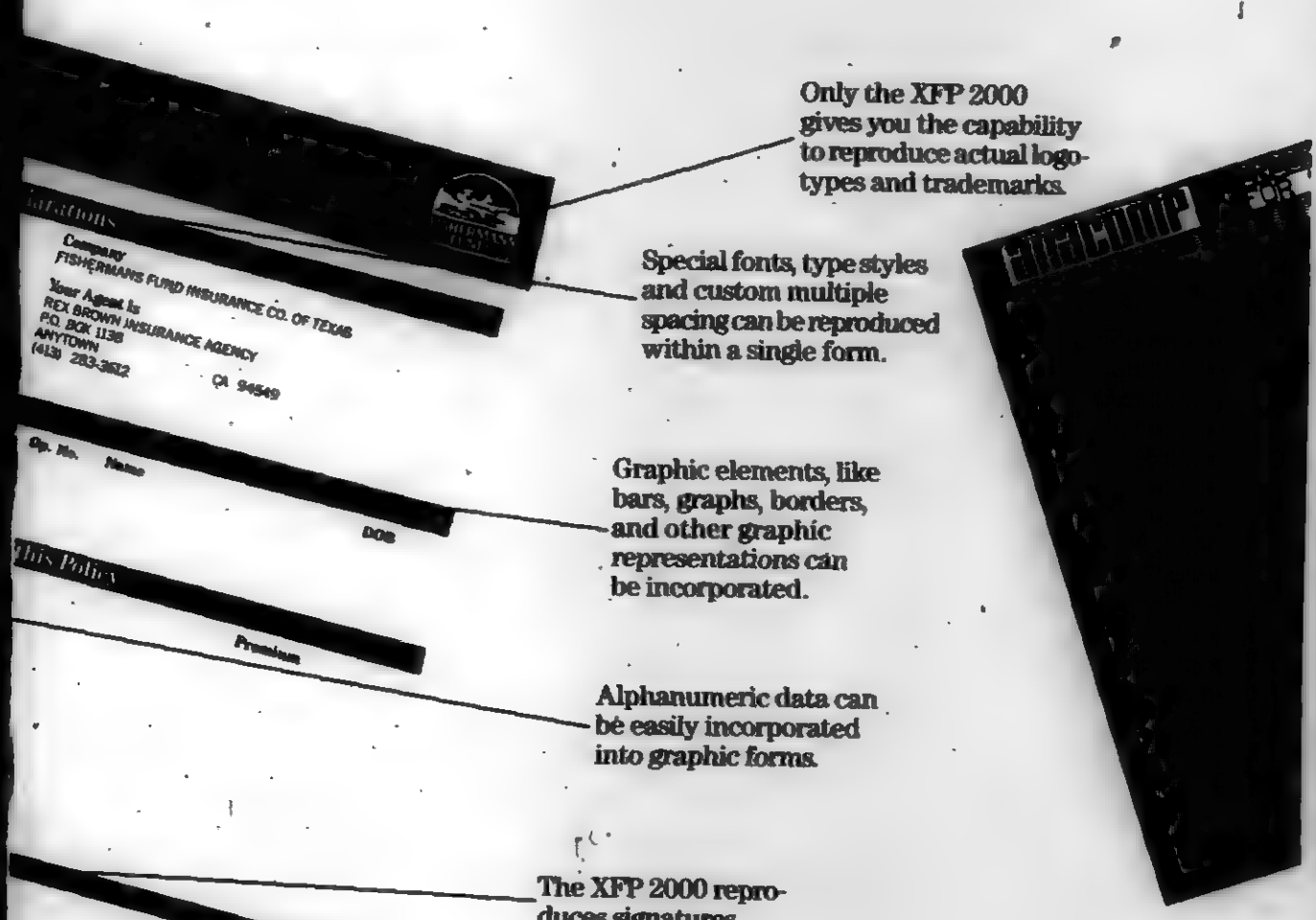
Journal of Information Systems Management Spring 1991

■ Building complex applications in a computer-aided software engineering (CASE) environment is a mainstay of IS. However, users can become more involved in CASE and help IS reduce departmental backlogs. With CASE training, users can develop ad hoc query and reporting applications as well as simple applications at the work-unit level.

A user-oriented CASE tool should incorporate the following elements:

- Applications generation through the direct manipulation of icons representing reusable code.
- Fourth-generation language features of prototyping technology and interactive [illegible]
- Few user interfaces, a standard CASE environment and support for intertool interfaces.
- Expert systems as guides for effective CASE use. — *Lory Zottola*

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Focus on Operations XI. Las Vegas, April 7-11 — Contact: Computer Operations Management, Orange, Calif. (714) 997-7966.

IEEE International Conference on Robotics and Automation. Sacramento, Calif., April 7-12 — Contact: Robotics and Automation, Boca Raton, Fla. (407) 483-3037.

Service Trends Conference. San Francisco, April 8-9 — Contact: Lori Larsen, Ledgeway/Datapoint, Lexington, Mass. (617) 863-8500.

Information Security Managers Symposium. Chicago, April 8-10 — Contact: Pamela Blewett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Loop Implementation: The Next Steps. Monterey, Calif., April 8-10 — Contact: Electronicast, San Mateo, Calif. (415) 572-1600.

Computers and Software for Manufacturing Expo. Chicago, April 8-11 — Contact: Doug Kunz, Cahners Exposition Group, Stamford, Conn. (203) 352-8202.

National Design Engineering Conference. Chicago, April 8-11 — Contact: National Design Engineering, Stamford, Conn. (203) 964-0000.

CDC Exchange. Cambridge, Mass., April 8-12 — Contact: Margaret Murphy, Computer Sciences Corporation Exchange, Cambridge, Mass. (617) 499-1227.

The Conference Board Information Management Conference. New York, April 9-10 — Contact: Conference Board Registrar, New York, N.Y. (212) 339-0290.

Seybold Technology Forum. Cambridge, Mass., April 9-11 — Contact: Deborah Hay, Seybold Computing Group, Boston, Mass. (617) 742-5200.

The Software Development Management Conference. San Francisco, April 9-12 — Contact: Software Development Conferences, San Francisco, Calif. (415) 995-2471.

Supercomputer Conference. Newport, R.I., April 9-12 — Contact: John Miguel, Federal Information Processing Council, Middletown, R.I. (401) 841-4591.

Society for Information Management 1991 Institutional Member Conference. Tucson, Ariz., April 10-12 — Contact: SIM, Chicago, Ill. (312) 644-6610.

Unix Challenge 1991. Tyngsboro, Mass., April 10-12 — Contact: Andree Fontaine, Boston University, Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Voice '91. Anaheim, Calif., April 10-12 — Contact: Voice '91, Houston, Texas (713) 974-[illegible].

APRIL 14-20

Congress on CIM Databases. Cambridge, Mass., April 14-17 — Contact: Wilma A. Hurwitz, CAD/CIM Alert, Boston, Mass. (617) 232-[illegible].

International Technical Communication Conference. New York, April 14-17 — Contact: ITCC, Thornwood, N.Y. (914) 742-[illegible].

Information User Association: Architecting for the '90s. Salt Lake City, April 14-18 — Contact: IUA Headquarters, Chicago, Ill. (312) 644-6610.

Nastec 3.0. Atlanta, April 14-19 — Contact: Dave Cochrane, National System Programmers Association, Milwaukee, Wis. (414) 423-2420.

Boston Users' Exchange. Baltimore, April 15 — Contact: Ron Block, CUE, New York, N.Y. (212) 633-5080.

Cardtech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4256.

Knowledgeware International User Conference. Atlanta, April 15-17 — Contact: Knowledgeware, Atlanta, Ga. (404) 231-8575.

Securetech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4256.

Wireless Data Networks Conference. Washington, D.C., April 15-17 — Contact: Business Communications Review, Hinsdale, Ill. (800) 227-1234.

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The needing edge

Despite economic blahs, forward-looking companies keep exploring ways to find tomorrow's business solutions

BY ALICE LAPLANTE

During an economic downturn, when many companies are slashing budgets and staffs, you'd expect investigation of such technologies as multimedia, handwriting recognition, CASE, imaging and expert systems to grind to a halt. Right?

Wrong.

"We've been amazed at how robust interest in emerging technologies has been," says Bill Caffery, vice president and director at Gartner Group, Inc.'s Advanced Technology Group in Stamford, Conn.

Despite a tough economy, it appears that many information systems organizations are willing to put aside (or at least live with) concerns about buggy technology, the financial stability of small specialized vendors or the lack of standards that usually dogs advanced technology. Record numbers are creating advanced technology groups, and many user departments are now doing their own exploring. The reasons seem to be good planning — and healthy fear.

"Technology changes so quickly, we can't afford — for competitive reasons — *not* to track it," says George McCall, vice president of planning and administration for IS at San Antonio-based insurer United Services Automobile Association (USAA). "There is no doubt that we would lose money — not to mention a competitive edge — in the long run if we failed to keep on top of newer technologies."

Critical to success

Indeed, a poll of *Computerworld Premier 100* winners, judged to be the nation's most effective users of information technology, showed that nearly three-fourths considered leading-edge technologies to be "critical" or "very important" to their competitive success.

LaPlante is a free-lance writer based in Palo Alto, Calif.



Alan Levenson

Southern California Gas' Holmes: *"All too often, new technology becomes a solution in search of a problem. 'Proceeding that way can be a backwards approach, he says*

According to Gartner Group, start-ups of advanced technology groups are widespread and growing rapidly. A recent Gartner Group survey of 268 U.S. companies showed that 27% had either a full- or part-time advanced technology group. More than 40% of larger firms had a full-time group. A study by Index Group, Inc. in Cambridge, Mass., places the figure closer to 50%.

"Frankly," Caffery says, "our expectation was that activity in this area would slow, but we've found that the typical company tends to be more aggressive, taking a long-term view toward the importance of keeping an eye on advanced technology."

Chunka Mui, an Index Group managing associate, says companies behave in two ways in tough economic times. Some continue evaluating advanced technology, though with a keener eye towards business payoffs. Others cut or downsize explorations when the going gets tough, he says.

Many companies fall somewhere in between. "The recession has had an impact on Rockwell's appetite to invest in looking at advanced technology," says Bob Scheussler, director of IS technology at Rockwell International Corp. in Seal Beach, Calif. Even so, the aerospace firm continues to look for cost-effective ways to use electronic data interchange, computer-aided software engineering (CASE) and network document exchange, he says.

To help keep abreast of key emerging technologies, U.S. corporations are employing a diverse set of strategies (see company profiles beginning page 68):

- At Texaco, Inc., an advanced technology group sponsors monthly and annual seminars for business units and publishes a newsletter.
- In Atlanta, National Linen Service uses a no-cost, local high-technology center to do much of its up-front research and prototyping.
- USAA employs a formal advanced technology review built right into its corporate structure and is highly supported by top management.
- At Northern Telecom, Inc., a training department developed a sophisticated multimedia system without any involvement from corporate IS.

Regardless of their approach, most organizations are careful to avoid what are seen as the two

Continued on page 67

INSIDE

How four companies do it
Profiles begin on page 68

An alternative to advanced tech groups
Page 73

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Continued from page 65

biggest dangers of developing advanced technology: overemphasizing short-term goals and noodling around technologically while ignoring practical business applications.

"All too often, new technology becomes a solution in search of a problem," says Bob Holmes, a computer technology research analyst at Southern California Gas Co. in Los Angeles. Proceeding that way, he says, "can be a backwards approach to developing cost-effective business systems."

"The most fatal flaw for any [advanced technology group] is to become branded as an ivory tower," Gartner Group's Caffery agrees. "Once that happens, it's a terminal disease."

To avoid irrelevance, most advanced technology group strategies welcome heavy involvement by user departments.

Consultants, however, warn against the dangers of *too much* user involvement, which can lead to runaway costs, duplicated efforts and failure to consider important standards issues.

Striking the delicate balance required can be challenging for IS managers. "It's a little bit like being a farmer," Holmes says. "You plant the crop, water it occasionally and see what grows. It can be a little frustrating, though, to have so little control over what ultimately happens."

Despite such frustrations, U.S. organizations continue to successfully use several approaches to evaluating and developing advanced technology:

• **Creating advanced technology groups.** The most popular tactic is to create an advanced technology group. Without a formal procedure in place to keep an eye on advanced technology, the reasoning goes, the cost of missed opportunity can be much greater than the evaluation process would have been.

Advanced technology groups can typically be grouped into four distinct types, according to Gartner Group (see chart this page). Banking and financial services are most likely to have dedicated advanced technology groups.

Yet another important trend is also emerging: user departments evaluating emerging technologies. "In the past," Index Group's Mui says, "an advanced technology group had a lock on advanced technologies. Now, we're seeing a lot more quasi-advanced technology groups within business units."

For example, a highly skilled graphics department is probably already exploring advanced technologies in its specialized field — even if the company has an advanced technology group in IS. Often, IS and the department work closely together.

"In cases where a business unit has done its own research, the role of my group is to try and share [the information] with other business units," Rockwell International's Scheussler explains. "We serve as the arms and legs."

Ironically, growing user appreciation of technology ultimately seems likely to diminish the role of centralized advanced technology groups, Mui says.

• **Rotating employees.** Some organizations rotate IS employees in and out of advanced technology groups to keep outlooks fresh and real world implementation skills sharp. This is the case at Jet Propulsion Laboratory's (JPL) Pasadena Space Flight Operations Center.

Membership in JPL's 15-person advanced technology group is awarded on a "scholarship" basis, according to Carl de Silveira, technical group supervisor. Regular IS employees as well as visiting scholars and technicians right out of school take one-year stints in the group.

"We want to bring in young people as well as academics, old-timers, people who have had years of implementing projects — anything to ensure we get a fresh outlook," de Silveira says.

• **Fielding advanced technology SWAT teams.** Many companies are already handling technology transfer as quickly as possible. IDS Financial Corp., a Minneapolis-based subsidiary of American Express Co., is a good example.

When the advanced technology group builds a working prototype that interests an IDS business unit, a team is transferred into the user community to perform a pilot test.

"We've found this to be a good mechanism for successful technology transfer," says Bob Procaccini, director of emerging technology research at IDS.

"As soon as a user department has bought into a technology and gives us the go-ahead to build a production system, it then assumes all further development costs," Procaccini explains. "The [research and development] budget is just a way to jump-start the process."

• **Careful piloting.** There is near universal agreement that a carefully planned and controlled pilot project is essential before any technology — new or established — should be implemented corporatewide.

However, consultants say many companies still make the mistake of seeing the pilot as a test of a technology's appropriateness or feasibility — not as a measure of the true costs involved.

"It is *essential* to use the pilot as a costing mechanism," says Paul Berger, president of Consulting, Inc., a Lawrenceville, N.J.-based management consulting firm. "See what the actual numbers are, and extrapolate from that."

That's exactly the approach used by The Ultimate Corp., an East Hanover, N.J.-based reseller of Pick Systems' Pick-based machines. The company wanted to build an expert system to improve telephone technical support provided to customers by 50 employees.

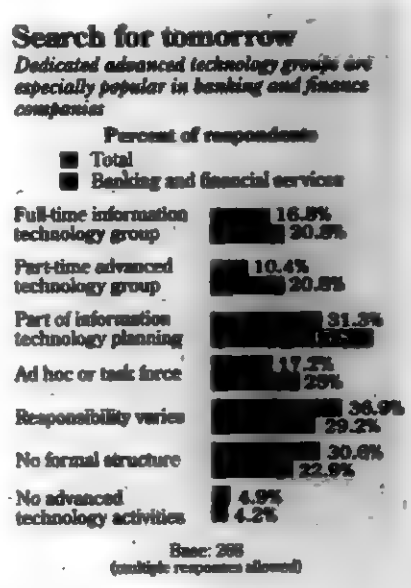
During the pilot, Ultimate carefully tracked all expenses, including training and support. "We were 15% to 18% over our original estimate," says Frank Covvey, director of IS at Ultimate. As a result, estimates of the full-scale implementation were revised, and the pilot, now in its testing phase, was a success.

At IDS, the advanced technology group recently finished a rough prototype using a handwriting recognition prototype and has received funding for a more advanced version. Field pilot tests will begin in the fourth quarter. "The purpose of the pilot is to generate numbers," Procaccini explains. "Before we even think about production, we have to have a solid business case, and that includes a thorough cost assessment."

For now, at least, many IS organizations appear to be willing to keep looking toward investing in tomorrow — even if it means a little bit of extra work and expense today. •

Search for tomorrow

Dedicated advanced technology groups are especially popular in banking and finance companies



Source: Gartner Group, Inc. CW Chart: Paul Mark

A must have

More than three-fourths of 1990 Computerworld Premier 100 winners considered advanced technology 'critical' or 'very important'

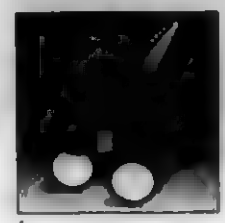


Source: Survey of *CW Premier 100* winners

Four types of advanced technology groups

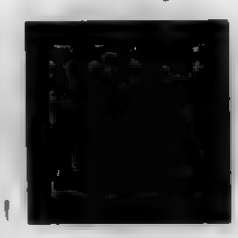
Most advanced technology groups fall into one of four categories. Although most groups are a mix, most favor one style

ENDANGERED SPECIES



Scholar

- Almost pure R&D focus
- Few reality checks or implementation worries
- Often seen as "ivory tower" and impractical
- Spends 70% of time on technical issues, 30% on organizational issues
- Approximately 10% of advanced technology groups



Priest

- Tries to explain new technology to the masses, line managers, CEO and CIO
- Attempts to link new technology to strategic and executive issues
- Spends 55% of time on technical issues, 45% on organizational issues
- Approximately 20% of advanced technology groups

FAVORED SPECIES



Navigator

- In between scholar and priest
- Primarily a statesman
- Intermediary between all levels of researchers, end users, managers and corporate executives
- Spends 35% of time on technical issues, 65% on organizational issues
- Approximately 25% of advanced technology groups



Guerilla

- Works at grass-roots level
- Takes fiercely tactical approach
- "SWAT Team" mentality
- Spends 45% of time on technical issues, 55% on organizational issues
- Approximately 45% of advanced technology groups

Source: Gartner Group, Inc. CW Chart: Paul Mark

Making it work

To more effectively evaluate advanced technology, experienced IS managers and consultants offer the following advice:

- Put a formal procedure in place for investigating promising technologies, making sure senior management supports it both financially and organizationally.
- Keep end users informed of new technologies so they can be thinking of and suggesting possible applications in their business areas.
- Ask vendors to assume part of the risk of building prototypes of or beta testing applications involving new technologies.
- Ask an independent expert, a consultant not affiliated with the corporation or a vendor to assess the feasibility of proposed projects.
- Before full-scale implementation, perform a carefully controlled pilot test that tracks costs and determines whether the technology works as planned.

ALICE LAPLANTE

EXECUTIVE REPORT

USAA builds in advanced technology

In 1980, United Services Automobile Association (USAA) outlined its first long-range strategic systems plan. Today, more than a decade later, looking ahead at technology has become a corporate way of life.

Evaluating and implementing emerging technology is built right into the corporation's organizational structure and is supported at the highest management level, says George McCall, vice president of planning and administration for information systems at the San Antonio-based insurance firm.

Two years after drafting its strategic systems plan, USAA established a special advanced technology group. Its mission was to track emerging technologies, develop prototypes and notify business units if and when there was an appropriate match.

The group's activities are monitored by a research and development review committee board, which consists of presidents of the various USAA companies, including USAA Information Systems, the systems arm of the company.

"This board decides where they will spend the corporate research dollars and to which line of business those dollars will eventually get charged," McCall says.

For example, in 1988, USAA unveiled an image processing system capping six years of research and prototyping. Although exact cost savings figures are confidential, USAA says the move eliminated 39,000 sq ft of prime office space previously used to store one year's worth of claims and correspondence documents. Some 160 file managers and delivery clerks were eliminated.

Customer relations and worker productivity also improved, McCall says.

But USAA even goes one step beyond built-in management support: The firm also ties R&D to the bottom line of business units that would be customers of the new technology.

"We have a sponsorship program in which every project has to have a user sponsor who is responsible for signing off on the cost/benefit analysis prior to project implementation," McCall explains. This keeps USAA researchers' feet firmly on the ground, he says. Without a user sponsor, experimentation with technology cannot go past the prototyping stage. ●

ALICE LAPLANTE

TACTICS: Create R&D review committee board supported by top management, tie R&D to bottom line of business units and require a user sponsor for every advanced tech project.

Back to basics

Albert Smith, executive vice president at Bell Atlantic Systems Integration Corp., recommends that firms evaluating advanced technologies consider some basic questions:

- Will the advanced technology help me meet the goals of my business plan?
- Will the technology change my business plan? Is this beneficial?
- Are the risks associated with this leading-edge technology worth taking?
- Can the advanced technology function within my existing infrastructure?

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National Linen lets vendors do legwork

When it came time to get serious about multimedia, National Linen Service in Atlanta decided to take a novel, money-saving approach: Let vendors do the up-front legwork.

A division of National Service Industries, Inc., the firm had looked at multimedia for several years as a better way to train production workers in its 110 U.S. textile plants. The technology, however, was dismissed as immature and expensive.

But last summer, Mark Davison, vice president of strategic systems, decided it was time to launch a serious investigation.

TACTIC: Minimize research and prototyping costs by using the services of a high-technology center and multimedia vendors.

Why not have potential vendors bear the up-front time and expense of researching and prototyping a multimedia application, he wondered.

So Davison went to Inforum, an Atlanta-based high-technology center that runs a corporate "national briefing service." Davison gave Inforum his firm's technical requirements, and Inforum did product and vendor research. Inforum then sent out a request for proposals to 30 vendors, 18 of which replied.

> **DAVISON TOLD THE two vendor finalists he would like to see prototype systems, developed on their own time and at their own expense. He outlined what he wanted and sent them home.**

After reviewing proposals, Davison and his staff narrowed the list down to four companies. He sent the short list back to Inforum, which organized and set up technology briefings and provided the demonstration rooms and equipment.

Each vendor then gave Davison and his seven-person task committee a one-hour demonstration, followed by a one-hour question and answer session.

Because Inforum makes its money from participating vendors, which pay a percentage of any contracts signed as a result of the briefings, the energy and financial cost to National Linen was nearly zero.

The company's resourcefulness didn't end there, however. Davison told the two vendor finalists he would like to see prototype systems, developed on their own time and at their own expense. He provided each vendor with National Linen's materials, outlined what he wanted and sent them home.

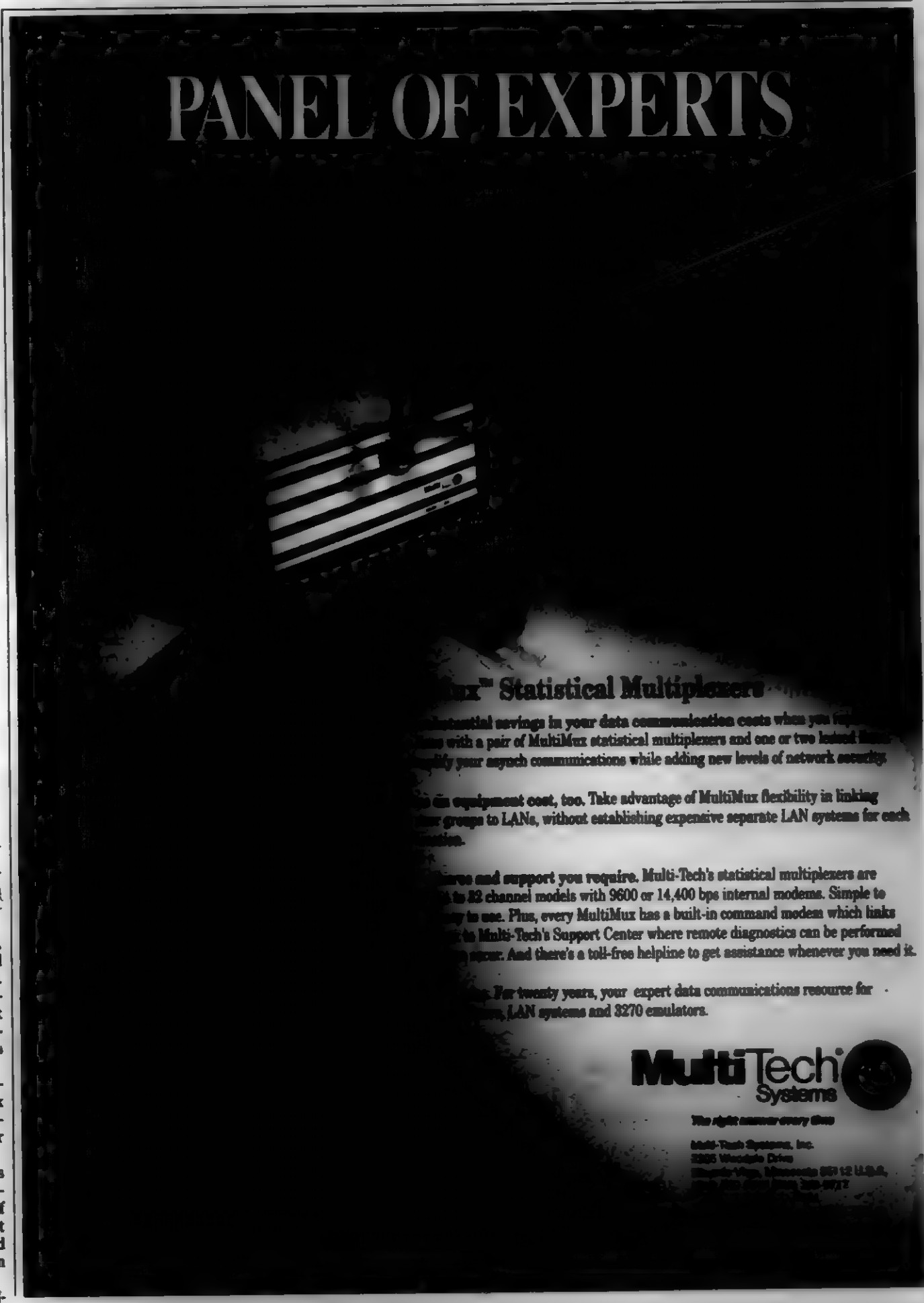
How did he sell the idea? "We viewed this as a long-term partnership and asked them to view it this way as well," Davison explains. "We saw it as their job to fully educate us on their products and services and told them this was the best way to do it."

Davison took both prototypes to National Linen's annual manager's meeting last August, set up a booth that displayed both systems and asked managers from around the country to vote. The winning vendor was then awarded the contract to build 110 systems.

Davison is currently working with Inforum on another project and says he expects to follow the same process.

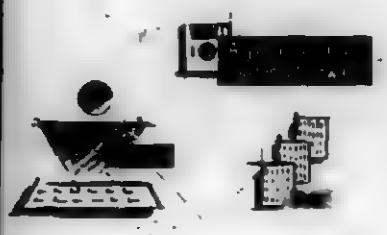
"We are a lean and mean data processing shop," he says. "It is essential for us to leverage our in-house resources with services available elsewhere." ●

ALICE LAPLANTE



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Open systems protect user's investment in information systems, data and training. Industry-wide support for open standards helps guarantee compatibility of existing open products with future ones and compatibility of one vendor's offering with another's.

Faster Time to Market

Open Systems help end-user companies respond to market opportunities more quickly. Open systems lead to the Computer-Integrated Enterprise where information can flow easily between functional groups (e.g., engineering and manufacturing) reducing the time it takes new products to go from idea to reality.

Lower Costs

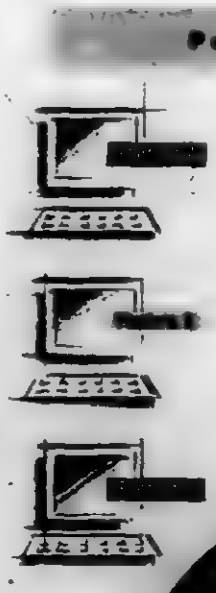
- In-house software development and maintenance costs are lower because the same software can run on multiple platforms without modification. Software costs are also lower through growing availability of purchased software packages.
- Training costs are reduced through consistency of software regardless of the underlying platform.
- Hardware costs are reduced through increased competition and improved price/performance.

Improved System Integration

It is easier to integrate products from different vendors, and those developed by the user, when they conform to a common set of open standards. Open systems make it easier to connect products from different vendors so they can communicate and share data and resources.

Enhanced Global Operations

Because open standards are international in scope, open systems enable a business to more easily integrate foreign operations with domestic operations. Open systems improve communication and information exchange throughout multinational enterprises.

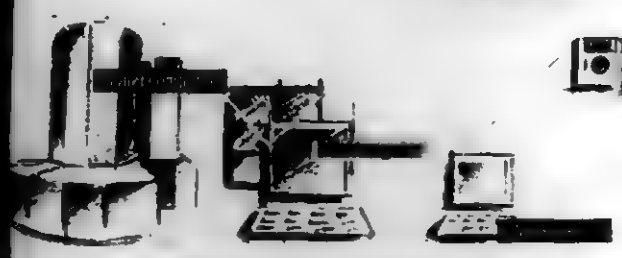


Portability

The ability to use or migrate, application software, systems software, data and/or people across different competing platforms from multiple vendors.

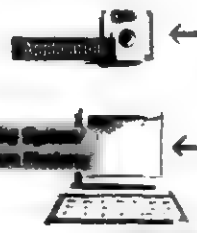
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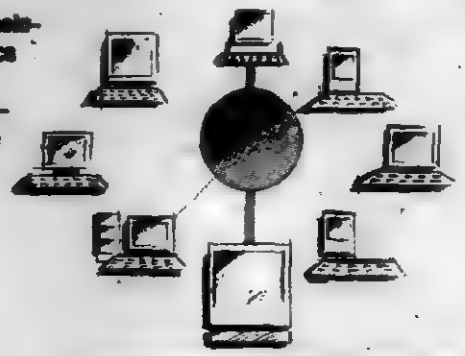
Open Systems consist of products and technologies designed and implemented in accordance with vendor-independent standards. In a distributed multi-vendor computing environment, Open Systems enable users to achieve portability of applications, data and people, interoperability and scalability.



Scalability

The ability to use the same applications and systems software on all classes of computers from desktop workstations to supercomputers.





Interoperability

The ability to have applications and computers from different vendors work together on a network.

Standards-based Interfaces

Open systems are built on standards that define application and system interfaces in: networking, operating system, user interface, data management, graphics and software development.

[illegible]

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Quick handoff is Texaco's goal

At Texaco, Inc., the focus is on scouting around for advanced technology and transferring tools into the hands of user departments as quickly as possible.

"We're involved in initial prototyping efforts, but the idea is to get the business unit involved as much as we can and let the users take over at the earliest possible opportunity," says Jeff Lin, a senior systems analyst at Texaco's Advanced Technology Department in Houston.

Although the 30-member group is charged with investigating emerging technologies, its main thrust is on technology transfer, educating end users and soliciting feedback and suggestions on which projects to pursue.

TACTICS: Use a 30-member advanced technology department to expedite technology transfer to business units. Hold seminars and classes and sponsor monthly and annual advanced technology meetings. Publish a newsletter as well in order to keep business units well-informed.

"We send out surveys within the different business units, asking them what they want to see, what they want to evaluate and basically respond to their requests," says Lin, an artificial intelligence specialist.

Besides spending a major portion of its time on seminars and training classes, the department also sponsors an annual advanced technology conference for end users from Texaco's business units aimed at stimulating ideas and involvement.

Industry figures and vendors are also invited to speak at monthly technology meetings. In addition, the department publishes newsletters to get word out to interested end users.

"There is always a strong tendency to try and fit a technology to a problem, instead of the other way around," Lin says. Focusing on transferring technology to user groups helps keep the emphasis on practical applications, he adds.

As one example that the process works, Lin cites the case of a Texaco production engineer who learned about an expert systems tool kit at an advanced technology briefing. Afterwards, the engineer went back to his laboratory and developed a successful drilling diagnostic system using the same tool kit.

The new system, which helps determine the proper drilling tools and methods based on mud at the potential site, has been adopted by Texaco drilling facilities around the globe, Lin says. •

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Users do it their own way

It's a fantasy for many end-user organizations: to embark on an advanced technology initiative with no hindrance from a centralized information systems group.

Northern Telecom, Inc.'s training department decided to live out that dream. The group recently launched an ambitious project to develop state-of-the-art multimedia-based training courses and reference materials incorporating full-motion video, audio, photography and text.

northern telecom

TACTIC: Bypass a busy central IS department by developing a multimedia educational system within the training department.

"Our MIS department is focused on functional projects," says Thor Carden, senior human resources development specialist. "They don't have time for this sort of thing.

"Because we are a technology company . . . there's a lot of information about a lot of different technologies floating around," he adds. "It's easy, in that you can find people who know a lot about a lot of different things and hard because you have to decide on an individual basis what technology is right for your department."

Carden says he considers the 18-month project a success but acknowledges there can be significant risks in pursuing a decentralized approach to implementing new technology.

Although the group conducted a feasibility study and pilot project, Carden says, many were astonished by the $20,000 to $25,000 price tag for each unit.

Another problem is finding ways to share knowledge gained from the project with other departments. "We've made some attempts to broadcast what we've done," Carden says, "but unfortunately, there's no formal way of letting people know. That's one of the drawbacks." •

ALICE LAPLANTE

Now is the time for a new kind of group

FIRST PERSON

BY JAMES KOBIELUS

Being in an advanced technology group is nice work if you can get it. People in such groups explore technologies most of us know only by name or reputation: artificial intelligence, multimedia, virtual reality, voice and handwriting recognition, parallel programming and neural networking computers, among others.

However, there are several serious problems with many advanced technology groups.

Many advanced technology groups exist to produce a continuing stream of dog and pony shows — demonstrations that illustrate the potential of fancy-pants technologies to match real business requirements. The advanced technology group credo is "demo or die." The reason is that promising demonstrations often become the basis for full-blown pilot projects.

Another fundamental flaw is that advanced technology groups are charged with finding problems (i.e., business applications) to match some predetermined set of solutions (i.e., advanced technologies). When they are staffed by zealous technologists unschooled in the ways of business, advanced technology groups can acquire a "country club" reputation.

Yet another serious problem is that such groups often fixate on new, unproven technologies. They overlook the vast majority of strategic business systems that can be developed by using smart new recombinations of familiar technologies.

What's needed are internal groups that can help companies make the most of technology-enabled business opportunities, regardless of whether they involve state-of-the-art technologies.

One possible moniker for these groups might be "systems opportunities groups." They would differ from advanced technology groups in two fundamental ways:

• **Business-mission orientation.** Systems opportunities groups would focus squarely on strategic, mission-critical business concerns. Specifically, they would seek out opportunities and threats in the company's competitive environment. They would then ask what role, if any, technology-enabled initiatives might play in that regard.

Projects and initiatives would fall into categories defined by corporate strategies: consolidation, standardization, automation, customer service, reduced time to market, productivity enhancement, etc.

The work might not always involve buying or installing new hardware, software or circuits. Instead, the bulk of the group's efforts would involve innovative cost containment and quality-control approaches that use existing systems.

• **Ready-made corporate legitimacy.** Systems opportunities group projects would be headed by people with strong corporate credentials. Such individuals would have the clout needed to push through innovative solutions that may otherwise founder on the shoals of internal politics.

These "trail bosses" would be one part corporate patron and one part team leader on projects. Their primary purpose would not necessarily be to generate ideas but rather to bring legitimacy to these projects.

If managed correctly, systems opportunities groups could be a focus for ongoing corporate transformation — a place where good, even revolutionary, ideas find the corporate resources and legitimacy they need to get a fighting chance for success. •

Kobielus is a telecommunications analyst at Fairfax, Va.-based Network Management, Inc., one of the largest local- and wide-area network systems integrators in the U.S.

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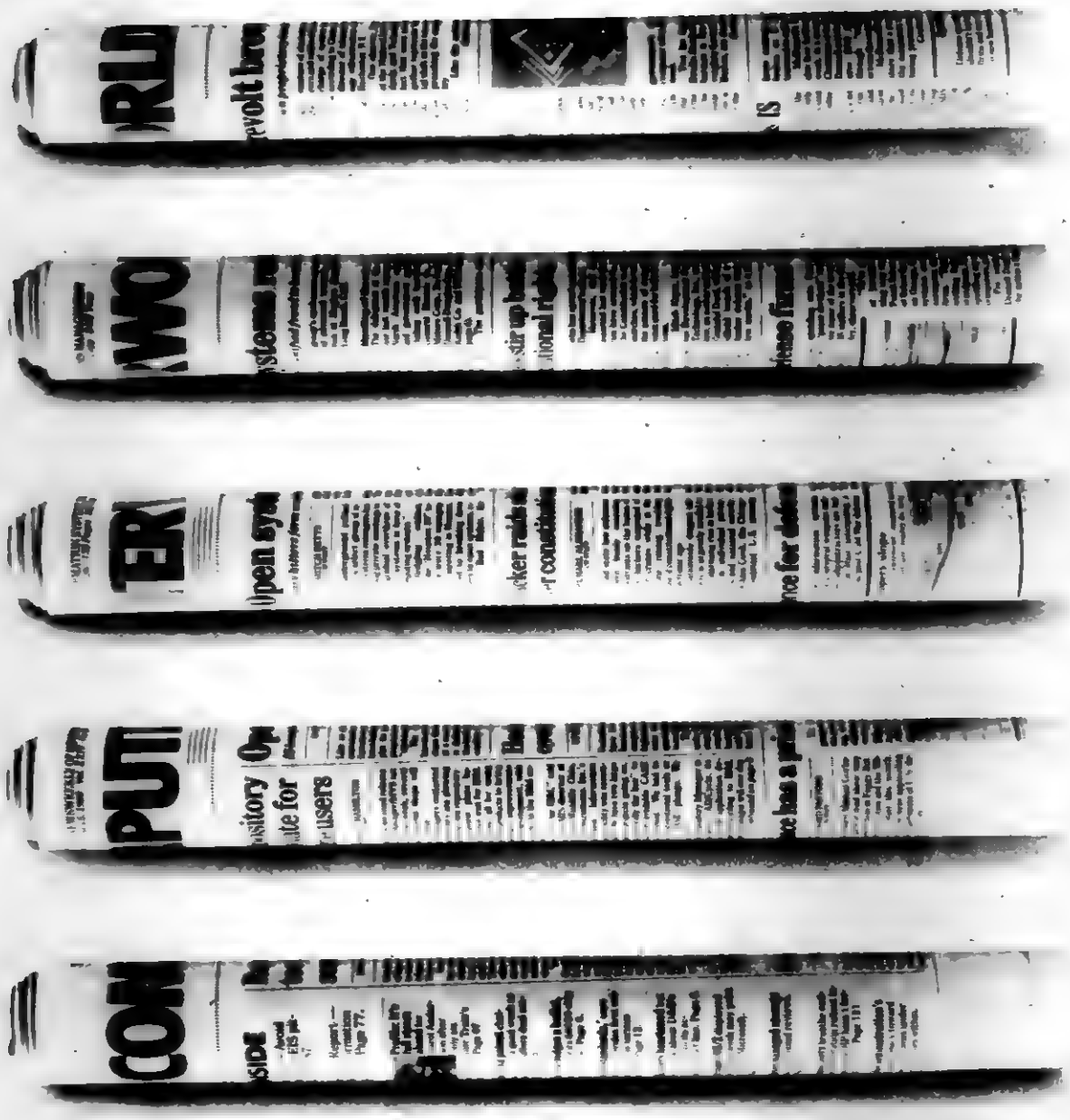
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INTERVIEW

Raymond Kurzweil

'What turns me on is to create technology that impacts people's lives'

Raymond Kurzweil turned 43 in February, but there was little time in his schedule for celebration. Kurzweil, a quiet, curly haired computer scientist, must find enough hours in a week to run one company, consult for two others he founded and sold and continue research and development in the pattern recognition field. If anything, Kurzweil's birthday simply emphasizes how much he has achieved in so short a time.

The son of a conductor and an artist, Kurzweil says he knew by the age of five that he wanted to be a scientist. He wrote his first software program at age 12 and won an award for a database system when he was 13.

At 16, he took first prize from among 65,000 entrants in the International Science Fair with a program that could create original musical works in the style of certain composers. The award helped him get into MIT.

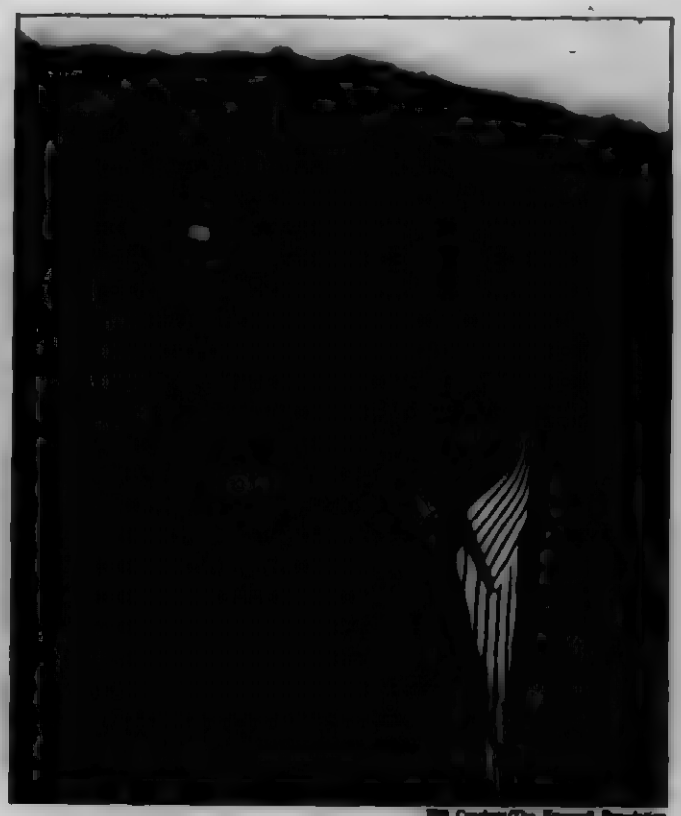
In 1974, Kurzweil started his first company, Kurzweil Computer Products, Inc., and unveiled a prototype for the Reading Machine, an optical scanner that converts print to speech. He sold the firm to Xerox Corp. in 1980.

Two years later, Kurzweil's passion for music and artificial intelligence found an outlet in two companies he started: Kurzweil Music Systems, Inc. and Kurzweil Applied Intelligence, Inc. Kurzweil Music makes the Kurzweil 250, a digital synthesizer. He sold the company last summer to a Korean firm.

At Kurzweil Applied Intelligence, Kurzweil put into practice his vision of the future of computing: voice recognition as a user interface. Kurzweil claims the company holds 75% of the speech recognition market.

Admirers call him a Renaissance man: inventor, philosopher, poet and industrialist. Critics say he's a whiz kid who isn't a whiz at business, since his companies have not been profitable.

Free-lance writer Glenn Rifkin recently spoke with Kurzweil at his office in Waltham, Mass.



Will Crockett/The Stock Production

Q When you were 13 and thought of your first computer program, did you envision the technology field evolving as it has?

A I'm not really surprised. I've always felt that digital information could encompass many types of phenomena — from sound, speech and music to pictures and three-dimensional objects. Almost everything can be digitized. Even our genetic code can be digitized.

It was also clear to me that a gradual price/performance revolution of digital electronics would ultimately allow all of these types of information to become practical and cost-effective.

Q How do you define artificial intelligence?

A AI is the art of creating machines that perform functions we associate with human intelligence. Intelligence is the ability to use limited resources in an effective way using abstract reasoning, the ability to recognize patterns and the ability to solve problems in a limited time period.

People most often associate AI with expert systems, which emulate one type of cognitive function, our rational faculties. But probably 80% to 90% of our brains are devoted to pattern recognition and skill acquisition.

- **Personal:** Born Feb. 12, 1948
  Married to Sonya R. Kurzweil, Ph.D., a child psychologist in Newton, Mass.
- **Education:** B.S., computer science and literature, MIT (1970)
- **Technology accomplishments:** 1967: Developed expert system for college selection. Sold to Harcourt Brace Jovanovich, Inc. for $100,000 plus royalties
  1976: Principal developer of first print-to-speech reading machine for the blind
  1984: Principal developer of first computer music keyboard
  1986: Principal developer of first commercially marketed speech recognition [redacted]
- **Selected awards and honors:** 1982: Computer Industry Hall of Fame
  1986: The White House Award for Entrepreneurial Excellence
  1988: Inventor of the Year (MIT, Boston Museum of Science, Boston Patent Law Association)
  1990: Engineer of the Year Award (*Design News*)
- **Hobbies:** Bicycling, hiking and playing the piano

Q At what point in AI's evolution are we?

A We are creating systems that can emulate human intelligence within a narrow domain. They diagnose a limited domain of illnesses, play a game like chess, make a type of financial decision, guide a missile toward a building. These systems become idiots again when they go outside their area of expertise.

As AI matures, we're trying to broaden the machine's areas of expertise by combining different AI systems such as speech recognition, natural language understanding and the ability to make decisions within a certain expert domain. This will provide an expert assistant to interact with verbally. But we have a long way to go before we can emulate human functionality.

Q People have grown pretty cynical about AI in the

Continued on page 76

Continued from page 75

past five years. Critics say it hasn't met its potential. What do you think?

A That's unfair, because every time we master a particular area of AI, it ceases to be considered AI. It's just like a magic trick — when you know how it's done, it's no longer magic. Take machine vision, for example, which today is a $300 million business. People don't consider that AI, but it is part of AI.

People usually just mean expert systems when they refer to AI, but that's just one small part of it. By the end of this decade, most software will be intelligent, but it won't necessarily be called AI.

Q You've started three companies and created several important pieces of technology, yet your companies have not been stunning successes. Other computer entrepreneurs, such as Bill Gates and Scott McNealy, have taken companies to astronomical heights. Why haven't you been able to do the same thing? Is it lack of focus?

A That's apples and oranges. Personal computers are a revolution that has already taken place; it's a multibillion dollar industry. Speech recognition has not yet become as ubiquitous as PCs have.

We don't think speech recognition will replace the keyboard or mouse, but it will take its place alongside those as another major modality of communication between person and machine. It will represent a very large market.

Today, we're leaders in that market. It's just not possible to have built a billion dollar company on speech recognition in 1990, but it will hopefully become possible as the '90s progress.

Q Does that matter to you, running a billion dollar company?

A What turns me on is to create technology in my field, which is pattern recognition, and have it have an impact on people's lives.

Company size, whether $1 billion or $20 million, isn't that meaningful other than that it represents a relative degree of impact on the world. To the extent I would like these technologies to have the greatest impact possible, size is important.

Q There is a scenario in your book, *The Age of Intelligent Machines*, in which you say technology will essentially eliminate people's handicaps. Please explain.

A What handicapped people are missing is some narrowly defined skill, but otherwise, in most cases, they are normally intelligent. Thus, the ability of a computer system to provide a narrowly defined intelligent function is very often a perfect match to the narrow deficit of a handicapped person. Computer technology will be a great leveler, dramatically lessening disabilities.

Q What else do you envision when you look toward the future?

A The question is: What is really going to happen when computers can compete with human intelligence or exceed it?

Once a computer can emulate essential human functionality, it can then combine that with the enormous superiority it is already displaying in its ability to remember billions or trillions of facts with extreme precision, to access that information at extremely high speed and to perform functions over and over again very quickly.

If it can read a book, there's nothing to stop it from reading every book that's ever been published and all magazines and technical journals and from mastering all human knowledge. So once it reaches equality with human intelligence in some areas, it is necessarily going to be greatly superior to human intelligence in other areas.

The ramifications of that are difficult to understand. Much of our pride is associated with our confidence in being superior in the intellectual realm.

Q What are the philosophical implications of machines that are more intelligent than people?

A The key is the issue of consciousness and what it means to be a living, conscious entity and whether a machine that appears to emulate humanlike functionality is conscious.

Perhaps the best way to understand the paradoxes this issue confronts us with is to examine the following scenario: Eventually, we'll be able to scan a human being, and a computer will take note of the exact structure of all of our neurons and other cells. You could then imagine creating a new computer that would be wired up in exactly the same way as the person just scanned.

If you ran into this computer, it would seem very much like the original person to you. The question then is, is it the same person? Does this computer have consciousness? One might say yes, because you'd get all the sense of consciousness if you interviewed it.

The bottom line is: There is no scientific experiment you can conduct to determine whether any other entity — an animal, machine or person — is conscious.

Q What will be the impact of the expanding intelligence of computers?

A It will have a very profound impact on society and the role that human beings play. Despite the fact that computers, automation and machines have increasingly been able to perform functions that human beings can, human employment has increased quite dramatically. We went from 12 million jobs employing 30% of the population 100 years ago to over 120 million jobs employing 50% of the population.

Not only that, the sophistication of the jobs has increased, and they pay six times as much in constant dollars. However, the question remains: What will people do in the year 2050, given the enormous intellectual power computers are likely to have?

Q Is there anything out there you wish you had created?

A There are lots of things I'd have enjoyed doing. Pen-based computing and dynamic handprint systems are very exciting. They will open up computing to a large sector of people who are resisting computers so far.

Q What's next on your technology agenda?

A I'm quite involved with the next generation of speech recognition — the ability to understand very effectively the bulk of English with discrete speech. We are working on a continuous speech recognizer with Fuji Xerox that right now is programmed for Japanese. A person can speak natural Japanese phrases that are multiple words, and the machine will recognize those with accuracy.

Q How would you like to be remembered if it all stopped tomorrow?

A That I created technologies that had a positive impact on people's lives. ●

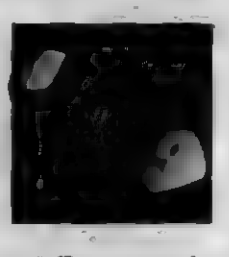
Kurzweil companies have the profit blues

While an acknowledged technical whiz, founder fights 'bad businessman' image

Three years ago, *Business Week* featured a less than flattering piece on Raymond Kurzweil's business acumen. The headline read: "This Whiz Kid Isn't Such a Whiz at Business." The gist of the piece was that Kurzweil, while an acknowledged technical genius, has yet to prove his skills in the executive suite.

"He is simply not a businessman," says Harvey Newquist, chief executive officer at Relayer Group, a Phoenix-based AI consulting firm. "His Kurzweil 250 synthesizer was a revolutionary product, but it was priced completely out of whack with the market" at $10,000, he says. "Kurzweil Applied Intelligence has yet to turn a profit, even though it's one of the oldest voice products on the market."

Such thinking is "off target," Kurzweil insists. "My primary interest is technology, but I've been able to assemble expert management teams, and I work closely with them," he says.



Kurzweil sold his first firm, Kurzweil Computer Products, to Xerox Corp. in 1980 for $6 million. The Reading Machine, Newquist says, has done little for Xerox's bottom line, although he says it could be as much Xerox's fault as anyone's.

Competing head-to-head with Far East manufacturing companies in the consumer electronics field proved to be too much for Kurzweil Music, which Kurzweil sold to a Korean company. "I don't think there's been any American company able to compete successfully in that marketplace," he says.

Nonetheless, the company had consistently lost money, and Newquist says he believes it would have gone under if it hadn't been bought.

Kurzweil claims that Kurzweil Applied Intelligence is doing very well from a business perspective. "It has strong support from its investors and has made tremendous progress in growing its revenue," which has gone from $3 million in 1987 to $10 million last year. However, it has yet to show a profit.

GLENN RIFKIN

School mixer: Take one part computer science, one part lit

While in college during the late 1960s, Raymond Kurzweil majored in computer science and literature — an odd combination by MIT standards at the time.

Computer science was a new major at the school when Kurzweil was a student there. There were eight or nine courses and only one computer: an IBM 7094 with 32,000 words of 36 bits each and a 2-msec cycle time. The machine was shared by thousands of students and professors.



Because he had taken all of MIT's computer science courses by his sophomore year, Kurzweil turned to literature — specifically, creative writing.

According to Kurzweil, there were only a few students interested in the humanities at MIT then, but because the school was wealthy, it had "an excellent — if somewhat freewheeling — humanities department." In fact, one of Kurzweil's professors was Lillian Hellman, the American writer, who taught only one class of seven or eight students per semester.

"We met once a week for several hours in her apartment," he recalls, "and she would give very intense attention to each one of us, critiquing our writing and short stories and segueing into anecdotes of her own life. It was fascinating."

Even with such a role model, Kurzweil says he spent only a few moments of "adolescent passion" thinking about becoming a writer. He felt the pull of technology more strongly.

Although not pursuing writing as a profession, Kurzweil has kept his interest alive in the area of nonfiction. His first book, *The Age of Intelligent Machines*, is a massive tome that took three years to complete.

Kurzweil says the writing process is not that different from creating technology. "You have to build step by step in both processes," he says.

GLENN RIFKIN

NATIONAL

BRIEFS

Knocking our socks off

▶ **The Patent and Trademark Office** of the U.S. Department of Commerce has released its **Top 10** list of the firms winning the most U.S. patents during 1990. They are: Hitachi Data Systems Corp. (908 patents), Toshiba Corp. (891), Canon Kabushiki (868), Mitsubishi Denki (862), General Electric Co. (785), Fuji Foto (767), Eastman Kodak Co. (720), Philips Corp. (637), IBM (608) and Siemens AG (506).

And the winner is . . .

▶ . . . **Stanford University**, whose team of computer programming students emerged victorious in what sponsor **AT&T Computer Systems** described as "a five-hour battle of logic, strategy and mental endurance." The finals of the 15th annual **ACM Scholastic Programming Contest** pitted 25 teams from universities in the U.S., Europe, Canada and the Pacific Rim against each other in trials testing their ability to create programming answers to real-life dilemmas such as routing fire trucks around closed streets. The Netherlands' **Vrije University** took second honors.

Poised for debut

▶ **Siemens Nixdorf Printing Systems**, a high-performance, low-impact printer joint venture between Burlington, Mass.-based **Siemens Nixdorf Information Systems** and Louisville, Colo.-based **Storage Technology Corp.**, has its headquarters site pinned down and its management lineup in place, Chief Executive Officer H. Werner Krause announced earlier this month. Some 80% of the new firm's approximately 500 employees will be located at a Boca Raton, Fla., headquarters, Krause said.

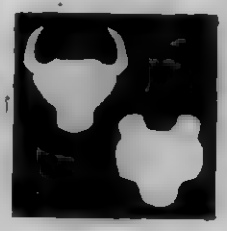
Tighter bonding

▶ After two years as joint marketeers, Newton, Mass.-based **Marcam Corp.** is about to acquire Toronto-based **Shawware, Inc.** Marcam makes IBM Application System/400-based process manufacturing software. Its Canadian ally-turning-acquiree is a privately owned supplier of maintenance and materials management software for the AS/400. The deal will be a stock-swap, according to Marcam.

Public offering pace picks up

BY NELL MARGOLIS
CW STAFF

Last fall, a market research firm that tracks technology firm initial public offerings (IPO) ran into a wall: With tech stocks battered and the national economy bleeding, said Richard A. Shaffer, head of New York-based Technologic Partners, "We debated skipping the 1991 edition of our survey of the tech firms most likely to go public." So few seemed likely to take the plunge, he said, there was a serious question as to whether the list would be long enough to merit publishing.



Last week the wall lay in shards, stampeded by a herd of public-bound computer companies almost 100% larger than last year's contingent, Shaffer said.

Really? No, rally. Some Wall Street watchers are even beginning to talk in terms of a rerun of the Big One of 1982-1983, said John Rohal, an analyst at Alex. Brown & Sons, Inc. in Baltimore. "The elements seem to be lining up: reasonably low interest rates, low inflation, reasonably slow growth that encourages investors to invest without making them feel like they'd be fools to invest in something as risky as technology." In addition, he noted an absence of other investment themes, such as the mid-1980s leveraged buyout frenzy, that might serve to distract potential tech investors.

Also auguring well for a boom in technology issues is the solid performance logged by firms such as Microsoft Corp., Sun Microsystems, Inc. and Novell, Inc. during the recent hard times — an endurance record that has not escaped the notice of investors, Rohal said.

However, analysts agreed, even while the prevailing market conditions eerily evoke those that ushered in the now-legendary 1982-1983 rally, no such event is guaranteed.

"Yes, there is definitely a window," Paine Webber, Inc. analyst Robert Therrien said. What might close it? "A realistic appraisal of how tech companies are performing," he speculated. "Every year going in, Wall Street overestimates the capacity of tech companies. Every year, when its unrealistic expectations aren't met, Wall Street retaliates."

In fact, Shaffer noted, last year also started with a flurry of strong IPO predictions, "only to see the IPO market killed in the second half by recession fears and the prospect of war in the desert." The Federal Trade Commission's current investigation into business practices at Microsoft, which tripped the firm's stock last week, is the kind of event that could ruffle newfound investor confidence in technology stocks.

However, Shaffer said, the one predictable thing about the market — particularly the volatile technology sector — is its unpredictability, and at the moment, 30 to 40 firms appear raring to go public. As was the case last year, he said, networking and software look to be the technological hooks most likely to spear investor dollars.

What profile is least likely to attract capital? "If it takes more than a single sentence to describe what your firm does," Shaffer said, "you're in a poor position. Investors are easily bored, and they've got plenty of places to park their money."

TOP SIX PICKS

Good bets to go public in 1991

- **Chipcom Corp.** (Waltham, Mass.): makes so-called "smart communications hubs" that reduce cabling needs in local-area networks
- **Intuit** (Menlo Park, Calif.): designs financial software for homes and small businesses
- **Network Computing Devices, Inc.** (Mountain View, Calif.): X Window System display station vendor
- **Sybase, Inc.** (Emeryville, Calif.): makes high-performance on-line relational databases
- **Synopsis, Inc.** (Mountain View, Calif.): provides logic synthesis for design automation
- **Wellfleet Communications, Inc.** (Bedford, Mass.): designs systems that interconnect similar and disparate networks

Source: Technologic Partners — CW Chart: Tom Monahan

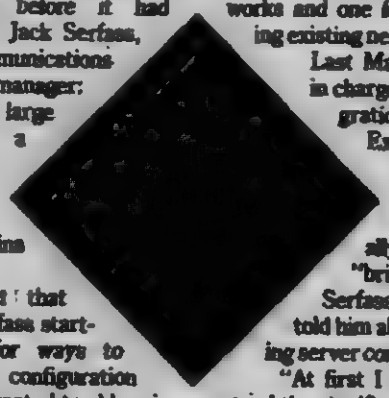
Preferred takes the leap into network maelstrom

BY JIM NASH
CW STAFF

WILTON, Conn. — Taking the high dive into a dark pool is crazy. So is stepping from a relatively concrete and nontechnical industry into the slippery maw of personal computer-based networking.

For Preferred Systems, Inc., a newborn in the highly competitive and potentially bruising networking market, the risk appears to be worth it, if for no other reason than the experience gained, according to its founder, Preferred Systems is the high-tech spin-off of Preferred Health Care, Inc. (PHC). PHC is a public firm that manages mental health benefits (see story page 81).

Last year, PHC decided to move its client and service provider databases off its IBM Application System/400 and onto a Novell, Inc. local-area network. In the process of downsizing its databases, the company learned what many before it had learned, said Jack Serfass, PC and communications network manager: Configuring a large network is a project that requires healthy doses of stamina and nerve.



It was at that time that Serfass started looking for ways to automate the configuration process. He wanted to abbreviate the weeks-long task of assigning access and peripherals rights to users on each file server. That same process must be duplicated on each server, and mistakes often wait to show up after the network is already running, he said.

Unable to find software that could simplify configuration, Serfass and his staff remained determined to shrink the time and complexity of configuring servers. They began developing the software in-house. The team came up with two applications: one for configuring new networks and one for reconfiguring existing networks.

Last March, the man in charge of PHC's migration project, Executive Vice President Steve White, casually asked what "bright ideas" Serfass had. Serfass told him about automating server configuration.

"At first I didn't understand the significance of that," White said. "It didn't sound that radical to me. When I finally grasped what they had done, it stimulated my thinking."

White, who left PHC last July to become vice president of Charter Medical Corp. in Macon, Ga., said that although Serfass' team had built the software, the company still knew little about the market for such a product.

"The more we researched the industry," he said, "the more we discovered that no one else knew very much either. That is a key element to embarking on a risky business. It's what tells you that you have virgin territory."

Scott Stein, an analyst at Technology Investment Strategies Corp. in Framingham, Mass., took a look at the finished goods and said he believed that what he saw would be a unique entry in the PC applications market.

"I went in early one morning," White recalled. "I said, 'Jack, I'll bet that if the company were to create a business structure, you could benefit from that software.' That weekend, we sat in my home in Connecticut developing a business plan."

Although the idea did not meet instant and unanimous approval from others in the company, Paul Litwak, executive vice

Continued on page 81

Two firms criticize IBM Norway's leasing policy

BY DON RADOLI
SPECIAL TO CW

OSLO — Two leading Norwegian computer leasing companies have accused IBM Norway of luring customers into seemingly competitive leasing agreements. The companies claimed that after IBM has obtained an agreement, it charges the customer exorbitant prices both for upgrades and new equipment.

Rolf Sandanger, president of Norway's CMA-Computer, has charged IBM with deliberately enticing customers into these contracts in order to influence their future equipment procurement policies. IBM's assessment of the residual value of its equipment after the contract expires is extremely high, he said.

A customer can reportedly purchase an Application System/400 from a third-party leasing company at half the price IBM charges for the same machine. Upgrades are also extremely expensive compared with what the customer pays for the same equipment on the open leasing market, according to both companies.

"If a customer has an AS/400 Model 35 or 45 and wishes to upgrade to Model B50 or 70, he can get the upgrades from leasing companies at prices that are sometimes 60% lower than what IBM charges," Sandanger said.

Paul Johannesson, president of Norwegian leasing firm Cominvest, said it is important for the customer to be aware of what might happen should he terminate the contract.

Staying mum

None of IBM's leasing customers wished to comment publicly on their leasing agreements with IBM, and IBM Norway's managers were not available for comment.

Meanwhile, in stark contrast with U.S.-based parent IBM, which posted a healthy pretax profit of $6 billion last year, IBM's Norwegian subsidiary recently recorded a pretax profit of only $6.8 million — a 67% decline from 1989, when the subsidiary earned $20.6 million. Total revenue rose slightly from $400 million in 1989 to $416 million in 1990.

IBM Norway President Roar Hoel said the dive in net income for last year was caused by expenditures totaling $48.3 million on equipment for leasing as well as the company's early retirement program. Fifty employees left the company last year under the early retirement scheme. Exports from Norwegian industry to IBM's production facilities rose 36% to just over $33.3 million.

Radoli writes for Computerworld Norge, *an IDG Communications Norwegian publication.*

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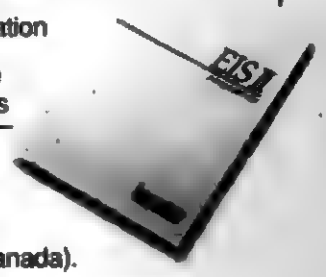
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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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INTERNATIONAL BRIEFS

By any other name?

▶ Dutch technology firm **Philips Telecommunications N.V.** is in the midst of restructuring not only its operations but also its name. According to a recent report in the financial press, the firm — still predicting a 1990 net loss in the ballpark of $2.33 billion — will emerge as **Philips Electronics N.V.** The current Philips board and management will remain in place after the reorganization.

Czech DEC

▶ **Digital Equipment Corp.** took its Central and Eastern European expansion campaign a step further with an announcement early this month that a DEC subsidiary will open in Prague this June. With a 1-year-old Hungarian joint venture kicking in "results that have far exceeded our expectations," said Alberto Fresco, vice president and country group manager at Digital Europe, "we believe the same will be true in the Czechoslovakian market."

With help from le Grand Bleu

▶ Paris-based **Adviseurs S.A.**, supplier of decision support systems to corporate data centers throughout Europe, is taking its line to the U.S. through a subsidiary recently established in New York. According to John Z. Dorn, the subsidiary's president, Adviseurs' European success has been achieved partly through its long-term status as an **IBM France** marketing partner. "We expect to duplicate the phenomenon for corporate America," Dorn said.

Gainer

▶ Munich, Germany-based **Computer 2000 AG** is bent on becoming Europe's largest peripherals and software distribution company serving the IBM Personal Computer and compatibles market by 1992, founder and Chairman **Jochen Tschunke** said in November. The firm's 1990 earnings, announced earlier this month, suggest that the goal is not entirely unrealistic. Taking into account several acquisitions made within the year, Computer 2000 posted revenue up 130% to $400 million. The firm is now realizing more than 40% of its revenue from sources outside Germany, according to the report.

German Railways: May the best firm win

BY HEINRICH VASKE
IDG NEWS SERVICE

FRANKFURT — Major computer companies are currently courting German Railways, and with understandable eagerness: Whichever firm wins will participate in building a Europewide cooperative transportation management system.

A panel discussion organized by German Railways' transportation management recently revealed just how different the manufacturers' data processing approaches are when solving extensive logistical railway problems.

Looming large among the panel's questions were: Can the railways, including those in the former East Germany, integrate their heterogeneous hardware and software systems environments in the future? And how can a European and worldwide information technology application be created while also taking into account other means of transportation?

IBM Deutschland supports an all-encompassing German railway architecture and standardized framework based on its corporate parent's Systems Application Architecture, according to IBM spokesman Edmund Hug. However, "the whole thing has to take place in a heterogeneous environment of different suppliers of hardware, software and services," Hug said.

There will no longer be a single data processing manufacturer that makes all decisions for a company such as German Railways. Unix will play an important role in unifying the different architectures. However, the decisive factor will be to standardize workstations.

Goetz H. Siebrecht, managing director at Unisys Deutschland GmbH, supported open systems over proprietary software. He said there is a trend in Germany that the railways should follow and cited Unix as the central point. He claimed that for the first time, Unix allows user independence of hardware and, therefore, guarantees investments. Moreover, it renders an inexpensive software palette because most of today's applications are developed for Unix systems.

Peter Hess, project director of logistics consulting at Tandem Computers Deutschland GmbH, launched the discussion on Unix vs. proprietary software. He said Unix is not suitable for developing logistical architecture. One disadvantage, for example, is that the initial program load always has to take place on site. In addition, there are no polished management components, and Unix is not a transaction-oriented operating system.

Peter Page, a member of the board of directors at Germany's Software AG, and Joerg Rieder, Digital Equipment Corp. GmbH's managing director, also spoke in favor of open systems. Page stressed open cooperation among different partners, which should be encouraged by the railways. He proposed that the German Railways turn away from a "general enterprise in classical style" and concentrate on different suppliers to reach a common solution.

A "general staff plan" would make sense for the railways' data processing partners as an orientation aid for its business partners. Rieder said he considers this one of the most important tasks for German Railways in the future. He said the motto must be "strategy before organization and organization before technology." Technology is already available to integrate an information system for road and air traffic, railways and waterways. Otto H. Grueneberg, a member of Siemens-Nixdorf Informationssysteme's board of directors, outlined an example for such a solution, independent of transport means: The Canadian postal authority is currently using a system that guarantees delivery within four days. Each transport segment, from railways to airlines to trucks, is completely controlled.

Vaske writes for Computerwoche, *an IDG Communications German publication.*

EXECUTIVE BRIEFS

Arvin named to Meridian post



Mark A. Arvin has been named to the newly created position of executive vice president and chief financial officer at **Meridian Technology Leasing Services.**

Arvin formerly served as vice president and CFO at the Deerfield, Ill., computer lessor, which posted revenue of nearly $586 million last year.

McLean, Va.-based **Corporation for Open Systems (COS)** announced earlier this month that its president and chief executive officer, **Lincoln D. Faurer,** is retiring.

He will be replaced by COS' chief operating officer, Steve Hudson, pending approval by the board of directors in May.

Faurer is a retired lieutenant general in the U.S. Air Force and a former director of the National Security Agency.



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Volunteer group offers IS benefits

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — A volunteer group based here has put the art of giving into the age of computing. At Non-Profit Computing, Inc. (NPC), the spirit of giving lasts all year. The volunteer group helps nonprofit organizations enter the age of computing by giving advice about what gear to buy and providing custom programming services.

NPC, which has affiliate groups all over the world, is made up of "PC gurus" who run the gamut from information systems staff members at large corporations to independent consultants and people who just like to play around with computers.

Among the more recent NPC clients is the St. Aloysius Education Clinic. The clinic's 20 Panasonic Co. and Apple Computer, Inc. personal computers are used by some 650 students in kindergarten through sixth grade.

The clinic serves children from two schools in New York's Harlem neighborhood, where the computers help teach reading and writing. A math program recently got under way as well.

"The computers are so motivational to our children," said Beth Pettit, a teacher at Public School 92 and director of the education clinic. "We even have them in special education classes."

A joint effort

NPC worked with other organizations to help the clinic get its PCs from a New York university that was upgrading its systems. "NPC helped us design the systems, gives us technical assistance and fixes them when we have problems," Pettit said. "They've got a great bunch of people; we're very grateful to them." She added that the clinic is seeking additional PCs to expand its programs.

Ben Stock, an NPC member who also volunteers at the St. Aloysius after-school program that helps children with their homework, said NPC sometimes has problems finding homes for the computers it receives. "Most of [the equipment] is really old," he said. "We get Displaywriters and original CP/M machines and IBM PCs."



So, more often than arranging for the computers themselves, NPC members are called on for advice. The group runs monthly workshops and arranges for one-on-one assistance at the user organization's shop. NPC is currently providing Displaywrite training to New York's Spanish Repertory Theatre, for example. All of NPC's services are provided free of charge; there is no paid staff.

NPC was founded in 1984 as a special interest group of the New York Personal Computer Users' Group. "I started thinking that a lot of people needed help but couldn't afford consultants and didn't know where to turn," said John German, who co-founded NPC with current volunteer coordinator Joanne H. Malbin and is still very active in the organization.

"And I knew from the users' group that there were people in the PC community who volunteered their time and effort, only not with activities to do with computers," German said. "Here we had a lot of people with the skills, and organizations that needed them. So I started trying to make a match."

Events were helped further when industry analyst Esther Dyson "donated the contents of her office," German said. German and Malbin got on the telephone and found groups that needed the software; the NPC was born.

In fact, NPC is affiliated with 17 groups worldwide that help nonprofit organizations. These groups are located in Berkeley, Calif., Houston and Middletown, Conn., as well as in Toronto, London and Berlin, Germany. NPC recently published a guide to groups that provide services similar to its own and is trying to formalize relationships with these other groups so they can direct potential donors to groups located closer to the donor.

Like many organizations, the number of NPC volunteers fluctuates wildly through the year. It ranges from a core group of maybe 20 to a high of 100 or more who give anywhere from two hours per year to 10 or more hours per week, NPC members said.

Nonprofit body allows options for disabled

BY SALLY CUSACK
CW STAFF

PELHAM, N.Y. — In 1970, Cristina McMahan was born with cerebral palsy.

In 1981, D. Bruce McMahan donated a personal computer to his daughter's special education class at Yonkers Public School in New York, and the National Cristina Foundation (NCF) was unofficially born.

The NCF, a nonprofit organization officially founded in 1985, solicits obsolete computers and related technology from businesses throughout the world to assist people with special needs in achieving goals and reaching their full potential.

According to Yvette Marrin, president and co-founder of NCF, the organization has distributed, at no cost, in excess of 5,000 PCs and peripheral equipment to help train people with differing abilities.

Marrin is a music box of uplifting anecdotes, each one telling how technology helped a child succeed: a proud little girl given the means to make her father a birthday card, the wheelchair-bound boy playing his very first game of basketball, albeit electronically, and the list goes on.



Ten years after the original PC was donated in Yonkers, Marrin can point to a list of projects the NCF has successfully completed with the aid of computer companies that have been willing to dig into their storerooms for contributions.

The unique value of technology to her students began to dawn on Marrin just as the concept of desktop computing was beginning to define itself in the marketplace, she recalled. "PC technology was young, and you couldn't just pick up a phone and place an order. We weren't exactly sure how to start."

Marrin did realize, however, that students with cerebral palsy, spina bifida and other conditions that restrict upper body movements had a difficult time with traditional pen-and-paper techniques. Seeing that an electric typewriter improved the situation to a small degree, Marrin said she felt a PC could offer even more toward helping her pupils gain learning independence.

Expert help

Together with a biomedical engineer and an occupational therapist, Marrin explored ways to help the computer meet diverse individual needs. Progress was slow, considering that user groups were scarce back then, and none catered to educators interested in assistive technology, she said.

In Cristina McMahan's case, writing was an especially tiresome situation. Beyond a few sentences, writing is an absolute chore for many such students, Marrin said. Therefore, one of the first software applications brought in was a word processing program.

In addition to writing, the class soon learned that technology was helpful in a dozen different ways. The PC aided in independent reinforcement and drill practices, assisted children with math problems and allowed them to play games. According to Marrin, the system gave them a sense of empowerment.

"The PC allows children with differing abilities to take control and operate independently and permits them to master skills without intervention," she said, adding that the PC is also a "patient and nonprejudicial teacher, wonderful for reinforcement and practice exercises."

Outdated PC equipment

Citing a report from Dataquest, Inc., a market research firm in San Jose, Calif., Marrin noted that almost 30 million PCs will be obsolete by 1994. The U.S. Department of Labor predicts that by the year 2000, some 25 million jobs will be created that require a knowledge of computer technology.

By soliciting outdated equipment for training and educational purposes, NCF tries to help bridge a wide gap by creating a skilled work force. Expanding beyond the classroom, the organization has placed industry-donated PCs in job training facilities, hospitals, vocational and rehabilitation centers and correctional institutions, Marrin said.

The NCF now serves almost 40,000 people in 400 locations in 30 states and five countries, according to Marrin.

Helping hands

The following are among the computer industry companies that are helping the National Cristina Foundation in its efforts, according to President and co-founder Yvette Marrin:

- Apple Computer, Inc.'s Office of Special Education and Rehabilitation in Cupertino, Calif. Apple maintains a database of hardware, software and publications related to adaptive technology.

- The IBM National Support Center for Persons with Disabilities in Atlanta. Established to educate people about how adaptive technologies are applied to aid persons with disabilities, the center maintains a database of approximately 850 products related to assistive technology. It also has staff members available to answer questions or to mail specific information.

- The Trace Research and Development Center in Madison, Wis. In addition to developing adaptive technologies, the organization has worked closely with Apple, IBM and other computer manufacturers in an effort to make computer systems more accessible to those with differing abilities. The center also offers a comprehensive database of adaptive technology products.

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   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
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   - 32. Programmers, Software Developers
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   - 12. Vice President, Asst. VP
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COMMENTARY

Nell Margolis

Multiple-choice predictions



The computer leasing industry is a vibrantly healthy sector showing expected 1991 growth in the 15% ballpark.

The computer leasing industry is an embattled former boomtown that will be fortunate to see 1991 growth in the 6% ballpark.

Which of the above statements — the former, courtesy of Gartner Group, Inc.; the latter brought to us by Technology Investment Strategies Corp. — is true?

If the answer isn't "both," we're in trouble because each is the conclusion of a recent survey by one of the few reputable market research firms attempting to bring some statistical certainty to computer leasing — an industry sector that has often eluded definition, never mind quantification. When it comes to computer leasing, if you can't trust Gartner or TISC, whom can you trust?

Want to have it both ways? Here's how: Trust Gartner. Trust Technology Investment Strategies. Don't trust statistical certainty.

According to the 1990 Survey of the U.S. Computer Dealer and Lessor Industry coproduced by Gartner Group and the Computer Dealers and Lessors Association (CDLA), whose membership is estimated to cover 80% of the third-party industry, that industry logged 7.5% actual growth in 1989 (in contrast with 15% estimated by Gartner) and was projected at 19% growth in 1990, which had yet to close when the survey was done last fall.

Gartner did hedge a bit, noting that continued economic woes and negative trends particular to the leasing sector could drive 1990 and 1991 growth into the 10% to 15% neighborhood.

The Gartner report was issued in mid-January. That gave us about six weeks to be glad before Technology Investment Strategies, Gartner's archrival, clocked in with alternative stats.

According to TISC, even Gartner's 10% to 15% neighborhood turned out to be a high-rent district for the third-party leasing industry, which moved into the 3.6% or 4.6% growth area (depending on whether you look at profits or volume) in 1990.

TISC projected a slightly rosier 5.4% profit growth and 5.5% volume growth for 1991; however, TISC President Charles Greco added his bet that a win by IBM Credit Corp. (ICC) in its current lawsuits within the industry [CW, March 11] could depress the third-party market "into a negative growth situation by the end of 1992."

WANT TO HAVE IT both ways? Here's how: Trust Gartner. Trust Technology Investment Strategies. Don't trust statistical certainty.

Imagine a user — a banker trying to decide whether to finance leases this year, for instance, or an IS director trying to decide whether the lessor who seems to be offering a good deal is going to survive to honor its tempting terms — attempting to get some guidance from the industry's two premier surveys. This image will certainly linger in *my* mind the next time someone tells me how easy it is becoming for users to seek shelter from the apparent chaos and contradictions of the third-party leasing industry in the apparently safe arms of ICC.

However, imagine this: The user simply skips the statistical summary and focuses on the rest of each report. Suddenly, it looks like Gartner and TISC are actually talking about the same industry. In fact, the growth numbers are about the only glaring disparity.

Drop them, and what you get from both reports is the profile of an industry with a widely diverse makeup, in a largely reactive (to ICC) state, amid a wrenching — but in some instances successful — attempt to diversify their leasing portfolios, affected by the same macroeconomic conditions that apply to U.S. industry and generally optimistic in nature.

This profile might drive you away from doing business in or with this sector. It might entice you. It might inspire you to seek more information. What it won't do is give you the potentially dangerous illusion of statistical certainty.

How fast is the third-party leasing industry growing? After reading the computer industry's best-pedigreed surveys, who knows? And as long as you know that, who cares?

Margolis is *Computerworld*'s senior editor, industry.

Preferred

CONTINUED FROM PAGE 77

president at PHC, saw one black-and-white advantage. "It's hard to make money in the service business, if you want to provide good services at good prices," Litwak said. "I saw this [tangible marketable product] as a good way to get back some margin."

REVIEWS OF THE two Novell-compatible products before and since the show have been strikingly encouraging.

White and Litwak spotted an additional business advantage. "Sure, it was outside of health care and workers' compensation, but this wasn't a start-up," White explained. "We had already pulled it off. We already had a product."

Last April, Preferred Systems was incorporated.

"The worst that can happen is we will lose the money we put into [Preferred], get out and lick our wounds," Litwak said.

He admitted to some minor mental flutters. "Going home the night we made the decision, I told myself, 'You've got a lot of nerve to do this,' " he said. "But we are pretty sensible people. We're as able to do this as anybody is."

In fact, White said, the founders believe that Preferred is better able to do it because the company was, in effect, its own alpha-test site.

"My first temptation is to say I've been involved in other projects like this, but this one is unique," White said. "It will accelerate the acceptance of networking technology . . . by taking the scariness out of going to a network."

Rave reviews

In February, Preferred and its two applications, Origen and Lanstandard, held a coming-out party at Networld in Boston. Reviews of the two Novell-compatible products before and since the show have been strikingly encouraging.

"Origen is great for network managers," said Matt Ventura, systems administrator at the University of Rhode Island in Kingston, R.I. Ventura has overseen a beta test of the product in his 200-user computer lab. He said he has used Origen to shorten to a matter of hours the configuration time for his student users.

Analysts who have seen the products said that even if Preferred's automation software is the only product it produces, the company will probably succeed as a business.

"I think they have a real thing here," Stein said. The products are based on reality. [They grew out of] the company's own concerns."

Family ties

If spinning off high-techling Preferred Systems, Inc. was a little easier for executives of Preferred Health Care, Inc. (PHC), it might have been by benefit of PHC's own entrepreneurial background.

Wilton, Conn.-based PHC is a 6-year-old spin-off from Four Winds, Inc., a Katonah, N.Y.-based hospital company. A group of clinical mental health professionals from Four Winds saw that mental health benefit claims often were either underpaid or overpaid.

Steve White, PHC's former executive vice president, said the group realized that by scrupulously detailing mental health benefit cases on computer databases, they could allocate benefits more fairly and consistently.

Since then, PHC has become one of the fastest growing small companies in the U.S. The company showed 47% growth in profits in 1989, tallying $14.6 million in sales, according to *Businessweek*. That may pale in comparison to some volatile high-tech companies, but for an insurance management firm, it has drawn attention.

JIM NASH

Advanced tech awards granted

The U.S. Commerce Department has awarded the first research grants under its Advanced Technology Program, which is intended to assist U.S. companies working on advanced technology.

The grants, which amounted to $9 million, will be given to companies developing such technology as flat-panel displays, X-ray lithography and wiring-board interconnect systems.

The federal government is expected to hand out additional grants during the fiscal year. Congress authorized about $36 million for the program this year and a similar amount for the following year.

The program is aimed at fostering emerging technologies with significant economic benefit, according to the Commerce Department. The Microelectronics and Computer Technology Corp. (MCC), for example, received an award to support research that will be used to commercialize what MCC called a Photorefractive Volume Holographic Storage subsystem.

MCC researchers have found a way to store pages of information as images in a photorefractive crystal material array called strontium barium niobate. The images can be retrieved 100 to 1,000 times faster than from a disk drive, MCC said.

MICHAEL ALEXANDER

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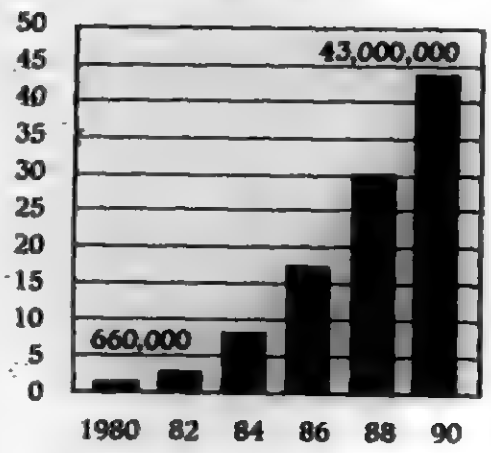
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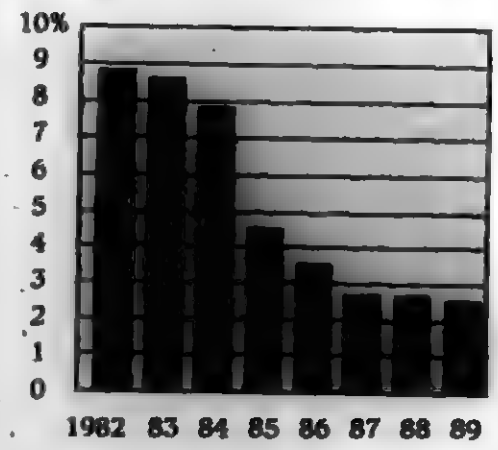
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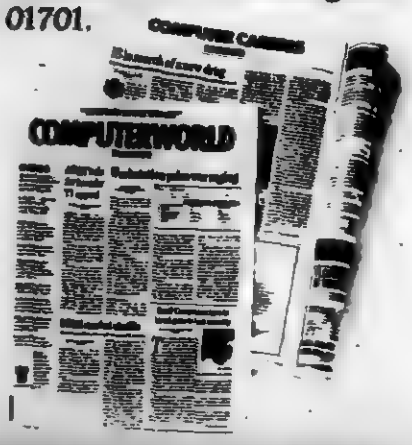
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Room for IS creativity in mail-order firms

If you don't mind working late during holiday seasons, a catalog company may be the place for you

BY SHERYL KAY
SPECIAL TO CW

During times of high unemployment, information systems professionals may find success by seeking jobs in companies that occupy the nooks and crannies of U.S. business. One area in which demand for IS programmers and analysts is increasing significantly is the mail-order industry.

With increased competition for the limited shopping time of today's consumers, mail-order companies are relying more heavily on IS to create innovative marketing and inventory applications. Fortunately for IS professionals, many mail-order firms are willing to pay big bucks for the right talent.



The downside of IS positions in mail-order companies is that professionals are asked to wear many hats, and they must work under high pressure during busy seasons such as Christmas.

In addition, mail-order IS professionals must be ready to consider relocating in order to change jobs because mail-order companies are scattered in locations throughout the U.S.

IS professionals in the greatest demand among mail-order companies are those with a combination of business and technical skills, such as systems analysts and managers.

In fact, mail-order companies will often pay up to 10% above national averages for those kinds of professionals, according to Jim Bond, placement manager at Robert Half International, Inc. in Hartford, Conn.

Strong business skills

Spiro Papantonatos, director of systems and programming and a 31-year veteran at Spiegel, Inc. in Oakbrook, Ill., says he finds that because IS is such an integral part of Spiegel, the people he hires must have strong business skills along with the usual technical background.

This sort of background can pay off in the long run. Former IS employees often become business systems liaisons, working as go-betweens for the IS and user community, according to Papantonatos.

One key area of systems development in mail-order companies is marketing, says Winnie Tuszynski, vice president of IS at Dick Blick Co., an art supply catalog firm based in Galesburg, Ill. To help a company expand its mailing base, IS professionals analyze, massage and manipulate demographics and other assorted customer information that has been collected.

"Our company depends heavily on our programming staff and what information we supply to our other departments," Tuszynski says.

Another significant applications development area is inventory control. "We are always looking for ways to buy better and to ship quicker," Tuszynski points out — so once again, a large part of the company's success relies on IS.

One of the attractions of working in an mail-order firm is that the applications are unique.

"Many of these marketing and inventory systems are very esoteric — not as structured as your standard accounting systems — so they can be more difficult and a challenge to IS professionals," says Paul Pecorin, vice president and chief information officer at Lillian Vernon Corp. in Mount Vernon, N.Y.

Experience not required

Interestingly, recruiters and IS hiring managers in the mail-order business say previous mail-order experience is not required for new hires in IS, even though the implemented systems are unique and extremely tricky to develop.

"It may be slightly easier for others coming from another mail-order or retail company," Papantonatos says, "but they still won't have the full knowledge of how we function." Each mail-order company is different in its size, terminology and business requirements, so even programmers with mail-order experience will need training at a new firm.

Technologies that are the hottest in mail-order IS fall into the midrange category: Professionals would do well to have a background in IBM's System/36, 38 and Application System/400 because those are the systems most often used at mail-order companies, Bond says.

However, IS professionals coming from other industries in which the IS departments are more structured may not be comfortable with a career in mail order. "We all wear many hats, so if you're used to working on only one project, you will be frustrated with a catalog company," Pecorin says.

Mail-order business volume is also subject to peak seasons, particularly from October through December. Pressure is put on the IS department to offer superior customer service at a reasonable cost by fine-tuning and monitoring systems in order to keep response time to a minimum.

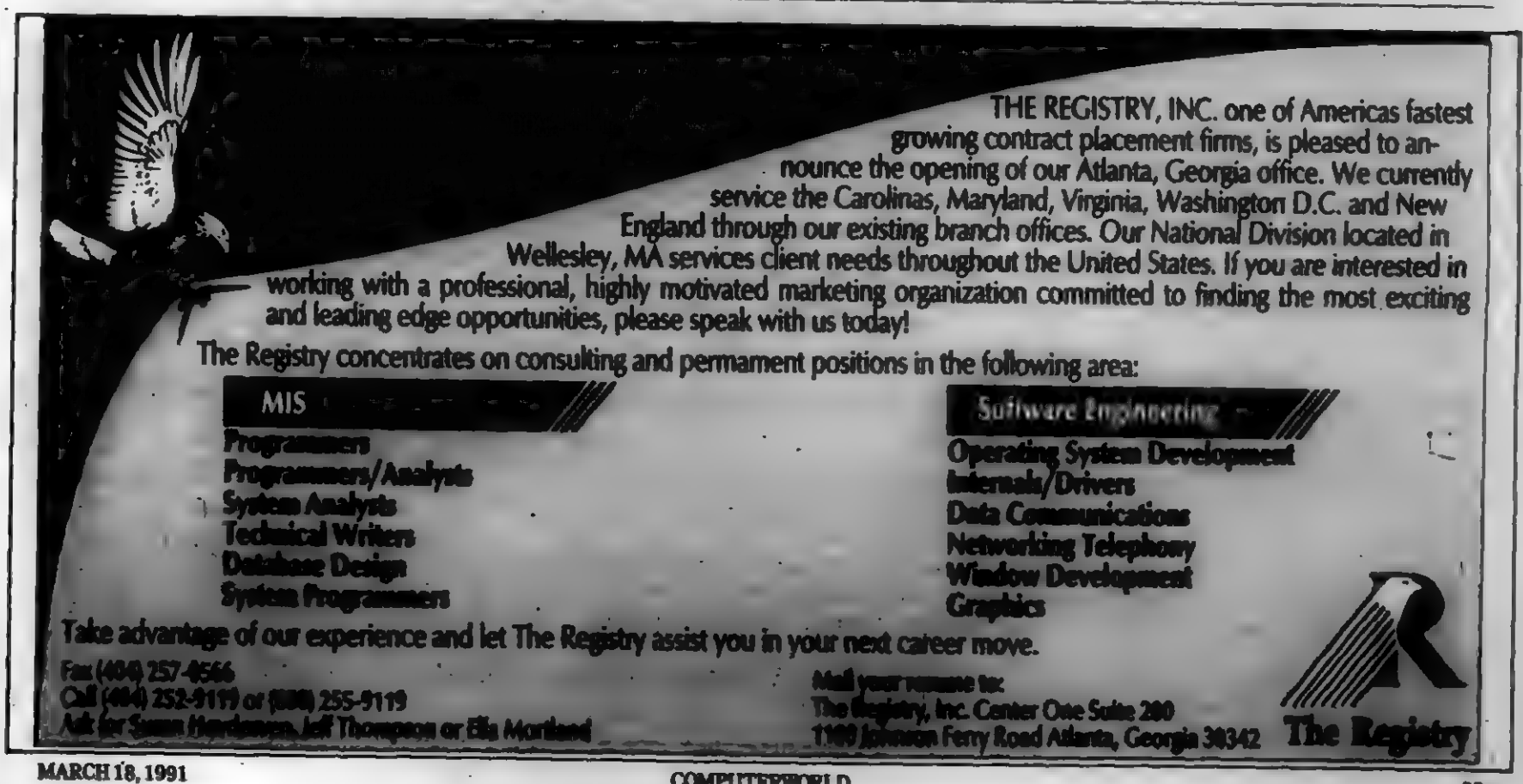
"There can be long hours, so people must be more flexible and do more on their own," Papantonatos says.

Those who can handle the pressure and the lack of structure at mail-order companies should consider the relocation issue.

"Should an IS professional wish to stay in the mail-order line of business, they've got to be open to moving, as there is no mail-order capital of the U.S.," Bond says.

MAIL-ORDER COMPANIES are relying more heavily on IS to create innovative marketing and inventory applications. Fortunately for IS professionals, many mail-order firms are willing to pay big bucks for the right talent.

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.



A tale of two Missouri cities

IS employment opportunities spry in the west, dry in the east

BY JILL VITIELLO
SPECIAL TO CW

Although St. Louis and Kansas City are located on opposite sides of Missouri, they might as well be on opposite ends of the planet as far as information systems professionals are concerned. Because of a severe economic downturn in St. Louis, many IS professionals are out of work and see few prospects for employment on the horizon. However, their Kansas City counterparts are, for the most part, enjoying stable employment, thanks to a more resilient economy.

For example, when St. Louis-based McDonnell Douglas Corp. lost a government contract last year, the company laid off approximately 4,000 workers. "Now, there's a glut of IS professionals out there whose experience is job-specific to defense contracting. Their skills are not readily transferrable to other industries," says Darrell Parrish, branch manager at Source EDP's St. Louis office. Parrish adds that this is the worst market he's seen in more than seven years in St. Louis.

According to Parrish, there are so many IS professionals looking for work and not finding it in St. Louis that many are considering options such as retraining, changing careers or relocating. However, most people in St. Louis want to stay because they consider it a good place to live and, until recently, a good place to work. They credit the urban revitalization program that began in the 1960s, which was sustained throughout the '70s and '80s, with making St. Louis a desirable city.

No place like home

Recruiters in Kansas City report a basically healthy economy in what some residents affectionately think of as a "big, small town." Programmers with about four years of experience are having no trouble finding jobs, particularly in companies with smaller IS departments. However, Trans World Airlines, Inc.'s recent reduction in work force and noticeable slowing of new hires among senior systems analysts and middle managers earning upward of $40,000 could be indications of a softening market.

Even so, it appears that Kansas City is better prepared to weather a recession than St. Louis because of the difference in the two cities' economic bases. While St. Louis is larger and is home to more Fortune 1,000 companies, a disproportionate number of programmers, analysts and managers were employed by the defense industry.

Companies that provide services to the defense industry have been greatly affected. Southwestern Bell Corp., for example, announced a hiring freeze in November, and no thaw is in sight.

Kansas City boasts diversified industries with no one field claiming the bulk of IS professionals, thereby reducing the risk that hundreds would be affected by a downturn in one area such as defense.

IS saves money

Employment experts on both sides of the state are quick to point out that the information services area is not as severely affected by corporate downsizing as some other professions. Even during downturns, when some departments are completely eliminated, companies must maintain a small IS staff to keep the business running smoothly. "Companies recognize that IS professionals save them money," says Randy Pace, IS manager at Robert Half International, Inc.'s St. Louis office.

That perception may be truer than ever. One trend having an impact on both cities is the availability of contract labor in the marketplace. Some companies that cannot hire full-time employees bring in programmers and systems analysts for specific projects. Occasionally, companies dangle the carrot of permanent employment when hiring contractors for temporary work. These "intent to hire" agreements say that if the person turns out to be a good fit for the company, and if the company is allowed to hire, the short-term assignment may become a full-time job.

Many out-of-work IS professionals, particularly in St. Louis, leap at these opportunities because job openings are scarce. Now, even flourishing companies are using the "try before you buy" method of hiring. In fact, the practice is so common that recruiting firms are offering the arrangement to their client companies and to the IS professionals they recruit.

There are exceptions, however. General Dynamics Corp. in St. Louis recently downsized and is at a complete hiring standstill. According to Cindy Rosburg in General Dynamic's human resources department, the company "is discouraging contract labor" by having the president or other high-level executives approve requests.

The IS professional most likely to be chosen for assignments in St. Louis or Kansas City fits the same profile: "one who has a combination of technical skills and business knowledge," says David Pitt, IS recruiter at Dunhill of Topeka in Topeka, Kansas. "Most employers are looking for people with CASE experience and an understanding of the IBM AS/400. These factors make a person more marketable. Anyone who has been too removed from current technology will have a tough time finding a job."

Positions phased out

Indeed, Mark Mabe, MIS director at Missouri Western State College in Kansas City, has phased out several existing positions and replaced them with updated ones. To keep up with users' demands, Mabe changed the MIS group's focus from supporting operations for a central computer system to providing data communications, networking, data cabling and personal computer support in his Hewlett-Packard Co. shop. "We're doing more with the same number of people," he says.

Digital Systems Consultants, Inc. in St. Louis, a software services company, makes it a policy to hire individuals who possess "good programming skills, ability in several languages, database knowledge and a background in a variety of projects," according to Steve Martak, a recruiter with the firm.

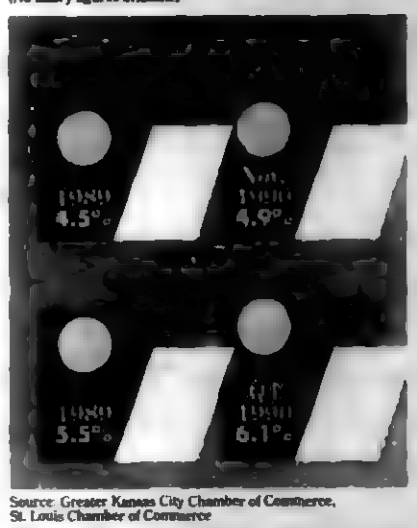
When scientific engineering consulting assignments lagged, the company was able to redirect its cross-trained professionals to the booming commercial side of the business, which provides VAX, VMS and Unix software services.

Most people in St. Louis say the downturn has reached bottom, and those in Kansas City express a guarded optimism that their economy will remain strong. All agree, however, that the IS professional best prepared for any uncertainty is the one who is highly marketable, mobile and motivated.

Vitiello is a speech writer and free-lance journalist based in East Brunswick, N.J.



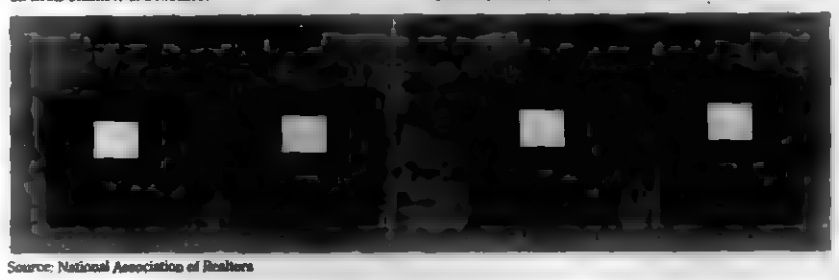
(No salary figures available)



Source: Greater Kansas City Chamber of Commerce, St. Louis Chamber of Commerce



Source: Chamber of Commerce



Source: National Association of Realtors

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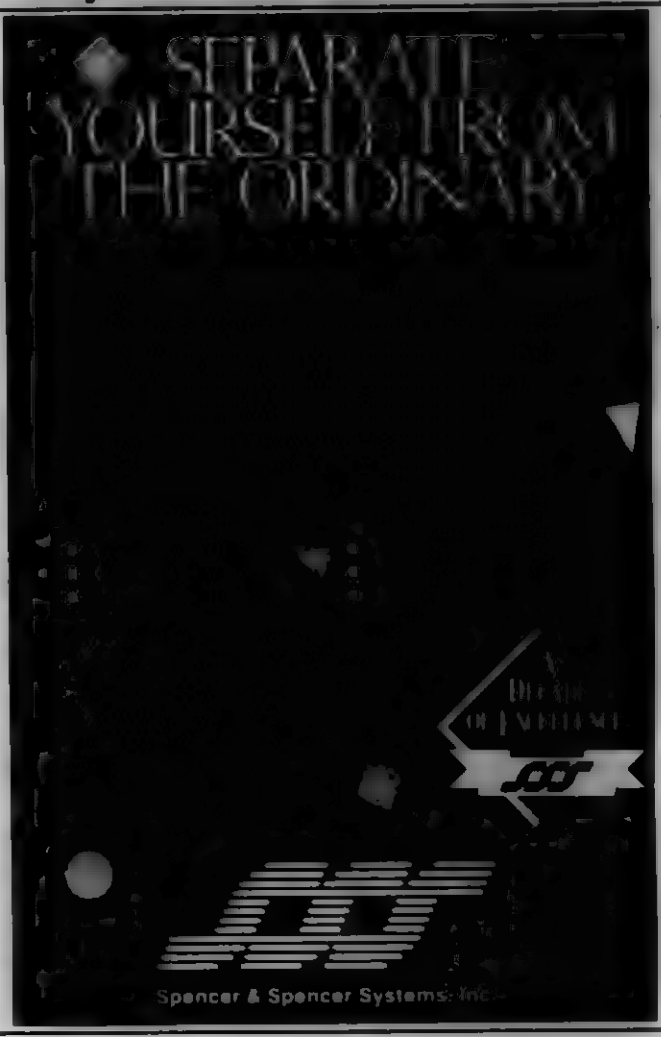
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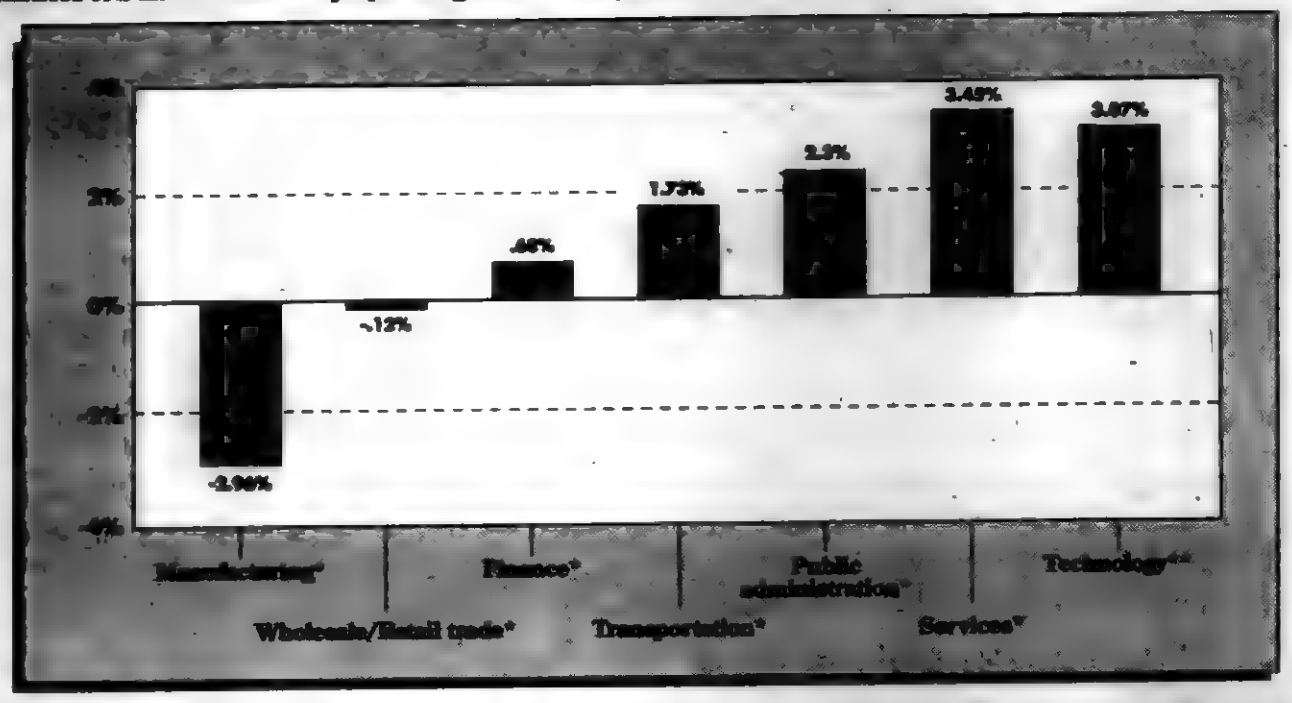
Computerworld/CorpTech Career Index

Technology and service industries led all others in employment growth during 1990

Percent change in number of employees from December, 1989 to December, 1990

*Source:
U.S. Dept. of Labor, Bureau of Labor Statistics, January 1991

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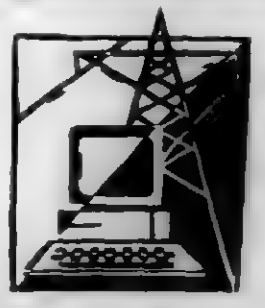
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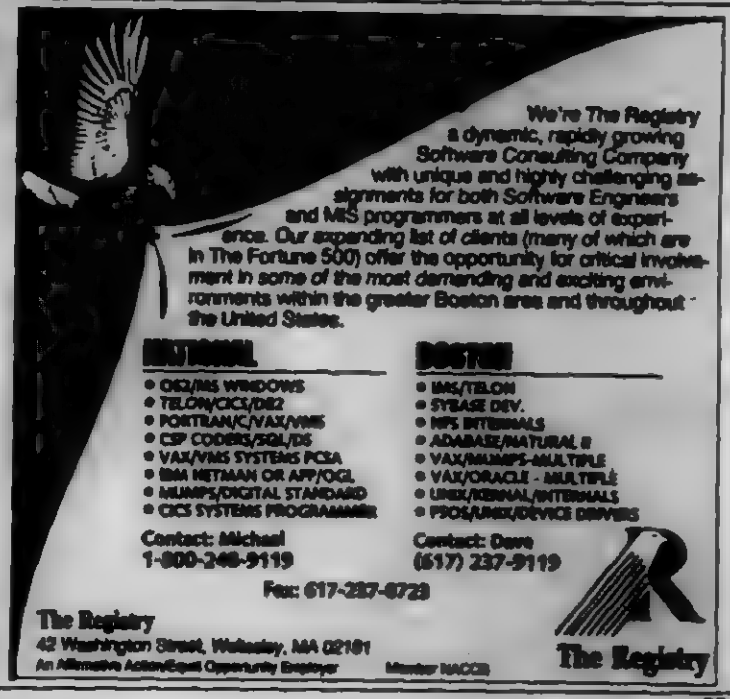
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When a vendor files for bankruptcy

Laws can protect users, and steps can be taken to minimize the impact

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY DENNIS S. DEUTSCH
SPECIAL TO CW

You're a corporate information systems buyer, and you just found out the firm that sold you thousands of dollars worth of software one year ago has just filed for bankruptcy. What does that mean to your users? Fortunately, the law provides users with some protection, and there are specific steps that can be taken to minimize the impact of such an event.

Until recently, when a software vendor filed for bankruptcy, users suffered heavy consequences and were at the mercy of the bankruptcy court. For example, they could be restricted from using the software they had obtained from the vendor before the bankruptcy was filed. But today, some of those restrictions have been eased, and for the most part, it's business as usual unless the user has a grievance to take up with the vendor's provision of the software.

One issue for users to be concerned about is the license agreement and what it or other agreements executed at the same time provide for when a vendor goes bankrupt. For example, users may unknowingly waive certain rights if they continue to pay the license fees and use the software. Users also need to know that they have to go through the bankruptcy trustee, who holds a lot of clout in determining their rights to continued use of the software as well as service and support.

Panic button

Overall, users shouldn't panic. Bankruptcy does not necessarily mean that the vendor company will cease to operate. There are various forms of bankruptcy in which a business or corporation can choose to file.

If the vendor is a corporation, it may file for Chapter 11, which, in effect, is a business re-organization. This will provide the vendor with relief from its debtors for the purpose of restructuring its debt so it can work toward removing itself from bankruptcy.

The key here is that the vendor intends to continue to operate, albeit under the direction of a trustee appointed by the bankruptcy court. In a Chapter 11 filing, it is the vendor's intention to continue to service its customers. If the vendor is a partnership or owned by an individual proprietorship, the same may be achieved. The vendor continues in business and continues to operate under the auspices of the bankruptcy court.

However, vendors can file for Chapter 7, a more drastic form of bankruptcy in which the vendor ceases to operate and its assets are liquidated, with the proceeds being distributed among the creditors. Even in this case, though, users may still obtain the right to continue to use their software.



Users need to understand their rights in using licensed software obtained from vendors that file for bankruptcy. Until 1989, this situation presented a very real problem for the computer industry: All users were at risk of having their rights terminated in the event of the vendor's bankruptcy. In 1988, however, Congress alleviated this problem by passing the "Intellectual Property Bankruptcy Act of 1988," which is an amendment to the Bankruptcy Code. By the terms of this amendment, a user can elect to retain his rights to continue to use licensed software.

The downside of this provision of the code, however, is that even though it provides additional protection to software users, it also provides a trade-off for the protection of the bankrupt vendor's creditors. If a firm elects to continue to use the software, it must continue to pay any fees due the vendor pursuant to the license agreement. The election to do so also serves to waive a firm's right to any claim it may have under the license agreement against the vendor.

For example, suppose a user does not feel as though the vendor has totally lived up to its contractual obligation. As a result of his dissatisfaction, he is considering either suing the vendor or filing a claim for arbitration against the vendor. At this point, the vendor files for bankruptcy. A user's election to continue to use the software will require him to pay any outstanding licensing fees. But in so electing, he is waiving his rights to make any legal claims against the vendor in the future.

To elect to confirm the contract once the vendor goes bankrupt, a user must state his intentions in writing and address them to the trustee of the bankrupt vendor's case. The name and address of the trustee assigned to the case can be obtained by calling the bankruptcy court clerk or by writing to the court where the vendor has filed — most often in the district where the home office of the vendor is located.

State your interest

Users should also contact the trustee if they want to obtain continued service and upgrades. The user should indicate his interest in the vendor and attempt to ascertain what the intention of the trustee is with respect to providing service. If the user is not under an existing maintenance agreement, the vendor is not obligated to provide him with any service.

Remember, if the vendor has filed for Chapter 11, its best interest is to continue to support its users. Income from providing users with that service is one way a vendor can pull out of the bankruptcy hole.

Next week's legal column will explain how users can protect themselves through an escrow agreement to provide for the continued maintenance of their software in the event of a vendor's bankruptcy.

Deutsch practices computer law in Hackensack, N.J., and is an adjunct associate professor of law at Fordham University School of Law in New York.

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	Closing price	Recent high	Recent low
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XT Model 086	$500	$550	$450
XT Model 089	$500	$625	$400
AT Model 099	$650	$775	$500
AT Model 239	$775	$925	$700
AT Model 339	$925	$1,000	$900
PS/2 Model 30-286	$1,100	$1,300	$1,000
PS/2 Model 60	$1,400	$1,700	$1,300
PS/2 Model 70P	$3,300	$3,500	$3,000
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,350	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$2,200	$2,500	$1,900
Deskpro 286	$800	$1,000	$700
Deskpro 386/20	$2,650	$3,000	$2,300
Apple Macintosh Plus	$750	$975	$700
SE	$1,150	$1,350	$1,100
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Information systems training entails a trade-off between keeping the brightest students interested and risking losing the attention of those who can't keep up with the material.

Fortunately, a number of methods have been put forward to address this problem. They include the following:

- Self-assessment tests, pretests and posttests that can pinpoint students' levels of ability.
- The A-B-C method, which is a form of multilevel workshops that customize training according to students' abilities.
- Computer-based training (CBT), which allows students to work at their own pace.
- Split classes, a method that divides the beginning and advanced students into separate classrooms.
- Student pairing, a partnership approach in which the more expert students aid the beginners.

Testing can help avoid the off-balance classroom predicament in the first place. Self-assessment tests usually consist of multiple-choice questions that probe a student's basic and intermediate knowledge. The tests not only reveal levels of ability, but they can help trainers determine the overall training needs within their companies.

Trainers can also offer pre- and posttesting to students at the beginning and the end of the course. These tests measure initial experience levels, and they provide the student with a preview of the course. Questions should be organized by subject in the order in which the materials are presented in the course, either chronologically or in increasing order of difficulty. A comparison of the pre- and posttests' results will give the students confirmation of how far they have come and how much they have learned.



If evaluation testing isn't an option, trainers might want to consider the relatively new A-B-C methodology. This method, which requires experienced instructors and special course materials, allows the trainer to customize the course work to the student population.

Here's how it works: Each major course topic is divided into three sections. Section A consists of vocabulary and basic concepts. Section B includes intermediate concepts and practical applications. Section C contains advanced concepts.

Each workshop is similarly split into three levels. Level 1 includes workshop basics such as definitions of data and job-control language, initialization of default options, program boilerplating and so forth. Level 2 is the meat of the workshop, where most of the work is done. Typically, level 2 will include several tasks for the student: some required, some optional and some "extra credit."

Level 3 contains advanced materials such as performance and optimization considerations, software tool use, interconnection with other workshops or cooperation with other users in a joint project.

In practice, the trainer skips the advanced students to section B and C workshops, while beginners start at the lower end, working their way up.

Clearly, a lot of juggling is involved, but the method provides a great deal of flexibility in the training curriculum. The training is customized for the audience, thus maximizing the company's return on its training investment.

While the A-B-C tack is certainly innovative, the next option, CBT, is perhaps the most ideal solution for student diversity. One of the major advantages of CBT is that students start at their current level and work at their own pace with the trainer available for questions.

Trainers don't always have this option. CBT start-up costs are high, and it requires an expert course developer who must constantly update the techniques and information.

Dividing classes into two groups, placing the beginners with one instructor and the advanced students with another, is yet another approach.

However, this option is extremely resource-intensive because it requires two classrooms, two instructors and two sets of class materials. The advantage of this approach is that it gives the students quality education and the greatest payback in terms of individual attention.

One of the most common solutions is pairing beginners with advanced students — also known as "two at a terminal." The idea is for advanced students to assist and teach the beginners, thus freeing up a trainer's time to continue with the class.

However, while this solution may be the easiest for the trainer to implement, it is not necessarily the best method for the students. Advanced students have a tendency to take over, and they are easily frustrated with a beginner's slow typing and may take control of the keyboard. This hinders the beginner's learning experiences, such as learning how to use a keyboard.

DETERMINING THE LEVEL of student ability with pretests can help avoid an off-balance classroom predicament in the first place.

Second, the advanced student may cover ground much too quickly for the beginner. The beginner then tends to learn the advanced student's shortcuts, rather than the basics of the course.

Picking the method that works for your environment involves making some tough decisions. To maximize the student's learning experiences, try either the A-B-C methodology or CBT. If you are strapped for resources, try student pairing. If you have plenty of staff and resources, split the students into two classes. In all of these cases, get the greatest benefit you can from your training dollar by using pretests to determine the level of student ability.

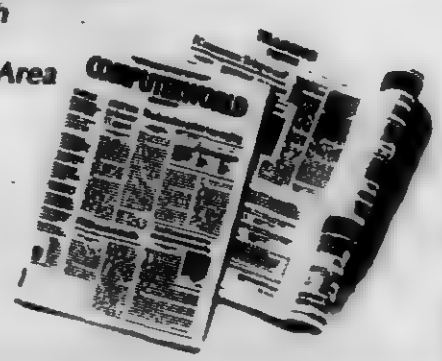
Lyon is a senior education consultant at Compuware Corp.

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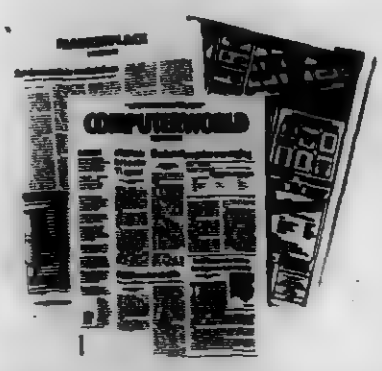
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INDUSTRY ALMANAC

Latest picks and pans

Investment ratings for a sampling of high-profile software and hardware stocks show that what is the pits in one brokerage firm's opinion may be a prize in another's

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[illegible]	Avoid	Buy	
[illegible]	Buy	Neutral	
[illegible]	NR	Neutral	
[illegible]	Hold	Buy	
[illegible]	Hold	Neutral	
[illegible]	Buy	Attractive	
[illegible]	Hold	Unattractive	
[illegible]	Buy	Unattractive	
[illegible]	Avoid	Neutral	
[illegible]	NR	Unattractive	
[illegible]	Buy	Neutral	
[illegible]	Avoid	NR	

NR: Not rated

CW Chart: Paul Mock

ANALYSIS IN BRIEF

Apple Computer, Inc. may look forward to additional revenue thanks to royalty payments from Microsoft Corp.

Because a federal judge dismissed two of the three bases of Microsoft's defense against Apple's copyright infringement suit, the probability looms that Microsoft's Windows will ultimately be held to have infringed Apple's copyright on its icon-based operating system.

Microsoft's remaining card is the contention that the Macintosh/Windows approach to graphical user interfaces is the only logical way to construct such a system and thus cannot be protected by copyright. However, given that Hewlett-Packard Co. has developed a similar interface in a very different way, Microsoft's claim may not hold up.

If Apple could put a hole in the Windows market, it could then fill that space with its own software ported to Intel Corp.-based machines.

However, because 60% of Apple's machines run Microsoft products, Apple would be hurting a major supplier of software to its own user base.

Therefore, Apple is likely to settle for a royalty payment in the range of 2% to 10%, which is traditional in such cases. Apple may also hit makers of Windows-based applications with royalty charges. However, any profit stream from royalties will be relatively short-lived, as Microsoft would redesign Windows to remove offending features as quickly as possible. — *Apple v. Microsoft — What Does Apple Want? Prudential Securities, Inc., March 11, 1991.*

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- AT&T said it would raise its per-share offer for NCR Corp. from $90 to $100 if NCR agreed to merger talks. NCR management did not budge; its stock price slipped 1¼ points last week to close Thursday at 96⅜. AT&T edged up ½ a point to 33⅜.
- Data General Corp. jumped 2⅛ points — more than 21% — last week, closing at 12⅛ after unveiling Aviion 7000 and 4000 servers.
- Investors stomped IBM down 4⅜ points to 128⅛. Some analysts have recently downgraded their ratings in anticipation of slightly lower first-quarter earnings due out in mid-April.
- February's book-to-bill ratio for the semiconductor industry shot up, according to the Semiconductor Industry Association, meaning that new orders outpaced shipped orders last month. Meanwhile, National Semiconductor Corp. advanced ⅝ of a point to 7⅛ after posting profits of $5 million for the third quarter.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, MARCH 14, 1991

TOP PERCENT GAINERS

Alloy Computer Prod.	139.62
Wang Labs Inc. (b)	29.63
Phoenix Technologies	26.00
Anacomp Inc.	25.00
Comshare Inc.	22.39

TOP PERCENT LOSERS

AST Research Inc.	-17.86
Allent Computer Sys.	-17.65
Intecron Systems Corp.	-16.71
Dynatech Corp.	-16.16
Archive Corp.	-15.71

TOP DOLLAR GAINERS

Comshare Inc.	3.75
Data General Corp.	2.13
IPL Systems Inc.	2.00
Phoenix Technologies	1.63
Pansl Corp.	1.63

TOP DOLLAR LOSERS

Adobe Systems Inc.	-6.75
Compaq Computer Corp.	-6.13
Microsoft Corp.	-6.00
Autodesk Inc.	-5.75
Borland Int'l	-5.50

Exch	52-Week Range			March 14 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Off 0.13%
OTC	19.00	5.38	3 COM Corp.	8.88	-0.50	-5.33
NYS	69.75	52.50	American Info Techs Corp.	66.00	1.25	1.93
NYS	44.13	29.00	AT&T	33.88	0.50	1.50
OTC	9.63	0.88	Aristi Communication Corp.	2.75	-0.13	-4.35
NYS	58.25	38.50	Bell Atlantic Corp.	47.13	-0.50	-1.05
NYS	57.63	40.00	Bellsouth Corp.	52.38	0.25	0.48
OTC	19.50	8.25	Compression Labs Inc.	19.50	1.38	8.06
NYS	41.00	23.38	Contel Corp.	41.00	0.75	1.86
OTC	5.13	1.75	Data Switch Corp.	4.75	0.38	8.57
NYS	28.75	8.88	Digital Comm. Assoc.	17.50	-0.88	-4.76
OTC	25.25	12.25	Dynatech Corp.	20.75	-4.00	-16.16
OTC	12.88	5.50	Fibronix Int'l Inc.	9.25	0.13	1.37
OTC	4.00	1.75	Gandalf Technologies Inc.	2.88	0.00	0.00
NYS	4.50	1.63	General Datacomm Inds.	2.75	-0.13	-4.35
NYS	34.13	23.50	GTE Corp.	33.50	1.38	4.30
OTC	6.75	0.75	Intecron Systems Corp.	1.41	-0.28	-16.71
NYS	60.88	40.25	ITT Corp.	58.63	-0.63	-1.06
OTC	44.13	17.88	MCI Communications Corp.	26.50	-1.00	-3.64
OTC	21.00	2.75	Microcom Inc.	8.25	0.35	4.17
NYS	34.00	4.00	Network Equipment Tech.	8.50	1.50	21.43
OTC	14.63	4.00	Network General	11.75	-1.00	-7.84
OTC	15.50	8.13	Network Systems Corp.	13.00	1.00	8.33
NYS	32.00	22.13	Northern Telecom Ltd.	31.75	0.13	0.40
OTC	52.75	17.25	Novell Inc.	49.00	-3.50	-6.77
NYS	88.50	67.00	Nynex Corp.	74.75	-1.50	-1.97
NYS	47.88	38.25	Pacific Telesis Group	40.38	-1.25	-3.00
ASE	14.25	4.75	Pairel Corp.	14.25	1.88	12.87
SYS	29.13	8.88	Stanstic Atlanta Inc.	15.88	0.13	0.78
NYS	58.50	47.25	Southwestern Bell Corp.	53.75	-0.38	-0.69
NYS	46.38	30.63	United Telecom	35.13	-0.50	-1.56
NYS	40.75	32.38	US West Inc.	37.88	0.00	0.00
Computer Systems						Off 3.12%
OTC	8.75	0.58	Allent Computer Sys.	1.44	-0.31	-17.65
ASE	18.88	10.00	Amdahl Corp.	19.25	-0.75	-4.05
OTC	68.25	24.25	Apple Computer Inc.	65.25	-2.50	-2.97
OTC	13.88	4.25	Archive Corp.	7.38	-1.38	-15.71
OTC	29.25	7.50	AST Research Inc.	23.00	-5.00	-17.86
NYS	7.38	3.88	Bolt, Beranek & Newman	6.50	-0.25	-3.70
NYS	18.88	4.88	Commodore Int'l	17.38	0.13	0.72
NYS	74.25	35.88	Compaq Computer Corp.	64.88	-6.13	-8.63
OTC	2.63	0.13	Computer Automation Inc.	1.06	0.06	6.00
NYS	21.50	6.75	Control Data Corp.	11.75	-1.00	-7.84
NYS	30.88	8.38	Convex Computer	15.75	-1.63	-9.38
NYS	51.25	20.00	Cray Research Inc.	41.50	-0.88	-2.08
NYS	13.25	3.50	Data General Corp.	12.13	2.13	21.28
NYS	3.38	0.75	Datapoint Corp.	2.75	0.00	0.00
OTC	28.88	7.50	Dell Computer Corp.	26.13	-0.50	-1.88
NYS	85.13	46.50	Digital Equipment Corp.	77.00	-4.75	-5.81
NYS	38.13	13.75	Harris Corp.	28.50	0.25	0.86
NYS	90.63	24.88	Hewlett Packard Co.	48.50	-1.25	-2.51
NYS	139.75	98.25	IBM	128.13	-4.38	-3.30
OTC	14.00	7.75	Information Int'l	8.00	-0.75	-8.57
OTC	26.75	10.50	Intergraph	24.00	-1.00	-4.00
NYS	3.13	0.50	MAI Systems Corp.	0.88	-0.06	-6.72
NYS	149.88	114.00	Motorola Electronics	134.25	-3.25	-2.36
OTC	28.00	9.00	Mentor Graphics Corp.	15.00	-1.75	-10.46
NYS	99.25	44.50	NCR Corp.	96.38	-1.63	-1.66
OTC	35.50	11.00	Pyramid Technology	22.63	-0.50	-2.16
OTC	34.00	9.75	Sequent Computer Sys.	16.63	-2.13	-11.36
NYS	47.25	18.00	Silicon Graphics	41.00	-3.50	-7.87
NYS	35.13	14.63	Stratus Computer Inc.	32.75	0.50	1.55
OTC	37.25	15.00	Sun Microsystems Inc.	33.38	-1.25	-3.61
NYS	30.13	8.88	Tandem Computers Inc.	14.75	0.13	0.86
NYS	38.50	23.50	Tandy Corp.	32.75	-0.75	-2.24
OTC	35.50	8.75	Tonotech	16.75	-1.50	-8.22
NYS	7.88	1.38	Ultimate Corp.	5.00	-0.13	-2.44
NYS	16.00	1.75	Unisys Corp.	5.63	0.13	2.27
ASE	6.00	2.00	Wang Labs Inc. (a)	4.38	1.00	29.63
Software & DP Services						Off 1.36%
OTC	63.38	17.00	Adobe Systems Inc.	46.25	-6.75	-12.74
OTC	51.25	16.75	Aldus Corp.	47.38	-3.50	-6.90
OTC	34.88	12.00	American Mgmt. Systems	23.13	-0.75	-3.14
OTC	18.25	7.50	American Software Inc.	12.75	-0.50	-3.77
NYS	3.75	1.38	Anacomp Inc.	3.75	0.75	25.00
OTC	23.50	10.50	Analysts Int'l	16.75	0.50	3.08
OTC	18.13	4.88	Aspect Tele	8.38	-0.50	-5.63
OTC	10.25	4.50	ASK Computer Sys.	8.38	0.13	1.54
Auto Data Processing						Off 0.13%
NYS	97.00	45.25	Auto Data Processing	82.38	-2.88	-4.41
OTC	80.25	32.00	Autodesk Inc.	47.25	-6.75	-10.86
OTC	31.50	12.00	BGS Systems Inc.	30.25	0.00	0.00
OTC	43.88	17.75	BMC Software Inc.	41.00	-1.75	-4.09
OTC	21.50	11.00	Boole & Babbage Inc.	15.00	0.00	0.00
OTC	85.50	14.00	Borland Int'l	48.25	-5.50	-10.23
NYS	11.88	0.88	Businessland Inc.	2.63	0.13	5.00
OTC	18.63	4.50	Cognos Inc.	15.63	-2.00	-11.35
NYS	16.88	4.38	Computer Associates	9.25	0.13	1.37
OTC	17.75	7.75	Computer Horizons	12.25	-1.00	-7.55
NYS	64.00	38.75	Computer Sciences	61.50	-1.75	-2.77
NYS	11.75	6.63	Computer Task Group	10.63	-0.38	-3.41
OTC	25.25	13.00	Comshare Inc.	20.50	3.75	22.39
OTC	16.00	3.75	Corporate Software	11.25	-0.50	-4.26
NYS	47.00	27.88	General Motors E (EDS)	44.13	0.88	2.02
OTC	18.75	7.25	Gist Systems Int'l	16.50	-1.25	-7.04
OTC	4.75	1.88	Hogan Systems Inc.	4.00	0.00	0.00
OTC	12.00	5.00	Index Technology	11.00	-0.38	-3.30
OTC	19.13	7.75	Information Resources	17.38	-1.75	-9.15
OTC	17.50	2.63	Informix Corp.	5.88	0.25	4.44
OTC	7.88	1.38	Intelicorp Inc.	2.88	0.31	13.91
OTC	8.00	2.50	Interleaf Inc.	6.38	0.88	15.91
OTC	40.00	10.00	Knowledgeware Inc.	37.38	-0.88	-2.29
OTC	46.00	18.75	Legent Corp.	38.75	-3.69	-8.65
OTC	38.25	12.50	Lotus Development	25.88	-0.13	-0.48
OTC	32.00	13.63	Micrografx	20.00	0.75	3.90
OTC	113.00	82.75	Microsoft Corp.	98.00	-6.00	-5.77
NYS	10.13	4.00	On Line Software Int'l	10.13	0.38	3.48
OTC	29.38	4.88	Oracle Systems	9.50	0.38	4.11
NYS	17.88	7.00	Parasophic Systems	11.00	-0.38	-3.30
OTC	7.88	1.25	Phoenix Technologies	7.00	1.63	30.00
NYS	52.00	31.88	Policy Management Sys.	48.00	-2.38	-4.72
NYS	25.88	11.50	Reynolds & Reynolds	20.13	0.13	0.63
OTC	18.13	6.88	Sage Software Inc.	10.75	-0.38	-2.27
OTC	25.00	14.75	SEI Corp.	24.75	0.75	3.13
OTC	18.13	12.25	Shared Medical Systems	16.38	-0.63	-3.69
OTC	36.25	12.00	Software Publishing Corp.	28.75	-4.25	-12.88
NYS	13.38	8.50	Sterling Software	12.75	-0.13	-0.97
OTC	26.00	8.50	Sungard Data Sys.	12.75	-0.38	-2.86
OTC	46.50	17.75	Symantec Corp.	43.00	-1.25	-2.82
NYS	34.88	4.50	System Center Inc.	8.00	0.75	10.34
OTC	37.25	12.75	System Software Assoc.	21.00	-1.75	-7.69
OTC	27.38	4.75	Wilcox	18.00	-0.38	-1.84
Semiconductors						Off 1.67%
NYS	25.88	19.38	Advanced Micro Devices	22.00	-0.63	-2.78
NYS	11.88	5.50	Analog Devices Inc.	10.75	-0.75	-6.52
OTC	22.75	5.25	Chips & Technologies	11.00	-1.50	-12.00
OTC	59.75	39.00	Intel Corp.	47.88	-4.25	-8.21
NYS	13.00	6.13	LSI Logic Corp.	9.13	0.38	4.29
NYS	16.75	6.75	Micron Technology	16.75	1.13	7.23
NYS	59.38	46.75	Motorola Inc.	52.63	-2.00	-3.66
NYS	8.88	3.00	National Semiconductor	7.88	0.63	8.66
NYS	46.75	22.50	Texas Instruments	42.38	-3.38	-7.38
OTC	12.25	3.00	VLSI Technology	8.63	0.50	6.15
ASE	14.88	4.00	Western Digital Corp.	4.88	-0.38	-7.14
Peripherals & Subsystems						Up 4.09%
OTC	2.00	0.88	Alloy Computer Prod.	0.75	0.44	139.62
OTC	2.25	0.88	Apertus Technologies	1.94	0.00	0.00
OTC	34.00	7.00	Banctec Inc.	11.75	0.25	2.17
ASE	10.13	4.13	Cognitronics Corp.	6.25	-0.25	-3.85
NYS	31.25	14.63	Conner Peripherals	28.50	0.25	0.88
ASE	22.00	7.00	Datatrain Corp.	11.25	-1.25	-10.00
NYS	10.88	4.25	EMC Corp.	8.50	0.25	3.03
NYS	47.25	33.75	Eastman Kodak Co.	46.13	-0.38	-0.82
OTC	9.88	4.38	Emulex Corp.	8.63	-0.38	-4.17
OTC	34.88	14.00	Evans & Sutherland	19.50	-2.75	-12.36
OTC	8.50	3.50	Iomega Corp.	5.88	0.19	3.42
OTC	29.25	6.75	IPL Systems Inc.	26.50	2.00	8.51
OTC	1.94	0.13	Maxtor Systems	0.75	0.06	8.91
OTC	17.00	2.63	Mentor Corp.	8.63	0.88	13.91
OTC	13.38	3.88	Micropolis Corp.	11.25	-0.75	-6.25
NYS	93.75	73.63	3M Corp.	91.25	0.50	0.55
OTC	14.50	6.00	Prime Inc.	9.38	0.38	4.17
NYS	21.25	8.50	QMS Inc.	19.00	0.25	1.33
OTC	27.25	12.38	Quantum Corp.	24.88	-1.38	-5.24
NYS	8.25	4.38	Recognition Equipment	5.50	-0.25	-4.35
OTC	9.88	4.00	Resch Inc.	8.63	0.13	1.47
OTC	19.38	6.63	Seagate Technology	15.13	-0.38	-2.42
NYS	38.38	11.00	Storage Technology	31.50	0.63	2.02
OTC	4.00	1.25	Tandon Corp.	3.50	-0.38	-9.67
NYS	22.88	11.88	Tektronix Inc.	21.75	-0.88	-3.87
OTC	0.88	0.16	Televideo Systems	0.44	-0.06	-12.40
NYS	88.88	88.00	Xerox Corp.	88.13	-1.88	-3.28
Leasing Companies						Up 2.94%
OTC	16.00	6.88	Amplicon Inc.	14.75	-0.25	-1.67
OTC	4.38	0.31	Capital Associates	0.88	0.06	16.52
NYS	28.88	14.63	Comdisco Inc.	25.88	-2.25	-8.00
OTC	18.25	9.25	LDI Corporation	13.75	1.00	7.84
OTC	5.88	2.25	Selectarms Inc.	2.75	0.00	0.00

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Laws

FROM PAGE 1

Forecast International, a defense market research firm in Newtown, Conn.

• Allied casualties from "friendly fire" show the need for improved target recognition systems and other methods of distinguishing friend from foe, especially when multinational forces are involved, said Richard Thomas, director of the Center for Strategic Technology at Texas A&M University. "If we had sold M1 tanks to Saddam Hussein, how would we tell who is inside them?"

• Cloud cover in the early days of the air campaign hampered bomb targeting and damage assessment because only one of the allies' seven imaging satellites was capable of seeing through cloud cover, said John E. Pike, space policy analyst at the Federation of American Scientists in Washington, D.C.

• Satellite cameras looking for Iraqi missile launchers were defeated by camouflage, tunnels and even ditches, according to Jeffery Shaffer, a military analyst at the Center for Strategic and International Studies in Washington, D.C. Commanders found that the surest way to locate the mobile launchers was to rely on people, by having scouts sneak behind enemy lines in superquiet dune buggies.

Nevertheless, the use of technology in the war earned high marks from defense analysts. "The electronics worked darn well. It's really hard to find fault," said Ron Hertenstein, vice president of Forecast International.

Analysts said the computer-guided Patriot missile system worked remarkably well in knocking down Iraqi Scud missiles headed for Israel and Saudi Arabia, considering it was never designed to protect civilian areas. In a Feb. 15 speech at the Patriot's manufacturing plant in Andover, Mass., Bush praised the system for intercepting 41 of the 42 Scud missiles it engaged.

The Patriot missile, one of the many high-tech heroes in the war, did not start out as a Scud-buster. It was originally designed to hit enemy aircraft and ignore missiles, but in 1984 the U.S. Army began to upgrade the Patriot's computer software so it could intercept missiles, too.

"It is a very software-intensive system and deliberately so. That way we can play with the system's operational capabilities by changing the software," said David Harris, spokesman for the U.S. Army Missile Command near Huntsville, Ala.

In fact, the Patriot's guidance software was fine-tuned several times during the war to improve its chances of hitting the Scud warhead and hitting it earlier. The software upgrades were flown from the U.S. to the war zone and distributed to Patriot batteries in Israel, Saudi Arabia and Turkey, Harris said.

In contrast, the Scud launch detection system was hatched from a system designed to pick up intercontinental missile launches from the Soviet Union, which would provide about 30 minutes' warning time, according to Baranauskas.

The encrypted satellite data indicating a Scud launch had to be sent to the North American Aerospace Command in Colorado, where the signal was picked up by large specialized dishes, processed by mainframes and then relayed to the Middle East. There was no time to put bulky, specialized dishes in the desert, so there was no direct link from these satellites to the ground commanders. Under the revamped Strategic Defense Initiative program, the U.S. Department of Defense is working on mobile ground stations that would track enemy launches on a more local level, Baranauskas explained.

The highest praise went to the allies' command and control systems, which created a web of communications links among air and ground forces. "In light of previous command and control fiascos [such as poor coordination of the Grenada invasion], this gets an A+," Shaffer said.

Analysts said the only caveat to their glowing reviews is that Iraq turned out to be a disorganized, low-tech enemy that made no effort to disrupt the high-tech systems, so their robustness was not really tested. Also, "we're not always going to have six months to get ready for a war," Thomas noted.

Shaffer said the computer-intensive Airborne Warning and Control System (AWACS) planes did an outstanding job coordinating the air campaign and directing air support for the ground war, while battlefield commanders were able to download intelligence data from satellites via direct data links.

A small mainframe computer at the U.S. Central Command in Riyadh, Saudi Arabia, was responsible for generating a single Air Tasking Order for the coalition air forces [CW, Jan. 28]. On a daily basis, it matched the military firepower to the selected targets and set the sequence of events so, for example, a fighter would not be flying over the explosion caused by a cruise missile.

Thousands of computers of all shapes, sizes and ages were used in the Persian Gulf theater, ranging from Grid Systems Corp.'s laptop microcomputers and Compaadd Corp.'s 1486-based desktop systems to Hitachi Data Systems Corp.'s- mainframes. Many of the Marines' microcomputers were linked on Banyan Systems, Inc. local-area networks, said Lt. Col. Larry Sims, head of technical services for the U.S. Marine Corps in Quantico, Va., while other services used Novell, Inc. LANs.

The satellite-intensive network for Operation Desert Storm, called the ODS-Net, was created by the U.S. Army Information Systems Command at Ft. Huachuca, Ariz. Col. Steven C. Harman Jr., who oversaw the network design and installation, said the network can be reconfigured rapidly to route data traffic around battle-damaged sections.

ODS-Net consists of 20 subnetworks managed by a network control center known as "the AWACS of the Saudi network" because it monitors the collection of routers, bridges, packet switches and satellite trunks. A typical message transmitted via satellite from the Persian Gulf travels more than 46,000 miles and takes less than three seconds to reach the U.S.

Howitzer hang-up



The computer in Capt. Owen Englander's Howitzer battery was both a curse and a blessing.

In case of an amphibious assault by Marines, which did not occur during the war, Englander was prepared to move his battery of six Howitzer artillery guns ashore. The guns are controlled by the Battery Computer System, which can transmit firing orders to guns spaced hundreds of yards apart and still have the shells strike the target at the same time. Previously, the Howitzers had to be kept close together for manual firing instructions, which made them more vulnerable to enemy attack, Englander told a pool reporter aboard the USS Gunston Hall.

However, 1st Lt. Steve White said the computer is not user-friendly. It is supposed to keep track of ammunition stocks as shells are fired, but White said it is easier to keep track in a logbook. In addition, White has a crew that performs all firing calculations manually as a backup and to ensure that gunnery officers can still do it the old-fashioned way.

U.S. details price of business with Iraq

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — More than $500 million in U.S. computer equipment and other high-tech gear was shipped with government approval to Iraq in the five years leading up to the Aug. 2 invasion of Kuwait, the U.S. Department of Commerce revealed last week.

Details of the exports have fueled charges that the U.S., in its tilt toward Iraq during the Iran/Iraq war, unwittingly handed Saddam Hussein much of his ability to wage mischief on a grand scale.

Government officials refused to identify suppliers or speculate about the uses to which the equipment was put, saying only that it generally was not suitable for military applications.

A 110-page computer printout released by the department last week showed exports of "computing equipment" such as the following:

• $1.1 million shipment to an "Arab company" to "control and monitor the production of detergent chemicals."

• $2.8 million shipment to the Iraqi Atomic Energy Commission — use not specified.

Critics skeptical

Given reports of Iraq's efforts to develop chemical and atomic weapons, administration critics were skeptical about claims the technology had no military use. "Many of the sales went to sites identified as military, sites which were subsequently bombed," said Gary Milhollin, director of the Wisconsin Project on Nuclear Arms Control.

Milhollin said two sales of computer equipment — each for $8.7 million and each licensed for use by the Iraqi Interior Ministry for a "personnel database" — were especially troubling. "It's highly likely that was used for internal security purposes, to keep track of people," he said.

A congressional source looking into the exports said the equipment for the personnel databases came from Sperry Corp., which later merged with Burroughs Corp. to form Unisys Corp. A spokesman for Unisys would not comment except to say the firm had followed all applicable laws and regulations.

Washington attorney Paul Freedenberg, who was under secretary of commerce for export administration when many of the exports were approved, acknowledged that some sales to Iraq should not have been allowed. "Knowing Saddam Hussein now, we don't want to sell him anything. But at the time, it made sense. The White House didn't want to tilt against Iraq, and the Commerce Department had no legal justification for [blocking exports there]."

Reports that the U.S. is preparing to ship Brazil an IBM vector-processor add-on to an IBM mainframe computer, boosting it to a supercomputer-class machine, have caused critics to charge that the administration has not learned a lesson from the Iraq experience.

Brazil meets only one of six nuclear nonproliferation credentials required for the import of U.S. high-performance computers and the computer is to be used by the Brazilian aircraft manufacturer Embraer, which a Brazilian newspaper said last May was selling Iraq technical services and helping it "to improve the performance of the Soviet Scud missiles."

Embraer severed its ties to Hussein under public pressure after the invasion of Kuwait.

"Why the hell is the White House doing this? Their answer is, the export comes with guarantees to only do peaceful calculations," a congressional source said. An IBM spokesman said IBM had carefully followed all export licensing rules.

Boom-ing business

The U.S. Department of Commerce approved two-thirds of all licensing petitions for exports to Iraq during the five years before the Persian Gulf war

U.S. license applications for exports to Iraq, 1985-1990

	Approved	[redacted]	Returned without action
Applications	771	[redacted]	323
Dollar value	$1.5B	[redacted]	$462M

Exports included computer and communications systems, integrated circuits, mapping and photographic equipment, communications countermeasures gear, flight simulators, chemical and biological agents, underwater detection equipment, trucks and helicopters

Source: U.S. Department of Commerce — CW Chart: Tom Monahan

NEWS SHORTS

Mouse creator honored

Douglas C. Engelbart, 66, a computer visionary who conceived the idea of desktop computing in 1951 and later invented the mouse user interface, received the 1991 Coors American Ingenuity Award last week. Engelbart also developed word processing, database software, split screens, computer graphics and windows at the Stanford Research Institute in the 1960s, but his work was ridiculed by the mainframe-oriented computer industry at the time. Past winners of the award, which honors unsung heroes of innovation, include technology pioneers John Atanasoff, Jack Kilby and George Dantzig.

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IBM takes CIM to mainframe

IBM announced a series of mainframe-based software applications last week to help manufacturers manage and control a range of production functions in computer-integrated manufacturing (CIM). The CIM Production Planning Series/MVS and VSE includes 11 modules that form the basis for a manufacturing resource planning system. Among the potential benefits IBM is promoting with the new software series are reduced inventory, better control of engineering changes and increased responsiveness to market demands. The applications, slated to be available the third quarter of this year, will run under DB2 on both Enterprise System/9000 and System/370 machines and will utilize the common user access windowing facility of IBM's Systems Application Architecture.

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Vendors sign with software council

When a corps of software vendors in search of better business ethics within their industry sector launched the Software Business Practices Council (SBPC) last fall, skeptics wondered how far the group's self-policing efforts could range while major players such as Computer Associates International, Inc. and Dun & Bradstreet Software remained outside the fold. The big guns, in turn, said they would be more likely to cast their lot with a mainstream effort rooted in, say, software industry association Adapso. Last week, skeptics and players alike saw their reservations addressed. Even as a planned merger of the fledgling SBPC into Adapso became a done deal, 17 new companies signed on — among them, D&B Software, CA, Andersen Consulting and Oracle Systems Corp.

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CDC aims at open platforms

As further evidence that it is moving from proprietary solutions toward a systems integration approach, Control Data Corp.'s Computer Products Group last week announced a new version of EDL, its repository-based information management system. Version 5 of the product will run on Control Data's Cyber mainframes but will also support open platforms from Sun Microsystems, Inc., Hewlett-Packard Co., Digital Equipment Corp. and IBM. The software will have three modules, addressing users, managers and systems administrators. Control Data, which claims 450 EDL users worldwide, said the system will be available in May at a base price of $3,000 per user.

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Glitch found in HP minicomputers

A hardware problem that disables error detection circuitry after a power failure was discovered by HP in its HP 3000 Models 950 and higher in December. The difficulty with the memory controller was that it could pass errors through to a disk, according to a user. HP developed a software patch for the bug. The patch is available through HP's field offices.

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Translator works on interfaces

Neuron Data Corp., an expert systems vendor in Palo Alto, Calif., said last week it has a product that can decipher the variations among the leading graphical user interfaces. Neuron claimed Open Interface can quickly map user applications to a variety of interfaces, including the Open Software Foundation's Motif, Microsoft Corp.'s Windows and Presentation Manager, Sun's Open Look and Apple Computer, Inc.'s Macintosh interface. Open Interface reportedly provides a screen layout editor and a set of C libraries for each environment.

Health board rebuts VDT miscarriage link

BY CAROL HILDEBRAND
CW STAFF

Pregnant women who spend a large portion of their time in front of VDTs do not run a higher risk of miscarriage, according to a report issued last week by the National Institute of Occupational Safety and Health (NIOSH). However, VDT health activists remained unconvinced, pointing out several issues they claimed the study did not properly address.

The NIOSH report compared the rate of miscarriage between two groups of telephone operators employed at two companies spread across eight Southwestern states. A total of 882 pregnancies were studied.

The first group used VDTs, and the control group used LED equipment. Both types of equipment produce extremely low-frequency electromagnetic field (EMF) emissions at 45 to 60 Hz and very low-frequency (VLF) EMFs at 15 KHz. The report found that the LED equipment did not emit VLF emissions above background levels. The rate of miscarriage was 15% for VDT users vs. about 16% for non-VDT users.

"I think the study is very reassuring to women who use VDTs and are concerned about miscarriages," said Teresa M. Schnorr, principal author of the report for NIOSH, which is part of the U.S. Department of Health and Human Services.

However, Karen Nussbaum, director of 9 to 5, the National Association of Working Women in Cleveland, said the study is limited and that "it's a mistake to draw broad conclusions from it."

Louis Slesin, editor of the newsletter "VDT News," said he had problems with the measurements of the EMFs. "First, you can see that they did the measurements on EMFs two years after they had collected the pregnancy data, so it was an afterthought," he said.

Slesin also said using LED operators as a control population caused some problems because at times, their EMF emissions were equivalent to those of the VDTs. "They shouldn't have stretched to include EMFs as part of their conclusions," he said. "If they had just said the use of VDTs, I would have a lot less problems with it."

The 9 to 5 group faulted the study's use of only two VDT models and the measurement of emissions from only 48 of them.

Both Slesin and Nussbaum also questioned the study's omission of questions about stress, which earlier studies have linked to VDT health problems.

> "I THINK THE STUDY is very reassuring to women who use VDTs and are concerned about miscarriages."
>
> TERESA M. SCHNORR
> NIOSH

The third problem both groups found also involved the scope of the project. The report looked at miscarriages in recognized pregnancies but did not look at early fetal loss.

Schnorr acknowledged the lack of early fetal loss data, saying that techniques for detecting it have only recently been developed. She said that studies at Mt. Sinai Hospital are currently examining that issue.

Oracle

FROM PAGE 1

Manager, Oracle executives said. Several other companies are reportedly considering Oracle's offer to assist in "loosely coupling" their stand-alone hardware systems.

"The advantage of parallel systems is that one computer can stop while the others keep going," said Kenneth Jacobs, senior director of marketing at Oracle's RDBMS product division.

In a Vaxcluster, that means the number of deferred writes to a single, shared Oracle Version 6.2 database goes up, and there are fewer interruptions from the DEC Lock Manager required to keep VAX updates to the Oracle database "in sync," Jacobs said.

Industry analysts said the Oracle Version 6.2 news brings relief to hundreds of sites that run Oracle Version 5.0 or 6.0 on single VAX machines and are waiting to cluster them.

"In the short term, the only people to benefit from this Parallel Server option will be the Vaxcluster clients," said Donald Feinberg, program director for software management strategies at Gartner Group/Infocorp in Santa Clara, Calif. "Now, they'll be using Oracle 6.0 the way it's supposed to be used on a Vaxcluster."

DEC may enjoy its own windfall from the Oracle announcement, which is expected to spark additional hardware sales to customers prevented from clustering their machines under Oracle Version 6.0. "We like to have good things keep happening to the Vaxcluster environment," said William LaVigne, Vaxcluster systems marketing manager at DEC.

Previously, VAX users had only two choices for running Oracle in a Vaxcluster: They could run Oracle Version 5.1 in a Vaxcluster mode with each machine updating a single copy of Oracle, or they could use SQL*Net to connect multiple VAXs, each running a separate copy of Oracle Version 6.0.

"We have been unable to move to Oracle 6.0 because of the amount of system overhead involved," noted James Rochfort, manager of operations at a TRW, Inc. unit with three production Vaxclusters at Hanscom Air Force Base in Bedford, Mass.

During the 18-month wait for Oracle to repair its Vaxcluster product, the base continued to run Oracle Version 5.1 on more than a dozen production VAXs that were "maxed out" by a user community of 3,000, Rochfort said. "We have been loud and vocal in our requests to Oracle to provide us with a clusterable version of Oracle 6.0. The development of future Unix "distributed lock managers" still has the potential to extend existing Oracle databases in Unix sites, Feinberg said.

Pyramid is already working on a distributed lock manager to complement Oracle's Parallel Server, said Mark Bishop, Pyramid's database marketing manager. "There is a major effort under way that will enable multiple Pyramid systems to run against a single Oracle database," Bishop said.

Ratings sheet

Codd and Date, Inc. verified these TPC Benchmark B results of Oracle's Version 6.2 running on Vaxclusters

Nodes	CPUs per node	Memory per node	Trans./sec.	Transaction cost/sec.
3	6	[illegible] bytes	329.8	$[illegible]
4	6	[illegible] bytes	435.7	$[illegible]

Tests were conducted on multiple VAX 6000 Model 560 systems using VMS Release V5.4-1

Source: Codd and Date, Inc. CW Chart: Paul Mack

Tandy CD-ROM set to shatter high-price barrier

Internal CD-ROM drive with $399.95 retail price sacrifices a little bit of speed for affordability

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Tandy Corp. is set to break through the high price barrier restricting the mass marketing of compact disc/read-only memory (CD-ROM) technology by introducing an internal CD-ROM drive at a retail price of $399.95.

The Tandy CDR-1000, which will be introduced at the Sixth Annual Multimedia CD-ROM Conference being held here this week, will be available immediately, according to the firm. Although its performance lags behind other CD-ROM drives on the market, with an access time of about 900 msec, analysts concurred that users will probably be willing to sacrifice the slight delay in retrieval for a drive that is hundreds of dollars less expensive than its competitors.

"I definitely think that end users will give up performance for price," said analyst Bob Abraham, vice president of Freeman Associates, a market research firm in Santa Barbara, Calif. "This type of access time delay, which is in the hundredths of a second, is noticeable but forgivable by a user."



Although speed is an issue, "Tandy's CD-ROM drive price is getting the product down to where it needs to be to reach the mass market," said Bob Gaskin, an analyst at Dataquest, Inc. in San Jose.

Other CD-ROM drives range from NEC Corp.'s $599 portable version to Sony Corp.'s high-end internal drives that retail for about $1,200.

Despite the slower speed, Tandy said it is able to offer the 150K byte/sec. data transfer rate established as part of a minimum standard for multimedia personal computer systems last year by a group of vendors.

Microsoft Corp. is also expected to demonstrate its own Windows-based multimedia authoring tool at the conference.

The product, code-named Windoc, is a software developer's tool that provides a direct link to a hypertext engine in Windows 3.0, providing a common interface retrieval structure under Windows for developers writing multimedia applications on CD-ROM discs, according to a Microsoft spokeswoman.

"This product is a tool for authoring certain kinds of applications. It is somewhat limited in that it is best-suited for text-intensive applications and can be used in conjunction with other authoring programs," the Microsoft spokeswoman said.

There is some resistance in the CD-ROM industry to Microsoft's entry into this market. "It's one thing to evangelize a consistent interface and quite another to dictate the tools needed to make that interface," said Nick Arnett, chief analyst at Santa Clara, Calif.-based Multimedia Computing Corp.

However, a standardized search-and-retrieval system for CD-ROMs is necessary to help the CD-ROM market take off, according to Fred Meyer, president of Meridian Data Systems, a customized publishing systems house in Scotts Valley, Calif.

"We think Windoc under Windows 3.0 could provide a standard way of accessing information on a CD-ROM," Meyer said.

Microsoft

FROM PAGE 1

and OS/2. Last week, however, they were uniformly tight-lipped about the probe.

Gates "is flabbergasted" by the vitriolic comments directed at his company, said Vern Rayburn, chairman and chief executive officer of Slate Corp., who attributes a lot of the comments to sour grapes on the part of developers who put their eggs in the wrong basket.

Microsoft claims it is not a monopoly because it faces competition in every market it is in, added Bill Bluestein, an analyst at Forrester Research, Inc. Although it is the predominant supplier of PC operating systems, alternatives include versions of Unix, Apple Computer, Inc.'s Macintosh and Digital Research, Inc.'s DR DOS.

Analysts tended to dismiss charges that Microsoft purposely deceives the industry. Developers are more apt to accuse Microsoft of heavy-handedness, if not unfair practices.

Microsoft has been "damn arrogant for a long time," said an attorney for a large developer, who said he believes the FTC investigation will become a "lightning rod" for complaints from all sides of the industry.

"The frustration in the industry over the OS/2 vs. Windows controversy is the primary instigator," said Will Fastie, publisher of "The Fastie Report."

Microsoft is "acutely" aware of these sentiments, but Rayburn and Stewart Alsop, publisher of the "P.C. Letter," said company officials neither understand why nor know what to do about it.

"We know some people, like [Lotus Development Corp. President] Jim Manzi, think we faked them into writing for OS/2, and that's not the fact," said William Neukom, vice president of law and corporate affairs at Microsoft. He said Microsoft has told developers to write to Windows for years, adding it placed its bets on Windows and OS/2.

If the FTC decides Microsoft is acting in an anticompetitive manner, it can order remedies ranging from a cease-and-desist order to restitution. It could even order the breakup of Microsoft. The U.S. Department of Justice only steps in when criminal actions, such as conspiracy or restraint of trade, are involved, an FTC spokesman said. Much depends on whether the FTC is focusing on the 1989 announcement as an artificial restraint on Windows or views it as a move to deceive competitors into writing for OS/2. Microsoft has since declared that its own short-term focus is squarely on Windows development.

"It appears the FTC is a little out of date. Microsoft is clearly not trying to restrain Windows," Alsop quipped.

Fastie said the real issue is whether Microsoft's applications group unfairly benefits from Microsoft's dominance in desktop operating systems and environments. None of the developers contacted believes Microsoft maintains a "Chinese wall" between the two groups, although opinion is split on whether that creates a problem.

Fastie, Rayburn and many analysts view Microsoft as a formidable competitor that, while not particularly innovative, keeps its ears open and acts quickly, often to the chagrin of outfoxed competitors. "It doesn't mean they are doing anything illegal; they just are scrappy," Fastie said.

Microsoft is not expected to change its aggressive approach unless it is forced to. Still, some angry developers hold out a glimmer of hope that Microsoft might take the hint and voluntarily take a lighter approach to handling its affairs.

Is it vapor or wares?

"When Microsoft enters the room and flips its hat, dozens scramble to catch it," Philippe Kahn, chairman of Borland International, Inc., said in a recent interview.

Microsoft's competitiveness has spurred charges that it announces nonexistent products with features that match or beat the competition. When it released OS/2, Microsoft said MS-DOS 4.0 would be the last formal release of DOS. When Digital Research, Inc., which produces an alternative DOS product called DR DOS, subsequently introduced DR DOS Version 5.0 last April, Microsoft immediately announced it would have its own Version 5.0, which is not yet available.

A similar situation occurred in January after Go Corp. announced a press conference to demonstrate its newly created pen-based operating system. A week before the Go conference, Microsoft officials hastily arranged a breakneck tour to demonstrate a prototype of their Pen Windows handwriting recognition technology — a product without final delivery date, price or feature set.

A perceived about-face on OS/2 enraged many software developers. Lotus Development Corp., for example, has invested upward of $50 million in OS/2, a source said. These developers are now struggling to catch up with Microsoft, which has had a head start in releasing Windows applications.

JAMES DALY

Ultrix comes to VAX 9000 with DEC's Version 4.2

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. brings its own flavor of Unix to the mainframe VAX 9000 this week with the announcement of Ultrix 4.2 and a companion version with special graphics enhancements for workstations and servers.

The next significant change in Ultrix comes later this year, company officials said, when the operating system switches its kernel to the Open Software Foundation's OSF/1 kernel and complies with AT&T's Unix System V Release 4.

Along with new support for the mainframe platform, DEC will be bundling an enhanced version of Ultrix SQL into Ultrix 4.2 in much the same way it included the runtime version of its RDB relational database manager in the VAX/VMS operating system. Also new in Ultrix 4.2 is support for Fiber Distributed Data Interface on the Decstation 5000 and support for the TA 91 high-end tape drive.

The new version of Ultrix SQL 2.0, based entirely on Ingres Corp. technology, now supports on-line backup of the database without bringing the machine down. DEC also improved the integrity of database transactions and doubled the support of large table definitions.

The companion version of Ultrix 4.2 is Ultrix Worksystem Software 4.2, which includes additional features designed for workstations and servers such as multiscreen support, allowing users to display up to three screens at once on the Decstation 5000.

It also offers support for X Window System 11 Release 4, the latest version of X Window shipping from MIT.

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TRENDS

DEC VAX 6000 and 8000 series

Current fair market values

Discounts on used VAX 6000s have caused prices on used 8000s to drop. Today, a used VAX 8700 sells for about half of last year's price

VAX 6000 series; fair market value as of February 1991

VAX model*	First available	List price	Used market value (in dollars)	Used market value (as a percent of original list price)
[illegible]				

VAX 8000 series; fair market value as of February 1991

VAX model	First available	List price	Used market value (in dollars)	Used market value (as a percent of original list price)
[illegible]	Jan. '86	[illegible]	$8,000	9%
[illegible]	Jan. '86	[illegible]	$8,000	9%
[illegible]	March '87	[illegible]	$20,000	19%
[illegible]	Aug. '86	[illegible]	$12,000	12%
[illegible]	Oct. '86	[illegible]	$19,000	18%
[illegible]	Dec. '88	[illegible]	$46,000	9%
[illegible]	Aug. '86	[illegible]	$10,000	8%

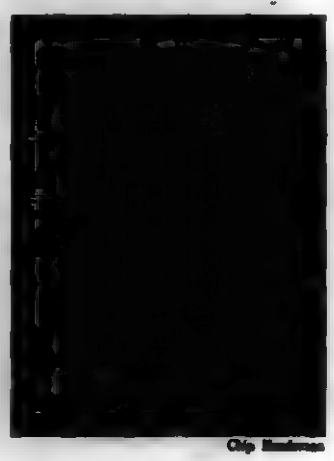
*Not enough information on the VAX 8600-220, 8600-520 or the 8600-430 to establish a current fair market value

Source: Technology Investment Strategies Corp., Framingham, Mass.

CW Chart: Tom Monahan

NEXT WEEK

Mackey J. McDonald, chief executive officer at Wrangler, has seen the blue jeans business change dramatically in a short span of five years. He says he devoutly believes that timely information is the key to conquering the new competitive forces. McDonald shares his thoughts on IS in *The CEO View*, a monthly series in Manager's Journal.



Chip Henderson

Desktop personal computers based on the Intel 80386SX chip have been hot sellers of late; they are regarded in some quarters as the new minimum corporate computing platform. Technology Analysis continues its coverage of these systems with a look at 20-MHz machines from both Dell Computer and Advanced Logic Research.

INSIDE LINES

Loose lips sink ships

In late January, when Microsoft revealed it was taking the shackles off Windows development, it was tough to sort through angry comments from software developers who felt they had been duped into developing for OS/2. Last week, in the wake of a disclosure that Microsoft is being probed by the feds, it was tough to get any industry exec to comment — at least on the record. Rather than bury all the juicy stuff, we've decided to print some comments here that we can't attribute, along with some wry observations about the supposed "Chinese wall" the company claims stands between its applications and systems software divisions.

- A developer close to Microsoft says the object linking and embedding scheme Microsoft is pushing for Windows applications was actually developed on the applications side. It was first homegrown for Powerpoint and further refined in Excel 3.0, which was released in May 1990. "Yet the libraries still have not been released [to developers] in any stable form," the developer says. "There's enough stuff there so that it smells funny. It could be like the Keating Five in that there is a perception of impropriety."
- "There is no separation of church and state. Gates is the king and the pope. He's like a bumblebee cross-pollinating different flowers at Microsoft. He personally does code reviews on system software and applications software." — *Anonymous*
- "It seems Microsoft has a win/lose attitude. They are determined to win at your expense. They want to win and make sure that you lost and then rub your face in it. Their attitude is: 'If we humiliate you in the process, then maybe you'll go away and not come back again.' " — A developer who has negotiated with Microsoft
- "The only thing more dangerous than betting against Microsoft is to bet *with* them." — *Anonymous*
- "Bill Gates didn't set out to be liked." — Stewart Alsop, industry analyst and publisher of "PC Letter"

He should know, right?

Some would argue that Microsoft should spin out its applications software sector into a separate business unit, thus defusing suspicions that the tight link between operating systems and applications divisions constitutes improper business practices. Not likely, Microsoft officials said. "We don't think it's required. We're running it legally and fairly and in good faith," said William Neukom, vice president of law and corporate affairs. "There would be nothing in it for us."

As The Mail-Order World Turns

Northgate Computer Systems rebutted last week's item here about funding problems. Gary Held, president of the mail-order PC firm, indicated he is fed up with bankruptcy rumors spread by competitors and said that Northgate not only has plenty of room left on its line of credit, but it also reduced bank debt "substantially" last year. Held said the company's earnings report, expected to be released in two weeks, will show that it returned to profitability in the first two months of this year. He also confirmed Northgate lost money in 1990.

Now hear this! Now hear this!

This promises to be a busy week for fault-tolerant computing, with announcements scheduled from both DEC and Stratus Computer. Industry sources say Stratus will introduce an eight-way processor to succeed its six-way system, plus a uniprocessor based on Intel's N10 RISC chip. DEC is expected to deliver on earlier promises to extend crash-proof computing more broadly across the VAX line, with the unveiling of two or three new VAX FT3000 models.

***A final word on Microsoft:** The company's defenders rebut any antitrust tendencies by pointing out that computer users are free to select from alternatives such as Unix or the Macintosh and its operating system. Well, sources briefed by Microsoft on the so-called Portable OS/2, otherwise known as Version 3 or more cynically referred to as OS/3, said future versions will work not only with RISC-based Unix workstations but also with the Macintosh. Is there such a thing as too much success? But hey, enough bickering. If you've got real news, get in touch with News Editor Pete Bartolik at (800) 343-6474.*

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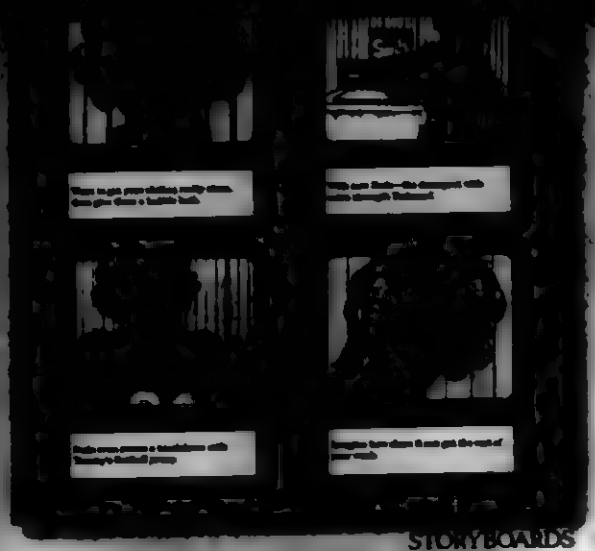
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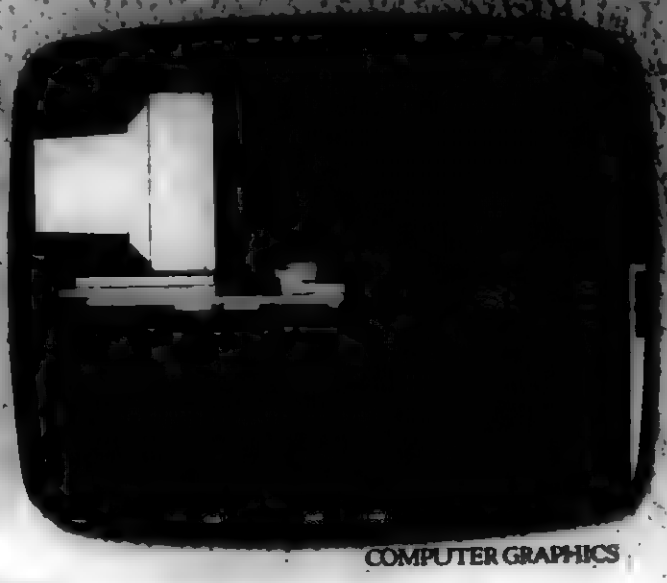
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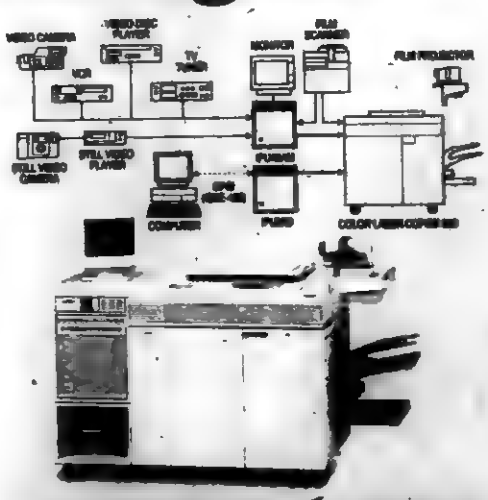


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COMPUTERWORLD

FTC probe won't tame Microsoft

Execs pledge to remain 'aggressive' in market

BY PATRICIA KEEFE
CW STAFF

REDMOND, Wash. — Competitors who envision a "kinder, gentler" Microsoft Corp. emerging from the aftermath of a government antitrust probe will be sorely disappointed, according to company President Michael Hallman.

Microsoft confirmed two weeks ago that the Federal Trade Commission is investigating a November 1989 press release in which Microsoft and IBM defined what Windows would and would not do [CW, March 18].

"We will not back away from our commitment to the industry and the business or from being a very aggressive company. We are not trying to win a popularity contest," Hallman said. Instead, according to Hallman, Microsoft

Continued on page 6

Outlook turns bleak as IBM profits slip

BY NELL MARGOLIS
CW STAFF

As IBM goes, so goes the computer industry, analysts agreed last week. They also concluded that the announcement of dismal profit prospects for 1991 by the largest computer company means bad news for other firms.

IBM's first-quarter profit is likely to be 50% below analysts' expectations on flat revenue, IBM said last week. Revenue is likely to remain flat throughout 1991, and profits, once estimated at a 5% gain for the year, will probably decline.

The falloff will hit "across all product lines and across all geographies," IBM spokesman Peter Thonis said. It reflects no product or corporate problems, he added, but results from customer reluctance to spend during economic hard times.

Many analysts took IBM at its word that problems stemmed from external economic factors such as the recession and the Persian Gulf war.

"IBM isn't telling us anything we didn't know or shouldn't have known last December," said Paine Webber, Inc. analyst Robert Therrien.

Peter Labe, an analyst at Labe, Simpson, Inc., agreed. "We're in the middle of a worldwide recession; IBM is in the middle of a difficult high-end transition," he said. "What did people expect?"

High expectations

With Wall Street projections so far off the mark, Therrien and others indicated, the investment community apparently expected that IBM would be able to marshal its technological, financial and corporate resources to make an end run around worldwide economic disorder.

Last week, IBM indicated it could not. That news contributed to a 60-point drop in the Dow Jones industrial average last Tuesday, as investors appeared

Continued on page 8

One reason: IS budgets feeling pinch

BY CLINTON WILDER
CW STAFF

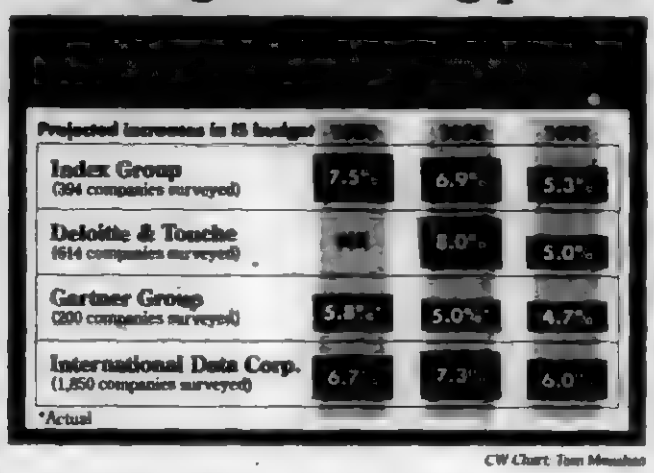
When the lease on Corning, Inc.'s IBM 3084 mainframe expired last year, one might have expected the $3 billion manufacturing firm to upgrade. Instead, it renewed the 3084's lease at a lower rate, in accordance with a three-year corporate policy to hold information systems spending flat, according to Harvey Shrednick, vice president of information services.

Corning is typical of scores of large U.S. corporations whose IS departments are consolidating, downsizing applications to smaller platforms and generally doing more with less.

Last week, IBM's lower revised earnings projections served notice that its bottom line and those of other vendors are feeling the squeeze of those tighter IS budgets.

"IBM has been banking on companies like us buying new mainframes, and we're not,"

Continued on page 8



CW Chart: Tom Monahan

Banyan set to ensnare OS/2 in Vines

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — A version of the Banyan Systems, Inc. Virtual Networking System network operating system that will support OS/2 clients is "imminent," according to the networking vendor.

Industry analysts predicted that Vines Version 4.1 — currently in beta testing — will be unveiled at next month's Association of Banyan Users International conference in Toronto.

OS/2 will soon join MS-DOS and Microsoft Corp.'s Windows clients in their ability to be centrally added or deleted anywhere across multiple interconnected Vines networks without requiring manual updates to servers.

Computers running OS/2 will also participate in Banyan's Streettalk global naming service, which allows a user anywhere on a Vines network to communicate directly with other computers without having to know their location and specify access routes to them.

The OS/2 support is critical to

Continued on page 96

Amdahl eyes AD/Cycle turf

BY ROSEMARY HAMILTON
CW STAFF

Amdahl Corp., the longtime IBM mainframe competitor, is about to go after another market dear to IBM's heart: applications development.

Industry analysts said they expect Amdahl to unveil a highly automated mainframe-based development platform that will include a database management system, a high-level language and a code generator. An Amdahl spokesman confirmed that a major software announcement will take place tomorrow but would not provide details.

The company said it will also announce tomorrow an extension of its current product line, which analysts and users said is likely to be the long-expected IBM 3390-compatible disk drive. Hitachi Data Systems Corp., the other IBM mainframe competitor, has had its 3390-like disk drive on the market for several months.

The Bank of Montreal confirmed that it had tested an Amdahl systems development facility code-named Huron two years ago but discontinued it

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COMPUTERWORLD BUYER'S SERVICE

Most productive

Users of Realia's PC-based Cobol compiler give it the highest score in ability to increase programmer productivity

See Buyers' Scorecard page 70

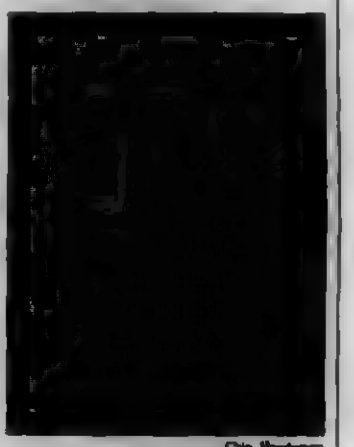
Product	Score*
Realia's Realia-Cobol	73
Microfocus' Microfocus-Cobol	71
Liant's RM-Cobol	60

*Scores are based on product ratings combined with importance assigned to each criterion

CW Chart: Doreen St. John

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INSIDE



Chip Henderson

The CEO View features Wrangler's Mackey J. McDonald, a strong believer in the power of information to transform manufacturing processes. Page 59.

Rock of Gibraltar? We'll find out next month if the coalition of DEC, Compaq, Mips and others will sink or swim. Page 4.

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4 Ignorance is (not) bliss: The Software Publishers Association embarks on a campaign to educate the public on the growing problem of software piracy.

6 Affiliated Computer Systems is taking IBM to task, charging that its business is an outsourcing infraction of the 1956 Consent Decree.

8 A Washington, D.C.-based coalition of university, industry and labor leaders is concerned that the U.S. is losing its technological edge over competing countries.

10 Microsoft and 3Com are cooking up a recipe that blends 3Server with LAN Manager to fulfill an earlier promise of support.

12 A new precedent may be set if incriminating electronic mail messages sent among three Los Angeles police officers accused of beating a motorist are used as evidence in court.

16 An ambiguous U.S. Treasury Department study pleases both Adapso and advocates of repealing Section 1706 of the Tax Reform Act of 1986.

95 Two operating systems are better than one was Stratus' apparent motto as it unveiled the industry's first RISC-based fault-tolerant computer.

Quotable

"We will not back away from our commitment to the industry and the business or from being a very aggressive company. We are not trying to win a popularity contest."

MICHAEL HALLMAN
MICROSOFT

On FTC antitrust probe of Microsoft Corp. activities. See story page 1.

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The 5th Wave



"I'M SORRY, BUT MR. HALLORAN IS BEING CHASED BY SIX MIDGETS WITH POISON BOOMERANGS THROUGH A MAZE IN THE DUNGEON OF A CASTLE. IF HE FINDS HIS WAY OUT AND GETS FIRST TO THE MINOTAUR HE'LL CALL YOU RIGHT BACK; OTHERWISE TRY AGAIN TUESDAY."

EXECUTIVE BRIEFING

■ **Clamps on corporate information systems spending** bode ill for IBM and other systems vendors, possibly for the entire year. Overall spending growth is predicted at just 5%, and at many major corporations, including Manufacturers Hanover Trust and Corning, IS spending is flat or below last year's levels. IBM warns analysts that earnings will be well below earlier projections, and other vendors are expected to follow suit. **Stories, page 1.**

■ **Amdahl will launch a software challenge to IBM.** The longtime mainframe rival is expected to unveil an alternative to IBM's AD/Cycle this week, including a database management system and a high-level language and code generator. AD/Cycle customers say they are open to hearing the pitch from Amdahl for the new software offering, code-named Huron. **Page 1.**

■ **Wrangler CEO Mackey J. McDonald** is a firm believer in using IS to enable change in the apparel industry. But McDonald says he feels the industry is still behind where it should be in IS implementation. **Page 59.**

■ **A defiant Microsoft says it won't back down** from aggressively competing and setting standards in the wake of the recently revealed FTC investigation. **Page 1.**

■ **IBM is accused of violating the Consent Decree** by one of its outsourcing competitors. Dallas-based ACS says IBM has re-entered the service bureau business in violation of the 1956 U.S. Department of Justice decree. **Page 6.**

■ **E-mail messages among Los Angeles police officers** can be used as evidence in a current brutality case, legal experts say. The officers sent messages from cruiser-based mobile data terminals on the night a motorist was allegedly beaten by police. **Page 12.**

■ **The debate over outsourcing of network management** rages on. While some users try to draw the line between outsourcing tactical pieces and keeping strategic ones, others push for an all-or-nothing approach. **Page 51.**

■ **Scientific computing is gaining wider acceptance** for commercial applications. Firms such as Monsanto, Dow Chemical and the regional Bell operating companies are looking to big number-crunchers to cut product development costs and tie into corporate networks. **Page 27.**

■ **Outsourcing at Southland** is a good news/bad news scenario. The retail operator realizes cost savings but has had to smooth over some rough spots regarding control, priorities and disaster recovery capability. **Page 61.**

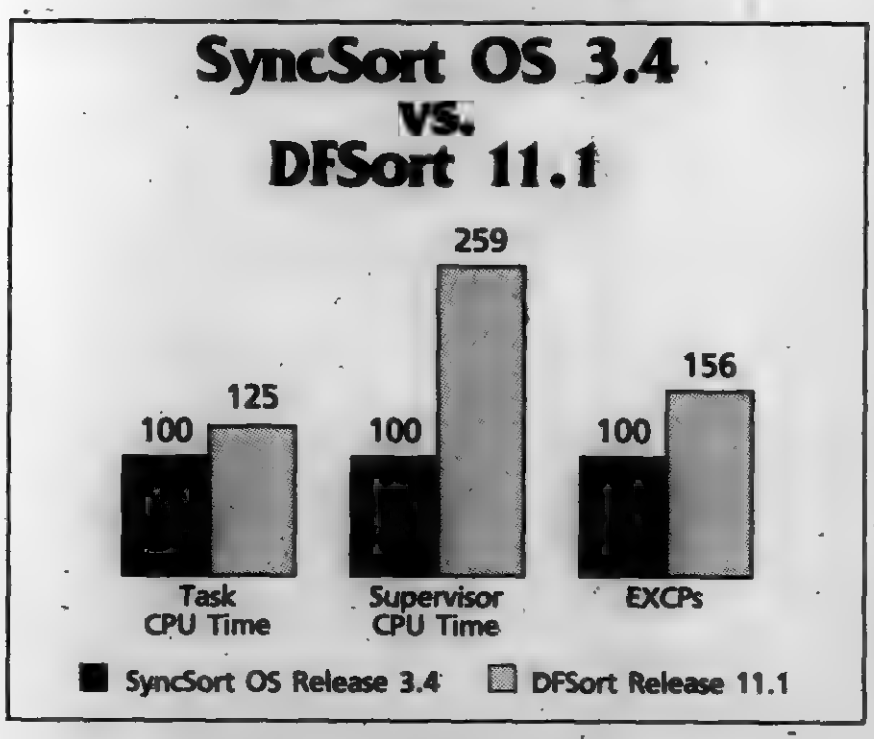
■ **Exposure to foreign cultures** can be a great advantage for IS professionals. Resumes that mention overseas work experience "are being pushed to the top of the pile," one headhunter says. **Page 81.**

■ **Software maintenance is finally getting the respect** it deserves. Attention is being given to code analysis, restructuring and reverse-engineering tools to help overwhelmed IS groups get control over systems and move them to new platforms. **Page 65.**

■ **User companies selling IS services commercially** rate the overall experience positively — but advise treading carefully. **Page 73.**

■ **On-site this week:** Macintosh, OS/2 or Windows? That's the burning question facing NBC TV Stations, which is trying to decide which PC standard offers the optimum mix of user-friendliness and networking capability. **Page 41.** Louisville Gas & Electric uses a mainframe-based hazardous waste tracking system to ensure compliance with federal EPA and OSHA requirements. **Page 31.**

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Allies to produce RISC low end

Gibraltar Group consortium may try hand at laptops, data centers next

BY MARYFRAN JOHNSON
CW STAFF

The fiercely competitive Unix desktop market will get another jolt early next month when a computer industry coalition known as Gibraltar Group reveals its plans to produce a low-end, inexpensive workstation based on reduced instruction set computing (RISC).

Guiding light

Sales of Sparc-based systems — dominated by Sun — have chewed up the lion's share of the RISC market



Source: International Data Corp.

The potential market for the machine is vast, encompassing the customer base of the new allies: Digital Equipment Corp., Compaq Computer Corp., Mips Computer Systems, Inc., Microsoft Corp. and The Santa Cruz Operation (SCO).

"We are not establishing any new standards, only specifications for a particular platform," said an official at one of the firms, who spoke on the condition he not be identified. "We will produce a RISC workstation first, but the potential is here to move upward to the data center and downward to laptops."

Industry standard specs

The "reference platform" produced by the alliance — which sources said will assume a name other than Gibraltar Group when it goes public in a few weeks — will be a set of hardware and software specifications complying with established or de facto industry standards.

The machine will house an Extended Industry Standard Architecture bus, DEC's Turbo Channel bus and eventually Future Bus Plus, an emerging industry standard.

Sources close to and within the firms in the alliance last week confirmed several elements of the upcoming announcement, including the following:

- Microsoft and SCO will provide the shrink-wrapped software so crucial to the success of the initiative.
- SCO will eventually package and distribute the Open Software Foundation's (OSF) OSF/1, but other operating systems will be offered as well, particularly Microsoft's OS/2 follow-on, New Technology or Portable OS/2.

Offering multiple operating systems to work with the new standard — rather than forcing everyone to adopt OSF/1, for example — is considered a key attraction for customers.

- Mips' RISC chip is the chosen microprocessor architecture, ensuring it a spot as the fourth RISC chip alternative to Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc), Motorola, Inc.'s 88000 and Intel Corp.'s I486 and expected I586.

Mips RISC chip could boost the prominence of its own Decstation line, said Peter Burris, an IDC analyst. "Compaq could help it do that, and Compaq desperately needs access to software expertise with some solid partners it can count on."

DEC said it will continue to fully support its own Unix workstation strategy based on the Mips chip and OSF/1 operating system.

> OFFERING MULTIPLE OPERATING systems to work with the new standard — rather than forcing everyone to adopt OSF/1 — is considered a key attraction.

Analysts said they see this machine, which is at least two years from availability, as a challenger to low-end workstations from Sun, Hewlett-Packard Co.'s Apollo division and eventually IBM as well.

"They're choosing the Mips chip for three reasons," said David Card, a Unix analyst at International Data Corp. (IDC) in Framingham, Mass. "DEC uses it already. It's not Sparc. And Microsoft is developing New Technology [Portable OS/2] on it."

David Ditzel, director of advanced development at Sun, said he tried to sell Sparc to Compaq and failed. He claimed it would take two years to develop a system based on the expected specifications.

From DEC's point of view, enhancing the market for the

While each company in the alliance has much to gain against workstation competitors Sun, HP and IBM, users will ultimately be the biggest winners of all, industry analysts agreed.

"More choices. More competitive technologies. I can't see how users could possibly lose," said Sandra Gant, an analyst at Gartner Group/Infocorp in Cupertino, Calif.

Yet there are substantial technical challenges ahead in any attempt to establish binary compatibility between applications written for Unix or OS/2, Card noted. "Binary compatibility is what you need for shrink-wrapped software if you're going to run the software in different implementations of the same chip architecture and operating system," Card said.

Senior Writer Richard Pastore and West Coast Senior Correspondent J. A. Savage contributed to this report.

SPA fights ignorance of software piracy laws

BY JAMES DALY
CW STAFF

SAN FRANCISCO — The Software Publishers Association (SPA) stepped up its efforts last week to end illegal copying of software with a renewed public awareness campaign designed to eradicate the rampant piracy it said costs the software industry up to $7 billion annually.

"Many people who copy software don't even know they are breaking the law," Executive Director Ken Wasch said at the Washington, D.C.-based group's four-day symposium.

The simplicity of software piracy, however, creates a daunting challenge to developers. Most personal computer users can copy a $500 program onto a $2 disk in just a few seconds. "We're the only industry that empowers every customer to become a manufacturing subsidiary," Wasch added.

SPA members said an early objective is to make users aware of the many forms of piracy, including unauthorized duplication, downloading copyrighted software from electronic bulletin boards, dealers loading free software onto hard disks to sweeten a sale and counterfeiting. "This is fundamentally a policy of education," Symantec Corp. President Gordon Eubanks said.

How big is the problem?

By comparing actual software sales with the number of purchases each PC sale is expected to generate, the SPA estimated that nearly half of the software running on PCs in the U.S. is pirated.

That figure leaped to 80% in Germany, while in South Korea, the group calculated that an incredible 98% of the software is illegal. "Software pirates are our No. 1 competitor," said Tom Lemberg, chief counsel at Lotus Development Corp.

The SPA also announced the new Copyright Protection Fund, which will be used primarily to explain the legalities of copying software and to finance legal action.

Several companies have already contributed $15,000 to $30,000 each to the fund.

Pirates' booty



Software vendors claim that unauthorized duplication is a multibillion dollar problem

PC software industry revenue, 1990	
Worldwide	$10.2 billion
U.S.	$4.6 billion

Additional revenue lost annually to software pirates	
Worldwide	$6 billion-$7 billion
U.S.	$2 billion

Source: Software Publishers Association
CW Chart: Doreen St. John

The cost of piracy is ultimately borne by the licensed user, who suffers when software companies have less funds to spend on further product development.

Wasch said the SPA receives about 10 calls daily on its toll-free piracy hot line and has filed more than 70 lawsuits against software pirates.

The group has also distributed more than 10,000 copies of its self-audit kit, which allows companies to ferret out illegal copies of software.

CORRECTIONS

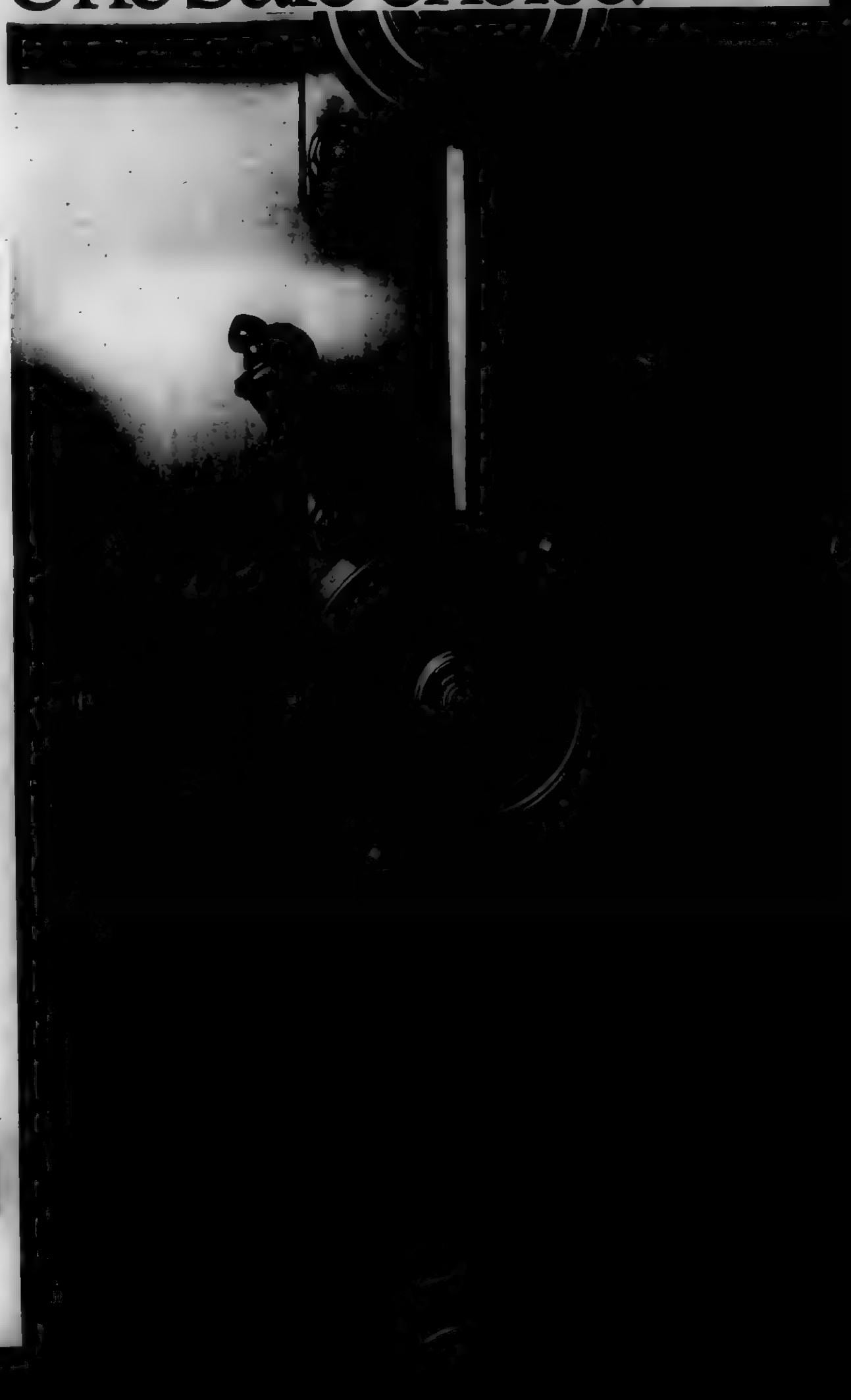
The Product Spotlight on project management software [CW, March 11] incorrectly attributed Project Software & Development, Inc.'s Project/2, a mainframe software package, to Primavera Systems, Inc. Primavera is a vendor of personal computer-based products.

Kevin Morrow, research analyst at The Ohio Co. in Columbus, Ohio, was referred to as simply "Morrow" in a March 11 story.

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NEWS SHORTS

Sage, Index finalize merger

The merger of Sage Software, Inc. and Index Technology Corp. became official last week as stockholders of both companies approved the action. The combined companies will have a user base of approximately 10,000 users, Sage said. Both sell software in the computer-aided software engineering market.

. . . . . .

Group studies phone access to data

The North American Telecommunications Association (NATA), based in Washington, D.C., formed a task force last week to speed the development of software interfaces between telephone systems and computer databases. For example, users want to automatically link incoming calls with customer records, but there is little generic software for such applications, NATA said. The first meeting of the NATA Computer-Telephone Interface Task Force, set for April 18 in Arlington, Va., will include representatives from IBM, Digital Equipment Corp., Hewlett-Packard Co., Bellcore and others.

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Derailment cuts long-distance cable

A train derailment in Pt. Conception, Calif., last Tuesday caused delays for AT&T and MCI Communications Corp. telephone customers as calls were rerouted. The train severed a fiber-optic cable, tying up circuits throughout the peak workday calling hours. MCI said 500,000 calls coming in and leaving Northern California, Oregon and Washington were delayed.

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Retirees sue IBM over benefits

A group of 200 retirees brought a class-action suit against IBM last week, charging that they, along with about 300 other former employees, were given benefits that were inferior to those subsequently offered a second group of employees. The plaintiffs took early retirement from IBM's Lexington, Ky., plant from 1989 to early 1990 and were given one year's salary as severance pay. When IBM sold the plant to Clayton-Dubilier in August 1990, it paid two years' salary plus $25,000.

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Sprint to expand European service

Belgium's telecommunications authority announced agreements last week to jointly provide a series of international services with U.S. Sprint Communications Co. The carriers will interconnect their respective virtual private network services and their CCITT X.400-compatible electronic mail services. Under a one-stop shopping arrangement, international customers can ask either carrier to set up dedicated lines in both countries.

. . . . . .

Senate to consider easing Bell limits

The Senate Commerce Committee voted 18 to 1 to allow the regional Bell telephone companies to manufacture telecommunications equipment, one of several activities barred by the decree that broke up the Bell System. The full Senate must vote on the measure, and the House of Representatives is likely to introduce similar legislation. The Senate panel, the White House and the Baby Bells argued that lifting the ban will lead to product innovation and help U.S. competitiveness. AT&T and consumer groups said it will invite unfair competitive practices leading to higher prices.

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Unisys weather contract in doubt

A Department of Commerce official testifying before a congressional subcommittee last week admitted that the U.S. is "seriously contemplating" terminating its contract with Unisys Defense Systems for Nexrad, a computer-enhanced weather radar system. Gray Castle, a deputy undersecretary of commerce, said Unisys may default on its requirements to provide working software for Nexrad, which Weather Service officials say is at least $59 million over budget and as much as two years behind schedule.

More shorts on page 96

Competitor: IBM bucks decree

BY CLINTON WILDER
CW STAFF

DALLAS — Darwin Deason's stated philosophy is: "Good things come to those who are patient, but normally it's the leftovers from those who hustle." Now, an impatient Deason is trying to hustle IBM back before the U.S. Department of Justice because of IBM's entry into the outsourcing business.

Deason, chairman of Affiliated Computer Systems, Inc., will meet with representatives of several other outsourcing vendors here today to discuss what he alleges are violations of the 1956 Consent Decree between IBM and the Department of Justice. Deason contends that IBM's selling of remote processing services violates the decree's prohibition of IBM participating in what was then called the service bureau business.

"It's now called outsourcing, but it's the same thing," Deason said. "We think it's crystal clear that they are in violation." He also accused IBM of pricing outsourcing services below cost in order to win big contracts.

Deason said he believes IBM is in violation on deals in which it processes a customer's data remotely, such as serving New Orleans-based Hibernia Corp. from IBM's data center in Denver. On-site facilities management, like that performed by IBM at Eastman Kodak Co., is not a violation in Deason's opinion, although he is planning to ask the Justice Department for "an expanded version" of the Consent Decree to cover facilities management.

What the decree says

The decree defines service bureau business as "the preparation with tabulating and/or electronic data processing machines of accounting, statistical and mathematical information and reports for others on a fee basis." The decree required IBM to transfer all of its service bureau contracts to an independent subsidiary, Service Bureau Corp., which it later sold to Control Data Corp.

IBM's denial

An IBM spokesman denied that IBM's outsourcing services violate the decree. "That is absolutely incorrect," spokesman John Clark said. "Our service offerings comply with the terms of the Consent Decree. IBM is not in the service bureau business." He declined to elaborate.

Of the six companies that had agreed last week to attend the meeting, four are based here: Power Computing, Inc., Kimberly-Clark Computer Services, Lomas Information Systems and Information Network Corp.

Others accepting the invitation were Systematics, Inc. in Little Rock, Ark., and Wayne, Pa.-based Sungard Data Systems, Inc.

FTC

FROM PAGE 1

concentrates on creating vision, innovation and standards, which he said is the proper definition of market leadership.

Still, both Hallman and Jeff Raikes, vice president of office systems, agreed that Microsoft needs to continue with, and perhaps enhance, what they said is a long-standing policy of maintaining a "broad dialogue" with people who have problems either with what the company does or how it does it. "Given the level of intensity [of criticisms], are we doing more than we would ordinarily do? Yes," Hallman said.



Hallman: *Microsoft will stand tough, play fair*

Both executives repeatedly emphasized Microsoft's willingness to "communicate our strategy to anyone who will listen" and, in return, to be open to any suggestions for improvement.

"We've made some mistakes," Raikes acknowledged, adding that the company needs to learn from them. He tracked down several developers at a recent industry gathering specifically to address their complaints.

Hallman and Raikes repeatedly labeled many of the accusations leveled against Microsoft by competitors as "absurd." They denied that Microsoft is overly competitive in its dealings, as some have alleged.

"What is so bizarre about this is that the whole concept of a free enterprise system is competition," Hallman said. "Because we believe there is a better way to deal with fonts, why is that 'punishing [Adobe]'? These arguments are anticompetitive," he said.

Both Hallman and Raikes shrank from the term "Chinese Wall," which has been used to describe the partition between Microsoft's systems and applications groups but said the company is very conscious of a perceived advantage. They insisted all developers are treated the same, whether they are internal or external to Microsoft, and added that all product information is kept confidential.

"This notion that Windows somehow was under a bushel basket and no one knew about it but our applications division does not square with the facts," said Hallman, noting that "literally hundreds" of independent developers had Windows applications ready to go during the May 1990 rollout of Windows 3.0.

That's absurd

Moreover, the "data does not support" the "absurd idea" that Microsoft's applications group unfairly benefits from the operating system group's near monopoly. "In a lot of applications areas, we are such a distant No. 2 that to conclude we have a monopoly is an abuse of the word," Hallman declared.

It is true that the systems group has taken advantage of a reverse flow of information, for example, object-linking technology. But Microsoft said it will entertain suggestions from any source. "I know for a fact the system group is working with several developers right now," Raikes said.

As for Microsoft's monopoly in the operating system side, Hallman said, "you could argue that MS-DOS is the reason the industry has grown to the size, value and import that it has. It's the reason the PC industry has exploded."

> "IN A LOT of applications areas, we are such a distant No. 2 that to conclude we have a monopoly is an abuse of the word."
>
> MICHAEL HALLMAN
> MICROSOFT

Both executives also responded to criticism that Pen Windows is nothing more than a vaporous preemptive strike against Go Corp., which unveiled pen-based computing software this year. "What should we do? Not enter the market? Choice is good for users," he said. The alternative, he added, is never to say anything until a product is ready to ship. "That makes for a terrible environment for corporate customers to plan in."

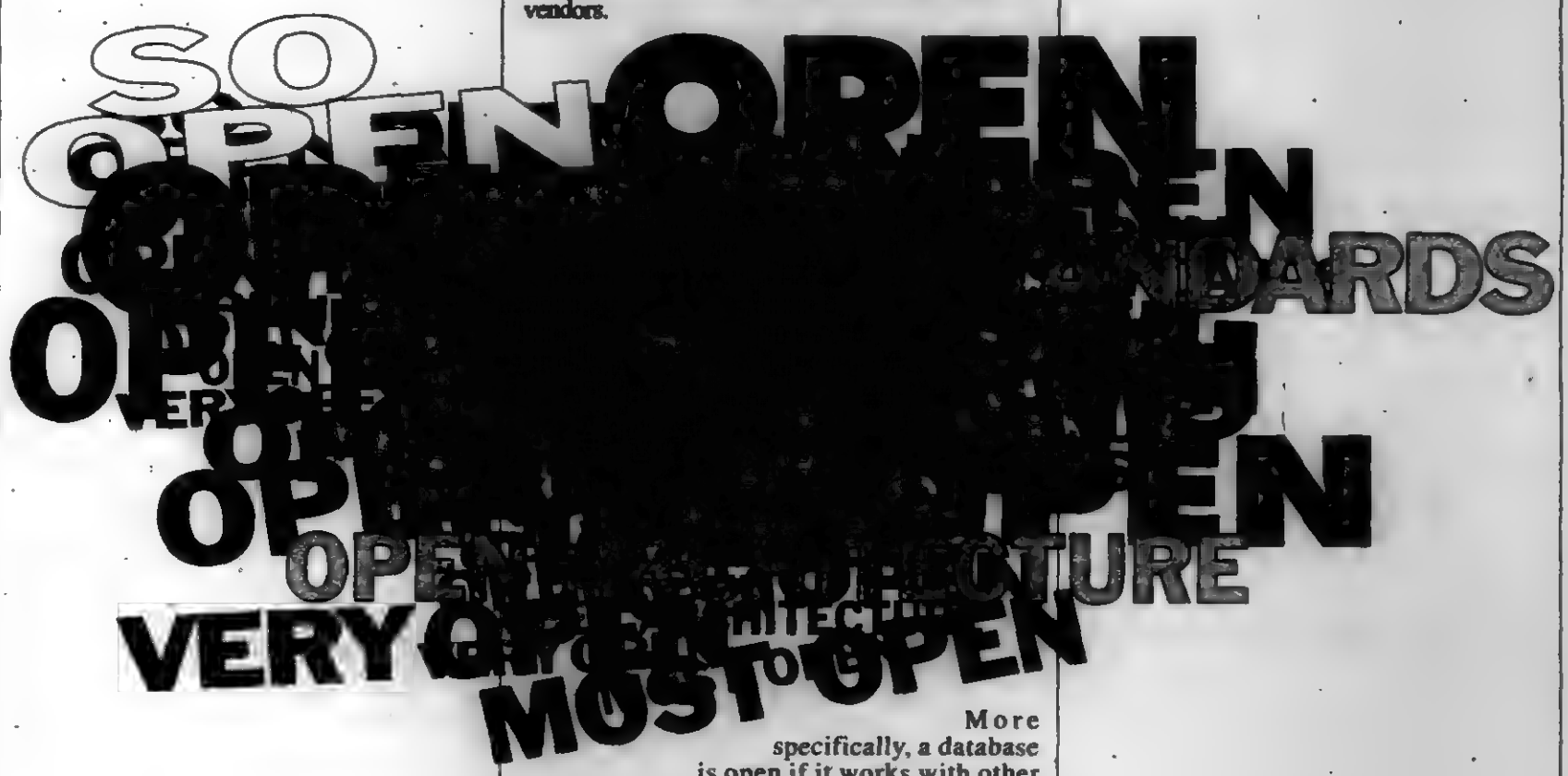
Raikes bristled at the charge that Pen Windows is nothing more than an idea on paper. He outlined a several-year history of Microsoft's interest not only in pen-based computing but multimedia and graphical interfaces.

Closing Arguments

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Today, some software companies claim that their software products are "open." They may even graft the word onto their product names. It is a confusing situation, but a clear definition of "open" is finally emerging.

Software is "open" only if it adheres to industry standards and works with products from other vendors.


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U.S. losing high-technology edge

Report says government, business must devote more money to research

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A broad-based coalition of industry, labor and university leaders said last week that the U.S. should alter its technological priorities to stem the loss of leadership in areas including electronics, information processing, materials and manufacturing.

The Council on Competitiveness capped a two-year study with a report saying the U.S.' position in many critical technologies is slipping and, in some cases, has been lost entirely. The report said the U.S. is leading or even with competing countries in 61 areas, including computers, software, communications and biotechnology. However, it also said the U.S. is losing or has lost the race in 33 technologies, such as memory chips, computer displays and several facets of manufacturing.

The council set forth 11 pages of recommendations, including the following:

- The president should direct government agencies to "increase dramatically" the percentage of federal research and development expenditures allocated to critical "generic" technologies — those basic areas that enable improvement on many commercial fronts.
- Congress should accelerate the depreciation of manufacturing equipment, make the R&D tax credit permanent and consider relaxing the antitrust laws that sometimes inhibit beneficial industry partnerships.
- Trade associations and consortia should share information about generic technologies as well as the cost and risk of developing the technologies.
- Companies should increase their funding for generic technologies, put more emphasis on manufacturing techniques and accelerate time to market though concurrent engineering and parallel product development.
- Universities should work more closely with industry to ensure that new technology finds rapid real-world applications.

The private, nonprofit group plowed little new ground in its recommendations. However, several members of the group said this latest call to action is the first broad-based agreement among government, industry, labor and university leaders. "It reflects a remarkable consensus; it's a singular accomplishment in that regard," said George Fisher, chairman of Motorola, Inc.

The report breaks with tradition in another way. "Given the reality of the federal deficit, this report does not request new [federal] money," said retired Navy Adm. B. R. Inman, who headed the study group. "It's a matter of [shifting] priorities."

Inman said the group did not necessarily favor canceling any "megaprojects" — such as the space station and the superconducting supercollider — but generally agreed that they could be stretched out to free up funds for more work in generic technologies such as intelligent manufacturing.

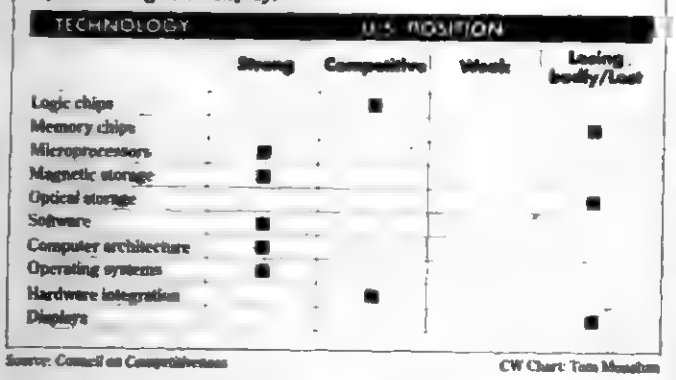
Conspicuously missing from the consensus so far is the White House, although Inman said President Bush had enthusiastically endorsed an earlier, and similar, council report in a 1988 campaign speech.

Others were less hopeful that the Bush administration, generally opposed to government sponsorship of civilian technology projects, would warm up to this latest call for help. At a hearing last week to discuss the report, Sen. Ernest F. Hollings (D-S.C.) said, "[The administration] says 'free trade, free trade.' That's the singsong I've had to listen to for 10 years while the country goes broke."

Sen. Albert Gore Jr. (D-Tenn.) was equally blunt. "There's a willful unwillingness to do this in the White House."

Weak links

Despite its strength in computer architectures and software, U.S. industry is judged to be trailing badly in the fields of memory chips, optical storage and displays



Source: Council on Competitiveness
CW Chart: Tom Monahan

Pinch

FROM PAGE 1

Shrednick said. "It's not worth the investment in the new technology. I don't think the economy and the Gulf war have as much to do with [IBM's results] as the press would indicate."

IS spending by U.S. companies is expected to grow only about 5% this year, according to several surveys by consulting and market research firms. But the news for large systems vendors is even worse because capital budgets — the source of funds for big-ticket mainframes and minicomputers — are being squeezed the hardest.

According to a survey of 200 IS sites by Gartner Group, Inc. in Stamford, Conn., IS capital budgets will increase by a paltry 3.5% this year, down sharply from 7.7% in 1990. "In the fourth quarter, we found that people really lowered their growth plans due to the recession," said Stacey Flynn, program director at Gartner Group.

The combination of increased hardware price/performance and reduced IS spending may have IBM and other vendors caught in a kind of double whammy. While current mainframe users are either delaying purchases or finding lower cost alternatives such as re-leasing used CPUs, there is little source of new demand for big iron.

"Among my colleagues, fewer and fewer people need the big MIPers," said Warren Harkness, director of corporate IS at Bose Corp. in Framingham, Mass., and a board member of the Society for Information Management. "If you have them, you keep them, but people just aren't buying that second, third or fourth mainframe."

Even some of IBM's most coveted customers, buyers of the Enterprise System/9000, are in cost-containment mode. New York-based Manufacturers Hanover Trust Co. has purchased two ES/9000 Model 720s — not to greatly increase its mainframe capacity but to anchor its plan of consolidating eight data centers into two.

Trimming the bill

The consolidations will save an estimated $30 million per year in IS costs, said H. Edward Nyce, executive vice president of management information technology services. Corporate technology spending is down 2% to 4% this year at the $60 billion bank.

"IBM has a tough sell in hitting the marketplace in a very, very trying economic time," Nyce said. "I think there has to be an impact" on IBM revenue because of IS departments moving to smaller platforms, he said.

Another industry area to feel the squeeze may be new, emerging technologies without a proven record for investment payback. Companies are scrutinizing IS projects for fast, tangible impact in a tough economy.

"We put our money in projects that have customer value or payoff," Nyce said. "Those that are just nice to have get a lower priority."

At Corning, where the IS budget has been flat for three years, "we call it the 'Vital Few' mentality," Shrednick said.

IBM profits

FROM PAGE 1

to take IBM's concession as an early warning sign that the computer industry in general is in for a bad stretch.

The barriers that stalled IBM are unlikely to be surmounted by many other firms, analysts said. "Ninety percent of the U.S. computer industry is going to show terrible first-quarter numbers," Labe predicted.

IBM's talk of softening "across all geographies" is the most troubling news, said Martyn Roetter, a director at Cambridge, Mass.-based Arthur D. Little, Inc. "If IBM is correct about its own [international sales] situation — and there is no reason to believe otherwise — this speaks volumes about what companies with lesser overall strengths will encounter," Roetter said.

With Europe apparently plunging toward a recession, the impact will be widespread among U.S. computer vendors, according to Richard A. Shaffer, head of New York-based market research firm Technologic Partners.

Shaffer pointed out that computer vendors of every stripe and size have spent the past two years heavily investing in the European markets. Now, he and others predicted, the European economy is going to fall out from under those vendors, and the U.S. economy has not regained enough strength to compensate.

The fall will be twice as hard, according to many analysts, if the dollar continues to strengthen against foreign currencies. That could not only hurt sales but also reduce the U.S. dollar value of sales that are made. This could mean further industry consolidation, more downsizing with its danger of reduced service and support, less product development and higher prices.

Slip-sliding away

Growth in user expenditures is expected to slow down in all areas of the U.S. computer industry this year except for a modest rebound in multiuser [illegible]

(Percent growth in user spending)

	Growth 1990	Growth 1991*
Midrange (minis and mainframes)	[illegible]	1.0%
PCs/ workstations/ LANs	9.5%	7.0%
Packaged [illegible]	12.0%	8.0%
Services	11.0%	10.0%
*Projected		

Source: International Data Corp.
CW Chart: Marie Haines

Some firms will fare better than others, analysts said. Nimble companies will outpace stodgy ones, and software and services will fall off less abruptly than hardware. "Software is more like meat and potatoes; it also tends to be cheaper and easier for an IS director to sneak through without corporate approval," Shaffer said. Leased and used computers could be in for a boost in popularity.

The firms best equipped to withstand worldwide economic woes, said Byron Walker, a credit analyst at Moody's Investment Services, Inc., will be those with strong balance sheets and sage [illegible].

IBM's comeback will begin at the same time the worldwide economy's does, the company indicated last week. And as IBM goes, analysts said, so goes the computer industry.

Enterprise storage unveiled

Epoch Systems, Inc. and Storage Technology Corp. unveiled plans last week to jointly develop "a new class of storage systems" aimed at solving the dilemma of enterprisewide management of mainframes and Unix-based networks.

Scheduled to appear sometime next year, the new products are intended to "bring 'glass house-quality' storage facilities to the network computer," said Greg Kenley, chief technology officer at Epoch Systems in Westboro, Mass. The products will automate and control the storage and management of data from desktop systems to supercomputers by combining Epoch's Renaissance storage management architecture with Storage Tek's 4400 Automated Cartridge System library and storage products, company spokesmen said.

Louisville, Colo.-based Storage Tek also made an equity investment of less than 10% in Epoch Systems.

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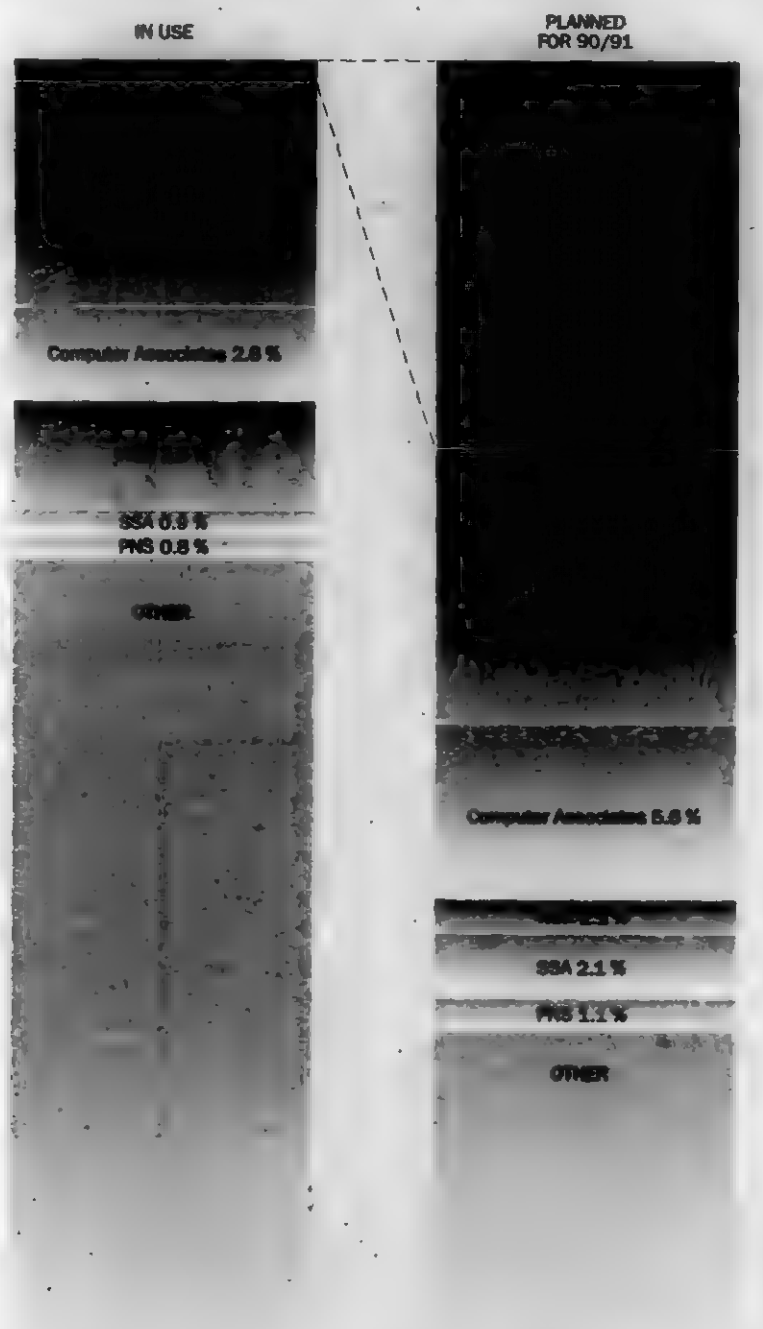
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Netware update has users cheering

BY JIM NASH
CW STAFF

PROVO, Utah — Novell, Inc.'s replacement of Netware 286 with Netware Version 2.2 last week drew applause from network managers who noted that Version 2.2 holds all of Novell's work group products and takes less time to install.

Novell combined its ELS Netware Levels I and II, Advanced Netware and System Fault Tolerant (SFT) Netware products to create a single Version 2.2. Netware 286 accounts for more than 80% of Novell's operating system unit sales, said Craig Burton, chief executive officer at Clarke Burton Corp., a research firm in Salt Lake City. Many of those user sites are small to medium-size firms.

Like Novell's high-end product, Netware Version 3.11, Version 2.2 pricing has been based on the number of users rather than its features, as was previous Novell software. Novell will market Version 2.2 for five users at $895, 10 users at $1,995 and 50 users at $3,495.

Many managers said they were surprised by Netware's contracted installation time. Brian Hughes, technical support manager at Idaho State University, said the beta-test version he brought on-line three weeks ago was installed in 90 minutes using 15 high-density disks.

Novell executives tell horror stories in which it took inexperienced administrators of Netware 286 networks more than one day to get a system running. Another beta-test user, C. E. Langenberg, data processing manager at Red Dot Corp. in Seattle, said Netware SFT required 49 low-density disks and as many as 106 disk swaps during the process.

Langenberg said Red Dot technicians could bring up the network in "a couple of hours," but people who had only occasional need to boot up a network could work an entire day at it.

Novell also cut installation time by making optional a hard disk error-checking routine that Langenberg said had consumed one hour of installation time in previous Netware 286 products.

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3Server gets LAN Manager

BY JIM NASH
CW STAFF

REDMOND, Wash. — Microsoft Corp. and 3Com Corp. will deliver an answer in May to the requests of owners of 3Com's 3Server who want to run Microsoft's LAN Manager network operating system.

Last week, a Microsoft spokeswoman said that Santa Clara, Calif.-based 3Com will ship 8mm and ¼-in. tapes containing OS/2 Version 1.21 for a price yet to be determined. The tape will hold, among other applications, LAN Manager Version 2.0 code, which will deliberately be missing one undisclosed LAN Manager file. Owners of 3Servers can then buy a copy of LAN Manager Version 2.0 to put LAN Manager in production.

Jay Misra, product manager for 3Com's 3+Open network operating system, said the tapes are slated to ship the first week of May.

Network administrators can load the tape in a 3Server and place the LAN Manager file disk missing from the tape onto an administrative workstation. By transferring the file to the server, the spokeswoman said, users get a fully licensed LAN Manager on a 3Server with all of Microsoft's support and warranty benefits. The process technically keeps the firms' promise that Microsoft would sell and support LAN Manager for 3Servers.

3Com decided last year to license its 3+Open network software, based on LAN Manager code, back to Microsoft. Since then, the spokeswoman said, many 3+Open users have asked for LAN Manager on their 3Servers.

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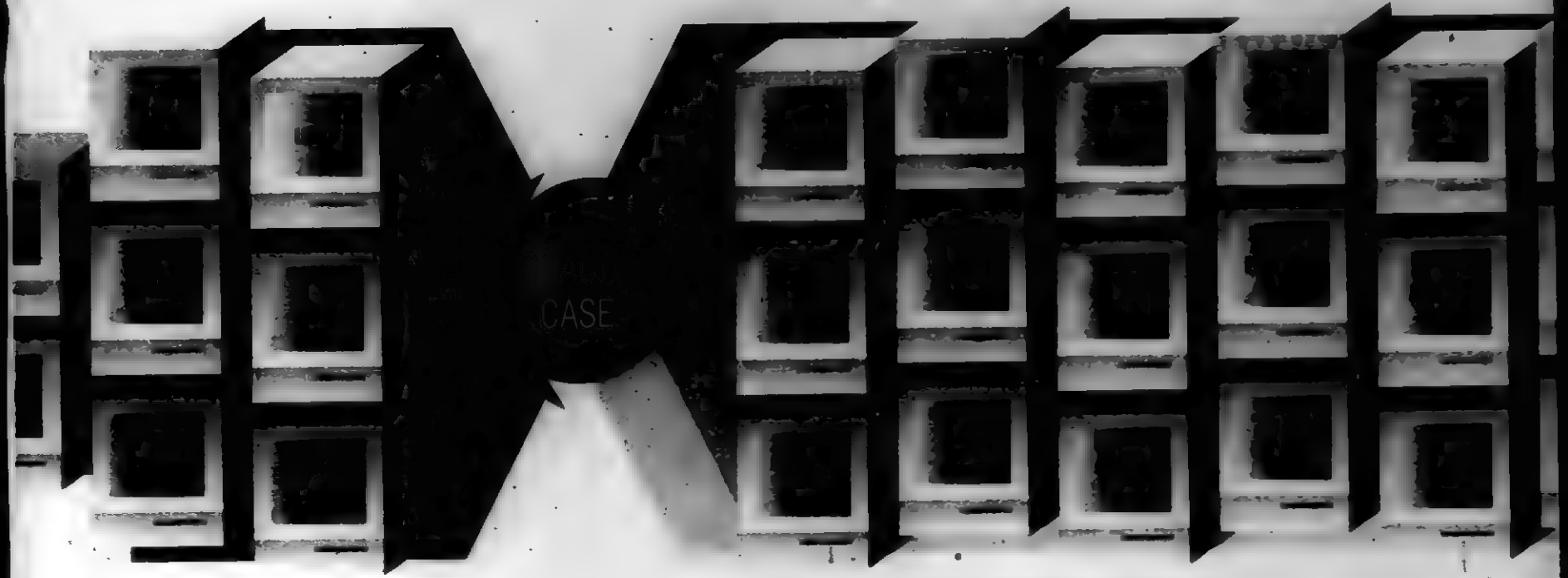
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AT&T's 5ESS switch to go wireless

BY ELLIS BOOKER
CW STAFF

HOUSTON — Riding the high-flying winds of wireless networking, AT&T Network Systems announced last week that its flagship 5ESS digital central office switch will have wireless capabilities by 1994.

The announcement, which came at Supercomm '91 here, was described by AT&T as a signal that it intends to significantly expand its global cellular systems business. The 5ESS switch is the most widely deployed digital switch in the world with more than 1,500 installations worldwide, according to AT&T.

The wireless feature will be compatible with both the Cellular Telephone Industry Association standards in the U.S. and Groupe Speciale Mobile in Europe, AT&T said.

The future 5ESS will be compatible with its existing cellular switch, the Autoplex System 1000, AT&T said. However, a company spokeswoman who said AT&T was adding the wireless capability to the 5ESS in response to customer demands confirmed the 5ESS now becomes AT&T's platform for wireless, wide-area networking.

AT&T Network Systems also brought one of the newer possibilities of videoconferencing to Supercomm. Along with Huntington Bancshares, Inc., it demonstrated how an automated teller machine (ATM) equipped with a video link can become a remote bank office. With AT&T smart card and Integrated Services Digital Network technology, an NCR Corp. ATM facilitated a real-time videoconference with a teller.

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–Robert V. Zimmerman,
Manager of Information Systems Technology,
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E-mail role in LA cop probe

BY JIM NASH
CW STAFF

Electronic messages transmitted between computers assigned to three Los Angeles police officers suspected in the beating of a black motorist could be used as evidence to show "intent to harm," according to legal experts.

A Los Angeles County grand jury investigating the alleged abuse of Rodney G. King on March 3 is including the transcripts as evidence. John C. Lautsch, an Orange, Calif., computer-law attorney, said the documents could "show intent to harm" on the part of the police officers sending the messages.

In the King case, potentially incriminating statements were transmitted between three squad-mounted Motorola, Inc. mobile digital terminals and a communications center console, a police spokesman said. He would not confirm or deny whether the messages are part of an internal investigation.

Observers are looking at the following verbatim exchange in particular.

First officer: "I haven't beaten anyone this bad in a long time."

Second officer: "Oh not again . . . Why for you do that? . . . I thought you agreed to chill out for a while . . . What did he do?"

First officer: "I think he was dusted . . . many broken bones later . . . after the pursuit . . ."

Legal experts said they know of no previous case in which electronic messages have been used as evidence in a criminal case. Most agreed that such communications are likely to be treated as recorded voice transmissions.

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Impact of Section 1706 still at issue

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Critics of Section 1706, a provision of tax law that affects thousands of contract programmers, said a just-released study by the U.S. Department of the Treasury gives them new ammunition for a campaign to repeal the language slipped into the Tax Reform Act of 1986.

However, the repeal effort, led by the National Association of Computer Consultant Businesses (NACCB), will run against the pro-1706 forces of Adapso, a computer software and services trade association. Adapso argued that the study bolsters the case for Section 1706.

Section 1706, which applies to programmers and analysts who get work through brokers, led to the reclassification of many of these workers as employees rather than independent contractors. Under Section 1706, the classification is determined by a test derived from common law instead of the more permissive rules used in other industries.

Much of the long-awaited report to Congress was inconclusive or ambiguous, which allowed both sides to find passages to their liking. Adapso, for example, agreed with the Treasury study that misclassification of employees as contractors is a significant problem and that Section 1706 has not disrupted the labor market or been too difficult to administer.

On the other side, Harvey Shulman, general counsel for the NACCB here, said the Treasury study "blows away" the original rationale for Section 1706, which was that brokers had an unfair advantage over other technical service firms because independent contractors tend to underpay their taxes.

The study showed that independent contractors pay the same amount of taxes as employees do and that Section 1706 is revenue-neutral, Shulman said. But Mitchell Gorsen, assistant general counsel for Adapso in Arlington, Va., countered that Section 1706 is only revenue-neutral under the "ridiculous assumption of 100% compliance."

The revenue effect of Section 1706 is important politically because a previous repeal effort was stalled by the question of whether removing Section 1706 would worsen the federal budget deficit.

The Treasury study did not make any firm recommendations about repeal or retention of Section 1706, but it did question the fairness of having different rules for technical service workers who use brokers and those who do not.

Patriot airs portable plan

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — Patriot Partners, the software venture by Metaphor Computer Systems, Inc. and IBM, last week detailed its plan for encapsulating software so end users and developers will be shielded not only from differences in operating systems but also from writing new code when creating new applications.

Called Constellation, the project groups object-oriented code into components. "It's not a brick, like object-oriented code, and it's not a building, like an application, but a wall," said David Liddle, president of Patriot.

Like building a house on different kinds of soils, a developer would hide the specific mud, sand or operating system by using components that are geared to that operating system. Then, the developer, or users, would assemble other components, such as the floor, ceiling and walls of a house on top, without regard for the type of foundation. In an application, this would be like putting graphics tools on top of the operating system components.

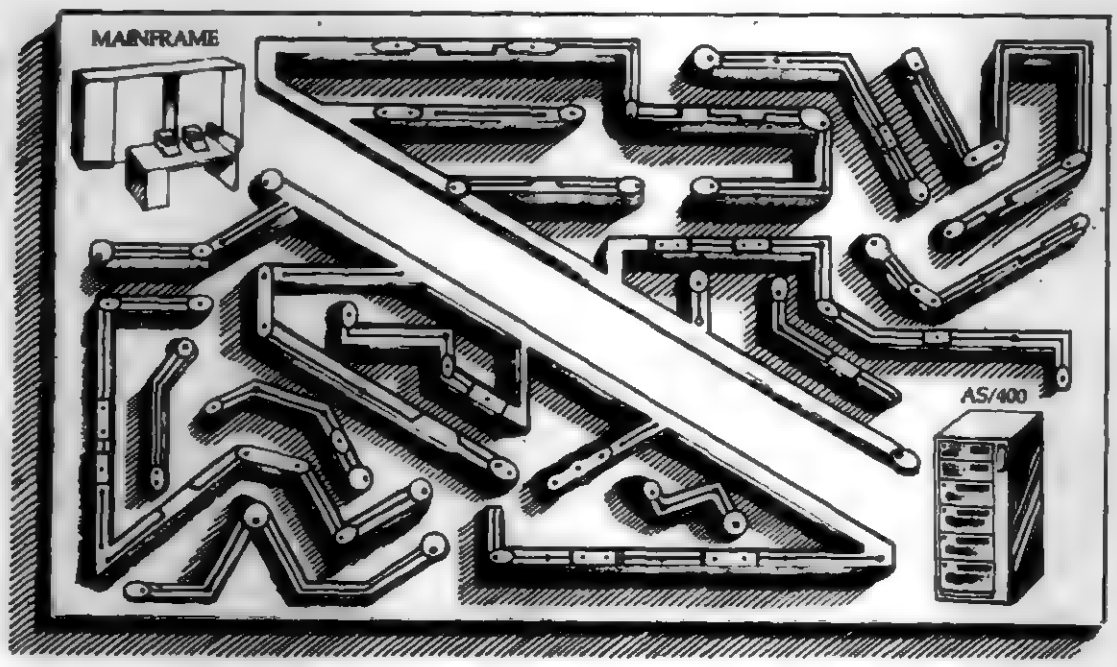
Developers or end users could use components such as building blocks and only write code for the application desired.

Liddle claimed component software is different from object-oriented software, but developers said Patriot may just be adding new buzzwords to the lexicon.

"A lot of what was described was putting a slightly new set of words onto object-oriented programming," said Doug Pollack, vice president of marketing for object-oriented software developer Parcplace Systems in Mountain View, Calif. Components, however, appear to be a collection of objects with something in common having a common protocol.

Patriot plans to deliver detailed specifications to developers this year and have developers' kits available by mid-1992, a spokeswoman said. There will be no licensing fees — only the cost of developer kits.

In the long run, Liddle plans on using the Constellation concept to sell more software. Providing an easier method of building new applications for smaller groups of users could help future growth as well as keeping development costs down, Liddle said.



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1991 digital review TARGET AWARDS WINNER

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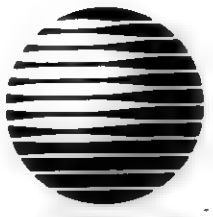
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TECH TALK

Wait not, want not

■ Call-waiting signals are the bane of computer modem users. The signals distort the data flow and, in most instances, cause the modem to disconnect from the telephone line. The father-and-son team of Gerald and Bruce Goldman recently received a patent for a device that makes it possible for modem users to continue transmitting in the presence of a call-waiting signal. The device was designed to detect a call-waiting signal and reroute the call to ring the phone without disrupting the data flow. If the receiver of the call decides to pick up the phone, the device sends a signal to an identical unit on the other end and stops transmission. When the call is completed, transmission continues.

Lighting edge

■ Edge emitter light source may one day replace laser printing devices, according to executives at Westinghouse Electric Corp. and Tokyo Electric Co. The two companies have formed a joint venture to manufacture and market an edge emitter technology that they said delivers better resolution and gray-scale printing capability and is three to five times more reliable than laser printing devices. Edge emitter devices, based on a process developed by Westinghouse, derive their light from the edge of a thin film of zinc sulfide, discovered to be 100 times brighter than light from the face of the film.

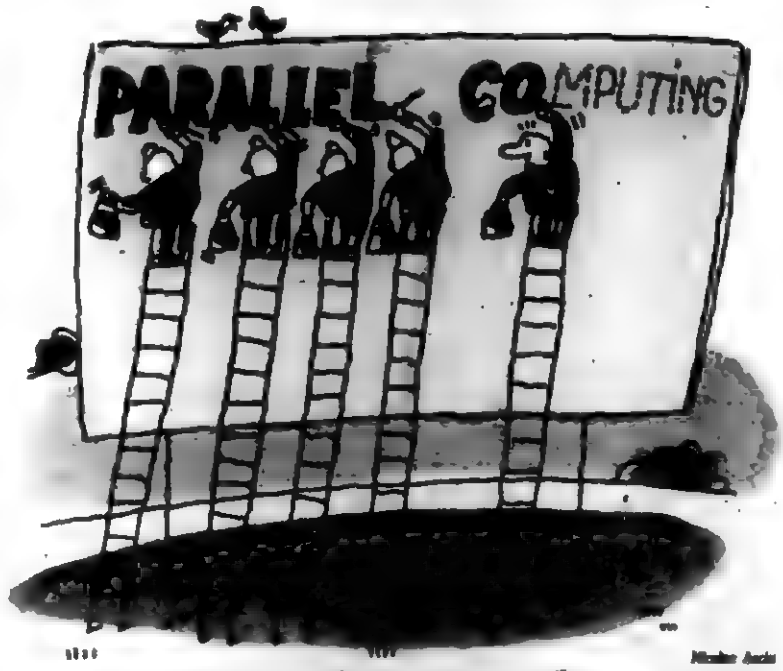
Sammi in space

■ Kinesix, a division of Scientific Software-Intercomp, will begin marketing this month what the company said is the first graphical user environment that enables users to develop and customize graphical displays without complex coding. The Unix-based graphical user environment, called Sammi, allows users to alter the look and feel of an application without the time-consuming burden of rewriting computer code. It has been selected for use in the Freedom space station.

Parallel computer wins FLOPS race

Multiprocessing supercomputer judged to be far faster than sequential machines

BY MICHAEL ALEXANDER
CW STAFF



Researchers at the University of Tennessee last week declared a parallel computer built by Thinking Machines Corp. to be the world's fastest computer. The machine ripped off a stunning 5.2 billion floating-point operations per second.

The independently sponsored test confirmed what proponents of parallelism have long avowed: Nothing beats a parallel computer when it comes to raw power. The nation's top computer scientists, researchers and some corporate computer users are increasingly inclined to agree.

Conventional supercomputers will be obsolete by the mid-1990s, according to W. Daniel Hillis, president of Thinking Machines in Cambridge, Mass.

Thinking Machines and a group of 15 universities are collaborating on a parallel machine that will be capable of executing one trillion floating point operations per second. The computer is slated to be completed by 1993.

Parallel computers are the wave of the future because computer designers are beginning to bump up against the physical limits of single processor computers, according to H. T. Kung, a leading parallel computer scientist at Carnegie Mellon University.

Many hands, light work

Supercomputers work on computing problems sequentially. By comparison, massively parallel computers divvy up a problem among many processors. It is like choosing between having a single secretary in a typing pool type a 100-page report or giving 10 secretaries 10 pages each and putting them all to work at the same time, said Elizabeth Schermerhorn, deputy director of the Northeast Parallel Architectures Center at Syracuse University.

Applications written for parallel machines run up to 100 times faster than those executed on serial computers.

The long-held belief that software designed to orchestrate the work of many separate processors would not be designed for several more years, if at all, is finally beginning to fall under advances in programming, Schermerhorn said.

Parallel computers have been in use at academic and scientific labs for several years, and only recently have they begun their march into the corporate world. "There are a lot more of the things out there than people realize," Schermerhorn noted.

Intel Corp.'s scientific computer division, Ncube, Maspar Computer Corp., Supercomputer Systems, Inc. and Teradata Corp. are already marketing parallel machines. Supercomputer makers Cray Research, Inc. and Convex Computer Corp. are working on parallel computers, too. Last week, Digital Equipment Corp. said it planned to enter the parallel computer market later this year, perhaps in a joint effort with Maspar.

Early users of the technology are using the machines largely for scientific and engineering tasks; increasingly, they are being put to work on solving business problems. Dow Jones & Co., for example, has used a parallel computer for text database retrieval.

E=MC² (plus or minus)

BY MICHAEL ALEXANDER
CW STAFF

A supercomputer at Cornell University that is used to simulate gravitational collapse has produced results that challenge Einstein's general theory of relativity.

Cornell scientists said their computer simulation of Einstein's theory indicated that if a gigantic cloud of particles that was shaped like an elongated football gravitationally collapsed on itself, the regions near the pointed ends would abruptly compact into thin needles of infinite density and gravitational force.

However, these needle-shaped, "naked singularities" do not actually exist in outer space, said Stuart Shapiro, who helped develop the simulation with colleague Saul Teukolsky. The two are professors of astronomy and physics at Cornell. "If the theory says they exist, something is wrong with the theory."

Einstein's theory, which describes how matter warps space and time to produce gravity, is fundamental to physics. The theory is used to explain phenomena ranging from the alleged Big Bang that triggered the birth of the universe to the bending of light by the gravitational field of stars.

Cosmic hypothesis

Before the Cornell findings, physicists had hypothesized that the only singularities that could exist would be found in black holes in outer space. Black holes are regions in space where gravitational force is so strong that no matter or energy, not even light, can escape.

Because nothing inside a black hole can "communicate" with the rest of the universe, singularities inside black holes would be unable to disturb the behavior of the external universe. This hypothesis of "cosmic censorship" was first advanced by Roger Penrose, a physicist at Oxford University, in 1969.

The Cornell scientists have concentrated on highly asymmetric formations shaped like needles and pancakes to probe cosmic censorship. Those are the most difficult configurations to treat mathematically and require a supercomputer to investigate, the researchers said.

Shapiro and Teukolsky took three years to develop and test their supercomputer model, which runs on an IBM 3090 600J supercomputer at the Cornell National Supercomputer Facility. A typical run of the model takes up to 24 hours on one processor of the six-processor computer.

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DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
EASE OF USE			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications *without programming*	Yes	Yes	No
Modern pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
PRODUCTIVITY			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
POWER & FLEXIBILITY			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	6	3
INDUSTRY STANDARD			
#1 Selling, #1 Rated *multiuser database; over 3 million users (1)(2)*	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 55% of PC database systems sold (3 times nearest competitor) according to the most recent report by the market research firm Ambis & Surveys (Oct. 1990) (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX, and SunOS. Macintosh and other UNIX Platforms are announced.

Based on what our customers tell us, we made a list of some of the most important features to look for in data management software.

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As you can see, dBASE IV offers exclusive advantages in many categories.

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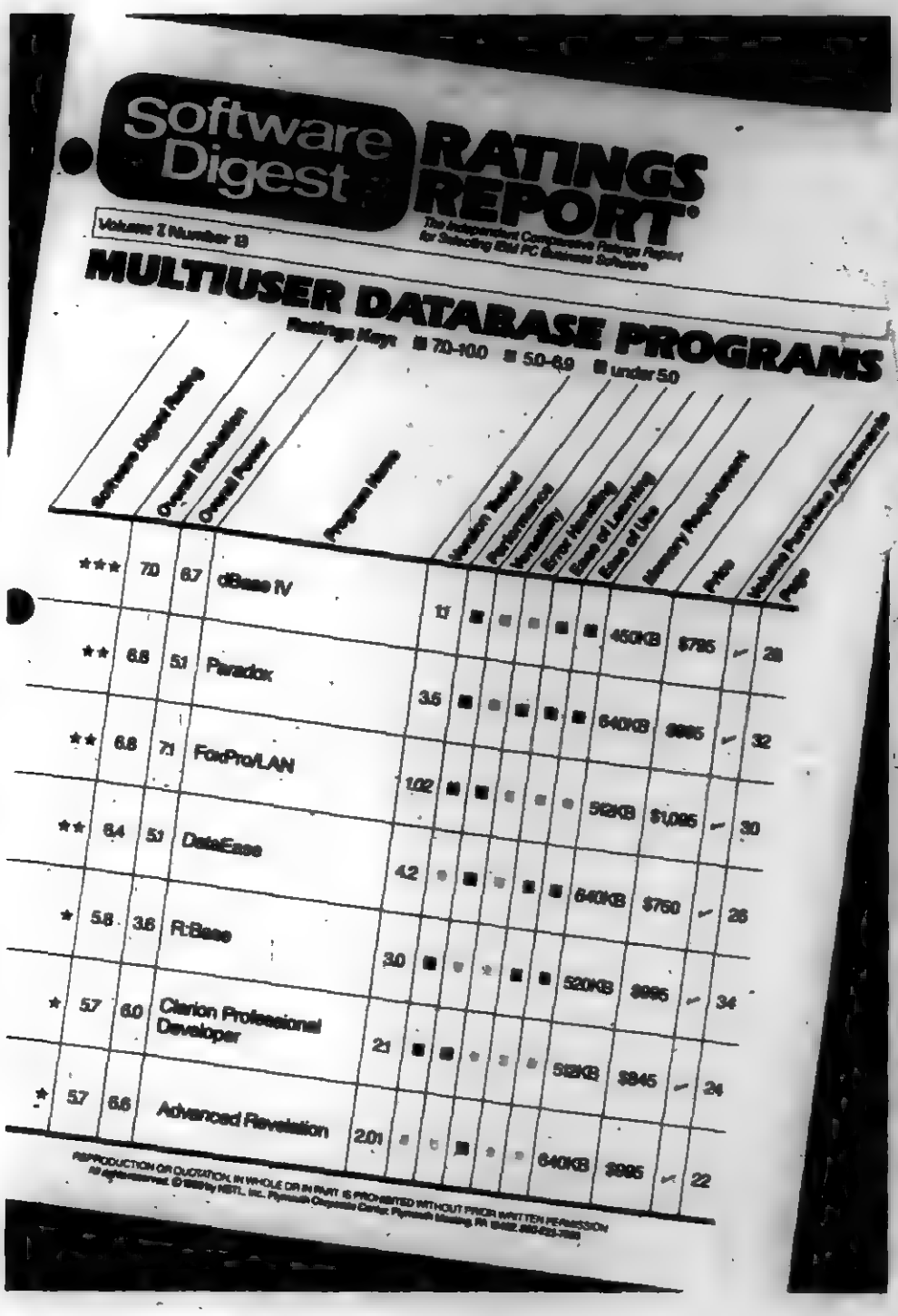
When all the facts are on the table, it's easy to see which database software is best.

Of course we aren't the only ones who have come to this particular conclusion.

Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

Trademark/owner: dBASE IV, Ashton-Tate, Ashton-Tate logo/Ashton-Tate Corp. Other company or product names mentioned may be

dTruth Comes Out.



Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

"Among the top ranking programs, dBASE IV (version 1.1) is the most well-rounded, with solid performance, versatility and usability." Commenting on speed, *Software Digest* points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use and Ease of Learning, dBASE IV scored in the Excellent Range as many times as any other multiuser database product tested.

For a free evaluation kit, including competitive details and a free demo disk, call toll-free: 1-800-437-4329 ext. 1416. Better yet, call 1-800-2ASHTON to upgrade to the new dBASE IV now.



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EDITORIAL

Margin notes

IBM THREW A large bucket of water on the stock market last week, reminding everyone that despite all the postwar rejoicing, there's still a recession going on.

Conventional wisdom has it that IBM's financial slowdown is more indicative of the market in general than of its own internal problems. But it's a good time to look at just how dramatically the dynamics of the hardware market are changing.

Ironically, IBM's cautionary earnings note coincides with recent glowing reports about the performance of its RISC System/6000 line of workstations and servers. In fact, the RS/6000 is proving a formidable competitor to IBM's pricey and proprietary Application System/400 midrange line and even the low end of the mainframe family.

Analysts have also noted that despite erratic earnings, IBM's profit margins have declined steadily during the past six years. IBM has traditionally enjoyed profit margins that were the envy of every industry. That's because mainframe hardware could be counted on to generate up to 80% margins and until very recently, mainframes made up the vast majority of IBM's sales.

But the market is changing. The fact is that small, modular systems such as workstations and servers don't generate the profit of proprietary mainframes. As price/performance ratios spiral downward, the trend toward smaller systems is beginning to show up in the bottom line of the industry's biggest player.

This trend is being driven across the board by users and IS departments in America's largest corporations. Users are exerting greater influence than ever on the buying process with their expectations colored by glitzy demonstrations of supercheap MIPS. IS departments, aware that the issues of developing complex systems are a lot more involved than raw processing power, are taking these economies into account when making the final buying decisions. Their rule of thumb is to look at small platforms for development first and turn to the mainframe only as a last alternative. While "client/server" is still a hollow buzzword, you can count on applications emerging during the next two years that will give the concept some substance.

As we've said before in this space, the mainframe market continues to show surprising resilience and even modest growth. Proprietary architectures will be around for a long time, if only to support the enormous base of mission-critical software already installed on them. But the clear trend in hardware is toward a commodity market with the value added in applications software and networking. The changing buyer mind-set will drive prices lower and make margins narrower. That's the good news for users. The bad news is that the development tools to exploit this emerging class of cooperative computing aren't nearly as well developed as their host-based counterparts. The momentum is on the side of open systems, though, and it is only a matter of time before the new economics of computer hardware takes hold.



LETTERS TO THE EDITOR

Making the grade

I was amused by the report on Windows 3.0 in the March 4 issue, especially the section entitled "Users give key features high marks." Perhaps I'm old-fashioned, but I don't think that grades from C+ to B+ indicate particularly high standards for a product being touted as the primary graphical user interface for all non-PS/2 personal computers. In fact, I think it is just another example of the continuing tragedy of Microsoft, a company badly flawed by arrogance, carelessness and greed.

The incredible proliferation of software and freeware that is needed to make DOS bearable to work with in a professional environment is indicative of the poor job Microsoft did in designing version after version of DOS. Windows itself is designed to cover up the inept user interface that Microsoft DOS provides for the IBM-compatible PC.

I should be grateful to Apple: Only the continued success of the Macintosh forced Microsoft to provide anything resembling a multitasking, usable environment.

David Scott Goen
Systems Engineer
St. Louis, Mo.

Cause of failure

Regarding "Project Management tries anew," [CW, Feb. 18] the article ignores what I believe is the root cause for the failure of these systems: a lack of knowledge of the underlying processes of project management — a condition that better software will not mitigate.

Project management software is not, as stated, a "software product looking for an application." It is a software product looking for a defined process, skilled practitioners and finally, management that uses the information resulting from proper application of the processes. The key element in the justification of the acquisition of systems is the return on the investment of the application. I would submit that the majority of companies employing these systems cannot currently justify the investment.

I believe that there is a huge opportunity for the application of the analytical processes of project management in terms of potential productivity gains and cost savings, but in order for industry to take advantage, it must realize that the "magic" is not in the software. The application is merely a means that aids in the achievement of an end.

Wayne MacGregor
Vice President
Planning & Scheduling Systems
Project Management Technologies, Inc.
Littleton, Colo.

On the Rim

Your article, "Far East isn't recession cure-all" [CW, March 4], suggests that Pansophic Systems', Applications Software Division, has not pursued a Pacific Rim Strategy.

Pansophic Systems has long been established in the Pacific Rim. The applications software products have been in Australia since 1985, with offices in both Sydney and Melbourne since 1986. We have had strategic partnerships for sales and support in Singapore and Malaysia since 1985. In 1989, we established a strategic alliance in Hong Kong. We expect to be announcing additional partners in the Asian/Pacific area within the calendar year.

Pursuit of a global strategy certainly requires time and commitment from any organization. At Pansophic, we are completely committed to a worldwide strategy. We can assure your readers that the globalization of our business has been both challenging and rewarding.

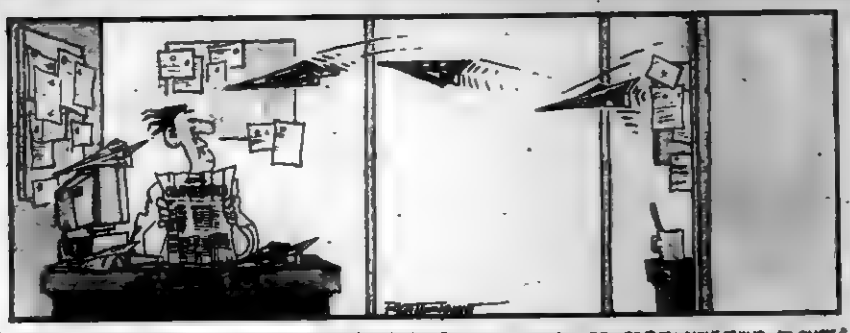
John R. Wark
Vice President, Marketing
Applications Software Division
Pansophic Systems, Inc.
Lisle, Ill.

No confusion here

Regarding "No limelight for OS/2 at show" and "User gripes on OS/2 to spur IBM marketing blitz," [CW, March 11] your continued coverage of the OS/2 and Windows confusion makes the UI/OSF Unix struggle seem quite tame, reasoned and understandable. The confusion in the Microsoft/Intel world makes Unix an exceedingly viable and attractive solution for the desktop.

John Neubert
Director, Academic Computing
Drew University
Madison, N.J.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*



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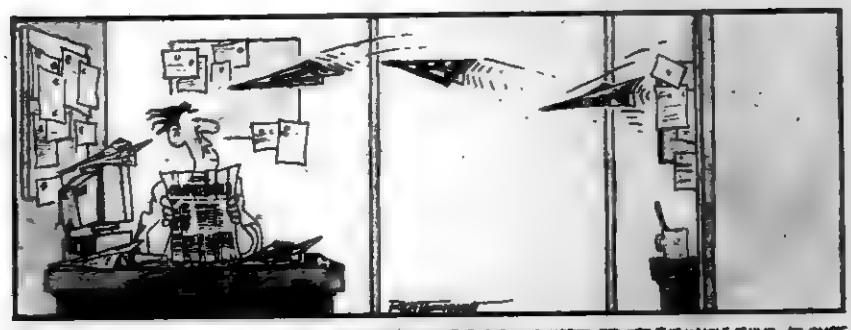
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- 31. Mgrs., Supvr. of Programming, Software Dev.
- 32. Programmers, Software Developers
- 99. Sys. Integrators/VARs/Consulting Mgt.

OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 51. Sales & Mktg. Management

OTHER PROFESSIONALS
- 70. Medical, Legal, Accounting Mgt.
- 99. Educator, Journalists, Librarians, Students
- 99. Others _____

(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
- A. Mainframes/Supercmps
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Local Area Networks
- F. No Computer Involvement

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Forget Milken, blame it on Kapor

How spreadsheets contributed to harebrained speculations

JOSEPH W. BARTLETT



As a practitioner specializing in finance and middle-market leveraged buyouts, I have been as astonished as the next man at the hyperbolic growth of extremely risky financings during the 1980s, a due bill now being honored in the insolvency courts.

This is good news for me in a professional sense. The recent cascade of troubled companies has been sufficiently deep and wide to revive my career, and those of others like me, as workout lawyers. It's deja vu all over again (as Yogi Berra would say) as we return to our stints in the early '70s representing debtors, creditors and trustees in bankruptcy court.

Still, one has to wonder, what brought us to this point? What got into Wall Street? What caused the players to run amok, providing financing for so many harebrained schemes? How did the financial buccaneers find their running room, adding debt upon debt until even valid business enterprises began to topple under the weight? Where was the "prudent man" during this feeding frenzy? Where were the bankers and investment bankers capable of saying "No"?

The shorthand explanation, popular in the press and literary circles, is that greed-crazed yuppies, infatuated with their BMWs and Park Avenue co-ops, went, in effect, bananas, dragging all around them into an abyss of superheated credit, lunatic investment decisions and general financial excess.

My problem with that explanation is that people have always been greedy. That's what capitalism has been built upon ever since Adam Smith explained the phenomenon. Why did we go crazy in the '80s and not the '70s or the '60s or some other decade?

"Big picture" types, mostly from the political left, answer that question by citing Ronald Reagan and the Social Darwinism his administration both preached and practiced. Reaganomics is a handy scapegoat now that Reagan is out of office and can be kicked around without fear of a vigorous response.

Again, I wonder. The fiscal and monetary policies of the Reagan administration may have appeared revolutionary, but that was mostly the effect of conservative rhetoric. The Reagan programs were, by and large, consistent with the policies of earlier administrations. Reagan's defense spending increases, for example, were in line with what Jimmy Carter had been up to. And while Reagan did cut federal income taxes and, as with all tax cuts, the rich tended to be favored, those tax benefits were largely soaked up by increased state and local taxes.

One is therefore compelled to look for unique events which might explain the phenomenon — free variables in the calculus which appeared for the first time during the 1980s or at least had their first real impact during that decade. Once one isolates an element not extant in any of the comparable periods, then there is a plausible candidate for some sort of cause-and-effect theory.



Someone recently wrote that the bizarre decline in the test scores of American primary and secondary students, particularly whites, is probably to be laid at the feet of the one ubiquitous new factor accompanying, more or less linearly, that decline — the advent of television and the consequent renunciation of preteenage and teenage reading.

Using the same mode of reasoning, I would identify the one unique element in the landscape of the 1980s as the promiscuous use of computer spreadsheets.

While this might seem trivial to many, for those of us who have been in the corporate finance business over an extended period of time, it is clear that the spreadsheet has revolutionized financing techniques.

It has done this primarily by enabling all hands interested in securing investment capital to enhance their presentations with a dazzling array of seemingly compelling numbers (all in the nature of forecasts, to be sure), which show "conclusively" why a given loan or investment will make the capital provider rich.

In a sense, we have Bill Gates and Mitch Kapor to thank for the astonishing rise (building to a crescendo in the RJR/Nabisco transaction) of imprudent investment decisions. In the '80s, if somebody wanted to collect a ton of money in order to lay their hands on assets, the investment bankers prepared a "book" in which they laid out a discussion of the business on the micro level and the market for the firm's products on a macro level (with much of the information culled from standard reference guides) and then wound up with the high fastball — a shower of numbers projecting future results.

We have always had projections, of course, and projections have always been optimistic. But what Gates, Kapor and other giants of the software industry enabled the young shamans of the 1980s to accomplish was an irresistibly dazzling array of numbers. The effect was mesmerizing — to see was to believe and to act. As *Time* magazine would have put it in the argot practiced there under the late Henry Luce, backward ruled (he ruled).

Bartlett is a New York-based partner in the national law firm of Gaston & Snow.

We can't keep ducking the touchy-feely stuff

LARRY M. SINGER



Let's be honest. For the average information systems manager, delving into the intricacies of personnel management is a somewhat distasteful task that ranks in priority just below "Should I have tacos for lunch?" and just above "I'd worry more about AD/Cycle if I could ever understand the damn thing."

Managers are so concerned about projects, deadlines and budgets that they seldom have the time, inclination or background to ponder the complex and often vague issues that surround the equally complicated human side of IS. Yet managing human trends is becoming a matter of survival.

It is already clear that, as we move into the 1990s, things are changing radically and IS professionals no longer fit nicely into traditional corporate molds. Organizations that do not face up to these changes will face even worse problems with projects, deadlines and budgets. They will also face even more crises, triggered by staffing deficiencies and plummeting morale.

Some of the critical personnel issues facing IS at this juncture are the following:

- Part-time employees and leaves of absence.
- Older employees.
- Obsolete job titles.

The old-fashioned and simplistic picture of an entire department of full-time employees working nine to five is no longer accurate.

An IS manager who automatically rejects any employee who is not able or willing to work the traditional hours may lose critical options. Part-time employees can be highly productive if they are self-motivated and properly managed.

Leaves of absence are becoming a complicated subject for many companies. The growing number of two-income and single-parent households make it increasingly likely that employees will occasionally have personal or family situations that force a difficult choice: Obtain a leave of absence or quit.

It is more difficult to manage a staff when one or more key players is out for several months, but granting such leaves will show the rest of the staff that the company does attempt to help its employees. Loyalty in one direction is often rewarded with loyalty in the other.

Contrary to common expectation, allowing leaves does not trigger a flood of requests. Employees may talk about leaves, but relatively few will actually request one. In the real world, a leave of absence is traumatic. Besides the obvious loss of income, the person inevitably feels some degree of separation anxiety and guilt about leaving his or her work for others.

Older employees present a different challenge. Data processing may be a relatively new profession, but some of the early participants are now in their mature years. In the early days, managers were typically those with the most experience or knowledge and staff were those employees with the least. This is no longer necessarily the case.

IS managers may now find themselves with employees who have more experience, more knowledge and more user contacts than they have. It is clearly more difficult to properly manage an older employee than the programmer/analyst with two years experience who is thankful for every morsel of wisdom from a more experienced manager. Difficult, but not impossible.

IS managers must adapt their management tactics to accommodate the new demographic reality: encouraging older employees to share their knowledge with greener staff members; adjusting the amount of direct supervision to individual requirements; and learning to ask for advice and suggestions.

It is also time to rethink job titles. Too many IS departments use the same boring job titles. Our classic job descriptions seem etched in stone, and managers react with surprise when anyone suggests a change. After all, didn't Charles Babbage himself coin the terms programmer and systems analyst? If they were good enough for the 19th century, shouldn't they be good enough for the 1990s?

No, they aren't. Despite the condescending attitude of many managers, titles *are* important, especially to those who strongly feel their job titles do not match their duties. Specialization is the natural outgrowth of an increasingly complex world embracing multiple application platforms and new approaches such as computer-aided software engineering, but the customary titles and job descriptions seldom match reality. Traditional job titles applied to nonconventional duties cause resentment and undermine morale. Titles do count — often more than salary.

Not all of these ideas will be welcomed by the personnel department or other parts of the corporate bureaucracy. Companies often allow inertia to interfere with sound people management. But the stakes are too high to ignore the battle. Those IS directors who develop and champion an active approach to people issues will give their organizations a competitive advantage.

Singer is the author of two books on data processing and Communications for MIS Professionals and Managers, soon to be published by McGraw-Hill, Inc.

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SOFT NOTES

Firms ink VAR pact

Epoch Systems, Inc. and Prime Computer, Inc. recently signed a value-added reseller agreement authorizing all of Prime's commercial systems and Computervision computer-aided design and manufacturing sales offices and distributors to resell the entire line of Epoch-1 Infinitestorage servers and Infinite-storage software.

The worldwide contract provides a "valuable addition to Prime Systems Integration's ability to provide its customers with integrated information systems," according to Gerald Butler, president of Prime Systems Integration business unit. Epoch Systems provides several storage technologies, including on-line archiving and network backup and recovery systems capability.

The Unix-based systems market is showing excellent growth throughout the Asian region when compared with the overall systems market, according to a recent report by International Data Corp.'s Asian Research Center.

The study estimates the compound annual growth rate for the region is at 46.9% for total Unix-based hardware shipments. This is compared with 23.3% for the overall hardware market, the study said.

Science and IS drift together

IS looks to high-performance computing for resource-saving strategies

BY MARYFRAN JOHNSON
CW STAFF

ORLANDO, Fla. — As corporate networks grow and multiply, stronger ties are being forged between the business-oriented information systems world and the once-isolated divisions of scientific and technical users.

That trend, according to executives attending an IBM conference here recently, is slowly elevating the importance of high-performance computing in the corporate view.

"Scientific computing is vital," said Thomas Lane, director of the Numerically Intensive Technical Computing Center at Dow Corning Corp. "It is an incredible way to maximise the corporate resources."

Jeffry Canin, president of Canin Consulting in San Francisco, agreed. "The complexity of networking and maintaining overall corporate control is bringing a return of MIS involvement" to scientific and technical computing, he said.

Describing The Dow Chemical Co. as "technically driven but focused on marketing and customer needs," Lane said greater reliance on scientific computing can offset the costs of laboratory testing, which in turn cuts costs in waste disposal and compliance with safety regulations.

Variations on that theme were echoed by others among the 450 executives, who came from national research laboratories, universities and industry to attend IBM's Technical Computing Executive Conference.

The trials of managing heterogeneous networks dominated many of the conversations during the three-day meeting.

"Networking that works and cheaper supercomputing" were the watchwords for Scott Glaspie, manager of external research and development at Monsanto Corporate Research in St. Louis, Mo. "There is a strong drive among our vice presidents to communicate quickly and easily," Glaspie said. "There is also an increasing need for access from the PCs to the mainframe, which brings up all sorts of issues such as security."

Management expertise

Jerry Latta, vice president of IBM's Technical Computing Systems Division in Milford, Conn., said he believes scientific and technical users are increasingly turning to IS for the expertise to manage these multivendor networks.

Another change IBM has noticed in the manufacturing sector is certain customers' willingness to write the IBM applications programs for their machines, then have IBM maintain the system over its lifetime. "It saves them money in the long run," said Robert Tiel, a senior consultant at IBM's Industrial Sector Division.

Tiel said he also sees a "changing management attitude" toward the views of the technical users. When the IS department does battle with the engineering department, Tiel noted, "the engineers are winning 99 times out of 100."

There was a distinctly businesslike cast to the potential benefits listed for high-performance computing: solving practical problems, reducing time to market and increasing productivity.

"We feel the market pressure to develop and produce at a high level," said Chip Kemppainen, manager of computer-aided engineering at ADC Telecommunications, Inc. in Minneapolis. His firm, which counts regional Bell operating companies among its customers, merged its technical and business computing departments during the past three years to eliminate unproductive infighting over resources.

FEATURE: PICK SYSTEMS

More than an operating system, it's a cult classic

BY ALAN RADDING
SPECIAL TO CW

Can you update and reposition a sleeper and wind up with a box office hit? Microsoft Corp. has certainly made that argument with its new release of Windows, and that's what Pick Systems is trying to do now with its Pick operating system/database.

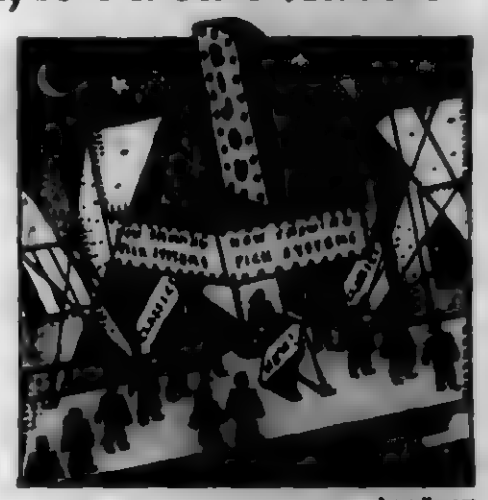
As an operating system, Pick has been something of a cult classic for more than 20 years, although how much of one is still open to debate. Pick Systems claims Pick is licensed on 270,000 multiuser midrange and workstation systems and 110,000 single-user personal computers, while a 1991 Datapro Research Corp. study put the installed Pick base at 260,000 CPUs, not counting PCs, according to Datapro analyst Herb Gepner.

What is indisputable is that Pick has a fervent following wooed by Pick's easy ways and multiuser capabilities.

"I was really skeptical when I heard about it, but it's remarkable how flexible it is," says Barry Windus, director of MIS at Potpourri Collections in Medfield, Mass.

Pick Systems has always insisted that its product is more than an operating system, however. Now it is aiming to expand its base and tap a new population of

Continued on page 32



James Kemmerer

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Computer watchdog tracks hazards

Federal crackdown on hazardous materials tracking spurs utility to automate manual system

ON SITE

BY MAURA J. HARRINGTON
CW STAFF

LOUISVILLE, Ky. — The U.S. government's crackdown on the tracking procedures for handling hazardous materials was a major factor in Louisville Gas & Electric Co.'s (LG&E) decision to convert its manual tracking system to a mainframe-based automated system.

Now two years old, that system has saved the utility hundreds of thousands of dollars per year, largely by eliminating the expense of outside contract work and by smoothing the federal inspection process. The rules on hazardous materials come from the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA).

The Hazardous Materials System (Hazmat) is a homegrown program that is linked to LG&E's Materials Management Information System, according to Terry Naulty, LG&E's manager of environmental affairs.

The hazardous materials system is accessible to users when they are working with the Materials Management Information System through IBM 3270-type terminals. The applications reside on an IBM 3090 Model 200J mainframe.

The communications link is via IBM's Systems Network Architecture and several types of communications media, including fiber-optic cabling and microwave, depending on the location of the site, said Ken Brockman, LG&E's manager of technical support.

Easy search and retrieval

Hazmat, completed in 1989, was written by LG&E in two years. Its purpose, according to George Seitz, manager of systems development at LG&E, is to let employees at any LG&E site easily search and retrieve information on any hazardous materials used in the company.

Written in Cobol, Hazmat is accessible via a menu under IBM's VSAM and CICS. Users need only press one key on their terminal to get into Hazmat. Then they simply follow the menu-driven directions to find the desired information, according to Seitz.

Users may be employees, such as data entry clerks, or shop floor workers who process work orders for materials.

Naulty, who headed up the design of Hazmat, quantified LG&E's savings from it as "hundreds of thousands of dollars a year and lots of work."



Louisville Gas & Electric *saved thousands of dollars when it automated its manual tracking system on an IBM 3090*

"Before Hazmat, we had to make sure files were being kept at each facility and updated on a regular basis," Naulty said. "For example," he added, "we also had to take monthly and weekly inventory records and figure out the maximum and minimum readings for each material, and we're talking thousands of materials, each with its own report." Naulty noted that many of the materials used at LG&E are deemed hazardous by the government but are unlikely to be recognized as such by the general public.

"Hazardous materials include welding rods and plate steel, which wouldn't seem like hazardous materials sitting on the shelf but give off fumes that are considered hazardous, so they must be recorded carefully," Naulty said.

When a user is working with the inventory list in the Materials Management Information System, an automatic link to Hazmat tells the worker whether any products contain hazardous materials as defined by OSHA and the EPA.

When Hazmat detects a product that includes one or several hazardous materials, it copies the information from its own dictionary and generates a special government form.

Because the system is companywide, all hazardous information can be tracked throughout LG&E's 17 different sites, Naulty said. Also, Hazmat can automatically generate annual and daily activity reports that regulate the total amount of hazardous materials used during the specified period.

Since last January, Hazmat has been marketed to other companies across several industries by EPI International, a software development and consulting firm based in Atlanta.

Candle enhances DB2 storage analysis system

BY JEAN S. BOZMAN
CW STAFF

LOS ANGELES — Candle Corp. said last week it will soon ship a new version of its DB2-DASD storage analysis program to the 1,300 DB2 sites that use Candle's Omegamon for DB2 systems monitoring software.

The new version enhances the original program, shipped in November, which monitors the use of disk space by IBM's DB2 relational database management system.

Buff Jones, general manager at Candle's Database Tools Division, said, "Database administrators would like to set goals for disk drive usage and to get control of DB2's allocation of disk space." A goal of 15% free space is adequate, she said.

Counting the cost

Candle's enhanced DB2 package includes a new cost/benefit analysis program that puts a price tag on the amount of unused disk drive space allocated for DB2 data tables.

Sometimes as much as 40% to 60% of costly disk drive real estate is unused, wasting $85,000 per year for databases that are 5G to 20G bytes in size, Candle Chief Executive Officer Aubrey Chernick said. "You can reclaim some of that wasted space by defining new parameters on the screen," he said.

The Candle software identifies which data sets should be moved in order to free up more disk space.

> "DATABASE administrators would like to . . . get control of DB2's allocation of disk space."
>
> BUFF JONES
> CANDLE

DB2-DASD, now being tested at large DB2 sites such Levi Strauss & Co. in San Francisco, is scheduled to be available in the second quarter. It is priced between $8,000 and $32,000, depending on the size of the host IBM processor.

The Candle program runs under IBM's MVS/ESA, MVS/XA or MVS/SP operating systems and supports DB2 Version 2.1 and later DB2 releases.

Oracle 6.2 not for Vaxclusters alone

Unix vendors hoping to see other Parallel Server Option versions by 1992

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Will Oracle Systems Corp. be able to transplant Oracle Version 6.2 Parallel Server Option beyond the Digital Equipment Corp. Vaxcluster for which it was created? A number of Unix systems vendors and parallel processor makers appear to think so and are trying to make it happen by 1992.

Pyramid Technology Corp. is already working on a distributed lock manager that would enable the firm to "cluster" multiple Reliant series machines together [CW, March 18].

"It's a multilevel project that will release products in different stages," said Mark Bishop, database marketing director at Pyramid. "But we're working on something that allows multiple systems to run against a single database."

Pyramid rival Sequent Computer Systems, Inc. in Beaverton, Ore., is developing its own version of a distributed lock manager, said Rich Wells, Oracle program manager at Sequent.

Development of an equivalent to DEC's distributed lock manager is a prerequisite for making Oracle Version 6.2 work.

"We've had code in-house for more than four months," Wells said. "We're very confident that we can get a beta product out the door by the end of this year."

Production copies of the code will probably not surface until 1992, he said. Still, the argument for clustering is compelling, as customers will be less likely to "box swap" when processing needs outstrip the capacity of their installed computers. Users could "scale up" their systems by tacking more computers onto an existing cluster.

Parallel targets

Parallel processors are another target for the Oracle Parallel Server Option, said Kenneth Jacobs, director of relational database management systems marketing at Oracle. "We know it works, and we'll see it rolling out in the supercomputer area sooner than we will in the traditional computing area," he said.

Brad Bradley, director of marketing at Meiko Scientific Corp., agreed. A working version of Oracle Version 6.2 exists, Bradley said. "We've been working on it for the last 18 months, and I would say that working with Oracle was very much a two-way street."

Meiko's lock manager is functioning, and a beta-test release of the product should be ready by the third quarter, Bradley said. Meiko uses Sun Microsystems, Inc.'s industry-standard Scalable Processor Architecture and Intel Corp. i860 reduced instruction set computing chips.

Richard Wyckoff, company spokesman at Ncube, said last week that although Version 6.2 is up and running on its parallel processing machines, "Oracle 6.2 is not in a final form or at a point where we could sell it."

Oracle Chief Executive Officer Larry Ellison has said one of his goals is to use Ncube's parallel processing computer to run the Oracle RDBMS at 1,000 trans/sec. or more.

"Oracle 6.2 is designed in such a way that it should be portable to other systems," said Charles Phillips, vice president of research at Soundview Financial, Inc. in Stamford, Conn. "But the Pyramid and Sequent versions are kind of showcase platforms for Oracle because Oracle's trying to show their commitment to the Unix market."

Supercomputer versions will also prove valuable to Oracle marketing, Phillips said, because extremely high transaction rates may be demonstrated for the Oracle RDBMS on those machines. "But in terms of revenue, the Vaxcluster platform was the most critical one for Oracle 6.2."

Design market seen soaring

1991 revenue for CAD/CAM/CAE industry predicted to hit $7.7 billion

BY SALLY CUSACK
CW STAFF

CAMBRIDGE, Mass. — Core business revenue for the computer-aided design, manufacturing and engineering (CAD/CAM/CAE) industry will reach a whopping $7.7 billion this year, according to Daratech, Inc., a market research and consulting firm based here.

Basing these numbers on worldwide sales of CAD/CAM/CAE hardware, software and services by U.S. firms, Daratech projected the overall market would reach $25 billion by the middle of the decade.

In his keynote speech, Robert M. Williams, vice president of engineering and plant operations systems at IBM, told the 300 users at this year's Daratech conference that CAD purchase decisions have been elevated from the departmental level into the boardroom in major firms across the country.

"If a CAD system goes down, companies could have thousands of engineers sitting on their hands," Williams said.

Just browsing

Most users came to the conference to learn about new technologies and to examine the strategies vendors were offering.

Robert Sullivan, assistant technical service manager at Teleco Oilfield Services, Inc. in Meriden, Conn., came to "see what the trends are and learn more about different platform options."

Teleco Oilfield is currently using Xerox Corp.'s hardware combined with homegrown software to implement CAD applications in its measurement-while-drilling activities.

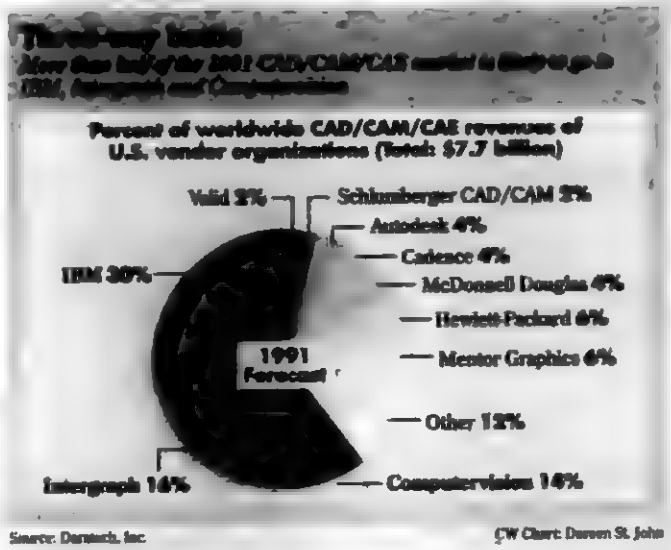
Sullivan indicated that the company is looking to put more decision-making capabilities into the hands of the engineers while giving them the ability to perform more up-front analysis functions.

The firm has considered several architectures, including Digital Equipment Corp. and Sun Microsystems, Inc.'s Sparcstations, but no decision has been made yet.

Daratech currently ranks IBM, Intergraph Corp. and Computervision, a Prime, Inc. company, as the industry market share leaders.

While the research company forecast 12%, 10% and 10% growth rates, respectively, for these companies within the next 12 months, analysts are keeping an eye on how the sluggish economy will effect the CAD business.

According to Charles M. Foundyller, president of Daratech, most vendors have reported first-quarter slowdowns and are "proceeding with caution." He said most U.S purchase decisions are being delayed by an average of three to six months, and more approvals are now required for capital expenditures.



Source: Daratech, Inc. CW Chart: Doreen St. John

Pick

FROM PAGE 27

potential customers by concentrating marketing and development efforts on database functionality and emphasizing Unix for the operating system role.

"People call Pick an operating system, but as an operating system, we're lousy. We have no color, no graphics, no communications. What we've always been is a multiuser database application environment," says Steven Kruse, vice president and general manager at Pick Systems.

> "PEOPLE CALL PICK an operating system, but as an operating system, we're lousy."
>
> STEVEN KRUSE
> PICK SYSTEMS

Pick Systems sees Pick ultimately as a relational-like database similar to Oracle Systems Corp.'s Oracle, Ingres Corp.'s Ingres or Informix Software, Inc.'s Informix, which run under a variety of popular operating systems, starting with Unix. Advanced Pick, an upgrade that makes Pick Unix-compatible, was released last July. A single-user PC version running under DOS is in beta testing and is scheduled for release in June, Kruse says.

Advanced Pick is notable for more than its shifting of emphasis away from Pick as an operating system. It also marks a new initiative on the part of Pick Systems, which has seemed content to let Pick licensees do most of the innovating.

Reactions to its first effort are mixed. Jim Jobson, president of Pick developer Rigden, Inc. in Boulder, Colo., is enthusiastic about Advanced Pick. "I rewrote a pricing module in a week using Advanced Pick. If I had tried to do the same thing in R83 [the 1983 release of Pick, considered standard], it would have taken a lot longer," he says.

Alan Glassman, a Pick software development consultant in Houston, is less impressed. "While we sat here watching DOS go all the way to Windows, Pick goes nowhere," he says.

Users have been slow to move to Advanced Pick. Kruse estimates that half of new Pick sales on the PC are Advanced Pick, while only 10% of new minicomputer Pick sales are for Advanced Pick.

Storybook Heirlooms, a start-up catalog marketer in Menlo Park, Calif., uses Advanced Pick because that is what the catalog marketing application it bought from Rigden runs under. Storybook systems manager Ann Killeen likes Pick because "you can understand it. It's so sensible."

Picked because of Unix

The agency computer development and marketing group at Hartford, Conn.-based Aetna Life and Casualty Co. opted for Advanced Pick because it operates as an application running under Unix, manager Ken Clark says. The group liked a particular application that was available on Pick, but "when we did an evaluation, there was concern about Pick as the operating system," he says. With Advanced Pick, however, Clark's group could have both the Pick application and Unix.

The Unix option has become a driving force for Pick. Unix gives Pick the communications and graphics capabilities it lacks, while Pick gives Unix users access to its universe of more than 4,000 business applications. Sandra Gant, a Gartner Group/Infocorp analyst, concluded in a recent Pick report, "The marriage of Pick and Unix has rejuvenated the Pick market."

Many Pick users agree. "Communications is a problem if you're running Pick in native mode, but running under Unix, communications is fine," Windus says.

The ability to take advantage of newer, leading-edge hardware is also enticing. Running under Unix will free Autostyle, Inc., a manufacturing firm in Grand Rapids, Mich., from its dependence on an old, proprietary Ultimate Corp. 7000 running Ultimate's licensed version of Pick, according to MIS manager Carrie Rodgers-O'Neal. "We're looking for a major vendor: HP, IBM, DEC," Rodgers-O'Neal says. "We're using an Ultimate 7000 machine, and we've had two head crashes in six months."

While the Unix connection and Pick's availability on the PC (see story below) have extended the appeal of the system, it is Pick's classic benefits — portability, ease of programming and availability of applications — that still hold users.

"We fell into Pick six years ago," says Tom Ward, manager of information systems at Ferguson Enterprises, a plumbing and electrical wholesaler in Newport News, Va. In that time, Ward has virtually dispensed with operations support altogether. His shop has six programmers and no operations staff.

By comparison, Ward cites a smaller company with a traditional mainframe system that needs 18 programmers and 18 operations staff members to support fewer users and fewer applications. "With Pick, we do more with one-third of the development staff and none of the operations staff to speak of," he says.

Testing portability

Ferguson has tested Pick's portability, growing through a variety of Honeywell/Ultimate systems from Honeywell, Inc. to the Unix/Sequoia system from Sequoia Systems, Inc. The most recent migration to the Unix system took Ward's six-person programming staff a total of just two man-weeks to convert and verify 1,200 programs, he says.

Sometimes, it is the seemingly smallest things that make the biggest difference. The Plymouth County Registry of Deeds in Plymouth, Mass., was attracted to Pick because it allows variable-length fields, a product of Pick's architecture. "I can't stress how important that is to us," says Richard Seibert, assistant register of deeds.

The registry must track hundreds of thousands of names of property owners; misrecording or improperly abbreviating a name can have serious legal and financial ramifications.

If Pick can manage its preferred transition to database operations while continuing to please its older core of users, observers and users say, it will truly have the best of both worlds — the trait of a survivor.

Radding is a free-lance writer based in Newton, Mass.

Pick a smaller system

The Pick operating system/database is not limited to large and midrange systems: Pick runs on a PC, although not under MS-DOS. There are DOS products, however, that provide a level of Pick compatibility.

Advanced Revelation Version 2.0 from Revelation Technologies, Inc. in Bellevue, Wash., runs under DOS while having a variable-length architecture similar to Pick. Pick users take advantage of the Advanced Revelation architecture to move data between DOS and Pick applications.

Using Revelation, Beauty for All Seasons, Inc. in Idaho Falls, Idaho, effectively runs Pick on a PC network, MIS manager Wade Snedaker says. Beauty also runs Ultimate's version of Pick on its main Honeywell minicomputer. "The only difference with Pick on the PC is that it is not as smooth," he notes.

The Kittery Trading Post in Kittery, Maine, uses Revelation to handle data generated by the cash register system, which it passes to its primary Pick system. The problem, however, "is that it's not real-time" because Revelation must be used to translate the DOS cash register data into Pick format, says Jim Cronin, director of MIS. If and when Kittery moves to Pick in the Unix environment, he notes, the firm can get a real-time point-of-sale system that dumps data directly into the Pick files.

ALAN RADDING

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NEW PRODUCTS — SOFTWARE

System software

Banner Software, Inc. has announced an enhanced version of VSM/VM, a systems management software package designed for IBM mainframes.

The product's Autopilot component controls consoles and interactive applications as well as network functions. It can also automatically initiate at least one VM, VSE or MVS system and components such as VTAM, CICS, TSO and ISPF.

Pricing for a VSM/VM package that includes Autopilot begins at $9,000.

Banner Software
9719 Lincoln Village Drive
Sacramento, Calif. 95827
(916) 364-0900

Applications packages

Access Technology, Inc. has announced Release 3.0 of 20/20, an integrated spreadsheet package designed for Digital Equipment Corp. VAX/VMS machines.

The product's spreadsheet publishing capability enables users to create and output presentation-quality reports of spreadsheet data, the vendor said. A search-and-replace feature allows users to search a spreadsheet for text strings and replace them with other strings.

Pricing ranges from $600 for a Vaxstation to $42,000 for a VAX 9000 system.

Access Technology
2 Natick Executive Park
Natick, Mass. 01760
(508) 655-9191

Allen Systems Group, Inc. has announced Job Alert, a real-time, historical job problem management tool designed for MVS environments.

The product monitors initiated tasks and the completion of batch jobs, records corrective actions and archives job control language listings.

License fees are priced from $15,300 to $22,400, depending on CPU group.

Allen Systems Group
750 11th St. S.
Naples, Fla. 33940
(813) 263-6700

Utilities

Data Center Software, Inc. has announced a software package designed to run as a detached, batch or on-line process for monitoring systemwide or individual conditions on a Digital Equipment Corp. VAX machine.

Monitor/Plus can identify system components that contain diminished disk space, excessive I/O and CPU use, unavailable Decnet nodes and stalled or stopped queues.

Statistical and usage reports reportedly enable system managers to configure the product to react to system glitches according to their requests.

Pricing ranges from $1,995 to $4,995, depending on VAX CPU size.

Data Center Software
70 Berrick St.
Beverly, Mass. 01915
(508) 922-5500

NEW PRODUCTS — HARDWARE

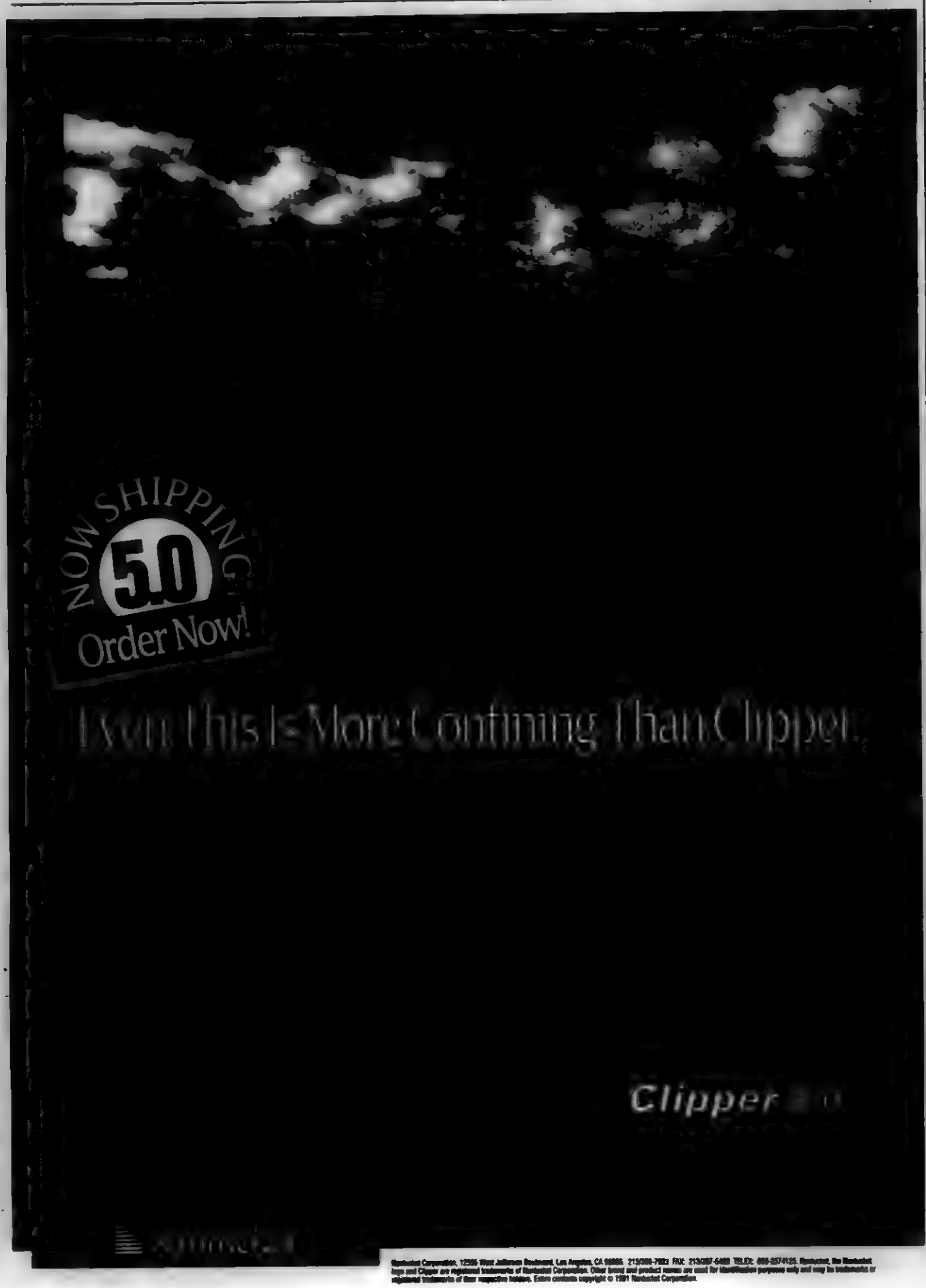
I/O Devices

IBM has announced an impact printer that reportedly enables users to print multipart forms, cards, envelopes and labels at a rate of 800 lines per minute.

The IBM 6252 Impactwriter features a right-to-left paper path design that allows all maintenance and operator jobs to be completed at the device's front end. An 80-character LCD panel that reports messages in plain English and two forms-feed tractors that can be adjusted by turning a single knob are included.

Five models are available for midrange systems, large enterprise computing environments and small computer platforms such as the IBM Personal System/2 and RISC System/6000. Pricing ranges from $9,950 to $12,450, depending on model.

For more information, contact your local IBM office.



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COMMENTARY

Richard Pastore

Picking a portable



Many Compaq LTE 386S/20 users said they bought the notebook PCs because six months ago they were the only ones available from a name vendor. But with notebooks now shipping from AST, Dell, Tandon, Sharp and others, the market has matured to a point where the makers must vie for users' dollars with differentiated designs. It's time for buyers to base their purchases on substantive features.

Power: On the desktop, Intel 80386SX-based platforms are such a commodity that the choice is virtually moot. But in notebooks, a 20-MHz 386SX can cost 25% — or $1,000 — more than an 80286-based model. So if you don't need to run Microsoft Windows, you could save some money here.

Drives: By all accounts, Conner Peripherals has got its 60M-byte drive act together. The hard disks are now showing up in everybody's notebooks. IBM will even ship the 60M-byte disk as a standard with its much-discussed but still unannounced PS/2 L40SX portable. Unless the machine will forever be a one- or two-application platform, it probably makes sense to pay the extra $500 for

Continued on page 43

Truetype troubles slow Windows upgrade

Integration of scalable fonts into the popular graphical interface lengthen update schedule

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. will not deliver its update to Windows 3.0 until at least October because of difficulties incorporating the new Truetype outline font technology into the core of the new release, according to sources briefed by the company.



Windows 3.1 was originally scheduled for a midyear rollout, but its arrival date is now uncertain, sources said, and beta-test versions are just now slowly trickling out.

However, Truetype is expected to be widely available later this year as part of System 7, Apple Computer, Inc.'s next major release of the Macintosh operating system.

Insiders said the delays directly relate to Truetype, outline font technology jointly developed by Microsoft and Apple as a way to break market leader Adobe Systems, Inc.'s stranglehold on that market.

"Truetype has become more of a technological challenge than they first thought," said an information systems manager at a large telecommunications company.

Truetype is apparently not the only thing delaying Version 3.1. "Last we heard, there were still bugs in the shell, and they haven't yet chased down the drive letter problems," said Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond.

Truetype is intended to allow users to scale, rotate and otherwise manipulate fonts. Version 3.0 users have long complained that its bit-mapped fonts cannot be scaled, while outline fonts can be scaled to any size based on a mathematical description. Bit-mapped fonts are often slow to display on-screen, print inconsistently and demand big chunks of hard disk space because each font must be stored separately on disk.

> INSIDERS SAID THE DELAYS directly relate to Truetype, outline font technology jointly developed by Microsoft and Apple as a way to break market leader Adobe Systems' stranglehold on that market.

Truetype will be incorporated directly into the Windows Graphics Device Interface, making the font available for all applications. The package will ship with 13 standard Truetype fonts, Microsoft Chairman Bill Gates said.

Microsoft officials are also faced with the challenge of getting printer manufacturers to commit to Truetype before they actually get their hands on the product.

A market leader

Adobe's Postscript is already well-established as the market leader in page description languages, and some manufacturers have been hesitant to abandon that standard.

Leading the way, Apple recently announced two low-cost printers that are the first printers on the market to take advantage of the Truetype technology.

Truetype Version 3.1, which will be compatible with Version 3.0 applications and drivers, is also expected to exploit object linking and embedding capabilities and address complaints about Version 3.0's file manager, which has to revert to DOS commands to perform a number of functions.

R:base gets link to outside applications

BY JAMES DALY
CW STAFF

BELLEVUE, Wash. — Microrim, Inc. has released an extension to its R:base database management system enabling R:base applications to transparently connect with non-R:base applications.

The new Dynamic Application Integration (DAI) feature allows an R:base user to integrate other applications into R:base menus and programs or run any application, such as a DBMS, word processor, spreadsheet or graphics program, from within the R:base environment.

For example, a developer can write an application that runs accounts payable database applications, can mail-merge letters through a word processing application and can generate graphics, all while using R:base as a central application menu.

The DAI feature introduction is a key element of the first release of Microrim's Upgrade Express program, which Microrim President Jack Noonan said will provide a steady diet of functional product enhancements three times per year. The first release of Upgrade Express includes DAI and several speed improvements.

An Upgrade Express subscription will cost $129 per year, although Microrim is offering a special introductory price of $99 until April 30. The upgrades can also be purchased individually for $99.



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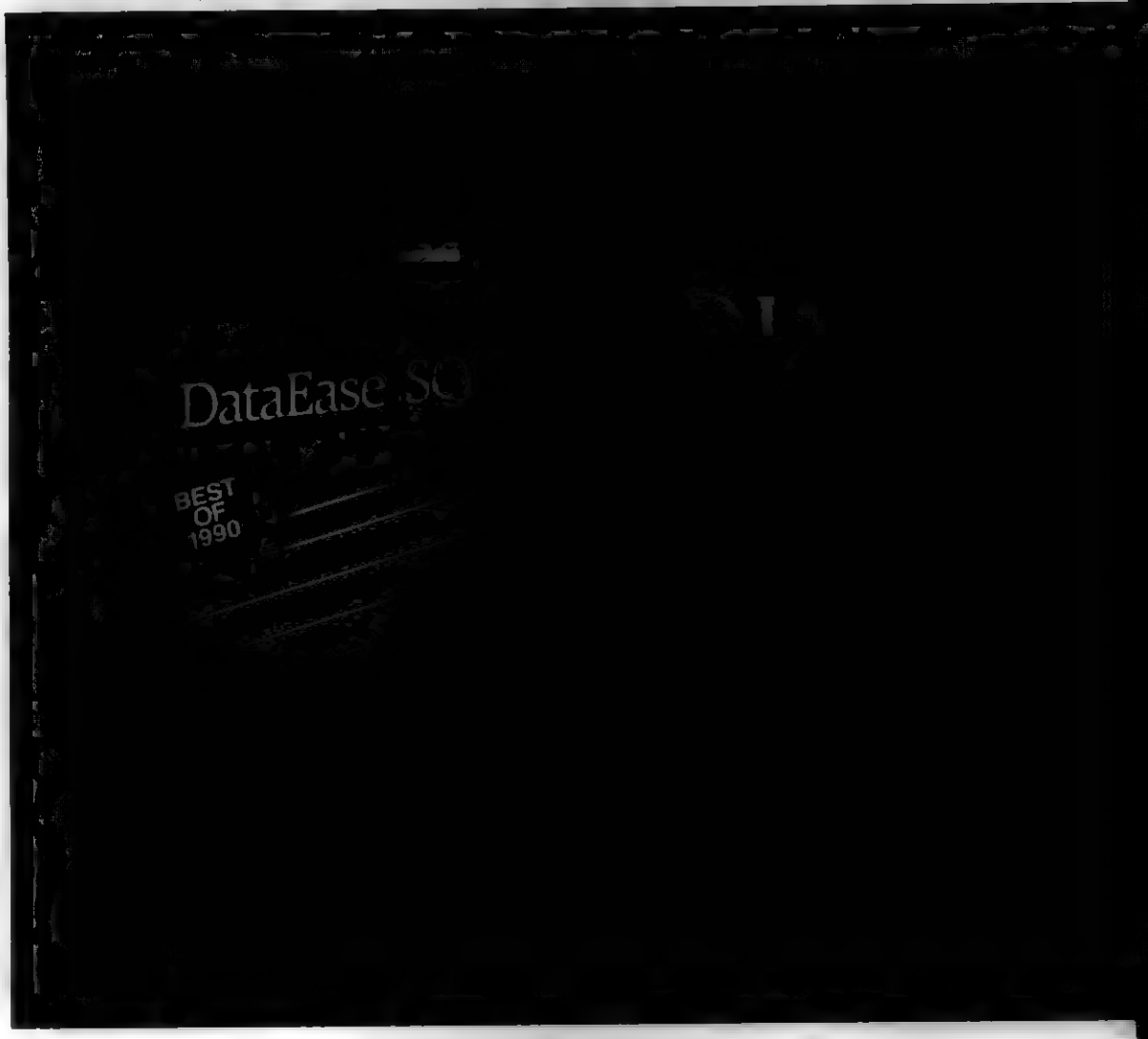
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NBC airs 'Desktop Challenge'

Executive may need Solomon's wisdom and a gypsy's crystal ball to decide

ON SITE

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Off in one corner of his toy-filled office, Apple Computer, Inc. and IBM account representatives fight over scratched-out logos in a miniature Japanese rock garden. But Joe C. Harris Jr., director of information technology at NBC TV Stations, has another battle to worry about — the one churning up his gut: user-friendliness vs. communications.

That about sums up the line of demarcation that divides competing desktop strategies based on Apple's Macintosh operating system and IBM's OS/2. Harris has the unenviable task of trying to choose one.

The unexpected wild card in this showdown was Microsoft Corp.'s Windows 3.0. Its rocketing popularity, along with a little pressure from MIS, forced Harris to audition it, but in the end, it was the first to get the hook. The less noticed OS/2 outclassed Windows on several fronts — including communications and memory management — and held its own in ease of use and manageability.

Harris today oversees six NBC-owned TV stations and seven sales offices populated by about 1,200 users. These sites are currently running traffic and financial systems on IBM Application System/400s. A sales information system runs off of a third-party IBM 3090. NBC is predominantly IBM.

A growing proliferation of personal computers, coupled with a move by the TV stations to cut costs, had intersected with a directive from NBC's chairman to make it as easy as possible for customers to do business.

Harris decided that a consistent, multitasking desktop might be key. Just when he thought OS/2 was the way to go, Windows 3.0 "burst on the scene like a flood," and he began to notice Apple opening up. So there he was, "trapped in a triangle" he "could kill the world for."

Networking was also key. Here again, Windows fell short, said Glenn Urbanski, manager of sales and traffic systems at the division. The workstations have to tie into a network linking the 3090, the TV stations' AS/400s and the corporate token-ring.

During the summer of 1990, Harris and his team put together a blueprint for the ideal desktop. It had to be cost- and system-efficient, easy to use and manage and able to provide a consistent interface. Above all, it had to be something people would use.

"If you have 20 workstations and only 10 are used, you are losing money," Harris pointed out.

Exploring options

Assisted by his peers at parent company General Electric Co., a heavy user of both OS/2 and the Macintosh, and a two-man team at NBC, Harris has spent the last six months exploring the nether reaches of Windows, the Macintosh and OS/2.

Each man was assigned to a different system: Harris, a fan of Lotus Development Corp.'s 1-2-3/G, took OS/2; Alan Bernstein, manager of systems administration and operations, got Windows; and Urbanski worked with Apple.

Harris went to IBM, Apple and Microsoft, explained his predicament and demanded they each build him a prototype to prove their system was the answer to his problems. After they each complied, he then refused to let the companies teach "the big dummy — me" how to use the systems. The point was to test user-fri[illegible]

"If you tell me, I will hear; if you show me, I will see. But if you let me *experience* it, I will know," he explained, citing Chinese philosophy.

After weeks of building, testing and benchmarking, only Windows was axed. Harris was virtually back to square one. Both OS/2 and the Macintosh fit the bill. The prime difference comes down to NBC TV's perception that the Macintosh is much more user-friendly and a more factually based belief that IBM's connectivity is not only further along but also better suited to NBC's technology base.

Ironically, Harris, who worked with the OS/2 system, is leaning toward what he sees as a user-intuitive Macintosh. Conversely, Urbanski and Bernstein appear to be favoring IBM, primarily because of its robust connectivity and ability to tie into NBC's IBM investment.

Harris talks constantly about the role communications plays in enabling the sales staff at the TV stations to do their jobs. In fact, he is a big proponent of using electronic data interchange. In the short term, he worries the most about getting users comfortable with their systems as well as keeping a lid on the system support and maintenance costs. None of the TV stations have on-site computer support.

The goal is a "user-stupid" system, meaning users are not to be excessively tied up in training classes or left spinning their wheels while the system slowly executes commands. System basics must be attainable as close to immediately as possible.

What the final decision will be is anyone's guess, including Harris, who at this point would rather wrestle with his taxes than pull a workstation strategy out of the hat by mid-April. At NBC, however, tax refunds are on Apple as the desktop of choice.

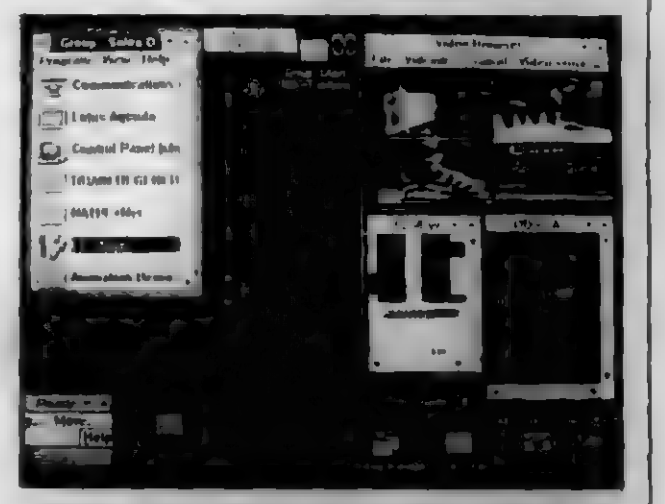
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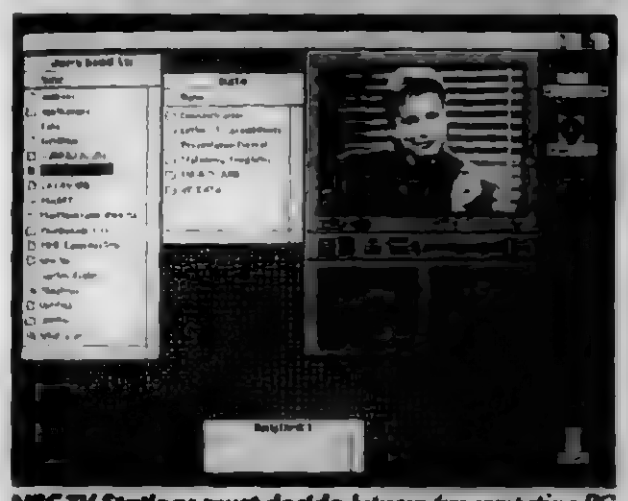


Harris *fell into his job*

It probably qualifies as the zaniest office at NBC TV Stations. Telephones ring, technicians fiddle, and heads constantly poke through the doorway when Joe C. Harris Jr. is in town. Yet Harris sits unruffled amidst the chaos. Between answers, he shouts minimally worded instructions, confirmations and dates at the constant stream of people wandering in and out of his office, pausing only to order soda and to castigate his OS/2 setup, which will not allow him to exit a program as fast as he would like. Today, his AS/400 is down.

Harris is a former newsman and salesman who stumbled into his current project, in part because of his fascination with electronic gadgets and a tendency to speak his mind. Harris thought his 14 NBC-owned TV stations and sales offices needed to have intelligent PCs and a standardized suite of applications. So his boss said, "Fine. You go do it." And Harris has been off and running ever since toward a mid-April "D-Day."





NBC TV Stations must decide *between two competing PC desktop strategies: the Apple Macintosh and IBM's OS/2-based Personal System/2*

DAT backups free systems managers

BY JIM NASH
CW STAFF

Digital audio tape (DAT) technology has hit personal computer networking and minicomputer environments in the form of fast, large-capacity tape drive backup systems. DAT backups are freeing up computer managers, some of whom were flipping cartridges 20 times per day.

Niel Svendsen, network administrator at Mobil Chemical Corp. in Beaumont, Texas, said he had grown frustrated with the speed and limited capacity of conventional tape backups for his two IBM Model 80 file servers.

The servers support about 70 IBM Model 55 workstations linked with Novell, Inc.'s Netware 286 SFT on a Datapoint Corp. Arcnet backbone, according to Svendsen.

Mobil picked up Carlsbad, Calif.-based Gigatrend, Inc.'s 2G-byte Serverdat backup system this year using an IBM Personal Computer AT bus. It reduced the overnight systemwide backup task to three or four hours without shutting down the network, Svendsen said.

Even three hours is too long, he said, so he has ordered an IBM Micro Channel version from Gigatrend, which he said is expected to reduce backup time to less than one hour. Svendsen said his only disappointment with the product so far has been inadequate documentation.

Other users said Gigatrend's capacity has boosted productivity by cutting down the number of times a cartridge must be flipped or replaced. "It boosts productivity to have one tape hold the whole thing," said George Shay, a software engineer at Panasonic Factory Automation in Franklin Park, Ill. Panasonic develops factory-automation software, he explained, and the source code for one program can stretch to 6M bytes or more.

Panasonic decided to use a Gigatrend Serverdat 121 with 2.5G bytes for its 40-workstation Novell Version 3.11 network because it is the largest backup that works on an Extended Industry Standard Architecture bus, Shay said.

Switching tapes on heavily used networks can get "messy," Svendsen said. With conventional systems, he explained, "if tape ran out in the middle of a backup, I'd have to catalog the tapes as the first part and second part. As it is, we have not come close to filling up a DAT tape."

> "IT BOOSTS productivity to have one tape hold the whole thing."
>
> GEORGE SHAY
> PANASONIC

ALR's Powerflex 20CSX offers flexibility, speed

Technology Analysis — A roundup of expert opinions on new products. Summaries written by Computerworld staff member Derek Slater.

Flexibility and speed are the selling points of Advanced Logic Research, Inc.'s (ALR) Powerflex 20CSX system. Reviewers praise the performance of Powerflex, an Intel Corp. 80386SX-based system that allows an easy plug-in upgrade to an 1486 CPU. However, they note that the absence of 32-bit slots limits the system's 486 potential.

Performance: Benchmark scores place the 20CSX near the head of its class, according to *PC World* and *PC Magazine*. The system fares well in CPU, disk and video speed tests. An unusual bonus is the extra 80286 chip on the motherboard, which operates as a backup if the 80386SX CPU breaks down. Though the system can carry a full 16M bytes of random-access memory, the motherboard limits CPU RAM speed to 5M bytes, which can slow the performance of space-hungry applications.

Expandability: The Powerflex has one 8-bit and five 16-bit expansion slots.

Documentation: *Infoworld* rated the documentation as very good. Included are system specifications, a glossary and explanations of on-screen error messages.

Support: ALR depends on dealers for technical service. Toll support lines are open during West Coast business hours.

Value: The suggested retail cost of a system, including Super VGA card and monitor, 3M bytes of RAM, a 110M-byte hard drive and a mouse, is $3,349. Reviewers said the Powerflex is a good value with a few noteworthy limitations.

Reviews Summary

Criteria			
Performance	Very good	Very fast	Top-notch
Expandability			
Documentation	Very good	NC	NC
Support			
Value	Very good	RAM ceiling a problem	High-priced
Reviewer's score			

Published reviews score represents Infoworld rating only. NC: No comment. These are excerpts. Refer to actual reviews for details.

RATINGS

- **Users:** user at a large insurance firm (*overall performance:* 9, *cost:* 10); Kevin Weigel, Wimpey Minerals PA, Inc. (8, 9)
- **Analysts:** George Thompson, Datapro Research Corp. (8, 9); Jerry Caron, Faulkner Microcomputer Reports (8, 8)
- **Financials:** Eric Zinita, Rauscher Pierce Refsnes (*overall rating:* 5); Stephen K. Smith, Paine Webber (7); Jim Poyner, William K. Woodruff & Co. (4)

"They have $30 million in cash, and we're expecting another good result this quarter," Smith said.

"ALR's growth rate is about 20%, with a weaker balance sheet than the market leaders," Poyner said.

ALR Powerflex 20CSX

score:

Points (maximum)	Category
23 (30)	Published reviews
16 (20)	Analysts' ratings
13 (15)	Users' ratings
19 (20)	Cost evaluation
8 (15)	Vendor financials

(Maximum score: 100)

ALR responds

Comments from David Kirkey, vice president of marketing:

Performance: With the 486 CPU, this product performs as well as any 486 industry standard architecture system and for less money. If you're going for a fully configured 32-bit system, try our Businessveisa line.

Financials: We have money in the bank; the company is very solid. Revenue and profits have grown consistently.

Dell System 320LX: Good price, exceptional support

Dell System 320LX

score:

Points (maximum)	Category
23 (30)	Published reviews
13 (20)	Analysts' ratings
14 (15)	Users' ratings
13 (20)	Cost evaluation
11 (15)	Vendor financials

(Maximum score: 100)

Reviews Summary

Criteria			
Performance	Good	Slow	Conservative
Expandability			
Documentation	Excellent	NC	NC
Support			
Value	Good	Excellent	Higher than average price
Reviewer's score			

Published reviews score represents Infoworld rating only. NC: No comment. These are excerpts. Refer to actual reviews for details.

RATINGS

- **Users:** David Schemaydar, southeastern utility company (*overall performance:* 10, *cost:* 7); David Uechi, Brown Maxey & Oates Hartline (9, 10)

"I haven't had any downtime, and it's been compatible with every software or hardware [product] I've put in it," Schemaydar said.

"It's real durable, and I need the extra expansion slots in the large chassis," Uechi said.

- **Analysts:** George Thompson, Datapro Research Corp. (8, 8); Jerry Caron, Faulkner Microcomputer Reports (7, 9)
- **Financials:** Eric Zinita, Rauscher Pierce Refsnes (*overall rating:* 7); Jim Poyner, William K. Woodruff & Co. (8)

Dell responds

Comments from Paul Rubin, director of product marketing:

Performance: The 320LX was not designed to be the fastest computer in our line. It was designed to be the first 20-MHz 386SX shipping, and as such, it established Dell as a leader in being early to market with an important new processor.

The 320LX provides the user with the productivity of a 386-based PC and a low 386SX price.

Although the Dell System 320LX does not set any speed records, reviewers say that the system is reasonably priced and that Dell offers exceptional service and support.

Performance: *Infoworld* describes the 320LX's benchmark results as average. Dell's entry lacks the memory cache common to many of its Intel Corp. 80386SX-based competitors. However, it does use BIOS shadowing and an IDE hard disk controller.

Expandability: Because it has a much larger case for an SX system, the 320LX has room for eight expansion slots. The power supply capacity is an appropriately high 200 watts. There are five half-height drive bays, and reviewers note that drives are simple to install or remove.

Documentation: The manuals are very thorough. A diagram inside the machine makes it easy to identify system components, according to reviewers.

Support: Dell's support policies and service are tops in the industry, reviewers agree. Toll-free telephone support and support by fax are available during extended weekday hours and on Saturdays. A 30-day money-back guarantee and one year of free on-site service are also standard.

Value: The list price is $3,398 for a 320LX system equipped with 4M bytes of random-access memory, an IBM Video Graphics Array adapter and monitor, a 100M-byte hard drive and a floppy disk drive. Reviewers say the price is right for users who need expandability and strong support more than they need blazing speed.

Methodology: *Published reviews: average of numeric scores from product reviews published by personal computer publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of financial analysts' ratings of vendor financials and ability to support product multiplied by 1.5.*

Insignia delivers MS-DOS on Next

Emulator software opens Next to thousands of DOS-based applications

BY PATRICIA KEEFE
CW STAFF

MOUNTAIN VIEW, Calif. — Those who are smitten with Next, Inc.'s Next system but cannot or will not leave behind their DOS applications may find that Softpc 2.0 — scheduled to be available from Insignia Solutions, Inc. at the end of the month — will let them have their cake and eat it, too.

Softpc is a software emulator that essentially clones an IBM Personal Computer AT motherboard. The program also runs on computers from Sun Microsystems, Inc., Digital Equipment Corp., Hewlett-Packard Co., Apple Computer, Inc., Silicon Graphics, Inc. and Mips Computer Systems, Inc.

The trade-off, according to Nick Baran, editor and publisher of "Baran's Tech Letter," lies mostly in performance. He said Softpc is very slow, only runs programs written for Intel Corp. 80286-based computers and does not support IBM's Video Graphics Array standard or Microsoft Corp.'s Windows 386. "It's a useful product, but I think it will have a limited appeal," he said.

It is estimated that there are currently between 100 and 200 applications designed for the Next shipping vs. more than 50,000 MS-DOS packages.

However, Baran said he is skeptical that users would buy a Next machine if they wanted to stick with their DOS applications. He added that users can find database, word processing and spreadsheet programs for the Next. Lotus Development Corp., for example, offers the Improv spreadsheet for the Next.

Opening DOS doors

Steven P. Jobs, president and chief executive officer of Next, is more effusive. "Softpc will open up the entire MS-DOS world to Next computer users," he said.

Jobs also predicted that Softpc for the Next will make the system more attractive to the installed base of DOS-based PCs.

Insignia said interest in the $499 package is already high. "Our initial backing indicates this to be one of our most successful launches ever of Softpc," said Don Gallagher, vice president of sales at Insignia.

The Next computer provides Softpc 2.0 with one of its fastest performance rates, according to Insignia. Softpc runs under Nextstep 2.0 or later versions. It allows Next users to run AT-compatible software and Next programs side by side as well as share files between the two environments and copy and paste between windows. Users can also network with other workstations running Softpc.

The Next system's Adobe Systems, Inc. Postscript environment allows DOS screens to be captured with Softpc for use as images in other applications.

Softpc is a software emulation, allowing users to run more than one MS-DOS session at a time. Softpc for Next computers includes support for IBM's Enhanced Graphics Adapter and Color Graphics Adapter graphics standards as well as support for the Intel 80287 math coprocessor and expanded memory.

Computer Solutions changes name, focus

BY PETER BARTOLIK
CW STAFF

BURLINGTON, Mass. — A firm from an era that preceded personal computers, Computer Solutions, Inc., has changed its name to Powersoft and dramatically shifted its scope with the introduction of Powerbuilder, a client/server application development environment for Microsoft Corp. Windows users.

Computer Solutions, founded in 1974, was historically focused on MRPII applications but is recasting itself "from a low-tech to a high-tech, advanced technology company," claimed Mitchell Kertzman, president and chief executive officer.

Powerbuilder 1.0 supports SQL and initially will be integrated with the SQL Server from Sybase, Inc. and Microsoft, Sqlbase from Gupta Technologies, Inc. and Oracle Server from Oracle Systems Corp. The product is geared toward information systems operations as a high-level development tool featuring its own Powerscript procedural language.

Heading the development of Powerbuilder was David Litwack, senior vice president of the company and formerly executive vice president of Cullinet Software, Inc. Litwack said he believes "we are at the beginning of a mass migration" of IS to client/server development as the profession responds to mandates from corporate management to downsize IS operations.

"To develop this type of product, you have to merge two worlds: The mainframe guys are character-based, and the PC guys tend to think in an end-user mentality," Litwack said. Powersoft, which claims to have already signed licenses with American Airlines, Coca-Cola Foods and Smithkline Beecham Corp., is banking that IS operations will eschew the C language and other Windows programming tools in favor of a select number of high-level development applications.

The product, scheduled to ship in May, costs $2,995 per seat for a development license.

Pastore

FROM PAGE 37

the long-term capacity.

Modems: Modems are almost a given on computers that travel. But now there are fax modems as well as regular data modems to consider. Fax modems are a great convenience and a potential money saver. Everyone you do business with has a fax machine — but not everyone has a network you can dial into.

Power management: Some models allow you to shut off the notebook and swap batteries without rebooting. Nothing could be more convenient when you're in the middle of a database search and the final boarding call comes.

Batteries: There is still little differentiation here and a lot of deception. One vendor may rate its battery at three hours; another will say "up to" 3½ hours. The net result is you get only two hours of real-life use out of them. When the greater capacity, nickle-hydride technology begins showing up, users will have a real battery choice.

Reliability: Laptop computers fail twice as often as desktop PCs, according to one national PC service provider. Notebook buyers should be especially concerned because the machines trade their ruggedization for light weight.

Well-established players such as Toshiba and Grid have had time to hone their quality control. But the bargain-priced newcomers to the market may not have the materials and manufacturing experience to put together a solid box. Their service and parts networks are also in their infancy; finding fast, convenient support may be quite a challenge, according to independent service providers.

Ergonomics: Many car shoppers are swayed by the overall look and feel of cars as much as they are by *Consumer Reports'* ratings. Notebook vendors are paying more attention to such feel-good features.

Developers such as Compaq and Dell say they spend months surveying users to see if they like the floppy drive on the front or the side of the unit. They develop nonslip pads on the base, hinges that feel solid and stay where you put them, case latches that can't be unlocked accidentally and keyboards that feel like their desktop cousins. Together, these features can make a difference to the user.

A pound or two in the hand isn't worth as much as a unit's dimensions. Full-function systems such as the LTE and Tandon's NB/386SX will weigh from six to eight pounds for the time being. The ideal notebook size is 8½ by 11 in. — the size of a piece of typing paper. This size is a standard fit in the business world, whether you're talking desk drawers or briefcases. Adding a few inches, as IBM has done in its L40SX, may jeopardize spatial harmony.

Pastore is a *Computerworld* senior writer.

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applications.
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(If you're thinking
Sun, think again.)

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PROGRESS

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Computer still a baby, Joy says

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Propelled by progress on several fronts, desktop computers in the 1990s will grow exponentially more powerful while becoming dramatically easier to use, said William Joy, co-founder and vice president of research and development at Sun Microsystems, Inc.

To an appreciative audience of Sun users who gathered recently at the National Air and Space Museum, he explained "Joy's Law," which states that Sun workstations approximately double in performance each year. That means a Sun unit will compute at 4,000 million instructions per second by 1994, Joy said.

Sun workstations in 1994 will be good for 1,000 million floating-point operations per second, will have 1,000M bytes of memory and will attach to 1,000M bit/sec. networks, Joy said. "I know how to do this, but it's hard," he said. "We might be a year late."

Joy gave some clues about Sun's approach. Microprocessor clock speeds will increase modestly from 40 MHz to 66 MHz, but they will boost from one to three times the number of instructions executed per clock tick, an approach called superscalar processing. The top-of-the-line models will come with eight processors, Joy said.

What's down the road?

In a talk titled "The Future of Computing," Joy predicted the popularity of "nomadic devices" — electronic books, portable communications devices and the like. He also said computers will become an integral part of offices, conference rooms and theaters. For example, Joy said, systems will automatically make videos of meetings, index them for text retrieval using voice recognition and put the results into networked databases for later access by others.

"It's important to have a philosophy of innovation. We're in the very early days of computing, like automobiles in the 1920s," Joy said. Sun's vision is one of low-cost workstations, dedicated to a single person, with the power of a supercomputer linked to the world by networks, he explained.

Joy castigated corporate bureaucracy. "Truly bright people are a nonrenewable resource, and most of them are at small companies. In very large companies you also have bright people, but less densely, and they spend their time in meetings persuading others to get out of their way."

He said Sun's rule is: "By default, the answer is yes." That approach would not work everywhere, he conceded, such as in the loan department of a bank.

The larger computer companies have other problems, Joy asserted. "Computer companies founded before 1980 are in economic trouble because they misunderstand who creates value for the customer. It's the software writers who do that."

Sun has written about 2 million lines of system software in the past 10 years, Joy said. By the year 2000, it will have written 10 million to 20 million lines, almost all of it in the user interface for things such as voice processing, natural language programming, handwriting recognition and "heads-up [virtual] 3-D graphics," he said.

MICRO BITS

Zenith Data cuts prices

Zenith Data Systems, following on the heels of IBM, Compaq Computer Corp. and Dell Computer Corp., cut prices on select models of its desktop personal computers from 5% to 11.5%. The cuts affect four of its six desktop platforms, including its bottom-of-the-line Intel Corp. 80286-based PC and its top-of-the-line Z-386/33E. A Zenith Data spokesman downplayed competitive pressures, citing "normal course of business" as the reason for the cuts. Zenith Data cut prices on its desktop machines two months ago.

Next, Inc. announced that it has begun shipments of its $7,995 Nextstation color PC. The Nextstation uses 16 bit/pixel to display color images on its 17-in. monitor and also offers a 2.88M-byte floppy drive and 105M-byte hard disk, officials at the Redwood City, Calif.-based firm said. Next's high-end 32-bit color product, Nextdimension, is scheduled to ship next month.

Sun Microsystems, Inc. recently announced that its SunOS version of Unix has received X/Open Consortium Ltd.'s XPG3 Portability Guide Base certification. The XPG3 branding indicates that SunOS provides standard programming interfaces for the development of applications that can then be ported to various platforms.

Geoworks, Inc., developer of PC/GEOS and Geoworks Ensemble environments, recently signed a runtime license agreement with **Dimensions Research**, which produces the VP Planner family of spreadsheet products. Under the agreement, Dimensions Research will develop several applications for use with the PC/GEOS graphical user interface, the first of which will be a three-dimensional spreadsheet.

Imaging tool packs punch

BY RICHARD PASTORE
CW STAFF

Desktop publishers who would like to store high-resolution graphics on a network server have been stymied in the past by the unwieldy size of the data packets.

A 24-bit color image amounts to a 5M-byte, network-straining file. Some companies are offering image compression as a solution to this problem.

Torrance, Calif.-based start-up Video & Image Compression Corp. began shipping Picture Packer two weeks ago, a utility that compresses color and gray-scale images at ratios of 5-to-1, 20-to-1 and 30-to-1. It will shrink a 5M-byte image file to 172K bytes, a size more palatable for an Ethernet network, according to company President John White.

Compatible with IBM Personal Computers and compatibles, Picture Packer compresses and decompresses images with up to 24-bit color definition.

The $79 utility uses the Joint Photographic Experts Group algorithm for compression and works with desktop publishing applications and peripheral devices that support several popular graphics file formats.

BIOS promises laptop gains

BY MICHAEL FITZGERALD
CW STAFF

NORWOOD, Mass. — The advent of high-powered, battery-operated laptop computers is leading to some vendor creativity that could pay users dividends.

Phoenix Technologies Ltd., a maker of BIOSs for the personal computer market, brought out Phoenixview/LC, a video BIOS designed especially for laptops. According to Phoenix, the new BIOS runs video as much as 40% faster than other BIOS designs. It also has built-in power management facilities for laptop users.

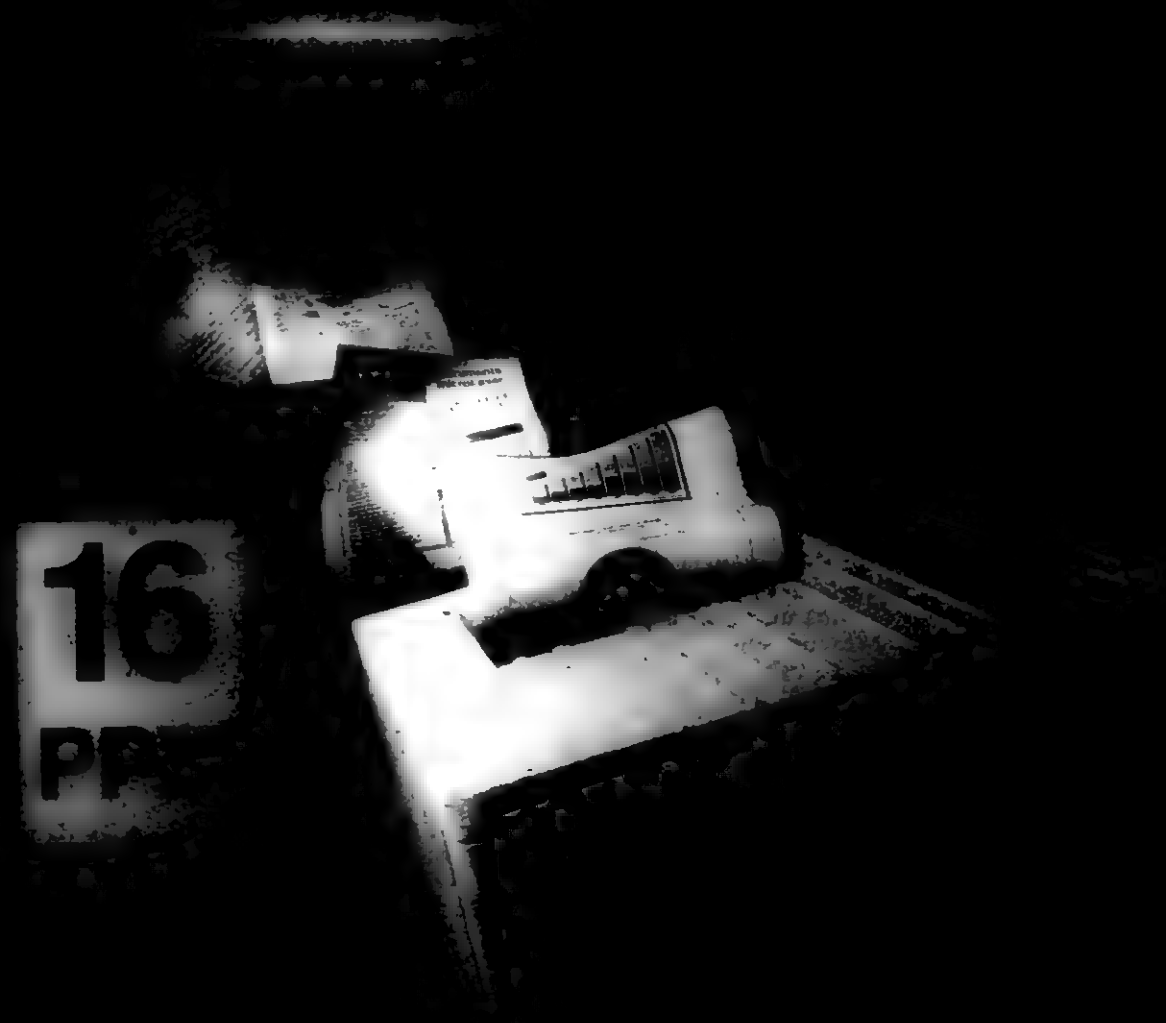
Such a product could benefit laptop users who want to run graphical programs such as Microsoft Corp.'s Windows or Geoworks Ensemble.

"Anything that's going to drive the screen faster in graphics mode in fact is going to benefit any user moving to the Windows environment," said John Dunkle, vice president of Workgroup Technologies, Inc. in Hampton, N.H.

Phoenixview/LC is being marketed largely to OEMs, mostly in the Far East.

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you guess wrong.)



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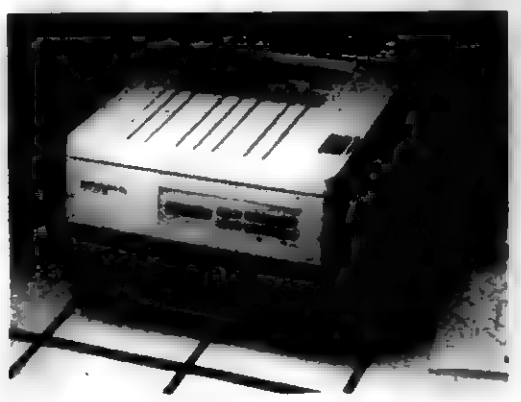
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NEW PRODUCTS

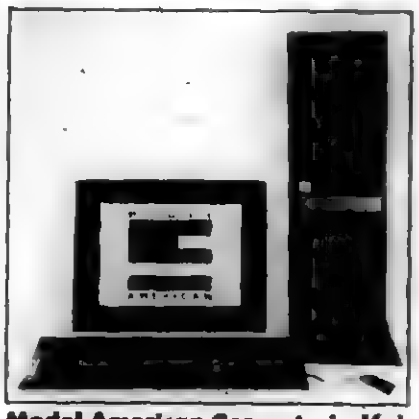
Systems

Scantron Corp. has introduced a portable pen-based computer terminal that allows users to transfer information to a database without requiring any key entry.

Scanscribe was designed with character recognition technology that enables the product to capture data as it is hand-printed on a paper form. The system's ability to define signatures, free-form sketches and diagrams allows its 8½- by 11-in. writing surface to be used for graphics entry.

The product is priced at $2,500.

Scantron
1361 Valencia Ave.
Tustin, Calif. 92680
(714) 259-8887



Model American Computer's *Model 386/25 and 386SX/20MHz offer greater fax capabilities*

Model American Computer Corp. has entered the personal computer market with its recent announcement of a pair of systems that feature a built-in facsimile capability.

The Model 386/25 ($2,495) and the Model 386SX/20MHz ($1,995) both include a built-in fax device capable of sending or receiving data at 9.6K bit/sec. The latter model includes an 80M-byte hard disk, a 3½-in. floppy drive and a two-button mouse. The former model includes desktop and tall versions. Both these versions include 4M bytes of random-access memory, a 120M-byte hard disk and 3½- and 5¼-in. floppy disk drives. All versions include MS-DOS Version 4.01 and Microsoft Corp.'s Windows 3.0.

Model American Computer
233 Needham St.
Newton, Mass. 02164
(517) 969-0093

Development tools

Realia, Inc. has introduced Real370, a personal computer-based, full-screen source-level assembler/debugger.

The product enables programmers to create, assemble and test mainframe assembler programs that were downloaded from a mainframe or created on a PC.

Real370 runs on IBM Personal Computer ATs, Personal System/2s or Intel Corp. 80286-based systems. A license fee costs $995.

Realia
10 S. Riverside Plaza
Chicago, Ill. 60606
(312) 348-0642

Apple Computer, Inc. has introduced an updated version of its Common Lisp development environment that is completely integrated with its Macintosh personal computer platform.

Macintosh Common Lisp 2.0 was designed as an interactive environment for performing object-oriented programming tasks. The product's support of the Common Lisp Object System, an object-oriented extension of Common Lisp, allows users to write portable object-oriented code that can be transferred among other Macintosh systems as well as between different platforms.

System requirements include a Macintosh Plus equipped with a hard disk and 2.5M bytes of random-access memory. A beta-test version is priced at $495, including a free upgrade to the final version.

Apple Computer
20525 Mariani Ave.
Cupertino, Calif. 95014
(408) 996-1010

Caseworks, Inc.'s Case:W Corporate Edition was designed for large-scale advanced Microsoft Corp. Windows programming.

The product supports secondary windows and Multiple Document Interface characteristics such as cascading and tiling of windows. The tool also monitors interface designs to ensure compliance with IBM's Common User Access, the vendor said.

A single-user version is priced at $995, and current Case:W users may upgrade their systems for $200. Case:W Corporate Edition began shipping last month.

Caseworks
1 Dunwoody Park
Atlanta, Ga. 30338
(404) 399-8236

Board-level devices

Dalanco Spry has announced a digital signal processing board that features analog and digital signal I/O for IBM Personal Computer ATs and AT bus compatibles.

The Model 250 is based on the Texas Instruments, Inc. 40-MHz TMS320C25 digital signal processor. It can provide data acquisition for eight single-ended channels at 12-bit resolution and can yield a maximum sampling rate of 250 KHz, according to the vendor.

The board can also be equipped with up to 128K bytes of zero-wait-state program random-access memory and 256K bytes of one-wait-state data RAM.

Pricing begins at $1,095.

Dalanco Spry
89 Westland Ave.
Rochester, N.Y. 14618
(716) 473-3610

Software utilities

Emerald Systems Corp. has announced an entry-level software package designed to perform unattended backup and retrieval of files on a Novell, Inc. network.

Scheduler automatically backs up files from multiple servers, local disks or various combinations of files, paths or directories at a time determined by a network manager.

The product's on-line tree structure maps the history of saved files by date, time and name. Scheduler runs on IBM Personal Computer XTs or Personal System/2s and is priced at $1,295.

Emerald Systems
12230 World Trade Drive
San Diego, Calif. 92128
(619) 673-2161

Best Power Technology, Inc. has announced Checkups, a software package designed to allow two-way communication between an IBM RISC System/6000 running under AIX and a Best Ferrups uninterruptible power supply.

During extended-line power failures, the product automatically triggers AIX routines to save data from memory to disks, close out work in progress and shut down the entire system, the vendor said.

Checkups is available for virtually all computers and operating systems and is priced at $125 or $250, depending on type of platform.

Best Power Technology
P.O. Box 280
Necedah, Wis. 54646
(608) 565-7200

Data storage

Curtis, Inc. has announced a read-only memory disk and drive emulator designed for IBM Personal Computer XTs, ATs or Extended Industry Standard Architecture-based computers.

The Romdisk PCF uses flash technology and Microsoft Corp.'s Flash File System to operate as a write-once, read-many device capable of adding data to the flash memory until it is full. It can erase flash memories at a rate of 4M bytes every 10 seconds and program flash memories at a maximum data transfer rate of 100K byte/sec.

A unit equipped with one flash single LU line memory module (SIMM) is priced at $895, and a device with one static random-access memory SIMM costs $995.

Curtis
2837 N. Fairview Ave.
St. Paul, Minn. 55113
(612) 631-9512

Overland Data, Inc. has introduced an automatic loading, nine-track tape drive designed for personal computer users.

The OD3210 supports 1,600 by 3,200 byte/in. operation. It includes microprocessor-controlled motors that optimize tape tension to ensure accurate reading of even tapes of marginal quality, the company said.

The product also includes a 1M-byte cache buffer and averages 45W of consumption.

The drive costs $4,995.

Overland Data
5600 Kearny Mesa Road
San Diego, Calif. 92111
(619) 571-5555

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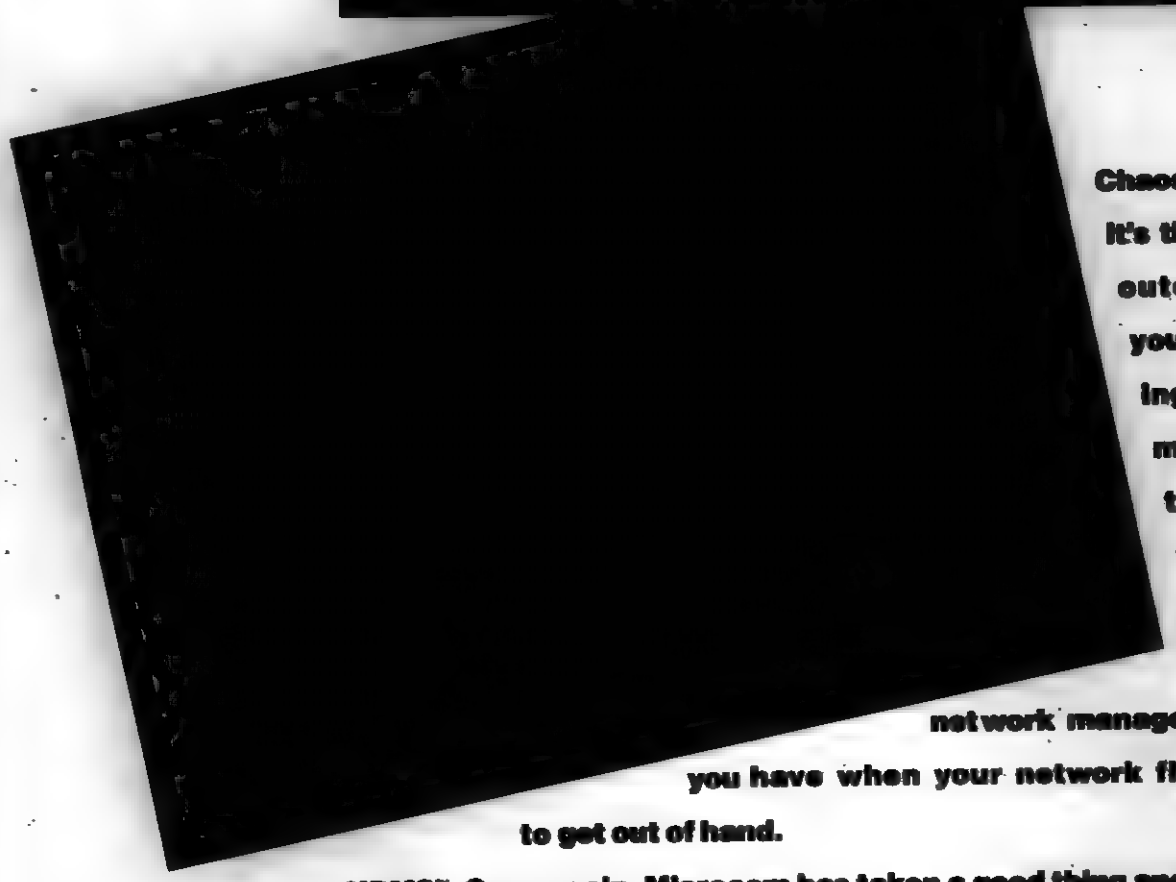
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BIT BLAST

COS loses president

Corporation for Open Systems, the umbrella organization for U.S.-based standards bodies, is losing its president, chief executive officer and first employee, Lincoln D. Faurer. Faurer, who oversaw COS' initial staffing and expansion since its inception in 1986, will be succeeded by COS Chief Operating Officer Steve Hudson pending approval by the organization's board of directors in May. Faurer will continue to serve COS in an advisory capacity this year.

COS test programs set up to ensure Open Systems Interconnect (OSI)-compliance and interoperability among vendors' products are beginning to see results. AT&T's X.25 Network Interface Release 2.0 was judged OSI-compliant by the COS Mark Program. Digital Equipment Corp.'s OSI Conformance and Interoperability Test Center has been accredited as a First Party Test Center under the COS Mark Program. IBM and Unisys Corp. recently became the first computer firms to register their file-transfer products in the OSInet Corp. Test and Registration database. A COS affiliate, OSInet is an association of computer and network vendors and users that supplies OSI test formats.

CC:Mail, Inc. in Mountain View, Calif., announced two programs to entice users to migrate from 3Com Corp.'s 3+Open Mail to its own local-area network-based electronic mail system. The announcement follows a joint announcement that 3Com will reference sell CC:Mail's system. CC:Mail will provide one free Post Office Pack for MS-DOS for each server version of 3Com mail converted. It will offer a three-for-one trade incentive to any company converting more than 500 3Com mail users to CC:Mail.

Outsourcing may be only answer for many

ANALYSIS

BY GARY H. ANTHES
CW STAFF

The life of the corporate network manager is not getting any easier. Networks are growing rapidly in size, complexity and cost; technical experts are expensive, hard to find and hard to keep; new technologies and new vendors appear at a dizzying rate; and users clamor for more and better service while their bosses demand lower costs.

For network managers confronting these forces, the question may no longer be whether to outsource but what to outsource. There seem to be as many answers to that question as there are companies looking for an answer.

The network outsourcing services market is expected to jump from $1.5 billion in 1989 to $5.6 billion in 1994, according to The Yankee Group in Boston. Dixon Doll, chairman of the DMW Group, a network consulting firm, recently said only 4% of users are outsourcing parts of their network operations today, but by 1995, 15% to 20% of U.S. corporate networks will be managed by outsiders.

The prevailing view among users is that a company can let go of the commodity-like network functions, sometimes called tactical functions. It is possible to save both money and headaches by letting someone else pull wires, provide circuits and move equipment. However, never let vendors get their hands on mission-critical or strategic areas, the reasoning goes. That is too risky, and vendors do not know a company's business like the company does.

Others call that nonsense: Users can outsource anything they want as long as they are careful. Not surprisingly, outsourcing vendors, such as Electronic Data Systems Corp. (EDS), hold that point of view. "Partial outsourcing is a nonsequitur. If you outsource, you do it as much as you can," said Charles Snodgrass, a vice president in EDS' telecommunications services practice. "I'd contend you gain control via outsourcing, not lose control. You can't hold me responsible if you've given me only a piece of the pie."

The tactical-strategic distinction is an arbitrary one anyway, Snodgrass said. "When a tactical circuit goes down, it becomes a strategic circuit."

EDS took total responsibility for the voice and data networks of National Car Rental System, Inc. networks that link thousands of rental and travel agents to National's car inventory and reservation systems.

The real issues are ones of risk and control, not who has day-to-day responsibility for a function. Todd Dagres, director of communications research and consulting at The Yankee Group, said it may make sense to outsource strategic functions — such as management of a mission-critical network — if a few senior people are retained to monitor the performance of the contractor and to do strategic network planning. "Keep a window into the network. Trust but verify," Dagres said.

It is also important to write a contract that allows plenty of flexibility for the customer to

Continued on page 54

Customer	Vendor	Description	Main goal
Kodak	DEC	Total network outsource	Reduce cost
Kendall	IBM	Network management	Reduce cost
Chevron	AT&T/Hughes*	Total network outsource	Reduce cost
Wickes	Andersen	Network management	Reduce cost
General Motors	EDS	Total network outsource	Acquisition
Merrill Lynch	MCI	Corporate backbone	Reduce cost
Exxon	AT&T	Point-of-sale network	Availability
Canadian Treasury	DEC	Network management	1-year transition

Source: The Yankee Group — CW Chart: Tom Monahan

USPS automates to lick increase in stamp prices

BY JOANIE M. WEXLER
CW STAFF

MERRIFIELD, Va. — Immersed in a project that puts IBM's System Network Architecture (SNA) on speaking terms with Unix-based personal computers, the U.S. Postal Service is automating its data entry procedures in a move that it hopes will keep the 29 cent stamp steady and holding.

In an effort to reduce operating costs, the postal service is currently about 20 nodes into automating the daily transfer of post office receipts from about 170 post office polling sites to five nationwide data centers housing IBM and Amdahl Corp. mainframes.

The network involves the installation of Intel Corp. 80386-based PCs running Interactive Systems Corp.'s Unix System V Release 3 operating system and Unix-to-SNA connectivity software from Malvern, Pa.-based Rabbit Software Corp. Unix does not easily fit into an SNA environment, requiring conversion software to allow them to [illegible]

"We expect to drastically reduce data entry errors and the time necessary to turn around information," said Frank Auger, an automation manager at the postal service's engineering and development center.

Auger said he expects the cuts in data entry turnaround time to result in operational efficiencies and cost savings because of the quicker availability of on-line management information. He added that the system will result "in faster closeout after hours, which should reduce dollars spent in overtime pay."

In addition, the new system will provide speedier tracking of lost items by replacing paper audit trails with electronic ones, Auger continued. "These are cost benefits that could help keep postage prices in check."

The polling centers running the Unix-based PCs gather financial and other data from U.S. post offices each night. The 80386s connect to 2,400-baud modems and poll PCs in the post offices over dial-up analog telephone lines. The Unix machines filter and transmit data to the mainframes, which run SNA protocols.

Direct communication

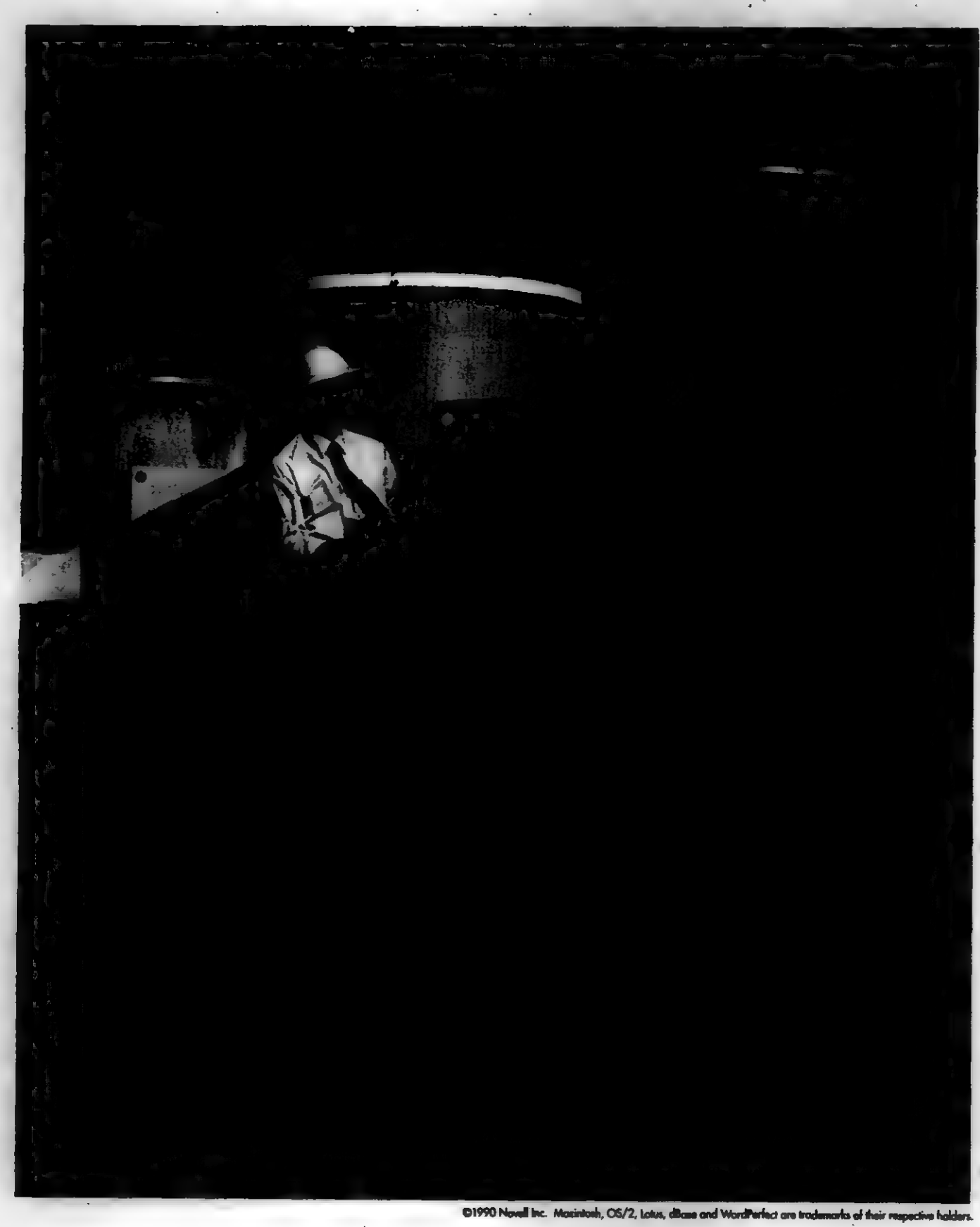
Rabbit's Open Advantage RJE software is allowing the Unix boxes to appear to communicate directly with an IBM mainframe's front-end processor, printers and other devices. Previously, the polling centers sent hard copies of the financial information to the data centers, where it was entered manually into the host computers from IBM terminals.

Equipment in the data centers does not have to be upgraded with the Rabbit software; each 80386 PC in the polling centers requires a gateway card and Rabbit software license, which collectively retail for $1,295.

The pickings for Unix-SNA connectivity software were slim when the postal system scouted out a vendor last year, Auger said. Only Rabbit offered an interface that allows his organization to programmatically control operations, he added.

The percentage of PCs running the Unix operating system is currently under 1%, according to CIMI Corp., a consulting firm in Voorhees, N.J. CIMI president Tom Nolle said he does not expect that number to ever top 10% because of competition among Unix, Microsoft Corp.'s Windows and OS/2 for control of the "power desktop."

NetWare Solves Issues At



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But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

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The Past, Present, and Future of Network Computing.

Fast-packet capability a concern for T1 users

ANALYSIS

BY JOANIE M. WEXLER

Companies with heavy T1 investments and burgeoning data networking applications must examine whether their vendors are offering a plausible migration path to fast-packet technology.

Fast packet represents the latest generation of wide-area switching aimed at supporting such emerging bandwidth-voracious applications as local-area network interconnection, imaging and videoconferencing.

The technology encompasses transmission of variable-length packets (frame relay) and fixed-length packets (cell relay). It blends the desirable traits of its circuit-switching and X.25 packet-switching predecessors, including efficient use of bandwidth, high throughput rates and low network delays.

Most T1 multiplexer vendors have said they will usher their customers into the fast-packet world by upgrading their existing circuit-switching T1 gear. Approaches include fast-packet cards that plug into the T1 multiplexer's bus (Network Equipment Technologies, Inc. and Newbridge Networks, Inc.) and creating a separate fast-packet device that hooks into existing multiplexers (Timeplex, Inc.). The resulting products are intended to support a hybrid circuit/fast-packet architecture.

Time frames for availability of the hybrid products have been fuzzy because vendors — like users — are grappling with the issue of how much they can squeeze out of existing devices before investing in a whole new architecture.

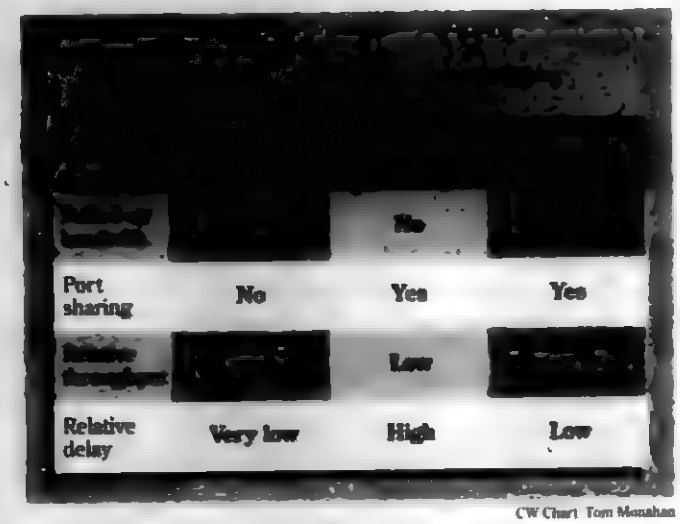
The strategy to patch a fast-packet card onto an existing circuit-switched multiplexer is "a transitional approach that gives users an opportunity to dabble in fast-packet technology," said Steven A. Taylor, president of Distributed Networking Associates in Greensboro, N.C. "But as a higher percentage of traffic becomes data, it may not be sufficient."

Taylor commented that Timeplex's plan to build a whole new fast-packet box "shows chutzpah" on the part of the company. "Timeplex is rightly acknowledging that its 10-year-old Link architecture can't do everything," he said.

Taylor said an advantage with the Timeplex approach is that a stand-alone, fast-packet device can be mixed and matched with other vendors' T1 gear. A disadvantage, he said, is integrating network management of separate devices.

Some users with the luxury of building new networks from the ground up, such as the computer services arm of Stuttgart, Germany-based Daimler-Benz, are deploying switches specifically designed to support fast packet. Currently, Stratacom, Inc. is the only vendor with a commercially installed base of fast-packet T1 multiplexers. Daimler-Benz recently contracted for 14 Stratacom multiplexers.

"With the Stratacom approach, you're clearly putting all your eggs in one basket," commented Dave Passmore, a partner at Ernst & Young in Fairfax, Va. "Without any circuit-switched bandwidth, you no longer have the assurance that particular types of traffic will always get through. You really have to learn how to do your network engineering."



CW Chart: Tom Monahan

Joining the club

Other companies, such as Fedex International Transmission Corp., are preparing for their growing network traffic by investing in multiple vendors' equipment to handle different applications (see story above).

Fast packet's attributes are made possible by the increased intelligence of networked devices and today's highly reliable transmission lines, which allow the elimination of the error detection and correction overhead that bogs down X.25 networks.

Traditional T1 multiplexers support circuit-switched voice and data traffic and allow users to nail up 64K bit/sec. increments of channelized bandwidth up to 1.5M bit/sec. X.25 packet switches improves upon circuit switching by breaking data into packets and dispersing them throughout all 1.5M bit/sec. of available T1 bandwidth to optimize the use of the communications link. However, the variable-frame format of X.25 packets does not make it suitable for voice because of network delays inherent to the packet structure.

A mixed bag

To get the blend of wide-area switching capabilities it needs, Fedex International, a subsidiary of Federal Express Corp. in Memphis, is not relying on a single T1 multiplexer vendor. Last fall, the firm added Netrix Corp. T1 multiplexers to its network of 5-year-old Network Equipment Technologies (NET) gear, creating a hybrid network spanning 26 cities.

NET's IDNX multiplexer currently only supports circuit-switching; Netrix switches combine circuit and packet switching in one box. Netrix has publicly stated that a third switching fabric — frame relay, a fast-packet technology — will eventually be incorporated into the architecture.

Gary Ragsdale, assistant vice president at Fedex, said the dual-vendor solution should satisfy Fedex's needs for two to three years. "We chose Netrix to solve an immediate problem of upgrading our custom-built packet switches because our software maintenance costs became unwieldy," he said.

The frame-relay support of the Netrix equipment is important, Ragsdale said, because "one of our primary concerns is to boost inter-LAN traffic above the 56K bit/sec. barrier."

JOANIE M. WEXLER

Outsourcing

FROM PAGE 51

make network upgrades as technology changes and one with performance metrics and vendor penalties in case problems occur, Dagres said.

Outsourcing does not have to mean giving up something on a permanent basis. The problems that suggest outsourcing, such as rising costs and personnel shortages, may be solved by one-time consulting or engineering engagements by networking experts.

Taking it slow

One way for a company to take a partial step down the outsourcing path is to give the vendor its network during second and third shifts and weekends while keeping control over the more critical prime time. As confidence in the vendor grows, more can be outsourced.

Melbourne, Fla.-based Harris Corp. outsourced its worldwide voice networks to MCI Communications Corp. but held on to management of its data communications. "We're very happy with MCI. It's a lot easier now," said Jim Odom, manager of network tools at Harris.

"But our data communications is very application dependent, with different applications using different protocols. The vendor doesn't understand our applications and doesn't understand the criticality when a circuit goes down," he said.

Odom said when data networks become as standardized as voice networks, it may be time for companies to look at outsourcing again.

Companies wondering what to outsource might look at their local-area networks, Dagres said. Most outsourcing vendors concentrate on wide-area networks and companies often overlook LAN outsourcing because LANs are not controlled centrally within the company nor is their cost accurately measured.

No matter what, a prudent company will carefully weigh its network outsourcing options. "You have to demonstrate you've entertained the possibility, or you'll be asked embarrassing questions you can't answer," said John J. Reis, president of International Telemanagement.

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VXM finds way to Balans multivendor tasks

Offers software first to provide load balancing across distributed networks

BY ELISABETH HORWITT
CW STAFF

BOSTON — VXM Technologies, Inc. has reportedly beaten industry leaders to the punch in providing a way to allocate and load balance tasks across a multivendor distributed computing network.

VXM's Balans software package will perform the above tasks across a variety of distributed computing platforms, including Sun Microsystems, Inc.'s Open Network Computing (ONC), the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) and Hewlett-Packard Co.'s Network Computing System (NCS), according to VXM President Franco Vitaliano.

NCS and DCE are technically equivalent since the OSF recently adopted NCS as the basis of its environment, he added.

Balans works with mapping and naming services such as Sun's Network Information Service and HP's Task Broker, which keep track of which services and computing resources are available on different systems, Vitaliano said.

As a result, applications that support Balans can transparently initiate tasks on various networked servers without having to designate the server's location or worry about whether the said server supports NCS, DCE or ONC, Vitaliano said.

Mapping provided

If an ONC client needs to access an NCS server, for example, Balans will provide the necessary mapping and translation to accomplish this. If a client application happens to support ONC, but wants to access an NCS, Balans will automatically map its request to an NCS-DCE naming/location service, he added.

Balans is also said to balance application loads across different servers, taking into account the comparative power of different CPUs and changing work loads.

Balans' ability to "glue Sun and DCE-NCS networks" into one distributed computing system is of great potential value to investment companies that are currently eyeing distributed computing as a way to set up applications for new products more quickly, according to Steve Levy, a former vice president at Boston-based investment firm The Putnam Cos. Levy helped develop a distributed computing platform at Putnam and recently started The MacGregor Group, a software company that will develop and implement similar platforms to investment company.

One concern Levy voiced, however, was the amount of work it takes to migrate existing applications to Balans. While the program is written in C, "you would still have to rewrite portions of applications" to support Balans, he added.

Levy described Balans as an advanced version of HP's Task Broker, a software offering that allocates jobs across a network of HP Unix systems. HP recently announced it is porting Task Broker to Sun systems in cooperation with Science Applications International Corp.

Unlike Balans, however, Task Broker does not hook into distributed computing systems such as NCS that allocate a given job among several computers, said HP spokesman Marc Lederhos. Instead, Task Broker determines which of several Unix-based systems should get the whole job. It was also designed for engineering work group networks of up to 30 or 40 nodes, not for extensive, enterprisewide sytems, Lederhos said.

Balans' first user site, Iowa State University, plans to use the product to automatically allocate and administrate system resources across Sun, HP and Digital Equipment Corp. Ultrix-based machines, the university said in a prepared statement. The installation will eventually incorporate 1,000 nodes, Iowa State added.

BALANS BALANCES applications loads across different servers, taking into account the comparative power of different CPUs and changing work loads.

When it comes out in the third quarter of this year, Balans is scheduled to support Sun's Scalable Processor Architecture and DEC Ultrix workstations. VXM plans to migrate the system to DEC VMS systems by the fourth quarter of this year and to IBM MVS systems by the first quarter of next year.

The program will also support the Network Queueing System, a software package that distributes batch jobs across a network. Originally developed for the National Aeronautics and Space Administration, the system is expected to become a Posix standard, Vitaliano said.

Pricing for Balans was not available.

Radio network developers target IBM mainframe links

BY MICHAEL FITZGERALD
CW STAFF

LINCOLNSHIRE, Ill. — Ardis, a partnership of IBM and Motorola, Inc., and CAP Gemini America have agreed to jointly develop an LU6.2 interface link between radio-based networks and IBM 3090 and Enterprise System/9000 mainframes. The move was given qualified praise by analysts as one that may make it easier for users to switch applications to radio data networks such as Advanced Radio Data Information Service (Ardis).

Currently, Ardis users must develop their own interfaces between their mainframes and the handheld radio network.

Alan Reiter, executive editor of the newsletter "Mobile Data Report" in Washington, D.C., said the interface was not going to ignite interest in radio data networks. "From a mobile data standpoint, this is just one of many, many pieces of trying to sell mobile data communications," Reiter said.

Users were equally reserved.

"It could be [useful]," said Tivadar (Max) Macskassy, manager of network and communications at Maersk Data, a Madison, N.J.-based subsidiary of Maersk, Inc. Having CICS connections through LU6.2 may not be as relevant, because distributed computing de-emphasizes the mainframe, Macskassy said.

This is "a very reasonable thing" for Ardis to do, said Joseph Baylock, program director at Gartner Group, Inc. in Stamford, Conn., while agreeing that the interface is one of many things Ardis needs to do. "To the extent the market at large is going to LU6.2, you want to be able to talk to your field force automation applications on the same basis," Baylock said.

Although no Ardis customers have asked for such an interface, Ardis said it believes that developing the interface will put it "in front of demand," said Barbara Wagner, an Ardis spokeswoman. The interface should ship by mid-April.

New York Life Insurance Co., an early Ardis pilot program, decided not to use Ardis to give 10,000 agents access to mainframes. The firm wanted to ship 40,000-character files, which cannot be handled by the network.

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NEW PRODUCTS

Network management

General Datacomm, Inc. has announced a DOS-based software package designed to support up to 256 network elements while running on an IBM Personal Computer AT or compatible.

The Netcon Small System Controller includes four serial ports for carrying diagnostic data, and a multitasking capability allows management routines to remain uninterrupted while continuous background surveillance is performed and while an operator configures the network, the vendor said.

The product is priced at $7,500.
General Datacomm
Middlebury, Conn. 06762
(203) 574-1118

Newport Systems Solutions, Inc. has unveiled a data compression enhancement package designed for Novell, Inc.'s Netware Link/64 and Link/T1 products.

A proprietary algorithm provides an average data compression ratio of 4:1, according to the vendor. The data compression enhancement is said to enable 9.6K bit/sec. lines to yield bandwidths of 38.4K bit/sec. or higher and 128K bit/sec. lines to yield bandwidth up to 512K bit/sec.

The product is priced at $1,595.
Newport Systems Solutions
4019 Westerly Place
Newport Beach, Calif. 92660
(714) 752-1511

Local-area networking hardware

Xerox Corp. has announced an integrated facsimile server that enables users of Novell, Inc. local-area networks to send and receive faxes directly at personal computers or workstations.

The Xerox Lan/Fax Express 21 comprises a Xerox telecopier 7021 plain-paper fax terminal and hardware accessory and software. The product enables users to fax computer-generated documents from a pop-up window without having to exit from the application, according to the vendor.

Other features include more than 350 fonts and support for Hewlett-Packard Co.'s Laserjet PCL page description language.

The product is priced at $6,995.
Xerox
Xerox Square
Rochester, N.Y. 14644
(716) 423-5090

Softnet, Inc. has announced a server that enables users of personal computer-based local-area networks to share a single intelligent facsimile board.

Sharefax Version 2.11 allows users to send data to a fax machine via a command line or a 27K-byte terminate-and-stay-resident (TSR) utility. The product includes hot keys that are said to enable users to access a fax machine while remaining within other applications.

A 50K-byte TSR utility can be used for faxing multiple files to one or more fax machines. The product also allows users to delete names from a fax log at the fax server. Fax transmissions can also be scheduled for later in the day when telephone line charges drop.

Pricing is $795 per server, regardless of the number of workstations.
Softnet
775 Franklin Road
Marietta, Ga. 30067
(404) 499-0007

Micro-to-host

Teamwrite Corp. has introduced a Microsoft Corp. Windows 3.0-based interface program designed for personal computers connected to IBM Application System/400s, System/34s, 36s or 38s.

SAA/Vision-400 allows host-generated screens to be styled to the Windows environment without requiring any changes to the host. Instead, host screens can be captured and stylized later in off-line mode, the vendor said.

Other features include support for multisessions in separate windows, 132-character support, mouse selection of input fields and automatic font resizing.

The product is scheduled to begin shipping next month. A basic program is priced at $199 per PC. A developer's kit that includes an on-line screen styling module costs $799 per PC.
Teamwrite
1403 N. Batavia St.
Orange, Calif. 92667
(714) 744-1496

Software Corp. of America, Inc. has announced an IBM Presentation Manager-based communications product designed to assist users in building connectivity workstations.

Talkthru for OS/2 ($350) supports asynchronous communications and IBM's Extended High Level Language Application Programming Interface in an OS/2 environment. It also features terminal emulation for asynchronous protocols and will operate with coaxial, asynchronous or networked devices.

Talkthru for OS/2 runs on an IBM Personal Computer XT, AT, Personal System/2 or compatible running OS/2 Standard or Extended Editions.
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- **3270 EMULATION**—CQ Computer Communications; NSA; Attachmate; Black Box; Sterling Software
- **5250 EMULATION**—CQ Computer Communications; Black Box; Emerald
- **X.25**—Microdyne; NSA
- **UNIX, XENIX, AIX**—The Santa Cruz Operation; Cleo; Serengeti Software
- **REMOTE JOB ENTRY**—CQ Computer Communications; Serengeti Software; Eastham Assoc.; Sterling Software; Barr Systems; NSA; Black Box; Cleo
- **APPC/LU6.2**—NSA

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MANAGER'S JOURNAL

EXECUTIVE TRACK



David L. Gaugler has been named director of the Systems Management Division at the **U.S. Internal Revenue Service** in Washington, D.C.

He is responsible for assistance on new technologies; monitoring regional, district and service center computer systems; capacity management; systems software; and data administration.

Gaugler had been assistant director of the IRS Martinsburg, W. Va., Computing Center since 1989.

He began his IRS career in 1967 in Washington and has held information systems positions in Fresno, Calif., Philadelphia and Dallas.

Gaugler holds a bachelor's degree in mathematics from Muhlenberg College and a master's degree in industrial engineering and computer science from Stanford University.

.....

Mark H. Breedlove has been appointed president and general manager at the **Allied-Signal, Inc. Automotive Certified Brakes Division** in Toronto.

Breedlove was formerly director of manufacturing logistics and IS at the Allied-Signal Autolite group in Fostoria, Ohio.

He joined Allied-Signal in 1979 in the financial operations of the Bendix Automotive Systems Group in Southfield, Mich. He joined Autolite in 1986.

.....

John R. Reese, former director of corporate communications and office automation at First City Bancorp, was named vice president and general manager at **Teleport Communications Group's** Houston office.

Teleport, based in Staten Island, N.Y., provides private-line voice, data, video and other telecommunications services.

At First City Bank, Reese helped negotiate a 10-year outsourcing contract with Electronic Data Systems Corp. He then joined EDS as telecommunications manager with responsibility for managing telecommunications networks and services at First City Bank.

Casual clothes, serious systems

Wrangler CEO Mackey McDonald has weighty things to say about IS in his business

BY CLINTON WILDER
CW STAFF

Blue jeans might not sound like a high-technology business, but don't tell that to Wrangler's president and chief executive officer, *Mackey J. McDonald*. Belying the casualness of both his product and his friendly Carolina drawl, McDonald is dead serious about the critical role of information systems in the rapidly changing apparel business.

Greensboro, N.C.-based Wrangler, a division of $2.6 billion VF Corp., in many ways represents a microcosm of fundamental changes that have hit many U.S. manufacturing industries. Where once it thrived on efficient manufacturing of commodity goods for mass markets, Wrangler must now cope with fickle consumer needs and new competition for retail shelf space.

McDonald, 44, joined Wrangler at the height of these fundamental changes in 1986 as executive vice president and was named president and CEO in 1988.

Although Wrangler has made great strides in using IS to enable business change, McDonald says he feels that the apparel and retail industries are far from where they should be in reaping technology benefits. McDonald has many other insights into applying technology to a rapidly changing business:

• On learning the importance of IS: McDonald says he became aware of IS' value "primarily through not having enough information and making huge mistakes as a result of that — putting products out that didn't work, having inventories that were out of control. Because that was so normal in our industry, it just was almost accepted.

Continued on page 62

THE CEO VIEW



City Exposure

Wrangler

The man: *Mackey J. McDonald, 44; B.A., prelaw, Davidson College; MBA, marketing, Georgia State University*

The career: *President and CEO of Wrangler, 1988-present. Also group vice president of parent VF Corp. with responsibility for Health-tex division. Executive vice president, Wrangler, 1986-88. President of former Troutman division of VF, 1984-86. Vice president of Lee division of VF, 1983-84*

Accomplishments: *Reduced Wrangler product cycle times by 30%; reduced some production lead times from one week to one day; implemented daily retail point-of-sale data capture for more accurate stock replenishment*

Business and technology goals: *Continue to diversify product line; reduce product cycle times by 50%; extend EDI links to more retailers*

U.S. business still follows the paper trail

BY JIM NASH
CW STAFF

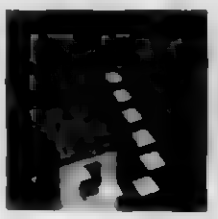
There is a bald mountain somewhere in Oregon dedicated to all the memos that computers were supposed to replace with electronic documents.

Without a doubt, paper-based communications are slowly being converted to electronic code. But despite all the advances in imaging and electronic data interchange technology, it is impossible to tell if the conversion rate will ever match the growth rate of paper use.

Roberta Jackson, president of the Boston chapter of the Association of Records Managers and Administrators, said the paper industry predicts a 20% increase in the use of paper by the year 2000.

Jackson said that electrons carry only 5% of all business information in the U.S., while 10 times that percentage could and should be imaged for electronic distribution and storage.

However, more than mere fondness for file cabinets keeps executives printing their correspondence. There is the satisfaction of getting or giving commendations on smooth, tangible paper, Jackson said. Congratulatory notes via electronic mail do not seem to cut it.



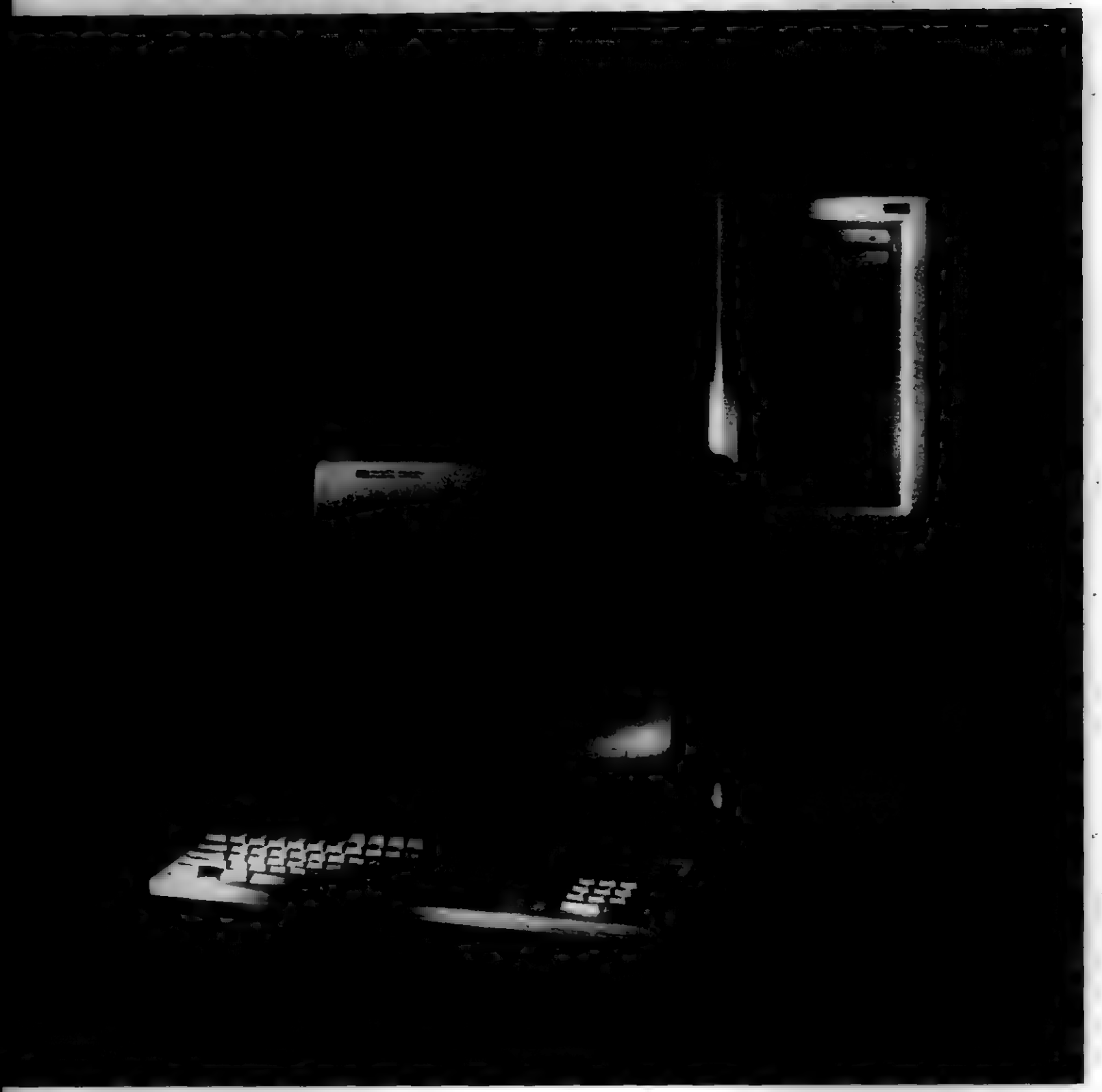
On the other hand, walking papers continue to be just that. According to Jackson, managers dealing with personnel matters show about the most resistance to electronic communication.

On a more concrete plane, judges and state regulators consider paper documents the "best evidence," she explained. For this reason, technology may even end up giving paper renewed life.

In an age when photographs, video and film can be very convincingly altered, the legal and government worlds are becoming increasingly suspicious of electronic documents stored on floppy disks, tapes and hard disks.

Responding to this continued insecurity, managers are more likely to store more documents in larger and larger warehouses as backups to their electronic cousins, Jackson said.

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HEWLETT PACKARD

[1] Computerworld, 10/2/89. [2] PC Magazine, 9/26/89. [3] Warranty applies to HP Vectra 486/25T and 486/33T PCs. Warranty offer available only in U.S. and Canada. © 1991 Hewlett-Packard Company CPPC012

Outsourcing at Southland: Best of times, worst of times

BY JOHANNA AMBROSIO
CW STAFF

DALLAS — Elliot McNeill's tale of outsourcing is the classic good news/bad news story. The good news is that McNeill, MIS manager at The Southland Corp., is getting good service and saving money. But getting there has not been easy, and some problems — billing and disaster recovery, among them — remain.

"Would I do it again?" McNeill asked. "Intellectually, I'd say no. But if I went back to 1988, and the circumstances were the same, yes, I would."

McNeill shared his experiences at a recent forum hosted by accounting and consulting firm Deloitte & Touche.

In 1988, McNeill recalled, Southland's chief executive officer became enamored of the outsourcing option after the company had completed a leveraged buyout resulting in a huge debt. "We had to downsize very quickly, and we were in cash-conscious mode," McNeill said.

On Jan. 1, 1989, Southland, the $8 billion operator of 7-Eleven stores, began its 10-year outsourcing contract with then-start-up Affiliated Computer Services, Inc. (ACS) based here. In exchange for low-priced processing services, Southland essentially gave its data center to ACS, providing the vendor with capacity to sell services to other customers.

"We contributed two CPUs — an Amdahl Corp. 5580 and an IBM 3090 — a satellite earth station and 96 computer operations employees," McNeill said. Southland also leased to ACS an 11-story building that housed the data center.

"We didn't have to move anything, and they gave us a break in pricing," McNeill said. At the time, ACS was a very small operation. "We were their second client," he noted.

Cultural tug of war

The first year of the relationship was a tug of war, McNeill recalled. "There were two company cultures with mixed data and mixed standards, and it was a challenge to everyone." But in 1990, "we got excellent service and still do; now, we're very pleased. But if you had asked me to speak here two years ago, I don't know if I would have," he added.

Some problems remain, however, and among them are sticky issues related to billing. Southland is charged by CPU hours, tape mounts, direct-access storage device use and lines of print. There are also fixed charges for terminals and communications equipment.

"The problem is that you can run the same job with the same input at two different times and get two different charges for it," McNeill said. "That's been a problem at our company."

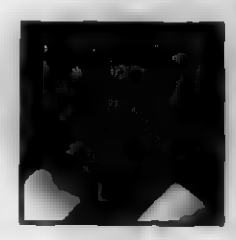
Another issue concerns disaster recovery. "Because ACS was such a small company, we still haven't had a satisfactory disaster recovery test. We're hoping to fix that next month," he added.

The cost savings are difficult to pin down. In 1988, McNeill said, Southland spent $13.2 million on information systems; in 1990, that figure was $10.8 million. "But we don't know for sure which part of that reduction was caused directly by outsourcing," he said. "We might have been spending less anyway due to our downsizing. It's hard to say."

Since its leveraged buyout, Southland has also undergone Chapter 11 bankruptcy protection and is now majority-owned by its Japanese affiliate, 7-Eleven Japan.

One result of the outsourcing is that Southland is "focused on cost," McNeill said. "It's like the electric company; you use less, you pay less." Still, he added, "I'm held accountable for every uptick in the bill."

Another problem is that "you lose control of technology and timing of upgrades," McNeill said. "And you lose the direct contact with vendors."



Nevertheless, he said, Southland retains firm control of its strategic direction as IS McNeill's in-house staff of 99 still does applications development and manages the relationship with ACS.

"When they're not performing, it's my duty to bring that to their attention," McNeill said. "And it's still our responsibility to keep up with technology trends. It's not in the vendor's best interests to tell us about trends like PC-based computer-aided software engineering because it takes cycles off the mainframe."

McNeill advised anyone considering outsourcing to "make sure you have very specific performance criteria for the vendor to live up to and performance remedies if he doesn't. Also, make sure that in the contract you have something very specific to be billed on."

Furthermore, he said, "be very careful that this is what you want to do because you can't go home again. If you decide you don't like it, you've already given up your technical employees and software licenses, and you don't have a data center anymore. It's not as easy to get out of as a marriage."

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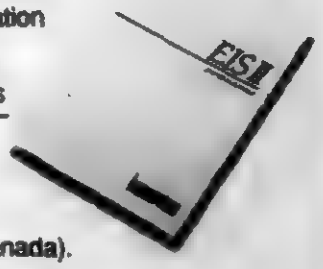
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information resources inc

*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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Wrangler

FROM PAGE 59

So I began to realize that without the information systems that you need, you cannot manage a business — particularly when you're trying to make major changes in the business."

• On how IS can enable change in business processes:

"Instead of just shipping inventory into retailers, we had to focus on what happens to the products once they get on the shelf. That meant we had to have continual feedback about what was happening there, and we basically didn't have any at all. In many cases, our retailers didn't have a lot either.

"So we've really been working hard on our EDI linkage to the retailers. But it's not just linking up — it's being able to change our manufacturing system so that we could respond to sales of products that took off, or cut back our production when products weren't selling quickly. We have a satellite dish on top of our building where we receive daily sales information from Wal-Mart and other customers like that. We can automatically generate orders based on that, and we have the Quick Response capabilities in manufacturing to be able to ship out those goods in a couple of days."

• On re-engineering manufacturing for Quick Response:

"That was the most difficult thing we went through. This whole idea of quick change, flexibility and producing different types of products was foreign to what we were good at. We had to not only implement a lot of new systems, we also had to change the mind-set of a lot of the manufacturing people. Actually, it was the mind-set of the whole company. We'd had some very profitable years, and the need for change wasn't seen by a lot of people."

• On implementing flexible systems:

"In a meeting in 1989 to discuss the new product development and manufacturing system, one manufacturing manager said, 'We can be as flexible as you want. All you have to do is tell us far enough ahead what you need and then stick to it.'

"My first reaction was, why did I have to be surrounded by bullheaded managers? But I realized it was my bullheadedness that was preventing me from seeing a key truth. The old system could not handle diversity because you did not have enough information about what type of product was needed and in what quantity. Schedules and product lines were continually changed with processes that were not designed for flexibility."



Chip Henderson

"I DON'T SEE HOW A company that is not moving extremely fast in information systems is going to survive."

Mackey J. McDonald
President and CEO
Wrangler

• On the progress of IS in the apparel industry:

"The apparel industry has a long way to go. We do far too much in this industry in just testing the waters, just putting products out there and hoping that somebody will buy them. The public goes in and either buys them because there's nothing else available, or they just turn up their noses and walk away, and then we've got huge inventories of nonproductive products. You need to know what's happening as soon as you put a product out there, so you can go into full production on it or just scrap it and go on to the next one.

"The ability to tie the retailer's and manufacturer's systems together and really control the right inventory out there is going to sort out the winners and losers in the next five to 10 years. There will be a lot of people who can't do it and won't survive."

• On the blending of IS into business units:

"Each of our strategic business units, like our Western or Rustler clothing lines, has a team to decide what it's going to take to be successful in their business. They have IS, manufacturing and marketing people, and they are given certain parameters — resources you can use, objectives you have to hit — but you decide how to run the business.

"So the people down in the IS group are really senior staff members in that particular business unit. They have a lot of decision-making power."

• On IS staff members as change agents:

"A big reason why we have moved as fast as we have is the mind-set of the IS people. They don't look at their job as, 'I do this over here; I do the programming.' They feel their job is to understand the business needs and present ways that we can address those business needs.

"Overall, I feel that our IS people had very good foresight as to what was necessary to change. They had a good external focus and were probably as aggressive as any group in our company at making those changes."

• On IS reporting to the CEO:

Wrangler's vice president of IS, Jeff Kernodle, formerly reported to the chief financial officer. "I moved him to be under me . . . and I need him. I don't see how a company that is not moving extremely fast in information systems is going to survive. I really don't."

A TOAST TO THE SWEDISH S

CALENDAR

Harvard University's Kennedy School of Government professor and noted author Robert B. Reich will be the keynote speaker at the Assist 1991 Conference for users of Andersen Consulting software. The conference will be held April 28-May 1 at the Westin Peachtree Plaza Hotel in Atlanta.

Reich is the author of the recently published *The Work of Nations: Preparing Ourselves for 21st Century Capitalism*. The conference theme is "Solutions and Strategies through Communication."

For more information or to register, contact Assist headquarters, 401 North Michigan Ave., Chicago, Ill. 60611, or call (312) 644-6610.

APRIL 14-20

Congress on CIM Databases. Cambridge, Mass., April 14-17 — Contact: Wilma A. Horwitz, CAD/CIM Alert, Boston, Mass. (617) 333-[illegible].

International Technical Communication Conference. New York, April 14-17 — Contact: ITCC, Tinnwood, N.Y. (914) 742-5098.

Information User Association: Architecting for the '90s. Salt Lake City, April 14-18 — Contact: IUA Headquarters, Chicago, Ill. (312) 644-6610.

Nastec 3.0. Atlanta, April 14-19 — Contact: Dave Cochran, National System Programmers Association, Milwaukee, Wis. (414) 423-2430.

Custom Users' Exchange. Baltimore, April 15 — Contact: Ilan Block, CUE, New York, N.Y. (212) 633-5080.

Cardtech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4256.

Knowledgeware International User Conference. Atlanta, April 15-17 — Contact: Knowledgeware, Inc., Atlanta, Ga. (404) 231-8575.

Securtech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4256.

Wireless Data Networks Conference. Washington, D.C., April 15-17 — Contact: Business Communications Review, Hinsdale, Ill. (800) 227-1234.

Lap & Palmtop '91. New York, April 16-17 — Contact: Peter O'Connor, Laptop Expositions, New York, N.Y. (212) 682-7966.

Downsizing Conference: Moving from Mainframes to PCs. Boston, April 16-17 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Electro/International. New York, April 16-18 — Contact: Alexus Rusnick, Electro/International, Los Angeles, Calif. (213) 215-3976.

RMSI User Group Europe Conference. Paris, April 17-19 — Contact: Karen G. Mac[illegible] (713) 783-8826.

Instore Systems: The Key to Better Customer Service. Orlando, Fla., April 17-19 — Contact: National Retail Federation, New York, N.Y. (212) 583-5113.

International Conference on the Application of Manufacturing Technologies. Alexandria, Va., April 17-19 — Contact: Lynn Boston, The Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

World Computer Law Congress. Los Angeles, April 18-20 — Contact: Michael D. Scott, Center for Computer Law, Manhattan Beach, Calif. (213) 689-5186.

APRIL 21-27

Adapso Management Conference. Miami, April 21-24 — Contact: Adapso Education Department, Arlington, Va. (703) 284-[illegible].

Electronic Funds Transfer Association Convention. Nashville, April 21-24 — Contact: EFTA, Alexandria, Va. (703) 548-[illegible].

Software Maintenance Annual Meeting & Conference. Philadelphia, April 21-24 — Contact: Robin Goss (707) 643-4423.

Computer Law Conference. Washington, D.C., April 22-23 — Contact: Barbara Fieser, Computer Law Association, Fairfax, Va. (703) [illegible]-1741.

Decision Support and Executive Information Systems: A Managerial Perspective. Cambridge, Mass., April 22-23 — Contact: Decision Support Technology, Cambridge, Mass. (617) 354-6468.

APICS 1991 Manufacturing Principles and Practices Seminar. Orlando, Fla., April 22-24 — Contact: APICS, Falls Church, Va. (703) 237-[illegible].

Reverse Engineering Forum. St. Louis, April 22-24 — Contact: Donna Skaggs, Washington University, St. Louis, Mo. (314) 889-4556.

Unix Today. Atlanta, April 22-24 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

NCGA '91. Chicago, April 23-25 — Contact: Sharon Sutton, National Computer Graphics [illegible], Fairfax, Va. (703) 698-[illegible].

Unix C++. Washington, D.C., April 22-25 — Contact: Unisix Conference Office, El Toro, Calif. (714) 588-9848.

International Tools and Techniques Conference. Boston, April 22-26 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Common Spring 1991 Conference. Las Vegas, April 22-26 — Contact: Common, Chicago, Ill. (312) 644-6610.

Uno, Inc.'s Spring Conference. Chicago, April 22-26 — Contact: Uno, Inc., Bladensburg, Md. (301) 864-[illegible].

Integrated Call Processing '91. New York, April 23-25 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

Speech Tech '91. New York, April 23-25 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

IRM '91. Orlando, Fla., April 24-26 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

Interex '91. Miami, April 25-26 — Contact: Latoya Bemis Coordinator, Latoya, Inc., Lauderdale, Fla. (305) 446-[illegible].

APRIL 28 - MAY 4

Scala & Sabbango User Group Conference. San Jose, Calif., April 28-May 1 — Contact: SSUG '91, Sunnyvale, Calif. (408) 720-8331.

Human Resource Systems Professionals Conference. Chicago, April 28-May 1 — Contact: The Association of Human Resource Systems Professionals, Dallas, Texas (214) 661-3727.

Focus Users Group '91. Anaheim, Calif., April 28-May 3 — Contact: Rosemary Moore, [illegible]

Organizing and Managing the IS Business. Southbury, Conn., April 28-May 3 — Contact: Polytechnic University Seminar Program Office, Hawthorne, N.Y. (914) 347-0940.

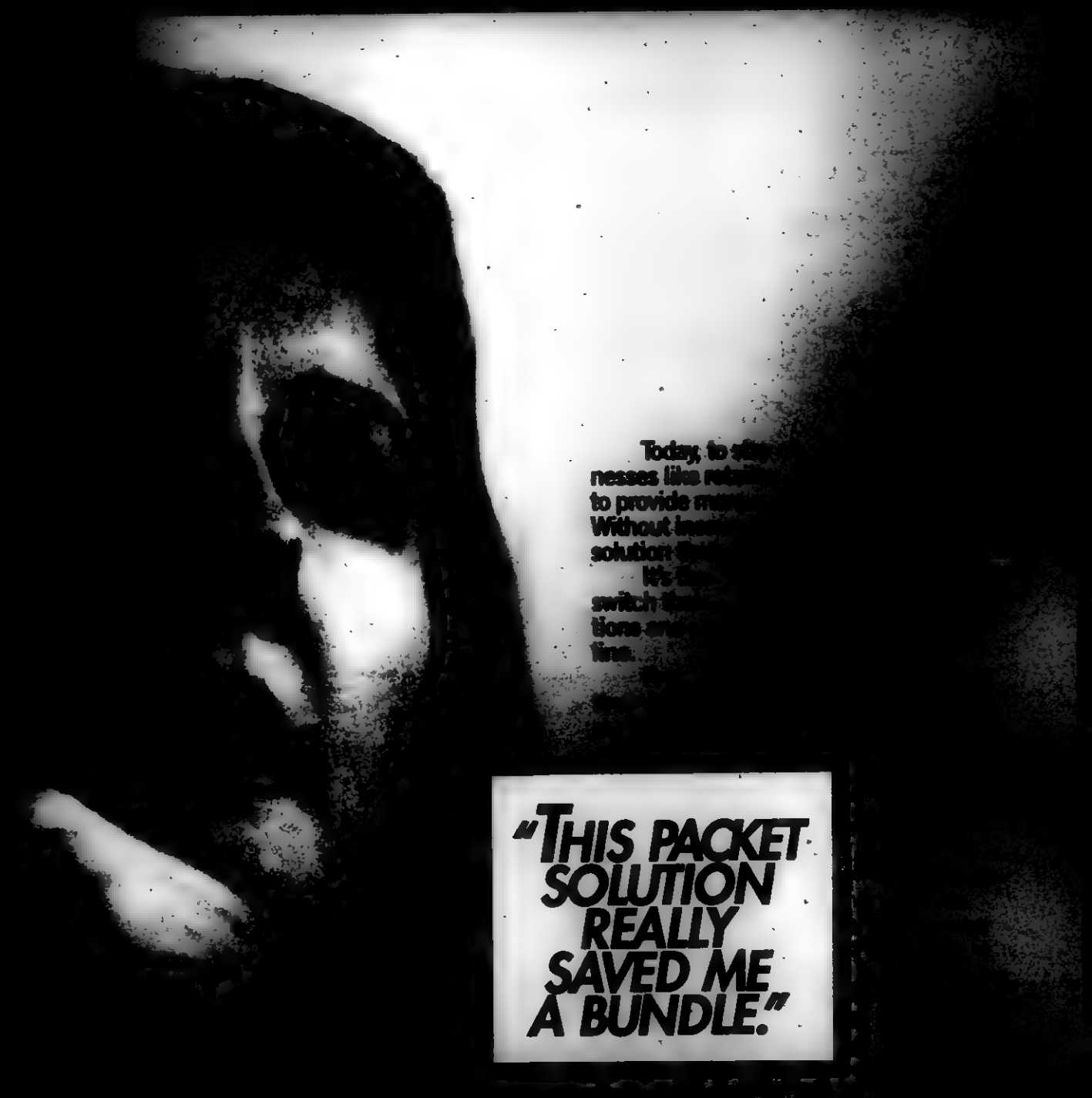
Downsizing the Corporate Information Systems. London, April 29-30 — Contact: Boston Systems Group, Boston, Mass. (617) 423-1670.

Association for Information and Image Management Show and Conference. Washington, D.C., April 29-May 2 — Contact: AIIM, Silver Spring, Md. (301) 587-8202.

IBA Edmonton '91 Spring Symposium. Edmonton, Alberta, April 29-May 3 — Contact: Ian Verhappen, Committee General Chairman, Edmonton, Alberta (403) 780-7917.

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SOFTWARE MAINTENANCE

Don't chase problems; control them

BY GEOFFREY BARNES and BILL DECHERD

Getting a handle on software maintenance can be like trying to herd lizards with a stick: While you're off chasing the most immediate problem, others crop up demanding as much or more attention. To top it all off, every now and then one of those lizards turns into an alligator.

Most information systems groups would like to get beyond the frenzy of finding bugs, updating applications and fixing systems failures to make fundamental, long-term changes to the systems that would ultimately afford them greater control over these more reactive tasks.

The catch-22 is that the daily problems are so consuming, it's difficult to get to the larger picture. Fortunately, there are tools that help automate both reactive and what could be called "active" maintenance.

In reactive maintenance, the staff is responding to a problem. Here, such tools as testers and debuggers can help (see story page 66).

Active maintenance is more controlled. The staff analyzes and updates applications in response to the changing needs of the enterprise, and changes are made while the system is stable.

The tools that enable an active maintenance approach go hand in hand with one of today's most popular buzzwords: re-engineering. Re-engineering can refer to a wide range of maintenance tools, from the simple, such as those that restructure code for readability, to the complex, such as those that move existing applications onto a new platform (see story page 68).

Simple or complex, several tools help maintainers analyze programs and understand how they interact systemwide.

Barnes is director of business solutions development at CAP Gemini America's National Re-engineering Practice.

Decherd is national project support manager at the firm.

Static complexity analysis tools analyze programs in batch mode without intervening or interacting with the code.

Some of these, such as Analysis of Complexity Tool, which is a part of Battlemap from McCabe & Associates in Columbia, Md., can produce a graphical representation of a program's control flow. A personal computer version is priced at $6,500.

Some static analysis tools use metrics formulas to analyze program complexity. These tools calculate the complexity metrics, point out areas of the source program that might be subject to error and make recommendations for improving the program.

One such analysis tool is Pathvu from XA Systems Corp. Priced from $29,000 to $55,000, Pathvu can also make suggestions for breaking a large program into smaller modules.

Finding structure

Output from a metrics-based analysis tool can help maintainers restructure complex programs to ultimately improve their readability, but this does not have to be a manual process.

Restructuring tools actually interact with the code, transforming spaghetti code into a respectable structured program. They do this by analyzing a program's control structure and imposing a structure in which routines have only one entry and exit point.

Such tools include Recoder ($90,000) from Language Technology, Inc. in Salem, Mass.; Superstructure ($28,000 to $45,000) from Computer Data Systems, Inc. in Rockville, Md.; and Retrofit ($55,000 to $103,000) from XA Systems.



Linda Black

Users need to be cautious when selecting restructuring tools, however, because different tools can produce radically different results.

It's also important to remember that there are two aspects to a "structured" program: modularity and structure. Automated tools deal with structure better than they deal with modularity.

Watch how it works

Sometimes, the best way to understand how a program works is to use an interactive code analyzer to watch it in action.

One example is Via/Insight ($57,000 to $89,000) from Viasoft, Inc. in Phoenix. This tool allows a programmer to trace program execution flow while looking at the source code on an IBM 3270 screen.

The effects of a change on various data elements can be quickly verified. The tool can be sensitized to a particular item, stopping the trace only when that data item is referenced or modified. If an unusual condition is encountered, Via/Insight can trace the logic flow backward to locate the anomaly.

Smartsystem from Procase Corp. in Santa Clara, Calif., does much the same thing for Unix and C users. It's priced between $1,750 and $8,750.

Similar capabilities on PCs are available with Micro Focus Cobol/2 Workbench ($3,290) from Micro Focus, Inc. This analysis and debugging workstation can simulate IBM mainframe environments.

But no matter how well-

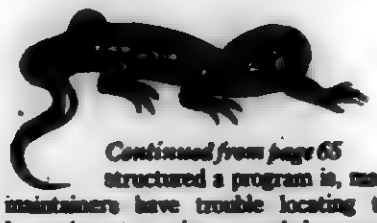
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INSIDE

Product Guide
A comprehensive listing of code-analyzing tools. Page 67.

Reining in Costs
A variety of tools can predict maintenance costs. Page 69.

Buyers' Scorecard
Realia tops user ratings of PC-based Cobol compilers. Page 70.



Continued from page 65

structured a program is, many maintainers have trouble locating the best place to make a needed program change. The problem is often not only where to put a change in the program, but also *which* program to change.

Because maintenance changes usually affect existing data elements, the placement of changes often depends on where else the affected data element is referenced or modified. It is important to understand how a change is going to affect data elements throughout the application.

A cross-reference tool can show where each data element is referenced. One such tool is X-Ref ($4,000) from National Database Software, Inc. in West Bloomfield, Mich. Cross-references generated with such a tool are usually easier to use than the normal compiler-generated ones because the references for each data element appear opposite the element definition in the source listing.

Systemwide cross-reference information can be obtained from tools that scan entire libraries and provide reports showing all places in an application where data elements are accessed and updated.

Examples of these tools include DCD III ($22,500) from Marble Computer, Inc. in Martinsburg, W. Va., and PM/SS ($75,000 to $150,000) from Adpac Corp.

Archaeology adventures

One of the most frustrating experiences for any maintainer is when source code doesn't match the program under analysis. Even worse is trying to understand an ancient program in which the source code is *completely* lost.

Unfortunately, there's not a lot of automated help for this problem. When mismatches are involved, the best bet is to recompile the production version of the program and compare object modules.

When source code is lost, the only recourse is to try to manually reconstruct the program. Some help can come from a disassembler tool — if anyone on the staff can read assembler code.

A few tools, such as XA Systems' React, will help bring the assembly code into skeletal Cobol, but they require substantial manual effort. Some consulting companies employ proprietary tools to help with this task.

The long-term goal is to prevent these problems by using version-control standards, procedures and tools. Source library tools, such as Panvalet ($22,500) from Panaphic Systems, Inc. in Lisle, Ill., and CA-Librarian ($18,000 to $105,000) from Computer Associates International, Inc. in Garden City, N.Y., store program source code, provide the capability to store multiple versions and offer access-control features.

For more comprehensive configuration control, a tool such as CCC from Softool Corp. in Goleta, Calif., may be the answer. This tool can store any machine-readable data and link data into multiple system configurations.

Previous versions of a program or an entire system can be retrieved.

Shops with purchased application packages often face the dilemma of how to install a new version of the package without losing customized changes. The Version Merger tool from Princeton Softech, Inc. provides assistance for impact analysis, consolidation and reconciliation of different versions of application programs.

Most IS executives know how much of their budget goes to maintenance, but they also face a business decision: Should they keep hiring people to run after lizards and wrestle alligators, or should they invest in some lizard-herding and alligator-prevention tools? The decision isn't easy, but if the right decision is made, it will pay dividends many times over. •





Don't even say the word "maintenance" at Boston Edison. At the Massachusetts-based utility, it's called "operational support," according to John Dubiel, manager of planning and technology.

"We're not trying to hide something," Dubiel says. "We're just trying to get across what our application programmers do, which is supporting applications that are in production."

The biggest obstacles Boston Edison maintainers face are old, unstructured applications. What's worse, most of the old code for back-office applications is written in assembler or fourth-generation languages, which makes tool selection difficult.

"We've been trying to rewrite those applications since the early '80s using some analyzing tools, but there aren't many of them," Dubiel says. So far, this has inhibited him from getting into re-engineering, although he's looking into conversion services.

Dubiel does use Viasoft, Inc.'s Via/Smarttest, a testing tool that allows him to see the program as it executes, and Legent Corp.'s Endevor, a source-code manager that keeps track of multiple versions of an application.

As for the future, Dubiel says his staff is in the requirements-gathering stage of incorporating computer-aided software engineering tools into the maintenance methodology. "We're looking at the implementation to begin this year, but it will probably take four to five years to complete," he says. "It's a long process."

SUSAN NYKAMP

Keeping the stress in check

There's an irony to reactive maintenance. As routine as it is, it's also extremely stressful, what with systems failures requiring immediate corrective action — often late at night — and bugs in system output, usually pointed out by unhappy users.

Some relief is available in today's crop of testers and debuggers, however. Old-timers probably remember the early days of IBM's OS operating system when core dumps were the only debugging aid. Today, even the most basic debugger provides a smart core dump.

For example, Abend-Aid from Compuware Corp. in Farmington Hills, Mich., prints an English language explanation of abnormal terminations. Although it doesn't fix the problem, it makes it easier to find the cause.

It's even easier to find bugs when you can watch them in action. Some debuggers let the programmer watch the source code as it executes at a user-controlled speed.

Examples of these tools include Xpediter from Compuware, Via/Smarttest from Phoenix-based Viasoft, Inc. and Intertest from Fort Lee, N.J.-based On-Line Software International, Inc.

These debuggers may not be able to point out bugs that are very complex, but they at least give the maintainer a scientific approach to finding the root of a difficult problem. Maintainers can make hypotheses about the nature of the problem, modify data values if necessary and then verify or refute each hypothesis.

Regression kicks

Once a change is made to a system, it needs to be tested. A particularly important testing technique is regression testing, which detects unexpected changes in the behavior of a system that result from another change to that system.

On-line systems can be regression-tested with mainframe tools such as On-Line Software's Verify. On personal computers, capture/replay tools capture keystrokes and system responses during a test session, play the keystrokes back for subsequent tests and compare the system responses on playback with responses from the original session.

PC-based capture/replay tools include Capbak from Software Research, Inc. in San Francisco and CA-Traps from Computer Associates International, Inc. in Garden City, N.Y.

One problem with capture/replay tools is that they flag all changes, both expected and unexpected. More sophisticated systems, such as DCATS from Systems Design & Development Corp. in Boulder, Colo., allow testers to develop test scripts that specify both the input message and the expected response.

Regression testing for batch systems often involves parallel testing, which runs the same data through the production and test versions of the batch programs and compares the resultant output files and databases.

File comparators, such as Comparex from Sterling Software, Inc. in Rancho Cordova, Calif., are commonly used to perform these comparisons. •

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Trax Softworks, Inc.

Source code analyzers[1]

VENDOR	PRODUCT	HARDWARE REQUIRED	OPERATING SYSTEMS SUPPORTED	MEMORY REQUIRED (BYTES)	LANGUAGES ANALYZED	ANALYSIS FUNCTIONS PERFORMED	METHODS FOR FLAGGING POTENTIAL PROBLEMS	TYPES OF REPORTS PRODUCED	MEASURES CODE COMPLEXITY	USER INTERFACE SUPPORTED	PRICE	MAINTENANCE FEE[2]
Abraxas Software, Inc. (800) 944-0377 (800) 367-0744	Code Check	IBM PCs and compatibles, Intertec, Apple Macintosh, DEC VAX	DOS, Macintosh OS, Ultrix, Unix	400K	C, C++	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, diagnoses code, flags potential problems	Annotates, highlights on reports, sends program modules, programmer-defined variables	Graphs, text, histograms	No	Command line, Windows, Presentation Manager	$495	None
Alden Computer Group, Inc. (416) 839-3536 (800) 825-5068	Alden/ Analyzer	Any IBM or compatible mainframe running MVS, AS/400, System/36	MVS, CPF, OS/400	An additional 15% beyond that required by program being analyzed	Cobol, RPG-III	Identifies untested code	Asterisks identify untested code on source list	Source list with execution statistics	No	Command line	$3,000 - $4,500	$540 - $675
Chesapeake Computer Systems Co. (410) 224-2900	Software II	IBM 3081, 3090 series	MVS, VM	1M	Cobol	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, flags potential problems, analyzes for elements of spaghetti code, embeddable data names	Identifies questionable code and problems	Statistical summary reports, map code	Yes	ISPF, IDEACOM, TSO	$10,000 - $50,000	$1,500 - $7,500
Computer Associates International, Inc. (516) 227-3300	CA-Optimizer	IBM mainframes running MVS, VSE, VM	MVS, VSE, VM	NP	Cobol	Flags potential problems	Annotated source list	Performs range analysis reports	No	None; runs in batch mode	$15,000 - $60,000	15%
Computer Data Systems, Inc. (301) 921-7000	Xref/Cobol	IBM mainframes and compatibles	DOS/VSE, MVS, VM	1M	Cobol, CICS, IMS, IDMS	Documents data and procedures, diagnoses code, flags potential problems, embeddable data names	By values and references	20 different graphs, text reports	Yes	ISPF, JCL, TSO	$10,000 - $25,000	18%
Compuware Corp. (313) 737-7300 (800) 521-6353	Navigator, Navigator/ PM	IBM System/370, ESA/370 for Navigator; IBM PCs and compatibles for Navigator/PM	MVS/ESA, MVS/SP, MVS/XA, OS/2	1M for Navigator/ PM	Cobol	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, diagnoses code, flags potential problems	Marks source statements	Code structure, path, data graphs, I/O charts, control flow graphs, data and paragraph cross reference	Yes	ISPF for Navigator; Presentation Manager for Navigator/PM	$20,000 - $45,000	15%, first year free
Digital Equipment Corp. (800) 344-4825	VAX LSE/ECK	DEC VAX, Micravax, Microvax	VAX/VMS	2.6M	Ada, Basic, Bliss 32, C, Cobol, Fortran, Pascal	Checks for unused, incorrectly used or undefined dataset variables, detects inconsistencies for programmer-defined variables, flags potential problems	Marks programmer-defined variables in report	Dataflow reports, IDB-STD-2167A report	No	Declarations, character-cell terminals	$1,500+	$12+ per month
Dynamics Research Corp. (508) 475-9090 (800) 522-7321	Adamat/D	DEC VAX, Rational, any Intel 80386-based PC running SCO Unix	VMS, Ultrix, SCO Unix	NP	Ada	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, flags potential problems	Summarized data reports, error flags inserted in code as comment lines	Standards adherence, consistency reports	Yes	Command line	$5,000 - $25,000	15%
Eden Systems Corp. (317) 848-9900 (800) 289-9900	QAInsitter Cobol, QAInsitter PL/I	IBM 3080, 3090 series, PCs and compatibles; Tandem mainframes on Cobol version	DOS 5.1 and higher, MVS, OS/2 1.2 and higher; Guardian on Cobol version	640K	Cobol or PL/I	Checks for ANSI or company standard conformity, detects inconsistencies for programmer-defined variables, flags potential problems	Graphics report, program listing with diagnostic messages, summary with line number references	Audit, diagnostic listing and summary, data report showing changes between program versions	Yes	ISPF on MVS, menus on PCs	$900 for PC version, $24,000 for Tandem version, $60,000 for MVS version	18%, first year free
Hypersoft Corp. (617) 864-6860 (800) 468-8860	Application Browser	DEC VAX, IBM PCs and compatibles	DOS, VAX/VMS	640K on PC, 500 pages on VAX	Cobol	Diagrams code, flags potential problems	Graphics and text reports; isolates modules for further study	Problem reports, call, perform and GOTO charts	No	Command line, proprietary windowing system	$3,000 - $40,200	1% per month for VAX; 1.25% per month for PC
Implements, Inc. (800) 950-9950	Codas	IBM PCs and compatibles	DOS, OS/2	640K	C	Provides source code reports	NA	Variable and function frequency, call trees	No	Command line	$395	$60
Language Technology, Inc. (508) 741-1507 (800) 752-6327	Inspector	IBM 3080, 3090, 4300 series	MVS/ESA, MVS/SP, MVS/XA, VM	118+ tracks disk space	Cobol, CICS	Checks for ANSI conformity, flags potential problems, graphs portfolio quality, measures complexity	Summary tables	Quality graphs, histograms, summary tables	Yes	ISPF	$18,000 - $27,000	15%
	Pinpoint	See above	See above	91+ tracks disk space	Cobol, CICS	Checks for ANSI conformity, diagrams code, flags potential problems, provides control flow analysis	Cross reference tables, in-stream program comments, warning messages on control flow chart	Annotated lists, metrics report, cross reference and control flow charts	Yes	ISPF	See above	15%
M. D. Pinkerton & Associates, Inc. (314) 644-1379	MDP Cobol Standards Analyzer	IBM PCs and compatibles	DOS 3.1 and higher	640K	Cobol	Analyzes data use, placement of comments and program structure, checks for ANSI conformity, detects inconsistencies for programmer-defined variables, flags potential problems	Code lists with marks, error messages	Data element use, unused data summary, standards violations, used and unused verbs summary	No	Menus	$895	20%
McCabe & Associates, Inc. (301) 596-3060 (800) 638-6316	Analyzes Complexity Tool with Battlemap	Sun, HP/Apollo, DEC, NCR, IBM PCs and compatibles	Dungen, HP-UX, Sun OS, Ultrix, VMS, DOS	4M	Ada, CMS2	Provides test paths, conditions, graphs	Graphics of code quality, lists of code paths requiring testing	Structure charts, testing information, module flow graphs	Yes	Command line, menu-based	$6,500	15%
Proteon Corp. (508) 729-8716	Smart-check/ SmartView	Sun-3, Sun-4, Decstation, IBM RS/6000, Silgs R3000, R4000	AIX, RISC OS, Sun OS, Ultrix	16M	C	Checks multiple dialects and ANSI conformity, detects inconsistencies for programmer-defined variables, diagnoses code, filters based on identifier type and use, flags potential problems, embeddable data names	Marks and provides navigation to problems	Call graphs, filtered text views	No	X Window	$3,500	10% - 15%
Quantasm Corp. (408) 244-6826 (800) 785-8086	ASM Flow Professional	IBM PCs and compatibles	DOS	256K	Assembler	Diagrams code, flags potential problems	Marked in flow charts	Flow charts, tree diagrams, register analysis, cross references, timing information, stack using	No	Command line, menus	$200	None
Set Laboratories, Inc. (800) 639-7328	PC-Metric, UX-Metric, VZ-Metric	IBM PCs and compatibles, DEC VAX, Sun Sparc-stations and 3 others	DOS, Unix, VMS	None	Ada, assembler, C, C++, Cobol, Fortran, Modula-2, Pascal, Quick Basic	Evaluates maintainability, readability, testability, flags potential problems	Exceptions report via text or graphics	Exceptions, procedure-by-procedure statistics, summaries, pie charts, histograms	Yes	Command line, menu-based	$199 for PC-Metric, $400 for UX-Metric, $600 for VZ-Metric	None
Software Quality Tools Corp. (800) 366-8645	Software Quality Management System	Sun Sparcstation and compatibles	Sun OS 4.1	4M	Ada, assembler, C, C++, Cobol, Fortran, Lisp, Pascal, PL/I, VHDL	Diagrams code, flags potential problems, measures actual and predicted failure rates and code volatility	Predictive modeling, identifies problem modules and time of next expected failure	Text, graphs of cost and time-dependent data	Yes	X Window	$15,000 - $55,000 for stand-alone version; $25,000 - $85,000 for network version	$225 - $1,275 per month
Testwell, Inc. (800) 377-9385	Analyzer	IBM 3090, 3080 series	MVS	1M	Cobol, CICS	Diagrams code, problems	Annotates or underscores points of questionable logic paths	Text coverage analysis and trace	No	Command line	$10,000	20%
	Structured	IBM 3090, 3080 series	MVS	1M	Cobol	Checks for modularity and complexity, flags potential problems	Structure violation report	Flowcharts/structure	No	Command line	$12,000	20%

[1]Code analyzers (as defined by CASE Associates in Oregon City, Ore.) evaluate source code for conformance with accepted programming practices and identification of "dead code" or logic flaws and measure program characteristics that makes them difficult to maintain, i.e. logic nesting, program size, number of verbs and I/O characteristics. Products listed are stand-alone code analysis tools. Maintenance tools that incorporate code-analysis functionality with other capabilities are not included.
[2]Maintenance fees are per year, unless otherwise noted.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE REQUIRED	OPERATING SYSTEMS SUPPORTED	MEMORY REQUIRED (BYTES)	LANGUAGES ANALYZED	ANALYSIS FUNCTIONS PERFORMED	METHODS FOR FLAGGING POTENTIAL PROBLEMS	TYPES OF REPORTS PRODUCED	MEASURES CODE COMPLEXITY	USER INTERFACE SUPPORTED	PRICE	MAINTENANCE FEE
[illegible]	AC Classic, AC Intel	IBM PCs and compatibles	DOS, OS/2	384K	C, Pascal, Modula-2, Module-2	Finds functions, data-type definitions, variables defined, structures, rationalizes data names	NA	Many; produces separate output files	No	Pull-down menus	$120	None
V-Communications, Inc. (408) 296-4224 (800) 648-8266	ACM Checker	IBM PCs and compatibles	DOS	384K	Assembler	Detects inconsistencies for programmer-defined variables, flags potential problems	Identifies file name and line number	Lists of code problems	No	Batch file, command line	$180	None
[illegible]	Logiscope	[illegible]	AIX, Domain, HP-UX, Sun OS, Ultrix, VMS	4M for workstation version	Ada, subset/ada, Adax, C, Cobol, Fortran, Pascal, PL/M, PL/I	Analyzes complexity, diagnoses code, flags potential problems, produces regression and test coverage analysis	Detects complex modules and testing weaknesses, verifies and validates code	Control graphs, call graphs, Kiviat diagrams	Yes	Downloaders, Goldmarch, Starbase, X Window	$15,000	19%
Viasoft, Inc. (602) 952-0050 (800) 222-6652 in the U.S. (800) 543-1078 in Canada	Via/Insight	IBM mainframes and compatibles	MVS/ESA, MVS/SP, MVS/XA	2M	Cobol	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, flags potential problems, rationalizes data names	On-line interface	Any programmer-defined view using ISPF	No	ISPF	$30,000 - $70,000	15%
	Via/Smart-doc	See above	See above	2M	Cobol	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, diagrams code, flags potential problems, rationalizes data names	Summary reports	Table of contents, master index, enhanced data cross reference, advanced source listing, structure chart, software metrics report	Yes	ISPF, ROSCOE, WYLBUR	$17,000 - $40,000	15%
XA Systems Corp. (408) 296-2600 (800) 344-0800	Xpediter	IBM System/370, System/390, PCs and compatibles	MVS/ESA, MVS/SP, MVS/XA, DOS	256 for DOS, 4M for MVS	Cobol	Checks for ANSI conformity, cross-reference logic, detects inconsistencies for programmer-defined variables, diagrams code, flags potential problems, reports on complexity and performance metrics	Creates and identifies problems by category in user list, indicates location	Management and organization level reports, metric analysis, logic and quality assurance diagrams and lists	Yes	ISPF, Microfocus runtime interface	$20,000 - $60,000 for MVS version; $1,500 - $3,000 for PC version	18%

The CASE for maintenance relief

BY GEOFFREY BARNES AND BILL DECKERD

CASE isn't just for development anymore — or so users are hoping. Computer-aided software engineering (CASE) may be best known for its promise to revamp and speed up the development process, but many observers also view it as an ideal maintenance environment.

Application development in CASE, also called forward engineering, starts with a business model, is followed by logical and physical design and ends with code generation. This process promises high-quality applications that require less maintenance and are undamaged by changes made to them.

The problem, however, is that information systems groups can't simply dump their existing applications and use CASE to write new ones. Embedded in those programs are long-established business rules that may exist nowhere else.

The crucial links between existing applications and a CASE environment lie in re-engineering and, more specifically, reverse engineering.

Reverse engineering inverts the forward engineering process, using existing code to produce a physical design from which a logical design is derived. A business model is built from the logical design.

Re-engineering can refer to a range of tasks and tools. In terms of CASE, it encompasses reverse engineering and forward engineering as a complete cycle.

A growing number of tools support reverse engineering. However, most of these handle only the data side of the job. ADW from Knowledgeware, Inc. in Atlanta and Data Analyst from Bachman Information Systems, Inc. in Burlington, Mass., support data reverse engineering.

The personal computer-based Bachman tool goes as far as to derive entity-relationship diagrams from Cobol and PL/1 data definitions.

Reverse engineering the process side is much more difficult than reverse engineering the data, and automated support is correspondingly lean. Vendors are, however, progressing in that direction. Some examples include the following:

- Design Recovery from Index Technology Corp. in Cambridge, Mass. This $9,800 tool, which ties into the firm's Excelerator line of CASE development tools, can populate an Excelerator repository with program structure charts derived from Cobol code.
- Source/RE from Transform Logic Corp. This $3,800 tool produces structure charts and logic flow diagrams and performs complexity analysis.
- The Intercase tool from Interport Software Corp. in Fairfax, Va. Intercase provides a platform for application analysis and can migrate structure charts into Knowledgeware's Information Engineering Workbench.
- Renaissance from Viasoft, Inc. This tool traces data and logic flow to isolate portions of code.

Because reverse engineering is still a formative concept, prospective buyers should carefully examine tools that bear such a label. Some tools have little, if any, link to CASE tools. •



Source: CAP Gemini America

Providers at your service

The following companies provide re-engineering services such as reverse engineering and restructuring applications, code reuse, transporting systems to new platforms and re-engineering for CASE (see chart):

- **Ernst & Young Redevelopment Engineering Services.** *Contact: Al Hershey (313) 971-1907*
- **Deloitte & Touche information technology consulting services practice.** *Contact: Thaine Lyman (312) 345-3532*
- **KPMG Peat Marwick.** *Contact: Kenneth Coppins (312) 444-1177*
- **Andersen Consulting.** *Contact: local Andersen office*
- **CAP Gemini National Re-engineering Practice.** *Contact: Tim Klimuc (212)-944-6464*
- **Coopers & Lybrand [Software Engineering Center of Excellence].** *Contact: Rich Harman (215) 963-8511*
- **Price Waterhouse RE/Center.** *Contact: Steve Errico (213) 396-3844*
- **Computer Task Group.** *Contact: Paul Fjelsted (919) 850-9861*
- **Bell Atlantic Systems Integration.** *Contact: Paul Sikora (703) 516-2911.*

Re-engineering forecast

According to IS executives at 13,000 large organizations, more funds will be allocated to re-engineering services than to products

Expenditures (in billions of dollars)



Source: G2 Research — CW Chart: Tom Monahan

To Denny Zweifel, the job of keeping a low-maintenance backlog starts with development. "It really depends on well-organized, well-thought-out, structured code," says Zweifel, who is division manager of analysis and programming at Deere & Co. in Moline, Ill.

That way, maintainers could spend less time fixing bugs and more time adding functional improvements for users. "Maintenance should be viewed as improvements to existing systems," he says.

There are plenty of bugs in the real world, however. The tools Zweifel uses on an everyday basis include Compuware Corp.'s Xpediter and XA Systems Corp.'s Xpert.

For cross-referencing, Zweifel uses Computer Data Systems, Inc.'s Scan/Cobol and Marble Computer, Inc.'s DCD III.

Deere already uses various CASE tools for development tasks. In terms of re-engineering, the company is pursuing various approaches and is evaluating several tools in that area.

However, "the controlling factor is not some maintenance tool," according to Zweifel. "It's how well you write the code in the first place."

SUSAN NYKAMP

Estimating maintenance costs

BY JUDITH S. DEBRANDT

You can count on two things from software maintenance: It will always be necessary, and it will always cost money.

Many companies are attempting to diminish these costs through re-engineering and computer-aided software engineering (CASE), but of more immediate concern is identifying and managing those maintenance costs that will not go away. Cost-estimating tools can lend a hand.

These tools are usually modules within sophisticated modeling software packages that address many phases of system development, not just maintenance.

Maintainers can input a variety of factors, including the development schedule, labor and tasks required to develop the application (including cost and hours), the risk involved and, more recently, function points, which measure a number of elements intrinsic to an application.

The cost-estimating tool can then build the project budget, provide staffing profiles, consolidate projects into a single portfolio for comparison purposes and isolate the cost for a particular phase such as maintenance.

Available tools vary widely in their functionality, ranging in price from $500 to more than $20,000. Some predict future patterns using historical data derived from actual projects. Others use mathematical theory with complex formulas that let maintainers tailor the estimate to reflect factors such as the use of "modern" development practices or the staff's skill level.

Well-established tools include Computer Associates International, Inc.'s CA-Estimacs and CA-Planmacs and Quantitative Software Management's Slim-Control.

CA's products take an historical approach based on more than 13,000 projects. They are derived from initial work performed by Howard Rubin. Personal computer-based, they sell for more than $20,000.

PC-based Slim-Control uses Larry Putnam's mathematical theory and recently added function point analysis.

Another function point-based tool is from Software Productivity Research, Inc. SPQR/20 Estimator is PC-based, costs about $5,000 and offers risk analysis features as well as cost projections that can be translated into foreign currency.

Other estimating tools are closely tied to methodologies and CASE. Andersen Consulting offers its PC-based Method 1, which provides cost estimates for all phases of the development life cycle. The $50,000 product is closely aligned with Andersen's Foundation methodology.

AGS Management Systems, Inc. has incorporated its estimating tools into First CASE, available in PC and mainframe versions and priced between $2,500 and $49,000. First CASE uses sensitivity analysis to provide minimum and maximum cost ranges for each phase.

Other vendors offer tools built around mathematical models. Market Engineering Corp.'s CB Cocomo, available on the Apple Computer, Inc. Macintosh, extracts Cocomo criteria into a spreadsheet (see story this page). It uses Monte Carlo simulation to determine the probability of the estimate and requires a companion product, Crystal Ball, to establish high and low ranges.

Softstar International, Inc.'s Costar, also based on Cocomo, runs on PC and Digital Equipment Corp. VAX platforms and costs between $800 and $1,500. It provides estimates for eight different maintenance activities.

Two new products are Gecomo Plus from GEC-Marconi Software Systems and Software Quality Tools Corp.'s Software Quality Management System (SQMS).

Gecomo Plus, which comes in workstation and mainframe versions priced from $4,000 to $12,500, uses both Cocomo and the new Ada model for Cocomo. It allows for separate input for the maintenance phase and has both graphical user interface and X Window System features.

SQMS, not yet released, will be available on Unix and MS-DOS platforms. It will be fed by the number and frequency of changes to the source code during development and will link the stability of the initial code to the expected number of maintenance actions. •

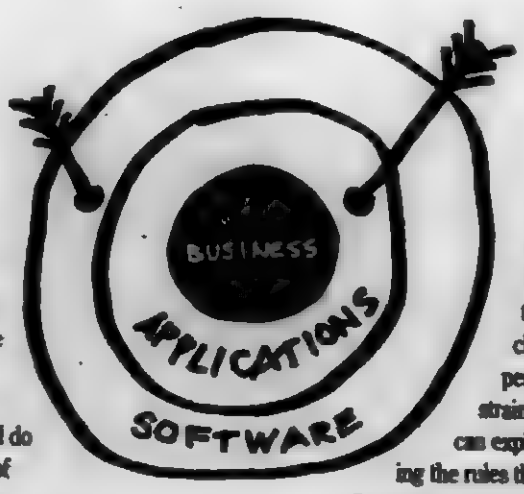
Cost-estimating theories

- Barry Boehm's Cocomo, which stands for Constructive Cost Model, is a mathematical model that can be refined with certain preset factors that alter the model.
- Larry Putnam's Software Life Cycle Management, or Slim, is another mathematical model that uses both productivity and manpower indexes.
- Howard Rubin uses mathematical formulas but factors in business practices unique to the company and independent of the model.
- Capers Jones similarly uses function points to look beneath costs at underlying quality and productivity issues.

JUDITH S. DEBRANDT

DeBrandt is program manager of the Software and Information Management Service at Information Strategies Group, Inc. in Vienna, Va.

As long as the aim of CASE vendors is better software, they'll be off-target.



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BUYERS' SCORECARD

Realia nets top ratings with fast approach

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Realia Corp.'s Realia-Cobol offers a fast, simple solution to the critical task of compiling and debugging large system applications, and its users like it that way.

Realia achieved the highest overall rating, with top scores in nine out of 15 criteria in *Computerworld*'s Buyers' Scorecard on personal computer-based Cobol compilers.

Despite having the smallest market share of the three products surveyed, Realia outscored both Microfocus, Inc.'s Microfocus-Cobol and Liant Corp.'s RM-Cobol by five points.

Each user group evaluated only its own product. A rating of 1 signified poor, and 10 was very good. Total scores were based on the average ratings of each group multiplied by the average importance ratings set by all users surveyed (see methodology next page).

PC compilers provide alternatives to mainframe-based compilers and thus offer more efficient, less expensive ways to maintain and develop large applications.

Realia and Microfocus aim their products primarily at emulating the IBM and compatible mainframe environment, while RM-Cobol is a multiplatform compiler that supports non-IBM mainframe and Unix applications.

Technical support, programmer productivity and debugging were the three top concerns of the users surveyed. (Each category achieved an 8.6 or higher importance rating.) Realia scored 8.4 in technical support, well ahead of the other products, and achieved the highest rating for providing a productivity increase, although Microfocus trailed by only a hair.

Microfocus users rated it highest for its debugging features, giving it a 9.3 — the highest rating for any product on any measure. (Second honors for highs in a single category went to Realia, which was given a 9.1 by its users for compilation speed.)

Other Microfocus strengths, according to the survey, include compiling mainframe-compatible applications — the key feature many users look for in PC compilers — and supporting computer-aided software engineering (CASE) tools.

Overall, however, the users rated basics such as technical support, code production, service, speed and ease of use as more important. Microfocus, which takes a more complex, full-featured workbench approach to its tool set, did not fare as well on the basics, coming in last place by a significant stretch in producing code and ease of use.

Portability turned out to be RM-Cobol's major strength. The product, which has had a long history, including ownership by a variety of vendors, scored top ratings in running on a local-area network, efficient memory use and compiling applications for a variety of platforms. In addition, it has developed a significant and loyal customer base, despite its many moves.

While its users applauded the open systems approach of RM-Cobol, multiple platform capability came in second-to-last overall in terms of user-assigned importance. RM-Cobol scored last in key areas such as debugging and speed as well as in the ability to increase programmer productivity.

RM-Cobol users would like it to offer better debugging and screen handling. Likewise, Realia users say they want to see CASE support and improved mainframe compatibility. Microfocus users say they want a graphical user interface and better memory handling.

Users' ratings of their overall satisfaction with the products also placed Realia at the top of the list. Realia users rated it 9 in overall satisfaction on a 1-to-10 scale where 10 is best. Microfocus and RM-Cobol users each assigned their products an 8 out of 10. ●

COMPUTERWORLD BUYERS' SCORECARD

PC-Based Cobol Compilers

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: Microfocus: 40; RM-Cobol: 35; Realia: 35

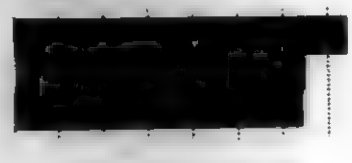
Product	Highest ratings	Lowest ratings
Realia's Realia-Cobol SCORE 65	Speed Ease of installation Producing code that does not require additional work	Support of CASE Compiling applications for different platforms Training required to use product
Microfocus' Microfocus-Cobol SCORE 61	Effectiveness of debugging features Compiling mainframe-compatible applications Ability to increase programmer productivity	Efficient use of memory Training required to use product Ease of installation
Liant's RM-Cobol SCORE 60	Compiling applications for different platforms Ability to run within a local-area network Producing code that does not require additional work	Product's support of CASE Training required to use product Ability to increase programmer productivity

KEY RATINGS

Realia achieved the highest ratings in five of the six areas that users said were most important to them, including speed and clean code production. The single highest rating for any category was given to Microfocus for effective debugging features

User importance rating:

8.7 Quality of technical support



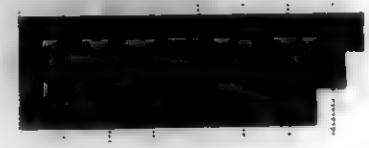
8.6 Ability to increase programmer productivity



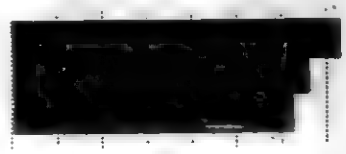
8.6 Effectiveness of debugging features



8.5 Producing code that does not require additional work



8.5 Responsiveness of vendor service



8.4 Speed

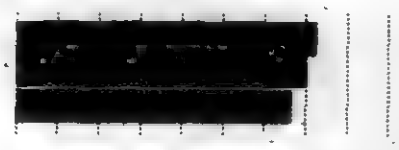


A CLOSER LOOK

Microfocus users rated their product tops in compiling mainframe-compatible applications and support of CASE. RM-Cobol users gave their product the highest ratings for its ability to run within a LAN, efficient use of memory and compiling applications for different platforms

User importance rating:

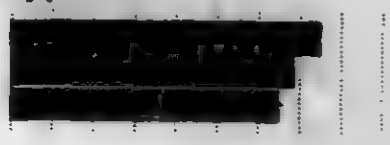
8.1 Overall ease of use



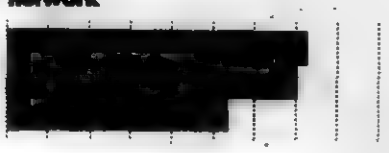
8.0 Compiling mainframe-compatible applications



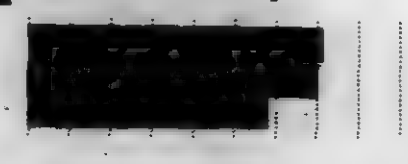
8.0 Cost vs. benefits provided by product



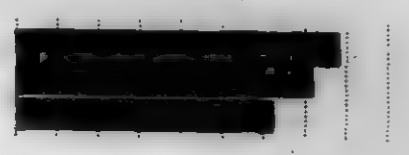
7.5 Ability to run within a local-area network



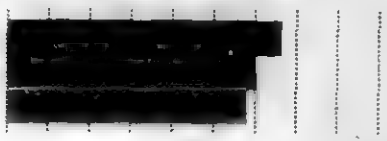
7.5 Efficient use of memory



7.4 Ease of installation



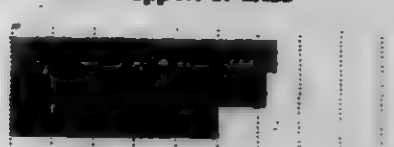
7.4 Training required to use product



6.8 Compiling applications for different platforms



6.5 Product's support of CASE



Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answers)

Likes
Mainframe compatibility
Speed
Debugger

Dislikes
Slow to upgrade
Debugger
Documentation

Likes
Debugger
Flexibility
Well-integrated

Dislikes
Memory requirements
Long learning curve
Documentation

Likes
Portability
Easy to use
Reliable

Dislikes
Needs better debugger
Error messaging
Manual

Loyalties

How likely would you be to purchase this product again if you were making the decision today?
(Reasons based on most frequently stated responses)

Response base: 35

34 — Likely
The reasons:
Best product, easy to use

1 — Unlikely
The reasons:
Locks network file locking

Number of respondents

Response base: 40

39 — Likely
The reasons:
Productivity gains

1 — Unlikely
The reasons:
Moving away from Cobol

Number of respondents

Response base: 35

30 — Likely
The reasons:
Portability

5 — Unlikely
The reasons:
Other products better

Number of respondents

Wish List

What features or functions would you like to see added?
(Answers are based on the most frequently stated responses)

- Computer-aided software engineering integration
- DB2 support
- Better mainframe compatibility

- Windows support
- Better memory handling
- Simplify

- Improve debugging
- Better screen handling
- Color in Unix modes

Vital statistics

Total number of respondents: 110

With which personal computer and operating system do you use this product?

80386/DOS	65
80286/DOS	21
80486/DOS & Unix	14
Workstation/Unix	10

On which platform do most of the compiled applications run?

Mainframe	53
Personal computer	46
Workstation	7
Minicomputer	4

How long have you been using this product?

0-1 year	32
2-3 years	38
4-5 years	18
More than 5 years	22

METHODOLOGY

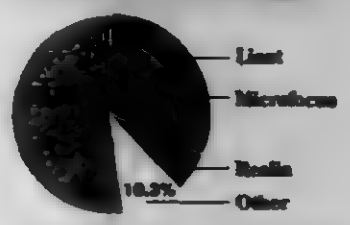
To qualify for *Computerworld*'s Buyers' Scorecard on personal computer-based Cobol compilers, a product had to be one of the top three PC-based compilers in terms of market share and installed base.

The response base was as follows: Microfocus, Inc.'s Microfocus-Cobol — 46; Liant Corp.'s RM-Cobol — 35; Realia Corp.'s Realia-Cobol — 35.

The survey was conducted by First Market Research Corp. in Austin, Texas, an independent telephone research firm. Random lists of users were surveyed. The lists were obtained from objective nonvendor sources and from vendors.

Market Share

Based on number of units shipped



Source: International Data Corp.

The total weighted scores were computed by multiplying the mean scores users assigned to all criteria by the mean scores each user group gave its own products. Ratings are presented in order of importance to all users based on these mean importance ratings.

For example, Realia's 8.4 rating for quality of technical support was multiplied by the importance rating of 8.7 for a total of 73. This figure was added to the other Realia ratings multiplied by their importance factors. The sum was then divided by the total number of categories — 15 — to determine Realia's total score of 65.

The categories were developed in consultation with consultants familiar with the products. The importance of each criterion was assigned based on user ratings on a 1-to-10 scale, with 10 being most important.

ACKNOWLEDGMENTS

Computerworld acknowledges the assistance provided by the following individuals and companies: Installed Technology International; Ed Acly, Technology Investment Strategies Corp.; Judith DeBrandt, Information Strategies Group, Inc.; and J. Chris Miller, J. Chris Miller and Associates.

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Look who's in the IS business

User companies are turning their in-house software and services expertise into commercial market offerings

BY BARBARA FRANCETT

Your company's business is light-years from the computer industry, but your information systems group has a dynamite system or service. Lately, your customers and vendors have been prodding you to offer it commercially. Do you take the plunge?

Most IS chiefs who've been there say they believe you can achieve prestige, new markets and revenue sources for your company by entering the business of IS. But the move requires important decisions about what to sell, how to organize, who to staff and where the money goes.

There are no simple answers here: What's wrong for one organization is right for another.

A common mistake is assuming "business is business," says Scott Shultz, general manager at Du Pont Information Engineering Associates (IEA) in Wilmington, Del.

IEA developed the Rapid Interactive Production Prototyping methodology for building software in Digital Equipment Corp. environments, an offering it has sold to external clients since Dec. 31, 1990.

"It takes a different skill set" to be a software or services company rather than, say, a manufacturing company, Shultz says.

The University of Southern California at Los Angeles (USC) found that out when it decided to sell the Total Online Application Development System (memorably dubbed TOADS), its fourth-generation language applications generator running on Prime Computer, Inc. machines.

"We had no intention of marketing" the system until Prime urged us to do so, says Dianne Bozier, director of USC Software Systems, formed in 1988 as an offshoot of USC's administrative computing group. Bozier and her group found themselves putting together price lists, user documentation, training and support for software previously provided free only to the school.

Consultants and IS chiefs strongly recommend that firms go into the software or services business with their eyes open. "You need to know who the competitors are and how they price their products, as well as what unique features differentiate your product," says Norton Kubilus, vice president of management services at Optimal Solutions, Inc., a consultancy in Hoboken, N.J.

"You can lose a bundle in supporting something that should never have gone to market," he adds.

William Harris, chairman at Belnke Harris & Associates, Inc., a New York management and information technology consultancy, adds customer service, maintenance, new releases and liability to the list of responsibilities.

Haves and have-nots

Companies that have made such a move advise the use of evaluation studies (see story page 76) and consultants to fill the gap between what a company has — the software or service — and what it doesn't have — commercial market expertise.

San Francisco-based Bechtel Group, for its part, launched an 18-month evaluation study to analyze whether it should move into the commercial realm. The impetus came from "clients, who often requested that the software tools developed for their [engineering] projects be left behind," explains John Lucas, president of Bechtel Software, Inc. in Acton, Mass., a wholly owned subsidiary of Bechtel Group.

Lucas, who was running another software firm at the time, participated as a consultant in the study. "The study showed this was a logical extension for Bechtel. It also recommended that we run it as a legitimate commercial software business," he says.

The company was incorporated in 1987, with Lucas as its first employee.

Bechtel Software consists of three divisions: project management and computer-aided engineering (CAE) software, engineering systems and AI Institute, which offers expert systems consulting services.



Michael Klein

The company employs no developers, acquiring its wares from other Bechtel groups and paying them for their services by contributing to a pool of development funds. The company also markets products from

Continued on page 75

Francett is a free-lance writer based in Bloomfield, N.J.

User companies with an IS twist

Company	Product/Service	Formed	Biggest surprise	Hardest task	Recommend?
USC Software Systems	TOADS 4GL application generator; financial and administrative systems	1988	The nuances of salesmanship	Learning to withstand rejection by potential customers	Yes, if you have a good product and good support
Bechtel Software	Computer-aided engineering and AI software; consulting	1987	None	Gaining the respect of Bechtel's other lines of business	Yes
Agway Data Systems	Computer and network outsourcing services; disaster recovery services; communications consulting	1987	The level of customer satisfaction	Acquiring marketing, advertising and on-site selling skills	Yes, if services have good internal reputation, you maintain business focus and you have top-down mandate

CW Chart: Marie Hulsen

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Continued from page 73

third parties, such as database vendor Oracle Systems Corp.

Support services augment the software and consulting businesses. Maintenance services are charged on an annual basis as a percentage of the software fee. Training and consulting fees are based on the product and the customer's needs.

Five years ago, Agway, Inc., a farmers' cooperative made up of eight different businesses in eight different industries, hired The Diebold Group, a New York-based consultancy, to study if and how Agway should approach the commercial marketplace.



IEA's Shultz: *Businesses differ*

"The study came back favorable and with a proposed business plan," says Dennis LaHood, president of Agway Data Systems (ADS), a wholly owned subsidiary of Agway created from the IS group.

ADS uses a chargeback system for internal users. Because internal users were thought of as customers, "that made the transition to handling external customers much less traumatic," LaHood says.

The company offers its external clients computing and networking outsourcing services, disaster recovery and communications consulting — but no software.

"We made a conscious decision to be on the service side [externally]," LaHood says. "Many of the software products developed internally provide competitive advantage to our internal client base. It wouldn't be appropriate to market them," he adds.

ADS continues to provide all aspects of IS to its internal customers, including systems development, voice and data networking, PC and minicomputer support and all new technical research and applications.

Sharing the burden

Beyond revealing the viability of a commercial move, a consultant can also take on some of the hassles associated with selling externally.

For commercial companies that are spun off as separate units, such as Fields Software Group, a sister company of Mrs. Fields Cookies and maker of the IBM System/38-based Retail Operations Intelligence system, hiring their own sales and marketing groups makes business sense. In Fields Software's case, selling $1 cookies to individual consumers and selling million dollar software to supermarkets demand different tactics.

However, commercial ventures that are not separate entities will increasingly rely on partnerships to "handle the burden of marketing and supporting products" at a reasonable cost, says Scott McLarnon, a consultant at Decision Research Corp.

Spencer Gifts, Inc., for example, joined in a partnership with a consultant to externally market and sell its Spencer Integrated Retail Information System (SIRIS), a mainframe-based retail system with relational database capability.

Eugene Murtha, Spencer IS vice president, met William G. Buoni, president of W. G. Buoni & Associates Ltd., at a meeting of the National Retail Federation in New York. Buoni possessed not only database design expertise but also software selling experience — qualifications

Continued on page 76

Breaking off is hard to do

Lack of experience, internal pressure forced WIS to drop commercial software

One company that has found it tough selling software to outside clients is Weyerhaeuser Information Systems (WIS), the IS arm of $10 billion lumber giant Weyerhaeuser Co. in Seattle. WIS dropped its commercial software business in January, according to Susan Mersereau, vice president and general manager at WIS.

"Our primary focus is to get better at serving Weyerhaeuser Co. That was questionable in the software area," she says.

Lack of internal acceptance and inexperience in the commercial marketplace worked against the venture, Mersereau explains.

WIS was created as a profit center in 1985 as part of a companywide diversification effort. Its 400 IS professionals serve both internal and external clients.

WIS provides services to its internal customers in four areas: networks and telecommunications, mainframe computing and local-area networks, applications development and support and research and development.

Externally, WIS sold in-house-developed software — a manufacturing system, transportation software and a computer-aided design scanning system — as well as services such as systems integration, disaster recovery and radio communications.



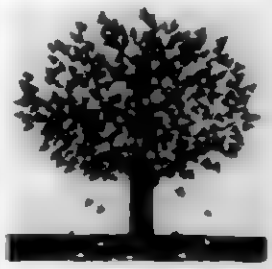
Mersereau: *I'd do it again*

That dual role resulted in conflict. "Originally, our focus was to go into the external market to improve our internal capabilities," Mersereau says.

WIS aimed to sharpen its project management, pricing and delivery skills as well as internal mechanisms such as billing, legal policies and contracts.

"We also wanted to find out if we were being competitive internally with our offerings or if we should buy outside products and services," she says. "This gave us a benchmark."

Problems arose. "The internal businesses didn't accept the commercial venture. They shared the perception that the best employees were being assigned to outside projects," Mersereau says.



Moreover, even though Weyerhaeuser had done extensive planning and had brought in external consultants before forming WIS, those efforts didn't anticipate some of the harsher realities of the software business.

"We learned that success in the software business requires staying power — product changes and development — outside our traditional scope," Mersereau explains.

WIS discovered that it had entered too many markets with too many products at the same time and had also miscalculated how long it would take to build a client base.

"We provided product support and upgrades," Mersereau says, "but we were constantly competing with vendors, which we would only have been able to keep up with by porting our products to more platforms. This would have required additional capital."

As a result, some products made money and others didn't. Mersereau declined to comment on profits, but 1990 WIS revenue was $50 million — $10 million in software and the balance in services.

Although the software business did not work out, Mersereau says her feelings about going into the business of IS have not soured. In fact, she says, the commercial plunge has been unquestionably worthwhile. "I would do it again in a minute," she says. "The transfer of knowledge was invaluable. We learned that we had to look at an offering from the product/service mix and ask ourselves if it should be offered internally."

Some of the products, such as the manufacturing system, are still used internally. WIS has made subcontracting arrangements to support its former external software customers.

Because the software business has been discontinued, WIS has changed the way it charges its internal clients. WIS still operates as a profit center for the services it offers externally, but internally it has shifted to a cost recovery system, a form of chargeback, Mersereau says.

Mersereau also emphasizes the importance of an intense executive commitment to such a venture.

Although Mersereau says she feels WIS has always had management's support, in hindsight she adds that WIS' efforts would have benefitted from closer attention.

"The support and commitment of the management structure of the company needs to deal with why you're there and what you're doing," she says.

WIS still has its hands in external undertakings through its disaster recovery services and systems integration efforts.

It has long-term contracts with external clients in both areas and plans to continue offering those services. ●

BARBARA FRANCETT

User companies with an IS twist II

Company	Product/Service	Formed	Biggest surprise	Hardest task	Recommend?
FMC	Network outsourcing; computer time services; manufacturing application software (in development)	1988	Differences between dealing with internal and external clients	Learning to cope with those differences	Yes, if you have low internal unit cost and high service level
Du Pont Information Engineering Associates	Rapid Interactive Production Prototying methodology	1987	Inexperience with services business	Working with both internal and external clients	Yes, but be aware of support requirements
Spencer Gifts	SIRIS retail system (available during 1991)	Not applicable	None	Staying focused on product development rather than being distracted by potential revenue	Yes
Fields Software Group	Retail Operations Intelligence store management system	1990	The difference between marketing cookies and marketing software	Learning software marketing	Yes, if the commercial venture is carefully planned
Weyerhaeuser Information Services	Manufacturing, transportation and CAD scanning software (operations and development); disaster recovery; systems integration; radio services	1985	Lack of support from internal businesses	Coping with the rewritings in planning	Yes

CW Chart_Marie Hanna

Continued from page 75

critical to Martha and his product.

Their pact enables Spencer to enjoy the benefits of selling its systems commercially without the headache of making sales, Martha explains.

The contract between the two firms includes revenue goals that must be met "within reasonable time limits," Martha says. Revenue will be split between the Birdsboro, Pa.-based consulting company and Spencer, although neither will reveal details of the arrangement. Spencer also retains the right to market SIRIS.



Lucas conducted study for Bechtel

Phase 1 of the system will be ready for sale to retail chains, department stores and food stores in June.

However, all the consultant advice in the world can't guarantee success. At Weyerhaeuser Information Systems (WIS), the IS unit of lumber company Weyerhaeuser Co., extensive studies and consultations failed to predict the hidden problems the company eventually ran into selling software. Those problems forced WIS to stop its software operations in January (see story page 75).

Dallas-based FMC Corp., a financial services outfit, began its commercial IS foray in 1988, following the recommendations of consultants. It sells services such as computing time and network outsourcing. But customers haven't been pouring in.

"We've successfully brought in revenue for the company, but the volume has been about half of what we'd like," says Randall Gannaway, director of the corporate data center, a DB2 shop. "There's a lot of people kicking tires out there."

For companies that do decide to take the commercial plunge, however, finding the right organizational and IS structure to back up the product or service is imperative. Some, such as Fields Software, break away completely to become a separate company. Others, such as Spencer, don't change the organization at all but rather take on a partner. And in many cases, the new business becomes a company subsidiary, operating independently but belonging to the parent organization.

Which way to go depends on the parent company's business, focus and goals.

As Randy Fields, former IBM mainframe programmer and chairman of Fields Software, notes, cookies and software are two businesses with little in common. Beyond the fact that it was Mrs. Fields' IS staff that formed Fields Software, the two are separate entities today. The cookie company pays to use the store management system like any customer.

When the relationship between parent company and spin-off remains close and the organization follows suit, staff members often flow from one to the other.

For instance, about half of Bechtel Software's 65 employees are from other Bechtel Group areas. A benefit of this arrangement, Lucas says, is career flexibility that helps Bechtel retain IS employees.

At ADS, the salaries of the 150-plus ADS staff members are paid by Agway. Some employees are devoted to internal development tasks, while others are assigned to both external and internal tasks. Assignments change with the length and needs of those projects, LaHood says.

Where the money goes

While profits remain elusive for many of these privately held fledgling ventures — with the exception of Field Software, which will achieve "significant profitability" in its first year, according to Randy Fields — their rule of thumb is to invest in building the business, then plowing revenue back into product development.

Last year, for instance, Bechtel Software's revenue was $12 million, a "good percentage" of which is applied to software enhancements and technology development.

USC Software Group puts the revenue it earns into the university's general operating fund and writes it off against the cost of development, which is in the millions, Bozler says.

IEA's revenue is poured back into the budget of New Business Design & Development Group, a "greenhouse for nurturing new business concepts" at Du Pont, according to Shultz.

ADS pays a dividend back to Agway each year, with a portion of its revenue retained for growth and reinvestment.

Despite its overestimation of the market, FMC reaps revenue and benefits from its external business.

Gannaway explains: "We have reduced costs internally because any revenue and profits the data center earns from its external customers is worked back into its rate structure and lowers the cost of computing hours."

While the challenges are many and the risks high — "Failure is more common than success," Fields notes — all of these IS entrepreneurs say they'd do it again to open new lines of business for the parent company. In fact, they encourage others to join them. •

To do and not to do

DO know what you're getting yourself into — you'll need to acquire a whole new set of skills to successfully sell software or services commercially.

DO set realistic expectations.

DO plan ahead to make your in-house-developed product more applicable to other businesses.

DO hire someone with expertise in marketing to do a market analysis.

DO think about what to develop next, or in a few years you'll have exhausted your market.

DON'T get into a business that is far removed from your company's primary business.

DON'T be naive about what it takes to bring a product to market and support it.

DON'T become enraptured with the profit-making aspects of external business and lose sight of the primary objective: strategic advantage for your firm.

Evaluation study ingredients

An evaluation study consists of the following, according to John Lucas, president of Bechtel Software in Acton, Mass.:

- **Market analysis.** Find out how and with what product or service you can compete against established companies. Questions include: What is the right product or service to sell? What market should we target? Does our product or service add value to that market? How can we differentiate ourselves from established competitors? How does our product fit into the competitor mix?
- **Mission statement.** Spell out your strategy and objectives. Is your objective profits, value added for the parent firm or new markets? What's your strategy for getting to your goals?
- **Business plan.** Put together a plan that describes the organizational setup (Will we be a wholly owned subsidiary or a separate company?); staff needs and costs (Should we hire executive staff, IS staff and/or sales and marketing staff, use the parent company's staff or contract with a third party?); start-up and operational costs; expected return on investment; and value-added concerns (Are we going to buy products? Will we make pacts with third parties?).

Lucas warns companies contemplating a commercial run that people can often make or break the venture. For example, don't take a software engineer and put him on the executive staff unless he belongs there.

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   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
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   - 12. Vice President, Asst. VP
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   - 50. Business Service (except DP)
   - 60. Government - State/Federal/Local
   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Retailer
   - 75. User Other _____
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   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
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   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President, Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
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Buddy system

▶ Small businesses got some big technology partners early this month when the **Business Information Center** opened in Seattle. A joint venture of the **U.S. Small Business Administration**, the **Service Corps of Retired Executives, Microsoft Corp.** and **IBM**, the center places a sophisticated reference library, an assortment of computer counseling stations and a panoply of sample business plans at the disposal of small business owners.

The winter of our content

▶ A 15% surge in semiconductor orders last month sent the **U.S. semiconductor industry's** book-to-bill ratio winging from .96 in January to 1.09 in February — the biggest month-to-month increase since March 1983, according to the Semiconductor Industry Association. Nearly $1.3 billion worth of new orders, or bookings, poured into U.S.-based semiconductor companies last month, the association said. Actual shipments into the U.S. market, or billings, for the month came to $1.2 billion — a 9% gain over the $1.1 billion billed in January.

Joining public life

▶ Colorado Springs, Colo.-based semiconductor company **Simtek Corp.** early this month added to what some Wall Street analysts believe will be a bumper crop of 1991 initial public offerings by technology firms [CW, March 18]. Simtek went public on March 6 with 1.95 million shares of common stock priced at $6 per share and an identical number of redeemable warrants at 10 cents per warrant.

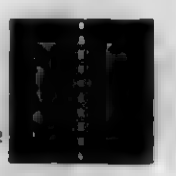
Fun and games

▶ Entertainment software player **Sierra On-Line** and educational and productivity software player **Broderbund Software, Inc.** are about to get their acts together. Sierra Chief Executive Officer Ken Williams will hold the same position at the consolidated firm, which will be created through a stock swap and will be headquartered in Oakhurst, Calif. Broderbund Chairman and CEO Doug Carlston will remain in charge of the new firm's Broderbund operations, which will continue to run out of its current headquarters in San Rafael, Calif.

Group tries taming 'electronic frontier'

BY JAMES DALY
CW STAFF

The ready accessibility of personal computers, telephones, modems and dial-up services has created a vast and, some say, legally ambiguous electronic landscape that is rapidly shaping up as the next proving ground for personal and legal freedoms.



Hackers, scholars and information police who will gather at the first annual Conference on Computers, Privacy and Freedom this week will take on thorny issues including the following:

- Defining limits in borderless "cyberspace"
- Balancing computer security with the free flow of information
- Safeguarding individual privacy in the face of instant-recall technology

This week, the Palo Alto, Calif.-based Computer Professionals for Social Responsibility (CPSR) association will begin working to clear away the haze when it sponsors the first annual Conference on Computers, Privacy and Freedom, at which hackers, police officers and scholars will come together in an attempt to determine exactly how free speech can be expressed in bits and bytes. The gathering has the potential to set fundamental directions in such areas as balancing computer security with a free flow of information and maintaining the right of individual privacy in the face of instant-recall technology.

"The problems involving the increased computerization of society are somewhat analogous to those that occurred with the advent of the automobile," said Eli Noam, a conference speaker who serves as director of the Center for Telecommunications and Information Studies at Columbia University in New York. "The car was a wonderful thing until we discovered that it produced something called pollution. Then we had to do something about it, or we were going to choke on its fumes."

From one perspective, the electronic age represents democracy in all its glory. It is no longer necessary to own a printing press and "publish" documents in the old sense of the word; information is now launched thousands of miles in all directions at the click of a keyboard. PC users can dial into hundreds of on-line bulletin boards and read opinion pieces, sell their old cars or tap into ongoing conversations dealing with everything from sexual kinks to the price of treasury bonds.

Continued on page 79

Laying down the law

Realizing that this technological genie can never be put back in its bottle, many people believe that education is the only solution. "There only exists an electronic frontier in that there are few regulations and policies that are well-understood and well-designed," said Jim Warren, an industry veteran who will chair the four-day Conference on Computers, Privacy and Freedom. Legal experts concur. "I've talked to judges who say their education [regarding electronic media] comes not from reading books or going to classes but from attorneys in court," said Donn Parker, a security consultant at SRI International.

Others note that information that flits unseen across wires, beams of light and radio waves has outrun the traditional rules of law. "A whole lot of jurisdictional law is based on borders, but borders don't matter anymore," adds Don Ingraham, an assistant attorney in charge of the High Tech Crime Team in the Alameda County District Attorney's Office in Oakland, Calif.

Telecommunications fraud, for instance, transcends state lines and federal and state jurisdiction. The result is that the rules are sometimes written while the game is being played. For instance, the federal government may pursue its Operation Sundevil case as one enormous prosecution, requiring unparalleled cooperation from state and local law enforcers, or it may handle the investigation on a regional basis. That decision is still being made, according to Gail Thackeray, the former Arizona assistant attorney general who directed the state's participation in the operation.

JAMES DALY

Sun branches out, spins off pair of subsidiaries

BY J. A. SAVAGE
CW STAFF

No longer an upstart start-up but a $3 billion company that is trying to preserve its entrepreneurial roots, Sun Microsystems, Inc. will have two new subsidiaries operating by July: Sunsoft, Inc. and Suntech Enterprises, Inc.

Sunsoft was chartered to promote system software for licensing to third parties rather than hoarding it within the Sun fold as a means of "adding value" to Sun workstations. Suntech was commissioned to ensure that non-workstation areas of endeavor, such as printers, compilers and multimedia applications, all become profitable or at least pay for themselves in the long run.

"Sunsoft's product line is like the foundation and framework of a house," President Ed Zander said. "Suntech's is like what color you're going to paint it and what kind of furniture you'll put in it."

Sun will continue to be responsible for workstation hardware; disk, tape and add-in memory; and applications.

"It's not clear you do this to make zillions of dollars," Zander said. Instead, the idea is to proliferate the Sun operating system and make it easier for clone and compatible makers to license system software.

Zander said the arms-length relationship between Sun and Sunsoft would put companies that intend to compete with Sun more at ease. "If I were a competitor of Sun and I wanted to buy Sun's operating system but had to walk into Sun in order to do it," he said, "that makes an uncomfortable selling relationship."

Prior to the creation of Sunsoft, Sun's strategy was to keep some of its system software, such as network management, to itself to provide added value for its own machines.



Zander will head Sunsoft, a new Sun subsidiary

"But that became an endless can of worms [in internal discussions], so we finally decided that there should be a way for compatibles to get equal footing," said Bill Keating, director of corporate technology marketing at Sun. "Basically, we won't have value-added software [now]," he added.

Eric Schmidt, president of Suntech, appears to have a more difficult mission in that the Suntech products must be shown to pay for themselves or risk being cut. "I don't have anyone else to fund me," he said. However, he added, "even though it sounds terrifying, it's not that bad."

For one thing, he noted, under the new subsidiary structure, Suntech's product lines will be sold by a dedicated sales and marketing force for the first time. This should make it easier to get to the bottom line, according to Schmidt. "Now, most customers don't even know we have a printer," he said.

"Our sales force doesn't bother with [system software, networking and peripherals] by and large," Zander added. "Our salesmen are computer guys."

The announcement of the new companies came only a couple of months after discussions first began, according to officials. "We're very unpredictable," Zander said. "We don't let the organization get in the way."

Details are still being worked out, and staff members have yet to move into centralized quarters.

German DP trade deficit rises

Computer industry urged to 'regain its export potential'

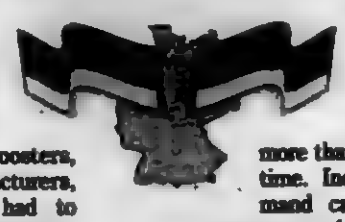
IDG NEWS SERVICE
Special to CW

HANNOVER, Germany — The German data processing industry's foreign trade deficit soared to a record high of about $45 billion in 1990 — a trend that is expected to continue. That deficit could well reach $5.7 billion in the current year, according to the German Federal Association of Office and Information Systems (BVB).

BVB Chairman Rudi Haeussler urged the computer industry to increase its efforts to make Germany internationally competitive in this area if it is to remain strong in the world computer market.

Germany "has to regain its export potential in order not to fall technologically and economically further behind competition from the Far East, the U.S. and other European neighbors," Haeussler said. High salaries and short work hours have already caused the country to fall behind.

Aside from the disproportionate relationship between imports and exports, Haeussler said, 1990 was a good year for the German office, information and communications industries. "Based on the figures calculated for the first three quarters of 1990, the sector has grown by about 10% and topped the $50 million turnover mark for the first time," he said.



Production value increased 6.2% to $21.7 billion. Software and services were the predominant growth boosters, while hardware manufacturers, facing cost barriers, had to struggle to adjust to the market.

The office equipment sector grew between 15% and 20% in 1990, mainly because of market expansion into the former East Germany. "We were surprised that this sector out of all the others profited the most from the new German states," Haeussler said. The move into eastern Germany also helped software houses, training institutes and telecommunications vendors grow.

The BVB reported that production in terms of value climbed from 10% to 15% to more than $10 billion for the first time. Increases in domestic demand caused primarily by the enormous need for a modern telecommunications infrastructure in eastern Germany have, however, cast a shadow on the value of exports, which are expected to decline for the first time, according to the BVB. The computer industry, however, did not profit significantly from the arrival of the new German states. "We misjudged the demand for computers in eastern Germany," Haeussler said.

Although there is interest in inexpensive, generic personal computers, the former East Germany has been reticent about mainframes and minicomputers, Haeussler noted. But even if the information technology sector grows this year to $10.5 billion after last year's decline of almost 6%, about 7% market growth will come from imports. Haeussler said he expects the professional PC sector to struggle the most.

Price cuts of up to 30% were expected with the conclusion of Cebit last week, according to Far Eastern manufacturers. According to Haeussler, these price reductions will make the already difficult market adjustment process that most manufacturers are currently experiencing even more difficult.

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DG co-founder joins Edsun Labs

WALTHAM, Mass. — Edson de Castro, co-founder and former chairman of Data General Corp., has joined the board of directors of Edsun Laboratories, Inc., a privately held company that specializes in developing graphic enhancement technologies and products for the personal computer environment.

Gordon Hoffstein, Edsun's president and chief executive officer, said that he was "absolutely delighted" to have de Castro join the board.



De Castro *joins Edsun's board*

"I greatly admire his business talent and acumen. Castro will provide an excellent balance to Edsun's board as well as to the company as a whole."

Hoffstein recently joined Edsun after leaving Microamerica, Inc., a major distributor of microcomputer products that he founded in 1979. De Castro will join Steven Edelson, Edsun's founder and chairman of the board, in providing engineering insight for future graphics product development, according to the company.

The company maintains a regional sales office in California as well as a worldwide network of distributors and agents.

Frontier

CONTINUED FROM PAGE 77

To others, it is a breeding ground for outlaws like Kevin David Mitnik. Prior to being jailed, Mitnik was, by all accounts, a dangerous guy with a computer [CW, Jan. 1, 1989]. He reportedly tapped into data banks and destroyed information, altered credit reports and disconnected the phones of celebrities. His most famous exploit, electronically breaking into the North American Defense Command in Colorado Springs, reportedly inspired the movie *WarGames*.

When dealing with today's technological wizardry, the Bill of Rights has come to mean different things to different people. It was written in the age of quill pens, long before information could be disseminated without physical form over copper wire or microwaves — a realm that writer William Gibson dubbed "cyberspace."

The result is that integration of civil rights and jurisprudence in the computer age has sometimes been clumsy, at least on the federal level. Last March, the U.S. Secret Service raided the Austin, Texas, home of Steve Jackson, who publishes numerous role-playing games. The agents seized computers they said contained a "handbook of computer crime." The handbook was, in fact, a rule book for a role-playing game. Jackson was not charged with any crime, but he said the government held his computers for nearly four months and the $125,000 he lost in sales put him close to bankruptcy.

Two months later, more than 150 Secret Service agents and prosecutors in Phoenix announced 28 new raids under Operation Sundevil. Although its primary focus was credit-card and telephone access code abuse, the nationwide dragnet shut down several on-line bulletin boards and seized 40 computers and 23,000 floppy disks. Indictments are reportedly in the works, but so far, the raids have yielded little except a lawsuit by the CPSR attempting to compel the Secret Service to reveal the investigation's standing.

Danger on the horizon

Some computer users took a look at the likes of Operation Sundevil and the Steve Jackson affair and believed they had spotted an ungainly beast crashing through an unfamiliar and hazy territory. The result was the Electronic Frontier Foundation (EFF), an organization designed to provide the legal armor necessary to apply First and Fourth Amendment protection to computer users. "We were looking at something that was big and ugly and going to blow up if we weren't careful how it got managed," said John Perry Barlow, cofounder of the EFF. "We want to create a culture and an environment that is free and open and characterized by its liberties rather than its limitations."

Barlow maintains that the EFF is not a safe house for hackers but that it wants the promise of basic liberties extended to a vast, unmapped and untamed landscape that spawns both outlaws and vigilantes.

Lawmen said the frontier analogy is farfetched. "Like the American West, there were people on this frontier long before the wild and woolly Europeans invaded," said Donn Parker, a security consultant at SRI International in Menlo Park, Calif. "The rules to the game are well-established; comparing the electronic community to the wild West is ridiculous."

EXECUTIVE CORNER

Alliant veteran fills CEO post

A management succession plan put into effect last year has boosted **Alliant Computer Systems Corp.** veteran **Craig J. Mundie** into the office of chief executive officer. Mundie, who has been with Alliant since the firm's founding in 1982, has served as president and chief operating officer since July. As CEO, Mundie replaces **Ronald H. Gruner**, who also served as vice-chairman prior to his resignation from the company last month.

The most recent in what appears to be a series of promotional announcements from Waltham, Mass.-based AI Corp. shows the knowlege-based management systems supplier expanding in directions both geographical and technological. **Dan Schmidt**, a 13-year veteran of Management Science America, Inc. who most recently headed up international operations for the former software firm (now merged into Dun & Bradstreet Software), has joined AI Corp. as president of AI Corp. Europe and vice president of international operations. Walt Simpson, former director of product marketing at Commodore Business Machines, Inc. is the new director of PC Business at AI Corp.; David Riley brings his 12 years of software industry experience to his new post as the firm's director of Digital Equipment VAX Business.

Tudayasu Sugita, former general manager of the Personal Systems Division of Fujitsu Ltd., recently became COO of Santa Clara, Calif.-based portable computer company **Poqet Computer Corp.** Fujitsu holds a stake in privately owned 3-year-old Poqet, along with the firm's founders and employees. At his new post, Sugita "will focus on the development and engineering of future products and continue coordinating engineering efforts between Poqet and Fujitsu," according to Poqet CEO Robb Wilmot.

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INTERNATIONAL BRIEFS

Merge and conquer

▶ Eyeing major expansion throughout the North American information services market, Toronto-based **Westbridge Computer Corp.** and neighboring **STM Systems Corp.** announced a stock-swap merger last week. In addition, the firms simultaneously announced the forthcoming combined firm's first alliance: an agreement with **IBM Canada Ltd.** under which IBM will become a stakeholder and business partner of the merged corporation. Final details of the agreement, financial and otherwise, were not disclosed. Some of these gaps will be filled in when the deal closes, according to Westbridge and STM.

Asian ad-ventures

▶ Japanese giant **Mitsubishi Corp.** and New York-based venture capital firm **Hambro International Equity Partners** have joined forces to launch a $150 million venture capital fund aimed at helping U.S.-based start-ups market in Asia. According to a recent report in the U.S. financial press, Hambro will target and evaluate candidates for funding assistance, while Mitsubishi will open up its vast access route to a panoply of resources.

Sense of security

▶ Information technology security is due for a climb up the priority list in **France**, according to recent reports in the French business press. Why? One compelling reason might be found in a recent study issued by French consulting firm **PSI**, which revealed that French companies spent a total of $950 million on information systems security last year and lost an estimated $1.6 billion because of computer accidents, error and fraud.

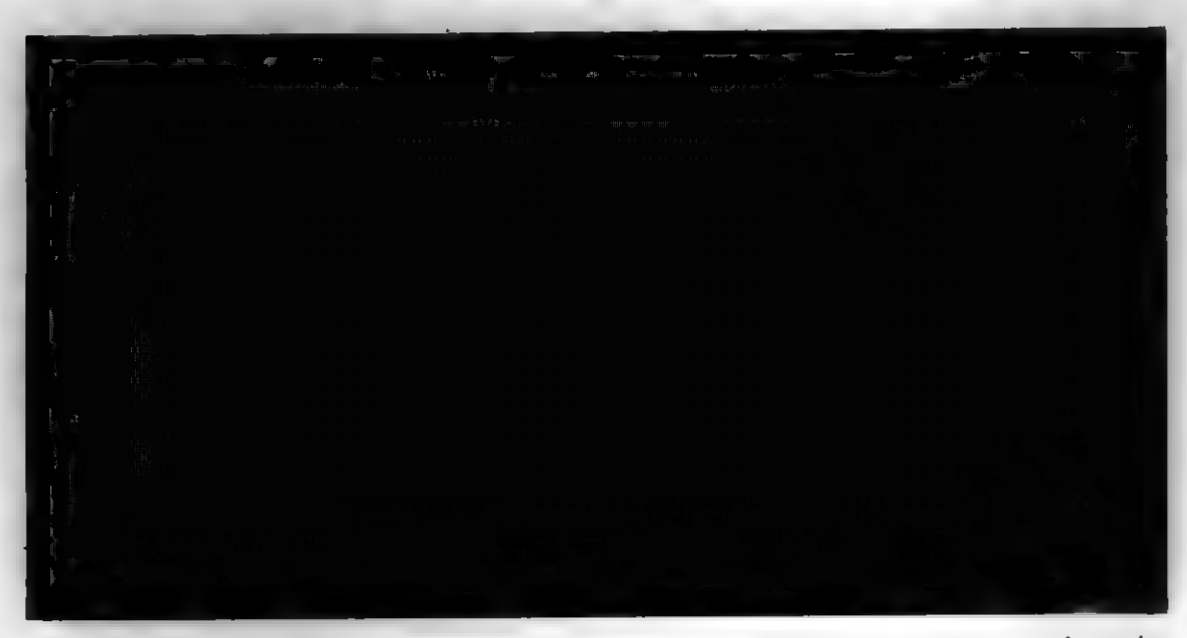
Video alliance

▶ Cebit, the huge information industry trade show held in Hannover, Germany, served as the setting for **Siemens Private Communications Systems'** mid-month announcement that it has extended its PBX and Computer Teaming (PACT) alliance program to video communication companies. Siemens sealed its PACT addition by signing up two new allies: Maidenhead, England-based **GPT Video Systems** and Peabody, Mass.-based **Picturetel Corp.**

A hand in Japan

▶ **Data General Corp.** has agreed to sell its Japanese subsidiary, **Nippon Data General**, to Kyoto, Japan-based electronics company **Omron Corp.**, the firm announced earlier this month. The deal, valued at approximately $46 million, will not sever DG's ties in Japan, the company said. Nippon Data General, which will retain its original parent company's name, will also become DG's exclusive Japanese distributor.

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IBM taps B&B for CICS monitor

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — As the next generation of Enterprise System/9000s approaches, IBM has to learn what many firms in the Unix and Digital Equipment Corp. markets already know: how to enable machines to share data through "loosely coupled" clusters.

To speed the process, IBM early this winter tapped Boole & Babbage, Inc., the 24-year-old systems utilities firm, to work with IBM's CICS engineers in Hursley, England. The joint development project is well under way, said Jack van Kinsbergen, chief technical officer at Boole & Babbage here.

Within two years, Boole & Babbage hopes to have aided IBM's development of a CICS teleprocessing monitor that coordinates computing tasks among multiple IBM processors.

Boole & Babbage's technology would give IBM users a way to "view" their applications in action, said Jeff Schulman, an analyst at Stamford, Conn.-based Gartner Group, Inc.

"IBM is suggesting that they start splitting their applications across multiple hardware platforms, but you can't distribute applications unless you've got the management tools in place," Schulman said. "Boole is integrating its performance management products around an application view rather than a platform view."

IBM has already taken the first steps toward such a client/server architecture, industry analysts said, by introducing OS/2 versions of CICS for desktop computers. But Boole & Babbage's software should allow for greater integration between the desktop transactions and those on the host mainframe computer, according to Alan Snitkoff, an analyst at New Science Associates, Inc. in Southport, Conn.

"This collaboration gives IBM a foundation for starting to distribute applications [once] confined to an MVS processor," Snitkoff said. "[Boole] is one of the independent software firms that will help IBM build products that fill in the holes in IBM's Systemview scheme."

Want overseas work? Better be flexible

BY KIM S. NASH
COMPUTERWORLD

In 1987, Ron Landry watched Indonesian workers clear away jungle growth with machetes and wished he could use the same method to dispose of the thick tangle of government regulations blocking completion of his company's planned data processing operation.

Frustration never won out, however. Instead, Landry, director of MIS at Freeport-McMoran, Inc., a New Orleans-based mining firm, spent two years cultivating local contacts and applying cultural understanding and a heap of patience to getting the facility up and running in Tembagapura, or "Copper Town" — a city built by Freeport from nothing but jungle.

Cultural flexibility is an increasingly valuable skill at a time when many businesses are setting up divisions or constructing alliances with partners in foreign countries. With the planned uniting of the European Economic Community in 1992 and the emergence of Asia as a business hub, international know-how has become a major career asset, says Steve Fogle, director of research for Korn/Ferry International's northwest region.

Fogle has seen a jump in the number of requests for information systems people with an overseas background, especially during the past three years. Resumes that mention work performed abroad are pushed to the top of the pile in today's job market, he says. People who have worked abroad can "most definitely command higher salaries," he adds.

Local point of view

Although most foreign assignments are not quite as tough as Landry's, most demand flexibility, patience and the ability to appreciate the local point of view. Not only are the laws governing business and technology different overseas, but foreign countries rarely apply technology in the same way Americans do.

"Anyone who's had such experience is better positioned to sift through the words of foreign colleagues in order to understand what they're really saying," says Rex Schemerhorn, manager of IS at Diamond Star Motors Corp. in Normal, Ill. Jointly owned by Chrysler Corp. and Japan's Mitsubishi Motor Corp., Diamond Star has kept Schemerhorn continent-hopping from here to Asia and back since he was hired in January 1987. He spends most of his time overseas in Tokyo and Nagoya, Japan.

Overseas experience isn't only a ticket to additional foreign postings; it can also pay off in terms of job responsibilities in the U.S. Landry, for example, says he is now asked to participate in major corporate restructuring decisions. "When we're looking to establish foreign businesses, IS considerations are being placed on the same level as financial, legal and political issues," he says.

With the right credentials, it is sometimes not even necessary to write a resume: Jobs come looking for you.



Pete Bates, former manager of information technology at Raychem, Inc., a multinational wire and cable parts-making company in Menlo Park, Calif., was recruited in March 1990 by Businessland, Inc., largely because of his IS experience in Western Europe, he says.

Now vice president of information services at Businessland, Bates says his knowledge of which technologies are feasible in which foreign countries made him attractive to the computer retailer. Businessland plans to expand current operations in the UK, Germany, Canada and Japan and eventually move further into the Far East, Bates adds.

"What intrigued the company most was that I had helped architect a complete data communications plan at Raychem instead of solving individual problems as they arose," Bates says.

Indeed, companies are not looking for a lot of stamps in a passport book: They are looking for the kind of sustained experience in one or a few countries that makes an individual fluent in the nuances of local business norms. IS success often depends on familiarity with and effective application of local customs. This is tricky, however, because business norms differ between countries and across oceans.

"When you talk to a CEO in Denmark, you use his first name, but in Germany, everyone — no matter his position — is Herr This or Frau That," says Jim Venske, the program director at NCR Corp.'s Europe Group. Venske has lived and worked in Western Europe for four years.

Motivating factors

Venske also discovered during his first job in Europe, when he was support manager at a data communications group in Sweden, that motivating Swedish workers requires more creative techniques than he might have used in the U.S., where money talks.

Scandinavian countries have high income tax rates — the rate was between 72% and 78% in Sweden at the time — so the prospect of a bonus or raise did not make IS workers buckle down, Venske says. He had to find other carrots to dangle, including company-leased cars and portable computers to induce his team to work the long hours required to meet deadlines.

Venske, who is now a consultant and project leader at NCR's Systems Integration Technology Center in Frankfurt, says other problems can stem from what he calls the "Ugly American" syndrome. Some Americans expect to remake Europe into another U.S., he explains, "getting mad when the rest of the world does not function like the States, which is not a good way to build contacts." Venske emphasizes that Americans should try to fit in with local residents and customs.

The kind of firm you work for and the length of overseas service can affect career growth. According to Fogle, multinational companies tend to be more interested in IS workers from high-visibility companies where they have likely had the opportunity to glean deeper and more varied experiences with international technology issues.

In addition, having worked in Europe does not necessarily prepare people for working in other parts of the world, particularly Asia, where local residents can be less receptive to American transfers than other nations, Fogle says. Like Americans, Japanese have a penchant for nationalism and privacy and will not generally hire U.S. transfers, he says.

Nash is a Computerworld researcher/writer, features.



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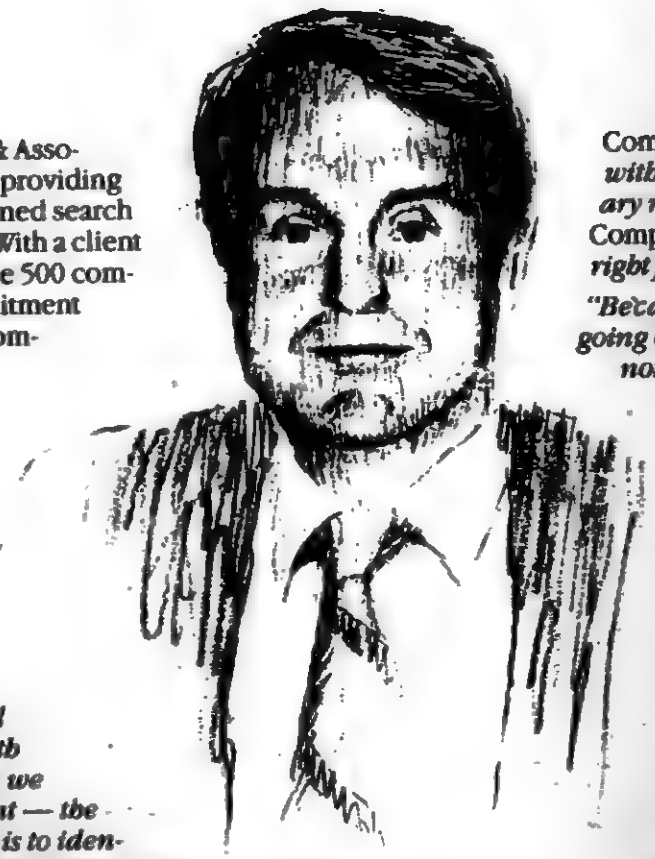
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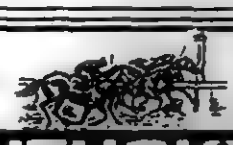
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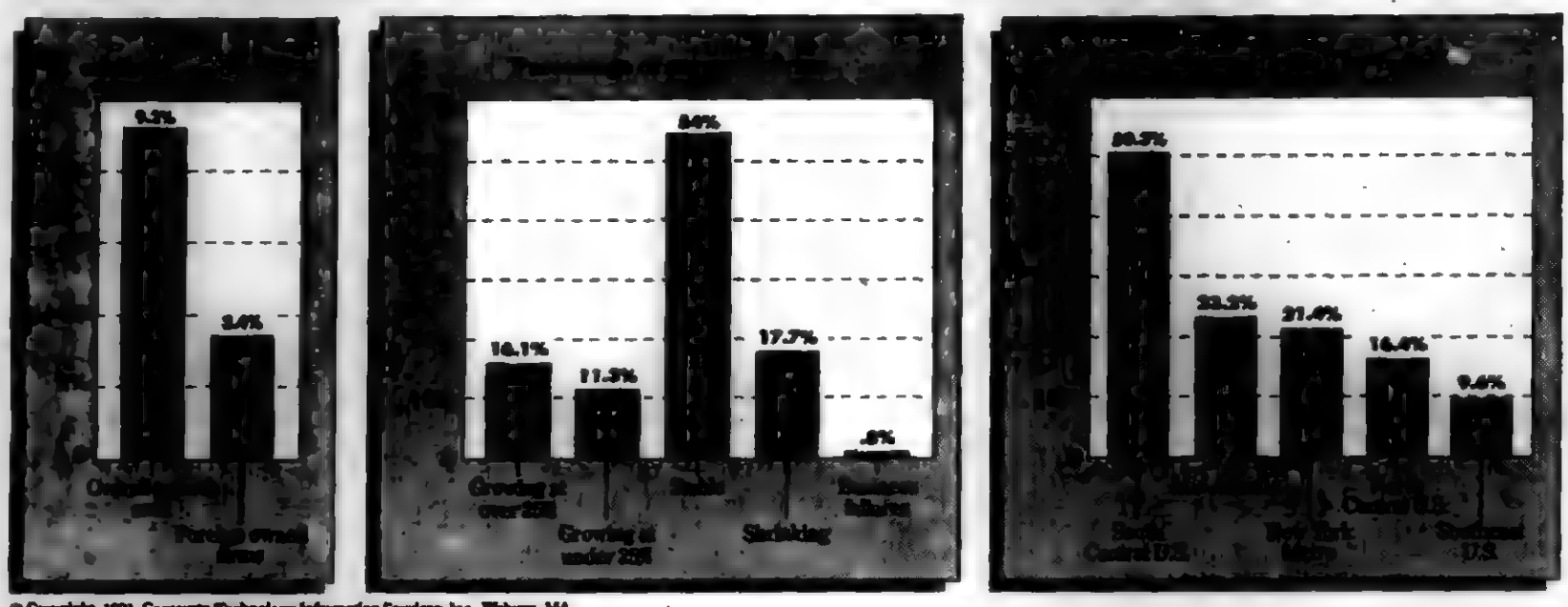
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Computerworld/CorpTech Career Index

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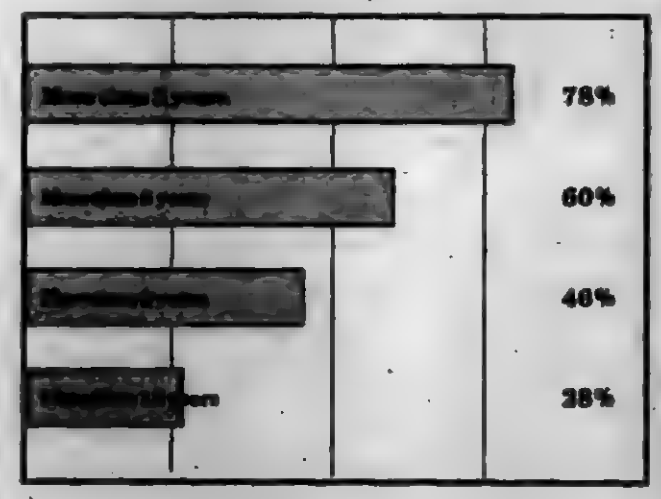
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Protect the source code of software investments

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY DENNIS S. DEUTSCH
SPECIAL TO CW

Nothing in life is certain, and that includes the business stability of software vendors. There is, however, a legal mechanism for protecting yourself and your company from the worst fallout of a software provider's failure or disappearance. This protective device is called a source-code escrow agreement, and it provides a means for a software purchaser to obtain a copy of program source code should a vendor go out of business.

Software source code is the program before it is compiled into a language that the computer can understand. As such, source code is needed to fix bugs, modify the software or write upgrade programs that will improve the application's functionality or efficiency. Without source code — although the program may be modified — systems staff will waste a lot of valuable time and money trying to upgrade programs and fix bugs.

A source-code escrow works this way: When buyers sign license agreements, they place the software source code in escrow at the same time. Escrow simply means in the possession of a third party (bank, attorney or other), which is neither the vendor nor the user. If the vendor files for bankruptcy, the user can write to the bankruptcy trustee electing to have the source code removed from escrow. The third party will then return the source code to the purchaser so that he can continue to maintain and upgrade the software.

Clearly, protecting software assets in this way is important, particularly in times of economic uncertainty. Unfortunately, probably no more than half of the IS community even knows about source-code escrow agreements and even fewer — maybe 25% or 30% — have ever used one.

No legal contract is ever simple. However, source-code escrow agreements are relatively easy to construct and enforce, if you keep a few essentials in mind. Following are some of the most important elements of an agreement:

• Get it in writing.

Do not rely on oral contracts for source-code escrow agreements. Sometimes, vendors will say the software source code will be available to you because it has already been placed in escrow. However, the bankruptcy trustee will demand to see a written agreement between you and the vendor before a copy of the escrowed source code is handed to you.

• Check the content.

Verify that the source code placed into escrow contains the source code for your program. Don't wait to find out that the code in escrow is a "Pac Man" program. The right to verify the escrowed source code must be written into the agreement. Most often, either verification is performed by a third party hired by the user or the verification is provided for a fee as a service by the escrow agent.



• Provide for the future.

Make provisions in the contract for regular updating of the escrowed source code. This is an essential step because all software will be upgraded and modified at some point. Consider what value the original source code to Release 1.0 would be to you if you are using Release 4.0 at the time of the vendor's bankruptcy. In addition to making provisions in your agreement for the escrowing of later versions, your contract must provide for independent verification with every change of escrowed code.

• Choose carefully when selecting an escrow agent.

The third parties that act as escrow agents can be banks, lawyers or private escrow companies. However, third-party agents must be negotiated and agreed to by both parties. If your vendor suggests that you use his attorney, be careful: The attorney will be more loyal to the vendor than to you. In the event of a dispute over the terms of the escrow agreement, you are already at a disadvantage if it is the vendor's attorney who is holding the source code.

There are disadvantages, too, if your lawyer serves as the agent. Although this scenario may seem to be an advantage to you, in the event of a dispute over the escrow agreement, your lawyer is now serving not only you but also the vendor (or its estate) as an agent. Your lawyer may be required to sit on the sidelines while you obtain a new lawyer to represent you in any dispute.

Although probably somewhat more expensive than using a lawyer to simply hold the software, the bank is probably a better alternative. The bank has not established any attorney/client privilege the way lawyers do, which might conflict with its obligations as an escrow agent.

Fees for private firms

You may consider using a private escrow company that deals exclusively with source code. One drawback to these companies is that they charge a fee for the original escrowing, an additional fee each time a new release is escrowed, another fee for the verification of each deposit and an annual fee while the software remains on deposit. To avoid hassles, make it clear in the escrow agreement who is responsible for these fees.

Also, don't rely on the escrow agent's contracts without having your lawyer review them during the software acquisition process. They may not be written adequately to protect the buyer's rights. They are, after all, written by escrow agents' lawyers whose prime interest is in protecting the escrow agent.

The entire software escrow process may appear to be complicated and costly, but consider the alternative: no vendor to support your software and no practical means to maintain or modify it.

Deutsch practices computer law in Hackensack, N.J., and is an adjunct associate professor of law at Fordham University School of Law in New York.

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The BoCoEx index on used computers

Closing prices report for the week ending March 15, 1991

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AT Model 099	$650	$775	$500
AT Model 239	$775	$925	$700
AT Model 339	$925	$1,000	$900
PS/2 Model 30-286	$1,100	$1,300	$1,000
PS/2 Model 60	$1,400	$1,700	$1,300
PS/2 Model 70	$3,000	$3,500	$3,000
Compaq Portable II	$900	$1,000	$875
Portable 286	$1,100	$1,350	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$2,200	$2,500	$1,900
Deskpro 286	$900	$1,000	$700
Deskpro 386/20	$2,850	$3,000	$2,300
Apple Macintosh Plus	$750	$975	$700
SE	$1,150	$1,350	$1,100
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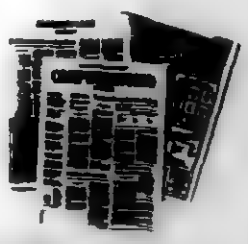
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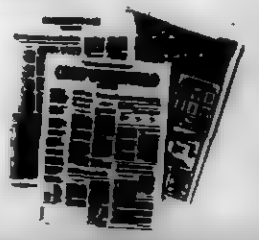
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COMPUTERWORLD
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How to tempt resistant execs to use computers

For starters, keep your training short and sweet

BY SUZANNE WEISEL
SPECIAL TO CW

To win over a senior executive who refused even to consider learning how to use the same word processing software as the rest of the company, Mary Ann Brink, the end-user computing project leader at the *Minneapolis Star Tribune*, decided to present it to him in a way he couldn't resist: She gift-wrapped the reference manual, adorned it with ribbons and bows and handed it to him.

High-level executives may put their pants on one leg at time like the rest of us, Brink says, but teaching them to use technology poses a different kind of challenge than training the average staff member.

For example, executives come into a technology-oriented training session with a myriad of preconceived ideas that lead to a number of training problems. Many start out afraid of failing in front of their peers or of wasting valuable time, according to Tori Coward, president of Tangent Computer Resources, a training firm in Fort Worth, Texas.

But the challenge isn't impossible. Trainers must be prepared to use different approaches to ensure smoother sailing when training executives. The following are some approaches that have worked:

- Keep the sessions short and flexible.
- Customize the training to suit the individual.
- Conduct the training off-site, away from distractions.
- Give positive feedback.
- Use easy-to-conquer hands-on exercises, which directly relate to the users' jobs.
- Enlist the help of high-level executives who know how to use technology to their advantage and are proud of it.



Tight schedules

Typically, Coward says, the higher up in the organization you go, the less time executives have to spend on training. She recommends limiting each session to half a day in length. However, according to trainers, another problem is the tendency of executives to think they can walk out at any time.

At the *Star Tribune*, executives may show up for regularly scheduled classes but probably won't make it all the way through. "They go out to make a phone call, and they never come back," Brink says.

One way around that problem is to customize the training to suit the individual. "If they want smaller groups or one on one, if they want audio-based training or off-site training, we make it available," says Marilyn Allendorph, MIS education supervisor at American National Can Co. in Chicago.

Another solution some trainers find helpful in keeping executives focused on the task at hand is conducting the training off-site.

At the American Cancer Society, executives are brought to the national training center. Not only are they removed from their usual place of business, but the atmosphere is deliberately more casual than the typical office setting.

The casual atmosphere also helps alleviate anxieties many executives have about using technology. Many are just plain afraid of looking stupid in front of their co-workers, according to Karen Tanner, director of special projects. More than once, an executive has handed one of the trainers a note asking that he not be singled out or embarrassed, she says.

Because many executives equate office technology with something used only by subordinates, it is important to convince them right off the bat that the technology will benefit them. Coward advises trainers to make a point of understanding how the executives will use technology to support their business requirements.

"They come in with a definite attitude. But if you find out ahead of time exactly what they want to gain from the training and then organize the session accordingly, they'll walk out amazed by what they've learned," Coward says.

For instance, she explains, if they see that using Lotus Development Corp.'s 1-2-3 to perform what-if scenarios can enhance their decision-making, they will be eager to learn how.

Seeing the results

At the American Cancer Society, within the first 10 minutes of a word processing session, executives are spell-checking a document that simulates something an assistant might ask them to approve. As soon as they have quick, realistic success, they want more, Tanner says.

According to Allendorph, executives often approach training like an obstacle course. "They try to figure out the easiest way possible to get through it without actually encountering anything that's going to change the status quo," she says. At American National Can, the goal is to make it easy, informative and available.

But making training available to suit the executives may not be enough. At Eastern Maine Healthcare in Bangor, MIS sponsored seminars to convince executives that electronic information could promote productivity gains, but the response was limited. According to Mary Jo MacLaughlin, director of MIS education, the best success they've had in reaching the top levels came from the chief information officer.

"Almost by osmosis, he has converted other executives. They see that he uses project management software, he uses E-mail and other tools that make his life easier, and they want to know more," she says.

Mary Texer, manager of technical training at the Federal Reserve Bank of Minneapolis, also saw interest in technology training soar once the bank president made it clear he was committed to it. After he installed a personal computer on his own desktop, Texer recalls, the training department was swamped with requests.

"Suddenly, waiting two weeks for the next scheduled training class wasn't good enough," Texer says. To accommodate the demand, one-on-one sessions were arranged for each of the 30 or so executives who had PCs.

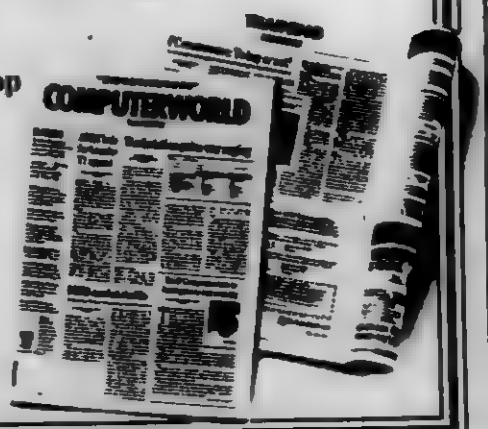
Weisel is a free-lance writer based in Framingham, Mass.

COMPUTERWORLD

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1 How do graduates of top IS schools feel about their education and careers? (Part 1 of a two part series)
Industry Closeup: *Information Systems in Transportation*
Integration Strategies: *Integrating Local Area Networks*
Close: March 26

8 What do employers say about graduates of top IS schools?
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Product Spotlight: *Sales Force Automation*
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RECOMMENDATION CHANGES

UPGRADED FROM NEUTRAL TO ATTRACTIVE: Computer Associates International, Inc. (Mabon, Nugent & Co.). Reason: Management's back-to-basics emphasis on increasing salesmen productivity and enhancing products, combined with growth of international division could push stock price up to $12 range.

UPGRADED FROM NEUTRAL TO STRONG BUY: Intergraph Corp. (Alex. Brown & Sons, Inc.). Reason: Firm said it plans to run its software on workstations from Sun Microsystems, Inc. in addition to its proprietary machines; current 9% operating margin should jump to 15% as firm reduces dependency on own platform.

UPGRADED FROM ATTRACTIVE TO BUY: Sierra On-Line, Inc. (Mabon, Nugent). Reason: Announced merger with Broderbund, Inc. makes company dominant in entertainment and educational personal computer software market.

DOWNGRADED FROM BUY TO HOLD: National Semiconductor Corp. (Prudential Securities, Inc.). Reason: Despite a show of profitability for the third quarter, sales stopped short of estimates; orders for current quarter should improve, but August may see downturn in business.

DOWNGRADED FROM MODERATELY ATTRACTIVE TO NEUTRAL: Oracle Systems Corp. (Donaldson, Lufkin & Jenrette Securities Corp.). Reason: U.S. business remains soft, and last quarter's 62% increase in international revenue is not sustainable; banks are tightening lending policies, therefore inhibiting potential customers from financing major Oracle purchases.

DOWNGRADED FROM ATTRACTIVE TO NEUTRAL: American Management Systems, Inc. (Paine Webber, Inc.). Reason: Strong business has pushed stock prices above fundamentals; shares now trade at about 20 times earnings-per-share expectations for the 1991 calendar year.

ANALYSIS IN BRIEF

Networking stocks seem resistant to the current recession. They have outperformed other technology sectors during the past six to nine months.

The future looks particularly robust for **Cabletron Systems, Inc., Cisco Systems, Inc., Novell, Inc. and Synoptics Communications, Inc.** because Wall Street watchers have underestimated the earnings potential of these companies. Intelligent hubs, internetworking and network operating systems are hot products now and getting hotter. Plus, buyer interest in networking has increased: Last month's Networld conference drew a record 20,000 attendees, up 25% compared with last year's total. *— Networking Overview, Needham & Co., March 1991.*

Semiconductor stocks have shot up since October 1990 and were recently fueled by February's strong book-to-bill ratio. Because more buyers bought chips last month than analysts expected, stocks that have declined most in the last one to two weeks will likely rebound over the near term. **Altera Corp., Cypress Semiconductor Corp.** and **Intel Corp.** should climb significantly as they have shown the strongest order patterns in recent months. These three firms are rated "Buy."
— Semiconductors: Industry Update, Prudential Securities, March 14, 1991.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Investors jerked IBM's chain, ripping its stock down 16¼ points to 111⅜ by Thursday after IBM warned of a first-quarter profit drop. Quarterly figures are expected the week of April 9.
- IBM's bad news stirred the selling of technology shares. Digital Equipment Corp. fell 8⅝ points to 68⅜; Compaq Computer Corp. and Cray Research, Inc. each lost 3¼ points, closing Thursday at 61⅛ and 37¾, respectively.
- The announcement of disappointing second-quarter financials for Software Publishing Corp. preceded that firm's 10¾-point plunge to 18. Meanwhile, Adobe Systems, Inc. turned heads with healthy first-quarter profits last week, climbing 4⅜ points to 51.
- New issue Atmel Corp., a semiconductor company based in San Jose, Calif., offered 4.5 million shares at $13 each on last Tuesday. Atmel closed Thursday up ½ a point at 13½.

Computerworld Stock Trading Summary

CLOSING PRICES FRIDAY, MARCH 22, 1991

TOP PERCENT GAINERS

BMC Corp.	19.12
Anacomp Inc.	18.97
AST Research Inc.	13.04
Fibronics Int'l Inc.	12.16
Adobe Systems Inc.	11.28

TOP PERCENT LOSERS

Software Publishing Corp.	-37.93
Businessland Inc.	-19.05
Tandem Computers Inc.	-15.38
Allied Computer Sys.	-13.07
IBM	-12.89

TOP DOLLAR GAINERS

Adobe Systems Inc.	5.25
AST Research Inc.	3.00
Bell Atlantic Corp	2.88
Borland Int'l	2.25
NCR Corp.	1.88

TOP DOLLAR LOSERS

IBM	-16.00
Software Publishing Corp.	-10.88
Digital Equipment Corp.	-7.88
Matsushita Electronics	-6.38
Motorola Inc.	-5.38

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NYS	89.75	62.50	American Info Techs Corp.	67.38	1.38	2.08
NYS	44.13	29.00	AT&T	32.88	-1.00	-2.95
OTC	0.13	0.06	Ariel Communication Corp.	2.63	-0.13	-4.55
NYS	56.25	38.50	Bell Atlantic Corp.	50.00	2.88	6.10
NYS	57.63	46.00	Bellsouth Corp.	53.00	0.63	1.19
OTC	32.75	8.25	Compression Labs Inc.	20.75	1.25	6.41
NYS	41.25	23.38	Contel Corp.	41.00	0.00	0.00
OTC	5.13	1.88	Data Switch Corp.	4.38	-0.38	-7.89
NYS	26.75	8.88	Digital Comm. Assoc.	17.38	-0.13	-0.71
OTC	25.25	12.25	Dynatech Corp.	19.75	-1.00	-4.82
OTC	12.88	5.50	Fibronix Int'l Inc.	10.38	1.13	12.16
OTC	4.00	1.75	Gandalf Technologies Inc.	3.00	0.13	4.35
NYS	4.88	1.00	General Datacomm Inds.	2.75	0.00	0.00
NYS	34.13	23.50	GTE Corp.	31.75	-1.75	-5.22
OTC	6.25	0.75	Infotron Systems Corp.	1.44	0.03	2.35
NYS	60.88	40.25	ITT Corp.	54.25	-2.38	-4.19
OTC	44.13	17.88	MCI Communications Corp.	25.88	-0.63	-2.36
OTC	21.00	2.75	Microcom Inc.	6.25	0.00	0.00
NYS	32.75	4.00	Network Equipment Tech.	8.13	-0.38	-4.41
OTC	14.63	4.00	Network General	11.25	-0.50	-4.26
OTC	15.50	8.13	Network Systems Corp.	12.63	-0.38	-2.88
NYS	32.00	22.13	Northern Telecom Ltd.	30.25	-1.38	-4.72
OTC	32.75	17.25	Novell Inc.	48.00	0.00	0.00
NYS	88.50	67.00	Nynex Corp.	72.00	-2.75	-3.68
NYS	47.88	36.25	Pacific Telesis Group	42.25	1.88	4.64
ASE	14.50	4.75	Parvit Corp.	13.50	-0.75	-5.26
NYS	29.13	8.88	Scientific Atlanta Inc.	16.25	0.38	2.36
NYS	59.50	47.25	Southwestern Bell Corp.	54.13	0.38	0.70
NYS	44.38	30.63	United Telecom	34.00	-1.13	-4.46
NYS	40.75	32.38	US West Inc.	38.13	1.25	3.39

Computer Systems — Off 3.34%

Exch	52-Week High	52-Week Low		March 22 Close	Wk Net Change	Wk Pct Change
OTC	8.75	0.56	Allied Computer Sys.	1.25	-0.19	-13.07
ASE	18.88	10.00	Amdahl Corp.	14.50	-0.75	-4.92
OTC	70.25	24.25	Apple Computer Inc.	68.25	-2.00	-3.07
OTC	13.88	4.25	Archive Corp.	7.88	0.13	1.68
OTC	28.25	7.88	AST Research Inc.	26.00	3.00	13.04
NYS	7.38	3.88	Bolt, Beranek & Newman	6.75	0.25	3.85
NYS	18.88	4.56	Commodore Int'l	16.13	-1.25	-7.19
NYS	74.25	35.50	Compaq Computer Corp.	59.63	-5.25	-8.09
OTC	2.50	0.13	Computer Automation Inc.	1.06	0.00	0.00
NYS	21.50	8.75	Control Data Corp.	12.00	0.25	2.13
NYS	20.88	8.38	Convex Computer	15.00	-0.75	-4.76
NYS	51.25	20.00	Cray Research Inc.	38.00	-3.50	-8.43
NYS	13.25	2.50	Data General Corp.	12.25	0.13	1.03
NYS	3.38	0.75	Datapoint Corp.	2.88	0.13	4.55
OTC	28.88	7.50	Dell Computer Corp.	26.50	0.38	1.44
NYS	95.13	46.50	Digital Equipment Corp.	68.13	-7.88	-10.23
NYS	38.13	13.75	Harris Corp.	25.00	-1.50	-5.66
NYS	50.63	24.88	Hewlett Packard Co.	47.25	-1.25	-2.58
NYS	138.75	96.25	IBM	111.63	-16.88	-12.88
OTC	14.00	7.75	Information Int'l	8.25	0.25	3.13
OTC	33.75	10.50	Intergraph	24.00	0.00	0.00
NYS	3.13	0.50	MAI Systems Corp.	0.88	0.00	0.00
NYS	149.88	114.00	Matsushita Electronics	128.00	-6.25	-4.66
OTC	28.00	9.00	Mentor Graphics Corp.	14.50	-0.50	-3.33
NYS	58.25	44.50	NCR Corp.	58.25	1.88	1.88
OTC	35.50	11.00	Pyramid Technology	23.50	-2.13	-8.30
OTC	34.00	9.75	Sequent Computer Sys.	15.75	-0.88	-5.26
NYS	47.25	18.00	Silicon Graphics	40.13	-0.88	-2.13
NYS	35.13	14.63	Stratus Computer Inc.	30.00	-2.75	-8.40
OTC	37.25	15.00	Sun Microsystems Inc.	29.88	-3.50	-10.49
NYS	29.38	8.88	Tandem Computers Inc.	12.50	-2.25	-15.25
NYS	38.50	23.50	Tandy Corp.	31.00	-1.75	-5.34
OTC	33.25	8.75	Tandon	17.50	0.75	4.48
NYS	7.88	1.38	Ultimate Corp.	4.75	-0.25	-5.00
NYS	15.88	1.75	Unisys Corp.	5.38	-0.25	-4.44
ASE	6.00	2.00	Wang Labs Inc. (a)	4.25	-0.13	-2.86

Software & DP Services — Off 2.33%

Exch	52-Week High	52-Week Low		March 22 Close	Wk Net Change	Wk Pct Change
OTC	53.50	17.00	Adobe Systems Inc.	51.00	5.25	11.36
OTC	51.25	16.75	Altos Corp.	46.88	-0.38	-0.79
OTC	24.50	12.00	American Mgmt. Systems	23.00	-0.13	-0.54
OTC	16.25	7.50	American Software Inc.	12.13	-0.63	-4.90
NYS	4.38	1.38	Analogic Inc.	4.38	0.63	16.67
OTC	23.50	10.50	Analysts Int'l	16.00	1.25	7.46
OTC	13.63	4.88	Ashton Tate	8.13	-0.25	-2.99
OTC	10.25	4.00	ASK Computer Sys.	8.00	-0.25	-3.03

Semiconductors — Off 5.27%

Exch	52-Week High	52-Week Low		March 22 Close	Wk Net Change	Wk Pct Change
NYS	25.88	10.38	Advanced Micro Devices	21.25	-0.75	-3.41
NYS	11.88	5.88	Analog Devices Inc.	10.88	0.13	1.16
OTC	21.75	5.38	Chips & Technologies	10.50	-0.50	-4.55
OTC	52.75	28.00	Intel Corp.	43.75	-3.75	-7.89
NYS	13.00	5.13	LSI Logic Corp.	8.88	-0.25	-2.74
NYS	17.38	6.75	Micron Technology	16.00	-0.75	-4.48
NYS	88.38	46.75	Motorola Inc.	57.25	-5.38	-8.58
NYS	8.63	3.00	National Semiconductor	7.13	-0.50	-6.56
NYS	46.75	22.50	Texas Instruments	37.50	-4.88	-11.50
OTC	12.25	3.00	VLSI Technology	8.25	-0.38	-4.35
ASE	14.88	4.00	Western Digital Corp.	4.88	-0.25	-4.13

Peripherals & Subsystems — Off 1.92%

Exch	52-Week High	52-Week Low		March 22 Close	Wk Net Change	Wk Pct Change
OTC	1.63	0.09	Alloy Computer Prod.	0.75	0.00	0.00
OTC	2.25	0.88	Apertus Technologies	1.94	0.06	0.00
OTC	24.00	7.50	Banctec Inc.	12.13	0.38	3.19
ASE	10.25	4.13	Cognitronics Corp.	10.25	0.88	9.33
NYS	31.25	14.63	Conner Peripherals	24.50	-2.00	-7.55
ASE	22.00	7.00	Data-tech Corp.	11.00	-0.25	-2.22
NYS	10.88	4.25	EMC Corp.	10.13	1.63	19.12
NYS	47.25	38.75	Eastman Kodak Co.	43.13	-2.00	-4.43
OTC	8.88	4.38	Emulex Corp.	8.88	0.25	2.90
OTC	24.50	14.00	Evans & Sutherland	19.50	0.00	0.00
OTC	8.50	3.75	Iomega Corp.	5.38	-0.31	-5.50
OTC	30.25	8.75	IPL Systems Inc.	22.75	-2.75	-10.78
OTC	1.94	0.13	Maxstor Systems	0.88	-0.06	-6.37
OTC	17.00	2.63	Maxtor Corp.	5.00	-0.88	-11.11
OTC	13.38	3.88	Micropolis Corp.	11.88	0.38	3.26
NYS	93.75	73.63	3M Corp	87.25	-4.00	-4.38
OTC	14.50	8.00	Prisearch Inc.	9.25	-0.13	-1.33
NYS	21.25	8.50	QMS Inc.	18.00	0.63	0.00
OTC	27.25	12.38	Quantum Corp.	23.50	-1.38	-5.53
NYS	8.13	4.38	Recognition Equipment	5.88	0.13	2.27
OTC	9.88	4.00	Reson Inc.	8.13	-0.50	-5.80
OTC	17.38	6.88	Seagate Technology	14.13	-1.00	-6.61
NYS	35.25	11.00	Storage Technology	30.00	-1.50	-4.76
OTC	4.00	1.25	Tandon Corp.	3.25	-0.25	-7.14
NYS	23.00	11.63	Tektronix Inc.	22.50	0.75	3.45
OTC	0.63	0.16	Television Systems	0.41	-0.03	-7.21
NYS	69.25	28.00	Xerox Corp.	53.50	-2.63	-4.69

Leasing Companies — Off 1.35%

Exch	52-Week High	52-Week Low		March 22 Close	Wk Net Change	Wk Pct Change
OTC	18.00	8.88	Amplicon Inc.	16.00	0.25	1.59
OTC	4.38	0.31	Capital Associates	0.50	-0.06	-9.45
NYS	29.38	14.63	Comdisco Inc.	24.88	-1.00	-3.86
OTC	16.25	9.25	LDI Corporation	13.50	-0.25	-1.82
OTC	5.88	2.25	Sykes Intl Inc.	4.00	0.25	6.67

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DEC pumps up fault-tolerant challenge

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — The lonely existence of Digital Equipment Corp.'s fault-tolerant VAXft 3000 changed abruptly last week with the rollout of four new family members ranging in price from $46,950 to $1 million.

The move stocks DEC's arsenal for a market share showdown with the leading vendors of crash-proof computing: Tandem Computers, Inc. and Stratus Computer, Inc. Yet it is clearly Tandem's high-end customers that hold the greatest allure for DEC, industry analysts said.

Researchers at Gartner Group/Infocorp predict DEC will garner 20% of the fault-tolerant computing market by 1995 — a notable shift from its current insignificant status. "The net market will increase because DEC is in it," said Sandra Gant, a Gartner Group/Infocorp analyst. "A lot of people DEC is going to sell to — like VAX/VMS customers or independent software vendors — would not have bought Tandem or Stratus in the first place."

DEC is pitching its VAXft systems as ideal front-end processors for large Vaxclusters in a strategy to "bulletproof" system reliability and enable it to crank out 500 to 1,000 transactions per second once the fault-tolerant VAX has the combined processing power of the cluster behind it.

On their own, the VAXft systems can produce only six to 25 transactions per second which is inadequate for large-scale online transaction processing. The four VAXft 3000 systems come in 11 different configurations and run the VAX/VMS operating system. They all contain the same CPU architecture, borrowed from the Microvax 3800 for the VAXft 3000 Model 310, but a faster processing chip was used to boost speed.

"If we were going to go with fault tolerance, our first applications would be as a user front end. As we get more and more remote sites, we would like to have a way to assure fault tolerance there," said Larry Stiefvater, a researcher at Kraft General Foods Research Technology Center in Glenview, Ill. "At this point, we don't need one, though. Our cluster is very reliable, and DEC has continually improved cluster features."

To some users, however, the power of the VAXft systems is stillless than impressive.

"That Model 110 is far too expensive for the VUPS [units of processing power] you get. I can do a similar job with twin Microvax 3100s and get the same power," said Hal Kolp, information systems operations manager at National Semiconductor Corp. in South Portland, Maine, a manufacturing location for the Santa Clara, Calif.-based firm.

The weakness in DEC's strategy will show up in software rather than hardware, users and analysts said.

"Your system is only as fault-tolerant as the software that runs on it," said Peter Corisaco, vice president of Profitco Operations Strategic Planning at Banker's Trust Co. in New York.

"A VAX 6400 cluster is extremely reliable, and it costs a lot less money," he added.

Included in last week's announcement was the limited availability of "disaster-tolerant" Vaxclusters utilizing Fiber Distributed Data Interface to share data between systems up to 40 km apart. A single cluster could be located in both New York City and New Jersey, for example, with data safely duplicated both locally and at the remote site.

Tolerant-minded

DEC expanded its fault-tolerant offerings beyond the 1-year-old Model 310 with four new models

VAXft series

	110	410	610	810
Performance				
VUPs*	2.4	6	6	12
Trans./sec.	6	16	16	25
Maximum memory	96M bytes	128M bytes	128M bytes	128M bytes
Price	$46,950-$69,950	$145,077-$150,000	$164,875-$750,000	$275,567-$1 million
Availability	120 days after order	June '91	July '91	July '91

*VAX units of performance

Source: Digital Equipment Corp. CW Chart: Doreen St. John

Stratus RISC machine debuts with dual operating system

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — Stratus Computer, Inc. trotted out the industry's first fault-tolerant computer based on reduced instruction set computing (RISC) last week, with the unexpected flourish of dual operating systems.

The XA/R Model 20, based on the Intel Corp. i860 RISC microprocessor, will run either Stratus' proprietary VOS operating systems or its FTX Unix system. All current VOS applications can be recompiled to run on the new RISC platform without rewriting code.

The XA/R Model 20 is the first in a line of RISC systems Stratus is planning to unveil during the next two years as it migrates its customers to the new platform.

"This is definitely a reassuring move for users — the idea of a choice between two operating systems on the same machine," said Wayne Kernochan, an analyst at The Yankee Group in Boston.

The Marlboro, Mass.-based vendor also introduced two high-end systems for its proprietary XA2000 Series 200 line; a new release of FTX Unix, which is based on AT&T Unix System V Release 4; and Stratus Intelligent Network Application Platform, an applications development platform that allows telecommunications companies to develop and manage intelligent network services.

The RISC-based XA/R machine, which runs at 40 million instructions per second, is slated to be available in the third quarter of this year, as are the high-end XA2000 Models 270 and 280.

Stratus' sphere

Stratus introduced two high-end systems along with its first RISC-based fault-tolerant computer

Model	XA/R 20	XA2000 270	XA2000 280
Processor type	Intel i860	Motorola 68030	Motorola 68030
Number of duplexed processors	1	7	8
Duplexed memory	32M bytes	64M bytes	64M bytes
Performance	Not available	Not available	Not available
Base price	$247,000-$275,000	$1,250,000	$1,411,000

Source: Stratus Computer, Inc. CW Chart: Nancy Kowal

Stratus also drew attention last week to its networking capabilities, underscoring a corporate direction to expand beyond its traditional role as a front-end processor in the financial and brokerage industries into markets where extensive connectivity and open systems are as important as never-fail computers.

High-growth areas

Stratus President William Foster identified insurance, travel and telecommunications as future high-growth spots for the $341 million company.

At Blue Cross/Blue Shield of Massachusetts, for example, a Stratus XA2000 Model 210 running Stratus' Network Express software serves as a gateway from 11 hospitals into the insurer's three mainframes from IBM, Amdahl Corp. and Bull HN Information Systems, Inc.

Eventually, all 140 hospitals statewide will have access through the Stratus machine in the Boston headquarters, said George P. May, director of provider automation services for Blue Cross/Blue Shield in Boston. "We're trying to be as open as we can to the hospitals so they can feel comfortable dealing with us," May said.

In addition to its new hardware, Stratus sketched out plans to develop software for the VOS and FTX operating systems, including a high-performance, commercial file system and a transaction monitor for distributed on-line transaction processing.

IBM also confirmed, in a separate announcement, that it will continue to sell the Stratus boxes under the System/88 label — an arrangement that will extend to include the Stratus RISC machines as well.

Amdahl

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because it did not appear that Amdahl was serious enough about the software, said John Meadows, the bank's senior vice president of systems architecture and development.

Looking back

However, Meadows said he would take another look now that Amdahl is preparing to officially market the software. "It was a good tool, you know. It really was," he said.

He also said the bank has installed IBM's Repository Manager, and although he supports the IBM application development strategy, it does not preclude him from looking at other vendors' offerings as well.

Analysts said the software could be positioned as an alternative to AD/Cycle, which IBM has been pushing as the industry standard for host-based application development. Initial reaction from some IBM shops contacted last week indicated that doors will at least be open for Amdahl to make its pitch.

Michael Sztejnberg, vice president of technical services at Manufacturers Hanover Trust Co., said he was unofficially informed about Huron by Amdahl "a couple of months ago." He said he would "definitely" consider it as a serious application development offering.

"From what I understand, it would be a product that is further along than AD/Cycle is today," Sztejnberg said. "It is more automated and would solve more of the steps within the development process. If it proves to be superior at this stage, most [users] would evaluate it on that basis."

Jim Cassell, a vice president at Gartner Group, Inc., said the Amdahl offering will not be a direct AD/Cycle competitor because it will take a different approach to software development.

"It doesn't do the life cycle," Cassell said. "It is rather complete, rather self-contained. You write in that environment, and it will take care of everything for you."

Aaron Zornes, a vice president at Meta Group, Inc., also likened it to a self-contained environment. "Huron will have its own database," he said. "So it's a database, repository and [fourth-generation language], and you can build applications to access data in Huron," he said.

More than meets the eye

On the surface, this move seems like an abrupt departure from the business of selling CPUs and disk drives, but industry observers said it is more a continuation of Amdahl's efforts to expand its revenue base. Earlier steps include a mainframe-based Unix operating system and a partitioning facility to logically split up a processor complex.

"I'm not surprised by this move," said Bob Djurdjevic, president of Annex Research, who said he was expecting an announcement in the "subsystems arena."

"They had another project called Aspen that was supposed to be a more efficient MVS and was canned in the mid-1980s when they started focusing on Unix. They were the first to offer [mainframe-based Unix], so they've had lots of software experience," Djurdjevic said.

AT&T corners NCR in takeover battle

BY MICHAEL FITZGERALD
CW STAFF

DAYTON, Ohio — Like a heavyweight boxer poised to finish off a bout after wearing down a smaller, though valiant, opponent, AT&T was seen last week as ready to land the final blow in its takeover effort against NCR Corp.

Widespread speculation that NCR is backed into a corner and will have to negotiate a deal with AT&T followed two unrelated events last week: a general stock market drop on news that IBM's earnings would be perhaps half of analysts' projections and a U.S. District Court decision invalidating NCR's employee stock ownership plan (ESOP). The court ruled that the ESOP had "the primary purpose of entrenching NCR's management."

Although NCR has appealed the ESOP decision, analysts said the merger is a done deal, with only price and timing to be decided. Some analysts think negotiations will begin before NCR's annual meetings on Thursday.

Offer of $100 per share

AT&T followed up the ESOP ruling by announcing that it will pay NCR shareholders $100 per share — $10 more than it offered in December — if it receives the 80% of shares it needs to oust NCR's board at the special meeting. However, some analysts speculated that AT&T's offer could grow by even more, perhaps to $110, if it is done through a stock swap.

"NCR is trying to figure out what the odds are that AT&T actually gets 80% of the vote. If that happens, NCR has no more say in anything," said Charles Neuhauser, an analyst at Legg Mason Wood Walker, Inc.

AT&T Chairman Robert Allen told an investor group last week that he thinks it is "in everyone's best interest to come to a negotiated agreement" before the meetings.

While NCR still has a poison pill defense, AT&T has challenged this as well, and the same judge who struck down the ESOP with a sharply worded opinion will rule on the poison pill's validity. Some observers said this works against NCR.

"The tone of the judge's [ESOP] ruling was really a public slap . . . at a whole series of tactics being deployed by NCR to block this [takeover]," said Harvey L. Poppel, a partner at Broadview Associates, a Fort Lee, N.J.-based specialist in information technology mergers and acquisitions.

NCR customers contacted said the struggle has had no immediate impact on them.

Unisys names Braun president, COO

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. executive Reto Braun was named president and chief operating officer of the computer and defense electronics company last week.

The promotion comes on the heels of Braun's appointment late last month to the Unisys board of directors. Braun, 49, had been executive vice president responsible for Unisys' corporate marketing and the U.S. and Pacific Asia Americas region marketing division.

His new post adds responsibility for all commercial computer marketing, product development and manufacturing operations worldwide, including the Computer Systems Product Group, corporate marketing, U.S. Information Systems and the Europe-Africa and Pacific Asia Americas divisions.

"Implementing the strategy Unisys has been hammering out over the last two to three or even four years" will be his short-term objective, Braun said. He added that the company's product introductions this year confirm "we did not cut R&D in the last two years."



Unisys' Braun moves up from VP to president and COO

Braun acknowledged that Unisys' debt ratio — $3.7 billion on a worth of $10 billion — is far too high, but he said he did not believe a partnership was necessarily the way to address the problem.

A partnership "could add to the problem or be one way to solve it," he said. Unisys has stated a goal of reducing its debt by more than $600 million this year.

Braun takes over the title of president from Chief Executive Officer James A. Unruh. Unruh, who also holds the title of chairman, will continue to be responsible for the defense systems, government systems, communications and networks group and corporate staffs.

Banyan

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New York-based Vines user The Turner Corp., said Dick Schell, director of information systems. Schell explained that one of the construction management company's major applications is an OS/2-based human resources management system from Peoplesoft, Inc. that integrates personnel, payroll, benefits tracking and other functions.

"The application is optimized for an OS/2 client with a single engine, so the OS/2 rollout is very important to us," he said.

Vines 4.1 beta-test user Mike Housley, systems technical services manager at the Arizona Public Services Co. in Phoenix, said that while bringing OS/2 into the client fold "is a major step that is consistent with the direction of my company and others, there will initially be limited application programming interface support" in the OS/2 Vines version.

Schell and Housley are two of six steering committee members of the Network Applications Consortium, a 40-company group that has taken a "power in numbers" approach to spurring the commercial development of Vines-integrated applications. As a result of its efforts, the committee recently began communicating on consortium business via a beta-test version of Lotus Development Corp.'s Notes tightly integrated with Vines 4.1.

Lotus' Notes was originally developed for OS/2 platforms and has been unable to run under Vines, which is inherently AT&T Unix System V-based. "This Vines release will allow us to put Lotus Notes services on all our OS/2 clients," said John Ryan, director of systems engineering at Compaq Computer Corp. and a consortium member.

Expanding Vines connectivity to other platforms will help keep Banyan sparring with local-area networking market leader Novell, Inc. Novell, historically work group-oriented, has recently taken steps to threaten Banyan's market share in enterprise networking by enhancing its Netware network operating system and forming a reseller partnership with IBM. Netware supports DOS, Windows, OS/2, Unix and Apple Computer, Inc.'s Macintosh clients.

AMD's 386 clone ready, but will it sell?

BY RICHARD PASTORE
CW STAFF

Intel Corp.'s days as the single source of 80386 chips will end today when Advanced Micro Devices, Inc. (AMD) unveils its 40-MHz versions of the microprocessor. At least one vendor has publicly adopted the clone chip, but a pending lawsuit and Intel's 1486 product proliferation may slow acceptance of the clone, vendors and users said.

AMD's AM386DX-40 microprocessor will offer 21% better CPU performance than Intel's 33-MHz 80386, the company said. A 33-MHz 80386 machine with a 64K-byte cache will deliver about 8 million instructions per second (MIPS) performance. For about $40 more in end-user cost, a similarly configured 40-MHz AM386 box will deliver 9 MIPS, according to Chips & Technologies, Inc., which will announce a chip set to support the 80386 clone this week.

AMD's second announced processor, the AM386DXL-40, was designed for low-power consumption, making it possible for the full 32-bit chip to operate in battery-powered portable computers.

AMD claimed to have shipped 10,000 AM386 units already, some of which have gone to Northgate Computer Systems, Inc. The Minneapolis-based direct marketer demonstrated personal computers last week based on the 40-MHz chip and an as-yet-unannounced 25-MHz 80386SX clone from AMD.

Northgate Chairman Art Lasere said he adopted the AMD chips "because Intel doesn't have them." The firm did not reveal pricing or ship dates for the PCs. However, it expects to be among the first to ship AMD-based boxes. AMD has claimed that about 25 vendors are evaluating and intending to use the chips.

The wrath of Intel

The clone chips will most likely interest second-tier PC makers such as Northgate rather than top names such as IBM, said Dean McCarron, an analyst at Instat, Inc. in Scottsdale, Ariz. He said the industry's big guns are more worried about incurring the wrath of Intel and about the pending lawsuit between that company and AMD. McCarron said he expects AMD's 386 market share to reach 10% next year.

While AMD won the right in court this month to use Intel's 386 designation, Intel is also suing for infringement of its chip microcode. AMD claims it contracted to use the code in 1976. Intel could not be reached for comment.

The case goes to trial this summer, but win or lose, "we will not be forced out of the 386 market," an AMD spokesman said. He noted that end users will not be liable.

Nevertheless, some users are skittish. "I don't know that I would buy [an AMD-based] computer until that lawsuit is settled. What happens to your machine if AMD loses?" asked Bruce Greif, project analyst at County Natwest, Inc. in New York.

Others applauded the added competition for Intel. "The fact that the chip's come out is a good thing. The competition improves the industry," said Michael Purcell, manager of technology planning and information resources at Baxter Healthcare Corp.

"As long as Intel maintains a steady flow of products, there's not a real necessity for us to make changes," said David Kirkey, vice president of marketing at Advanced Logic Research, Inc. Intel's current and future 1486 products are a better alternative for the company and its customers, Kirkey said.

Not even early adopters such as Northgate have completely thrown in their lot with AMD. "We'd prefer to stay 100% with Intel down the line," Lasere said.

Multimedia standards catching on

Software, hardware developers beginning to follow Microsoft's lead

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Although compact disc/read-only memory (CD-ROM) vendors agree that multimedia is an upcoming and promising technology for institutional and business applications, they have been stymied by a lack of standards — until last week.

Evidence of change was rampant at last week's Annual Conference & Exposition on Multimedia and CD-ROM held here, as CD-ROM developers and hardware and software vendors announced their support for proposed standards and labels announced at the show.

The widespread incorporation of Microsoft Corp.'s Multimedia Extension to Windows 3.0 in CD-ROM applications was proof that Windows could ease users' burdens of dealing with incompatible search-and-retrieval CD-ROM software. A Windows front end will eliminate the need to install weighty software on hard drives to access the data on different CD-ROM products using the Multimedia Extension.

"I think it makes sense to use Windows as a front end to CD-ROM applications," said show attendee John Newton, director of the Development Software Products Division at Xerox Corp. in Palo Alto, Calif.

Show attendee Sandra Scott reiterated Newton's support for Windows, adding that until now, users have been forced to learn a separate search-and-retrieval method for each CD-ROM application.

"Standards are an issue for us because our customers are looking for a direction" in which CD-ROM is headed, said Scott, manager of product acquisition at Soft-Kat, a CD-ROM distributor in Chatsworth, Calif., and a division of W. R. Grace & Co.

However, while Windows will help the CD-ROM and multimedia markets, Windows as a front-end search-and-retrieval system for CD-ROM applications is not a cure-all solution because it excludes both the Unix and Apple Computer, Inc. Macintosh markets, Scott said.

Andrew Young, founder and president of Young Minds, Inc. in Redlands, Calif., said his company is one of several Unix vendors trying to solve that problem on the Unix front.

Last week, the Rock Ridge Group, a Unix consortium, proposed a CD-ROM standard to the National Institute of Standards and Technology called the Rock Ridge Interchange Protocol. The proposed standard was designed to allow multiple file system extensions to coexist on the same CD-ROM disc, meaning that CD-ROMs could be read across multiple platforms, the group said.

Standards for CD-ROM, however, are not the only issues. Although multimedia is being incorporated into CD-ROM applications, vendors are also building multimedia systems, CD-ROM drives and other peripherals for the emerging multimedia market. And they are not all compatible.

Although the problem is far from being resolved, Microsoft announced last week that it has initiated a multimedia version of a *Good Housekeeping* seal of approval. The Multimedia PC, or MPC, label will be applied to IBM Personal Computer and compatible DOS-based systems that meet the basic Microsoft-made multimedia specifications introduced last November. So far, 12 companies have endorsed it, but IBM is not one of them (see story below).

Critical mass?

The approximate doubling each year of installed CD-ROM drives and commercial and in-house applications may be bringing vendor offerings closer to user needs

	Total number of titles (includes commercial and in-house)	Installed CD-ROM drives worldwide
[illegible]	[illegible]	[illegible]
1987	260	32,500
[illegible]	[illegible]	[illegible]
1989	1,418	545,000
[illegible]	[illegible]	[illegible]
1991*	5,916	2.9M
[illegible]	[illegible]	[illegible]

*Projected

Source: Infotech

CW Chart: Tom Monahan

Microsoft's MPC label not officially supported by IBM

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Microsoft Corp.'s distinctive IBM Personal Computer and compatible flavor of its new MPC consumer label is, ironically, not officially supported by IBM.

While several companies — including Tandy Corp., Zenith Data Systems, Fujitsu Ltd. and Philips Home Electronics, Inc., among several other hardware and software vendors — went along with last week's unveiling of the MPC label, IBM kept quiet.

"We are not one of the companies that formerly announced support for the MPC label because . . . we just don't feel a need to support that certain configuration," an IBM spokesman said last week.

However, if Microsoft were to turn the label over to an independent organization, "there would be no reason why we wouldn't support it since we support the idea behind it," the spokesman added.

According to Microsoft's Rob Glaser, general manager of the Multimedia Systems Group, Microsoft has every intention of offering the label to an independent organization, but it has not decided which trade group it will offer the label to at this time.

Some industry experts speculated that Microsoft would do well in offering the label to the Washington, D.C.-based Interactive Multimedia Association (IMA).

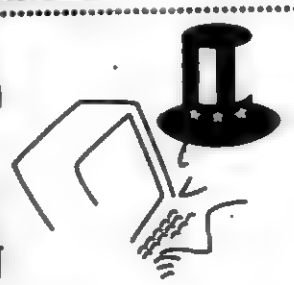
Microsoft, which joined the independent manufacturer's trade group as a sponsor last week, said it has to review all of its options before it makes a decision. Apple Computer, Inc. and IBM also belong to the IMA, which has a membership of 169 companies so far.

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TRENDS

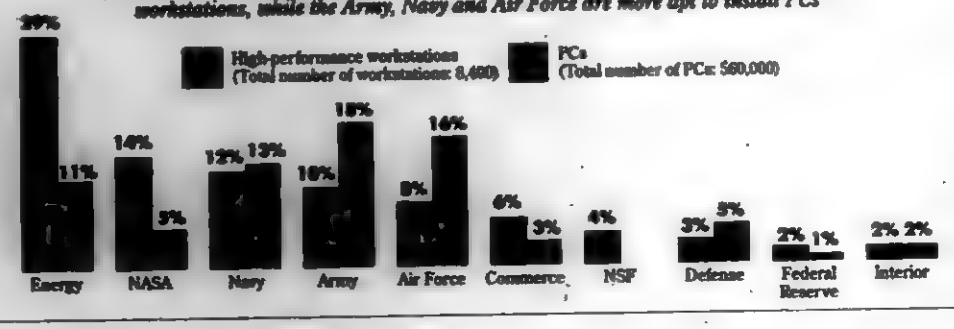
FEDERAL GOVERNMENT COMPUTING



While the federal government presents a large market for high-performance workstations and personal computers, only a handful of vendors control a significant portion of the market

Computer use by U.S. federal agencies
(Percent of installed systems)

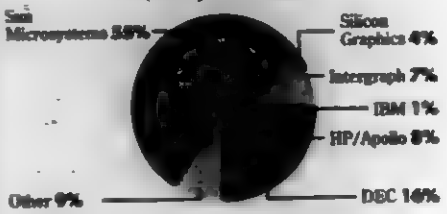
Emphasis on research requires the Department of Energy to depend heavily on high-powered workstations, while the Army, Navy and Air Force are more apt to install PCs



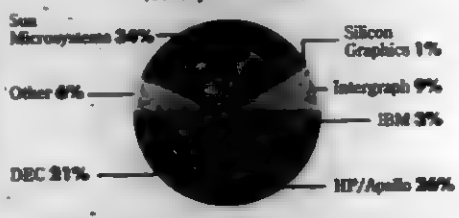
High-performance workstations
(Percent of market share by installations)

Sun Microsystems is even more dominant in federal agencies than in large companies

Federal government
(Total systems: 8,400)



Fortune 1,000
(Total systems: 44,000)



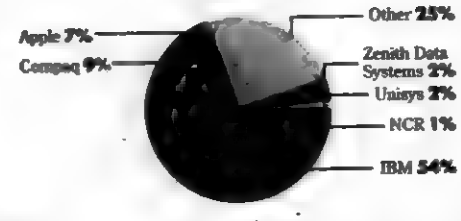
PCs
(Percent of market share by installations)

Zenith Data Systems and IBM struggle to be the leading PC supplier to the federal government

Federal government
(Total PCs: 560,000)



Fortune 1,000
(Total PCs: 1.9 million)



Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

Well-integrated local-area networks offer unparalleled opportunities — and headaches. Integration Strategies looks at how savvy IS managers like Ted Furtch at Crucible Service Centers have successfully woven LANs into their overall computing strategies. Plus, a look at the pros and cons of the different ways to integrate LANs.



Bob Mahoney

The idea behind IS self-directed work groups is to push management decision-making out to staff members. This increased responsibility, in turn, empowers IS individuals to do their jobs better and faster and eliminates the need for several layers of management. But this way of organizing is not a quick fix: It takes time, money and companywide buy-in.

INSIDE LINES

Editor's note: Last week in this space, *Computerworld* ran a series of anonymous quotes ("juicy stuff . . . we can't attribute") relating to the relationship between Microsoft and its third-party software developers. In doing so, we unintentionally violated some of our own guidelines governing balance and right of rebuttal. Some of the quotes included unsubstantiated charges and items of a personal nature that should not have been published anonymously. Furthermore, Microsoft should have been given the opportunity to respond to the remarks.

Computerworld may also have inappropriately implied that the quotes represented the sentiment of the third-party software community as a whole toward Microsoft and its management. We have no evidence that this is the case. Finally, because of an editing error, the four anonymous quotes were portrayed as coming from several sources when in fact one source was responsible for three of them. *Computerworld* regrets these errors and apologizes for any hardship they may have caused.

Late, but still early

NCR's Bill Eisenman, vice president of multiuser products, confirmed recently that some pieces of the company's System 3000 series are behind schedule. The 3450 and 3550 machines, including multiprocessor and dual-bus architecture versions, are about 30 days behind schedule but are on course for third-quarter delivery, ahead of the fourth-quarter shipment schedule NCR has promised its customers, Eisenman said. He said the firm had orders in hand for the systems from around the world but would not disclose volume or numbers.

They just don't get it

Is this why IBM stock plummeted? In an architectural design show last week, computer-aided design (CAD) software whizzed by on high-end PCs and RISC workstations. The loneliest exhibitors were the guys behind the IBM AS/400 booth. Nowhere to be found was IBM's RISC System/6000 — the logical choice for CAD graphics in the firm's line.

Windows' future not so far off

The arrival of Microsoft's Windows-32 next-generation graphical user interface may still be a year or more off, but Software Development Kits will be shipped to more than 100 developers by year's end, a Microsoft insider says. Specifications for employing Microsoft's object-linking and embedding strategy in the Macintosh environment are also slated to ship this year.

Beam me up, Scotty?

AT&T is telling analysts and potential buyers that its new SX notebook will be more than a "me-too" product. Although the specifications sound ordinary — 1½-in. thick, under seven pounds, 20-MHz processor, 20M-, 40M- and 60M-byte hard drive options, 2,400 bit/sec. internal modem and 10-in. IBM Video Graphics Array screen — the photo of an AT&T salesman in last week's *Business Week* showed what AT&T confirmed was a prototype of its new notebook with speaker-like grates and knobs above the keyboard. The firm wouldn't comment on those features, but we'll find out on or around April 15.

Let's get together

Sybase Corp. is expected to announce today that it is acquiring a small CASE company, which will broaden the privately held RDBMS firm's product line. Industry sources say they believe the firm is Rendale, Ontario-based Deft, which has sales of about $4 million per year. Sybase's sales are believed to be in excess of $100 million. Deft is known for its reverse-engineering tools and for its gateways to multiple RDBMS products. Sybase declined to comment on Deft.

Will D&B Software hold all of its announcements in Atlanta during the gridiron season after John P. Imlay Jr. acquires 6% of minority stock in the Atlanta Falcons? What better place to hash over lofty software issues than in a skybox? Although Imlay's reported $6 million purchase is for nonvoting stock, he was also guaranteed the right of first refusal on future stock sales. Inside tips on the Falcons' chances should be called in to News Editor Pete Bartolik at (800) 343-6474 or faxed to 508-875-8931.



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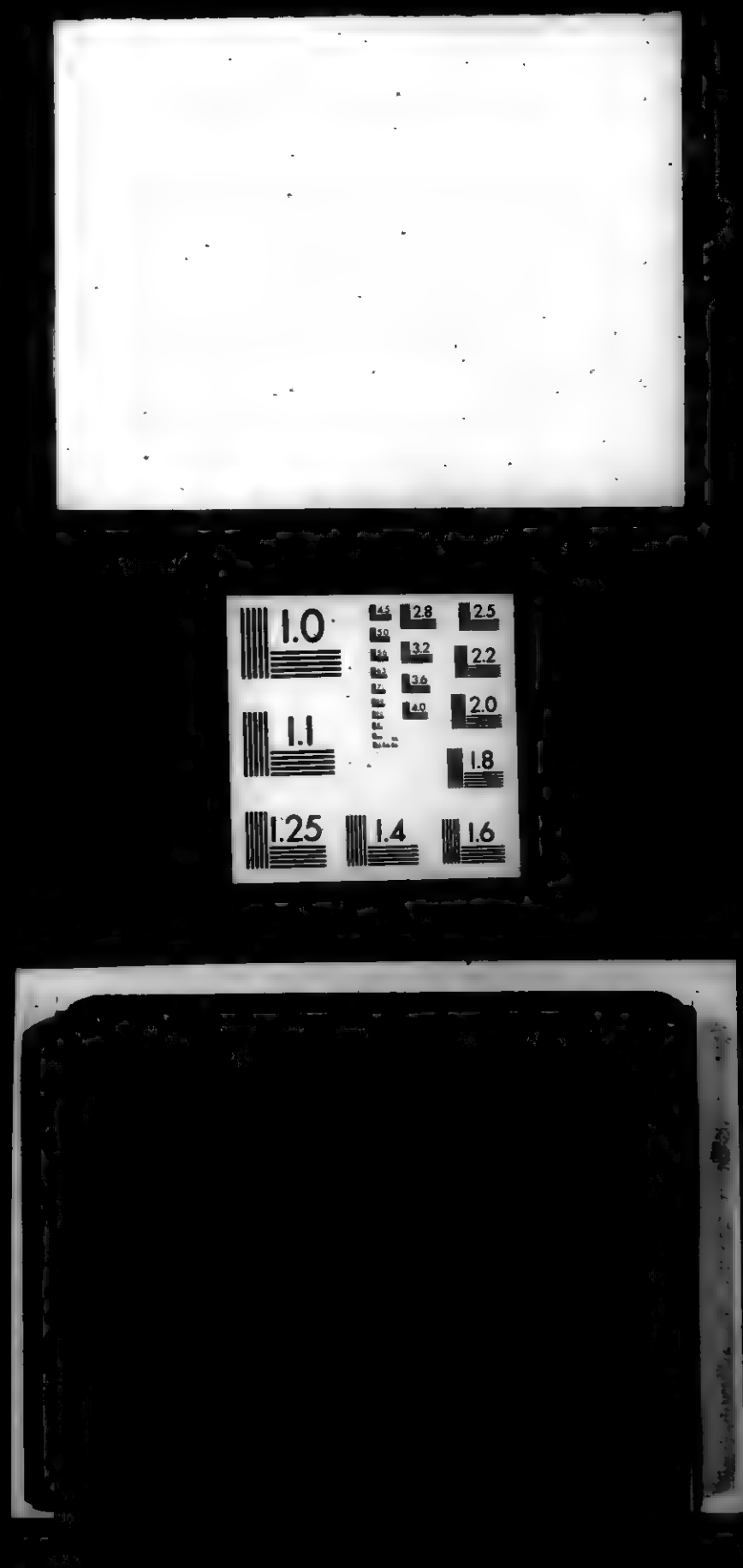
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COMPUTERWORLD

AT&T to cede more control over Unix V

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Unix System Laboratories, Inc. will formally distance itself from its AT&T parent organization Wednesday, when AT&T is expected to announce that it is selling a minority stake of USL to at least 11 computer vendors.

A USL spokesman confirmed that the vendors, which will hold individual stakes that together add up to approximately 25% of USL, include Sun Microsystems, Inc.; Fujitsu America, Inc.; Novell, Inc.; Amdahl Corp.; and ICL, Inc. Employees of USL will own 10% of the organization, and AT&T will retain the remaining 65%. The equity offering is a private placement deal that was two years in the making.

Continued on page 4

Spies linked to software scam

McFarlane implicated in scheme to distribute stolen Inslaw package

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A small software firm's eight-year battle to prove the U.S. Department of Justice misappropriated its product broadened into a tale of foreign intrigue last week. Legal filings in the dispute paint a picture of conspiracy and corruption in a tangled web involving current and past officials of the federal government and foreign intelligence agencies.

A former Israeli intelligence officer alleged in a sworn statement that former national security adviser Robert C. McFarlane gave the Israeli government case-tracking software that had allegedly been stolen from U.S. software developer Inslaw, Inc.

The affidavits, filed in the U.S. Bankruptcy Court here, are the latest salvo in the long-running struggle by tiny Inslaw to regain control of its law enforcement case-tracking software, which it claims was stolen by officials of the Justice Department and their friends for use in a complex set of business arrangements [CW, Jan. 1, 1990].



Software firm's dispute with Justice Department takes a new turn with allegations that former intelligence official Robert McFarlane passed its product to Israeli government

The former Israeli agent, Ari Ben-Menashe, told *Computerworld* that McFarlane gave the software to the Israel Defense Force's Signals Intelligence Unit in 1982 for use in penetrating the computers of foreign intelligence agencies that were using the same case-tracking software.

Ben-Menashe said Israel succeeded in doing that in one case, but he declined to name the country. McFarlane was deputy director of the National Security Council at the time and later served as national security adviser to former President Reagan.

"It is false in every respect," McFarlane said of the allegations made by Ben-Menashe. He said he had never given or sold software of any kind to anyone.

In 1982, the Justice Department signed a $10 million contract with Inslaw for the right to use the Promis case-tracking software at 42 U.S. attorney's offices. In 1983, the department stopped paying Inslaw, and the firm ended up in

Continued on page 101

Rival data, voice nets to hook up

BY ELISABETH HORWITT

NEW YORK — Godzilla shook hands with Mothra last week as IBM and AT&T announced plans to integrate their respective network management platforms to provide users with a "single view of voice and data operations," according to Bill Warner, IBM's director of network management.

Warner and AT&T Director of Network Management Bill Gilbert said their companies have been pushed into the agreement by large corporate customers that want to coordinate Netview's management of IBM's logical Systems Network Architecture networks with Accumaster's management of AT&T and third-party physical network products and services.

Under the agreement with AT&T, IBM will develop software that will for the first time allow Netview to step outside its traditional role as focal point for enterprise network manage-

A Netview host will be able to act as an "element manager" that feeds network data into another vendor's system, Warner

Continued on page 10

NCR softens resistance to buyout

BY MICHAEL FITZGERALD
CW STAFF

DAYTON, Ohio — Surrounding NCR Corp.'s world headquarters building is the Old River Lagoon, which NCR employees affectionately call "The Moat." Last week, NCR gave strong signs that it may soon lower its drawbridge to suitor AT&T and allow itself to be acquired.

A long-anticipated shareholders' vote was held Thursday on takeover-related motions by AT&T, but the tally will not be final until sometime between April 7 and April 11.

Sources close to NCR said late Thursday that they expect AT&T will not come close to the 80% vote needed to remove the entire board, but it will get more than 60% of the vote in a successful bid to replace the four NCR board members up for reelection, including Chairman and Chief Executive Officer Charles E. Exley Jr. and President Gilbert Williamson.

Sources close to AT&T confirmed these numbers but pointed out that the final tally could change.

The vote count may not matter, though, as a deal could be completed beforehand, thanks to NCR's move away from the $125 per share it has steadfastly said should be a starting point for negotiations.

The first signs came last Monday, when Exley and AT&T Chairman Robert Allen met for five hours. Wednesday, NCR's investment advisers told AT&T

Continued on page 99

Dayton showdown

- ▶NCR lowers asking price to $110 per share.
- ▶AT&T fails to get enough votes to oust NCR board.
- ▶Four NCR directors, including Exley, will likely be voted out.

Novell application manager shown behind closed doors

BY JIM NASH
CW STAFF

SALT LAKE CITY — Novell, Inc. demonstrated a new object-oriented software management application to developers and consultants here last week, according to several sources who saw the presentation.

Novell company documents obtained by *Computerworld* indicate the as-yet-unnamed product will use what is called a "management services protocol" to monitor, diagnose and control disparate applications running on Netware. Attendees a Novell briefing were told it will formally announce the product in about 60 days. Novell refused to confirm or deny whether it demonstrated the product.

Network managers who had not seen the product said they are worried that Novell may muddy the water with another management protocol.

Although several companies are rumored to be working on similar products for personal computer networks, none have been announced to date, according to industry consultants.

The Provo, Utah-based networking company currently sells software to manage its record manager, Btrieve, and its SQL engine, Netware SQL.

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INSIDE

Good news and bad: IBM unwraps its long-awaited laptop PC, page 8; announces plan to trim another 14,000 jobs, page 10.

Oracle data not so good as DBMS vendor sets aside $42 million to cover duplicate billing and data processing errors. Page 99.

Johnson Wax CIO dusts off his resume; department reports to CEO until replacement is found. Page 4.

Integration Strategies — The payoffs, pathways and pitfalls of linking LANs. Page 67.

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4 CIO Laurance Burden and IS director Randy Lengyel leave **Johnson Wax**, raising questions about the future of Proficere.

6 **Midway Airlines** files for Chapter 11 bankruptcy reorganization and awaits funds to help it resurrect IS projects held since August.

7 With an eye toward wooing IS managers, **Apple** has come up with client/server products that allow Macintoshes to connect with IBM mainframes and others.

8 Fans of **Compaq**'s original 386-based LTE notebook computer are being lured by newer, cheaper bait as AST Research, Dell and Tandem enter the waters.

10 **IBM** is planning to lose more than 14,000 positions this year in a number of ways, none of which include layoffs, the company claims.

12 Computer hacker Terminus pleads guilty to five felony counts in Baltimore and Chicago.

16 Filling in the final gap in its product line, **DEC** uses a winning combination of high capacity and high performance in tape subsystems.

99 A Harvard law professor speaks up for computer users' privacy rights, aiming for a 27th amendment.

101 A GAO investigation suggests that negligence by the **U.S. Department of Justice** may have resulted in sensitive information being compromised.

Quotable

"It's like having a train and a plane. Both move people, but in a different way."

JOSEPH ZEMKE
AMDAHL

On Amdahl and IBM's applications development environments. See story page 100.

SYSTEMS & SOFTWARE

25 The ability to run two operating systems is a key to **Stratus Computer**'s first crash-proof RISC machine.

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37 **IBM** says it won't give in to **Microsoft**: If Microsoft veers from the agreed upon path for the Release 3.0 generation of OS/2, IBM will go its own way.

45 Technology Analysis: Reviewers say **Ashton-Tate**'s Dbase IV Version 1.1 is stable but not as strong as the competition.

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59 The trucking industry is increasingly turning to IS to drive down fuel waste and streamline purchases.

COMPUTER INDUSTRY

79 Knowing raindrops won't keep falling on their heads, executives at California firms are forming water conservation plans.

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67 LAN integration can yield large payoffs, but the methods aren't clear-cut.

IN DEPTH

77 If implemented correctly, IS self-directed work groups can minimize management layers and increase staff effectiveness. By Carol A. Norman and Robert A. Zawacki.

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The 5th Wave



"CALL ME CRAZY, BUT I'VE GOT A HUNCH THIS VIRUS WAS GENERATED INTERNALLY."

EXECUTIVE BRIEFING

■ **IBM and AT&T are moving closer to hooking together** their respective network management technologies. IBM will develop software that allows Netview to feed data to a different host network manager, specifically, AT&T's Accumaster. The pact should make Accumaster a more viable option for companies with large SNA networks. **Page 1.**

■ **The feds urge a breakup of airline reservations systems'** monopoly control over travel agents. The U.S. Department of Transportation says agents should be able to switch between different systems on their PCs. American Airlines opposes the move, but the proposal could deflate congressional efforts to force airlines to divest their reservations systems. **Page 6.**

■ **An IS shakeup at Johnson Wax** leads to the resignation of Chief Information Officer Laurance Burden and a key lieutenant, IS director Randy Lengyel. A successor to Burden has not been named, and the fate of Johnson Wax's acclaimed Proficere skills-matching database is unclear. **Page 4.**

■ **A leading legal scholar calls for a computer privacy amendment** to the U.S. Constitution. Harvard Law School Professor Laurence Tribe says an amendment would extend constitutional protections to electronic mail and digital communications. **Page 99.**

■ **AT&T's attempted acquisition of NCR** appears to be closer to a resolution as NCR lowers its asking price from $125 per share to $110 per share. Although AT&T rejected the price, negotiations are expected to continue. **Page 1.**

■ **CIO salaries could potentially double** or triple during the next few years, according to speakers at a recent conference. However, higher risk, in the form of less job security, accompanies the higher rewards. **Page 62.**

■ **Midway Airlines files for Chapter 11 protection,** but the move may actually fund some shelved IS projects by securing a line of bank credit. Midway has already cut almost half of its support and development staff. **Page 6.**

■ **IBM's new laptop computer is expected to win market share** from Compaq, Toshiba and others. Although late and expensive, the L40SX should be a favorite among IBM loyalists. **Page 8.**

■ **IBM will slash 14,000 jobs** but promises to stick to its no-layoff policy. **Page 10.**

■ **Integrating departmental local-area networks into the enterprise** can yield big payoffs in cost savings and staff efficiency. But IS executives will likely find both technical and cultural challenges on the integration path, and they need to carefully consider who should do the work. **Page 67.**

■ **IS self-directed work groups** can reduce supervisory layers and provide technical staff members with management skills. The concept could result in less staff overhead and IS groups that deal more effectively with business units. **Page 77.**

■ **IS managers who stay on top of the latest** and greatest in technology will find themselves more employable and flexible in today's changing IS workplace. **Page 84.**

■ **Graduates from notable IS programs** say their education could have been better. Specifically, the programs should provide more hands-on work experience, technical training and business skills. **Page 96.**

■ **On-site this week:** R. J. Reynolds Tobacco is lighting up its spare parts inventory tracking in Winston-Salem, N.C., with an imaging system based on Wang hardware. **Page 29.** The Dallas law firm of Johnson & Gibbs dates its networked computing days back to 1985 and now runs 575 PCs on a Novell LAN. **Page 49.**

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HP/Apollo leaps RISC market

Low price, high performance to put HP ahead in RISC power arena

BY SALLY CUSACK
CW STAFF

NEW YORK — Hewlett-Packard Co. outdistanced the competition last week by rolling out a family of high-performance reduced instruction set computing (RISC) workstations that undercuts rivals by an average of $5,000.

In the first major announcement since the HP/Apollo Computer merger two years ago, the new HP/Apollo 9000 Series 700 hit ground with a base price of $11,990 for a 57 million instruction per second (MIPS), 55-MHz, entry-level, diskless 720 system. The base machine, which includes 16M bytes of memory and a 19-in. monochrome monitor, rates a 55.5-Specmark performance.

Other members of the series include the Model 730 and the Model 750, 76-MIPS machines priced from $19,990 and $43,190, respectively. Both systems offer 72.2-Specmark and 66-MHz performance.

According to George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn., the state-of-the-art systems give HP a 12- to 15-month lead in price/performance for the proprietary RISC supplier market.

Vicki Brown, an analyst at International Data Corp., a Framingham, Mass.-based market research firm, noted that HP's newly announced flexible lease terms will provide an easy migration path to the 700 platforms. "It has the potential to get HP into accounts that IBM, Digital Equipment Corp. and Sun Microsystems, Inc. can't reach," Brown said.

According to Ken Goldner, HP/Apollo's director of sales programs, the leasing program was designed for customers who want a RISC solution but are not quite ready to migrate for a variety of reasons.

"This includes customers with a large investment in the existing Motorola, Inc. 68000-based HP 400 series," Goldner said.

Former Apollo workstation users, such as SAS Institute, Inc. and Gerber Systems Technology, Inc., expressed confidence in the 700 as a logical migration platform to the Unix workstation environment.

I. Larry Diamond, director of desktop systems at Schlumberger Technologies in Ann Arbor, Mich., said the company committed to the 700 platform after evaluating the system for four months against products from DEC, Sun and Apple Computer, Inc.

This is Schlumberger's first purchase of HP technology, and the company will use the machines primarily for mechanical design applications.

Each 700 series system offers four different graphics options, and each can be configured as either a workstation or a server in standard Ethernet, Network Computing System and Transmission Control Protocol/Internet Protocol communications environments. All systems run HP-UX, HP's implementation of Unix.

The products provide both integer and floating-point performance capabilities and can operate in both the commercial and engineering marketplace, the vendor said.

More than 180 independent software vendors have announced their support for the Series 700. Among them is Cary, N.C.-based SAS, which has also signed a $15 million, three-year contract with HP to use the the systems for SAS internal development.

According to HP, the Open Software Foundation's OSF/1 operating system will be available on the 700 series later this year, and the announcement will include support for the Apollo token-ring network.

HP is also ironing out the details in a trade-up program to be officially announced on April 15. The program will allow up to $4,500 credit toward a 700 system from trade-ins on older systems from HP, DEC, Sun and IBM.

Billions at stake

HP hopes to increase market share in the pitched battle over workstation sales

Percent of worldwide market share by value of shipments (in millions)

Sun	$2,428	33%
HP	$1,539	21%
DEC	$1,212	16%
Intergraph	$505	7%
IBM	$476	6%
Silicon Graphics	$434	6%
Sony*	$194	3%
Next	$73	1%
Other	$529	7%
Total	$7,390	

*Sony figures reflect both Sony Corp. (Japan) and Sony Microsystems Co. (U.S.)

Source: International Data Corp.
CW Chart: Marie Haines

AT&T

FROM PAGE 1

Under the terms of the agreement, the 11 or 12 investors will name three USL board members, and AT&T/USL will name six. Nevertheless, AT&T will not have control because a so-called "super-majority" of 70% will be needed to approve any major changes in the USL charter. If the outside directors vote together, they will be able to effectively block any AT&T/USL-led initiatives.

Eventually, AT&T will likely become the minority shareholder of USL, observers said.

Observers said the move is expected to help allay industry concerns that USL, the entity responsible for developing, enhancing and licensing the Unix System V operating system and other Unix-related software, is too closely controlled by AT&T's computer systems group, which competes with USL's computer-vendor customers.

Closer ties with the OSF

In fact, observers added, the arm's length relationship between USL and AT&T might even lay the groundwork for a closer alliance between USL and the Open Software Foundation, a Cambridge, Mass.-based consortium that licenses a competing operating system called OSF/1. One long-term benefit to users may be an increased affinity between the two operating systems.

However, even if that does not occur, industry watchers said users will benefit in the short term by USL becoming more market-driven. "It will improve the overall quality of Unix and give users another choice," said Paul Cubbage, associate director of the Unix Systems Software Service at Dataquest, Inc. in San Jose, Calif. "And because USL will produce Unix implementations for specific chip sets, that will lower the cost of systems software for OEMs. That will ultimately be passed along to users."

The move "focuses all of USL's energy to develop Unix systems software, object-oriented tools and the desktop," said Judith Hurwitz, vice president of the Seybold Office Computing Group in Boston. "The implementation goes beyond the operating system." She said the international flavor of the investors "provides different perspectives of different users' needs."

Still, there will be challenges. "USL is not yet generating a positive cash flow, so who knows how many times it will have to go back to its investors?" said John Logan, vice president of the Aberdeen Group in Boston.

Further, Logan added, USL's technically oriented management might have a difficult transition to being able to guide a company that must make money on its own.

Johnson Wax CIO resigns

BY ELLIS BOOKER
CW STAFF

RACINE, Wis. — S. C. Johnson & Son, Inc.'s acclaimed information systems department saw the resignations of both its chief information officer and its director of IS management support services last month, *Computerworld* has learned.

Vice President and CIO Laurance Burden, who ran the 400-person, $70 million IS group, quietly resigned his post March 14; Randy Lengyel, services director, cleared out his desk last Wednesday.



Johnson Wax's Burden *left his post March 14*

Burden, who came to Johnson Wax in October 1988 from Firestone Tire & Rubber, Inc., said last week from his home that he had resigned for personal reasons and that the split was amicable. He said he was exploring several job alternatives.

Burden said he was proud of having been associated with Johnson Wax, which he called an outstanding company. He would not speculate on who might be his successor.

He has been a highly visible CIO, currently serving as president of the Society for Information Management.

A Johnson Wax spokesman confirmed that no successor for Burden has been named and that until a new CIO is found, the department will report to company President and Chief Executive Officer Richard M. Carpenter.

Lengyel could not be reached for comment, however, the company spokesman confirmed that Lengyel's department had been divided two weeks ago between William Vinck, senior IS director of policy and planning, and Richard Hann, vice president of IS technology services.

The impact of the management shifts on Johnson Wax's bold Proficere project, a "skills database" to match workers with work, could not be determined. Burden spearheaded Proficere, which won the Association for Computer Training and Support's Assist Award for quality in a training system last October.

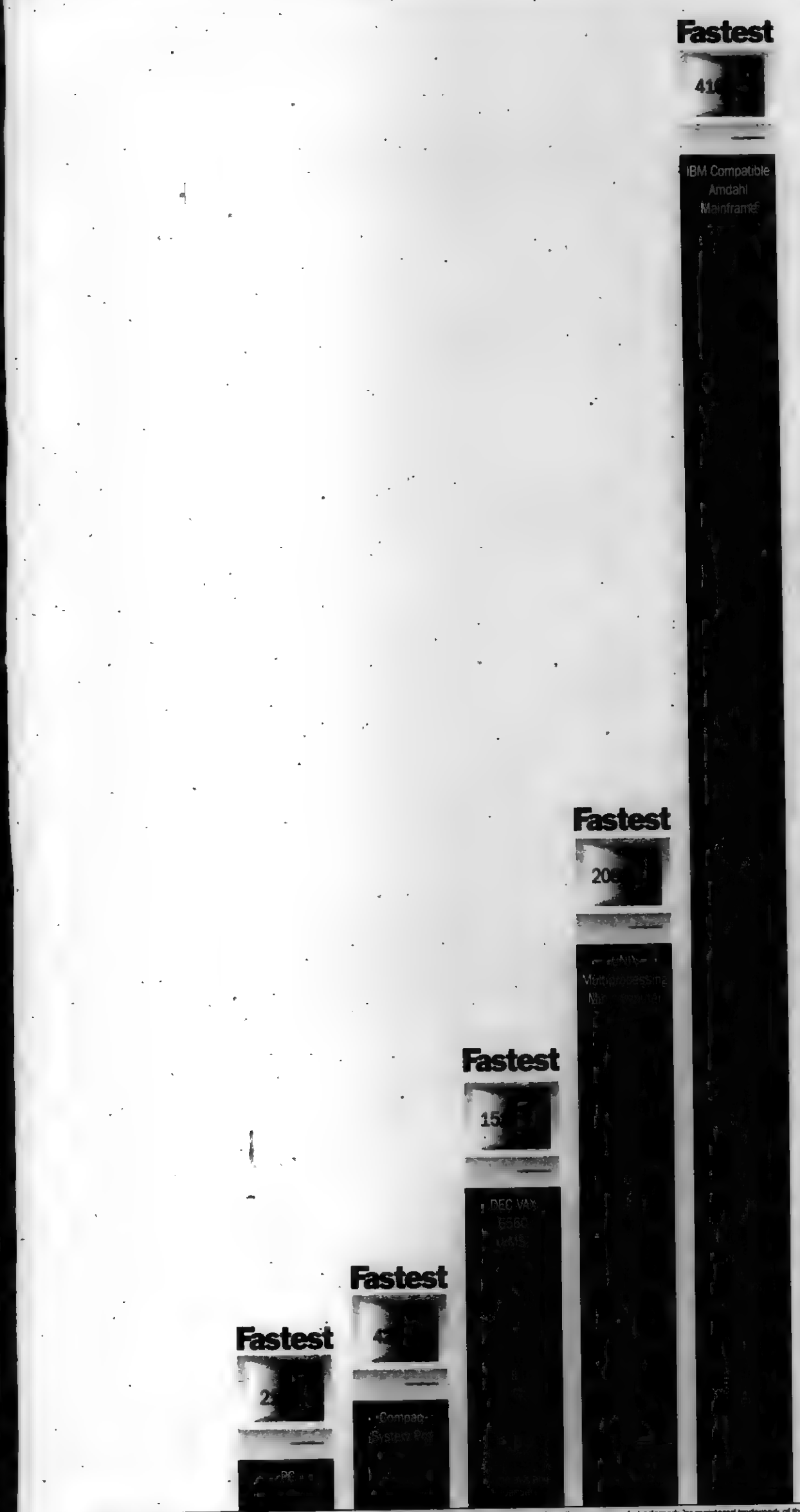
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NEWS SHORTS

FBI claims break in parts thefts

A nationwide computer parts theft and fencing ring that has committed nearly 100 burglaries in the Silicon Valley has been uncovered by the Federal Bureau of Investigation and police in Fremont, Calif. A 20-year-old man has reportedly admitted to stealing more than $10 million worth of chips, motherboards, personal computers and laser printers from computer firms throughout the San Francisco Bay area. A Fremont police spokesman said the man, who has not yet been charged, admitted burglarizing dozens of computer companies during the past six months and has been tied to thefts in Arizona, Texas, Florida, New Hampshire, Massachusetts and Illinois.

Copyrights for databases in doubt

The U.S. Supreme Court ruled last week that the alphabetical listings in a telephone directory lack the "creative spark" required for copyright protection. The ruling in *Feist Publications, Inc.* v. *Rural Telephone Service Co.* is bad news for the computerized information services industry because it raises doubts about whether any database of factual information is protected by copyright, Boston attorney Peter Marx said.

Intergraph adds image workstation

Intergraph Corp. announced a high-performance image processing workstation last week. According to the company, the Imagestation 6187 incorporates an integrated, parallel architecture that permits simultaneous viewing and manipulation of vector and raster data on a single screen. Targeted at geographic information systems applications, the system features 24-bit color and 8-bit overlay display capabilities and is priced from $107,000. Shipments are scheduled to begin this month.

Mips to introduce systems

Mips Computer Systems, Inc. is scheduled to introduce a pair of servers and a workstation tomorrow, filling out the lower portion of its product line. The systems, based on Mips' 33-MHz R3000A processor, are priced from $10,990 for the Magnum 3000/33 workstation, $11,990 for the RC3330 server and $36,500 for the RC3350 server.

Mellon's ISDN plans refreshed

Mellon Bank, a user of Bell Atlantic Corp.'s Integrated Services Digital Network (ISDN) offering, is back on track with plans for a major implementation of the digital data/voice links, after putting ISDN on hold earlier this year. Mellon Vice President of Data/Voice Networking Patricia Graham said the bank was eager to implement several competitive ISDN applications but had become discouraged when Bell Atlantic refused to quote prices and could not deliver ISDN lines for six months. Graham said Bell Atlantic told him that it will tariff ISDN this year and that it will be able to meet Mellon's initial needs for "a substantial number of ISDN lines" in Pittsburgh next year.

VAX software suppliers merge

Ranco Software, Inc. and Clyde Digital, two private software companies serving the Digital Equipment Corp. market, announced their merger last week. Renamed Ranco, Inc., the combined firms claim to be the largest independent systems software supplier in the DEC market, with 30 products and more than 10,000 customers worldwide. Ranco provides performance enhancement, automated operations and resource management software for VAX/VMS machines, while Clyde Digital supplies security and user support applications.

IBM outsourcing rivals convene

Representatives from eight outsourcing vendors met in Dallas last week to discuss one firm's contention that IBM's presence in the outsourcing business violates the 1956 Consent Decree. The vendor group, led by Affiliated Computer Services President Darwin Deason, will ask Adapso later this month to formally complain to the U.S. Department of Justice.

More news shorts on page 100

Feds to break reservation lock

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Department of Transportation (DOT) proposed regulations last week to break the airlines' near-monopoly control over the way travel agents can use, enhance or replace their computerized reservations systems.

The proposal would ensure that travel agents can use personal computers to access multiple airline databases and buy third-party hardware and software to enhance the systems provided by the four systems vendors.

The airline-owned vendors that supply the reservations systems now discourage or prevent those activities, according to the DOT.

Travel agents said they would welcome the flexibility, but American Airlines opposed the changes as an unnecessary and intrusive regulation of its Sabre system.

Max D. Hopper, American Airlines' senior vice president of information systems, and other company officials said the proposal ignores the airline's right to recoup a $1.3 billion investment in providing travel agents with the Sabre information service, terminals and enhancements.

Freedom of information

Travel agents subscribing to Sabre, for example, do not get timely or reliable information about United Airlines' flights, said Paul M. Ruden, senior vice president at the American Society of Travel Agents in Alexandria, Va. They would like to be able to use their PCs to switch to United's Apollo system for the best information on United's flights, he said.

Ruden added that the use of computers in travel agencies "will change significantly if the third-party computer hardware and software vendors jump into this niche . . . that was substantially closed until now."

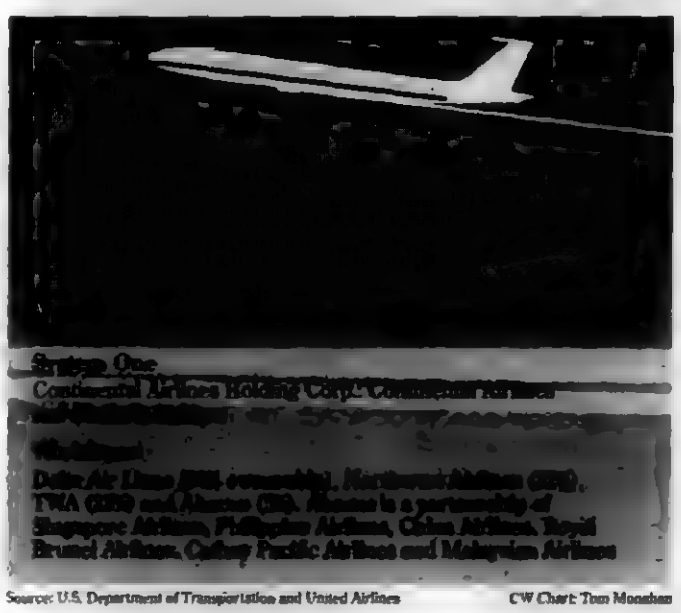
A third major feature of the proposal is an effort to break the restrictive contracts that vendors use to prevent travel agencies from switching to competing reservations systems. It would reduce the maximum contract term from five years to three, eliminate rollover and minimum usage clauses and prohibit the tying of ticket commissions to the choice of a reservations system.

The DOT said its proposal will extend and strengthen the existing regulations governing airline reservations systems to curb the anticompetitive behavior of the vendors, which the DOT asserts are exploiting their dual role as airlines and systems vendors to increase bookings and charge inflated booking fees.

Each of the reservations systems has an "architectural bias," the DOT said, because it is easier for travel agents to book the vendor's flights than it is to book flights on other airlines.

The DOT said it is seeking comments on whether to require vendors to separate their commercial reservations systems from their internal airline systems so they would not have any technical advantages over other airlines.

Some members of Congress have called for stronger action — namely, full divestiture of the reservations systems — but the DOT action will "take a lot of steam out of the legislative proposals," said Raymond Neidl, airline analyst at Dillon, Read & Co. in New York.



Source: U.S. Department of Transportation and United Airlines — CW Chart: Tom Monahan

Midway Airlines takes nosedive to bankruptcy

BY ELLIS BOOKER
CW STAFF

CHICAGO — Midway Airlines filed for Chapter 11 bankruptcy reorganization last week, hoping to end months of hard times caused by the combined effects of recession, high oil prices and an industrywide downturn in air travel in the aftermath of Iraq's invasion of Kuwait last August.

Like the rest of the company, Midway's information systems department had felt the squeeze. Since August, six of the department's 14 support and development staff members have either been laid off or have resigned without being replaced, according to Paul Tate, vice president of IS at the 11-year-old carrier.

Nevertheless, Tate was optimistic last week that a $40 million secured line of credit through Continental Bank N.A., announced along with the Chapter 11 filing, could fund some IS projects that had been shelved during the last eight months.

Midway expects an additional $20 million on May 1, when it receives the balance of the $64.5 million US Air paid last year for Midway's Philadelphia hub.

Back on the fire

IS projects that have returned to the front burner include the evaluation of additional fault redundancy for the airline's voice and data network and its data and reservations centers as well as enhancements to its existing large systems, including those supporting airplane maintenance and airline engineering.

In past years, Tate had waged an uphill battle with management for funding [*CW*, June 11, 1990]. It was a stance he did not abandon during the recent hard times.

"I continued to poke away on the importance of IS," Tate said. One of his short-term goals, he added, is to develop an "applications development methodology" for Midway, followed by the selection of fourth-generation languages or computer-aided software engineering tools.

This development environment — Tate is eyeing a distributed approach — will work with the IBM 390 Model 150 mainframe Midway installed two months ago to augment its IBM Application System/400s and its two IBM System/36s.

Apple offerings link Mac to database servers

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Beefing up its efforts to connect with information systems managers, Apple Computer, Inc. announced a series of client/server products last week designed to link Macintosh client workstations with large-scale database servers.

The new products, based on Apple's Data Access Language (DAL) — formerly known as CL/1 — will allow Macintoshes to engage in more cooperative processing with IBM mainframes and computers made by Tandem Computers, Inc., Digital Equipment Corp., Data General Corp. and Hewlett-Packard Co. and with dedicated data servers made by Teradata Corp. The support for IBM's VTAM networking facility running under MVS will be available in July, but other versions may not be available for months after that, Apple said.

DAL, an extended version of ANSI-standard SQL, enables interactive data access to multiple database servers. Part of the DAL software resides on the client while the rest resides on the server. Most Macintosh-to-host access in the past has been through terminal emulation.

Industry analysts were skeptical about the impact of Apple's DAL ports.

Richard Finkelstein, president of Performance Computing, Inc. in Chicago, said it would be hard for him to make a "business case" for recommending Macintoshes for client/server systems.

"The Mac [operating system] is a very closed, confined environment," Finkelstein said.

Others said the moves are a way for Apple to keep pace with client/server advances involving the IBM Personal Computer. "This brings Macintoshes to an equal or better level for transparent client application access to most of the widely installed SQL databases," said Aaron Zornes, an analyst at Meta Group, Inc. in Westport, Conn.

Users at one of the largest Macintosh sites are very interested in DAL. Seafirst Bank, which has been using Macintoshes since 1985, has 3,800 Macintoshes installed, even though its production machine is an IBM 3090 Model 600.

"We envision having a fairly substantial amount of data available to client/server systems and having the applications that massage that data resident on the Mac rather than on the database server or host," said Bob Bowman, a Seafirst vice president and manager of PC support.

Seafirst has been using DAL code in pilot versions of client/server systems running against the IBM mainframe's DB2 relational database management system but has yet to put them into production.

A step toward IS managers

News of the Macintosh client/server products came at the start of an Apple campaign to gain greater access to IS managers, who have often regarded Macintoshes as nonstrategic systems.

Apple also said Oracle Corp. and the Ingres Products Division of Ask Computer Systems, Inc. have written software that allows a Macintosh to become a relational database server. Macintoshes would use DAL to access remote Ingres and Oracle relational database management systems across a corporate network.

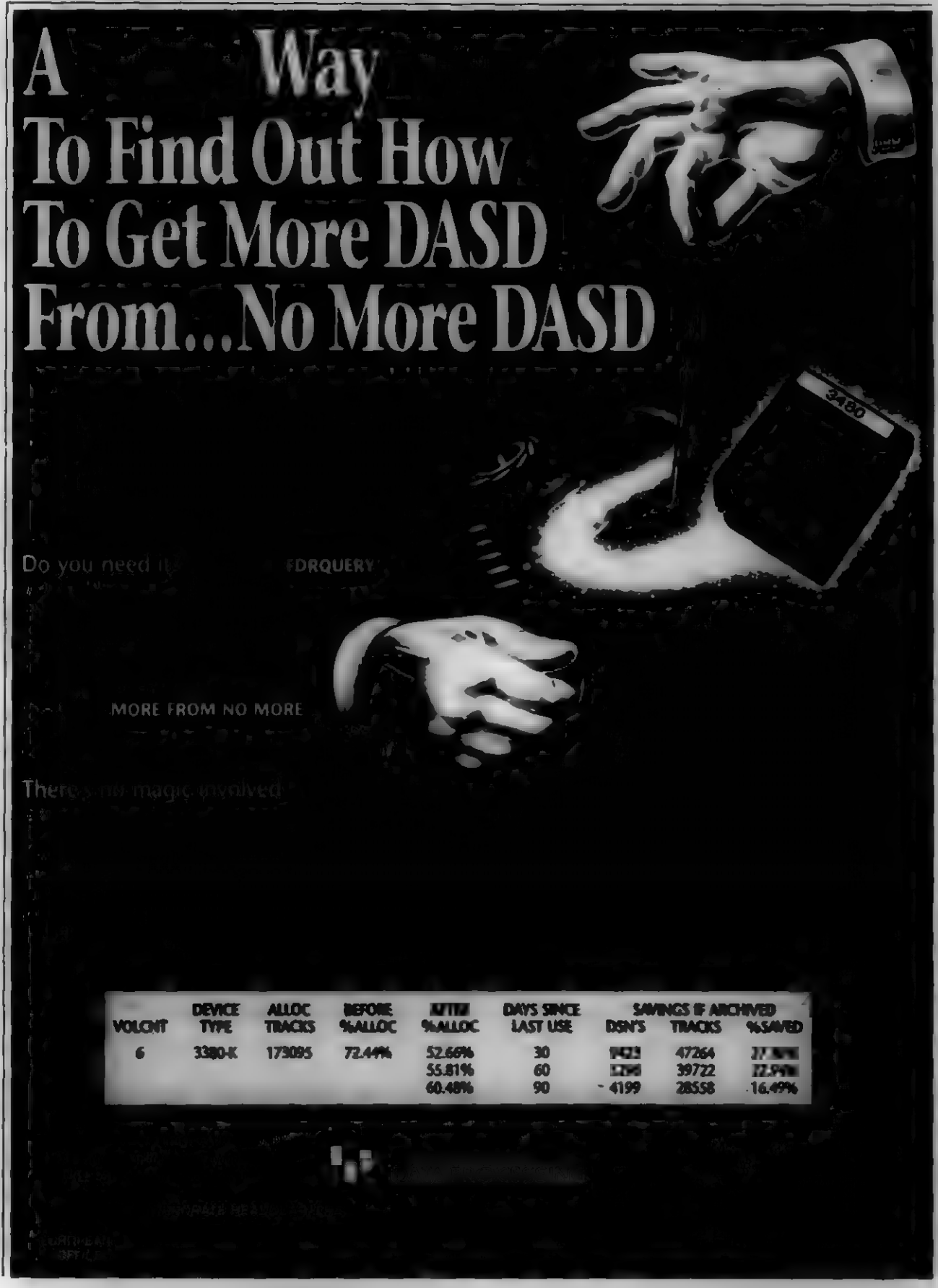
Apple will provide support for IBM mainframes running MVS with VTAM and the CICS teleprocessing monitor, giving Macintoshes access to DB2. Apple also announced that it had ported DAL to its own A/UX version of Unix.

Most of the new DAL support is being written by vendors other than Apple. Apple is working on the IBM ports, while other hardware and software vendors are writing ports to computers from Tandem, HP, DEC and Sun Microsystems, Inc. as well as to IBM's RISC System/6000, DG systems and client machines running MS-DOS, OS/2 and Unix.

RDBMS tools highlight show

SAN FRANCISCO — A variety of relational database management system-related products were introduced at the DB/Expo '91 show, including the following:

- On-Line Software International, Inc. in Fort Lee, N.J., announced the ProDBA tool for database administrators, which is priced from $20,000 to $40,000. The tool helps programmers manage the database catalog for IBM's DB2 and automates deletion and creation of DB2 tables.
- Hewlett-Packard Co. said it will license Gupta Technologies, Inc.'s SQL*Windows user interface, designed for use on client Microsoft Corp. Windows 3.0 machines and HP's own Allbase/SQL DBMS on HP 3000 and HP 9000 computers.
- Microsoft announced a new gateway to IBM mainframes. Built by Micro Decisionware, Inc. in Boulder, Colo., the software extends the reach of Windows and OS/2 client machines to IBM's nonrelational IMS database and to standard IBM VSAM files.



IBM laptop faces tough market

BY MICHAEL FITZGERALD and RICHARD PASTORE
CW STAFF

NEW YORK — By the time IBM's Personal System/2 laptop computer debuted last week, the only mystery still surrounding the machine was whether it will prove a viable entry and redeem the firm in the portable personal computer market.

Despite the hurdles of premium pricing, a late arrival and IBM's dreadful prior portable history, most observers said the L40SX will win market share at least in IBM loyalist camps.

Among true-Blue customers, the machine may take share away from Compaq Computer Corp., Toshiba Corp. and other top-tier players, users and analysts said.

"Being mostly an IBM company, we've had to go to someone else for laptops. If IBM can meet our needs, we'd tend to go with theirs," said Marvin A. Moolenaar, head of information systems planning and client services at Northern Indiana Public Service Co. in Merrillville.

"Corporate buyers who are after the safety of a well-established brand name now have IBM and Compaq to choose from. And they're going to want to go with IBM because it's the safe thing to do," predicted consultant Gib Hoxie, head of Boos, Allen & Hamilton, Inc.'s information industry practice.

However, the $6,000 price tag may hinder acceptance in the less IBM-loyal mass market, observers said. "IBM will have some problems because the discounts the Blue market gets won't translate to the mass market," said Will Fastie, editor of "The Fastie Report" in Baltimore. Several vendors have released SX portables smaller and lighter than the L40 at two-thirds the price.

Because IBM was a nonplayer in laptops for so long, some corporate buyers have already standardized on other vendors and do not see much advantage in switching. "There are enough good competing machines out there from Toshiba, Compaq, Grid and Dell that I don't think it's going to be a runaway success for IBM," noted user Stephen Rood, microcomputer technology manager at Coopers & Lybrand in New York.

Another deterrent: IBM's past efforts in the market have left IS managers cold. "When I think of IBM and laptops, I think of failure," said Sam Colello, MIS director at Chicago-based Oil-Dri Corp. of America.

But unlike IBM's earlier Portable PC and PC Convertible, which did not measure up to their contemporaries in price/performance, the L40SX for the time being appears at least technologically equivalent to the rest of the market.

"It's a better me-too than I expected," said Tim Bajarin, executive vice president of Creative Strategies Research International, Inc. in Santa Clara, Calif. He cited the size and clarity of the 10-in. screen. Other analysts and users have praised the full-size sloped keyboard.

"It's got the best keyboard of any [laptop] by far," said David Korus, analyst at Kidder, Peabody & Co. in New York.

Analyst sales projections call for a moderately successful year for the L40SX. With no supply constraints, IBM could sell 40,000 to 60,000 this year, said Peter Tiege, an analyst at Gartner Group/Infocorp.

Business traveler

Typically pricey, IBM's latest portable touts large storage capacity and advanced graphics features



IBM PS/2 L40SX

• Processor:	20-MHz Intel 80386SX
• RAM:	2M to 18M bytes
• Hard disks:	80M byte (2½ in.)
• Floppy disks:	1.44M byte
• Videos:	Sidekit VGA, 32 gray shades
• Keyboard:	84 full-size keys with 17-key numeric key pad
• Power:	Up to three hours
• Weight:	7.7 pounds with battery
• Dimensions:	12.8 by 10.7 by 2.1 in.
• Price:	$5,995

Source: IBM — CW Chart: Doreen St. John

Power of plastics

When IBM chose to launch a laptop effort in February 1990, it knew it could not afford the typical two-year lead time. Already late to market, the company saw its window of opportunity was closing fast. So IBM turned to its plastics technology arm for some innovative and risky shortcuts.

"We decided if we could not enter the market in about a year, we would not have a good position in the market," said Tony Hancock, chief executive officer at IBM's Information Products Division in Lexington, Ky.

Hancock's group designed the sloped keyboard and casing electronically and sent the three-dimensional data electronically to plastics production contractor Leap Technologies, Inc. in Otsego, Mich. Leap put the designs directly into production, skipping the mock-up and prototype stages.

Last week, IBM officially spun off its printer and plastics business, which will now be part of Lexmark International, Inc. Both Lexmark and Leap will market their wares to other computer and noncomputer clients.

RICHARD PASTORE

Top-dollar Compaq LTE has carved out loyal user base

BY RICHARD PASTORE
CW STAFF

Judging by user accolades, it was love at first sight between notebook computer users and the Compaq Computer Corp. LTE 386S/20, which debuted six months ago. While the honeymoon flush has hardly cooled, users are starting to notice some annoying traits. They also realize the pricey LTE is no longer the only fish in the sea.

Enticingly priced notebooks based on Intel Corp.'s 80386SX chip have lured away some Compaq loyalists. An original-model LTE customer, Blue Cross/Blue Shield of Massachusetts, Inc. recently tapped AST Research, Inc.'s Premium Exec as its SX notebook.

"The street price is significantly less for the AST. On two units, the difference was $3,500 total," noted John Thibodeau, manager of Blue Cross' PC application department.

Compaq's $7,000 list price ranks it as one of the most expensive notebooks on the market. Dell Computer Corp., Tandon Corp. and others are shipping SX notebooks priced at less than $4,000.

Compaq spokesmen said many of the lower priced systems lack Compaq's 60M-byte hard disk, built-in cache controller, 8½- by 11-in. size and options such as an expansion chassis.



Units shipped

	10/90	11/90	12/90	1/91	2/91
LTE 386S/20	580	1,000	1,100	4,000	4,500
	10/89	11/89	12/89	1/90	2/90
LTE 286	400	1,700	4,500	7,100	6,100

Source: Storeboard/Computer Intelligence — CW Chart: Marie Hattes

"Having the ability to put [the notebook] in a docking station makes my life very easy. It makes me much more productive, so it was worth the price," said Alice Goldberg, technology researcher and senior consultant at Ciba-Geigy Corp.

Many users also said the LTE's quality justifies its premium. "All the products I've used from Compaq have been very reliable," said Jeff Low, a personal computer coordinator at Shell Oil Co.

However, the LTEs do have some relatively minor annoyances, these same users said.

The LTE's keyboard receives the most criticism. The cursor-control keys are rearranged, and the nonalphanumeric keys are smaller than their desktop counterparts.

Compaq attempted the traditional inverted-T cursor key pattern, said spokesman John Sweney, "but every arrangement required compromise in the size of the machine, the keys themselves." Most users do not want the trade-offs, he said.

Keyboard aside, most users said the LTEs are a perfect match for their needs, with price being their only concern. But this cause for concern may not last. Compaq will soon have to lower its prices in the face of mounting competition, analysts and users predicted.

Novell

FROM PAGE 1

Limited application management is also available through Netware Version 3.11's support of IBM's Netview management system, a company spokesman said.

Sources at a Netware developers' conference here said they were told the new product was designed initially to manage unspecified Novell software on servers. A source close to Novell said any application — including general consumer applications such as word processing and spreadsheet software — could be monitored and controlled if they were written to link with Novell application program interfaces now under development.

Network managers will be able to see when and why applications are faltering. In some cases, Novell and third-party software will be able to remedy the situation automatically, the sources said.

The software reportedly will be part of an overlying network management strategy that Novell executives said would be formally announced at the end of May. Some of those who saw the demonstration reported that Novell said it will develop standard application interfaces and that it plans to publish the interfaces this spring.

Network administrators will be able to program management agents to collect object-oriented information, report information through synchronous and asynchronous means to managers and, in many cases, act directly on that information, one source said. Objects specifically cited in Novell's presentation as recognizable by the agents included gauges, strings, events, states and alerts.

The console, which is still under development, will combine information from Simple Network Management Protocol (SNMP), Common Management Information Protocol or other protocols with Novell's protocol, according to documents distributed at the demonstration.

Sources said they were told the console would monitor any device supporting SNMP.

One of SNMP's authors, Jeff Case, president of SNMP Research, Inc. in Knoxville, Tenn., said the protocol can be used to help manage any hardware or software item on a network.

Mitch Shults, an analyst at Business Systems Group, Inc. in Houston, said after attending the briefing that Novell's product has "powerful" implications for companies that need to cut down on the number of information systems people who now must monitor and control network software and machines.

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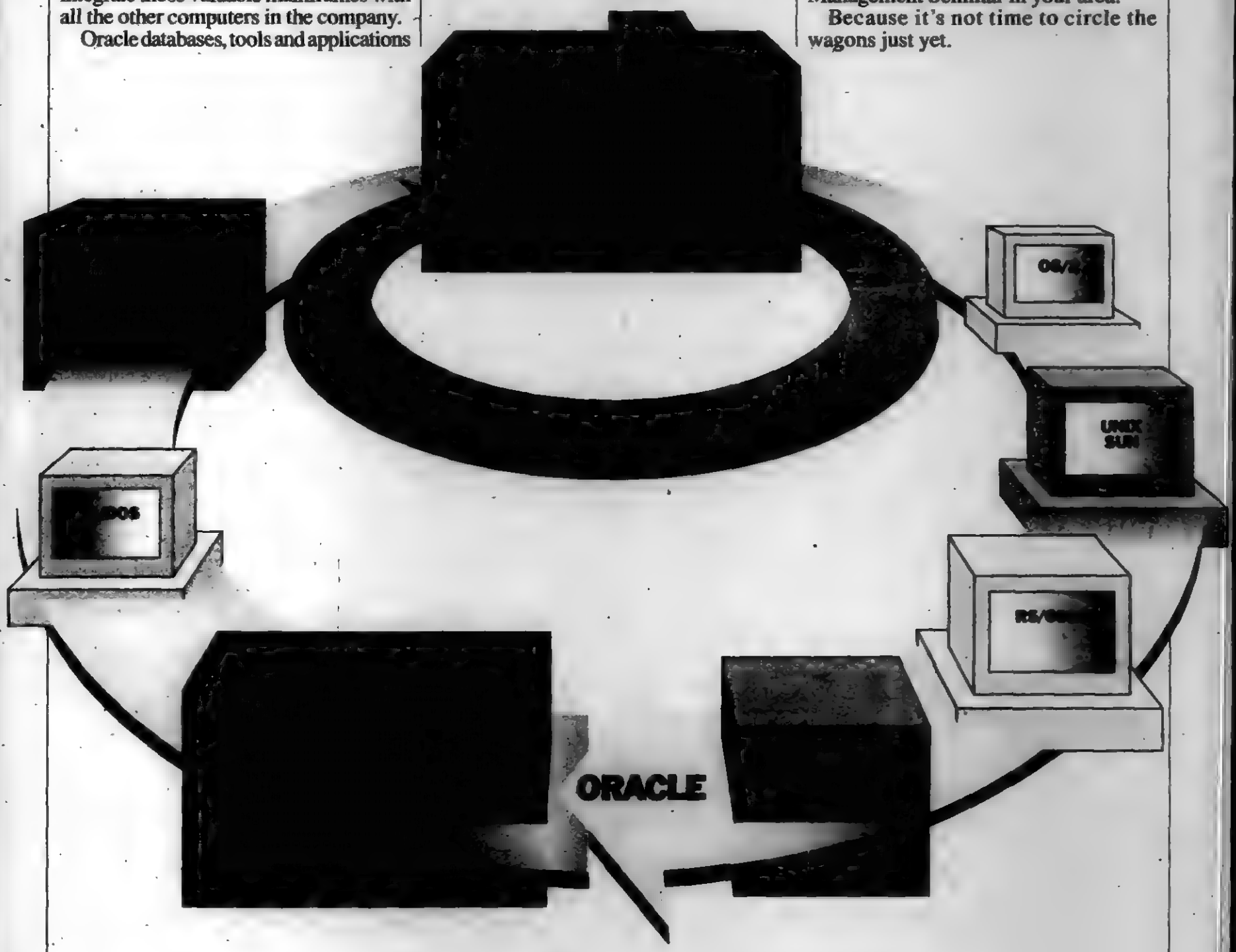
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Rival data

CONTINUED FROM PAGE 1

said. "Both management systems can play both roles."

IBM and AT&T are designing their integration offerings along the guidelines of the Open Systems Interconnect (OSI)/Network Management Forum's open peer-to-peer network management architecture, Warner said.

The software will allow users to consolidate configuration databases and trouble ticketing systems, correlate physical and logical alarms and share network status across their respective systems.

For example, one vendor's network management console, or host-based automation application, will be able to issue commands to the other vendor's management system to reconfigure a network system, initiate a test or collect status information. Users will also reportedly be able to graphically view the combined network installations on either vendor's management workstation.

These capabilities will extend to the third-party network management and networking systems that support Netview or Accumaster, vendor spokesmen said.

IBM's agreement with AT&T is likely to target prospective rather than existing Accumaster customers because AT&T's network management system is probably installed at only about a dozen companies right now, according to Ernst & Young partner David Passmore. "As I understand it, a number of key Fortune 500 accounts who have large enterprise SNA networks and Netview are also interested in acquiring Accumaster."

Blue Cross links Big Blue

One such company is Blue Cross and Blue Shield Association, which recently announced plans to implement a high-speed corporatewide network that will connect IBM SNA hosts over AT&T lines (CW, Feb. 11).

Having already picked Netview as its central network management system, the health care insurance giant has been "looking at Accumaster very carefully," said Blue Cross senior consultant Robert Schultz. "We see this announcement as very, very positive, since integrating Accumaster with Netview would make it much more useful to us."

IBM may be trying to counter a similar agreement that AT&T made about two years ago to integrate Accumaster with Netview's archrival Net/Master, Passmore said. The new agreement with IBM will not affect AT&T's relationship with Net/Master's vendor, Systems Center, Inc., Gilbert said.

IBM and AT&T will work with users this summer on such issues as how to support the system and which canned integration applications to develop, Gilbert said. The product rollout should begin in the first half of next year, with integrated problem and configuration management and trouble ticketing software that will be available to users "as a straightforward upgrade" of existing Netview and Accumaster software, he added. Pricing was not available.

Despite the peer-to-peer nature of the integration, Accumaster will not be linked to Netview via IBM's LU6.2 peer-to-peer interface, according to Warner. However, the two vendors said, the software will eventually support OSI/Network Management Forum specifications.

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Description	REALIA COBOL	COBOL/2[a]	COBOL/2 Workbench[a]
U.S. list price (with editor)	$995	$945[b]	$3,290
Price entitles user to year of free upgrades	YES	NO	YES
Automatic distribution of product upgrades	YES	NO	NO
Benchmark compile-and-link speed[c]	25 sec. (3 times faster)	1 min. 14 sec.	1 min. 14 sec.
Benchmark execution speed[c]	4 min. 11.4 sec. (4.3 times faster)	18 min. 17.2 sec.	18 min. 17.2 sec.
Benchmark executable file size[c]	104,713 bytes (2.6 times smaller)	282,288 bytes	282,288 bytes
Benchmark source available for review[c]	YES	N/A	N/A
DOS memory extender included	YES	NO	YES
No-charge run-time for DOS memory extender	YES	NO	NO
No-charge support for both EBCDIC and ASCII under CICS and IMS	YES	NO	YES
Dynamic Link Library (.DLL format) support under DOS as well as OS/2	YES	NO	NO
Dialect support for IBM VS COBOL, VS COBOL II, ANSI-74, ANSI-85, etc.	YES	YES	YES

a. Both are Micro Focus products. Company and product names are registered trademarks of their respective holders. Product information was current as of 12/5/90.
b. This COBOL/2 list price is $800. To get the editor, it's necessary to pay a $45 postage and handling charge.
c. This benchmark was created by Realia to test the competing compilers. Different benchmarks can lead to different results; the best benchmark is your own application.

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IBM work force to lose 14,000

BY MARYFRAN JOHNSON
CW STAFF

ARMONK, N.Y. — IBM last week announced plans to reduce its worldwide work force of 373,816 by more than 14,000 employees in 1991 through a variety of actions that include "voluntary incentive" programs and normal attrition.

A company spokesman stressed that no layoffs are anticipated.

At least 4,100 IBM employees are already packing for a move to Lexmark International, Inc., the company formed last week in the $1.5 billion sale of IBM's information products business unit to Clayton & Dubilier, Inc.

IBM Chairman John F. Akers said the firm's actions are "measurably improving the company's competitiveness." IBM will continue taking "the necessary steps to improve shareholder value for the years ahead," he said.

Accounting change

As one part of a long-term restructuring that began in 1986, IBM began implementing in January an accounting change mandated by the Financial Accounting Standards Board. The change requires firms to show on their balance sheets the costs of medical, dental and life insurance spanning each employee's career.

For IBM, compliance means a one-time, $2.3 billion after-tax accounting adjustment to recognize the accumulated obligation for IBM's active employees.

Company officials said the actions would have no impact on IBM's 1991 operating results. "We're not throwing any money over the side," spokesman Steven Eames said. "It's just an obligation that is listed now that was not listed before."

The latest restructuring moves should result in before-tax net savings of approximately $400 million in 1992 and annual savings of $600 million thereafter, IBM estimated.

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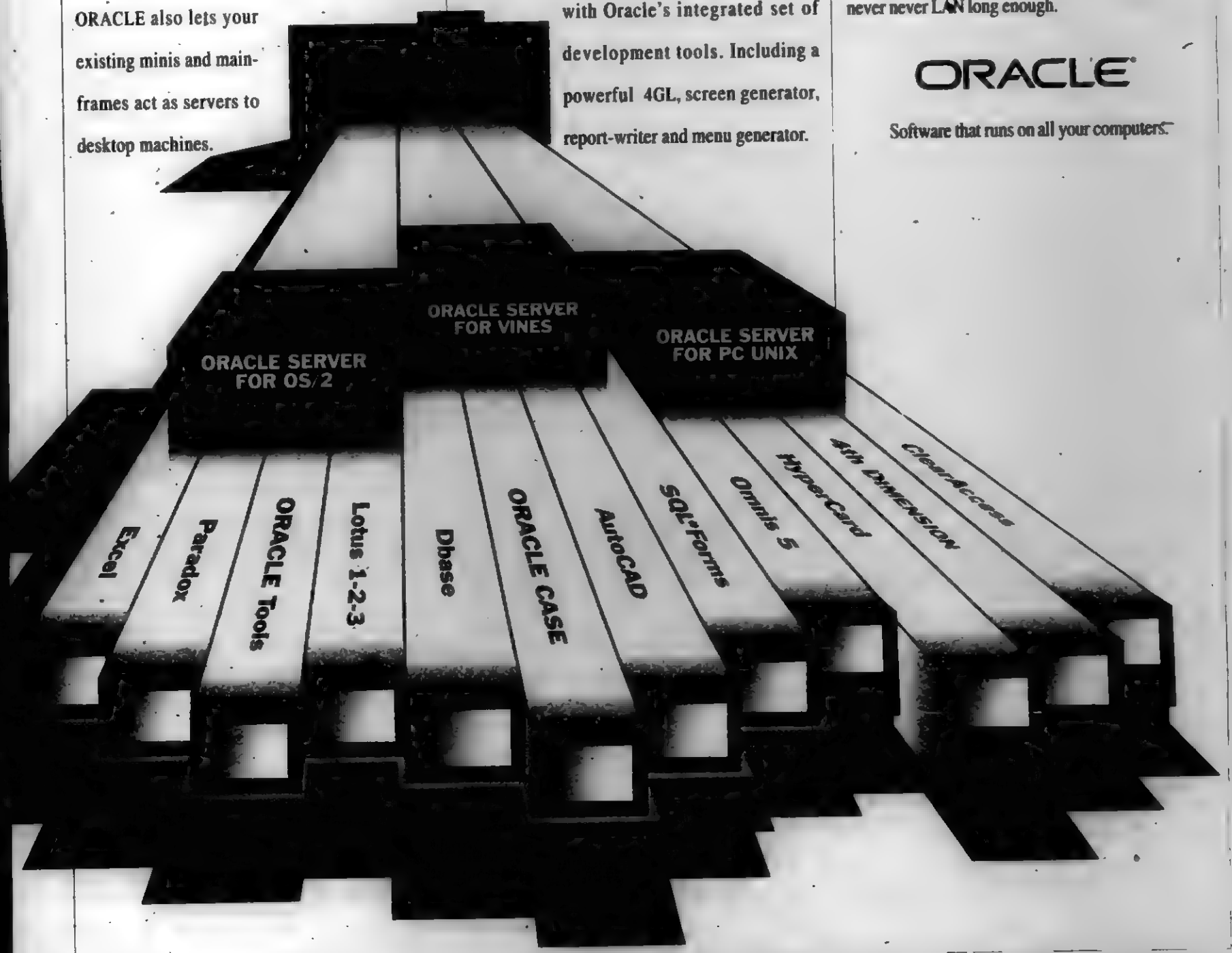
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Quattro Pro 3.0 rushes out

BY JAMES DALY
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. stepped on the gas in the fiercely competitive spreadsheet market last week with the introduction of a Quattro Pro upgrade only five months after the product's last release.

The release of the more graphically intensive *Quattro Pro Version 3.0* marks a victory for Borland's object-oriented program development approach, which has enabled the company to build and release applications at a dizzying speed. The accelerated introduction schedule has also allowed Borland to gain a step on market leader Lotus Development Corp. Lotus is expected to unveil its updated 1-2-3 Release 2.3 spreadsheet later this quarter.

Borland's aggressive approach appears to be paying off: According to Framingham, Mass.-based market research firm International Data Corp., Borland's U.S. spreadsheet market share doubled to 24% for the year ended Dec. 31, 1990.

In addition, the company continues to work on a version of Quattro Pro that will be optimized for use with Microsoft Corp.'s Windows 3.0 graphical user interface.

Quattro Pro 3.0 includes several what-you-see-is-what-you-get (WYSIWYG) features, including zoom features, pull-down menus and full mouse support. The upgrade will work on IBM Personal Computer XT-class machines with as little as 512K bytes of memory, according to Stephen Kahn, Borland's vice president.

Early users said the added WYSIWYG features have cut time and guesswork from their spreadsheet chores. "We get the results we want the first time we print," said Mike Finley, director of information systems at Six Flags Corp. in Houston.

Version 3.0 will be offered at a suggested retail price of $495. Registered owners of Quattro Pro Version 1.0 can upgrade for $99.95, while owners of Quattro Pro Version 2.0 can upgrade for $49.95. A local-area network setup, which adds one additional user to the network, costs $395. Borland will also offer competitive upgrades to owners of other high-end spreadsheets for $129.95.

The company also unveiled Proview Power Pack, a collection of graphics enhancements for Quattro Pro Version 3.0 users. Proview Power Pack provides additional clip art, fonts, macros and other presentation materials to augment those already found in Version 3.0. The package is included free in Quattro Pro Version 3.0 or may be purchased separately for $49.95.

Additionally, Borland introduced Paradox SQL Link Version 1.1, which connects PCs with data residing on a mainframe, and added Sybase, Inc.'s Sybase SQL Server relational database management system to the list of SQL servers supported by Paradox SQL Link. Paradox SQL Link Version 1.1 has a suggested retail price of $495.

Hacker sentenced to prison term

BY MICHAEL ALEXANDER
CW STAFF

CHICAGO — A self-styled computer hacker, who federal authorities said engaged in industrial espionage among other crimes, pleaded guilty to felony charges in Baltimore and Chicago last week. Under terms of a plea bargain, Leonard Rose, 32, will serve concurrently a one-year prison term for his role in each of five alleged fraud schemes.

In pleading guilty to the charges, Rose admitted that in October 1989 he knowingly received AT&T Unix source code from a former AT&T technical contractor who stole the code, according to U.S. Department of Justice documents.

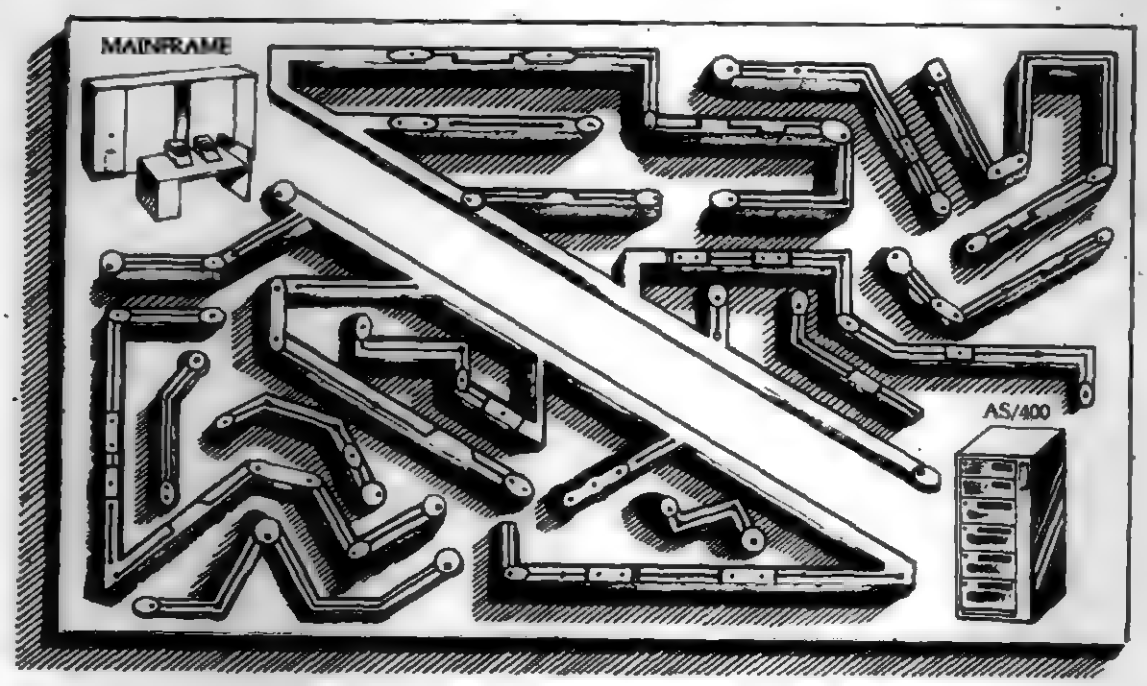
The consultant, who authorities said is now working under contract at IBM, remains under investigation.

"Rose provided the black market for the exchange of Unix source code to various places in Texas and Illinois," said William Cook, assistant U.S. attorney in Chicago. Rose also admitted to having inserted a Trojan horse program into the code's log-in sequence that was designed to secretly collect passwords.

Federal authorities in Chicago said Rose, who used the handle Terminus, also admitted that in January 1990 he transferred the modified Unix source code to a bulletin board system in Lockport, Ill., and to a computer account belonging to Craig Neidorf, a student at the University of Missouri.

In February 1990, Neidorf was charged in an unrelated case with conspiring to steal and publish a document describing the operation of Bellsouth Corp.'s 911 emergency telephone system. In July 1990, federal prosecutors dropped the charge against Neidorf, a former publisher of an electronic newsletter for hackers and telephone phreaks.

Rose also admitted that he downloaded the source code of proprietary AT&T programs stored in computers belonging to his employer, Interactive Systems, Inc. in Lisle, Ill., according to authorities.



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DEC offers enhancements to tape subsystem line

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. polished up its dull reputation in tape subsystems last week with the announcement of several high-performance tape products, including a new link between VAX/VMS systems and Storage Technology Corp. tape libraries.

"DEC has filled in virtually all of the major gaps in its product line," said Robert Abraham, vice president at Freeman Associates, Inc., a market research company in Santa Barbara, Calif. "They never had the edge of combining high capacity and high performance before. Now they do."

Topping the list of five new products is the $29,000 TF857 magazine tape subsystem with an unattended backup capacity of 18.2G bytes and a user data transfer rate of up to 800K byte/sec. Of greatest significance to DEC users, analysts said, will be this drive's ability to read data from previous DEC tape drives.

New technology, lower costs

The TF857 also uses a new technology with ½-in.-wide metal particle tape, which provides longer media life with lower operating costs than helical-scan tape drives. The only other large vendor to commit to metal particle tape is Hewlett-Packard Co., which produces the 4mm digital audio tape drive that DEC resells.

Other welcome news for DEC sites should be the partnership with Storage Tek to interconnect its 6,000-cartridge tape library with Vaxcluster systems running VMS Version 5.4 through an adapter and specialized server software.

"By making that available, DEC is removing an obstacle its salespeople have run into when selling high-end DEC systems against IBM," said Stan Corker, an analyst at the San Diego office of International Data Corp.

Just by spelling out its tape system strategy, DEC should clear away a lot of user frustration with the vendor's scattershot approach in the past, Corker added.

DEC also announced the TA91 cartridge tape subsystem for the VAX 6000, VAX 9000 and Vaxcluster systems as well as VMS support for the TZK10 ¼-in. cartridge tape drive.

Cisco routers win DEC role

BY JOANIE M. WEXLER
CW STAFF

To round out its selection of computer and communications equipment, the integration services arm of Digital Equipment Corp. has elected to resell Cisco Systems, Inc. multiprotocol routers rather than wait for a homegrown DEC product currently under construction.

Last week, DEC confirmed a one-year renewable reseller agreement with the router market leader that adds Cisco routers, bridges and network management products to DEC's U.S. price book. Cisco said the contract includes plans to expand the resale of its products worldwide within three months.

DEC affirmed that its networking group is continuing work on its multiprotocol router. The company would not provide a rollout schedule or comment on how DEC and Cisco products would be positioned vis-a-vis one another except to say that they will be "complementary."

"This is part of DEC's scramble for revenue," commented Janet L. Hyland, director of network strategy service at Cambridge, Mass.-based Forrester Research, Inc. "The DEC integration group is trying to bid on big jobs for multiprotocol environments, and the company doesn't have its own product."

DEC is already a leader in the router market by virtue of its installed base; DEC routers on the market today transport only the company's proprietary Decnet communications protocols. Cisco and other vendors' routers forward network traffic among heterogeneous environments by supporting multiple vendors' proprietary protocols as well as the public domain Transmission Control Protocol/Internet Protocol.

Why Cisco?

Cisco routers support a frame-relay interface that interoperates with the frame-relay interface on fast-packet pioneer Stratacom, Inc.'s T1 multiplexer, also a DEC partner. The Cisco relationship thus gives DEC the ability to sell a complete fast-packet network to early adopters of the emerging wide-area technology.

"The Cisco/Stratacom combination will give DEC a short lead in the market for selling to the few companies who are now ready for fast packet," Hyland commented. "But generally, by the time most companies are ready for the technology, the other router and T1 multiplexer vendors will support it, too."

DEC already resells Advanced Computer Communications, Inc. and Vitalink internetworking products. Proteon, Inc. said it is currently negotiating a deal with DEC similar to the Cisco partnership.

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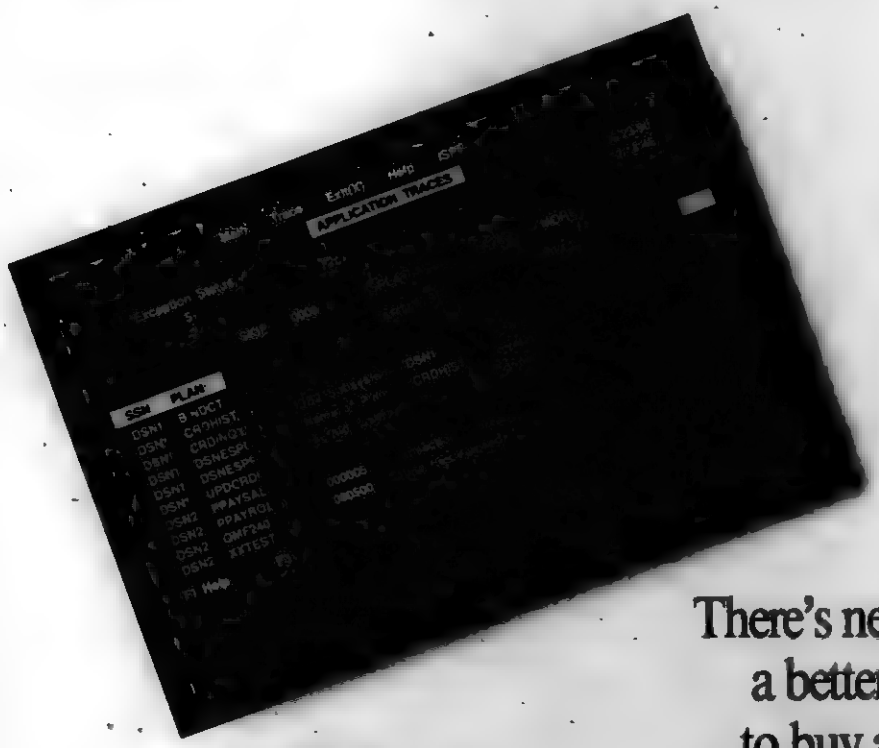
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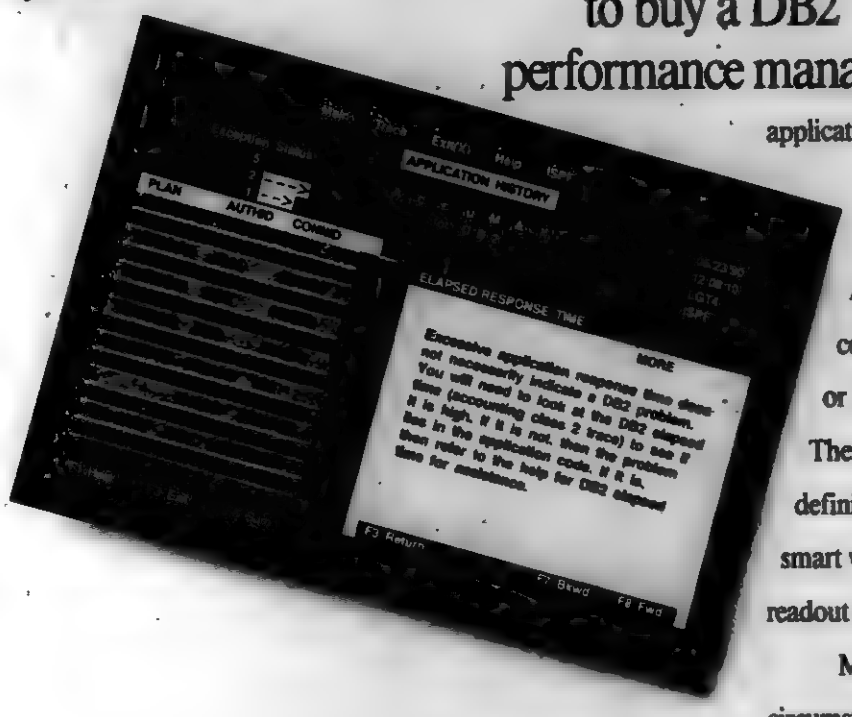


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ADVANCED TECHNOLOGY

TECH TALK

News on neural networks

■ Intel Corp.'s new Neural Network Training System (INNTS) makes it easy and practical to develop applications that use Intel's high-speed neural network chip, the company said last week. The INNTS includes two Intel 80170NX electrically trainable artificial neural network chips, two learning simulation software packages, diagnostic software, a programmer interface and specifications and adapter for any IBM Personal Computer AT-compatible computer. The neural network chip, which contains 64 analog processing elements and 10,240 trainable weights, can perform up to 2 billion interconnections per second, according to Intel. The entire neural network training package costs $11,800.

Quantum effects leap

■ Researchers at Los Alamos National Laboratory used computer simulation to achieve a breakthrough in the study of dynamical quantum effects in materials. The researchers were able to predict measurable properties of materials from simulations of quantum effects at the atomic level. "The problem has been trying to extract dynamical information from computer simulations of the quantum behavior," said Jim Gubernatis at the Los Alamos condensed matter and statistical physics group. "Small errors in the simulations produce large uncertainties at the level of material properties."

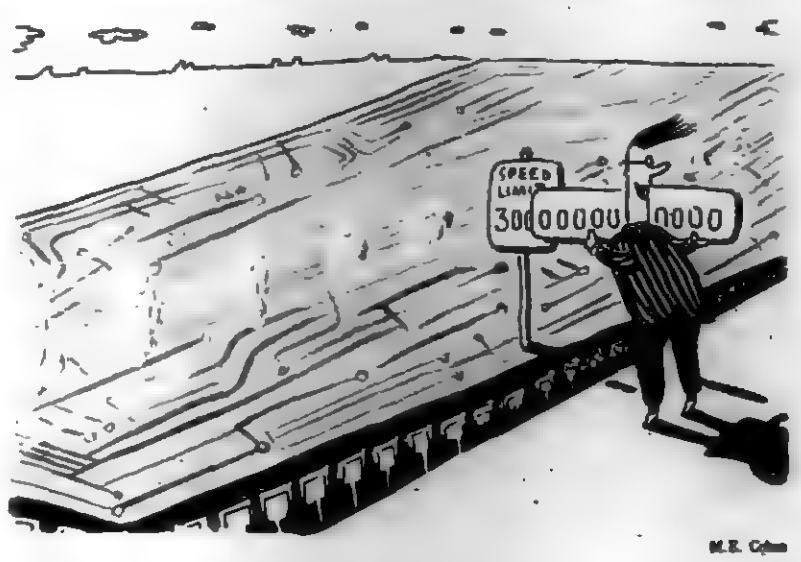
Grid unlocks multimedia

■ Grid Systems Corp. introduced a multimedia development system based on Intel's I486 and Microsoft Corp.'s and Tandy Corp.'s multimedia standard. Grid is a subsidiary of Tandy. The Grid 486EI-33 MPC system includes an I486 operating at 33 MHz, Extended Industry Standard Architecture, 8M bytes of memory, a 105M-byte hard disk drive and a compact disc/read-only memory player with CD digital audio outputs.

Scientists put their feet on the GaAs

Gallium arsenide draws increased attention as a faster alternative to silicon CPUs

BY MAURA J. HARRINGTON
CW STAFF



With about a decade of refinement behind it, gallium arsenide (GaAs) is finally being viewed by some corporate and academic researchers as a realistic alternative to silicon.

New methods of GaAs-based process manufacturing, such as the triple-layer metal method and photo lithography for GaAs, have drawn many high-end supercomputer vendors and private developers into finding a way to replace their silicon CPUs with the CPUs made with GaAs.

The two main components that make GaAs attractive to scientists are the natural high speed of the compound's electrons and its low-power dissipation, which is between one-fourth and one-half that of silicon, according to Gene Miles, an independent analyst.

"There is no doubt that gallium arsenide is a faster semiconducting material than silicon," Miles said.

High transfer rate

Traditionally, it has been difficult to put a high number of transistors on a chip made of GaAs because the high transfer rate of the electrons causes crossover between the CPU and the primary cache, according to Rich Brown, project director at the University of Michigan in Ann Arbor.

Camarillo, Calif.-based Vitesse Semiconductor Corp. has been able to pack up to 1 million transistors on a GaAs chip, according to Tom Dugan, director of Vitesse's Standard Products Division.

Two changes made in GaAs technology at Vitesse during the mid-1980s contributed to the company's success with its business of making high-speed logic chips with GaAs, Miles said.

First, switching from using gold to aluminum in the gate structure of the interconnects between transistors helped open a former speed bottleneck. Second, updating the company's manufacturing process from wet etching to a dry etching technique helped to solve the problem of the chip's brittleness, Miles explained.

Brown, who is supervising a team of faculty and students working on a CPU made with GaAs, said that since the team began the project two years ago, they have found that the combination between the hit rate and cycle time is vital to the success of a CPU made with GaAs.

Brown said that what separates his project from others going on at Japan-based Fujitsu Ltd. and Cray Research, Inc. is that his team has worked for two years to build computer-aided design tools that were made specifically in order to optimize the qualities of GaAs wafers.

Brown added that the university will eventually market the tools to help GaAs semiconductor manufacturers in the future.

Vitesse and other GaAs semiconductor manufacturers said they believe that CPUs made out of GaAs wafers will be a viable alternative to silicon by 1992.

However, semiconductor analyst Michael Slater at Micro Design Resources, Inc., a market research firm based in Sebastopol, Calif., said that despite the advances made in GaAs technology so far, it will be three to five years before the technology gains acceptance as an alternative to silicon in the high-end CPU market. He claimed the two major factors barring GaAs-made wafers from the silicon-dominant CPU market are high price and low density.

Software offers clearer images of the heart

BY MICHAEL ALEXANDER
CW STAFF

Researchers at the State University of New York at Buffalo have devised an interactive computer program aimed at enabling cardiologists to diagnose heart disease more accurately.

The new program is based on research in fundamental cognitive psychology about how people see, gesture and focus their attention. An algorithm in the software is based on psychological theories about how people perform these actions, according to David Sher, an assistant professor of computer science and one of the co-developers of the program.

Using the program, cardiologists will be able to use a computer to automatically highlight potential trouble spots in the heart walls depicted in a digitized image of an echocardiogram by merely gesturing with a light pen or cursor. Currently, heart physicians diagnose heart disease by viewing videotapes made from echocardiograms. The physicians note variations in the thickness of the heart walls and make other simple measurements by stopping the tape and examining the static image.

The pictures often have poor quality and lack important details, said Dr. Steven Rosenthal, a University at Buffalo clinical assistant professor of medicine, who collaborated with Sher on the project. The physicians already outline the heart walls in an echocardiogram with light pens or cursors, but the drawings are tedious and the results are imprecise, he said. "People are not very precise about locating where things are in an image," Sher said. "Computers are precise, but they confuse easily. With this computer program, we want to take advantage of the precision of computers and the intelligence of people."

The researchers also hope to develop a technique that will enable the computer to automatically trace a moving image of the cardiac wall and make precise, reproducible measurements while the physician simply monitors those measurements, making corrections where necessary.

The researchers said they believe the computer program will eventually be able to provide precise information on other ventricular functions such as the rate of contractions at different points in the walls and the volume of blood that is ejected from the heart.

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EDITORIAL

Repeal 1706

IMAGINE BUILDING A structure from the ground up without any detailed plans and then, after it's built, returning to the scene and finding various structural flaws, some of which undermine the very integrity of the building.

What are you likely to do? You knock it down and start again if the problems are bad enough.

That's what ought to be done with Section 1706 of the Tax Reform Act of 1986. Ditch it. That's the only conclusion that can be gleaned from the largely inconclusive and long-awaited study released by the U.S. Department of the Treasury last month.

Section 1706 bore the mark of doom from the start. It was tacked onto the Tax Reform Act without debate or proper hearings. Undoubtedly such hearings or an inquiry by the General Accounting Office would have unearthed at least some of the ambiguities and inconclusiveness offered by the Treasury study.

Specifically, 1706 segmented contract programmers, especially those working through brokers, as a special group apart from other contract workers. The rule essentially reclassified many of these programmers as permanent employees. Its stated intent was to make sure these programmers paid their fair share of taxes, implying that they were prone to chronic underpayment.

The independent contractors affected by the legislation sparred lustily with the big service companies, represented in large measure by Adapso, which lobbied heavily for passage (and now maintenance) of 1706. Both sides agreed to an independent Treasury study to assess the impact of 1706 on tax revenue and on the independents as well.

The study was so wishy-washy that both sides immediately claimed victory. What the study *did* determine was that 1706 is largely revenue-neutral. In other words, if people were cheating on their taxes, 1706 hasn't done anything to boost tax revenue. More likely, the contractors really weren't cheating that much to begin with.

What 1706 has done very effectively is sow confusion in the marketplace. The Internal Revenue Service guidelines promulgated a couple years ago were labeled as such by a federal judge. Ironically, 1706 was tacked onto a broader bill whose aim was tax simplification. In the spirit of the same, it should be repealed.

Singling out technical workers who use brokers isn't fair and never was. Why should one set of rules apply to contract programmers and another to, say, contract janitors?

In concert with a repeal, the IRS should put some more teeth into enforcement of its abundant existing codes. Make it painful to willingly misclassify an employee as an independent contractor. Catch the tax cheats and levy fines that the majority of people who pay their fair share would deem worthy.

But let's stop tarring and feathering one select group. The fact that this was done in the first place casts sufficient suspicion on the intent of 1706 and this in itself is reason for repeal.



LETTERS TO THE EDITOR

Make tech, not war

I was very supportive of Gary Chapman's viewpoint "Beware the fruits of war-tech" [CW, March 4]. Our country is the only superpower in the world glorified as being the best at war. The thought that our dominant industries have become dependent on pursuing destruction through the use of pinpoint accuracy is, to say the least, wasteful.

Considering that we have the technology to destroy ourselves and that our largest industries rely on providing anyone with resources the ability to destroy each other (remember Iran vs. Iraq — whose side were we on?), concentrating our energies elsewhere could be much more rewarding.

With additional economic problems surfacing at home every day, our unparalleled ability as innovators could be put to better use pursuing productive world markets that provide the opportunity to re-establish America in its rightful place. At the top.

W. Brian Cornwell
Research Marketing Coordinator
Sigma International, Inc.
Oakton, Va.

Good decisions

Regarding "Decision-making prowess" [CW, March 4], Mr. Fried's guidelines fall into the very same EIF trap they allude to avoid. They represent traditional systems development methods used to define static requirements, e.g., accounts payable.

Executive decision making is a dynamic process with highly fluid requirements. These requirements only apply to the business analysis which is in process. A successful completion of an analysis will often eliminate the requirement and spawn new and different information requirements.

Most importantly, the business/systems analyst's mission is to generate new "insights" about the business. These insights allow the executive to make decisions that are new and different. In other words, insights which allow the executive to gain competitive advantage from business insights not realized by competitors.

Edward F. Delker
President
Competitive Advantage Systems, Inc.
Chesterfield, Mo.

First blush

Please advise Karen Lee Cocks [CW, March 18] that the expression "at first blush," far from being an "esoteric, new-age term," is a well-accepted phrase using the word "blush" as a noun meaning "appearance."

Unfortunately, many well-meaning people are afflicted with knee-jerk paranoia.

Jed E. Goldberg, M.D.
Miami, Fla.

Second blush

Karen Lee Cocks should check her dictionary before she criticizes your use of the term "at first blush."

Funk & Wagnalls has this to say about the use of the word "blush." "A glance; glimpse: now only in the phrase at or on first blush."

I hope this "esoteric new-age term" doesn't embarrass her.

Denis Maher
Manager
Database Administration
University of Colorado
Boulder, Colo.

Oracle update

We were very gratified to read that our IBM mainframe installed base was pleased with our relational database management system, computer-aided software engineering (CASE) and tool offerings [CW, Feb. 25].

Since the survey, however, some changes in our product line have addressed one of the major shortcomings cited by your respondents: the integration of our CASE tools.

We have now released the Oracle CASE product line for IBM MVS and VM. This means that Oracle users can utilize one integrated family of CASE and application development tools in their IBM environments. Oracle users can distribute their database and tools in a client/server environment to take advantage of diverse hardware, operating systems, graphical user interfaces and networking protocols.

Dave Jones
Senior Director
IBM Product Line Marketing
Oracle Corp.
Redwood Shores, Calif.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

Leaving the Computer Stone Age

Our vision of what this tool can do is mired in the past

JOSEPH F. COATES



The computer has, to a large extent, fallen into the hands of dullards and short-term optimizers. That this marvelous product of American genius is increasingly and unnecessarily a rasping annoyance and irritation reflects a failure of business acumen.

All technologies are introduced in phases. What has happened with the computer, however, is that, in almost every large organization, it is stalled at phase one or two and used as a slave for the optimization of old functions rather than an aid in the creation of new ones.

All technologies are first introduced as a substitute means of performing some function that we want to do better, quicker, sooner or more reliably. The computer was introduced primarily to serve the interests of the back room boys — the green eyeshade crowd with their passion for counting the pennies and keeping the accounts straight.

That was fine for a while, but this stage dragged on far too long in most cases, and it is still going on in many.

It wasn't until almost 20 years after the computer was introduced into hospitals that it began to be an effective tool in the practice of medicine. In retailing, which is presumably more directly driven by a passion for customer satisfaction, the back room boys have dominated for so long that we are barely beginning to see the application of computers at the customer interface.

Only efficient

The second phase in the introduction of a technology is the search for more microeconomic benefits through reorganization of the flow of materials, goods or paperwork. This passion for efficiency often results in the sacrifice of effectiveness. Mindless machines in the service of robotized managers cannot learn to be useful *or* nice to their customers.

The traffic division in Washington, D.C., is a good example. This commendably efficient organization has a marvelous capability for keeping track of those who neglect to pay their parking tickets or commit other petty offenses. However, I have yet to receive from it one positive or useful notice relating to the effectiveness of any of the programs that are fed with my taxes and my information.



Robert Neubecker

Government is not by any means the only offender. Departments stores, mail-order houses and supermarkets all suck up massive amounts of information about consumers and give little or nothing back in terms of either value or service.

The third stage of the introduction of all new technologies occurs when they become cheap, familiar, commonplace and well understood. This is the revolutionary phase, when unprecedented applications tumble forth in abundance. Let us hope we are on the verge of that stage with computers and that we can find the will and the imagination to move forward.

What would the world be like if the computer were in the hands of imaginative and creative organizational leaders and technicians who were rewarded for effectiveness and customer service? We might have telephone operators who are actually able to be helpful, instead of poor drudges beleaguered by computer counts of their second-to-second activity. We might also be able to find a department store clerk who could call up our last five purchases, say something intelligent about our interests and direct us to a product particularly reflective of our established buying habits.

Playing the game

Somebody has to pick up the ball and make the computer an effective part of our modern world. If I could lay down a law, it would be that every manager of a computer system and every corporate mogul owning systems would be forced to spend 20 hours at Nintendo and 100 hours watching music videos. In that way, they might come to some understanding of what the computer is capable of.

If I were in charge of any large computerised organization, I would immediately fire most of the people responsible for its use. What they lack is playfulness, a passion for innovation, an orientation toward customers, a total systems approach to the business and even a scintilla of willingess to take a risk. To those people who *are* in charge, I recommend one question: Ask yourself "What has the computer done for us lately?"

Coates is president of J.F. Coates, Inc., a policy research organization. He was formerly assistant to the director and head of exploratory research at the Congressional Office of Technology Assessment.

First (and last) laughs

PAUL GILLIN



Salt in the sugar shaker? That's kids stuff! Here's some April Foolery form-fit for funsters in the corporate information systems department. See if anyone can resist a snicker when you spring your surprises on these folks:

- **Your print shop manager:** A jar of strawberry jam, a spatula and a room full of printers add up to some fun at invoice time! Imagine the mirth as the print room crew scrapes preserves off those terribly touchy printheads. Peanut butter, anyone?
- **Your applications programming manager:** It's amazing how many laughs you can get from one little programming change. Just take that payroll source code, move the decimal point one space to the left, recompile and get ready for payday mayhem! Or move it one space to the right and watch your CFO's head explode!
- **Your IS director:** This is what mail merge was made for! A snotty resignation letter, the department personnel list, a tall stack of paper, and your boss thinks his whole staff has called it quits! Was it something he said?
- **Your end users:** How many do you think will notice that their PC monitor is upside down? "Must be a virus," you say with a straight face. "You'll just have to live with it." Think of the neck injuries as they struggle with those inverted spreadsheets!
- **Your operations manager:** A power drill, a funnel and a big box of tapioca pudding turn your data center into a funhouse. Find the primary feed pipe to those water-cooled mainframes, drill a little hole and let the hijinks begin!
- **Your network manager:** Don't look now, but CICS is coming to its knees! All it takes is a PC, terminal emulation software and a little programming loop. Can you really be logged on enough times to tie up a $6 million mainframe? You bet!
- **Your personnel director:** It's such a tiny magnet but such a big problem when dropped in that box of super-confidential floppies! Surely he had them backed up. He *didn't*?
- **Your unemployment officer:** You gave *him* your employment history and letters of reference. Wasn't it sloppy of him to leave them on that shredder pile? Hey, no fair! You're the one who's supposed to play the jokes around here!

Gillin is *Computerworld's* executive editor.

Why take the RISC? We're all wondering

PETER BARTOLIK



Now, let's see if I've got this straight.

Compaq, DEC and Microsoft are teaming up with RISC-chip developer Mips Computer in a bid to stave off the market dominance of Sun and — take your pick — IBM or HP. Oh yeah, let's not forget that The Santa Cruz Operation, leading provider of the desktop Unix operating system, is also involved.

Something for everyone

These companies, we're told, are going to band together in early April to promulgate a specification for a new type of RISC workstation. It will be a *better* mousetrap, one that will not only provide the power of RISC but also tap *into* shrink-wrapped applications available for SCO Unix and Microsoft's Windows 32 and OS/2 Version 3.0 (or is it New Technology OS/2 or maybe Portable OS/2 — heck, I'm just gonna call it OS/3 as some others have taken to doing).

OK, I get it. This is going to be a new generation of desktop devices, picking up where Intel microprocessors and MS-DOS leave off. No, that can't be right; coming away from the debacle of OS/2 Versions 1.0 and 2.0, Microsoft surely understands that computer users are in no hurry to make that type of generational leap in technology. No way are they going down that path again after convincing everyone to upgrade their DOS applications to Windows applications.

Now, we all know Bill Gates and IBM are on the outs these days over OS/2, so maybe this is really designed to stick it to IBM and its successful RISC System/6000. That's a goal that DEC and Compaq can really belly up to. That makes sense.

Oh-oh, wait a second — DEC is going to push this as an Open Software Foundation (OSF) OSF/1 platform. But isn't DEC *in cahoots with IBM* — and HP, too — in the OSF and its plans for a better form of Unix? And isn't DEC talking about a RISC-based VAX technology to drive its VMS operating system into the future?

Ok, forget all that. I've got it now. Everyone knows that nobody likes Sun. This is just a way to block off the wild success of its Sparc architecture that recent reports now claim has achieved a 65% market share in the RISC market. No way can the industry let this upstart forge a monopoly in the RISC industry. Heck no!

Too big for its britches

I mean, just look at what Sun has done. Not content to stick with the Motorola CISC architecture, it went off and did its own RISC implementation. Not only that, but once Sparc was established as a viable product, the product specifications were turned over to a group known as Sparc International, which is responsible for future development of the architecture. And get this: Anyone who joins Sparc International not only gets the specs but also has a say in how to improve on them.

Just imagine what kind of shape the industry would be in if Intel had ever taken that approach ... Uh, strike that thought. We all know the computer industry didn't get where it is today using a committee approach to technology development.

Let's start again. There's a committee of five vendors ... Oh, forget it. This stuff is just too complicated; I need a lawyer to straighten out who's doing what to whom.

Bartolik is *Computerworld's* news editor.



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NEW DEALS

CVS to get XA2000

The CVS drugstore chain signed a $1.2 million contract with **Stratus Computer, Inc.** for a Stratus XA2000 system to run on-line applications for the chain. CVS plans to develop crash-proof applications for credit-card authorization, health insurance claims verification, store office automation and a central pharmacy system.

The British Columbia Lottery Corp. awarded a $1.9 million contract to **Digital Equipment of Canada Ltd.** to upgrade the lottery's business management system from Concurrent Corp. computers. DEC will supply systems, software, networking and consulting services for an integrated applications development and management environment.

Convex Computer Corp. recently installed a C220 supercomputer at **Canadair**, a subsidiary of Bombardier, Inc. Canadair will use the system for analysis and optimization of aircraft aerodynamic configurations. Convex also installed one of its C240 computers at the University of Illinois.

Stratus compiler spells migration boost

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

MARLBORO, Mass. — The element of surprise worked well for Stratus Computer, Inc. recently, when the fault-tolerant vendor unveiled the first in its new generation of machines.

Once it starts shipping next fall, the XA/R Model 20 will be the industry's first crash-proof, reduced instruction set computing (RISC) machine with the unexpected bonus of a dual operating system.

Stratus users can choose between the proprietary Virtual Operating System (VOS) or the Unix-based FTX, bringing their old applications to the new platform by recompiling them to run in native mode.

Challenging move

Much larger companies than the $341 million Stratus have struggled with the technical challenges involved in such a move and found them daunting. The $13 billion Digital Equipment Corp., for example, is still months away from producing a VAX computer with a RISC CPU that will be able to run the 10,000 existing VAX/VMS applications.

So how did Stratus pull this off so gracefully?

The two-part answer lies in the 11-year-old company's early choices.

Stratus' VOS was written in high-level languages, mainly PL/1 and C, that enable it to disengage smoothly from the underlying chip architecture. Only 3% of VOS is written in assembler language, which is notoriously difficult to port from one operating system to another.

Added to that is Stratus' sophisticated compiler technology — separating the code generator and optimizer from the compiler — which allows the company to change from Motorola, Inc.'s 68000 microprocessor to Intel Corp.'s I860 RISC chip with relative ease.

"The only way to successfully get two operating systems to run on the same platform is to engineer the idea in close to development of your systems," said Wayne Kernochan, an analyst at The Yankee Group in Boston.

"Stratus has compiler technology that has allowed them to map the instructions from their standard 68000 technology over to the I860, which is a pretty full-featured processor," said James Hammonds, vice president of The Sierra Group, Inc. in Tempe, Ariz.

"What is even more impressive is that users don't have to worry that much about their up-

Continued on page 32

Mass movement

- Stratus' XA/R Model 20 will be available this fall for $247,000 with the Unix-based FTX Release 2 or for $275,000 with VOS
- The Model 20 features a duplexed processor built around the Intel I860 running at 32 MHz with 512K bytes of cache memory added to the board
- The new RISC-based platform will also include the Motorola 68000 series of chips because its intelligent subsystems for communications and disk I/O will be based on the 68030
- Stratus users can recompile all current applications to run in native mode on the XA/R Model 20 and future members of the line. All application development tools offered on VOS will be available on the RISC platform
- Stratus' VOS is written in the high-level languages PL/1 and C, with less than 3% written in assembler language, making VOS portable between different architectures

Source: Stratus Computer, Inc. — CW Chart: Doreen St. John

Imaging poll shows interest, not action

BY ELLIS BOOKER
CW STAFF

SILVER SPRING, Md. — It is getting to be standing room only in the *Theatre du Imaging*, but there are still relatively few performers onstage.

End-user interest in electronic document imaging has never been higher, according to a recently released survey of end users by the Association for Information and Image Management (AIIM) and Datapro. Seven of 10 respondents, or 71%, of the survey sample said they have, are considering or are planning to implement an imaging system. This is up from 57% in AIIM's last major survey published in 1990.

However, of the 866 respondents, only 37% actually had a system in place. Of these, 26.9% had a single system in production, 2.5% had three systems, and 4.7% had two systems. Just 1.9% of the surveyed users had four or more imaging systems installed.

Growth in future

Nevertheless, the survey revealed that most users think document imaging will rapidly grow in importance for them. Users predicted the percentage of their documents stored and retrieved in digital form would grow from 15% today to 62% in five years.

Accompanying this growth, expenditures on document imaging will grow from 10% of the total information systems budget today to 27% of the budget in five years, the users predicted. These estimates, however, are somewhat lower than answers users gave in AIIM's 1990 survey, in which they said imaging would grow from 14% to 31% of their budget in five years. In the 1990 study, users had predicted their imaging budgets would more than double in five years.

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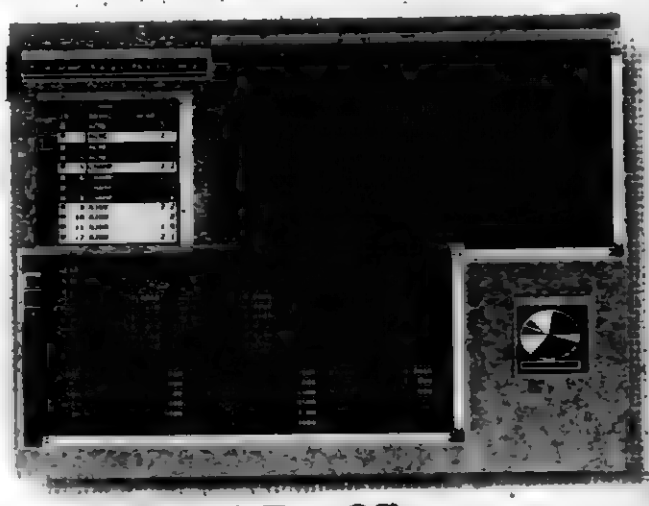
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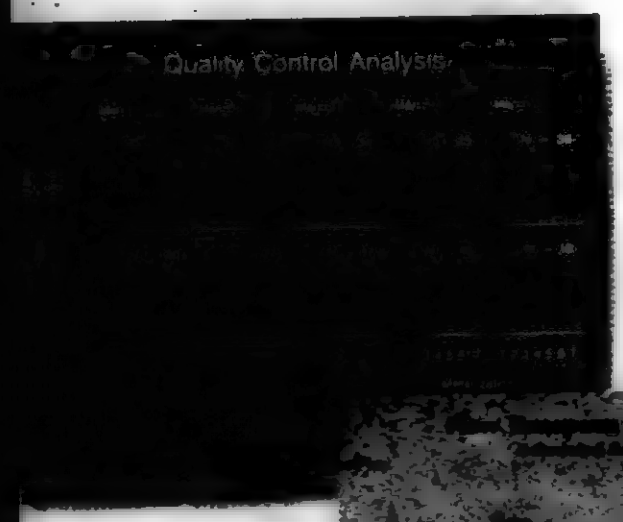
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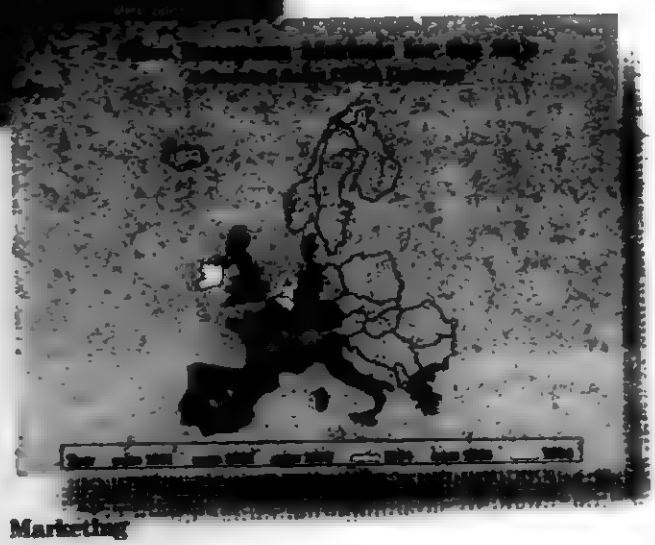


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SOFT BITS

Informix gets SQL tool set

SQL Solutions, Inc. in Burlington, Mass., has announced a programming tool for writing and debugging SQL code in the **Informix Software, Inc.** relational database management system environment. Called SQL Advantage, the product is available immediately for Informix databases on the Sun Microsystems, Inc. platform. Pricing starts at $7,500. Versions optimized for the AT&T 3B2 series and Hewlett-Packard Co. HP-UX systems will be available in the second quarter.

A telephone consulting service created for IBM Application System/400 users has been announced by **Synon Consulting, Inc.** in Glenview, Ill. By dialing a 900 number, AS/400 users in the U.S. will be able to discuss the following topics with a Synon consultant: Synon applications templates, Synon/2E-2G implementation, OS/400, OS/2 and AS/400-to-personal computer connectivity. The service costs $3.50 per minute.

Boole & Babbage, Inc. in Sunnyvale, Calif., has acquired a suite of CICS and VSAM performance utilities from **Quantum International Corp.** The two major products are Hiper-Cache and Xa-Relo, performance optimisers currently used by more than 200 IBM MVS installations worldwide.

The Santa Cruz Operation (SCO) and AT&T Computer Systems have entered a technology agreement whereby SCO will evaluate and certify the compatibility of its Unix operating systems with several AT&T work-group products, including the AT&T 6386SX/EL, 6386/25 and 6386E/33. SCO will also dedicate testing facilities and assist AT&T technical staff members to ensure compatibility of AT&T Stargroup and Starlan networking products with the SCO Unix environment.

Making U.S. intelligence more intelligent

BY GARY H. ANTHES
CW STAFF

When Iraq invaded Kuwait last August, U.S. intelligence analysts around the world saw an explosion in message traffic, a tidal wave of intelligence data that was difficult to deal with on a timely and orderly basis. One year from now, those analysts will have a new system in place, one that will help them deal with work load spikes caused by global emergencies.

McDonnell Douglas Electronic Systems Co. recently won a five-year, $40 million contract from the Pentagon to install an Automated Message Handling System (AMHS) for the U.S. military intelligence agencies. The system, to be installed at 50 sites worldwide, will feed message traffic from Autodin, the U.S. Department of Defense's message-switching network, and news stories from commercial wire services to thousands of intelligence analysts.

The purpose of the system is to give intelligence analysts a real-time pulse of the world's activities so unfriendly events can be anticipated and military and political trends can be spotted and analyzed. Officials said the new system will enhance both the timeliness and sophistication of analysts' work.

Each of the 50 centers will have from two to four Digital Equipment Corp. DS 5000/200 servers routing information to as many as 500 intelligence analysts on a local-area network. The magic of the system, according to McDonnell Douglas, lies in the servers' software for tailoring a flood of information to the needs of individual analysts.

The DEC Ultrix-based servers will run Topic Real-Time, a concept-based retrieval system from Verity, Inc. Topic will hold user-specified profiles that define subjects of interest to the analyst as well as weights indicating the importance of each topic and subtopic. The profiles act as filters, sending notices to analysts' workstations when messages or news stories of interest are received at the server. Messages are also ranked in order of their overall importance to the analyst.

"The analyst might have 500 messages to look at in a half hour," said Don Griggs, McDonnell Douglas' AMHS program director. "That's the beauty of Topic — he can look at the 20 most important, clicking on them as he wants to see them."

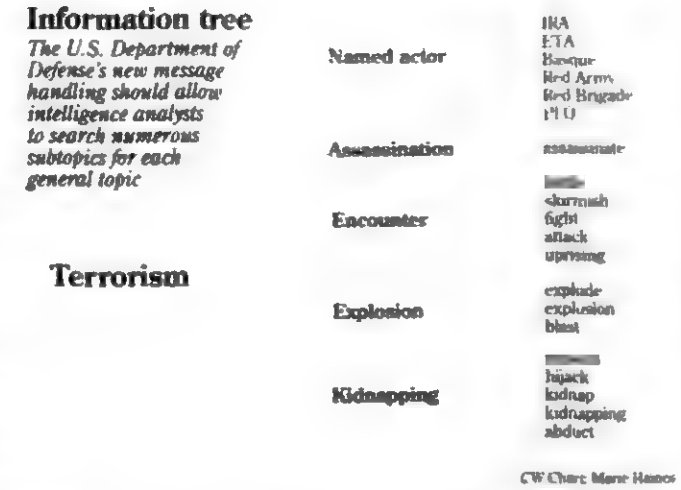
AMHS replaces a 15-year-old system that is based on DEC PDP-11 minicomputers accessed through dumb terminals, said U.S. Air Force Maj. Jim Daday, AMHS program manager. The system has primitive profiling capability, no feeds from wire services, no message archiving ability, and it cannot keep up with peak loads, he said.

Air Force Capt. Terry O'Heron, intelligence systems manager, estimated that the new system will save the Air Force between $75,000 and $100,000 per site per year in software maintenance costs. That is because 90% of the system is built from commercial off-the-shelf software, which is more reliable and requires no on-site support, he said.

Users will be able to do "retrospective searches" against an on-line magnetic disk database holding three months of messages or against an on-line optical disc system holding from six months to five years of activity. The searches also use Topic's concept-based retrieval methods, in which users define queries at any level in a hierarchy of subjects and then automatically receive information about related subjects.

Information tree

The U.S. Department of Defense's new message handling should allow intelligence analysts to search numerous subtopics for each general topic



CW Chart: Marie Hanos

RJR keeps tabs on parts with imaging system

Inventory cuts, more uptime may lower costs

ON SITE

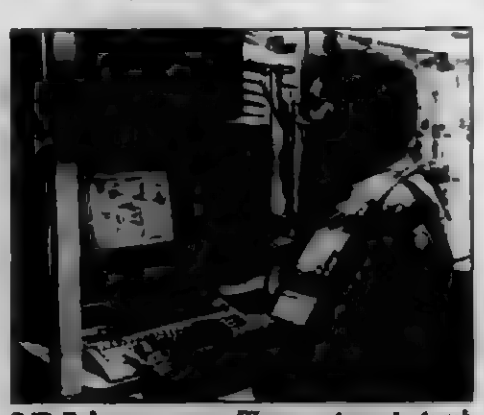
BY SALLY CUSACK
CW STAFF

WINSTON-SALEM, N.C. — Even as revenue shrinks in its controversial industry, R. J. Reynolds Tobacco Co.'s three major U.S. plants, in Winston-Salem and Tobaccoville, N.C., are churning out 190 billion cigarettes per year.

Divided into approximately 140 production units, the three facilities each house nine integrated cigarette-making machines. Each unit, or cell, produces 8,000 cigarettes per minute, and there are approximately 35 different maintenance manuals pertaining to the machinery located in each each cell.

To better track spare parts inventory and catalog the voluminous maintenance manual instructions, RJR Tobacco relies on a Wang Laboratories, Inc. imaging system and several integrated software programs developed in-house with Software AG of North America, Inc.'s Natural fourth-generation language (4GL) and Adabas database packages.

The company started looking for a system to coordinate spare parts availability with maintenance instructions in 1989. The bulk of the machinery comes from Europe, and the translations are not always straightforward, said Dan Tylak, principal systems analyst at RJR Tobacco.



RJR Tobacco uses *Wang systems to track spare parts and store maintenance manuals*

"The crux of the problem was that we did not have a bill of materials system. There are 120,000 spare parts to keep track of, and there was no way of knowing which parts went on which machines," Tylak said.

The company firm decided that developing and integrating a bill of materials system with an imaging platform would be the optimal solution.

RJR Tobacco was already using IBM mainframes and Digital Equipment Corp. systems throughout the organization and had been using Software AG's product as the corporate database management system and 4GL for almost eight years.

RJR Tobacco was also using Wang equipment, Tylak said, but that was primarily relegated to office automation and word processing operations.

"We proposed to prototype imaging on all the platforms, and one of the stipulations was that the imaging be compatible with the Software AG programs," Tylak said.

Neither IBM nor DEC had corporatewide, commercially available imaging systems at the time, and RJR Tobacco eventually elected to use the Wang Integrated Imaging System software on a Wang VS 5000 platform.

RJR Tobacco developed a bill of materials system with Natural and Adabas. Diagrams from the maintenance manuals were scanned into the Wang system, cleaned up and updated on a personal computer using Wizard, a Wang image-editing product.

The final images, including pictures of the assemblies and their parts, are then stored on magnetic disks. The system currently has 3,000 stored images.

There are 14 Intel Corp. 80386-based workstations connected to the Wang system, which in turn communicates over 56K bit/sec. lines with an IBM 3090-600J mainframe at the company's Winston-Salem headquarters.

The typical end user, Tylak said, is a mechanic who is not enthusiastic about using computers. "What they do like about the system is the quick delivery of spare parts," Tylak said.

To search for and order a part, mechanics simply log onto the system, pick an image and select the parts they need. The order is then transmitted to a stock room printer.

The printout shows who ordered the part, where it can be located and where it is to be delivered.

According to Tylak, RJR Tobacco will save by reducing spare parts inventory while increasing uptime and improving quality control numbers.

Staffs prepare for GTE/Contel merger

Merger teams looking for the best way to combine systems, 6,300 workers into one unit

BY ELLIS BOOKER
CW STAFF

STAMFORD, Conn. — Although GTE Corp.'s $6.6 billion acquisition of Contel Corp. was legally finalized last month, "merger teams" from the various business units of both companies have been meeting since last summer to figure out how to combine the two organizations.

One of the most complex of these combinations will be in the information systems departments supporting the telephone operations, which together have 6,300 employees.

Once merged, GTE and Atlanta-based Contel will become the largest carrier of local telephone traffic in the U.S. and the country's second largest cellular phone provider.

"The goal is to consolidate the two operations," said Martin C. Hoppe, vice president of corporate information management services at GTE.

Hoppe was adamant that following thorough evaluations of the computer platforms and software systems at each telephone group, there would be common customer information and customer billing systems. "We will not run duplicate functions," he said. "One (system) will go away."

"The telephone side is very systems-oriented," said Don Peeples, vice president of information technology at GTE telephone operations. He said the hoped-for operational synergies and cost savings of the merger depended on "getting the same platforms, processes and methods."

Peeples, in fact, was put in charge of the merger teams for the entire telephone operations group, including the IS departments.

An early and key decision for the IS team, Peeples said, was the choice not to "cherry pick the best of best" from each company's applications and computer hardware. Aside from the expense of creating interfaces between the dissimilar systems, such a process would have taken too long.

"Very quickly and early on, we decided to be fairly arbitrary and say the GTE systems would be the surviving systems," said Peeples, adding that some of the most promising Contel applications will be worked on as research and development projects.

In addition, Contel's Bull HN Information Systems, Inc.-based customer databases, which hold the records of 2.6 million subscribers in three data centers, will be converted to the primarily Cobol-based MVS format used on GTE's IBM and Amdahl Corp. mainframes.

The justification for this, according to Peeples, is that GTE's existing systems upgrade plans, such as relational and distributed databases, assume GTE systems.

GTE has four major data centers in Tampa, Fla.; Fort Wayne, Ind.; San Angelo, Texas; and Sacramento, Calif. Contel's five centers will be consolidated into the existing GTE facilities.

> "VERY QUICKLY AND early on, we decided to be fairly arbitrary and say the GTE systems would be the surviving systems."
>
> DON PEEPLES
> GTE

Charles Achuff, director of corporate information services at Contel for the past 2½ years, said the transition teams for the corporate IS departments — they began meeting about one month after GTE and Contel announced their definitive agreement to merge last August — have worked together smoothly.

GTE and Contel's IS organizations are similar: Both have relatively small groups serving the corporate headquarters and other IS groups for the various business units. Hoppe's corporate information management staff, for example, numbers about 160 people, while Contel has about 35 people in its group.

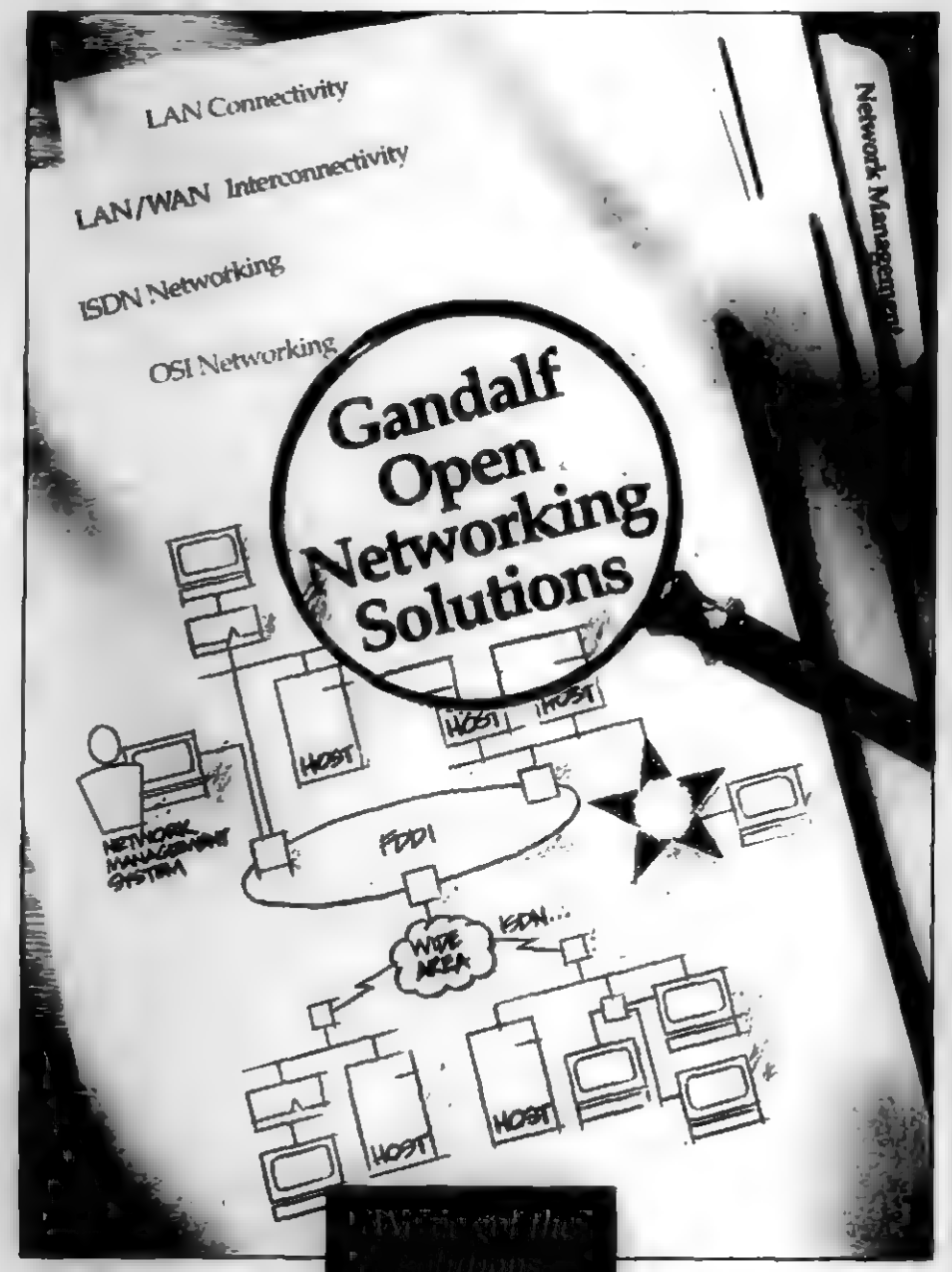
By contrast, the IS staffs at GTE and Contel's telephone operations number 5,200 and 1,100 people, respectively.

Peeples said GTE's goal was to make "one plus one equal one," and that staffing, including IS staffing, would not increase as a result of the merger.

This policy, plus ongoing early retirement and attrition at GTE, means "we'll end up with fewer data processing staff in 1995 than we had in 1990," he said.

GTE's $6.6 billion price for Contel represents GTE's plan to issue 1.27 GTE shares of common stock (valued at $32.50 each) for 160 million Contel shares. The combined company would have annual revenue of $2.4 billion.

A more detailed report on the IS consolidation challenge resulting from this merger will appear in next week's In Depth section.





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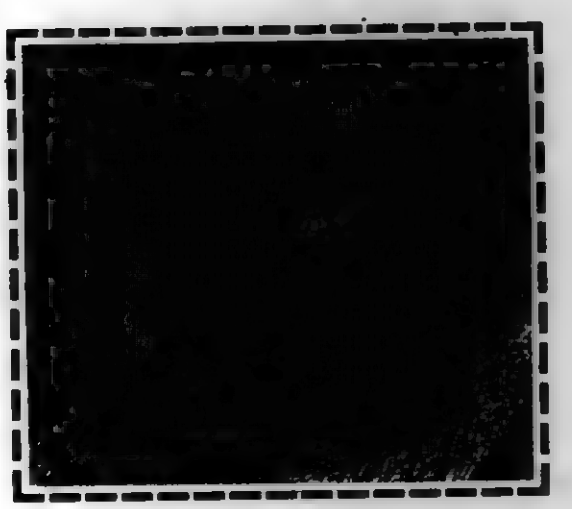
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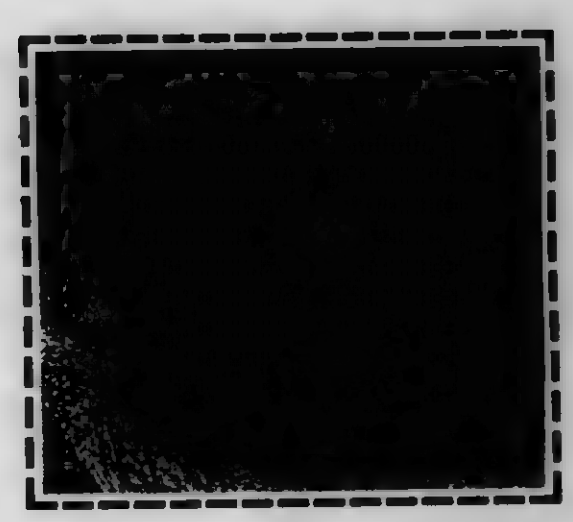
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Oracle addresses users' questions, complaints

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp. has long been known around Silicon Valley as the big "O," but now it seems the focus is on the big "Q" — quality — as well.

Stung by user criticism and the skepticism of industry analysts about the quality of Oracle software, the firm has put several programs in place to improve the quality of its software releases. Oracle Version 6.0, for example, underwent 27 maintenance changes before it was widely considered stable by users and analysts.

Recently, top Oracle executives have underlined Oracle's goal of designing software with few, if any, flaws. "We want to have zero-defect software," explained Michael Fields, president of the Oracle USA sales division. "When will we achieve zero-defect software? We're not sure. But we don't want to establish a goal that's easy to meet."

Oracle also named Ron Wohl, vice president of Oracle's Systems Product Division, as overseer of Oracle's quality assurance programs.

Last month, that quality program showed some early signs of success when Oracle received a Partnering for Total Quality Award from Sematech, the semiconductor manufacturing consortium based in Austin, Texas.

At least some industry observers said Oracle has a lot to prove, particularly to users of Digital Equipment Corp.'s Vaxclusters, who had to wait 18 months while Oracle software engineers repaired a flawed Vaxcluster version of Oracle 6.0 [CW, March 18].

Others said Oracle's statements about quality are beginning to change the organization. "There's more seriousness about putting out a quality product and about giving it adequate testing," said Tony Percy, a vice president of the Software Management Strategies program at the Gartner Group, Inc. in Stamford, Conn.

> "THEY UNDERSTOOD IT was better to get a piece of software that worked well than it was to get a defective piece of software out earlier."
>
> TONY PERCY
> GARTNER GROUP

"I think one of the reasons Oracle 6.2 was late was that they understood it was better to get a piece of software that worked well than it was to get a defective piece of software out earlier," Percy commented.

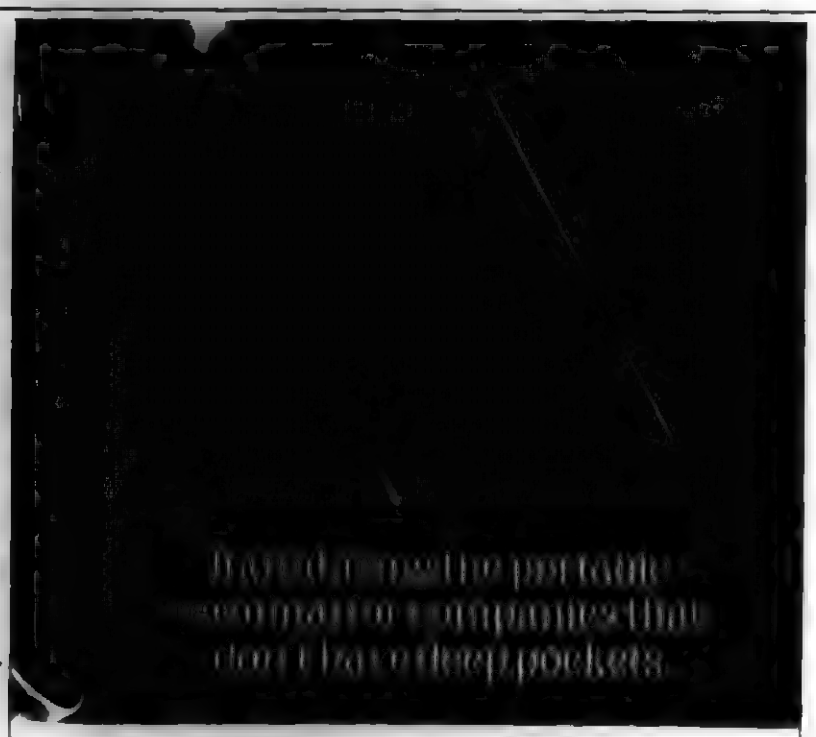
The Vaxcluster Oracle release, Oracle 6.2, was reviewed by customers while it was still in the development and testing stages, and the initial result appears to have been greater customer satisfaction.

"I was quite surprised at how clean the code was," said James (Skip) Rochfort, manager of operations at a TRW, Inc. unit that runs three production Vaxclusters at Hanscom Air Force Base in Bedford, Mass.

The Air Force site, which participated in the beta-test program, continued to use multiple copies of the Oracle 5.1 relational database management system while waiting for Oracle 6.2.

Percy said Oracle's quality program is the result of an understanding that future revenue growth is more likely to come from its installed base than from new accounts. He said Geoff Squire, president of Oracle's worldwide sales organization, had done much to convince customers that Oracle is responding to their complaints. "We think there has been a positive trend over the last six months," Percy said.

Last year, Oracle executives were made aware of user concerns about the quality of Oracle 6.0, which was often the subject of criticism at user meetings. Oracle started a new program for user feedback, the quarterly meeting for user group presidents, and changed the way beta-test software made its way into production tapes sent to user sites.



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Stratus

CONTINUED FROM PAGE 25

gradability into the next generation," Hammonds added. "That was a big stumbling block with Hewlett-Packard [Co.] and Apollo."

Most compilers take in source code and produce object code for a specific hardware. The Stratus compiler differs by separating the code generator and optimizer from the main compiler. Sharing a common code generator and optimizer are all six languages available on the Stratus platform: Basic, C, Cobol, Fortran, Pascal and PL/1.

"Instead of having to change every language compiler, we just needed to change the code generator," said Jim Holley, director of hardware product marketing at Stratus.

By following strict source code compatibility between its Motorola and Intel microprocessors and providing cross-compilers, Stratus also enables its users to generate object code for the next generation of machines on the present ones. "If you are waiting for an XA/R Model 20, you can start compiling your applications today on the XA2000 line, and when the Model 20 comes in, all you have to do is load the files," Holley said.

Users will also be able to connect the older XA2000 line with the XA/R platform under a single system view, running parts of applications on the speedier RISC processor if they wish, Holley added.

Shifting toward an entirely RISC-based line while keeping its proprietary customers happy gives Stratus "an incredibly flexible, robust offering with a lot of choices," said Sandra Gant, an analyst with Gartner Group/Infocorp in Cupertino, Calif.

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Utilities

Tallgrass Technologies, Inc. has announced Filesecure Version 1.44, a software package included with its Filesecure tape backup systems.

The software was designed to facilitate backups of Novell, Inc. Netware-based network attributes such as user access rights. It includes Netware's last accessed date field, which can be used to show the last time a file was active on a network. Network managers can use this data as a means to determine which files to archive in order to free up a file server's disk space, the vendor said.

The Filesecure storage management systems feature storage capacities ranging from 40M to 4G bytes and are priced from $495 to $4,595.

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Amalgamated Software of North America, Inc. has announced a C language-based job-monitoring software product designed for the IBM Application System/400.

Elimin8 allows jobs to be disconnected, held or canceled in any combination for unlimited selection criteria, according to the vendor. The product also allows jobs to be selected with generic names by user profile, group profile and job name. Lists of selection criteria can be maintained in separate source files.

Prices range from $1,000 to $2,500, depending on AS/400 model.

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Big Bear Lake, Calif. 92315
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Capacity Plus for VSAM, a data compression tool recently released by Softworks, Inc., features advanced compression methodologies and expert system capabilities that automatically determine the optimal compression method for data that is contained in various files.

The transparent software package features Continuguard, a system designed to continuously monitor compression procedures to prevent data corruption. The product is compatible with IBM's MVS/370, MVS/XA and MVS/ESA operating systems. License fees begin at $14,500.

Softworks
7700 Old Branch Ave.
Clinton, Md. 20735
(301) 856-1892

Development tools

Sinc, Inc. has announced that Flexgen Version 2.0, a Cobol applications generator for developers and end users, is available on Digital Equipment Corp. VAX/VMS and Ultrix-based systems.

The product was designed to facilitate the design of screen or form programs by providing options for color, field-entry characteristics, auto lookup windows and an autobrowse mode.

Pricing ranges from $7,000 on a Vaxstation 3100 to $67,000 for VAX 9000 versions. Pricing for Ultrix versions starts at $5,000.

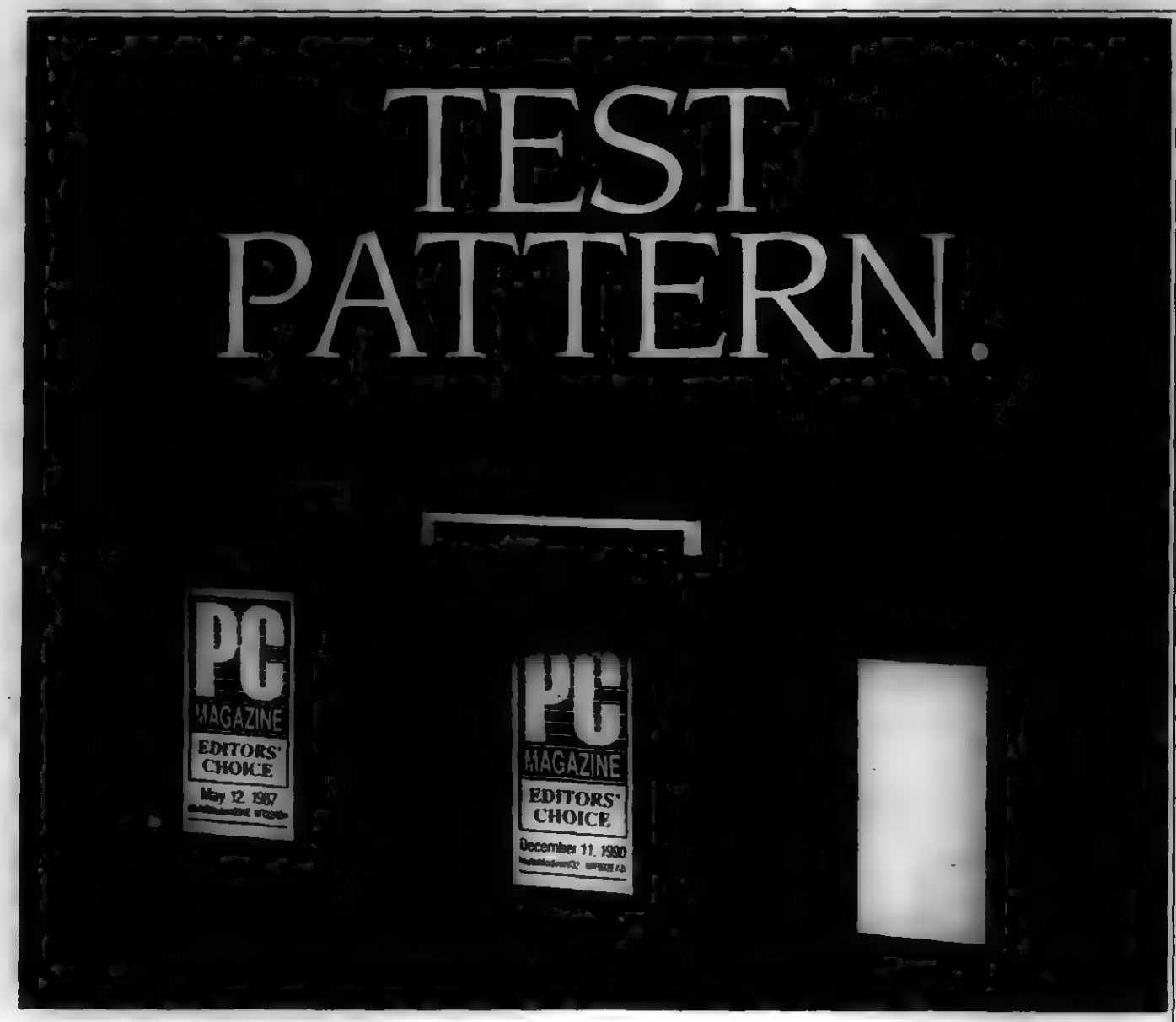
Sinc
1299 LaVelle Drive
Xenia, Ohio 45385
(513) 372-4334

Hewlett-Packard Co. and Tom Software, Inc. have announced a software application development tool for the Unix environment.

Application Xcellence was designed for HP 9000 Series 800 business servers and systems. It features a combination of business software and computer-aided software engineering tools as well as an application design facility that includes 13 core financial and 150 vertical application packages. A user interface that is controlled by the product's process compiler instead of by individual programs is also included.

Pricing ranges from $5,800 to $150,000, depending on type of platform and CPU size.

Tom Software
127 S.W. 156th St.
Seattle, Wash. 98166
(206) 245-7022



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PC Magazine 12.11.90 (Ziff Davis Publishing) 9600 BPS MODEMS: Breaking the Speed Barrier. PC LAN Labs tests seven rapid fire modems complying with the V.32, V.42 and V.42bis standards.

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NEW PRODUCTS — HARDWARE

I/O devices

Black Box Corp.'s PQ-Pro III Card, a recently announced printer emulation card, enables twinaxial-based computers to print on an IBM Proprinter and share the printer with a personal computer.

The card was designed to emulate an IBM 4214, 5224 or 5225 printer, regardless of the type of system to which it is connected.

The product fits into the Proprinter's optional serial port slot. It began shipping last month and is priced at $895.

Black Box
P.O. Box 12800
Pittsburgh, Pa. 15241
(412) 746-5500



Identification Business' *1600C*
laser printer was designed for various IBM systems

The Identification Business, a division of DH Technology, Inc., has announced a continuous-form laser printer designed for IBM 3270 mainframes, System/34s, 36s, 38s or Application System/400s.

Model 1600C features more than 30 typeset style fonts and a straight-through paper path design. Other features include more than 30 built-in bar codes, 300 by 300-dot/in. resolution and a printing rate of 16 page/min. The device is plug-compatible with twinaxial or coaxial interfaces.

A standard version is priced at $7,295. An optional twinaxial or coaxial interface can be purchased for an additional $1,595.

Identification Business
18079 Edison Ave.
Chesterfield, Mo. 63005
(314) 537-8400

Data storage

Storage Dimensions, a subsidiary of Maxtor Corp., has announced an erasable-optical storage subsystem designed for Silicon Graphics, Inc. Personal Iris workstations.

The X/Stor erasable optical subsystem ($7,390) features 1G- or 650M-byte removable cartridges and 35-msec average seek times.

Storage Dimensions
2145 Hamilton Ave.
San Jose, Calif. 95125
(408) 879-0300

Digital Equipment Corp. has announced the TF837, a streaming tape drive designed to perform unattended disk backups on VAX 6000 machines.

The product can reportedly back up as much as 2G bytes of data during a single shift. It can also be used for software distribution, data collection and data interchange.

The drive is based on DEC's digital storage systems interconnect technology and features a removable automatic cartridge loading magazine system.

The product lists at $18,000.

DEC
146 Main St.
Maynard, Mass. 01754
(508) 493-2143

Processors

Motorola, Inc.'s Computer Systems Division has announced reconfigured models of its Delta Series 8000 Unix-based, reduced instruction set computing (RISC)-based systems.

The systems incorporate Motorola's M88000 RISC chip set and feature a 1G-byte disk drive in addition to 300M- and 600M-byte drives. The series includes the deskside Model 8440, the office pedestal Model 8640 and data center-size Model 8840.

Pricing ranges from $19,995 to $41,415, depending on type of model and configuration.

Motorola
Computer Systems Division
10700 N. De Anza Blvd.
Cupertino, Calif. 95014
(408) 366-4480

Ariel Corp. has introduced a development system designed for Motorola, Inc.'s 24-bit DSP56001, a digital signal processing chip designed for Hewlett-Packard Co. 9000 Series 200/300 engineering workstations.

The DTK-300 ($4,995) fits into a single slot on a workstation and includes a digital I/O port that features a maximum synchronous data transfer rate of 6.75M bit/sec. and a digital signal processing software package.

The product also includes the DSP-300, a digital signal processing coprocessor board that yields a 3.39-msec processing speed for use in real-time signal processing applications.

Ariel
433 River Road
Highland Park, N.J. 08904
(908) 249-2900

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- 90 days of special "hot line" support.

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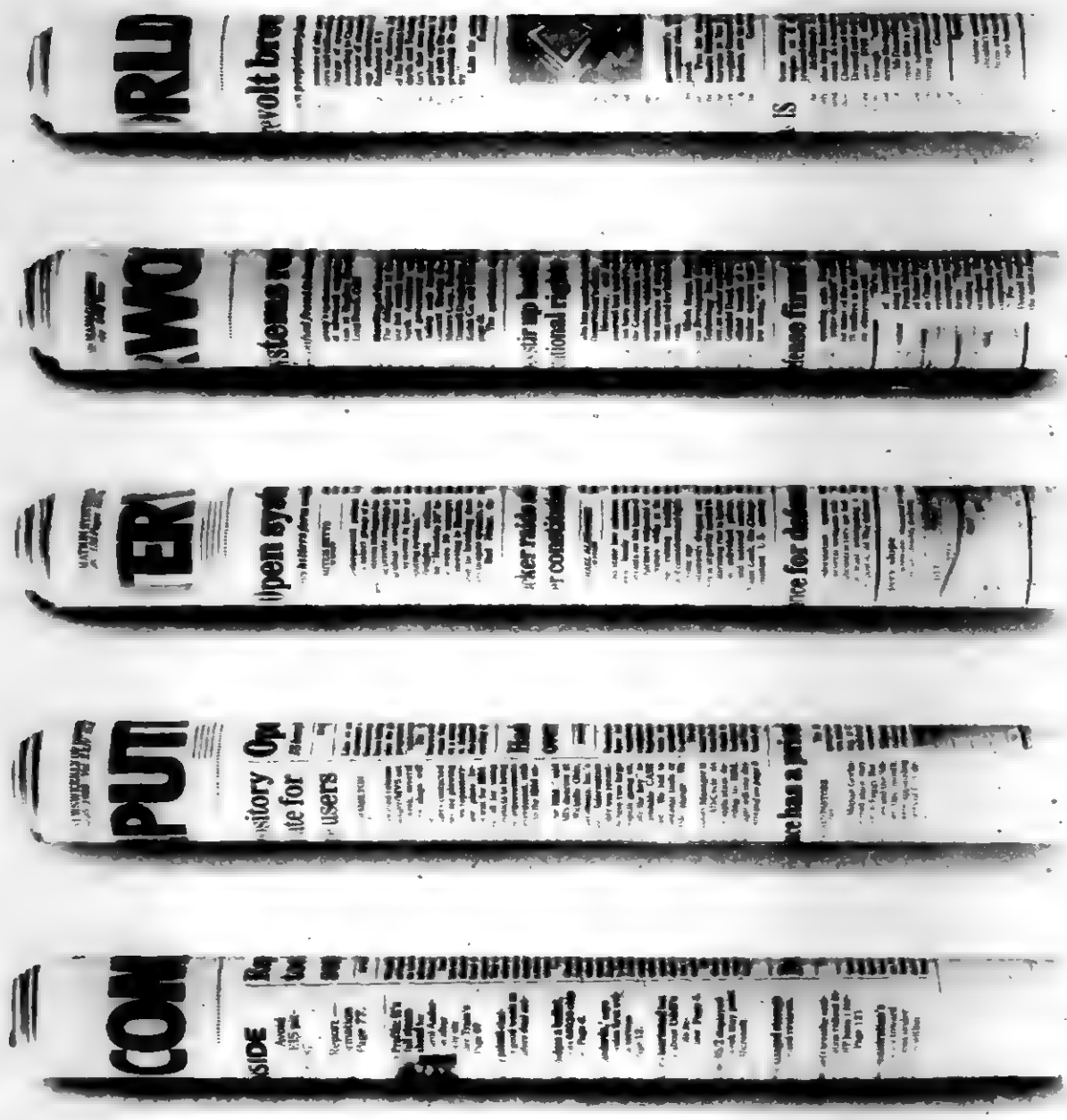
Systems generated with the RD/T module will run only in simulated IBM mainframe environments on independent OS/2 workstations. However, applications developed with the RD/T are compatible with the IEF and could be integrated into a fully configured IEF environment—including automatic regeneration for IBM mainframes. Soon, regeneration software will be available for Digital VMS and selected UNIX platforms, as well.

For more information, call 800-527-3500.

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COMMENTARY

James Daly

Not just a pretty face



There's nothing like the promise of money rolling in to get the creative juices flowing. That's been the lure drawing boatloads of programmers to the insanely popular Windows 3.0.

The trouble is, popularity often has no bearing on whether a product has accomplished great things. Look at the hula hoop. For the past year, Windows 3.0 has been in the same danger of being a pretty face but a cultural void — this year's model. The recent release of an admirable series of programming tools changed all that and now gives the celebrated graphical user interface an opportunity to become more than mag wheels on the personal computer industry.

This opening up of the development environment is essential to Windows' long-term success and ultimate value to the industry. Microsoft needed to get on with the business of encouraging a more open Windows market. If it were only Microsoft's applications that had benefited from Windows — they still often take up half of the Top 10 list of best-selling Windows applications — then Windows would have ultimately failed.

Continued on page 43

IBM sticks to its guns on OS/2

BY PATRICIA KEEFE
CW STAFF

Contrary to the advice of some of its large accounts, IBM is not about to hand over the desktop to Microsoft Corp.'s Windows 3.0 operating environment.

Nor will IBM sit back and allow Microsoft to "come up with a vision of New Technology [Portable] OS/2 that we do not share," said Joseph Guglielmi, general manager of marketing and development for IBM's Personal System/2 family of hardware and software, in a recent interview. Should Microsoft veer from the agreed on path for the Release 3.0 generation of OS/2, then IBM will "withdraw from that development effort" and go its way, he asserted.

Addressing the more immediate issue, Guglielmi said, "We will not relegate OS/2 to the server. I don't agree we have lost the desktop." In fact, the optimistic former president of IBM's Applications Software Division predicted that OS/2 will have the prevalent installed base over the next two to three years.

However, he acknowledged that IBM will need to overcome user "nervousness" at a perceived change in Microsoft's strategy or fidelity to OS/2. Moreover, "we need to ensure that the customer can see the value [of going to OS/2]."

That value is not just a matter of having a graphical user interface on the desktop, according to IBM. The as yet unreleased OS/2 Release 2.0 will enable users to bring together OS/2, DOS and Windows on the desktop, Guglielmi said. It will also provide users with 32-bit capabilities to which they can write application programming interfaces.



IBM's Guglielmi: *'I don't agree we have lost the desktop'*

OS/2, he added, was designed for customers who need reliability, multitasking and security — all key elements for those building a set of applications on which to run their businesses. Even so, Guglielmi sees no reason to limit OS/2 to advanced workstations. As the cost of OS/2 technology drops, so will its use move closer to the entry-level desktop, he predicted. "Our intention is to take OS/2 from where it is now and to drive it down as low as it can go," he said.

"We have taken OS/2 from the 'terrible twos' [Release 1.2] to 1.3, which is the first release that IBM delivered by itself," he said, adding that his goal this year is to make sure that the "value story of OS/2" is made known to customers.

"We have clearly recognized that Microsoft has chosen to focus its resources on Windows, and they have every

Continued on page 42

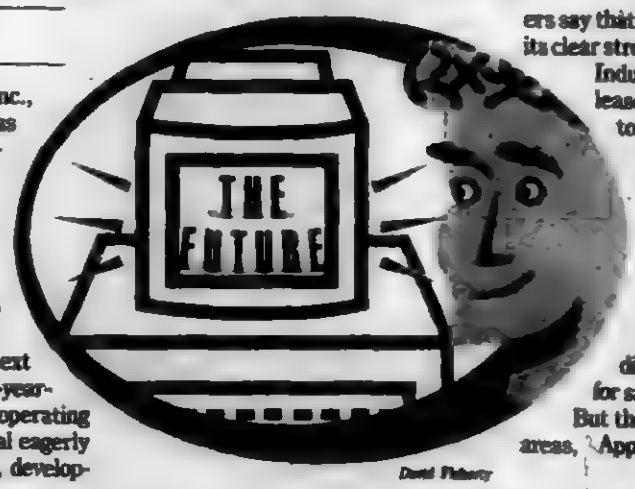
FEATURE: THE UPDATED MACINTOSH

Apple's future may rest in relying on its strengths

BY JOHN WEBSTER
SPECIAL TO CW

For Apple Computer, Inc., sharing the mountaintop has not been easy. Since Microsoft Corp.'s Windows 3.0 emerged last year as the industry's first serious challenge to the graphical capabilities of the Macintosh, there has been much focus on what Apple would do to counter the Windows onslaught.

While the anticipated release next month of System 7.0 — the one-year-overdue update of the Macintosh's operating system — promises to bring several eagerly awaited features to the Macintosh, developers say that Apple still needs to focus more on its clear strengths.



David Flaherty

Industry observers say Apple's release last year of cheaper Macintoshes and the soon-to-come advent of System 7.0, together with the Macintosh's tight integration with its own graphical user interface and operating system, still give it a leg up on Windows-based personal computers when it comes to such areas as graphics and multimedia, where there is still a lot of room for sales growth.

But they also say that to thrive in such areas, Apple needs to stream its core

Continued on page 44

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Pay-up time for shareware

Guilt over unregistered shareware use was the impetus behind SPUD

BY PATRICIA KEEFE
CW STAFF

March 17 was SPUD day, in case you didn't know, and we're not talking about the butter-laced carbs St. Patrick's Day partiers wash down with green beer.

Early reports indicated that SPUD, or Shareware Pay-Up Day, was probably not as popular as was the wearing of the green. But it may pack some punch in the long run if the Association of Shareware Professionals (ASP) decides to put some effort into publicizing it as an annual event.

SPUD is the fruit of the fertile mind of shareware user Paul Pease, a high-technology writer and planner based in Palo Alto, Calif. The idea, he said, was to spur guilt-ridden, unregistered shareware users into writing some long overdue checks.

Pease is not talking big bucks per individual user. Shareware ranges from $10 to $200 for a full-fledged package. Some purveyors don't even charge. "There's one guy who has 'smileware.' Payment consists of smiling at someone. Another guy has 'beerware.' He only asks that you have a beer and send him a postcard saying so," Pease chuckled.

Money adds up

If enough satisfied users register after trying out their software for 30 days, it can add up to significant income for individual shareware authors.

ASP President Paul Mayer, who also heads up Zpay Payroll Systems, Inc. in St. Petersburg, Fla., said he has made enough money from shareware to quit his onetime "day job," buy a spacious house in Florida and, on some days, sit poolside answering support questions.

Data Storm Technologies, Inc., with its Procom product, and Buttonware, Inc. each had more than $3.5 million in revenue last year, Mayer added.

Successes like these come despite the fact that ASP members estimated that a paltry 1% to 10% of users of their packages ever bother to register. Users of business programs are the most likely to pay.

Until now, the ASP never thought to designate a SPUD of its own. In fact, the group has specific rules against what Mayer calls "nagware." One such example of nagware is having a screen pop up every five minutes demanding payment.

Payday

User registration for programs offered by Zpay Payroll Systems in St. Petersburg, Fla., may be typical for shareware authors

$ The $60.95 Zpay III payroll package: 2,000 registered users out of an estimated 10,000

$ The $49.95 Grab Plus word processing utility: 8,000 registered users out of an installed base of 20,000 users

CW Chart: Doreen St. John

"Mostly what we worry about are those who do register. We want to give them the best service possible," he said. Because most shareware providers do not advertise, except through bulletin boards and the occasional shareware catalog, Mayer figures that a better product means more registrations. He will even service nonregistered users who call in with questions, reasoning that they will either register on the spot or tell their friends, some of whom might ante up.

"There's no pressure. We just hope people will respect our quality and effort and provide some reimbursement," Mayer explained.

However, SPUD has Mayer thinking.

"It was a great idea; it just needs more publicity," he said, adding that the ASP is thinking about making it an annual event.

Clone makers search for racer's edge in hardware

BY RICHARD PASTORE
CW STAFF

In these days of commodity desktop personal computers and keen competition, vendors are stretching to find creative ways to differentiate their new systems. In three recent announcements, the vendors sought to add new twists with modular drive bays, user-definable BIOS and graphics enhancements.

Albert Wong, who co-founded AST Research, Inc., a pioneer of upgradable CPU architecture, is now head of start-up Amkly Systems, Inc. Because upgradable CPUs are now common, Wong is trying for differentiation with a user-removable Peripheral Platform.

The Peripheral Platform is a metal frame containing the PC's power supply and all four drive bays. If a drive fails, users can swap in a spare, preconfigured platform and eliminate downtime to a few minutes. "Remove a few screws, and you can change the platform and motherboard in under 10 minutes," Wong said.

A less mechanical, more aesthetic distinction is the beveled back panel on the boxes. Rather than having the typical unfinished-looking steel back panel, Amkly designed a nice-looking back panel in case the rear of the PC is visible to workers sitting on the opposite side of the desk.

The three Amkly PCs are based on Intel Corp.'s 25-MHz I486, 33-MHz 80386 and 25-MHz 80386 microprocessors. Each incorporates the Extended Industry Standard Architecture bus, 2M to 4M bytes of memory and Super VGA graphics. Prices, depending on hard disk, range from $5,995 to $10,595 for the 486/25E, $4,995 to $9,595 for the 386/33E and $3,995 to $8,595 for the 386/25E.



Amkly Systems' *Peripheral Platform is said to allow users to replace faulty drives easily*

Irvine, Calif.-based Amkly will sell the systems through the dealer and systems integrator channel.

The differentiation in Wyse Technology's new Decision PC line comes mainly in the BIOS. It offers users the ability to define system drive types (3½ in. or 5¼ in.) and set up read-only memory via the systems' BIOS. Other than that, the products differ from previous Wyse PCs in their smaller chassis.

The Wyse PCs are based on the 25-MHz 486 and 20-MHz 80386SX chips. With a 110M-byte hard disk, the 386SX model costs $2,799. With a 300M-byte disk, the 486 model costs $7,199.

Epson America, Inc.'s latest PC, the Equity 386SX/20 Plus, distinguishes itself by being one of the first boxes to ship with Edsun Laboratories, Inc.'s Continuous Edge Graphics (CEG) support. CEG converts digital signals to analog in order to blend color between abutting graphics pixels and eliminate the jagged edges normally found on monitor displays, according to the vendor.

The color blending results in a palette of more than 700,000 shades and an apparent resolution of 1,563 by 1,280 pixels on a standard IBM Video Graphics Array monitor.

In addition, the PC comes with the more commonplace 2M bytes of memory, 32K bytes of cache and an optional 100M-byte hard disk for $3,449.

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SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE / ENTER. SPF/2 even displays the same status indicators.

You will also enjoy features not available on the mainframe. For example, SPF/2 supports 48 PF keys, automatically adapts to the number of lines in the various OS/2 video modes (full-screen or windowed), and scrolls the file as you move the cursor. And, you will appreciate OS/2's virtually instantaneous response time.

Try SPF/2 for yourself with a free real-working-code demo disk—just like the production version, except it doesn't save your editing changes to disk. Call the toll-free, Demo Request Hot Line at (800) 648-6700 and ask for SPF/2 Demo Disk #151.

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Multimedia in vendor sights

Enabling products on display at Microsoft-sponsored show

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Several vendors sought to fill needs in the area of multimedia with product introductions at last month's Sixth International Conference and Exposition on Multimedia and CD-ROM sponsored by Microsoft Corp.

• JVC Ltd. in Japan and C-Cube Microsystems, Inc. in San Jose, Calif., announced they have defined a high-resolution extension to the Moving Pictures Experts Group (MPEG) video compression algorithm. The algorithm is included in C-Cube's MPEG video decoder/processor, which debuted at the show. The MPEG processor is a single-chip product that can decompress digital video in real time, according to the company. The processor operates in two modes: the proposed standard MPEG mode and the JVC Extended Mode.

• Philips Consumer Electronics Co. in Knoxville, Tenn., demonstrated its Compact Disc-Interactive (CD-I) product. The hardware and software product, aimed at the consumer and educational markets, was designed to be easier to use than a videocassette recorder. The hardware can be hooked up to a television and includes a 3½-in. floppy drive. It only reads CD-I or compatible discs but is already supported by Eastman Kodak Co., Online Computer Systems, Inc., Capitol Disc Interactive, GTE Imagitrek and Interlight Productions, Inc., according to Philips. The product is expected to be priced at less than $1,000. No availability has been announced, but analysts speculated it could be formally introduced at the spring Comdex show in May.

• Intel Corp. released Version 2.13 of its Digital Video Interactive (DVI) system software. The release was designed to double the performance of DVI applications, running from a compact disc/read-only memory (CD-ROM) in a 16-MHz Intel 80386SX-based computer. The upgrade is free to registered DVI developers. New users can purchase Release 2.13 for $4,500, the company said.

• Trevose, Pa.-based Protocomm Corp., an Intel DVI system software developer, introduced Videocomm/NV, a software product for networking DVI applications. The product allows Intel's DVI-based motion video, audio and still-image files to reside on a Novell, Inc. Netware-based file server, according to the company. The first version, due to ship June 15, will support up to five workstations and retail for $3,800.

• Panasonic Communications & Systems Co. in Secaucus, N.J., introduced a 540M-byte CD-ROM drive with an access time of between 500 and 800 msec and a maximum data transfer rate of 1.3M byte/sec.

• Chinon America, Inc.'s Information Equipment Division in Torrance, Calif., introduced a CD-ROM drive with a remote CD audio control unit and digital display built into the chassis. The drive features an average access time of 350 msec.

• Hitachi Home Electronics Corp. of America in Compton, Calif., introduced what it claims to be the fastest CD-ROM drive on the market, with an average access time of less than 340 msec. The 680M-byte drive also features an airtight chassis, audio output, a life-extending sleep mode and a three-way caddy ejection, the company said. It is available immediately.

• Eastman Kodak Co., introduced two software developer's kits that enable developers to design applications with consistent photo-quality images on a personal computer. Full kits include the Photo CD development tool kit, Photo CD accessory, the Kodak Color Management System and color data encoding metric software, called Photoycc. Photoycc helps to efficiently represent color in digital form, the company said.

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IBM

CONTINUED FROM PAGE 37

right to do that," Guglielmi said. In response, IBM plans to execute a "well-defined" market strategy that will include "aggressive enhancements" to OS/2 Release 2.0 and the release of a "variety of products with client/server functionality."

He downplayed reports that IBM would spend $40 million to bolster OS/2 market share. While users will not see one big event, similar to the glitzy rollout of Windows 3.0, Guglielmi said IBM "has lots of ways to leverage what we do."

In addition to meeting with users and working with its substantial channel alternatives, one of those ways will include beefing up what Guglielmi conceded has not been a strong independent software vendor (ISV) program. Today, many developers said they have either shelved or outright abandoned OS/2 projects to work on Windows at the behest of both Microsoft and their customer base.

"We are adding resources to our ISV program now and will take a much more proactive support role with ISVs," Guglielmi said. This will include making sure developers are "educated correctly" and that they have access to IBM's OS/2 development team, as well as to the tools and developers kits that they need. "We will make sure we accommodate them."

Daly

CONTINUED FROM PAGE 37

Application builders such as Borland International's C++ Version 2.0, Parcplace Systems' Objectworks/Smalltalk, Jensen & Partners' Topspeed Development Environment, Tigre Object Systems' *Tigre Development Environment* for Windows and Gensoft's Dbfast are a quantum step forward for programmers. The traditional way of putting together a Windows application was to build it piece by piece with a programming language. Until recently this language had to be C, which was the only one that worked with Microsoft's Software Development Kit (SDK), an essential foundation for building Windows applications. This is no longer the case.

The new tools allow programmers to bypass the SDK option. And that's good news not only for independent software vendors and the end users they will supply, but it gives in-house developers a lot to talk about when they gather in a few weeks at Microsoft's Corporate Developer's Tools Conferences in New York and San Jose, Calif. It is now easier than ever for internal IS units to roll their own.

CLEARLY A GREATER breadth of programs would help Windows become the widespread standard Microsoft is hoping for.

Credit for this bountiful development palette should be given to Microsoft, which could have held developers hostage to the SDK but instead shared technical details with companies creating software tools under a program called the Open Tools Strategy. For instance, Borland licensed the resource compiler and Windows header file from Microsoft and bundled them with C++ Version 2.0.

Clearly a greater breadth of programs would help Windows become the widespread standard Microsoft is hoping for. At one panel at the recent Windows & OS/2 Conference, about half the people in the audience said they were waiting for Lotus' Windows version of 1-2-3 or Wordperfect versions for Windows before adopting a Windows spreadsheet or word processor.

With the release of the new development environments, most analysts expect the number of Windows applications to at least double in the next year. For the independent vendors the good news is they have more development tools now; the bad news is the cost of entry is lower so the competition will increase.

The squeamish, however, may want to keep one eye closed until then. For the next six to eight months, expect a frenzied development environment as new tools appear and old tools become overshadowed while developers choose their favorites and de facto standards emerge.

It will be a sloppy, no-holds-barred slugfest — free market economics in all its glory. But that is all in the future. Right now, developers have a lot to talk about.

Daly is a *Computerworld* West Coast senior correspondent.

Despite rise of RISC, PCs remain computing keystone for engineering

BY J. A. SAVAGE

SAN FRANCISCO — Reduced instruction set computing workstations may have drawn the biggest crowds of curious engineers at the recent 1991 Architectural Engineering Conference, but personal computers will retain the lion's share of the market, participants said.

"They're looking at workstations, but the PC platform is still the most popular," according to Terry Wohlers, president of Wohlers Associates, an engineering consulting firm in Fort Collins, Colo. "The PC installed base is so big, and it's easy to add more stations."

Apple Computer, Inc.'s Macintosh was also seen as an option in offices already "infiltrated" with Macintoshes, said Michael Dobbins, an engineer at Lockheed Missiles & Space Co. in Sunnyvale, Calif. "It's cheaper to go to a Mac than Sun," added Saji Haratani, also a Lockheed engineer. The Lockheed office is adding software to give Macintoshes dual use — adding computer-aided design (CAD) to its standard word processing functions.

Despite the PC's reputation for providing inexpensive seats, some engineers' clients are forcing them to go to Unix workstations as large engineering clients want data in a form they can use on their own workstations, according to Stephen Blodgett, an engineer at CAD/CAM & Technical Temps, a contract technical service in Oakland, Calif. However, Blodgett said, PCs are plenty powerful, and PC power is getting cheaper.

Jeff Jones, CAD specialist at Medical Planning Associates in Malibu, Calif., dissented. While the firm designs hospital floor space on PCs, Jones said he was looking into Sun Microsystems, Inc.'s workstations for higher quality graphics.

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Apple

FROM PAGE 37

strengths — the graphical user interface and operating system — and shift hardware and peripheral development to third parties. "There's no advantage to being one against the world," says Heidi Roizen, president of T/Maker Co., a software developer in Mountain View, Calif. "There are third-party solutions that can be supplied by thousands of companies whose strengths are peripherals."

Roizen also claims that putting research and development into peripherals has delayed such crucial portions of Apple's CPU lineup as dedicated servers and notebook computers.

Analysts agree that there is room for improvement in the company's overall product strategy. "I believe that from a hardware point of view, Apple certainly is behind the curve compared to other platforms," says Ashok Jain, editor and publisher of the "Macintosh Market Report."

To really pick up steam in the future, Jain says, Apple should license its operating system to hardware vendors and capitalize on the company's strengths.

On easy street

If Apple can cite its operating system as one of its chief strengths, then System 7.0 should add even more reinforcement, developers say. Several new features should make software developers' lives easier, particularly the operating system's Data Access Manager and enhanced file sharing, according to Tony Meadow, president of Everett, Wash.-based Macapp Developers Association, a nonprofit group of programmers using Apple's object-oriented interface development tool kit.

"What Apple is doing with the Data Access Manager is providing a standard way of accessing a relational database on a mainframe or minicomputer, and no one else is doing that. Anywhere it makes sense to access data, it will be handy. Since [database access] is so much easier now, developers will find it easier to support," Meadow says.

He says the file sharing capabilities in System 7.0 provide Appleshare file server technology in the operating system. As a result, "a file server is available on any machine, so you can develop more multiuser software."

While quick to praise the forthcoming operating system, developers still see shortcomings Apple should address in future versions. In particular, Apple needs to work on communication between Macintoshes on Appletalk local-area networks as well as mainframe access.

Built-in messaging, with directory services on every networked Macintosh, would pave the way for developers to create "massive group applications," says Shep Tamler, marketing manager for networked applications at CE Software, Inc. in Des Moines, Iowa. The firm's Quickmail electronic mail software is a big seller on the Macintosh.

"While messaging isn't a glaring omission in System 7.0, it would be a great leap forward and help the Mac stand out again," Tamler says.

From an end-user perspective, the Macintosh still falls short in mainframe access. "Apple needs to continue to build on its communications applications as far as accessing LAN protocols such as IBM's SNA," says John Maas, a consultant and technical specialist at Rochester, N.Y.-based Eastman Kodak Co.'s corporate IS department.

In addition, basic print functions could use an overhaul, Meadow says. "What System 7.0 doesn't have, but Apple is working on, is a new print architecture. [Currently] it's an artifact of early Macs. The printer manufacturer has to go through the hell of writing the driver. Also [needed is] memory protection, wherein each application has its own address space."

While the development community may praise the Macintosh's operating environment and System 7.0's advances, the real test comes from end users. While the Macintosh is already popular in the publishing industry, it is also garnering praise for its strides in multimedia.

Both Microsoft and Apple have begun to define their own multimedia standards. At its Multimedia Development Conference last December, Microsoft began distributing its Windows Multimedia Development Kit and draft specifications of multimedia system software extensions for the Windows and OS/2 operating environments.

For Apple's part, the Quicktime media manager is an operating system extension expected to be released along with System 7.0 at the Worldwide Developers Conference next month.

Although both firms are pushing multimedia with fervor, some users give the nod to the Macintosh over Windows as the multimedia platform of choice. "When I look at the state of development, Apple is the leader of the pack. They've taken integration of a number of [components] more seriously than anyone else," says Bill Sterner, manager of instructional research and user support within academic and public computing at the University of Chicago.

Sterner wants to develop multimedia applications for use as teaching tools. With Quicktime, he says, Apple has provided the system-level integration he needs to achieve his goals. "Apple is the most advanced in understanding that technology. Quicktime combined with System 7.0, Inter-Application Communications and Apple's networking approach are all pulled together without a lot of glue, as opposed to DOS."

Sterner says that multimedia users need either an Intel Corp. 80386-based PC or a Motorola, Inc. 68030-based Macintosh, which gives the Macintosh a better shot at making the final cut at many companies by eliminating the huge base of Intel 80286-based machines.

Meadows adds most developers would agree that the Macintosh is still ahead of Windows in multimedia development. "Quicktime is a complete architecture for handling media, and since the Mac was designed and conceived as a whole, and Windows sits over clunky DOS, Apple has the advantage," he says.

Home sweet PC

On the computer industry horizon, the most tantalizing dream remains the personal computer that truly functions as an easy-to-use home appliance. Microsoft Chairman Bill Gates, for one, is publicly promoting development of such a machine, and most industry observers agree that the home area is a logical place for a growth explosion in computing.

For the Macintosh, the concept of using computers as a home appliance is still far off, says Tony Meadow of the Macapp Developers Association: "There's still not any compelling reason why the average housewife would want to buy a computer. Maybe when ISDN and fiber optics are installed in a majority of houses, all this might make more sense."

Tim Bajarin, executive vice president of market research firm Creative Strategies Research International, Inc. in Santa Clara, Calif., says that Apple eventually plans to make more of a move into the home-appliance arena, but probably not with a Macintosh. "[Apple Chairman John] Sculley talks about doing things in consumer market, but it won't be a low-cost Mac. He's moving in that direction, but it will be a new box that might look like Nintendo or might look like a television."

JOHN WEBSTER

Webster is a free-lance writer based in San Francisco.

Macintosh power takes off with Rocket

Radius' accelerator card uses multitasking to boost processing speed

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — Radius, Inc. has unveiled a series of hardware and software offerings that will be welcome news to Apple Computer, Inc. Macintosh owners looking to squeeze more performance out of their machines.

Last week, the company announced the Rocket, a CPU accelerator card that adds computational muscle to the Macintosh II family. The Motorola, Inc. 25-MHz 68040-based Rocket speeds application processing with a design that creates a multitasking environment where the Rocket and Macintosh CPU share tasks.

The multitasking design splits up the work to maximize system resources, allowing the Macintosh CPU to handle certain low-level tasks while the Rocket processes the higher level tasks. For instance, if a video application can add stereo sound to accompanying animation, the package could use Rocket to display the video and the Macintosh processor to play the sound.

Rocket comes with an assortment of Radius software packages and is available now for $3,395. A logic board upgrade for the Apple IIFX sells for $3,999.

Radius also recently announced the 15-in. Color Pivot display monitor, which rotates to display documents either horizontally or vertically. The monitor features 1,152 by 882 lines of resolution and costs $1,995.

The Color Pivot may be configured with either the Macintosh SI and IICI built-in video or a Color Pivot interface. Color Pivot interfaces are available for the Macintosh SE/30, the Macintosh IISI, the Macintosh IILC and all Nubus Macintoshes for $795.

Another recent by-product of the firm's technological fervor is Impressit, software for the compression, storage and decompression of still images. This compression allows still images to be reduced for easier storage, manipulation and transmission while maintaining image quality, and it is often used in color publishing systems. Impressit is available now for $179.

Radius is also likely to benefit from a new wave of beneficence coming from Apple. Sources within Apple say that Chief Executive Officer John Sculley has moved to improve his rocky relations with third-party developers. Although Apple was planning to introduce a 21-in. color monitor this summer for about $4,000, the company realigned plans when Apple monitor makers such as Radius and Supermac Technology began to complain. Sources within Apple say the monitor will still ship on schedule but only outside the U.S.

Computervision clasps CAD

BY SALLY CUSACK
CW STAFF

BEDFORD, Mass. — Computervision, a Prime Computer, Inc. company, announced a three-axis surface machining package that can accept computer-aided design (CAD) geometry from virtually any CAD package on the market today.

Called Personal Machinist Universal, the software is available in versions for Intel Corp. 80386 and 1486 DOS-based machines and the Sun Microsystems, Inc. Sparcstation platform under Unix.

Targeted at automotive, mold-making and aerospace applications, the package accepts geometry from any CAD program that can generate an Initial Graphics Exchange Specification or Data Exchange Format.

Ed Sieroslawski, engineering supervisor at American Tool and Mold, Inc. in St. Joseph, Mich., said the company has been using the Computervision Personal Design and Personal Machinist products for more than one year.

"The staff is especially happy with the speed offered in the latest version of PM-3D," he said. American Tool is running the software on a mix of Intel 80386- and 1486-based machines over a Network File System networking environment. The company provides die cast mold designs primarily for the automotive industry.

The software's CAD capabilities reportedly include three-dimensional wire-frame modeling, Bezier surfaces, surface intersections and shaded pictures.

Volume shipments are scheduled to begin this month, with prices starting at $9,900.

In related news, Computervision also announced a 37% price reduction and the addition of solid modeling capabilities to its core Cadds 4X CAD software program. The core Cadds 4X product, called Solid Designer, has been reduced from $24,500 to $15,500.

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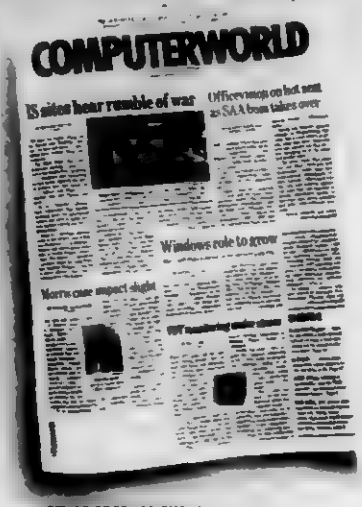
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Dbase IV: Feature-rich, slower than others

Ashton-Tate's Dbase IV Version 1.1

Reviews	Ease of use	Data integrity	Multiuser support	Performance	Application development	Documentation	Service & support	Value	Score
Infoworld 11/12/90	Very good	Very good	Good	Poor	Good	Very good	Satisfactory	Good	8.5*
PC Week 12/10/90	Satisfactory	Needs improvement	Good	Needs improvement	Good	NC	NC	NC	Good DBMS, but slow
PC Magazine 10/16/90	Bugs are fixed	NC	NC	Better, still slow	Balanced	NC	NC	Good	Faster, more stable
Users									
Peter Blanshan, Garber Travel	■	▙	NC	▙	▌	▙	▙	▙	
Tony Lima, Pacific System Design Workshop	■	▙	■	▙	■	▙	■	▙	
Michael Irwin, Washington, D.C. Metro Police Department	▙	■	▙	■	■	▙	NC	■	
Analysts									
Adam Green, Adam Green Seminars, Inc.	▙	▙	▌	▌	▌	▙	▌	▌	
Dean Hiller, D. L. Hiller & Associates	■	▌	▙	▙	■	▙	▙	▙	
Jerry Cashin, Faulkner Microcomputer Reports	■	▙	■	▌	■	▌	▙	▙	

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey.
*Infoworld score based on 1 to 10 ratings where 10 is excellent NC: No comment

Key: ■ Very good ▙ Good ▌ Fair ▪ Poor

Vendor financial ratings

Analysts	Long-term stability	Short-term performance	Average
Peter Rogers Robertson, Stephens & Co.	▌	▪	▌
W. Christopher Mortenson Alex. Brown & Sons	▌	▌	▌

Ashton-Tate reported a net loss of $18.1 million for 1990. For 1989, the company reported a net loss of $28.6 million

***Technology Analysis** — A roundup of expert opinions on new products. Summary written by free-lance writer Suzanne Weixel.*

Ashton-Tate Corp.'s Dbase IV Version 1.1 goes a long way toward re-establishing Dbase as a flexible, bug-free and feature-rich program. However, given the advancements the competition has made in the meantime, reviewers wonder if it is too little, too late.

Ease of use: Features such as the Control Center menu system and the QBE module make the program easier to use than earlier versions. Still, there is no support for a mouse in either operation or in target applications and, as *Infoworld* points out, integration among features such as SQL and Dbase modes is rough.

Data integrity: Dbase IV Version 1.1 includes many features to ensure data integrity, such as automatic file and record locking, multiuser password security, data encryption and transaction logging. However, reviewers say these features are sometimes awkward to use. For instance, *Infoworld* notes that the undo feature is only available before you move off the current record and that the programmer is responsible for maintaining data integrity for editing or deleting linked files. *PC Week* says the lack of restrictions on what can be entered into a database jeopardizes data integrity in interactive use.

Multiuser support: Reviewers praise Version 1.1 for features that simplify its use on a local-area network, particularly its file and record locking capabilities. But *PC Week*, says data sharing is inconvenient because many functions, such as packing, must be accomplished manually.

Performance: At best, reviewers say Dbase IV Version 1.1 performs moderately well; at worst, *Infoworld* says it is intolerably slow in a multiuser environment. However, Version 1.1 is faster than 1.0, thanks to a dynamic memory management system that lowers memory requirements to 450K bytes. The package also includes an integrated disk cache that can store files in random-access memory as well as access extended or expanded memory.

There are also some built-in tools for tweaking performance. For instance, users can specify the percentage of available memory used for application space vs. the amount used for overlay swapping. Developers can fine-tune the automatically generated Dbase language code. The new query-by-example module makes it easier to access data, although it does nothing to speed up querying.

Applications development: The development environment is one of Dbase's strongest areas. The programming language supports Microsoft Corp.'s Windows, pop-up and pull-down menuing and pick lists. There is also support for SQL, although two separate modes of operation are required. Programming is enhanced by new features such as the ability to update a record from an array and save a screen to memory, perform another task and then restore the screen. There are also fewer restrictions in this version on what can be done with user-defined functions.

Documentation: The many manuals that come with Dbase IV are thorough, but they lack a comprehensive index. Also, instead of updating them for Version 1.1, Ashton-Tate opted to include a Change Booklet, which only adds to the confusion.

Service and support: Although Ashton-Tate's free technical support is considered knowledgeable and helpful, it is not toll-free, and the lines are often busy.

Value: The reviewers' consensus is that Dbase IV Version 1.1 is the product that should have been released two years ago. The standard edition costs the standard database price of $795. The Developer's Edition, which includes utilities for debugging, customizing the application generator and distributing a run-time system, costs $1,295.



"DBASE IS NEVER going to be the fastest product on the market. But if you want to work with it, you can get almost any level of performance."

Tony Lima
President
Pacific System Design Workshop, Inc.

Ashton-Tate responds

Comments from Julie Cox, product manager for Dbase IV for DOS:

Data integrity: It is possible to impose restrictions on what can be entered into a form by storing rules for data entry within the form itself.

Multiuser support: Certain functions, such as packing, are deliberately made a bit more difficult to perform. Packing involves destroying data.

Performance: Dbase IV was not designed to be a speed demon; it was designed to be productive. Sometimes, features that make it more productive increase the overhead.

Applications development: SQL and Dbase modes are separate so that each language can be used for the applications it suits best.

Documentation: In the future, the documentation will be updated with the program.

Service and support: To improve the response time, a dial-in computerized system for the most frequently asked questions has been implemented.

Value: Now that the Dbase engine is squared away, we are in a position to deliver products that meet the users' needs in a timely way.

NEXT WEEK

▶ Borland International, Inc.'s Paradox 3.5 is a pricey upgrade with few new features. But new memory management makes it go VROOMM.

NEW PRODUCTS

Systems

Bristol Research Corp. has introduced a 20-in.-deep NEMA 12/4 rack-mountable computer.

The BRC-9400 was designed to withstand shock, vibration and wide temperature fluctuations that occur in industrial environments. The system can be configured with IBM Personal Computer AT-compatible Intel Corp. 80286- or 80386-based CPU cards.

A version that includes a 25-MHz CPU, a 1.44M-byte floppy disk drive, a 40M-byte hard drive, an IBM Video Graphics Array driver and 1M byte of random-access memory is priced at $5,500.

Bristol Research
1000 Brioso Drive
Costa Mesa, Calif. 92627
(714) 642-3373

Leading Technology, Inc. has announced the 9000LT, a laptop computer that includes a 12-MHz Intel Corp. 80C286 processor equipped with 1M byte of memory.

Other features include a built-in 3½-in. floppy drive and a 16-gray-scale, backlit screen. The product can operate for more than three hours on a single battery charge, the vendor said.

The product costs $1,699.

Leading Technology
10430 S.W. Fifth St.
Beaverton, Ore. 97005
(503) 646-3424

Software applications packages

Inter Solutions, Inc. has announced an enhanced version of Forecast that was designed for users of Lotus Development Corp.'s 1-2-3 Release 3.1.

Forecast-GFX ($145) features forecasting techniques such as time series analysis, multiple regression analysis, seasonal adjustments, smoothing, filtering and descriptive statistics. The product enables users to integrate graphs into a worksheet and display them on the same screen, according to the vendor.

The software package requires an IBM Personal Computer XT, AT, Personal System/2 or compatible running DOS Version 2.0 or higher.

Inter Solutions
161 Highland Ave.
Needham, Mass. 02194
(617) 449-6222

Calera Recognition Systems, Inc. has announced an optical character recognition system designed for the Microsoft Corp. Windows 3.0 environment.

Topscan Plus can be configured with Calera's CDP 6000 or CDP 9000 scanners. Both scanners feature scanning times up to 3.3 sec./page, character recognition rates of up to 250 char./sec. and a mean-time-between-failure rating of 10 million pages.

Topscan Plus requires an IBM Personal Computer equipped with 2M bytes of random-access memory, Windows 3.0 and a hard disk. Pricing for a system that includes a CDP 6000 is priced at $17,450; a version configured with a CDP 9000 costs $29,450.

Calera Recognition Systems
2500 Augustine Drive
Santa Clara, Calif. 95054
(408) 986-8006

Aria Systems' Imagit Flash Filing, an electronic document management software package designed for small businesses, runs under Microsoft Corp.'s Windows 3.0 with off-the-shelf IBM Personal Computer AT or compatible hardware.

The product includes a software compression/decompression routine for compressing or decompressing document images and features storage capacity for up to legal size (8½- by 14-in.) documents.

Imagit Flash Filing operates with Precision Software's Superbase database software package. Pricing begins at $599.

Aria Systems
4842 Smick St.
Philadelphia, Pa. 19127
(215) 483-3929

Alcom Corp.'s Lanfax Redirector for Windows features Fax Manager, a graphical user interface that enables local-area network users to send faxes directly from any printable Microsoft Corp. Windows application in the Windows 3.0 environment.

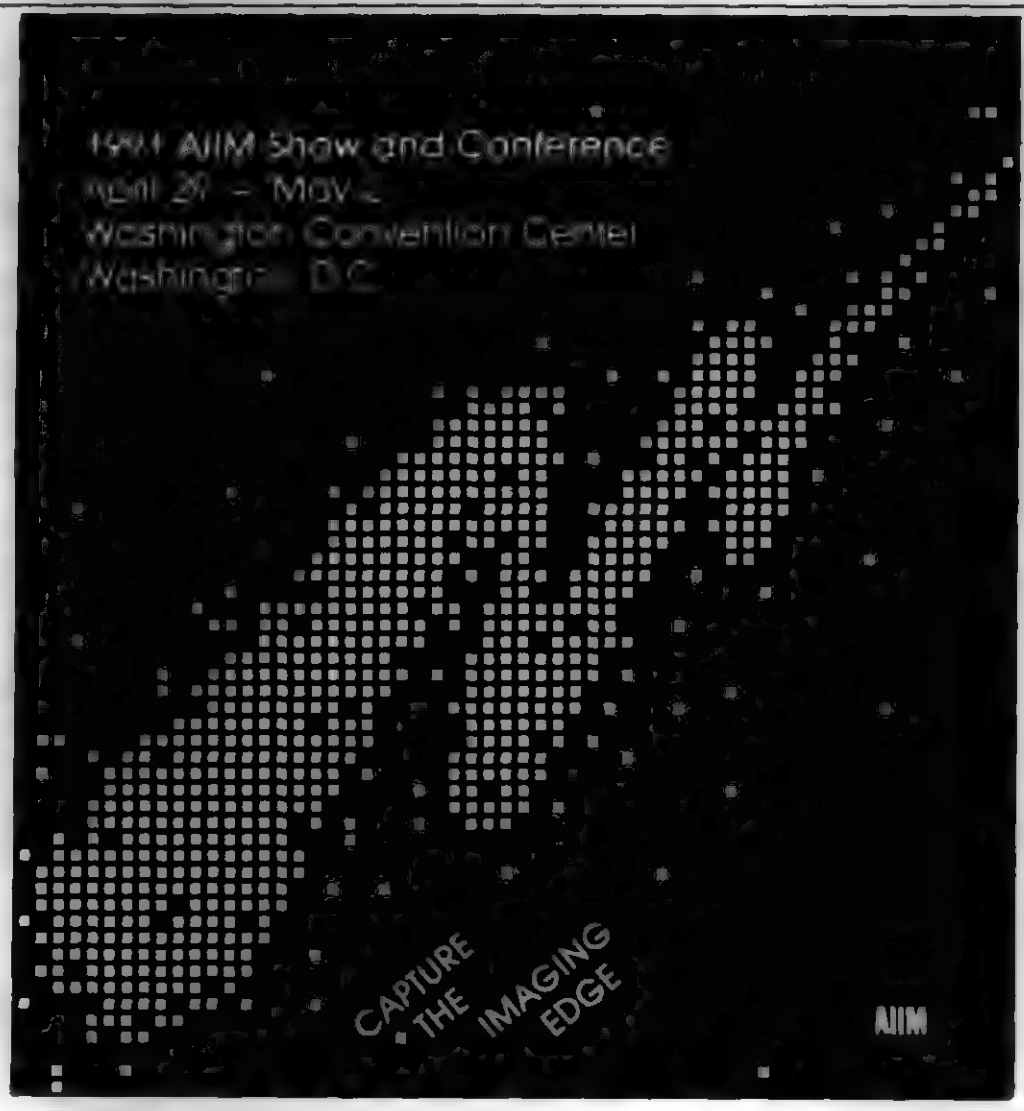
The product runs in Novell, Inc., 3Com Corp., Banyan Systems, Inc. or IBM NetBios environments.

Pricing for Lanfax Redirector begins at $995.

Alcom
2464 Embarcadero Way
Palo Alto, Calif. 94303
(415) 493-3800

Business Resource Software, Inc. has announced a software program that enables users of IBM Personal Computer XTs, ATs or compatibles to use a step-by-step guide for creating business plans.

Plan Write includes an integrated outliner, an interactive word processor and a spreadsheet processor designed for documenting business plans. Features include movable, sizable windows, which are used to copy information among plans, and edit, cut and paste commands that fa-



Plan to attend the world's largest and most comprehensive imaging event — the 1991 AIIM Show and Conference, April 29 — May 2 at the Washington Convention Center, Washington, D.C.

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Conference "Hotline" (301) 587-8202 Fax (301) 587-2711

CW

cilitate the initial formation of business plans.

The product began shipping this month and is priced at $99.95.

Business Software
2013 Wells Branch Pkwy.
Austin, Texas 78728
(512) 251-7541

Compete is a multidimensional financial modeling software package that Computer Associates International, Inc. acquired from Manageware, Inc.

Compete enables portions of data files, such as financials over time or financials by product, to be viewed instantly. CA also announced that it plans to release an enhanced version, CA-Compete Version 4.2, this month. The enhanced product is priced at $995.

CA
711 Stewart Ave.
Garden City, N.Y. 11530
(516) 227-3300

Powercore, Inc.'s Network Scheduler II Windows Interface was designed to work with Version 1.5 or higher of Powercore's Network Scheduler II, a scheduling program designed for use by work groups operating on a local-area network.

The interface enables Network Scheduler II users to gain access to Network Scheduler II's calendar data while remaining in the Windows environment. The product also allows multiple Network Scheduler II calendars to be opened simultaneously and permits file transfers between Network Scheduler II and other Windows-compatible applications, the vendor said.

The Network Scheduler II Windows Interface is priced at $595 per network server.

Powercore
One Diversatech Drive
Manteno, Ill. 60950
(815) 468-3737

Molecular Design Ltd. has introduced a chemical drawing package designed to facilitate the drawing of chemical structures, reactions or other scientific presentations within a Microsoft Corp. Windows-based environment.

ISIS/Draw reportedly enables scientists to insert structures and reactions into their word processing, spreadsheet or other application programs. Structures and images can also be moved on different platforms running ISIS/Draw, according to the vendor.

A single-user license for ISIS/Draw is priced at $495.

Molecular Design
2132 Farallon Drive
San Leandro, Calif. 94577
(415) 895-1313

Software utilities

Davinci Graphics, Inc. has announced Version 2.0 of the Rasterpro 720 Penless Plotter, a software tool designed for plot-intensive computer-aided design environments.

The product consists of three utilities: Procontrol, a menu-driven, MS-DOS-based software package that allows users to set up plotter output specifications from their workstations; Prosdi, a software driver for MS-DOS systems that enables files to be plotted from within Autodesk, Inc. Autocad applications; and Prolp, a firmware utility that allows both DOS and non-DOS users to create A- and B-size plots of any length.

A basic version of the product is priced at $3,495.

Davinci Graphics
870 Hermosa Ave.
Sunnyvale, Calif. 94086
(408) 737-8800

Peripherals

Interface Electronics, Inc. has announced a parallel print coprocessor that consists of a microprocessor-based I/O card that fits into an 8- or 16-bit slot of an XT/AT bus-based personal computer.

The Starboard Port accepts print data at an 8-bit bus speed from a PC or file server, thereby enabling the PC to be used by the operator while the port continues to communicate with the printer, the vendor said.

The product is priced at $199.

Interface Electronics
4579 Abbotts Bridge Road
Duluth, Ga. 30136
(404) 623-1066

Radius, Inc. has announced an IBM Micro Channel Architecture interface designed for use with its 19- and 21-in. Radius Two Page Display Systems for personal computers.

The TPD/PC-MCA enables IBM Personal System/2 users to use Radius' two-page, paper-white displays. The interface features 1,280- by 960-pixel resolution and incorporates an IBM Video Graphics Array chip.

The product costs $895.

Radius
1710 Fortune Drive
San Jose, Calif. 95131
(408) 434-1010

Suncom Technologies has announced Icontroller, a cursor control device that can be attached to the side of a laptop computer.

The device features three function buttons, optional cursor speeds and compatibility with Microsoft Corp.'s Windows software packages.

The product is priced at $99.95.

Suncom Technologies
6400 W. Gross Point Road
Niles, Ill. 60648
(708) 647-4040



WorkFlo Business System software electronically paper clips documents together so they never get separated.

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Avatar

65 South Street, Hopkinton, MA 01748

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DCW15

COMMENTARY

Bruce Sanders

The human side of E-mail

Electronic mail is fine for simply exchanging information. But the functions of E-mail are changing. Increasingly, members of work groups are using E-mail to collaborate. Even though working at different times and in different places, team members can address problems and make decisions more quickly because of computerized message exchanges.

Whenever people successfully collaborate, whether with or without E-mail, they persuade each other. They exert influence as they define the problems facing the team, identify what it will take to solve the problems and determine who will take what actions. However, persuasion is quite different when the teams in your organization communicate screen-to-screen rather than face-to-face. Those who excel with this new kind of teamwork will keep in mind the basics of effective persuasion, which consist of building trust with the people you want to influence, asking clearly for what you want, motivating others into action and showing the way.

The greater the trust, the more willing people are to take risks. Therefore, to be successful at influence, build a climate in which the targets of your influence trust you.

The problem is that we're accustomed to building trust through a handshake, a look directly in the eye, a pat on the back and all the other payoffs of face-to-face meetings. We're deprived of that with E-mail.

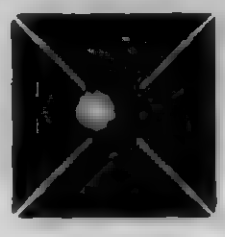
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User work bears fruit on Vines

Network Applications Consortium testing Banyan version of Notes

BY JOANIE M. WEXLER
CW STAFF

Not even two months after its formal inception, the Network Applications Consortium is seeing the first fruit of its mission to spur commercial applications development for enterprisewide networks.



The 40-firm consortium's steering committee — which comprises representatives from six large companies — is approximately two weeks into testing a version of Lotus Development Corp.'s Notes 2.0 specifically developed for the Banyan Systems, Inc. Virtual Networking System (Vines) network operating system.

Pacific Gas & Electric Co. — a large Vines and Notes user — got the application development ball rolling when it approached Lotus last year to develop a Vines version of Notes and realized that the need for a broader choice of Vines applications was shared by others.

As a result, other steering committee firms now intercommunicating via Notes-for-Vines are the Arizona Public Service Co., MCI Telecommunications Corp., Pennsylvania Blue Shield and The Turner Corp.

"Notes represents our first victory in working with vendors to get an application better integrated with Vines," commented John Ryan, director of systems engineering at Compaq Computer Corp. in Houston and a steering committee member.

Ryan explained that since Notes was natively optimized for servers running the Microsoft Corp. OS/2 and Windows operating systems, and Banyan servers are Unix-based, "Notes performance lagged. Now that Notes is tied to Banyan Sockets [software that links applications with Transmission Control Protocol/Internet Protocol, the typical communications protocols used in Unix networks], we'll get higher performance."

On-line with Vines

Currently, all firms in the Network Applications Consortium run Vines networks, which were architected from the ground up by Banyan to address corporatewide networking. All 40 companies will be on-line with the Vines-based Notes within three months, according to Ryan.

Notes is a sophisticated bulletin board-like application that integrates databases, electronic mail, file transfer and communication functions into one environment.

"It will take an application this hot to push our organization into the next generation of networked machines," commented Bill Sheehan, director of information systems at the Metropolitan District Commission, a government Vines site in financially strapped Massachusetts.

Sheehan explained that his myriad Intel Corp. multiprocessor-based PCs "will run until they die. So the next hardware platform change will have to give the taxpayers something very good for their money. A groupware application that really boosts our productivity — like Notes — could do it."

Dallas firm practices law of the LAN

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

DALLAS — While Johnson & Gibbs, P.C. lays claim to being the leading Dallas law firm in terms of size, it could also be considered a leader in its field in terms of networking technology.

The firm was an early adopter of local-area networks, buying Novell, Inc.'s first networking box, the Motorola, Inc. 68000-based Snet box in 1985. That box supported 24 workstations, and the firm would patch Arcnet adapters into it for a time.

Today, the firm has 575 personal computers and five file servers, all IBM clones, running on a Novell Netware 386 network with The Network Archivist from Palindrome Corp. serving as tape backup, solving some nagging problems for the firm.

There has been no looking back.

"[The network has] had an enormous impact," said J. Warren Huff, a firm shareholder and chairman of the technology committee, which was formed in 1984 to explore alternatives to centralized, minicomputer-based word processors.



"From a cold business standpoint, the simplest way I can explain it is that at the time of network, we had a large word processing center that did almost all of the documents, and we also had secretaries for almost all the lawyers, who couldn't be productive at all because they were not involved [in document production]."

Huff cited billing integration and electronic mail as other major advantages. The network has also saved the firm money.

"Our managing director believes that we paid for our system in about 18 months in just hard cost savings, before you factor in all the benefits of being more efficient," Huff said. "It's such a cost-effective way to deal with the process. On a per-workstation basis, it looked to me that the mini was about twice as much, for comparable performance."

Bruce Hatch, Johnson & Gibbs' systems administrator, said the firm is still enhancing the network. Most recently, replacing an Emerald Systems Corp. 120M-byte tape backup system with the one from Palindrome has brought surprising benefits, he said.

The backup system offers better security than the tape-based systems the firm used before because it does not involve tape changes, Hatch said. The Emerald system needed four tape changes each night.

Hatch credited The Network Archivist with being more adaptable to the users as well. Attorneys need access to numerous versions of the same document to compare language and changes. Hatch said that the Palindrome backup method has proven more efficient in viewing old versions of documents.

Continued on page 51



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Frame-relay service on tap

Nationwide fiber-optic network services provider Wiltel, a subsidiary of The Williams Cos., last week rolled out a public frame-relay service based on fast-packet multiplexers from Stratacom, Inc. Wiltel has reportedly installed eight initial Stratacom nodes; its Wilpak frame-relay service offers users a range of speeds from 64K to 1.024M bit/sec. Frame relay is a fast-packet technology that allows streamlined packet switching of sporadic data traffic.

A Switched Multimegabit Data Service (SMDS) interface linking Cisco Systems, Inc. routers to wide-area networks at T3 (45M bit/sec.) speeds is reportedly under construction by Cisco and NEC America, Inc.'s Switching Systems Division. The interface will consist of routing software from Cisco on a NEC adapter card and is targeted at users looking to use their routers to link local-area networks over SMDS. SMDS is a high-speed, fiber-based digital network service emerging from the regional Bell operating companies.

A volume discount incentive program for colleges and universities from FTP Software, Inc. delivers discounts on Transmission Control Protocol/Internet Protocol (TCP/IP) software of up to 50% off regular site license list prices. The program also includes reduced pricing on annual maintenance fees and support for multiple interfaces at no additional cost. Discounts apply to the academic version of PC/TCP Plus, FTP's TCP/IP implementation for MS-DOS-based systems.

Reportedly freeing up as much as 580K bytes of memory on an Intel Corp. 80286-based computer, Digital Communications Associates, Inc. is bundling Helix Software Co.'s Netroom memory relief software with its Ethernet network adapter cards at no extra charge.

Soft-Switch unwraps E-mail monitor system

BY ELISABETH HORWITT
STAFF

WAYNE, Pa. — Information systems managers who are tired of learning about electronic mail system failures from irate users may welcome a multivendor E-mail monitoring system announced recently by Soft-Switch, Inc.

Mail Monitor is a hardware/software solution that is said to to pinpoint systems that are not receiving or sending E-mail across an enterprisewide heterogeneous network. The system can be programmed to send out probes to various E-mail servers at regular intervals and will provide the user with color-coded alerts when a given node has not responded within a set period of time, according to Soft-Switch product manager Stuart Finn.

Beginning with Mail Monitor's expected release this summer, the vendor plans a slow roll-out of support for most of the 50 E-mail systems that are now supported by Soft-Switch's E-mail connectivity software. These will include E-mail products from IBM and Digital Equipment Corp., as well as leading local-area network E-mail systems, E-mail services such as MCI Communications Corp.'s MCI Mail and systems based on the CCITT X.400 standard, Finn said.

Active management

Edward Carmody, a group leader of corporate E-mail services at Rohm & Haas Co., said he expects Mail Monitor to provide his company with active E-mail network management for the first time. With some 9,000 users communicating via the chemical firm's international E-mail network, "any outage can have a significant impact on business," Carmody said.

At present, Carmody's group tends to find out about problems "only after they have escalated to the point of being a real issue," he added. Rohm & Haas plans to be one of Mail Monitor's first beta-test users.

Mail Monitor addresses a need for E-mail management that has burgeoned as "messaging has proliferated and become a valuable asset" said Walter Ulrich, a director at Arthur D. Little, Inc. in Los Angeles. The system will only work with Soft-Switch's E-mail products; however, most Fortune 500 companies with enterprisewide E-mail systems are Soft-Switch users, Ulrich said.

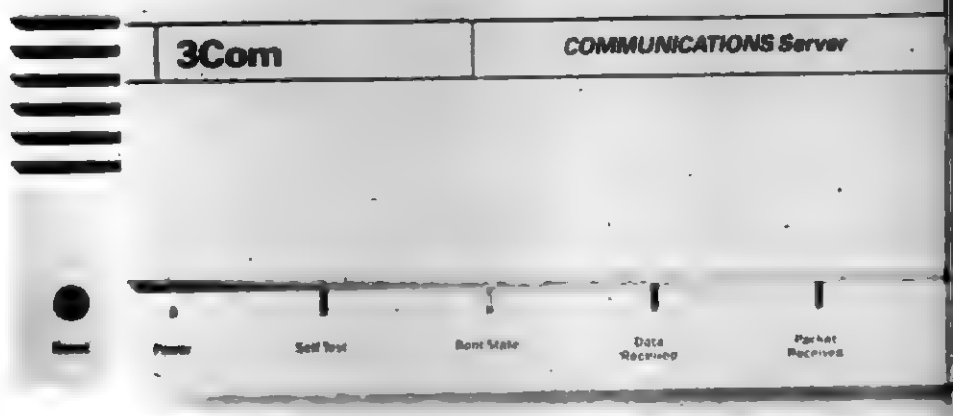
Say it with pictures

Mail Monitor allows users to graphically depict enterprisewide E-mail networks and zoom in on specific nodes, Finn said. The system also collects and correlates performance information such as how long it takes a message to traverse the network and servers' performance over time for later analysis, he added.

Mail Monitor requires installation of Soft-Switch Central, IBM host software that acts as a hub for different E-mail systems. Priced at $15,000, Central will soon run on Unix systems as well, Soft-Switch said.

Mail Monitor's $40,000 price tag includes an Intel Corp. 1486-based workstation running Microsoft Corp.'s Windows 3.0, Mail Monitor software, a hard disk, tape backup and 2,400 bit/sec. modem.

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3Com® terminal servers support every major protocol on your network with remarkable flexibility: XNS, TCP/IP, OSI and concurrent TCP/IP-LAT.

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PC maker Everex jumps into networking market

BY JIM NASH
CW STAFF

Does the world need another network operating system? Two companies, personal computer maker Everex Systems, Inc. and network software developer Webcorp, think so.

The two San Francisco-based firms announced last week that they are shipping Everex-Web, a work group-level, peer-to-peer system aimed at small businesses or small corporate departments. A spokesman for Everex said the company sees a market for three- to 10-work group settings that cannot afford Novell, Inc.'s Netware Version 2.2.

Bill Kalff, director of National Gypsum International in Point Richmond, Calif., said the new system is viable. "I've looked at the Novell and [Artisoft, Inc.] Lantastic network operating system, and I found Web the most user-friendly."

"There certainly is a niche for really small network operating systems today," said Tom Wood, an analyst at Business Research Group in Newton, Mass. But, Wood said, Novell and networking competitor Microsoft Corp. are both working to lower prices and increase capabilities for work-group networks. To the extent that they are successful, he said, companies such as Everex and Webcorp will be forced out of the market.

"It's crazy, if you ask me," Wood said of their long-term chance for success. Everex-Web is being shipped with Everex Speedlink adapter cards and as independent software in five-, 15- and 30-user versions. Prices range from $495 to $1,495. Everex said its system is compatible with Novell's Internet Packet Exchange protocol and will offer migration up to Netware.

"Web is a lot easier to install than [Novell's entry-level] Netware," said Chris Yalonis, principal at The Jupiter Group, a research firm in Fairfax, Calif. He oversaw beta testing of Everex-Web at Jupiter and said installation took "an hour or two."

"This is a good product for second-tier resellers to sell," Yalonis said. "For those developers or value-added resellers who don't want to invest in three or more employees needed to support Netware," he said, this is an option.

Kalff said he has 10 IBM or clone workstations in his Point Richmond office, three in Dallas and six in Miami.

Dallas

FROM PAGE 49

"We find that we can restore maybe 20 different versions of a file," he said. "If an attorney wants to know what it looked like 17 days ago, we can do that."

The firm is also removing a mission-critical application, its conflict-of-interest system, from an IBM System/34 and placing it on a local-area network. A conflict-of-interest check is necessary every time the firm considers doing new work, for both existing and potential clients.

Hatch said the decision to switch to a network-based system from the System/34 came because of the extremely limited capabilities of the old minicomputer's database, written in RPG.

"The conflicts system just got too slow, too cumbersome and inaccurate," Hatch said.

The programming is being done in Advanced Revelation from Revelation Technologies, Inc. and is essentially finished.

One minicomputer remains at the firm: a Wang Laboratories, Inc. VS system with some 10 terminals attached. The Wang system handles billing for the firm.

According to Hatch, it performs well and is integrated into the network, which allows attorneys to easily review and customize client bills.

Hatch said that while "someday, we'll be entirely on networks," the Wang system is very effective, and there is currently no software available for PCs or networks that does what it does.

In addition, Johnson & Gibbs recently finished installing a 56K bit/sec. wide-area network linking the Dallas office with its offices in Washington, D.C., Austin, Texas, and Houston.

These three sites have 50 to 70 node workstations each. Hatch said the WAN was installed to allow employees at each site to send electronic mail, transfer documents and install software remotely. Hatch also manages the network from his office in Dallas.

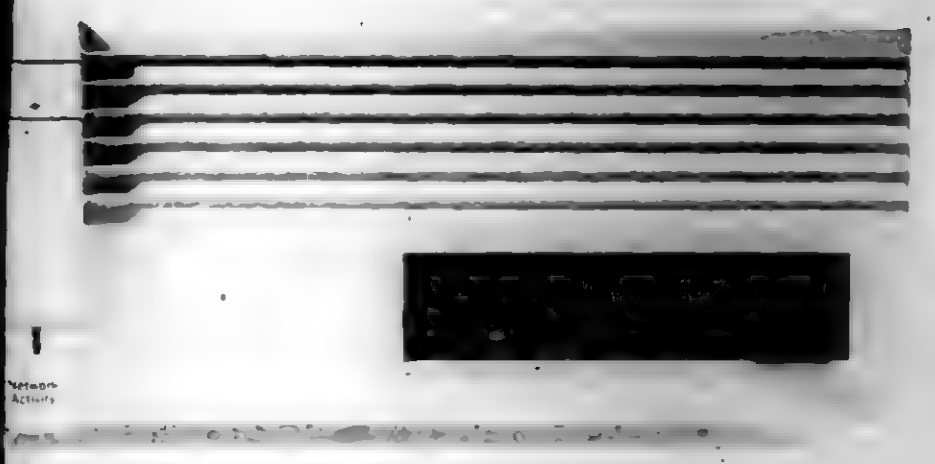
The firm is now deciding what software packages it will use as standards. Hatch said many attorneys use Wordperfect Corp.'s Library as a menu program, but the firm will standardize on Wordperfect Office 3.0 because of its calendaring and electronic Rolodex functions.

JOHNSON & GIBBS formed a technology committee in 1984 to explore alternatives to centralized, minicomputer-based word processors.

For spreadsheets, the field is considered to be wide open. Users have Lotus Development Corp.'s 1-2-3 in versions up to 3.1 installed in the accounting department, but Borland International, Inc.'s Quattro Pro and Wordperfect's Planperfect are also in use.

Hatch will also line up any online service that attorneys want. Lexis, Compuserve, West Law (a database service from West Publishing) and Information America are among the most frequently used.

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no time to realize how Herculean it may be. There are two kinds of people. Those who will tell you all the reasons something can't be done. And those who simply go out and do it. It should be obvious where we stand. Notice that our company logo sits squarely at the bottom of this page. Not the other one. We believe that nothing is impossible. And when you have 40,000 employees around the world who believe that too, then nothing is.

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Sanders

FROM PAGE 49

Moreover, what work team members say via E-mail often isn't wholly consistent with what they say in face-to-face meetings and in telephone conversations.

Some people react to E-mail by becoming much more adventuresome than in those other contacts. At the worst, they'll use the computer as a cloak to hide behind, making promises they won't keep or even insulting other team members.

By and large, though, the danger is in the other direction. Most people exercise too much caution in their E-mail correspondence. They feel they're more likely to be held fully accountable for their E-mail comments than for their face-to-face comments, so their business courage fades away when they're at the computer.

To maintain the trust important for influence, resist any urge to become either reckless or feckless in your E-mail messages. Also, make sure your work team trusts the computer system's security. Password protection and data encryption capabilities help. So does the ability, like that in Da Vinci E-mail and Wordperfect Office, to specify whether the message you're sending to a particular person can or cannot be picked up by a third party if your intended recipient isn't available.

Once you've established trust, ask for what you want, stating your request clearly.

Clear requests also help maintain trust. Because the people receiving your E-mail messages aren't there with you at the time, doubts can build about what you really mean. Researchers have long recognized how much energy is spent by people in organizations trying to read into messages what the sender truly wants. Not surprisingly, the real meaning often gets distorted by this speculation.

When you interact via E-mail, you often must probe your team members for their motivations because you may not have the chance to interact with them. Look for patterns in their messages and their responses as to what energizes them into action.

A software capability that helps in this search is message threading, with which you can trace the train of an E-mail conversation to spot a person's interest.

Another helpful feature is the capability to search E-mail messages by content. In this way, you can check out the hunches you formed from reviewing the message threads. Many E-mail packages have at least one of these two capabilities. Higgins from Enable Software, The Network Courier from Consumers Software, Office Works from Data Access, Da Vinci E-mail and Framework III LAN from Ashton-Tate each have both.

Once you've identified the interests, needs and desires of your targets of influence, focus your arguments on those areas. With the massive amounts of information hitting every work team member, the people you want to influence may not have even spotted how your suggestions can benefit them. So tell them as effectively as you can, via E-mail. When identical text will go out to a group of people, or if you don't yet know your targets of influence well, order your arguments based on your experiences with relative appeal of the arguments in similar situations.

Be a living example of what you are asking others to do. You want others to stay open to being influenced by your ideas. So use your E-mail messages to demonstrate how you are open to influence by the good ideas of your colleagues.

Join with your teammates to show one another the value of E-mail for persuasion. In doing so, you'll be guiding others in your organization to use E-mail as well. Information management professionals traditionally have had the opportunities and responsibility to provide that sort of leadership. The challenge is especially appealing in this case because E-mail can be a most influential business tool.

Sanders is a psychologist at Workgroup Associates in Vacaville, Calif.



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3Com presents 16-bit 10Base-T card

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — Recognizing the growing importance of 10Base-T for high-volume local-area networking, 3Com Corp. announced a 16-bit Ethernet adapter card for systems networked with unshielded twisted-pair wiring.

3Com already has 16-bit Ethernet cards for thin and thick coaxial cable networks. A 3Com spokeswoman said the new product, Etherlink 16 TP, is aimed at financial transaction processing firms and other organizations needing to send files across personal computer networks without investing in coaxial cabling.

Each Etherlink 16 TP costs $479; five cost $2,195. It features zero-wait-state random-access memory to cut access time.

One network manager said the card boosted his system's performance. Claude King, senior systems programmer at the University of Florida at Gainesville, said he has yet to run extensive tests, but users noted the faster response time.

"Users generally notice when response time increases 30% or more," said King, who manages the College of Journalism and Communications. He explained that the 16-bit card "moved the [throughput] bottleneck to the server." However, given its ability to reconfigure most servers for more performance, King does not expect problems.

Twisted pair is making a strong showing among network managers who either want to retain their investment in existing 10Base-T equipment or who want the flexibility of twisted pair's star topology, said Eric Buck, vice president and financial analyst at Donaldson, Lufkin & Jenrette, Inc. in New York. "The twisted-pair market is a hot segment of marketplace," he said.

An information systems manager at First National Bank of Chicago who requested anonymity said the bank is making a greater commitment to the Ethernet networks it has on its trading floor. In such an environment, the manager said, twisted pair's flexibility combined with 16-bit throughput makes it safer to build on 10Base-T networks.

Bob Willis, systems development officer at Security Pacific National Bank in Los Angeles, said he is using Pair Tamers, an early proprietary coaxial-twisted pair adapter from 3Com. The devices, hooked up to the bank's 3+Open LAN Manager Version 1.1 networks, cause tie-ups when traffic builds on the network. Willis said Security Pacific will probably upgrade to adapter boards in its PCs this year and will look at the Etherlink 16 TP.

DCE plan introduced

SAN JOSE, Calif. — A blueprint for yet another distributed computing environment was announced by five Transmission Control Protocol/Internet Protocol vendors at the recent Sun Microsystems, Inc. Connectathon conference.

FTP Software, Inc., Intercon Systems Corp., Interlink Computer Sciences, Inc., TGV, Inc. and Beame & Whiteside Software Ltd. said they will co-develop applications around Sun's Remote Procedure Calls (RPC). RPC is a modular set of networking protocols and services that allows distributed application processing across mixed-vendor networks.

Sun's widespread technology was rejected by the Open Software Foundation (OSF) last May for the RPC portion of its Distributed Computing Environment. OSF's rival in the race to provide the industry with "open" computing, Unix International, is also developing a distributed platform, and vendors such as Digital Equipment Corp. with its Network Application Support are honing their own versions.



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wide. 1989 *World's first and largest privately-owned transatlantic fiber optic cable completed.* 1990 *Sprint announces the first commercial video services to the Soviet Union.*

NEW PRODUCTS

Local-area networking software

Trellis has announced a bulletin board software package designed exclusively for Banyan Systems, Inc. Virtual Networking Software operating systems.

Tackboard Version 3.0 ($1,495) functions as an enterprisewide bulletin board for public communications and workgroup discussions.

The product enables users with appropriate access to post text messages created within Tackboard or data imported from DOS files, the vendor said. In addition, a scripting utility allows users to upload or download information to Tackboard.

Trellis
85 Main St.
Hopkinton, Mass. 01748
(508) 435-3066

Hughes LAN Systems, Inc. has announced Version 2.0 of Prolinc, an integrated local-area network connectivity software package that allows DOS and Microsoft Corp. Windows 3.0 systems to concurrently access multiple hosts, file servers and network operating systems.

Features include support for the Simple Network Management Protocol and Network Driver Interface Specification-compliant token-ring adapters and multiprotocol interoperability between token-ring and Ethernet networks.

The product is scheduled to be available this month and is priced at $595.

Hughes LAN Systems
1225 Charleston Road
Mountain View, Calif. 94043
(415) 966-7300

Electronic mail

CE Software, Inc. has aired an enhanced version of its electronic mail system for Apple Computer, Inc. Macintoshes.

Quickmail Version 2.5 supports personal computers and Macintosh systems in a PC-based local-area network environment that supports Apple File Protocol-compatible file services. The product also includes a Starnine Technologies, Inc. gateway to Novell, Inc. Netware Message Handling System

A second-quarter ship date is scheduled. Pricing for Macintosh, PC LAN and Appletalk versions ranges from $100 to $2,500, depending on number of users.

CE Software
1801 Industrial Circle
West Des Moines, Iowa 50265
(515) 224-1995

Front ends, multiplexers

Data Switch Corp. has announced two channel extension products designed to allow multiple mainframe channels to communicate with peripherals via high-speed communications lines.

The Model 9200 and Model 9400 Channelplexers both operate transparently to computer channels. Both models also feature a data compression technique designed to conserve bandwidth, according to the vendor.

Pricing for the Model 9200 starts at $70,000 per link. The Model 9400 is initially priced at $105,000 per link.

Data Switch
1 Enterprise Drive
Shelton, Conn. 06484
(203) 926-1801

Micro-to-host

Netmanage, Inc. has announced a Transmission Control Protocol/Internet Protocol (TCP/IP) network communications stack designed for Microsoft Corp.'s Windows 3.0 environment.

Newt ($500) includes a software development kit for Windows 3.0 developers and enables multiple concurrent sessions to be performed with multiple hosts. It features support for token-ring and Ethernet local-area networks.

According to the vendor, the product can also communicate with any host system running TCP/IP, including Digital Equipment Corp.'s VMS- and Ultrix-based machines, The Santa Cruz Operations' Unix-based systems, Sun Microsystems, Inc. workstations running SunOS and IBM AIX-, VM- and MVS-based computers.

Netmanage
10020 N. De Anza Blvd.
Cupertino, Calif. 95014
(408) 257-6404

Ohio Software, Inc. has announced an asynchronous communications software program designed for IBM and Microsoft Corp.'s OS/2 Presentation Manager environment.

Split Line ($295) complies with IBM's Common User Access and Systems Application Architecture guidelines. The product reportedly allows three communication sessions to operate and transfer files simultaneously. Files can be transferred at a maximum rate of 19.2K bit/sec., according to the vendor. Support for Kermit, Xmodem and Ymodem protocols is also featured.

System requirements include an IBM Personal System/2 Model 50 equipped with a minimum of 2M bytes of memory and OS/2 Version 1.2 or higher.

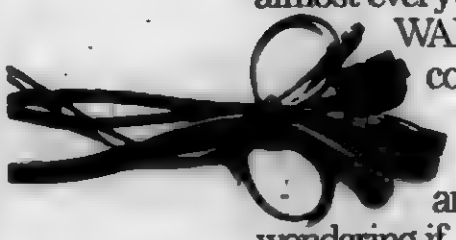
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MANAGER'S JOURNAL

EXECUTIVE TRACK



Raymond J. Sibiga has been elected vice president of information services at Arkwright Mutual Insurance Co., a risk management services firm based in Waltham, Mass.

Sibiga had been assistant vice president and manager of systems and programming at Arkwright since 1987. He was named assistant vice president of information systems in 1984 after Arkwright's merger with Philadelphia Manufacturers Mutual Insurance Co. in Valley Forge, Pa.

At Philadelphia Manufacturers Mutual, Sibiga was vice president of insurance services for two years.

Before that, Sibiga served as director of insurance information services at Aetna Life and Casualty Co. in Hartford, Conn., for 12 years.

Sibiga holds a bachelor's degree in business administration from the University of New Haven in Connecticut.

.....

Arthur E. Weiss has been appointed to the new position of director of MIS at **Nationwide Cellular Service, Inc.**, a reseller and distributor of cellular telephone service and equipment in Valley Stream, N.Y.

Weiss is responsible for coordinating all IS operations and overseeing Nationwide's 15-person MIS department.

Weiss had been project manager at Avnet, Inc.'s IS division for the past seven years. Before that, he worked as a senior systems analyst at Diplomat Electronics.

He holds a bachelor's degree in engineering from Columbia University.

.....

Robert M. Garrant has been named director of consulting services at **General Technical Services, Inc.** in Columbia, Md.

Garrant has 17 years of IS experience with the U.S. Army, RCA Corp., First Interstate Bank of California and Maryland National Bank.

The road to lower fuel costs

Trucking companies use IS to monitor fuel purchasing and reduce waste

INDUSTRY CLOSEUP
IS in Transportation

BY CARMEN D. WISEMAN
SPECIAL TO CW

Fuel is the lifeblood of the trucking industry. Without a steady fuel supply, the big rigs quickly grind to a halt. But maintaining financial balance while keeping trucks filled can be a dicey proposition for transportation companies.

Fuel costs typically represent 18% to 35% of a carrier's operating expenses. Because the cost of a barrel of benchmark light, sweet crude is subject to wild fluctuations in supply, demand and market value, these costs are a major X factor in profitability projections.

That's why the big carriers are increasingly turning to information systems to streamline fuel purchases, control vehicle refueling or cut down on fuel waste caused by poor driver or vehicle performance.



Ron MacDonald

Plugged in to prices

In the last 10 years, "carriers have become very sophisticated in the way they buy fuel," says Dave Willis, senior vice president of the American Trucking Association Foundation in Alexandria, Va. Almost all of the major carriers, for example, have at least a modem and a personal computer dedicated to dialing into fuel companies and obtaining comparative pricing data.

Other firms, Willis adds, play the oil and diesel futures markets via computer links. They buy fuel every day, monitoring quotes by way of computer.

J. B. Hunt, Inc. in Lowell, Ark., is one of the largest truckload carriers in the U.S. with revenue of $580 million. The company treasurer has several IBM PCs hooked into the fuel commodity markets, according to Thomas Sanderson, vice president of marketing services at the firm. By monitoring these markets on a minute-by-minute basis, the company can hold costs down when it buys fuel in bulk for its pumps across the country.

The system also allows J. B. Hunt to pass on the right fuel surcharge to its customers, Sanderson adds. Using pricing data gathered daily from the commodity markets and the Interstate Commerce Commission fuel index, the company can tailor surcharges to individual customers on a percent-per-mile basis every week.

Roadway Express, Inc., a less-than-truckload subsidiary of $3 billion Roadway Services, Inc. in Akron, Ohio, also supplies its own pumps at more than 650 facilities nationwide. Roadway Express' fuel pricing system, in place for about four years, has made replenishing supplies at these facilities faster and

Continued on page 61

The pain of business redesign

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Business process redesign is a catchy buzzword and a noble goal, but in reality it can be a gut-wrenching experience for many companies.

"The coin in which you pay for re-engineering is denominated in units of suffering," consultant Michael Hammer told 1,200 insurance industry information systems professionals at the recent Life Office Management Association (LOMA) Systems Conference in Orlando, Fla.

Hammer, president of Hammer & Co. in Cambridge, Mass., said insurance is the industry most committed to re-engineering the business. However, he added that few industries were in more desperate need of reshaping.

Most efforts to redesign business within the industry have fallen short of true re-engineering because they did not change the way business was done but merely applied technology to old processes.

"We've inherited a business organization that can't be fixed; it has to be eliminated," Hammer said. "The main problem with people who are trying to do re-engineering is that they aren't ready for the chaos of massive change."



Hammer is calling for insurance industry changes

Mutual Benefit Life Insurance Co. and United Services Automobile Association were cited for pioneering efforts to redesign the business.

Mutual Benefit reduced policy processing time from 25 days to four hours by replacing clerks who processed individual aspects of an insurance application with a case manager dealing with all aspects of the application.

As a consequence, however, a new level of position had to be created for the case managers, upsetting the company's organizational hierarchy.

"The compensation system did not allow for case managers. They saved the company with this process change but destroyed the organization," Hammer said. "Process redesign is the start of re-engineering. Everything has to change in response to that."

Although many redesign projects start out with the goal of process improvement, they ultimately become driven by cost reduction, similar to older process automation approaches, said Thomas Davenport of Ernst & Young's new Center for Information Technology in Boston.

BOOK REVIEWS

Tracing the trials and triumphs of a time-honored family

IBM's 360 and 370 Systems
By Emerson W. Pugh, Lyle R. Johnson and John H. Palmer
The MIT Press, $37.50

After almost 27 years, the IBM 360-370 architecture processors still weigh in as the computer industry's undisputed heavyweight champs. For those with an interest in the formative years of the processors — including the internal politics surrounding the 360, private IBM documents and a detailed discussion of the hardware designs — this book has the answers.



The authors relate how, by 1961, IBM's products consisted of a large number of incompatible systems ranging from punch-card electronic accounting machines to supercomputers. That year, Vin Learson, who later became IBM's chief executive officer, established a task force to address "the explosive growth in applied programming demanded by a larger number of dissimilar systems." The 360 architecture emerged; development on it began in 1962.

That was a good thing for IBM, because within two years, the firm was under competitive siege from the BUNCH companies. In response, IBM rushed to announce the System/360 in 1964 for delivery in 1965.

The authors explain that the 360 hardware achieved many of its original goals, but the software was a different story. Operating system OS/360 exploded into incompatible control programs such as Basic Programming Support and Basic Operating System.

The book goes beyond the technical ins and outs of these processors and introduces more than 100 people who designed and built the 360s. Further, the authors document many struggles that took place over the 360. "We somehow have an organization that destroys more men than it produces," former IBM Chairman Tom Watson wrote in a draft copy of an internal memo, one of many private IBM documents provided by the authors.

The personal touches are welcome, but this book is long at 848 pages. Some chapters overlap, and readers learn more than they may want to about core memories or punch-card accounting.

While the book does not give the full story of the 360/370 — from the labs to the field to the customer to the consumer, from the effect of IBM to the impact on the industry and society — it does provide a scholarly start.

GEORGE MCQUILKEN

AI for the masses

The Age of Intelligent Machines
By Raymond Kurzweil
The MIT Press, $39.95

Information systems managers interested only in the immediately practical side of computing should look elsewhere rather than wade through *The Age of Intelligent Machines*. But Kurzweil's 450-plus-page chronicle of artificial intelligence is not the college textbook it resembles.

Machines is provocative and entertaining reading. In witty, anecdotal style, Kurzweil follows AI through its philosophical origins and mathematical and mechanical roots, arriving at today's work on expert systems. The author predicts dates for future AI milestones and offers his vision of a society significantly changed by these advances.

Each section includes essays and stories from AI luminaries. Some are far afield, but on the whole, they enhance the thought-provoking quality of the book.

PETER SLATER

A door to open systems

Open Systems: A Business Strategy for the 1990s
By Pamela Gray
McGraw-Hill, $40.95

If your information systems department is pushing for open systems but is receiving no understanding from above, you might do well to slip a copy of *Open Systems* onto the boss' desk.

This book examines the importance and implications of open systems to the business community. In the first eight chapters, questions on who needs standards, types of standards and how they are created are answered, and Gray has kept the text simple and easy to read, given the weighty topic. The boss can stop reading at page 166. For the techies, the second half of the book delves more deeply into topics such as data handling, user interface and security.

ALAN J. RYAN

McQuilken, president of Codescope Corp. in Marblehead, Mass., is a former editor of the IBM Systems Journal. Slater is a Computerworld staff member. Ryan is a senior writer, features.

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Trucking

CONTINUED FROM PAGE 59

more cost-effective, says Helene Csvany, director of applications development at the company's Summit Information Systems subsidiary.

When a facility runs low and needs to order fuel, an operator at Roadway Express' Akron headquarters enters the facility's location number in a database on the company's IBM 3090 mainframe. The system immediately gives the most recent bids for an average of six vendors at each location.

In the bad old days of manual posting, Csvany says, the process was limited to two vendors for each location. Merely recording all the bid information took 12 hours per day.

Trucking companies that don't maintain an extensive network of refueling stations across the U.S. still need to get the best prices for diesel bought on the road. Leaseway Trucking in Beachwood, Ohio, keeps costs in check with a centralized road fuel purchasing system called Fuelbank.



J. B. Hunt's Sanderson: *When prices are high, manage fuel economy at the driver level*

"Fuelbank lets you control where and how much drivers can purchase," says Chris Wolfe, director of business IS at the multimillion dollar firm. "It helps keep waste and theft to a minimum."

With their Fuelbank credit cards, Leaseway's 10,000 drivers can buy fuel at a network of authorized truck stops equipped with point-of-sale devices that are tied into a third-party data collection system.

Fuelbank, which cost about $1 million to develop, has paid for itself, thanks to discounts achieved by purchasing road fuel in volume and to tighter controls over what drivers spend on their routes. Wolfe estimates that Fuelbank has trimmed overall road fuel costs by 10% and has also saved money by reducing theft, waste and accounting hassles.

More and more carriers are using on-board computers to zero in on drivers whose driving styles waste fuel and to assess differences between the fuel economy of individual trucks.

"When prices are high, you have to manage fuel economy at the driver level," Sanderson says. That's why his company uses on-board electronic monitors to determine the percentage of time drivers spend idling, speeding or going too slow, all of which waste fuel.

Moreover, at least 20% of the trucks in the U.S. now link these on-board monitors to satellite tracking systems, according to Ashok Boghani, a consultant at Arthur D. Little, Inc. in Cambridge, Mass.

"Every tenth of a mile per gallon gained in fuel economy is worth about $130,000 to $140,000 a month on our bottom line," Sanderson explains.

Schneider National, Inc., a truckload carrier in Green Bay, Wis., recently merged its on-board trip recorder technology with a Qualcomm, Inc. satellite system, says Dan Sellers, Schneider's vice president of IS. The company can monitor about 6,000 trucks and 7,500 drivers in real time.

Sellers noted Schneider has realized fuel savings ranging from 5% to 7% with the on-board recorders.

IS must keep on trucking

What-if planning may be the new wave of electronic decision-making, but so far, it has barely scratched the surface of the trucking industry.

Warren Powell, associate professor of civil engineering and operations research at Princeton University in Princeton, N.J., has developed Superspin, an optimization-based what-if planning tool to help companies minimize costs, including fuel. As fuel prices increase, this decision-making tool adjusts all costs of running a trucking company accordingly, including those associated with customer service and hauling empty trucks.

However, the real fuel savings, some industry watchers say, will come when trucking companies integrate these executive decision-making systems with logistics, tracking and dispatch systems.

Wiseman is a free-lance writer based in Watertown, Mass.

Shaping the future

"Fuel efficiency is a major force in truck shape, with growing emphasis on aerodynamic design," says Ron Glotzbach, director of engineering planning and support for Navistar International Transportation Corp., a truck manufacturer in Fort Wayne, Ind.

To create fuel-efficient truck designs, Navistar uses McDonnell Douglas Computer Systems Co.'s Unigraphics computer-aided design and manufacturing (CAD/CAM) software on a Digital Equipment Corp. VAX workstation. The truck cab must be a standard shape, but the CAD/CAM system lets Navistar add designer touches, including fuel-saving aerodynamic elements, to the basic model.

In the early 1970s, Glotzbach notes, a typical highway tractor trailer hauling 73,000 pounds at 55 miles per hour had a fuel efficiency of about 4.6 miles per gallon. Aerodynamic design has played a major role in increasing today's fuel efficiency to 7.8 miles per gallon.

So why aren't more trucks with sloping noses and wind-deflector panels out on the road? Fairings (aerodynamic structures) get in the way of service, and fitting an engine powerful enough to run a truck under an aerodynamically sloping cab front can be a problem, Glotzbach says.



Navistar's Glotzbach *looks for fuel efficiency*

"The challenge," he notes, "is to provide fuel efficiency and aerodynamic design while balancing customers' demands" for easily serviced trucks or ones that run a long time without service.

MANAGEMENT BRIEFS

Andersen taps two from competition

Andersen Consulting has lured consultants away from two competing firms to join its Information and Technology Strategy practice. **C. R. "Rudy" Puryear**, former national practice director at Nolan, Norton & Co.'s Chicago office, will head Andersen's information and technology strategy practice for the Americas region.

Tauno J. Metsisto, formerly a vice president at Index Group, Inc., will be based in Andersen Consulting's Boston office.

Cause, the association for the management of information technology in higher education, has announced two new papers offering contrasting views of **campus systems security** in its Professional Paper Series. "Information Security in Higher Education" highlights the importance of keeping campus systems secure, and "Open Access: A User Information System" argues for allowing campus users access to as much information as possible. Both papers are available for a fee from Cause, Suite 302E, 4840 Pearl East Circle, Boulder, Colo. 80301 (303) 449-4430.

The Center for Project Management has announced the launch of the **Project Management Consortium**, a cooperative effort to establish and maintain professional standards in IS project management training and methods. Modeled on the center's Education Consortium of 1980-85, the consortium will be open to a limited number of charter and full members. More information is available from The Center for Project Management, Suite 290, 18 Crow Canyon Court, San Ramon, Calif. 94583 (415) 837-0397.

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CIO careers more lucrative, but risky

BY CLINTON WILDER
CW STAFF

AMELIA ISLAND, Fla. — If you are a chief information officer, the good news is you can make more money during the next few years — perhaps more than you ever thought possible. The bad news is you are much more likely to get fired.

The rapid elevation of the information systems function has made the profession both more lucrative and more volatile, said Thomas J. Friel, a Menlo Park, Calif.-based managing partner at executive search firm Heidrick and Struggles, Inc. at *CIO* magazine's recent Perspectives conference.

Salaries for top IS talent have the potential to double or even triple over the next few years, Friel said, but executives may have to switch companies to attract them. "Insiders, many of whom have labored faithfully for years in IS, will not be automatically promoted," he said.

Many prominent IS executives have switched companies and industries during the past few months. In the most recent example that raised many eyebrows, Allan Ditchfield left MCI Communications Corp. for the top IS job at Cleveland-based insurance company Progressive Corp. [CW, March 4].

What makes an IS superstar who can command the big bucks? According to Friel, the key is simply "leadership and the proven ability to use technology to make money."

Texas Instruments, Inc. IS Chief John W. White, who shared a career-oriented panel with Friel, had a slightly different view. He said the critical success factor is using information technology to reduce cycle times in product development, distribution logistics or virtually any business process.

White also contended that rotating through non-IS functions is an important path to successful IS leadership and should be done early in one's career. "I think you need to move around and develop a broader base of experience," he said.



TI's White: *"I think you need to move around and develop a broader base of experience"*

White spent his first eight years at TI on the technical product staff, left the company to work for four years at two computer services firms and then returned to TI as manager of information services in 1973.

Stuart R. L. Smith, head of IS in the chemicals and polymers division of ICI Ltd. in the UK, said he spent part of his career "trading blows with the British version of the Teamsters" in a factory line management position. "You shouldn't do it just for the exposure but to actually succeed and be promoted within that line function," he said.

Friel likened the ongoing evolution of IS management to that of financial management in U.S. companies since World War II. The chief financial officer position gradually evolved from nonexistent to the vice president level and then to the executive suite. Now, he noted, companies are required by the Securities and Exchange Commission to have the position as a signatory to financial statements, and the CFO job can be a path to chief executive officer.

Following the same pattern, Friel predicted that more CIOs will become CEOs in the years ahead. "Along with the trauma of increased pressure on CIOs, there is also the opportunity to move up and out of the position," he said. "For those who can adapt and make money by applying technology, the future is very bright indeed."

Concerned about the state of IS? Then join me in changing it.

–Robert V. Zimmerman,
Manager of Information Systems Technology,
California State Automobile Association

Once a year, I join the most forward-thinking IS managers in North America at ASM's Information Systems Conference to share ideas, talk about options and find solutions.

ASM's conference is built *by* IS people *for* IS people. It's designed for the professionals who make things happen. And it's backed by the association that's dedicated to the success of IS and its people.

As chairman of the committee that put this year's conference together, I'm personally committed to ensuring that the conference provides you with the information you need to become a force to be reckoned with in your company.

This year's conference features a dynamic program that includes more than 35 world-class presenters, including three keynote speakers: **Bruce Rogow** of The Gartner Group, **Michael Hammer** of Hammer and Company, and **Rosabeth Moss Kanter** of the *Harvard Business Review*.

I would like to personally invite you to join me, ASM and 700 of your peers in Las Vegas, May 5-8, for the IS educational event of the year. It's not just another conference. It's four days of learning how you can innovate the application and direction of information technology to deliver results that support and define your business' objectives.

I'm confident that you'll leave Las Vegas feeling motivated, rededicated to your profession and armed with the answers you need for success in the '90s.

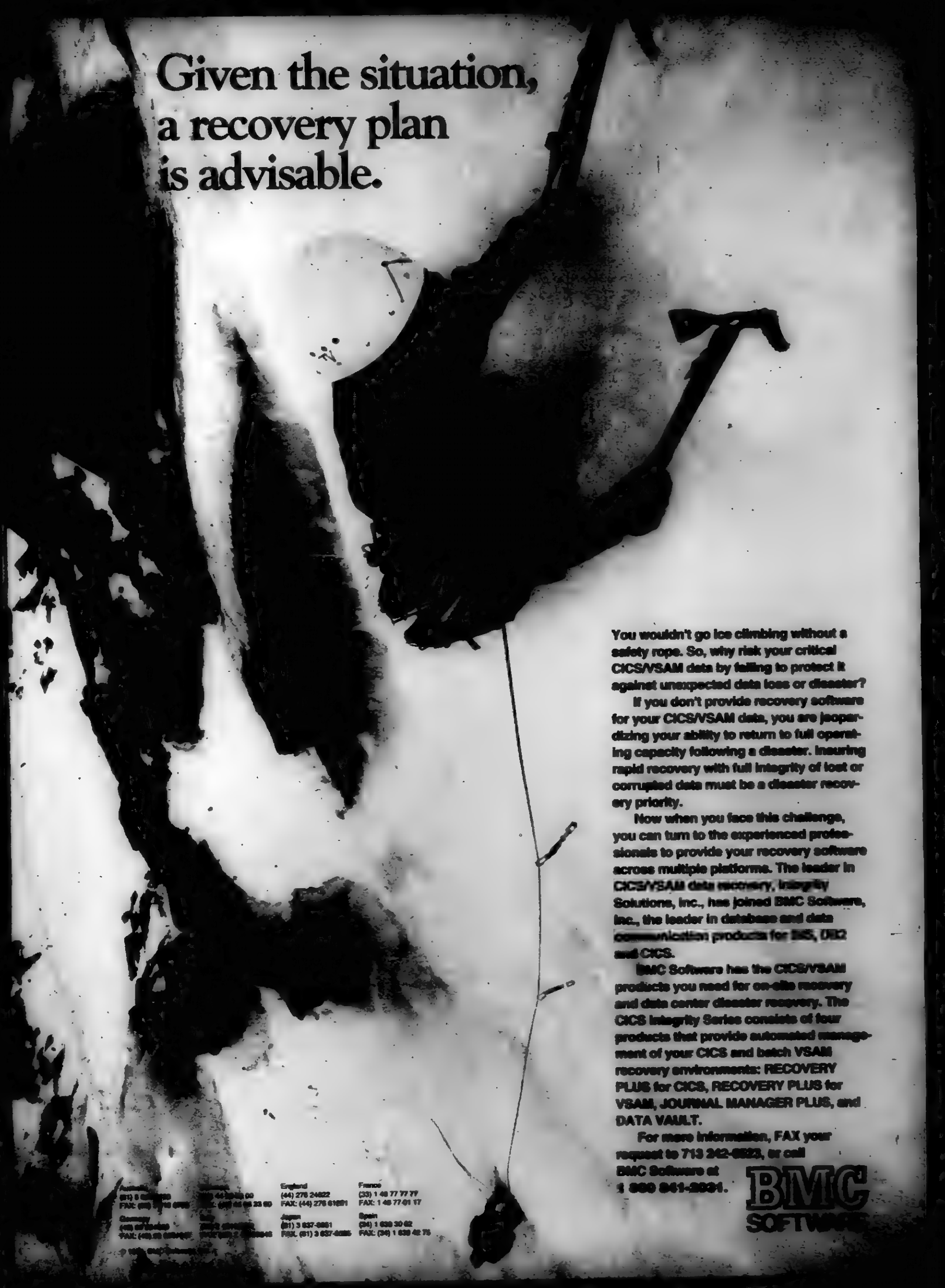
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Weather Service systems get mixed reviews

Expert panel praises technology but denounces implementation, management and cost

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — An independent panel of experts has given mixed reviews to the massive overhaul of the National Weather Service's forecasting systems, praising many of the technological underpinnings but urging stronger management and additional funding.

A committee of the National Research Council, an arm of the National Academy of Sciences, said it was favorably impressed with a prototype of the new Advanced Weather Interactive Processing System (AWIPS) but expressed concern over the "steady slippage" in its implementation schedule, now about two years behind original projections.

The 10-year, $3 billion effort combines and graphically displays weather observations from several sources and is the chief automated tool to be used by meteorologists at regional forecast offices. AWIPS is key to the Weather Service's effort to reduce labor costs by automating much of what forecasters currently do manually.

Staff reductions

The Weather Service hopes to reduce staffing at the forecast centers to a single meteorologist on the night shift. That plan assumes the meteorologist will concentrate on 12-hour forecasts during times of severe weather while the balance of the standard 48-hour forecast is produced automatically by supercomputers in Washington. The committee's report called that an "untested and questionable idea."

> SUPERCOMPUTERS are better than humans at processing the vast amounts of data needed for long-range forecasts, while people do a better job at short-term predictions.
>
> ELBERT W. FRIDAY
> NATIONAL WEATHER SERVICE

Weather Service director Elbert W. Friday agreed the concept needs to be tested. He said supercomputers are better than humans at processing the vast amounts of data needed for long-range forecasts, while people do a better job at short-term predictions, with the "crossover point" now at about 72 hours. He said that as weather models steadily improve, the crossover point is moving backward, and the Weather Service hopes to be able to rely on automated forecasts for 36 hours and beyond.

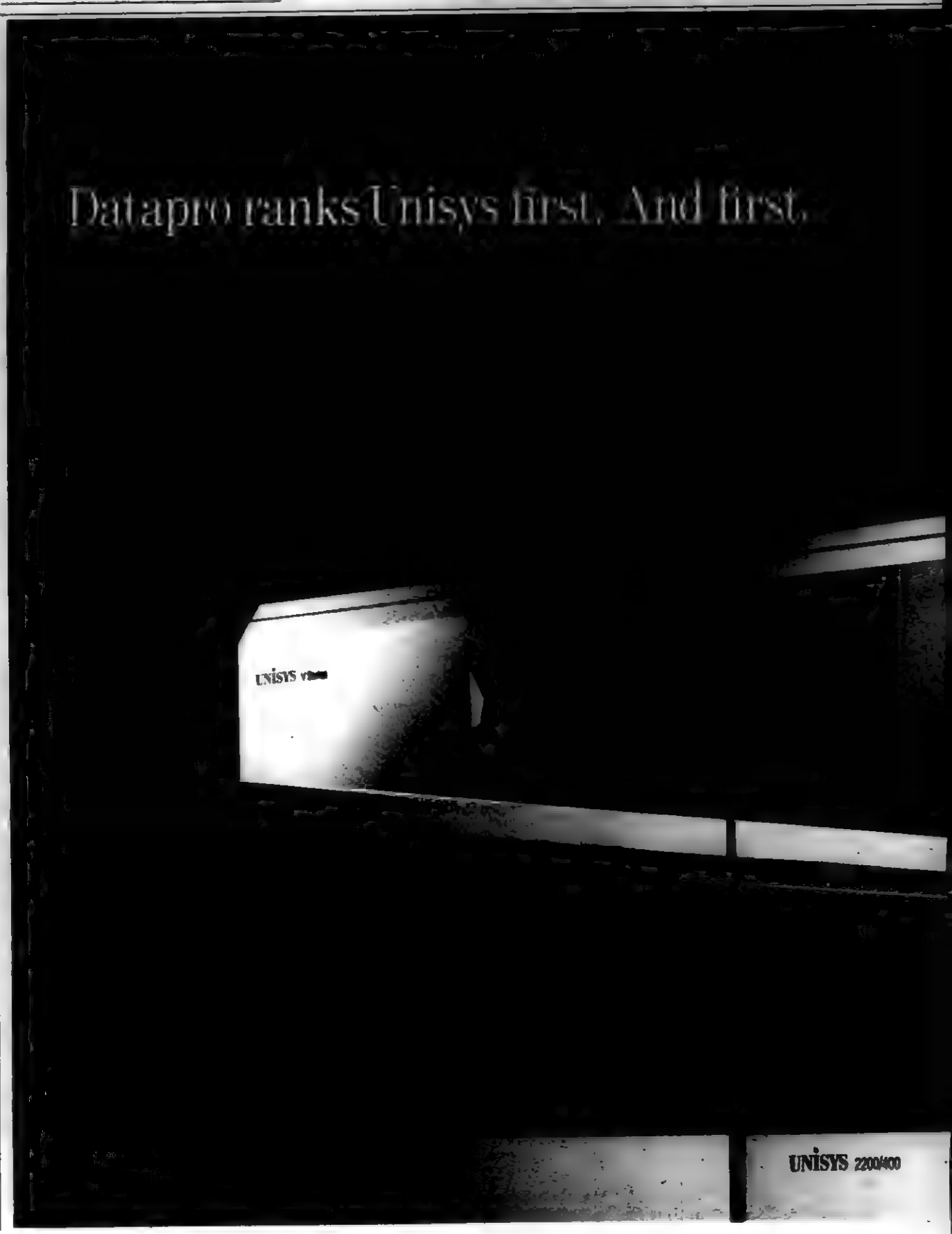
The panel praised the Next Generation Weather Radar (Nexrad) project for the reliability of its hardware — super-accurate Doppler radars — but said its software was flawed in its ability to detect and measure hail and to detect rapidly rotating storms that sometimes turn into tornadoes.

Excellent prospects

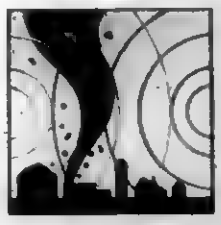
Testifying two weeks ago at a congressional hearing, Gary Castle, a senior official at the National Oceanic and Atmospheric Administration (NOAA) said, "The prospects for the Nexrad technology look excellent." However, he said, the Nexrad software contained substantial deficiencies, and the government was "seriously

Forecasting terms

- **Nexrad:** Next Generation Weather Radar, to be used by the National Weather Service, the Federal Aviation Administration and the U.S. Department of Defense, will replace 1950s-era radar with sophisticated Doppler units. Doppler radar units are able to measure precipitation and detect the rotational patterns of violent storms.
- **ASOS:** Automated Surface Observation Systems will automate the manual collection of surface weather data such as rainfall, temperature and wind speed through a nationwide network of smart sensors at airports and elsewhere.
- **GOES Next:** The next generation of Geostationary Operational Environmental Satellites will offer several times greater resolution than existing satellites for precise tracking of severe weather.
- **AWIPS:** The nerve center of the regional forecasting offices, the Advanced Weather Interactive Processing System will integrate and display data from Nexrad, ASOS and GOES Next while providing interactive tools for preparing forecasts.



contemplating" termination of the contract with Nexrad contractor Unisys Corp. The National Weather Service is a unit of NOAA, which is part of the U.S. Department of Commerce.



"The Weather Service modernization effort continues to have very serious cost, performance and schedule problems," said Commerce Department inspector general Frank DeGeorge, who also testified at the hearing. He said the project is likely to need at least $500 million more than is now budgeted.

It may be a bargain even at that price. Independent studies have estimated that more accurate and timely forecasts could save the U.S. billions of dollars annually in damage to property and crops.

Rep. James H. Scheuer (D-N.Y.) said the Weather Service should not be blamed for all the delays in the modernization program. He said the Office of Management and Budget had halted portions of the project several times and had cut funds for AWIPS to the point that it is out of phase with the rest of the modernization program.

The National Research Council committee also gave the Weather Service a mixed review for its implementation methods. It praised the service for employing a number of innovative procedures and said its use of prototyping and user involvement have reduced risk.

But the committee said it was concerned that project management, engineering and support staff "may not be as strong as required for an effort of this magnitude." It also said the Weather Service lacks overall plans and standards for configuration control and for the development and maintenance of complex software.

"We're taking this very seriously," Friday said. He agreed that management had been a little lean but was getting beefed up. He also said the Weather Service is increasingly turning to automated tools for help. A new project management system now keeps track of 10,000 tasks, a number he said will "multiply manyfold."



CALENDAR

APRIL 21-27

Adapso Management Conference. Miami, April 21-24 — Contact: Adapso Education Department, Arlington, Va. (703) 284-5302.

Electronic Funds Transfer Association Convention. Nashville, April 21-24 — Contact: EFTA, Alexandria, Va. (703) 548-8600.

Software Maintenance Annual Meeting & Conference. Philadelphia, April 21-24 — Contact: Robin Gross (707) 643-4423.

Computer Law Conference. Washington, D.C., April 22-23 — Contact: Barbara Fiser, Computer Law Association, Fairfax, Va. (703) 560-7747.

Decision Support and Executive Information Systems: A Managerial Perspective. Cambridge, Mass., April 22-23 — Contact: Decision Support Technology, Cambridge, Mass. (617) 354-6400.

APICS 1991 Manufacturing Principles and Practices Seminar. Orlando, Fla., April 23-24 — Contact: APICS, Falls Church, Va. (703) 237-8344.

Reverse Engineering Forum. St. Louis, April 23-24 — Contact: Donna Skaggs, Washington University, St. Louis, Mo. (314) 889-4556.

Unix Today. Atlanta, April 22-24 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

NCGA '91. Chicago, April 22-25 — Contact: Sharon Sutton, National Computer Graphics Association, Fairfax, Va. (703) 698-9600.

Unix C++. Washington, D.C., April 22-25 — Contact: Unisix Conference Office, El Toro, Calif. (714) 588-8640.

International Tools and Techniques Conference. Boston, April 22-26 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Mac, Inc.'s Spring Conference. Chicago, April 22-26 — Contact: Mac, Inc., Hedensburg, Md. (301) 699-8336.

Integrated Cell Processing '91. New York, April 23-25 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

Speech Tech '91. New York, April 23-25 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

EDI '91. Orlando, Fla., April 24-26 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

Interop '91. Miami, April 25-26 — Contact: Interop Events Coordinator, Interop, Inc., Coral Gables, Fla. (305) 446-5150.

APRIL 28 - MAY 4

Oracle & Sybase User Group Conference. San Jose, Calif., April 28-May 1 — Contact: ESUG '91, Sunnyvale, Calif. (408) 720-8231.

Bull Users Conference. Phoenix, April 28-May 1 — Contact: Bull Users Society, Cherry Hill, N.J. (609) 429-0775.

Human Resource Systems Professionals Conference. Chicago, April 28-May 1 — Contact: The Association of Human Resource Systems Professionals, Dallas, Texas (214) 661-3727.

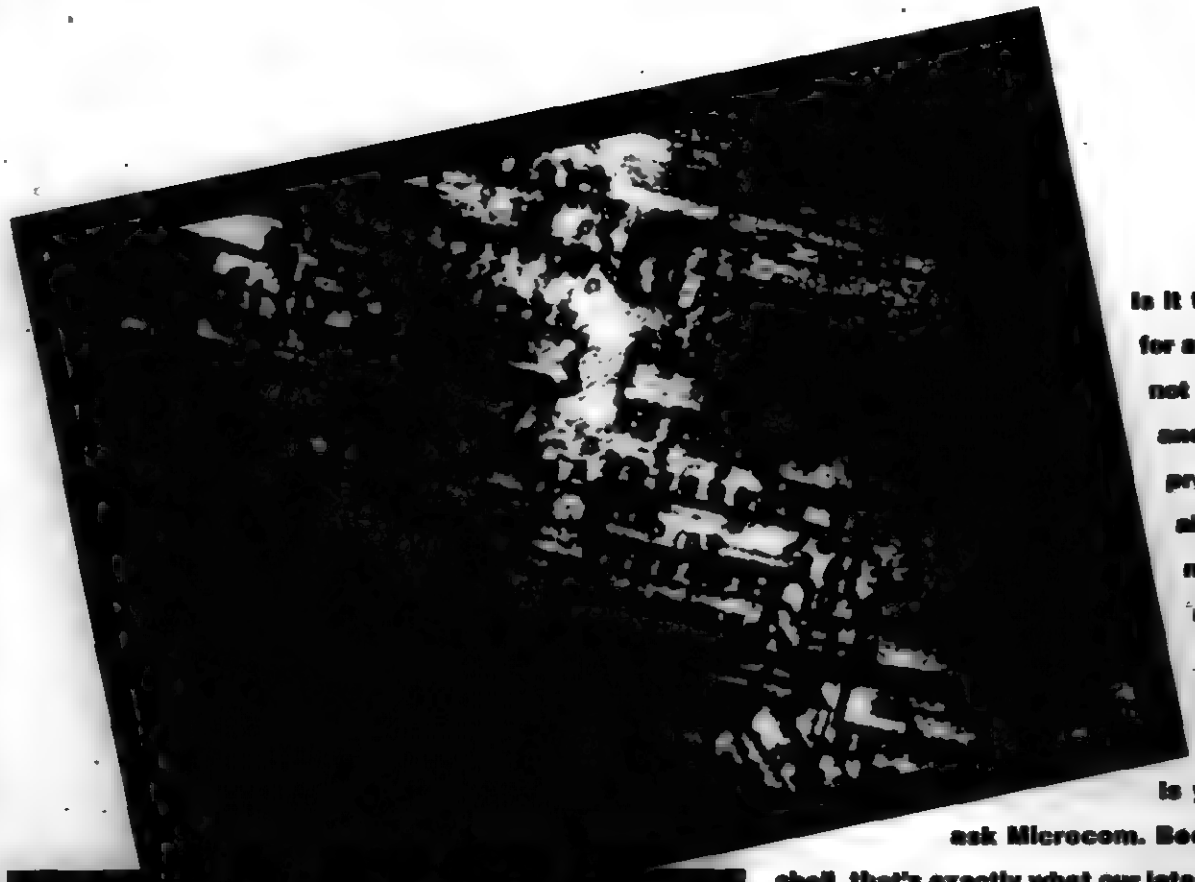
International Languages Conference. San Francisco, April 28-May 1 — Contact: Berlitz International, Santa Valley, Calif. (408) 439-1619.

Human Factors in Computing Systems (CHI '91). New Orleans, April 28-May 2 — Contact: Toni MacHaffie, Conference Administrator, (503) 591-1961.

Focus Users Group '91. Anaheim, Calif., April 28-May 3 — Contact: Rosemary Moore, Fuse, Inc., Marlboro, N.J. (201) 780-2185.

Downsizing the Corporate Information Systems. London, April 29-30 — Contact: Boston Systems Group, Boston, Mass. (617) 423-1670.

Association for Information and Image Management Show and Conference. Washington, D.C., April 29-May 2 — Contact: AIIM, Silver Spring, Md. (301) 587-8202.



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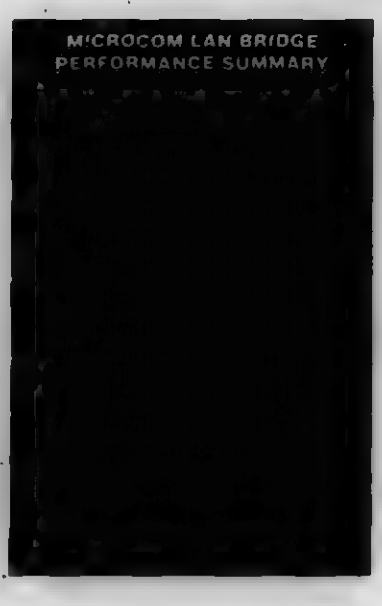
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INTEGRATION STRATEGIES

Linking LANs: Payoffs, pitfalls, pathways

BY JULIA KING
SPECIAL TO CW

If Pennsylvania Blue Shield hadn't moved to distributed data processing over a corporate LAN last August, network planner Mike Kinsey figures that he would probably have had to approach his boss two, maybe three, times by now seeking more money for additional mainframe memory. "The boss," Kinsey declares, "would have had me for lunch."

Today, Kinsey remains unconsumed. As for Blue Shield, the Camp Hill, Pa.-based health insurer has saved "hundreds of thousands" of dollars in mainframe upgrades. It has also achieved any-to-any connectivity across all of its diverse computing platforms.

The firm's reach now extends to state and national Blue Shield networks via wide-area links on its new token-ring local-area network.

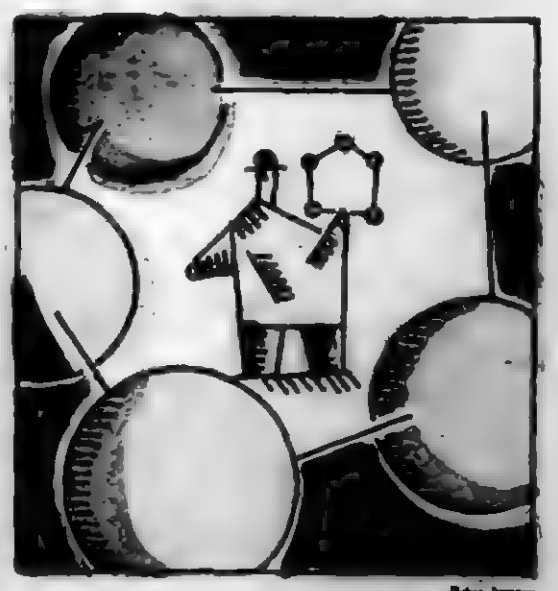
This level of network integration didn't come altogether effortlessly, however. First came turf wars with information systems personnel, who resisted the idea of spreading around centralized computing assets.

Next came the lengthy process of choosing a LAN operating system. Consensus among the separate IS groups that support the company's four business units was neither quickly nor easily won. Everyone wanted something different.

Then there were the battles with operating systems vendors, all of which wanted exclusive presence on Blue Shield's network.

"Banyan [Systems, Inc.], Novell, [Inc.] and 3Com [Corp.] — they all want to be the only game in town," Kinsey says. "They want you to go with their hardware, their software, their utilities. They have to come around to the idea that they can be only a piece of the corporation."

Blue Shield's experiences offer near-perfect textbook examples of the organizational and technical challenges of integrating LANs. They also illustrate some of the biggest payoffs — reduced costs and boosted efficiency — that most companies attain only after negotiating a number of common integration pitfalls.



Because of these pitfalls, experienced IS managers, vendors and consultants caution that organizations shouldn't expect to create a seamless communications infrastructure overnight.

Rather, experts say network integration is evolving slowly. For many, large-scale implementation will begin in three or four years, when more LAN-based applications software and more sophisticated network management tools are available.

"For the next five years at least, separate networks will exist unless something pretty thunderous happens," predicts Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass.

"LAN internetworks, which are typically separate from [IBM's] Systems Network Architecture networks, are being built but in a haphazard way with very little planning or coordination," she adds.

One reason for this is the lack of a unified architecture to allow everything to work together, says Jim Kennedy, vice president at the information industry practice of Booz, Allen & Hamilton in Washington, D.C. In its absence, "LAN integration is more hype than actuality," he says.

Still, there are users making integration efforts that are starting

Continued on page 69

Crucible forges strong links

LAN-to-WAN connection keeps steel moving and users smiling

INTEGRATING LOCAL-AREA NETWORKS

Crucible Service Centers

BY BARBARA FRANCETT
SPECIAL TO CW

Like any good company in the steel business, Crucible Service Centers, a specialty steel distributor, knows that saving small scraps can really add up.

Later this month, the Camillus, N.Y.-based firm will finish installing a new, multivendor LAN-to-WAN network at the last of its 18 U.S. sales and distribution sites. The integrated system has already shaved 36 seconds from the average order-entry response time, yielding an annual companywide savings of up to 35,360 hours, according to Ted Furtch, director of MIS.

"We've had big gains in speed and efficiency," says John P. Armbruster, district manager at the New England facility in Auburn, Mass., the second Crucible site to receive the new system. He reports a daily savings of between two and three hours.

Switching from an IBM 4361 host and on-site IBM 8100s lets Crucible distribution centers quickly share sales history, inventory and order-entry applications while still enjoying host access via an existing IBM Systems Network Architecture (SNA) wide-area network, Furtch says.

The new local-area network-based system, called XL-2000, includes AT&T Intel Corp. 80286-based desktop workstations linked to AT&T 33-MHz and 25-MHz file servers and Novell, Inc. Netware Version 2.15 running over unshielded twisted pair, all connected to an existing WAN (see details page 72).

Outdated environment

One of seven divisions of Crucible Materials Corp. headquartered in Solvay, N.Y., Crucible Service Centers nationwide were sharing an IBM 4361 host with the company's Specialty Metals Division. "It was always a distributed processing environment," Furtch says, but one badly in need of updating.

In the past, users often had to wait up to 40 seconds for their system to handle a transaction. Now, Furtch says, the average response time is between three and four seconds.

Those time savings add up to one hour per user per day, or about 680 work weeks per year.

Under the old system, inquiry and sales history reports were generated at a central site, then sent to the districts. "We wanted to do all order-entry tasks at the district level, including inventory, sales information, entering and processing orders and

Continued on page 72



Bob Mahoney

Crucible's Furtch: *LAN-to-WAN network saves 680 work weeks per year*

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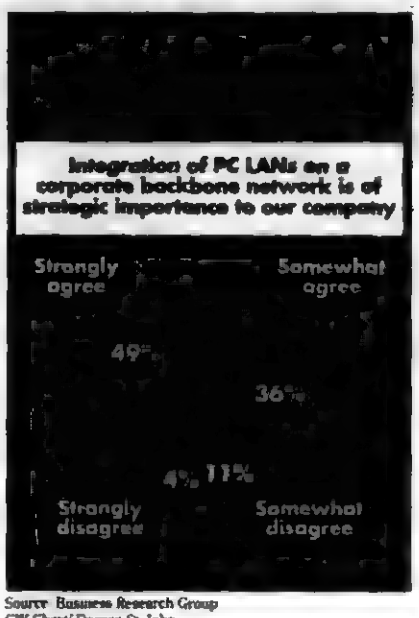
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PAYOFFS

Continued from page 67

to pay off in the form of cost savings, improved response times and shorter application development cycles.

One of these companies is Owens Corning Fiberglas Corp., which has tied together multiple Ethernet LANs and its IBM mainframe computers into a corporatewide token-ring network.



Source: Business Research Group
CW Chart: Doreen St. John

In doing so, the Toledo, Ohio-based company has eliminated the need for pricey front-end controllers and has cut overall network response time from six seconds to between one and two seconds, according to lead systems analyst Steve Poseler.

"Now that pretty much everything is LAN-attached, we're providing more information across more user platforms," Poseler says. In addition to applications such as electronic mail and word processing, application development has also been moved onto the network.

The ability to transfer applications and development tools from central IS departments to end users is a big benefit of network integration, says John Vicek, president of US Connect, a partnership of 16 regional network integrators.

The arrangement not only puts information in the hands of those who use it most frequently but also works to reduce application development time.

"The typical corporation has a three- to four-year backlog for application development," Vicek says. "You just don't have to wait three years to put in a LAN."

Once an integrated network is in place and software tools are made available, the expectation is that work groups will come up with their own applications, says Alex Nedzel, a senior manager at Ernst & Young in Cambridge, Mass. "You can think of LAN internetworking as an enabler of applications," he says. "An integrated network buys you the advantage of not having to justify the technology cost of every application opportunity."

Prime payoffs

At American Sterilizer Co. in Pittsburgh, MIS Director John Cianella counts better applications development among the chief payoffs of his company's integration work so far.

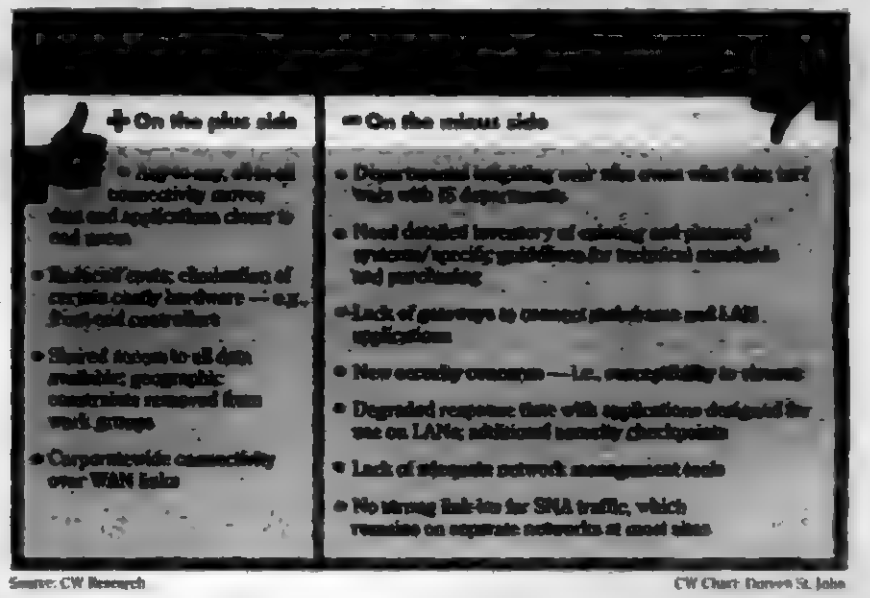
"What we have now is the ability to develop new applications without getting tied into the mainframe architecture," he says. "Applications are still developed by MIS and aren't turned out any faster, but they are better engineered."

Another advantage of network integration is the geographic freedom it allows work groups. For example, at Pacific Gas & Electric Co., LANs tied into wide-area facilities link more than 12,000 workers over a 90,000 sq-mile area. This allows people in different locations to work on the same project.

Moving computing resources closer to network-attached end-user workstations can also save money — a lot of it. Cianella says he was able to keep American Sterilizer's 1990 data processing costs at 1984 levels by converting traditional mainframe-based applications, such as accounting and payroll, to the network.

Cost pressures also prompted Columbia Pictures Entertainment in Burbank, Calif., to integrate its existing IBM, Wang Laboratories, Inc. and Digital Equipment Corp. workstations, says Charles Winning, manager of technical and network services. The company is now exploring wide-area network-to-LAN connections at other sites. •

King is a free-lance technology writer based in Ridley Park, Pa.



Source: CW Research
CW Chart: Doreen St. John

PITFALLS
Links: Trickier than you think

BY JULIA KING
SPECIAL TO CW

Don't be fooled: Incorporating local-area networks into your integration strategy can be only slightly easier than hand delivering every file yourself — and about as much fun.

Experienced users and consultants caution the naive that creating a successfully integrated LAN goes far beyond hooking into wide-area networks. There are many large pitfalls to beware:

• **Immature LAN software.** "One of the biggest problems is that software technology hasn't moved along to support certain LAN applications over a wide-area network," notes Art Beckman, manager of information technology services at Pacific Gas & Electric Co. (PG&E).

"A database designed for a file server on a 10M-byte LAN may be great for a small group," he says, "but if you put it out on a WAN, which can be a 9.6K bit/sec. to 56K bit/sec. line, it goes from being a great application to a poor response application."

Steve Poseler, a systems analyst at Owens Corning Fiberglas Corp., whose nationwide network contains some 70 LAN/WAN tie-ins, adds, "File-transfer applications, which tend to be large-volume traffic senders and receivers, especially bog down the network." Nevertheless, he says, "The trade-off is still there in terms of connectivity."

• **Bandwidth limitations.** Even within a building or campus, it's impossible to make high-speed connections between all LANs because the networks can operate at speeds from 9.6K to 10M bit/sec.

To minimize these problems, PG&E has established a LAN/WAN standards committee that has established LAN standards and purchasing guidelines for the company's various departments.

• **Lack of standardized mainframe gateways.** Even after physical network connection issues are addressed, there is a limit to the kinds of applications users can place on the network. This is primarily a result of the absence of standard gateways between LAN and mainframe operating systems.

At Pennsylvania Blue Shield, for example, LAN users lack an electronic mail capability because the E-mail software is mainframe-based. The company is now shopping for a LAN-based E-mail system as well as a means of linking it to the mainframe E-mail in place, says Mike Kinsey, a network planner at the insurer.

According to Howard Frank, chairman of Network Management, Inc., a Fairfax, Va.-based firm specializing in network integration, the nearly ubiquitous presence of mainframe-based software is one of the biggest obstacles to network integration.

"There is a giant amount of mainframe software around, and people just can't go off and redevelop it," Frank says. Just how long it will take before LANs are integrated at the application level remains uncertain, he adds.

In an effort to speed network-based applications, 24 corporate users with a collective installed base of some 2,500 servers and 75,000 network nodes recently formed the Network Applications Consortium.

• **Security fears.** Meanwhile, most users remain wary of placing traditional mainframe-generated applications on the network, even in environments where it is possible to do so today. And rightly so, according to Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass.

Built segment by segment around fairly rudimentary bridge and router technology, many of today's internetworks are "nowhere near as secure as they should be, nowhere near as managed as they should be and nowhere near as reliable as they should be," Hyland says.

"They are pretty flimsy and precarious — especially for individuals used to IBM mainframes, SNA networks and a hierarchical controlled environment," she adds. "To them, this stuff looks pretty green — pretty infantile, actually."

It should come as no surprise, then, that most IBM Systems Network Architecture (SNA) networks continue to operate separately, even at sites where long-term integration plans have been developed.

Here, a notable exception is The Travelers Corp. The Harford, Conn.-based insurance company said it intends to run SNA traffic as just another protocol on the corporatewide LAN it is implementing.

"The $64,000 question," Hyland says, "is will SNA change enough to carry LAN-to-LAN traffic, or will SNA traffic get integrated into LAN internetworks now being created?"

"Right now, most users can't accept that SNA will be folded in," says Harmut Burger, president of Electronic Data Systems Corp.'s technical infrastructure services, "but there's no question that folding in will come."

• **Lack of network management tools.** A big question mark is how tomorrow's integrated data highways will be managed. Despite claims to the contrary, users, analysts and systems integrators agree that no one network management system on the market can adequately monitor traffic, diagnose problems, correct errors and/or reconfigure around downed network nodes.

"Network management becomes real fierce in an integrated environment," says Joe Horvath, director of information management at Honeywell, Inc.'s homes and buildings business in Golden Valley, Minn.

Now that the company has tied together various departmental LANs and subnetworks over a facilitywide backbone, Horvath says, it is enlisting help from vendors for network management.

"No one vendor does it all today. We will probably wind up with two or three network management systems, which will have to talk to one another," he adds.

• **Politics.** "Organizational politics is a big problem, and in some cases, it's worse than the technical problems," says Jim Kennedy, vice president at the information industry practice of Booz, Allen & Hamilton in Washington, D.C.

"Typically, a department head puts in a LAN for his own department's needs. Then, because there is not good management and control capabilities, there's no good way to determine where a problem is. What results is finger pointing."

A chief information officer who has authority over standards goes a long way toward minimizing such problems, consultants, users and vendors agree. •

PATHWAYS

Do it yourself or order out?

BY JULIA KING
SPECIAL TO CW

So you've decided that the payoffs from better integrating your organization's local-area networks outweigh the possible headaches. Now you're ready for the next big question: Who's going to actually do the work?

The decision about whether to tackle LAN integration yourself or seek out one of several sources of outside help is one of the most important choices an information systems organization can make, according to veteran users and consultants.

Choices range from hardware and communications vendors to commercial systems integrators to specialized network integrators to regional integrators and even retailers.

Often, where a company buys its LAN hardware and software depends on the size of the organization. Large companies with offices scattered across the country tend to buy from suppliers with a national presence, most notably systems vendors.

If these firms are also looking for integration services, they often turn to the largest commercial integrators, such as Electronic Data Systems Corp. in Dallas and El Segundo, Calif.-based Computer Sciences Corp.

Although major integrators are not specialists in the LAN integration market per se, industry experts say their strength is in managing large-scale projects in the hundreds of millions of dollars range. Giant firms often subcontract out the LAN portion to smaller specialists.

Some consultants note that large commercial integrators offer an advantage over vendors such as IBM or AT&T because they are not likely to be as closely wedded to any one product line, although strong vendor alliances often do exist.

Other equipment and service options are value-added resellers such as Network Management, Inc. in Fairfax, Va., and Evernet Systems, Inc. in Los Angeles, which specialize in LANs and LAN/wide-area network integration but whose national presence is uneven.

A third choice is a partnership of local resellers, such as US Connect, which serves national accounts through a referral system. Recently, US Connect teamed up with Bell Atlantic Corp. to offer one-stop shopping for hardware, software and WAN transmission services.

Retailers such as Computerland Corp. and Businessland, Inc. offer yet another choice. But many corporate users seem to regard these outlets as having too little network expertise.

Businessland, for example, has had problems developing a nationwide support organization for LAN integration, says Jeff Kaplan, an analyst at The Ledgeway Group in Lexington, Mass. "There aren't a lot of people who know how to do this kind of integration."

Some IS shops simply don't trust any outsider with integrating their networks. "We do our own systems integration in our technical support department, and we're heavily invested in training our folks on staff," says John Cianella, an MIS director at American Sterilizer Co. whose staff includes two certified Novell, Inc. engineers.

Mike Kinsey, a network planner at Pennsylvania Blue Shield, says he will look for and listen to advice anywhere he can get it. "But when it comes to developing communication schemes, benchmarks and testing, we do it internally," he says. ●

Who you gonna call?

There's no shortage of help from LAN integrators, but each has its strengths and weaknesses

Suppliers	Strengths	Weaknesses
Systems vendors (IBM, DEC, etc.)	• Nationwide sales/service presence	• Prejudiced in favor of their own product lines — tendency to sell their own applications
Value-added resellers (NMI, Evernet, etc.)	• Network specialists	• Limited number of solutions • Uneven geographical coverage may be unacceptable to Fortune 500 users
Local reseller partnerships (US Connect)	• Emphasis on integrating LANs	• Tend to offer limited solutions • Uneven geographical coverage may be unacceptable to Fortune 500 users
National retailers (Businessland, Computerland, etc.)	• National presence • High-volume discounts	• Limited networking expertise • Better sales than service
Commercial systems integrators (EDS, CSC, Andersen, etc.)	• Experience and know-how in handling big integration projects • Strong in planning, analysis and software development, thanks to background in management consulting	• May have "mainframe mentality" — often subcontract out LAN portion of contracts • High-priced personnel • May not be into "lean and mean" paradigm that goes along with LANs

Source: CW Research

CW Chart: Doreen St. John

LANs help Allen-Bradley beat the clock

INTEGRATING LOCAL-AREA NETWORKS

Allen-Bradley

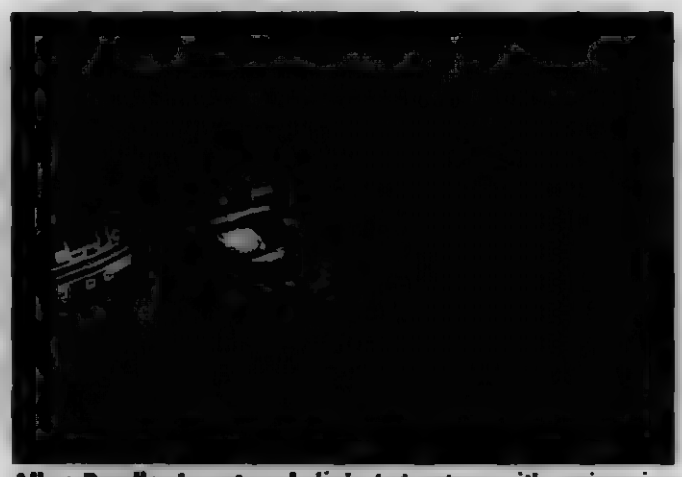
BY SUSAN R. NYKAMP
STAFF

Getting a product out the door fast is paramount in the electronics manufacturing industry. Milwaukee-based Allen-Bradley Co. is beating the time-to-market clock through aggressive integration of disparate work group local-area networks.

The company's Industrial Computer and Communications Group (ICCG) based in Highland Heights, Ohio, has linked heterogeneous LANs and tied them into a corporate mainframe to form an extensive computer-integrated manufacturing system.

"In this business, we have to introduce whole new generations of products every three years," says Joe Nemecek, the group's manager of technical computing services. A subsidiary of Rockwell International Corp., Allen-Bradley produces industrial control systems, including data acquisition, communications and quality management products.

The integrated network developed by ICCG encompasses Digital Equipment Corp. VMS systems, a variety of Unix workstations and DOS personal computers as well as Apple Computer, Inc. Macintoshes. That network ties into an IBM Enterprise System/9000 mainframe. The primary integration services are DEC's Network Applications Support software and IBM's Systems Network Architecture.



Allen-Bradley's network *links test systems with engineering and manufacturing to streamline product development*

Making connections

The network of LANs connects about 1,100 users in engineering, manufacturing and information systems groups at five locations. Another 200 connect directly through the mainframe.

The integration process started in 1983, linking systems in engineering, technical writing and quality assurance. In 1986, manufacturing systems were added, and by 1990, systems in marketing and customer support were integrated.

One result of the integration process has been a dramatic boost in manufacturing efficiency, according to company officials. For example, assembly time for printed circuit boards was cut from 15 days to three, and completion of engineering changes was cut from between one and three weeks to between two and three hours.

Interestingly, engineering and manufacturing — not IS — were the driving forces behind the LAN integration project.

"Engineering and manufacturing had the greatest need to integrate," explains Jeff Kent, manager of technical computing and design services. Since 1983, Kent's group has invested more than $1 million in the integration effort.

The need to expand the integration effort became clear last April when the ICCG disbanded its four separate product development groups and set up cross-functional business and project [redacted].

"Users have demanded seamless integration," Kent says. "The integration effort was driven by the willingness of everyone involved to cooperate as a team. Otherwise, it wouldn't have worked."

Despite the large technical challenges, the main problems in the integration process have been those of data management. "We're struggling with how to control the distributed data and manage it," says Michael Krueger, manager of MIS.

So far, he says, the solution has been twofold: to establish local areas of responsibility for managing information and to put together a set of procedures, standards and common formats.

Looking down the road, one goal is to develop a point-of-use inventory system made possible by the enterprisewide network. The ICCG also hopes to cut product time to market by another 33% and to expand the network to strategic global markets, according to Kent. That plan includes letting suppliers link into the network to access product design data.

According to Nemecek, "In this business, the winner is whoever can get the newest functionality to market first." ●

Other Modems
Take You From A To B.
Literally.

[redacted] B

Continued from page 67

checking stock," Furtch says.

The major problem was that the IBM 8100s were geared toward batch data entry and couldn't keep up with business growth, he explains.

Heavy use was also a factor. A total of 136 district managers, merchandising managers and sales staff members generated 5,000 to 9,000 transactions daily, including customer orders, inventory adjustments, debits, credits, invoice corrections and mill orders, Furtch says.

To handle the new system design, Crucible called in systems integrator ERI, Inc. The firm, a value-added reseller for AT&T and Novell, recommended building a web of personal computer-based LANs to handle independent processing at remote sites via an SNA link to the mainframe at headquarters.

Crucible also considered hardware and operating systems options, including Digital Equipment Corp.'s platforms and IBM's Application System/400, Furtch says, before deciding "PCs would give us flexibility and the most bang for the buck."

After rejecting 25-MHz IBM Personal Computer servers as too slow and also rejecting OS/2, Crucible chose 33-MHz AT&T Workgroup System PCs, modems and data circuits. "We liked the idea of having one supplier for the remote sites," Furtch says.

The next big decision was the choice of LAN operating system. The group looked at AT&T's Unix System V with LAN Manager and Novell's System Fault Tolerant Netware Version 2.15.

"We considered Unix because of its C base and because communications might be easier," Furtch says, "but we decided we wouldn't gain anything by going to an unfamiliar operating system." Performance was the determining factor.

"My philosophy is: 'Speed kills — your competition,'" Furtch explains. "We benchmarked both, and at the time, Unix's response time just wasn't good enough."

Close-up

Organization: Crucible Service Centers
Goal: Speed sales and distribution of specialty steel products.
Strategy: Link 18 sites nationwide via integrated LAN-to-WAN.
Payoff: Savings of 35,360 user hours per year.

For the WAN, studies by Crucible and ERI showed that SNA would be a better choice.

Implementation began Jan. 1, 1990. Crucible developed all applications and communications software and installed the equipment itself. "They wanted their people to know the network from the ground up," explains Jim Lahey, ERI field engineering supervisor.

All told, Crucible spent 1,200 hours in communications development and 2,000 hours on applications programming.

After nine months of developing and testing, the first installation took place in Rochester, N.Y. The largest site, in Chicago, received 21 PC workstations. The other sites received between three and 15 PCs.

LAN plan key

A key part of the LAN plan was to install and integrate the new system incrementally. "When you're rewriting everything, a modular approach doesn't affect the business," Furtch says. During the process, the IBM 8100 network and the new system were bridged together.

One PC in each location handles communications, while the 8100 handles batch processing. Keeping the 8100s lets Crucible stagger installation, training and testing.

Besides faster response time, the LAN-based system lets users call up customer sales history at local sites, improving customer service and planning. Users can now enter orders, check stock and track orders.

In addition, searches can now be done by customer, product name and part description.

Executives benefit, too, according to Furtch. A vice president of sales in Chicago now gets applications programs for inventory control and monitoring. "We can pass data to him through this system for his analytical work," Furtch says.

For now, ERI is handling upgrade questions and assisting in trouble-shooting. Eventually, a third-party maintenance firm will take over.

Mainframe databases are already being ported to the LAN, and the next step will be to tie in warehouse inventory systems.

"We like to control our own destiny," Furtch explains.

"With PCs, we can do that; we're not at the mercy of the suppliers. We can modify applications as we please." •

Prancett is a free-lance writer based in Bloomfield, N.J.

Tech specs

Crucible's desktop workstations are AT&T 286-EL systems with IBM Video Graphics Array monitors. These are linked to AT&T 33-MHz file servers at 13 sites and 25-MHz file servers at four other sites.

The LAN cabling topology is Starlan 10 — Ethernet over unshielded twisted-pair wiring. Novell's Netware Version 2.15 serves as the LAN's operating system.

A gateway from Network Software Associates, Inc. connects local sites to a WAN.

Communications to the mainframe are handled by the LU6.2 protocol running on top of IBM's SNA.

The protocol permits Advanced Program-to-Program Communications for PCs so file servers can work over SNA lines.

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A

Japan slow to follow path to promised LAN

COMPUTERWORLD JAPAN

TOKYO — The only hint of action in the young local-area networking world in Japan is in LAN integration, thanks to a wide variation in personal computers and software.

Most Japanese information systems departments look for a LAN vendor with a complete product line, including various connectivity tools such as routers and bridges, a backbone such as Fiber Distributed Data Interface and network management software. Most integrators help with design, consulting, service, maintenance and training.

The Japanese attitude contrasts with the attitude of many U.S. information systems departments, which often have the experience and expertise to choose, implement and integrate LAN systems themselves.

The low interest in LANs and LAN integration stems from the fact that most Japanese users and IS management personnel remain uninformed and unconvinced of the benefits of using LANs, industry observers say. The Japanese are thought to be three to five years behind the U.S. in their use of LANs.

The market research firm IDC Japan estimates that fewer than 2% of Japan's PCs and workstations are linked, compared with about 10% in the U.S.

Top Japanese LAN integrators include Software Research Associates, a well-known systems developer that specializes in Unix-based LANs, and Soliton Systems K.K., a joint venture with 3Com Corp.

Special software shortage

Multivendor connectivity is much more difficult in Japan for several reasons. Different protocols and machine codes require special software, and software engineers are in short supply. "Sneakernets" are still typical at many companies.

"Solutions here are very basic — just networking PCs to share resources such as printers and databases," says Martin Urban, managing director of the computer systems international section at AT&T Japan.

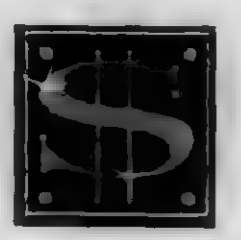
According to Junichi Saeki at Dataquest Japan Ltd., the installed base of LANs is still small and limited to advanced technology users such as automobile manufacturers and remote users of supercomputers. "Many customers are happy with office systems and don't see a need to move to a LAN," he says.

There have been other impediments to the growth of local-area networking here. Some barriers have been the same ones U.S. companies face: upper management resistance to IS spending, IS departments wanting to maintain centralized control and unsophisticated users.

Even so, observers say, distributed processing and end-user electronic communications will eventually spread in Japan.

"Since Japanese organizations are often 'bottom-up' systems, distributed processing is well suited to this style," says Naoko Munakata, a deputy director at Japan's Ministry of International Trade and Industry.

"This year is the beginning for LANs in Japan. LAN engineers are still very few, as are applications. But in the next two or three years, the number of engineers and applications will increase," Saeki says. •



TRW Environmental Safety Systems, Inc. in Fairfax, Va., has won a 10-year contract with the U.S. **Department of Energy** for systems engineering, development and management of a nuclear waste management system. The contract's value for the first six months is about $16 million. The value for the remainder of the contract has not been determined.

•

Late-paying taxpayers may find the Internal Revenue Service in even hotter pursuit following the completion of a $340 million automated collection system by **IBM's Federal Sector Division** in Gaithersburg, Md. Working as subcontractors will be **Andersen Consulting** and Houston-based **GC Services Corp.**, a systems integration and collections firm.

•

The National Cancer Institute awarded a five-year, $39 million contract to **Lockheed Integration Solutions Co.** in Sunnyvale, Calif. The institute's Advanced Scientific Computing Laboratory will be outfitted with an integrated, multivendor supercomputer system.

•

The New York City Department of Correction has named **Digital Equipment Corp.** a prime contractor to develop a system that will track telephone calls and commissary purchases made by 25,000 inmates in correction department facilities throughout the city's five boroughs. The five-year contract is worth $12.4 million. The system will combine VAX systems, networking software, telephones, private branch exchange switches, voice recognition and response units and custom software.

•

Federal courthouses nationwide will be able to communicate via a system of local-area networks connected to a wide-area network by a **Netrix Corp.** #1-ISS Integrated Switching System. Netrix procured the multimillion dollar, five-year project as a subcontractor to IBM.

•

The U.S. Army Communications-Electronics Command awarded **Serv-Air, Inc.** a $100 million contract to provide installation support services.

integrated support for UNIX UUCP, Kermit, Xmodem, and Ymodem protocols.

The T1600 also provides advanced password and callback security to prevent unauthorized access to your sensitive data.

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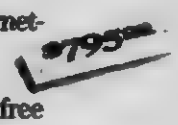
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The Data Communications Users Survey of August 1990 chose AT&T ACCUNET for Best Overall Satisfaction in Private Line Services.

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*Network Protection Capability option not available in all locations.

TYING IT TOGETHER

Kim Myhre

Buyer beware



Computer and communications manufacturers are now looking to customers for a new source of revenue: network integration products and services, including local-area network integration.

Their motivation is easy to understand: Vendors need to stabilize and/or supplement shrinking hardware margins.

They view network integration services as a "value add" that encourages vendor loyalty, generates incremental service revenue and creates opportunities for increased traditional product sales.

Unfortunately, few vendors claiming to be network integrators — including IBM — can currently provide complete connectivity and internetworking solutions.

The harsh reality is that many computer and communications vendors lack the resources, knowledge and experience to be full-scale network integrators.

Few vendors have the product portfolio needed to support complex technical requirements. Even fewer have the track record, project management skills and vertical industry expertise necessary to be true business solutions integrators.

As if these limitations were not enough, most computer and communications systems vendors have developed network integration strategies that focus on short-term sales and long-term customer account control. Less often do they reflect the actual requirements of their customers.

The general rule of thumb for integration projects undertaken by systems vendors is that 50% of the contract's value should represent off-the-shelf products, 25% should cover customized software/hardware development and 25% should represent project management, technical consulting, training and support.

The bottom line is: Many computer and communications vendors are likely to place their competitive needs above your network integration needs.

Can't have just one

In fairness, many vendors do, in fact, have excellent *proprietary* networking capabilities. But the cold truth is that few customers' internetworking requirements fit within a single vendor's approach. Even the promise of "standards" dulls in the face of a protracted and highly political development and deployment process..

So, it's fair to say that vendor claims of objectivity as network integrators are open to skepticism. By necessity, vendors must have a built-in bias toward their own products.

For example, while IBM will provide personal computer solutions, its financial objectives dictate that such solutions be designed to encourage larger systems sales. As an integrator, Apple Computer would probably prefer the opposite approach.

While the network integration business is very important to computer and communications systems vendors, they still need to learn a great deal to become effective service providers.

Some of their obstacles are technology- and product-related and will eventually fade. Other obstacles will require new and radical thinking about business partners and customers.

It sounds simple, but it's true: What makes sense for the vendor doesn't necessarily make sense for you — especially if you are working in a multivendor environment. This may be even more true in network integration.

For now, caveat emptor. •

Myhre is senior vice president at International Data Corp. in Framingham, Mass.

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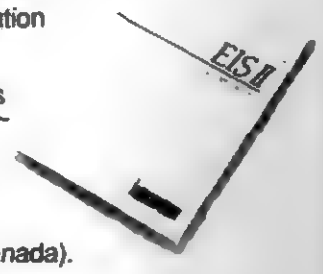
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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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F.Y.I.

Tools, money and technology are big concerns for managers contemplating the integration of separate information systems into an interoperable network.

Those are among the conclusions of a new study of 259 executives at Fortune 1,000 companies conducted by Business Research Group in Cambridge, Mass.

Asked to name the major problems in developing an interoperable network, 33% of the executives cited "lack of an effective network management tool," 30% cited the "high initial investment required," and 25% pointed to rapidly changing technology.

The two services most commonly shared now on a backbone network are central databases and electronic mail, 86% of the respondents reported.

Twenty-six percent of the respondents said that within two years their systems consolidation efforts will include simplifying data management, 22% said they will create common databases, and 20% said they will create a shared backbone network.

Teamwork takes work

Self-directed IS groups can collapse management layers and increase staff effectiveness, but they can also rock the boat if not eased in correctly

BY CAROL A. NORMAN
AND ROBERT A. ZAWACKI

Ask information systems managers whether they believe their organizations can have employee-to-supervisor ratios of 40 to 1, and chances are they'll say, "Impossible! Service quality will suffer! How can I have this ratio and add value to the business, which is what the CEO wants me to do?"

IS managers can have it all — quality service, added value and a leaner management layer — but it requires a management philosophy that encourages taking risks and empowering people as well as an organizational structure that puts that philosophy into practice.

IS groups in certain large companies are experimenting with the use of self-directed work groups, a team management approach that gives IS individuals the skills to handle change and make better business and technology decisions. Because they broaden their expertise, these IS individuals become more productive, motivated and satisfied with their jobs.

While still in pilot stages at most firms, self-directed work groups have the potential to improve IS effectiveness throughout a company. Because team members are expected to manage, evaluate and improve the group's work environment, IS staff members such as programmers and systems analysts learn skills that can ease interactions with business units and ensure effective system implementations.

For example, a systems analyst who has been trained in negotiation and conflict resolution would have not only the technical expertise to deliver a program but also the change management skills that are needed to make its implementation palatable to business users.

Who does what?

Unlike a traditional organizational setup in which a supervisor is the prime decision-maker, self-directed groups typically spread the decision-making among individual team members.

The IS manager of old becomes a team consultant or a team member, or he leaves the group or company (see story page 78). Manager attrition and turnover during the life of the work group account for much of the cuts in management salary overhead.

As a consultant, this person acts primarily as a group facilitator and team mentor as well as coordinator working with leaders in traditionally managed groups. For example, he may be called in by the group to give his opinion on a potential hire or advise a group member contemplating a move from maintenance into software development or a business unit.

The team then becomes responsible for scheduling work, vacation and leaves, negotiating task assignments, training, hiring replacements and appraising individuals' performance (see story page 78). Each team member is empowered to make commitments for which the entire team is accountable.



Pam O'Neill

Less trial and error

For new IS staff members, the group can shorten the company policy and technology learning curve. A mentor can guide the new members through the intricacies of the organization as well as tell them who the IS experts are for questions on maintenance, networks and so on. There's less trial and error involved; the person becomes an effective part of the IS group more quickly.

Furthermore, broadening an IS individual's responsibilities fulfills his high need for achievement and enables him to value his work more. In fact, with the kinds of nontechnical decision-making skills developed in this participatory management setup, team members are likely candidates for leadership roles in traditionally managed groups.

Self-directed work groups are not the latest quick fix or *One Minute Manager*. They are usually part of a hybrid company — one in which the majority of groups (and thinking) are hierarchical. Many self-directed work groups take years to reach maturity, with only about 75% of pilot projects ever getting that far. Twenty-five percent fail or are on their way to failure because they lack the vision, planning and staff buy-in vital to their existence.

Fall short on any one of these elements and the consequences are not good. One IS self-directed work group pilot, for instance, had top management behind it and support from employees but no business unit acceptance. That work group is no longer functioning.

All involved in the project must understand that while the concept of self-directed

Continued on page 78

Norman is a principal systems specialist in the customer support group at Digital Equipment Corp. in Colorado Springs and a member of a self-directed work group. Zawacki is a professor of management and international business at the University of Colorado in Colorado Springs.

Tips for teams

- Believe that people want and enjoy meaningful work and will work hard to accomplish worthwhile goals
- Continually measure individual and business unit satisfaction with the self-directed work group
- Provide timely feedback for the group and individuals
- Outline a clear career growth path for team members and those who choose not to participate
- Be prepared to be in it for the long haul; these groups take time to reach maturity
- Expect your training budget to double

Continued from page 77

IS work groups is attractive, it is not one without costs. Expect, for example, to double your IS training budget in the first 12 to 18 months as team members come up to speed on the duties once relegated to the former group supervisor. Furthermore, the majority of these costs will not go to technological training but to "soft" management-type courses.

Hard to get used to

Self-directed work groups will also take their toll on employees. Some staff members will not get used to the fluid makeup of such groups and will quit or move on to more structured environments within the organization.

Getting self-directed work groups to work takes work.

IS managers and group consultants must help employees understand that a self-directed work group is a risky proposition and that they may become frustrated. For those individuals unable to handle this pressure, IS must ensure the existence of "safety nets" — feedback mechanisms and clear career options — to make the risk less threatening.

Feedback is solicited from team members as well as the business organization at large. IS measures satisfaction with the work group through questionnaires in which work group individuals rate satisfaction with each other and their consultant (see story below).

Business units also get into the act by rating such service staples as reliability, responsiveness, competence, access, courtesy, communications, credibility, security and understanding of the business unit. These assessments happen throughout the life of the self-directed work group — typically at inception, six months, 12 months, 18 months and so on.

IS group feedback is gathered at a group review process that occurs every 30 days. The group uses these review sessions to assess team effectiveness and job satisfaction. Individual performance appraisals and feedback happen on a yearly basis (see story bottom). If a performance improvement program is in place for an individual, feedback can occur every 60 days.

Career motivation

Along with feedback, a clear career path has been found to be a primary motivator for IS professionals. That's why organizations with self-directed IS work groups on their minds need to ensure they have a career track in place. Because the upshot of these groups is a reduction in management layers, the business management track may not be as viable an option as it once was. A technology track must exist that delineates the technical, business and management competencies needed to move from position to position in IS.

This track usually contains levels that are roughly comparable in salary and status to the traditional business management track.

When implemented correctly, self-directed work groups have tremendous potential. They can increase team productivity while increasing employee satisfaction and developing leadership skills; heighten technical preparedness for new products, services and business; increase IS service quality to business units; treat team members as major contributors in the process; and develop a successful self-directed work group model that can be applied to other aspects of the business.

These are benefits your chief executive officer can relate to. ●

Self-directed leadership

In a traditional hierarchical IS department, managers are managers. They set goals and deadlines and give feedback to employees. In a self-directed work group, the leader's role evolves into that of counselor and consultant to the group.

"Egoless" leaders — ones who get their feelings of self worth not only from getting IS projects out the door but also from watching people develop into well-rounded individuals — make this change with minimal strain. They are able to hand job control to team members.

Not all traditional managers will be able to make this shift, however.

Leaders whose overriding motivators remain personal advancement and recognition either move into the hierarchical structures of other IS groups or leave.

Companies must provide career options to keep valuable employees for whom the work group option doesn't work. Taking a 'do this or die' controlling attitude will only serve to alienate prospective work group converts.

For good measure

Measuring satisfaction throughout the life of a self-directed work group provides an important gauge from which IS proponents can judge the health of the pilot group — and the company's perception of it.

The following are sample statements from questionnaires sent to work group participants and business units. Respondents' answers are based on a scale of 1 to 7, where 7 is the highest rating:

■ Business unit access to the IS team

There is access to someone in IS to solve technical problems

There is realistic response by IS to our business needs

■ Individual satisfaction with the team

My job requires a lot of cooperation with other people on the team

Coach and co-workers on this job almost never give feedback about how well I am doing in my work

■ Individual's satisfaction with team consultant

The degree of respect and fair treatment I receive from the consultant

The amount of support and guidance I receive from the consultant

Breaking appraisal tradition

Self-directed work groups take committee approach to reviews

BY ROBERT A. ZAWACKI AND CAROL A. NORMAN

One responsibility of self-directed work group members is to handle individual performance appraisals. While this is only one activity for the work group staff, it is indicative of the scope of skills each member of the group acquires.

We're all familiar with the traditional review — a once-per-year meeting with an information systems superior who tells you what he thinks of your performance. Often, you walk away feeling as if you've been judged on ancient history or behavior you did not know was unacceptable.

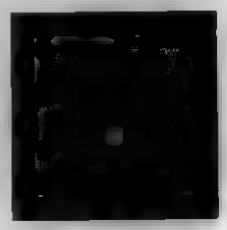
The self-directed work group, on the other hand, takes a committee approach to performance appraisals that relies on peer ratings and self-review (see story right). This kind of review more accurately appraises an individual's performance throughout the year and helps set an agenda for an individual's growth.

The effect these committee appraisals have on the individual is one of empowerment. The team member is involved in setting goals for himself and therefore feels in control of his career growth. Furthermore, as a member of the team, he can integrate his goals with team and organizational objectives, thus strengthening the entire company.

This process does have its drawbacks, however, the primary one being that it is time-consuming. Each team member needs to provide input into each performance evaluation on the team; if there are 40 team members spending an hour each on an evaluation, the process can take up to 40 team-hours in input alone.

It's also not uncommon for team members to feel uncomfortable writing their own appraisals, never mind being wary about rating their peers. This wariness may be well-founded because individuals are sometimes too lenient or too harsh in appraising others, especially if they have not been trained properly in the process.

Because of the free exchange of information that occurs, a poorly trained team can face peer disputes and competition. Its mandate, however, is to work out problems, going to the counselor only to break an impasse.



Yet the benefits outweigh — and even cancel out — the drawbacks a team can encounter.

The process is time-consuming, yes, but it taps the whole team as a source of performance appraisal instead of relying on one supervisor's perception of an individual's work. Therefore, the consultant (former supervisor) is free to spend more time mentoring team members and formulating team direction.

Because the performance appraisal comes from people who have worked closely with the individual, it is a more accurate judge of his talents and weaknesses. Trading time in return for a more effective evaluation is a trade-off many employees will make.

In fact, even though they take time to complete, performance appraisals are seldom late because the responsibility for completing the appraisal is on the individual's shoulders.

His own review will be based in part on contributions to the group. ●

Performance review

The information systems performance appraisal process proceeds as follows:

• **Job document in place.** A performance appraisal begins with a document put together by the work group that clearly outlines job descriptions, group expectations for individual behavior and requirements.

Requirements are used to identify activities that demonstrate job success, the criterion by which the group gauges employee performance. This ensures that the measurement of an employee's performance is rooted in job content.

• **First notice.** The IS group administrative assistant notifies the individual about the review by committee approximately 30 days before it occurs. The individual chooses a performance evaluation chairman, someone who is an advocate of the person's work.

• **To committee.** The review committee typically consists of the person to be reviewed, the performance evaluation chairman, the group's management consultant and at least two other randomly selected team members.

• **Group input.** The individual outlines for his IS team his accomplishments and training during the past year. Team members base their performance evaluation input on this information. The committee chairman collects comments and feedback from the group over two weeks. The individual receives and reviews a copy of the input.

• **Self evaluation.** Based on this feedback, the individual writes his own performance evaluation, which committee members review.

• **Discussions.** The committee meets with the individual to discuss the performance evaluation.

• **Summary.** The chairman writes a summary of the meeting, including any promotion or raise, if applicable. The completed evaluation document is signed and sent to human resources.

• **Goal setting.** The committee and individual formulate a development and job plan for the coming year.

NATIONAL BRIEFS

Relax, be happy

▶ IBM said last week that it was enhancing alternative work arrangements for employees. Employees will be able to receive full benefits for three years while working 20-30 hours per week, and they will now be able to work part-time beyond the previous three-year limit. A work-at-home program for part-time employees who cannot report to their normal locations was previously tested on a pilot basis at 13 locations and will be expanded nationwide.

Prime disclosure

▶ DR Holdings recently filed its annual report on Form 10-K for the fiscal year ended Dec. 31, 1990, indicating Prime Computer, Inc. had a net loss of $135,418 for 1990, compared with a net loss of $276,758 in 1989. Prime also showed an operating income of $82,234, up from a loss of $94,716 in '89.

Sequent squeeze

▶ Sequent Computer Systems, Inc. said last week that it will report a loss for the quarter ending March 29. Citing the slumping economy and the Persian Gulf war, company President Scott Gibson indicated the number of prospects for its high-end on-line transaction processing systems has been high, but "getting the business closed in this period of economic uncertainty has been a major challenge."

Ross cashing in

▶ Ross Systems, Inc. said it has filed a statement with the Securities and Exchange Commission for an initial public offering of stock. The company said it anticipates a price of $8 to $9.50 per share. The company supplies applications software and services to users of Digital Equipment Corp. computers.

Tektronix hunt

▶ As part of a corporate realignment, Tektronix, Inc. said it has formed a Computer Graphics Group comprising its network displays, graphics terminals and color printers groups. It expects to name an outsider to the post of vice president in charge of the group within two weeks. The company also groups various lines of business into the test and measurement group and the television systems group.

Firms save every drop of water — or else

BY JIM NASH
CW STAFF

If raindrops were bytes, you would not need a calculator's memory to store what has fallen throughout California in the past five years.

Despite last week's rains, at the drought-parched region's companies the topic of water — how to save it, where to find it, how to replace it — is quickly rising from maintenance shop discussions to boardroom debates.

Nowhere are the issues more pressing than among the California computer firms that have replaced environmentally suspect chemical-based manufacturing cleansers with water-based alternatives — and, ironically, are now being clobbered by the environment they acted to preserve.

Semiconductor and chip makers are re-using purified production water in the cooling towers of their heating and air-conditioning systems. Other firms are going further, institutionalizing conservation. One company has even appointed a "water czar."

"We've done everything we could with the toilets, water reuse and everything else," said Mike Johnson, facilities manager at Hewlett-Packard Co.'s 26-acre complex in Palo Alto, Calif. "We even looked at the way janitors mop floors. In the past, one janitor was responsible for cleaning a whole building section. Now we team up janitors." The change, he said, saves HP 1,000 gallons of water per week.

Sony Engineering and Manufacturing Company of America in San Diego also took Mother Nature's hint. "We've been working on this issue for two years," said Clint Michaelis, Sony's executive vice president. Sony expects to bring a water-recycling plant on-line this spring as part of a $3 million to $4 million capital investment program aimed at conservation, he said.

Hoping to recycle 10% to 25% of the 800,000 gallons Sony uses each day at its picture tube manufacturing plant, the company has given an employee the dry tongue-in-cheek title of water czar. Michaelis said the czar's conservation task, however, is very serious: San Diego is

Continued on page 83



Infrared photo *of HP's campus shows which spots need water*

IRS accuses Fujitsu units of tax fraud

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — The U.S. Internal Revenue Service has slapped a $64.1 million-dollar penalty tax on two U.S. subsidiaries of major Japanese *mainframe maker* Fujitsu Ltd., alleging they evaded taxes.



Fujitsu filed a protest in the U.S. Tax Court. "Fujitsu disputes the ruling and feels it is fairly setting the transfer price for computers and semiconductors," company spokesman Mike Bierne said. The transfer price is what one unit of Fujitsu charges another for a part or product: For example, the amount Fujitsu Microelectronics, Inc. or Fujitsu America, Inc., the two U.S. subsidiaries involved in the case, pay for products made by the parent company in Tokyo.

The IRS accused the two companies of falsifying income reports by paying unreasonably high prices for microchips from the parent, thus lowering their income. It also claimed that Fujitsu paid taxes on the items in Japan rather than in the U.S.

Such cases are not unusual between the U.S. government and Japanese companies, Bierne said. They arise from differences in interpreting the U.S./Japan tax agreement, which was created to avoid double taxation. The agreement provided that if the tax is paid in Japan, it need not be paid in the U.S. and vice versa. Other major Japanese computer vendors have also been tagged in [illegible].

Paid in Japan?

"The U.S. wants the tax paid there, but we feel we already paid it in Japan," Bierne said. "The dispute regards where the taxes should have been paid."

According to the IRS, Fujitsu America filed false returns by reporting a lower income. According to the U.S. tax authority, Fujitsu America owes $8.1 million in delinquent taxes in addition to another $19.7 million in late [illegible].

Fujitsu Microelectronics was accused of evading $14.4 million in taxes between 1980 and 1983. The IRS wants that amount plus a $21.9 million late fee, according to a Japanese press report confirmed by Fujitsu.

Bierne did not know when the company would know the outcome of its appeal.

Valigra is the Tokyo bureau chief for the IDG News Service.

Yet another British invasion, telecommunications style

BY ELLIS BOOKER
CW STAFF

SAN JOSE, Calif. — A new regulatory framework in the UK and the prospect of increased competition at home has prompted British Telecommunications PLC to begin an aggressive campaign for business in North America.

On March 31, British Telecommunications' two U.S. subsidiaries — the packet network company BT Tymnet, Inc. and the network equipment unit British Telecom, Inc. — were consolidated into a single organization. Dubbed BT North America, the 1,700-employee operation has a single sales/marketing service and support organization based here.

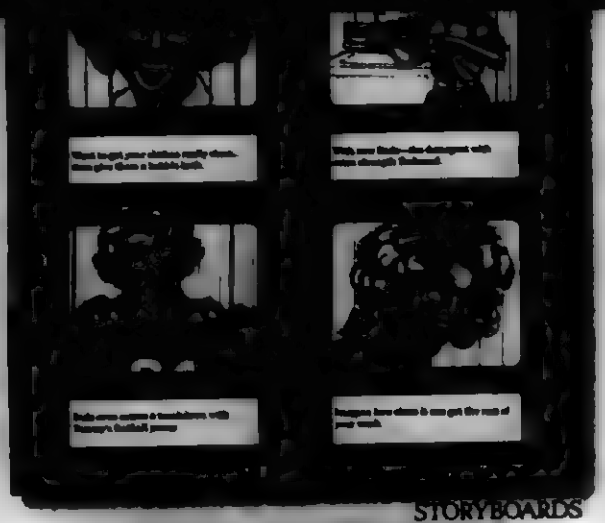
BT officials said late last month that it had always been their intention to merge the North American operations. But they also conceded that a prime cause for the reorganization, which began one year ago under the code name Sovereign, was the anticipated end of the two-company telecommunications infrastructure in the UK.

"This certainly was a factor," said Ron Bamberg, vice president of business development and planning at BT North America. "By definition, BT will face more competition in the home market."

BT, he added, is certainly preparing to protect its domestic market, but it also recognized it needed to build a stronger global operation.

North America, with its massive market for network equipment and services, was a key component of the global expansion strategy, Bamberg said. The estimated market in North America for value-added net-

Continued on page 81


STORYBOARDS


COLOR TRANSPARENCIES


COMPUTER GRAPHICS


FLAT OBJECTS


CAD/CAM/CAE SYSTEMS


PRINTED MATERIAL


ART


DESKTOP PUBLISHING

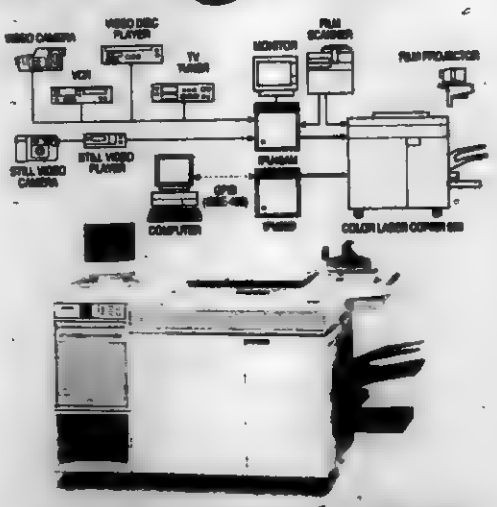

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INTERNATIONAL
BRIEFS

Sigma Unix R.I.P.

▶ The **Sigma project,** Japan's Unix-based answer to its shortage of computer programmers, is buckling under to international standards. According to a report in the Japanese business press, several participants in the project recently said it failed to attract widespread support in Japan, even though some 200 companies, including **IBM Japan Ltd.** and major Japanese computer companies, are involved in the effort. Instead, members have been flocking to international Unix standards such as those proposed by X/Open Consortium Ltd., the Open Software Foundation and Unix International, Inc.

I can't get no . . .

▶ An annual territorywide survey of hardware vendor performance has shown that **Hong Kong** users' confidence in their suppliers has eroded for the second straight year. In addition to a broad-based concern about pricing issues, the **1990 Customer Satisfaction Survey** conducted by Hong Kong-based research firm **Graham Mead Associates** indicates that users are less than enthusiastic about the performance of the people who sell and service the vendors' products.

British

CONTINUED FROM PAGE 79

work services is $600 million to $700 million, which includes revenue from customer premises equipment, value-added network services, transmission and applications.

Larry Cynar, an analyst at Dataquest, Inc., a market research firm in San Jose, said he expected the change would have little impact on customers. "As a provider of public networks, you want to be transparent," he said. "Users shouldn't have to worry where the equipment is or who services it."

Competitive pressure on BT started in the mid-1980s. Soon after the U.S. dismantled the Bell System in 1984, deregulatory winds swept through England, eliminating the monopoly BT had enjoyed.

Unlike AT&T, which faced a multiplicity of competitors, competition for BT was introduced in the form of a single provider: Mercury Communications PLC.

This duopoly of BT and Mercury was recently reviewed by the Office of Telecommunications (Oftel), the UK's analog to the Federal Communications Commission. Oftel's duopoly review, completed earlier this year, calls for effectively opening the market in the UK to domestic and foreign competition and gives BT more pricing flexibility.

The Tymnet packet data network, which was acquired from McDonnell Douglas Corp. in November 1989, was integrated with Managed Network Services, BT's domestic public network, last September. The resulting 4,500-node Tymnet Global Network offers protocol conversion, local-area network services, electronic data interchange and electronic messaging.

Trade groups lobby for chip pact

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The U.S. computer and semiconductor industries got their act together last October. Now they have taken it on the road to Capitol Hill, recently telling separate Senate and House panels why the U.S. should sign a new five-year semiconductor trade pact with Japan when the existing one expires in July.

The 1986 agreement with Japan has had limited success. While it largely ended Japanese dumping of semiconductors in the U.S., it failed by a wide margin in its goal to boost the foreign share of Japan's semiconductor market to 20%. Starting at a base of 8.5% in 1986, that share now stands at 13.5% with just four months remaining in the agreement.

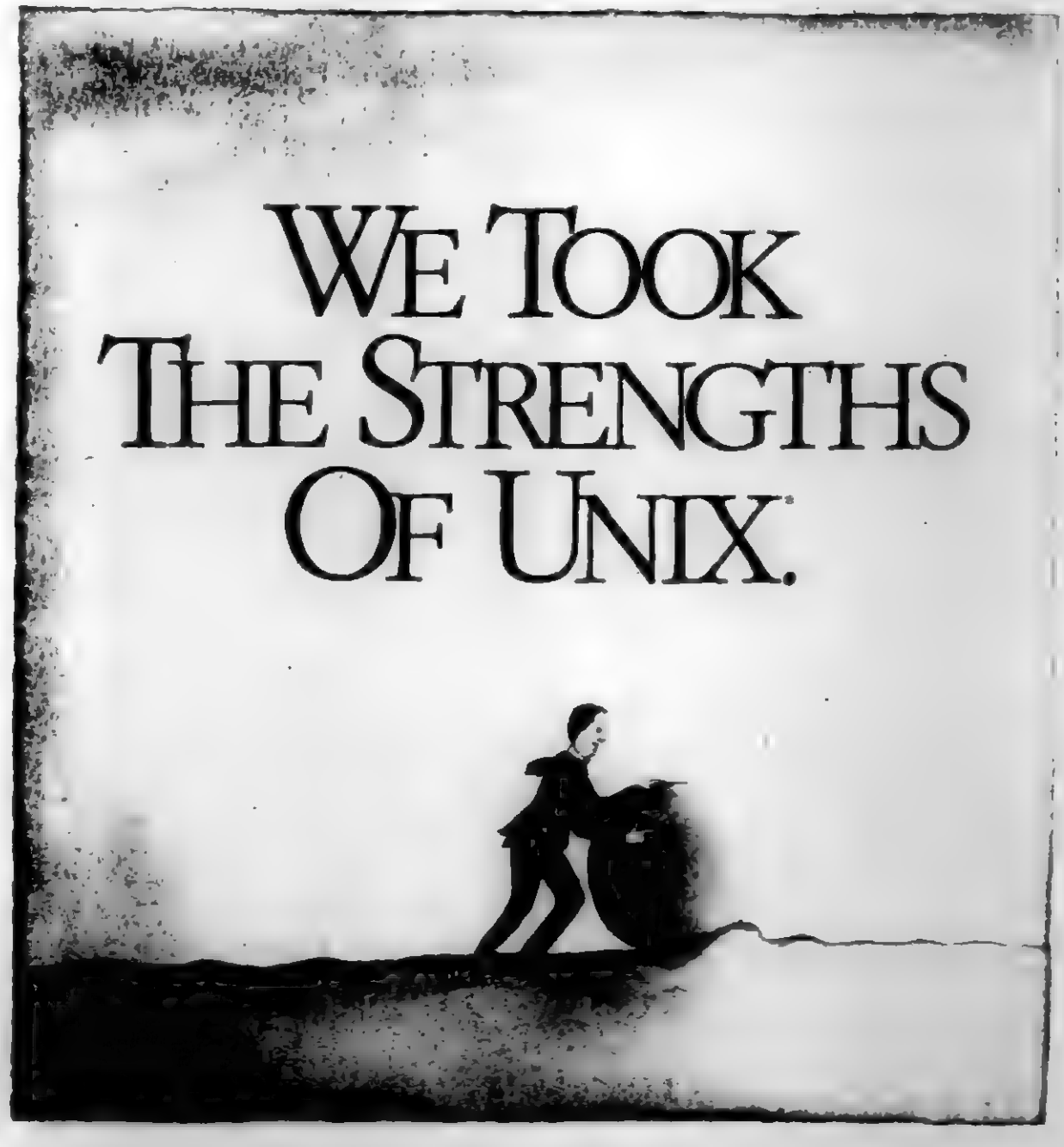
What is our share?

The U.S. enjoys a 12.6% share of the Japanese market. One percentage point is worth $200 million in annual sales and more than 1,000 U.S. semiconductor jobs, according to the Semiconductor Industry Association (SIA).

Representatives of the SIA and the Computer Systems Policy Project (CSPP) told trade panels of the Senate Finance and House Foreign Affairs committees that despite the mixed results of the 1986 agreement with Japan, the U.S. should press for a new agreement, stretching out the 20% goal until the end of 1992.

A new five-year pact should also include a reduced role for the U.S. government in determining dumping violations but should add a fast-track procedure for responding to dumping allegations by U.S. industry, the groups said.

The groups have not said what target, if any, should replace the 20% figure in the agreement after December 1992. However, at a press briefing here recently, Wilfred Corrigan, chief executive at LSI Logic Corp., said foreign suppliers ought to have at least a 30% share of the Japanese market by 1996.



Preserving the lifeblood of manufacturing

For Silicon Valley semiconductor companies, water is the lifeblood of the manufacturing process. This makes it hard to keep up a business-as-usual attitude as the region trudges through its fifth year of the worst drought in more than 10 decades.

The good news is that many of these firms have had water conservation policies in place for at least three years and claim to be ready for this year's mandatory water rationing program, which will cut back their water supply by as much as 35% in some cities.

The bad news is that many companies could face long-term cutbacks in new product developments to save water if the drought continues, according to experts.

"What is happening here is that companies that have been investing the capital for future products are now being forced to rethink their plans and take into consideration that they may have to cut back on production due to the drought," said Gary Burke, president of the Santa Clara County Manufacturer's Group, a public policy association formed in 1978.

Avoiding extremes

Santa Clara-based Vitesse Semiconductor Corp., however, is one of many companies taking measures to prevent having to go to that extreme.

At Vitesse, water conservation efforts include investments in education and about $500,000 worth of new equipment so far, according to facilities manager Mark Beck.

"These rations don't take us by surprise . . . I think we'll be able to meet the 35% reduction," Beck said, referring to the pending water rationing program that is expected to hit Santa Clara this spring.

Other semiconductor companies are also doing what they can to save water wherever possible.

For example, Intel Corp., also based in Santa Clara, has its own water treatment facility for recycling purposes. Water used in the chip manufacturing process is cleaned and reused in Intel's corporate air-conditioning cooling system in the corporate offices, a company spokesman said.

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Water

CONTINUED FROM PAGE 79

contemplating a mandatory 50% water rationing plan for this year.

In 1987, HP was using 55,000 gallons of water per day at its headquarters. Johnson said that amount had been reduced 32% by 1989. That year, executives received water-use reports daily. Satisfied that waste has been reduced to a practical minimum, reports are now issued monthly, he said.

Once-per-day monitoring is still in use at Unisys Corp.'s San Diego plant. The complex, according to John Boothman, semiconductor manufacturing and packaging site manager, uses 118 million gallons of water annually, 63% of which goes to wafer fabrication. Boothman said the facility is reclaiming 34 million gallons of water per year by pushing it through cooling towers after it has been used in wafer production.

Even combined with the 20 million gallons it is conserving at the spigot, Boothman said, Unisys is curbing consumption by 45%, 5% shy of the possible 50% ration. San Diego is considering fines that would double the cost of water used beyond the 50% limit the first month and triple it in the second month of excess.

If rationing is instituted and Unisys cannot conserve the last 5%, Boothman said, it could mean $306,000 in fines the first month and $460,000 every month thereafter. Unisys could log a new round of savings if it builds a proposed wastewater purification facility — a multimillion-dollar investment, Boothman said.

SAN DIEGO IS considering fines that would double the cost of water used beyond the 50% limit the first month and triple it in the second month of excess.

Silicon Valley governments are debating whether to move their call for voluntary conservation of 25% up to a mandatory 35% restriction. In San Jose, IBM opened a $5.7 million plant this month at its storage systems division designed to clean contaminated groundwater it pumps from under its 550-acre campus. About half of that water will be used in cooling towers, irrigation or, after further treatment, in disk assembly manufacturing, said June Andersen, manager of environmental programs at IBM in San Jose.

The remainder, about 400,000 gallons per day, will be pumped back down to the aquifer, Andersen explained. The new plant gives an extra brush to groundwater already being pumped and filtered to reduce the pollution caused years ago when IBM underground chemical vats leaked.

IBM expects no financial payback from the plant, Andersen said: "It's not supposed to be cost-effective."

Thought-provoking greenery

The majority of high-tech California companies, particularly those in Silicon Valley, put most of their water into their grounds. IBM rides the fence here, using water for its plum and walnut orchards. The orchards, which are the third largest in the entire Santa Clara Valley, are watered enough to keep them alive, but not enough to allow them to bear fruit.



David McLeroy, president of Green Leaf Landscape Management, Inc. in San Jose, said many Silicon Valley companies take more than mere pride in their landscapes. "The main industry here is brain power, not manufacturing," McLeroy said. "Fly over the valley and you see buildings that house people, not machines, that are generating research and development and software."

He said many residents believe the creativity in Silicon Valley is in part attributable to the environment. San Jose notwithstanding, "the area would have a Los Angeles look without the greenery," McLeroy said.

Mike Johnson, facilities manager at Hewlett-Packard Co., agreed. True, he said, the 1,100 individually cared-for trees on HP property are valued at $1.3 million; but more importantly, landscaping "allows people the freedom to be creative and to think."

In October, HP and two other valley companies took to the skies in an effort to water-efficiently preserve at least part of their grounds. HP, Tandem Computers, Inc. and Measurex Corp. chartered a plane to take infrared photos of their campuses.

Johnson said HP overlaid the photos on a computer-aided design mockup that showed each shrub and tree on the company's property. Yellowish areas on the color photos indicated flora in need of more water; red areas indicated adequate moisture.

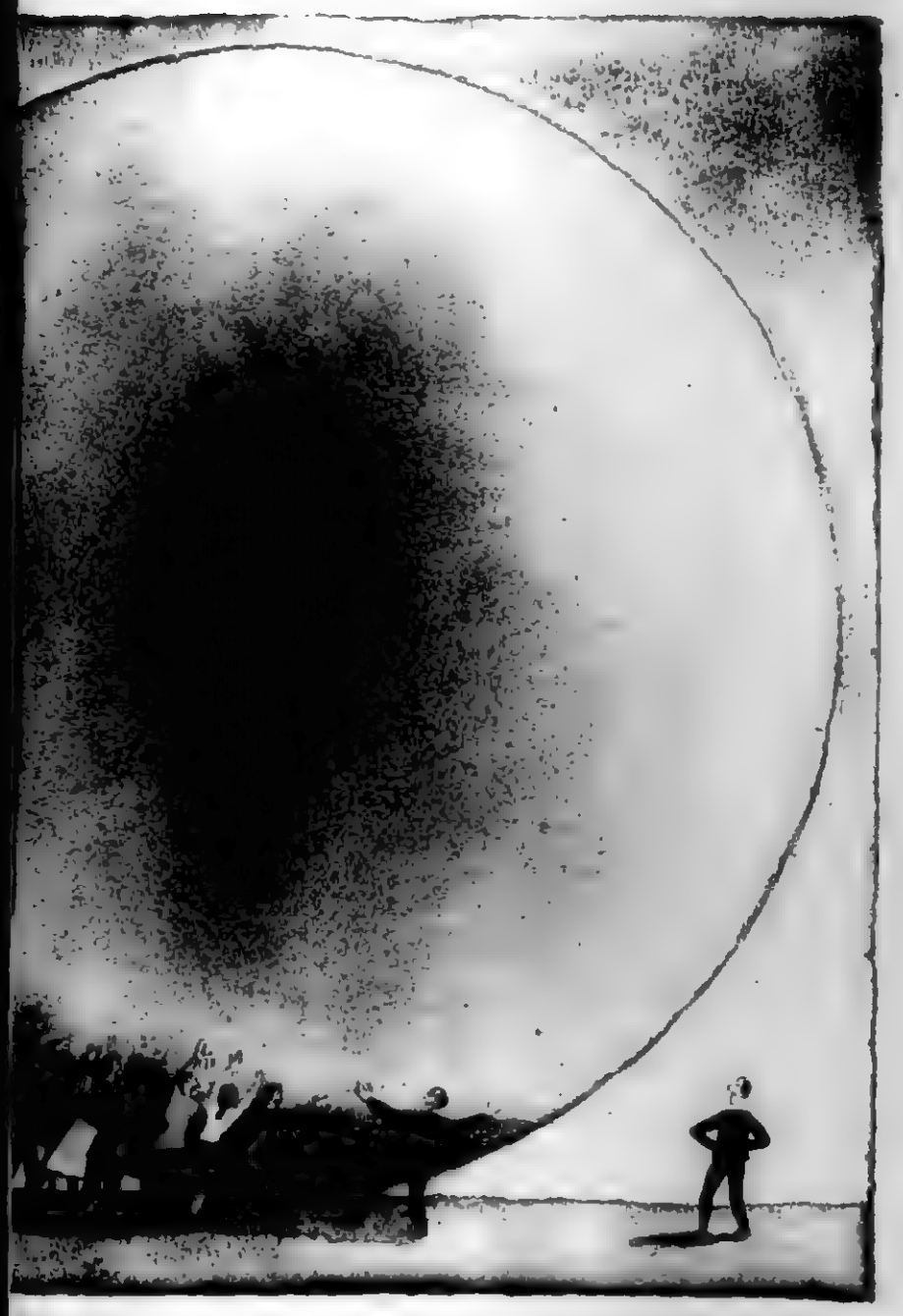
Using the photo/graphics map, HP can give its grounds keepers care instructions for specific trees, Johnson said. The company uses an HP 1000 running third-party software to turn drip irrigation on and off remotely to each of its tree banks.

HP is now setting up its own weather station to measure temperature, humidity and wind speed to better coordinate watering. Below-ground water sensors are on order.

If worse comes to worst, he said, HP will maintain as many trees and shrubs as possible, letting the fewest number die. In the meantime, the computer maker is planning more drought-resistant greenery using indigenous plants. Either way, he said, "HP is not going to have a desert."

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Managers must stay on their technical toes

Fast Track is a monthly column dedicated to answering questions on career directions.

BY ROBERT KLEVEN
SPECIAL TO CW

Q I have been in applications programming for 12 years and am now an information systems officer at a company that employs approximately 600 IS people. In the past, success in this field has been measured by the number of people one manages or by one's breadth of experiences. Yet recent trends seem to indicate that managers have to become more specialized. Does this mean that to continue to succeed, I must become more technical?

S.K.
Rutherford, N.J.

A The answer is yes. The industry is becoming more technical as the user community becomes more sophisticated and demanding. Rapidly changing technology will not make managers' jobs any easier. It will demand greater technical competence on their part. The positive aspect of this is that they will find themselves more employable and flexible in today's changing IS workplace.

Q I am an Air Force officer with an MBA and 10 years of military experience. Last year, I transferred into a job using minicomputers for flight simulation and developed an interest in a career in IS. I am now enrolled in a bachelor's program in computer science at a local college. If I leave the service, what would be the best way for me to enter IS?

T.L.
Benbrook, Texas

A Complete your BS degree and develop a resume that highlights your real-time programming experience. Then, apply to companies that can use your flight simulator experience or are in government systems product development. Don't resign from the service until you have tested the job market first because you probably will not be compensated at the level you have achieved as an officer with 10 years of service.

Q I have more than six years of experience in a very large IBM environment as a Cobol programmer/analyst with CICS and DB2 experience. I'd like to hear about the financial side of overseas contract assignments. Can it be a way to obtain more income?

Initials and town withheld

A The most promising area of opportunity right now is in the Middle East because of the postwar reconstruction. Find companies that will have a major role in rebuilding Kuwait. For example, Computer Sciences Corp. will be hiring contractors to rebuild the Kuwaiti government's IS infrastructure, and Andersen Consulting won a contract to restore facilities and systems at Kuwait Airways Corp. There are tax advantages to work in Kuwait — salaries are tax-free — but for more information, contact a certified public accountant.

Q I am a registered pharmacist looking to expand my career horizon. I worked five years at a retail pharmacy chain while I earned an MBA and then became a sales representative for a major pharmaceutical company. I am currently enrolled in a graduate computer and information science program. What would be some of the career options that would be available to me given my training and experience?

Initials and town withheld

A Finish your graduate program before attempting to secure very scarce entry-level positions in IS. Right now, a new grad in IS would be more economical to train than someone without a graduate's degree and who has been in the work force for more than five years. When you do complete your master's degree, target pharmaceutical or biotechnology firms.

Q I have been an independent consultant for the past three years. I currently bill about $100,000 per year. Can you enumerate the advantages and disadvantages of incorporation?

F.G.
Pineville, La.

A Upgrading to a corporation has the following disadvantages: There may be significant legal and other fees involved in formation; the corporation's activities are limited to those granted in its charter; it is subject to numerous regulations and requirements; it must secure permission from each state in which it wishes to operate; and its income is subject to two types of taxation rather than one.

The major advantage of a corporation is that legal liabilities are addressed to the corporation itself rather than to its owners. And unlike a partnership, a corporation can raise capital from a large number of investors through issuing bonds and stock. For more information, however, contact a tax adviser.

Q What are the best steps to take to climb the IS ladder? Is specialization or diversification best?

Initials and town withheld

A First and foremost, become knowledgeable about the business of the organization. Understanding what the business needs of the enterprise are and having the visionary capabilities to understand how technology — whether it be personal computers, minicomputers, mainframes, languages or whatever else — can be applied to the advancement of the business shortens the time it takes to climb the rungs more rapidly than any other single factor.

Kleven is the founder of Robert Kleven & Co. in Lexington, Mass.

We welcome your questions. Send them to Cathy Duffy, Careers Fast Track, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Your initials and town will be printed unless you request otherwise.

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SYSTEMS ANALYST wanted. Duties: conducting feasibility studies, requirement definitions & analysis, estimating time, cost, manpower resources & hardware configurations using tools & techniques unique to the Unisys LINC environment; submitting design proposals & LINC solutions to information system problems confronting businesses; development, testing & operation of systems so produced on Unisys mainframes (Unisys A, B and U series). Also responsible for converting existing or previous applications into LINC databases across software & vendors using advanced LINC features e.g. GUI, OFFLINE, NOFORMS, LINCUBER; developing LINC networks to interface with LINC & non-LINC qualified devices & communicate with other (non-Unisys) mainframes via CP2000; Analytical activities like database design, normalization & Optimization. Need a Bachelor's degree in Engineering or Computer Science & 2 yrs. exp. as a Systems Analyst or Programmer Analyst. 2 yrs of the related exp. must include using LINC software & 1 yr of exp must include working in LINC extensions & interfaces. The related exp. or 1 univ course must include using LDA, UDX, the LINC on-line & reports development environment, LINC networks database, LINC utilities, report routing techniques, analyzing LINC logs, COBOL/DMSII & the DASD generated by LINC code, ICC intercom, WFL, general A series environment, CUBIX & the IBM PC. Pay is $46,000/yr. 40 hrs/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #100780. Employer Paid Ad.

SYSTEMS ANALYST/SOFTWARE ENGINEER wanted. Duties: Analyzing user requests and implementing solutions. Recommending and discussing software improvements and hardware compatibility and needs with users which includes: maintaining existing systems to support new business requirements and hardware upgrades; combining existing systems for data mobility, reporting standardization and coherency; designing, modeling and implementing new systems; providing multi-user access to existing and new systems; system interfacing and access platform data transfer. Need a Bachelor's degree in Computer Engineering or Computer Science and one yr. exp. as a Software Engineer. Required exp. must involve software development using each of the following: CLIPPER Compiler, dBase III+, C, IBM PC Network applications, ARCNET, Star and Novell, data modeling design and implementation, software diagnosis and debugging, importing data in SDF Format and exporting data to SDF Format. Pay is $32,300/yr. 40 hrs/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #7491. Employer Paid Ad.

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Working knowledge of AS 400 CL, System 36 DDL, and RPG language and utilities a must. College degree with a major in Computer Science a plus. Excellent benefit package. Please send salary history with resume in confidence to: CW-64573, Computerworld, Box 9171, Framingham, MA 01701-9171.

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Issue Date: October 31, 1991
Close: September 27, 1991



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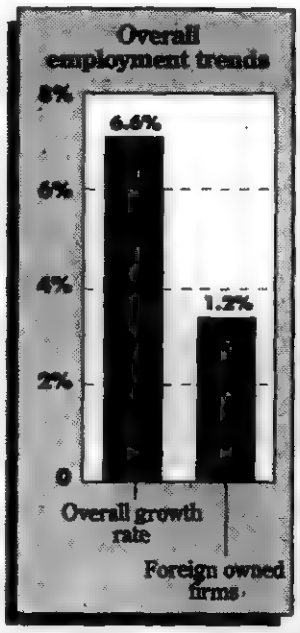
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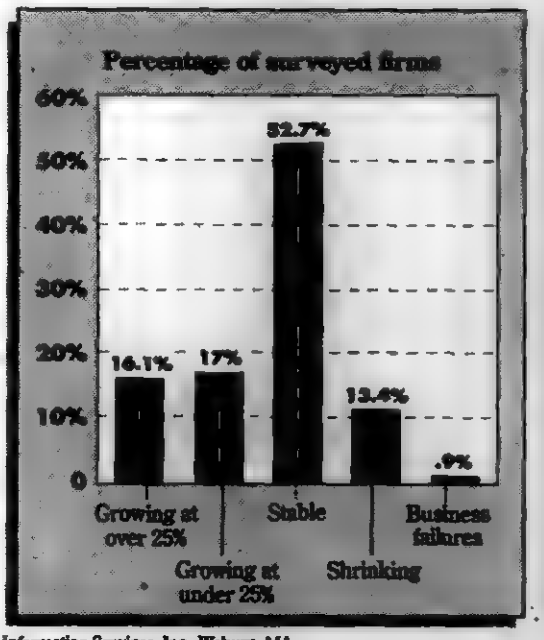
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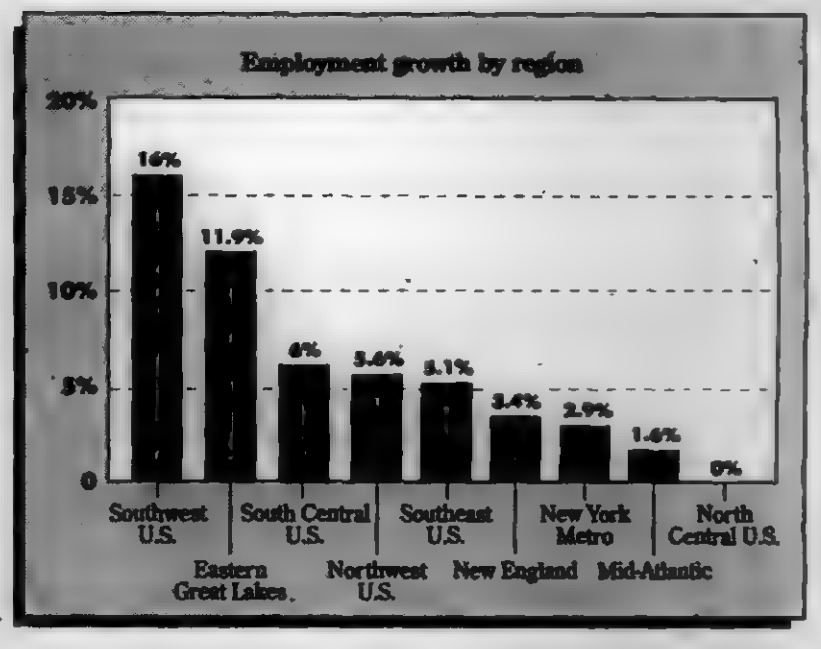
- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Prospects for minorities in computing.
- Merits of an Electrical Engineering degree for a computer career.
- Information Systems salaries from Computerworld's annual survey with the Data Processing Management Association.

Computerworld/CorpTech Career Index

More than one-third of small- and medium-sized technology firms involved in defense are expanding their workforce, based on a survey of 112 defense manufacturers







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DATA CENTER MANAGER

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Software QA Engineer: Develop/execute functional quality test plan for proprietary CAE software and support tools, incl. acceptance, load stress, and regression tests; test coverage analysis; hardware platform configuration and performance tests; etc. M.S., C.S. or C.E. 2 yrs. exp. CAE software engineering. Exp. must incl. use of CAE software for design and testing of software simulation models, software source and configuration management systems, electronics design methodology, UNIX and Aegis; C and C++. Also advanced academic course work in design/analysis of algorithms/graph multiprocessors, networks and computer communications, and operating systems. $42,000/yr., 40 hrs./wk. Place of employment and interview: Wilsonville, OR. Must have legal right to work. Clip ad and send with resume to: Job Order 5550100, 875 Union Street, N.E., Salem, OR 97311 not later than May 1, 1991.

SOFTWARE ENGINEER. Conducts analysis and development of computer software and related programming materials in order to interface with existing hardware systems. Designs and tests software systems. Directs the designing and testing of program logics, coding of programs for computer operations. Researches and plans new techniques and product development. Presents flow charts and code routines required for data processing. 40 hrs/wk. 8:30 am-5:30pm. $18.78 P/HR. Requirement: Masters degree in computer science, 6 months training in HDLC protocol and CCITT x.400 standards and two years of experience as software engineer. Send resumes to: Job Service of Florida, 105 East Broward Boulevard, Fort Lauderdale, FL 33301. Attention: Job Order No. FL 0413414.

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(207) 773-4749
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- Minimum 5 years data processing experience.
- Bachelor's degree in Computer Science, Business Administration with Management Information Systems emphasis or a related field.
- Knowledge of security and control of automated systems, application systems development and maintenance, disaster recovery planning and testing, and other data processing-related functions.
- Strong analytical, interpersonal, planning and technical writing skills required.
- Knowledge of CA-1, CA-7, CA-11, PANAUDIT PLUS, EASYTRIEVE desirable.
- Knowledge of TSO, MVS, RACF and SDSF preferred.
- Strong oral and written communication skills essential.
- Ability to deal effectively with all levels of personnel to include senior management, outside consultants, and suppliers.
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Qualified persons interested in this position should forward a cover letter and resume by April 29th to:

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342 West 200 South, Suite 125
Salt Lake City, Utah 84101

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Engineering Senior Analyst: Provide technical understanding of materials properties interaction with moisture, thermal and mechanical stresses in packages. Provide materials and failure analysis for advanced plastic and ceramic packaged devices in support of Assembly Technology Development. University training, research or experience with thin films, their properties and characterization: SEM/EDX/WDX, sample preparation; dielectric analysis; AC/DC and thermography. Ph.D/equiv/Mat. Sci/Engr. $4,195. Job Location: Chandler, AZ. Qualif. applic. send resume or applic. letter with ad by April 20, 1991 to: AZ DES Job Service, Attn: 732A Re: 5146298, P.O. Box 6123, Phoenix, AZ 85005. Emp pd ad. Proof of authorization to work in U.S. required if hired.

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- 2 years' experience with MVS/ESA or MVS/XA system performance in a multi-CPU, shared DASD system environment.
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Personnel Department
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Brainerd, MN 56401
Or Call (218) 828-7330

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District Office

Salary: $4380 - $5519/month

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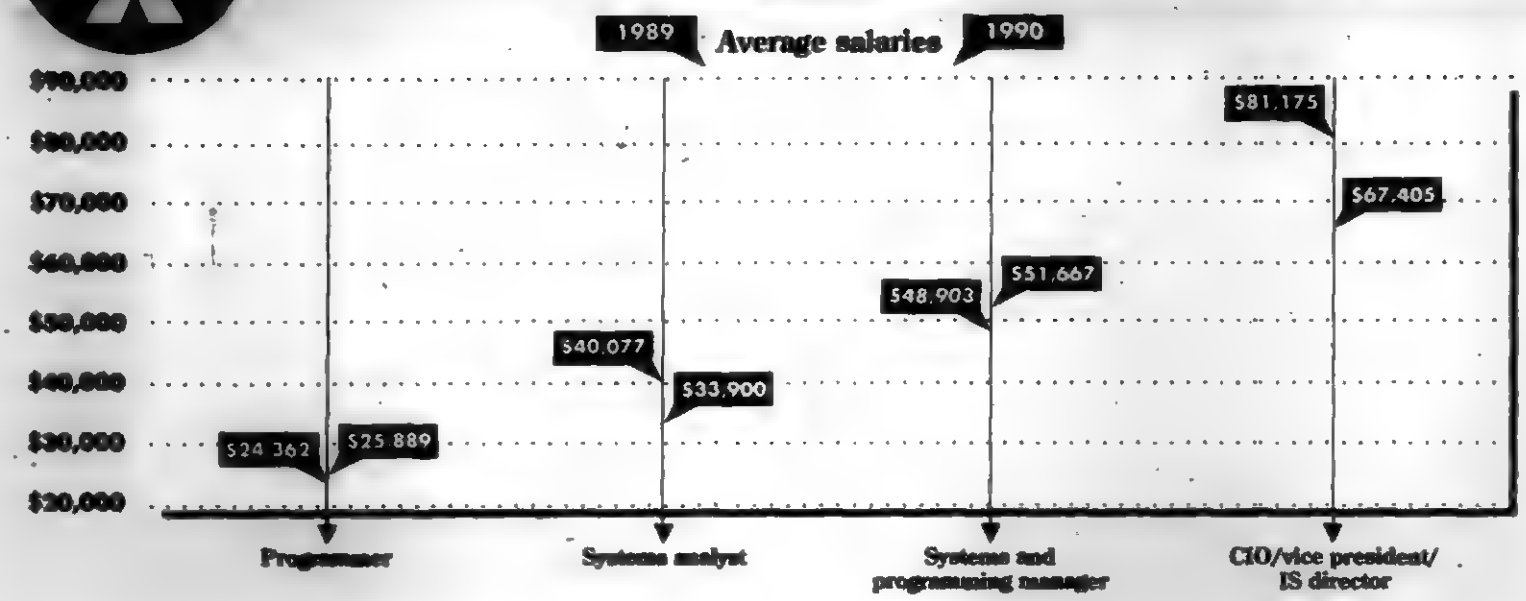
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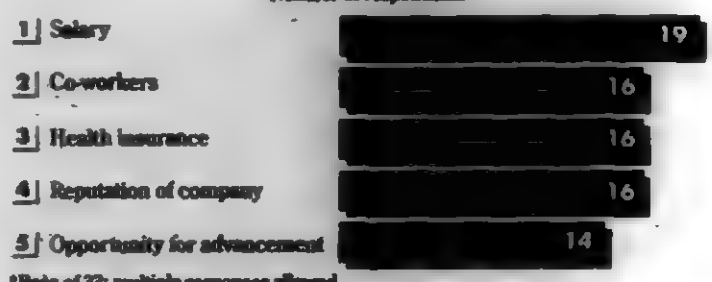
INDUSTRY CURRENTS

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What are the most important positive aspects of your job? (Top five responses)

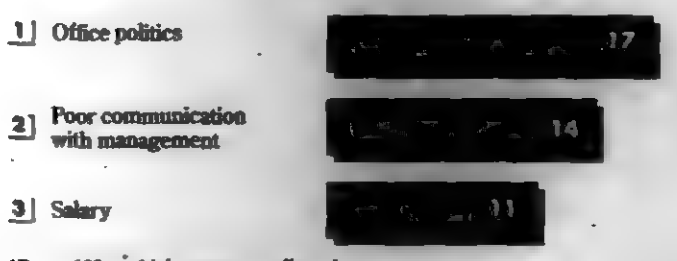
*Number of respondents**



*Base of 33; multiple response allowed

What are the biggest frustrations of working in health care IS? (Top three responses)

*Number of respondents**



*Base of 33; multiple responses allowed

Source: *Computerworld* salary survey and job satisfaction survey

CW Chart: Doreen St. John Illustration: David Flaherty

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Beta site trade-offs: There's no free lunch

BY BARBARA DEPOMPA
SPECIAL TO CW

Buyers enticed by the "free" fruit that comes with becoming a beta-test site may want to look carefully before taking a bite.

Essentially, a beta-test site works this way: A company contracts with a vendor to use the product (sometimes free of charge or at a discount) and provide feedback. The vendor may implement suggested changes and send them back for repeated review by the tester. When a product is tweaked to the point at which it can be released to the public, the tester receives the updated version and continues as a regular user.

At its best, beta testing products builds good relationships with vendors, which brings better service and support and increases an information systems organization's competitive advantage by being the only one using particular leading-edge products. In addition, beta testers can sometimes shape products to better suit their processing needs.

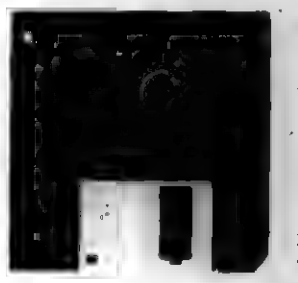
At its worst, beta testing can be a frustrating, time-consuming experience. Products may have problems, the test site may need to run duplicate systems, which is a costly undertaking, and nondisclosure agreements impose strict confidentiality orders on beta testers.

Before organizations decide whether they want to become beta-test sites, they should analyze their reasons: If the primary goal is to get the latest and greatest software or hardware hassle-free (at least for a period of time), then an IS organization really shouldn't get involved. Beta testing requires a strong time commitment from the company.

Shaping the future

For Giorgio Sorani, division head of MIS at Lubrizol Corp., a chemical manufacturer in Wickliffe, Ohio, the reason to become a beta-test site was not only to develop good vendor relations but also to be able to play a part in shaping products to fit their needs. "It gave us the opportunity to shape the finished product and help define priorities for future enhancements," says Sorani, whose company became a test site for Texas Instruments, Inc.'s Information Engineering Facility computer-aided software engineering tools.

Gaining a competitive edge by using software and hardware that hasn't yet become a commodity is also a popular reason among beta testers. Sorani says becoming a test site is one of the best possible ways to use emerging technologies and stay ahead of the competition.



One intangible reason to head down the beta-test road is that it can be a morale booster, according to Tod Dixon, vice president of information resources at Northeast Utilities in Berlin, Conn. He says his IS staff of over 400 gets a kick out of working on new products before they are announced. "They enjoy it, and we find it rewarding to have some influence in a product's development," he says. His company has beta-tested IBM's 3090 mainframe line along with other products from IBM and other vendors.

The downside to agreeing to be a beta-test site is that once you sign on, it's difficult to get out of an agreement. The time commitment can be very significant at times, but potential beta testers should be aware of this at the beginning. When a software program doesn't work properly and the going gets tough, "they can't walk away. That's when the real work [in beta testing] begins," says Jeff Nepper, director of tax technology at Deloitte & Touche in Washington, D.C., whose company has been a beta-test site for Lotus Development Corp.'s 1-2-3 Release 3.0 as well as other spreadsheet and accounting programs.

Consequently, when things do go wrong, users just have to be ready. "Anything in beta is a time bomb waiting to go off," says John Dunkle, president of Workgroup Technologies, Inc., a Hampton, N.H.-based personal computer consulting firm. Dunkle's organization has beta-tested many PC software programs from developers including Microsoft Corp., Borland International, Inc., Adobe Systems, Inc. and others.

Two ways to thwart the havoc of program glitches is to save data to older program versions or test the product on duplicate systems. For example, some software programs enable users to save the data created by the beta-test program to an older, more stable version. Or as Dixon suggests, test the product while running a complete duplicate of the data on more stable equipment to verify the differences in results between the old and new systems and ensure that at least one complete copy of the data survives.

However, this kind of testing hikes up the costs of being a beta-test site. "There are some expenses involved in testing in terms of both equipment and people," Dixon says. "By running data in parallel, the costs of hardware, software maintenance and staff is nearly double what it would cost to run the program after announcement."

Maintaining confidentiality is another beta-test hurdle to clear.

"Keeping your mouth shut is a major responsibility," Nepper says, because every beta tester is required to sign nondisclosure agreements. After more than two dozen experiences as a beta tester, Nepper says he has become adept at dealing with people who are interested in what he is testing. "You must make them understand that you can't break your disclosure agreement," he says.

Overall, beta testing works best when an IS organization is willing to commit to long hours and sacrifice some frustration in the name of progress, veteran testers say.

DePompa is a free-lance writer based in Upper Marlboro, Md.

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AT Model 339	$875	$1,000	$800
PS/2 Model 30-286	$1,100	$1,300	$1,000
PS/2 Model 60	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,300	$3,500	$3,000
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,350	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$1,900	$2,100	$1,850
Deskpro 286	$800	$1,000	$700
Deskpro 386/20	$2,050	$3,000	$2,000
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Graduates say IS programs need to get down and dirty

First part of a two-part series.

BY ALICE LAPLANTE

Graduates of some of the country's most reputable information systems programs generally applaud the way their alma maters prepared them for jobs in corporate IS departments. But in the same breath, many say their education could have been even more valuable if they had been given more contact with the business world.

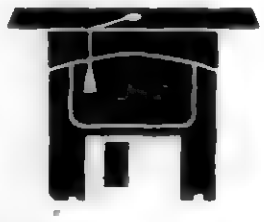
Specifically, graduates indicate that IS programs could be improved in three ways: They could offer more hands-on, systems-related jobs or internships; they could provide more technical training on a diverse range of hardware and software from a multitude of platforms and vendors; and they could teach how to solve business problems using IS.

Work experience essential

When Todd Knight attended the University of Texas at Austin in the mid-1980s, he realized his education was missing one major element: He wasn't gleaning practical experience in the IS field.

"I could see it was going to be tough getting out of school with the same degree as everyone else and finding a good job," Knight says. The University of Texas had no formal work-study program, so he officially dropped out of school every other semester to work so he could get hands-on experience.

Knight, who graduated with a bachelor's degree in data processing in 1987, is now a senior consultant at Ernst & Young in Houston.



Not everyone has it so hard. Elizabeth Guebert, who received a bachelor's degree in data processing administration from the University of Georgia in 1989, was able to gain that leading edge in a work program while attending school. In her job at the IS department's high-technology laboratory, she did everything from configuring machines, adding circuit cards and upgrading processors to working with animation and presentation graphics software.

"I wouldn't have learned any of this in the core course work," says Guebert, who is now an IS administrator at the North Carolina National Bank in Charlotte.

Andrew DeMaio, who received his master's degree in IS in 1988 from New York University and is now a senior consultant at Booz, Allen & Hamilton, Inc. in New York, expresses the point best: "The world is not a Harvard Business School case study. There is absolutely no substitute for real-world experience."

Other recent graduates say their technical education — particularly advanced coding — was a high hurdle they hadn't quite cleared by the time they landed their first jobs.

"The biggest problem I've had in adjusting to my job was not getting enough technical skills in enough depth," says Tammie Fisher, an associate programmer/analyst at The Coca-Cola Co. in Atlanta. "You don't do a lot of it in college. You get a list of how to do it, but you don't really go into it." Fisher particularly would have liked to learn more about fourth-generation languages — something she didn't get while earning her bachelor's degree in MIS at the University of Georgia.

Guebert stresses that the basic core classes at the University of Georgia were excellent, "but I think we needed to get more technical, get our hands dirtier," she says.

Some graduates even indicate that they have yet to see the application of some of the more theoretical aspects of their course work in their current jobs.

This was the case for Chris Garner, who graduated last year with a master's degree in MIS from the University of California at Riverside. He already had a nontechnical job at GTE Corp. but wanted to move toward a more systems-oriented career path — a goal he accomplished halfway through his graduate work. Now a senior account executive at GTE, he says that while his education gave him a broad grounding in basic technical and business skills, "a lot of the more theoretical stuff didn't do a lot for me," Garner says. "To this day, I cannot see how I can apply some of the things taught in a database design class to my job."

Business savvy is another area that some graduates say can't be stressed enough in IS programs.

"It's important to understand all of MIS — from the coder all the way to the business analyst," says Kevin Fein, a project manager at Battelle Pacific Northwest Laboratories in Richland, Wash., who earned a master's degree in MIS at the University of Arizona in 1989. "You can be a fantastic programmer and not understand how to solve a routine business problem."

The program at the University of Arizona, Fein says, allows students to pursue independent, business-oriented systems projects under the supervision of a faculty member who allows them to tailor the program to meet their needs.

School can't do it all

Most IS graduates conclude that the most a good school can do is provide the basics: The rest is up to the student.

"You can't pack 10 years of experience into a 20-month program," says Donald Rylander, a programmer/analyst at Burlington Northern Railroad Co. in St. Paul, Minn., who received an MBA from the University of Minnesota last year.

Rylander says that although he had a lot of technical "catch-up" to do at his job, he had a good enough education to pick it up without any problems.

Cindy Butcher, a software application specialist at Hewlett-Packard Co. in Palo Alto, Calif., who received her master's degree in MIS from the University of Arizona in 1989, concurs.

"As the demands of your job increase, practical experience will be your best tool," she says. "But my education did provide a good IS foundation so that I could identify and pursue my interests in depth once I got out into the real world."

Part II will take a look at what IS executives say about the preparedness of graduates from top IS schools.

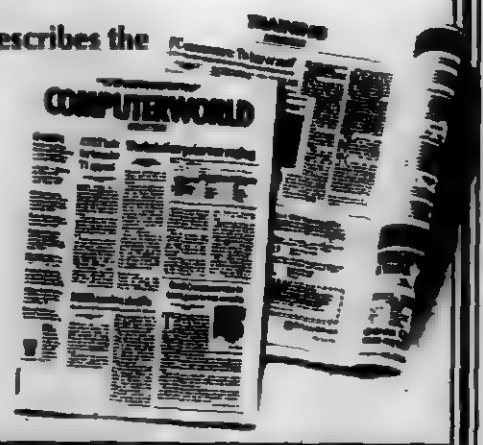
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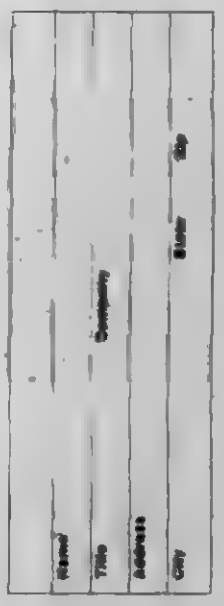
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INDUSTRY ALMANAC

INVESTMENT OVERVIEW

You have heard it before: The domestic recession, coupled with the prospect of a softer European economy, makes for slim pickings in the stock market. Investors have their backs up, poking around for predictable companies likely to post positive financials this quarter.

So where should you look, and what is the near-term picture for the technology sectors? A round-up of recent brokerage firm reports provides guidance:

Software and services. First-quarter 1991 results will be the first test of both recessionary impact and the endurance of current inflated stock valuations, said Charles Frumberg, an analyst at Mabon, Nugent & Co. He predicts that business will not be as bad as some people fear. Yet shares have gushed so much lately that investors' tolerance for pain will drop — as will stock prices — on earnings news even the slightest bit disappointing. Frumberg calls **Electronic Data Systems Corp.** and **Logent Corp.** attractive.

Large systems. Smart investors will match vendor product cycles to user buying trends rather than try to outfox macroeconomic conditions, S. G. Warburg analyst David Wu said. Big corporate buyers are between mainframes right now, waiting since fall 1990 for announcements of next-generation computers to become reality. **IBM** and **Amdahl Corp.** plan to ship their new mainframes late this year or early in 1992. This should kick life into profits at both firms, Wu said, labeling IBM and Amdahl "buys."

IBM's warning two weeks ago of weak first-quarter 1991 earnings took a heavy toll on its share price, however, and prompted some analysts to downgrade ratings. Prudential Securities, Inc. now rates IBM a "sell," citing weak equipment sales in all product lines except the RISC System/6000 workstations.

Service sales at **Digital Equipment Corp.** should grow in the current quarter, according to Laura Conigliaro, an analyst at Prudential Securities. Her advice: Buy DEC now. An upswing in service revenue combined with DEC's cost controls and work-force reductions can potentially offset uncertainties in its hardware sales, driving up its share price.

Small systems. Analyst Andrew Neff at Bear Stearns & Co. predicts that revenue in the personal computer sector will sprout between 5% and 15%, fed mainly by new product cycles in major firms, such as **Compaq Computer Corp.**, **Apple Computer, Inc.** and **AST Research, Inc.** Notebooks and laptops are hot, Neff noted, and Compaq dominates the market. AST recently announced volume production of its notebook, and Neff said he expects a notebook machine from Apple this year.

The desktop segment stands to reap rewards from the downsizing seeds sown by many user companies, Wu said. Along with Apple, **Silicon Graphics, Inc.** is a worthy long-term investment because it caters to two fast-expanding markets: three-dimensional color graphics and affordable high-performance workstations.

However, sell **Sun Microsystems, Inc.**, he advises. Strong momentum from IBM's RS/6000 and **Hewlett-Packard Co.**'s new workstations will probably bite into Sun's profits in 1992, slowing its growth to somewhat less than the 20% projected for the workstation industry.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- AT&T gained ½ a point last week to close Thursday at 34¼, while NCR Corp. gained 1¾ points to 99⅝. NCR's annual meeting revealed that AT&T has gathered enough NCR shareholder proxies to replace four people on NCR's board.
- Software makers blossomed during the first week of spring. Microsoft Corp., which some analysts consider a safe harbor during uncertain earnings times, rocketed 11⅛ points to 106⅛. Borland International, Inc., which Shearson Lehman Brothers, Inc. calls a good long-term buy, gained 7¾ points to 58, topping its 52-week high.
- After rolling out a new laptop computer, IBM regained 2 of the 16¼ points it recently lost, closing Thursday at 113⅜. Hewlett-Packard Co. climbed 4⅝ points to 50 after introducing a new workstation line.
- Compaq Computer Corp. picked up 1½ points to 62⅝, while possible merger partner Silicon Graphics, Inc. [CW, March 11] slipped ⅛ of a point to 39⅜.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, MARCH 28, 1991

TOP PERCENT GAINERS

Altera Computer Sys.	30.00
Capital Associates	26.26
Intecron Systems Corp.	21.70
Borland Int'l	19.58
Maestor Systems	18.17

TOP PERCENT LOSERS

Alloy Computer Prod.	-33.33
Network General	-24.44
Ariel Communication Corp.	-19.05
Micrografx	-12.35
Analysts Int'l	-11.11

TOP DOLLAR GAINERS

Microsoft Corp.	12.38
Borland Int'l	9.50
Computer Sciences	8.50
Altos Corp.	8.38
Apple Computer Inc.	4.75

TOP DOLLAR LOSERS

Matsushita Electronics	-4.00
Network General	-2.75
Micrografx	-2.50
Analysts Int'l	-2.00
Digital Equipment Corp.	-1.00

Exch	52-Week High	52-Week Low		March 28 Close	Wk Net Change	Wk Pct Change
Communications and Network Services — Up 1.75%						
OTC	19.00	5.38	3 COM Corp.	8.25	0.75	8.82
NYS	68.75	52.50	American Info Techs Corp.	67.00	-0.38	-0.56
NYS	44.13	29.00	AT&T	34.25	1.38	4.18
OTC	8.75	0.88	Ariel Communication Corp.	2.13	-0.50	-19.05
NYS	56.25	36.50	Bell Atlantic Corp.	51.38	1.38	2.75
NYS	57.63	49.00	Bellsouth Corp.	53.20	0.25	0.47
OTC	24.25	8.25	Compression Labs Inc.	23.00	2.25	10.84
NYS	41.25	23.38	Contel Corp.	41.00	0.00	0.00
OTC	5.13	1.88	Data Switch Corp.	4.63	0.25	5.71
NYS	26.75	8.88	Digital Comm. Assoc.	17.63	0.25	1.44
OTC	25.25	12.25	Dynatech Corp.	20.25	0.50	2.53
OTC	12.88	5.50	Fibronix Int'l Inc.	11.38	1.00	9.64
OTC	4.00	1.75	Gandalf Technologies Inc.	3.00	0.00	0.00
NYS	4.50	1.63	General Datacomm Inds.	2.88	0.13	4.55
NYS	34.13	23.50	GTE Corp.	31.63	-0.13	-0.39
OTC	6.25	0.75	Intecron Systems Corp.	1.75	0.31	21.70
NYS	80.88	40.25	ITT Corp.	58.63	2.38	4.38
OTC	44.13	17.88	MCI Communications Corp.	25.63	-0.25	-0.97
OTC	21.00	2.75	Microcom Inc.	8.25	0.00	0.00
NYS	24.75	4.00	Network Equipment Tech.	8.00	-0.13	-1.54
OTC	14.63	6.00	Network General	8.50	-2.75	-24.44
OTC	15.50	8.13	Network Systems Corp.	12.75	0.13	0.99
NYS	32.00	22.13	Northern Telecom Ltd.	31.38	1.13	3.72
OTC	32.75	17.25	Novell Inc.	30.50	1.50	5.08
NYS	68.50	57.00	Nynex Corp.	72.50	0.50	0.69
NYS	47.88	36.25	Pacific Telesis Group	43.00	0.75	1.78
ASE	14.50	4.75	Penril Corp.	13.63	0.13	0.93
NYS	29.13	8.88	Scientific Atlanta Inc.	17.50	1.25	7.69
NYS	58.50	47.25	Southwestern Bell Corp.	56.13	2.00	3.70
NYS	48.38	30.63	United Telecom	24.00	0.00	0.00
NYS	40.75	32.38	US West Inc.	39.13	0.00	0.00
Computer Systems — Up 5.18%						
OTC	8.75	0.88	Altos Computer Sys.	1.63	0.38	30.00
ASE	18.88	10.00	Amdahl Corp.	15.63	1.13	7.78
OTC	70.25	24.25	Apple Computer Inc.	68.00	4.75	7.51
OTC	13.88	4.25	Archive Corp.	8.63	1.13	15.00
OTC	29.50	7.50	AST Research Inc.	27.25	1.25	4.81
NYS	7.38	3.88	Bolt, Beranek & Newman	7.00	0.25	3.70
NYS	18.88	4.50	Commodore Int'l	18.38	2.25	13.95
NYS	74.25	35.50	Compaq Computer Corp.	62.63	3.00	5.03
OTC	2.50	0.13	Computer Automation Inc.	1.00	-0.06	-5.93
NYS	21.63	6.75	Control Data Corp.	12.00	0.00	0.00
NYS	20.88	8.38	Convex Computer	16.75	1.75	11.67
NYS	51.25	20.00	Cray Research Inc.	38.63	0.63	1.64
NYS	13.25	3.50	Data General Corp.	13.13	0.88	7.14
NYS	3.25	0.75	Datapoint Corp.	2.88	0.00	0.00
OTC	28.88	7.50	Dell Computer Corp.	28.50	2.00	7.55
NYS	85.13	45.50	Digital Equipment Corp.	68.13	-1.00	-1.45
NYS	38.13	13.75	Harris Corp.	25.38	0.38	1.50
NYS	50.63	24.88	Hewlett Packard Co.	50.00	2.75	5.82
NYS	139.75	98.25	IBM	114.00	2.38	2.13
OTC	14.00	7.75	Information Int'l	8.25	0.00	0.00
OTC	25.75	10.50	Intergraph	25.25	1.25	5.21
NYS	3.13	0.50	MAI Systems Corp.	0.88	0.00	0.00
NYS	149.88	114.00	Matsushita Electronics	124.00	-4.00	-3.13
OTC	28.00	9.00	Mentor Graphics Corp.	15.25	0.75	5.17
NYS	100.50	44.50	NCR Corp.	99.50	1.25	1.27
OTC	36.50	11.00	Pyramid Technology	24.00	3.50	17.07
OTC	34.00	8.75	Sequent Computer Sys.	17.75	2.00	12.70
NYS	47.25	18.00	Silicon Graphics	39.88	-0.25	-0.62
NYS	35.13	14.63	Stratus Computer Inc.	34.25	4.25	14.17
OTC	37.25	15.00	Sun Microsystems Inc.	31.75	1.88	6.28
NYS	28.88	8.88	Tandem Computers Inc.	13.75	1.25	10.00
NYS	39.50	23.50	Tandy Corp.	32.38	1.38	4.44
OTC	33.25	6.75	Teradata	18.00	0.50	2.86
NYS	7.88	1.38	Ultimate Corp.	4.63	-0.13	-2.63
NYS	15.88	1.75	Unisys Corp.	6.00	-0.38	-5.88
ASE	5.75	2.00	Wang Labs Inc. (b)	4.38	0.13	2.94
Software & DP Services — Up 3.91%						
OTC	55.25	17.00	Adobe Systems Inc.	54.00	2.50	4.85
OTC	53.25	16.75	Altos Corp.	53.25	6.38	13.60
OTC	25.00	12.00	American Mgmt. Systems	25.00	2.00	8.70
OTC	18.25	7.50	American Software Inc.	12.75	0.63	5.15
NYS	4.63	1.38	Anacomp Inc.	4.13	-0.25	-5.71
OTC	23.50	10.00	Analysts Int'l	16.00	-2.00	-11.11
OTC	13.63	4.88	Ashton Tate	8.63	0.50	6.15
OTC	10.25	4.00	ASK Computer Sys.	7.75	-0.38	-3.13

Exch	52-Week High	52-Week Low		March 28 Close	Wk Net Change	Wk Pct Change
NYS	67.00	45.25	Auto Data Processing	64.38	3.50	5.75
OTC	60.25	32.00	Autodesk Inc.	50.50	2.25	4.66
OTC	31.50	12.25	BGS Systems Inc.	29.50	-0.50	-1.67
OTC	43.88	17.75	BMC Software Inc.	42.25	2.25	5.63
OTC	21.50	11.00	Boole & Babbage Inc.	15.50	0.25	1.64
OTC	88.00	14.00	Borland Int'l	58.00	9.50	19.59
NYS	11.00	0.88	Businessland Inc.	2.13	0.00	0.00
OTC	18.63	5.00	Cognos Inc.	15.00	0.13	0.84
NYS	16.88	4.38	Computer Associates	8.88	0.63	7.58
OTC	17.75	7.75	Computer Horizons	12.50	-0.75	-5.66
NYS	68.50	36.75	Computer Sciences	68.50	8.50	10.63
NYS	11.75	6.63	Computer Task Group	9.88	-0.63	-5.96
OTC	25.25	13.00	Comshare Inc.	20.75	0.75	3.75
OTC	16.00	3.75	Corporate Software	11.25	-0.13	-1.10
NYS	47.00	27.88	General Motors E (EDS)	43.88	4.13	10.38
OTC	18.75	7.25	Gist Systems Int'l	15.00	-0.50	-3.23
OTC	5.13	1.88	Hogan Systems Inc.	5.13	0.75	17.14
OTC	12.00	5.00	Index Technology	10.25	0.00	0.00
OTC	19.13	7.75	Information Resources	18.88	1.13	6.34
OTC	17.50	2.63	Informix Corp.	5.25	-0.38	-4.07
OTC	7.88	1.38	Intellicorp Inc.	2.50	0.25	11.11
OTC	8.00	2.50	Interleaf Inc.	8.00	0.88	15.22
OTC	40.00	10.00	Knowledgeware Inc.	39.88	3.88	10.78
OTC	46.00	16.75	Legent Corp.	39.00	0.50	1.30
OTC	39.25	12.50	Lotus Development	28.25	1.50	6.06
OTC	32.00	13.63	Micrografx	17.75	-2.50	-12.35
OTC	113.00	59.75	Microsoft Corp.	106.13	12.38	13.20
NYS	10.50	4.00	On Line Software Int'l	6.38	-0.38	-5.55
OTC	34.00	4.88	Oracle Systems	9.00	0.00	0.00
NYS	16.50	7.00	Paradigm Systems	11.75	1.00	9.30
OTC	9.38	1.25	Phoenix Technologies	8.38	1.00	13.56
NYS	52.00	31.63	Policy Management Sys.	48.00	0.75	1.55
NYS	23.63	11.50	Reynolds & Reynolds	19.25	0.25	1.32
OTC	16.13	6.38	Sage Software Inc.	10.38	0.13	1.22
OTC	25.50	14.75	SEI Corp.	24.75	0.13	0.51
OTC	19.13	12.25	Shared Medical Systems	17.50	0.88	5.30
OTC	38.25	12.00	Software Publishing Corp.	20.50	2.63	14.69
NYS	13.38	6.50	Sterling Software	13.38	0.75	5.94
OTC	26.00	9.50	Sungard Data Sys.	16.00	1.50	11.11
OTC	48.25	17.75	Symantec Corp.	48.25	3.50	7.82
OTC	24.50	4.50	System Center Inc.	8.75	-0.25	-3.57
OTC	37.25	12.75	System Software Assoc.	19.75	-0.50	-2.47
OTC	27.38	4.75	Vistek	19.88	0.50	3.13
Semiconductors — Up 5.34%						
NYS	26.88	19.38	Advanced Micro Devices	22.00	0.75	3.53
NYS	11.88	5.50	Analog Devices Inc.	11.25	0.38	3.45
OTC	21.75	5.25	Chips & Technologies	10.75	0.25	2.38
OTC	52.75	26.00	Intel Corp.	46.75	3.00	6.86
NYS	13.00	5.13	LSI Logic Corp.	9.50	0.63	7.04
NYS	17.38	6.75	Micron Technology	16.13	0.13	0.78
NYS	68.38	46.75	Motorola Inc.	57.25	0.00	0.00
NYS	8.63	3.00	National Semiconductor	7.13	0.00	0.00
NYS	46.75	22.50	Texas Instruments	39.88	2.38	6.33
OTC	12.25	3.00	VLSI Technology	9.25	1.50	12.12
ASE	14.88	4.50	Western Digital Corp.	5.38	0.75	16.22
Peripherals & Subsystems — Up 4.06%						
OTC	1.38	0.09	Alloy Computer Prod.	0.50	-0.25	-33.33
OTC	2.25	0.88	Apertus Technologies	2.25	0.31	16.10
OTC	24.00	7.50	Bantec Inc.	13.25	1.13	9.28
ASE	10.50	4.13	Cognitronics Corp.	10.50	0.25	2.44
NYS	31.25	14.63	Conner Peripherals	25.00	0.50	2.04
ASE	22.00	7.00	Dataram Corp.	10.88	-0.13	-1.14
NYS	10.88	4.25	EMC Corp.	9.88	-0.25	-2.47
NYS	47.25	33.75	Eastman Kodak Co.	43.63	0.50	1.16
OTC	10.00	4.38	Emulex Corp.	9.50	0.63	7.04
OTC	34.88	14.00	Evans & Sutherland	21.50	2.00	10.26
OTC	8.50	3.75	Iomega Corp.	5.38	0.00	0.00
OTC	28.25	8.75	IPL Systems Inc.	23.25	0.50	2.20
OTC	1.81	0.13	Maestor Systems	0.81	0.13	18.17
OTC	17.00	2.63	Mentor Corp.	5.25	0.25	5.00
OTC	13.38	3.88	Micropolis Corp.	12.38	0.75	6.45
NYS	93.75	73.63	3M Corp.	88.50	1.25	1.43
OTC	14.50	6.00	Printronix Inc.	10.50	1.25	13.51
NYS	21.88	8.50	QMS Inc.	21.88	2.88	15.13
OTC	27.25	12.38	Quantum Corp.	24.50	1.00	4.26
NYS	6.13	4.38	Recognition Equipment	5.88	0.25	4.44
OTC	9.88	4.00	Rexon Inc.	8.25	0.13	1.54
OTC	17.13	6.63	Seagate Technology	16.00	1.88	13.27
NYS	35.25	11.00	Storage Technology	33.25	3.25	10.83
OTC	4.00	1.25	Tandon Corp.	3.38	0.13	3.85
NYS	24.50	11.63	Tektronix Inc.	23.25	0.75	3.33
OTC	0.63	0.16	Televideo Systems	0.38	-0.03	-7.84
NYS	69.25	28.00	Xerox Corp.	67.00	3.80	6.54
Leasing Companies — Up 6.29%						
OTC	18.00	6.88	Amplicon Inc.	15.25	0.25	1.67
OTC	4.38	0.31	Capital Associates	0.75	0.19	26.26
NYS	28.38	14.63	Comdisco Inc.	25.75	0.88	3.52
OTC	16.25	9.25	LDI Corporation	13.50	0.00	0.00
OTC	5.88	2.25	Salestern Inc.	4.00	0.00	0.00

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Oracle rewrites financial plan

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Oracle Corp. has a brand-new chief financial officer (CFO) — and there is a whole stack of financial problems waiting for him.

The appointment of Jeffrey Henley, former CFO of Pacific Holding Company in Los Angeles, to executive vice president and CFO came on the heels of a quarterly financial report last week indicating the following:

- Oracle has increased its bad debt reserve by $42 million, after finding millions of dollars in uncollectable bills; $7 million of that was charged against third-quarter earnings.
- Oracle has violated its loan covenants with a syndicate of 13 international banks that extended a $250 million line of credit to Oracle last summer. Oracle is prepared to renegotiate its loans with the banks, possibly paying a monetary penalty, Oracle USA President Michael Fields said.
- Oracle has decided to restate previous financial reports in accordance with new software revenue recognition guidelines from the American Institute of Certified Public Accountants. Henley said an initial review of Oracle's financial status revealed a lot of challenges — but none that are insurmountable. "I think the groundwork to improve the company's financial controls is in place," Henley told a group of financial analysts here last week, "and I have seen nothing so far that makes me feel I've made the wrong [job] decision."

Skeptics on turnaround

Analysts at the meeting said they were unconvinced that Oracle has turned the corner on its financial downturn, which began last fall when the 13-year-old firm posted its first loss — a $36 million bombshell that drove Oracle stock down more than 50%.

Longtime Oracle observers were also skeptical. "I find contradictions in what they said that were very disturbing, actually," said David McGoveran, president of Alternative Technologies, Inc., a database consulting firm in Boulder Creek, Calif. "Many of us who have had direct experience with Oracle's business practices over the years feel there's a lot of sidestepping around the basic issues that face this company."

The flawed accounts receivable bookings were blamed on duplicate billing and data processing errors in the Oracle sales divisions. Fields said a new Oracle Financials accounting system had been put into place recently, replacing homegrown software running on a minicomputer.

Henley, 46, was formerly CFO at Saga Corp., a large food service and institutional catering firm. He replaces Jeffrey Walker, who was Oracle's CFO for the past five years and who will now run Oracle's applications software business.

Oracle held revenue steady at $269 million, the same as in the second quarter, and showed a nine-cent-per-share profit. Profits were $12.1 million, an improvement from just $6.7 million in profits last quarter [CW, Jan. 7], but were down significantly from the $24.3 million reported for the third quarter one year ago. The company emphasized that it showed a positive cash flow of $24 million after two quarters of negative cash flow.

Oracle recently reduced its $168 million debt by $15 million, company spokesmen said. Arthur Andersen & Co. is going over the firm's books and advising management on changes.

Constitutional scholar calls for 'high-tech' amendment

BY JAMES DALY
CW STAFF

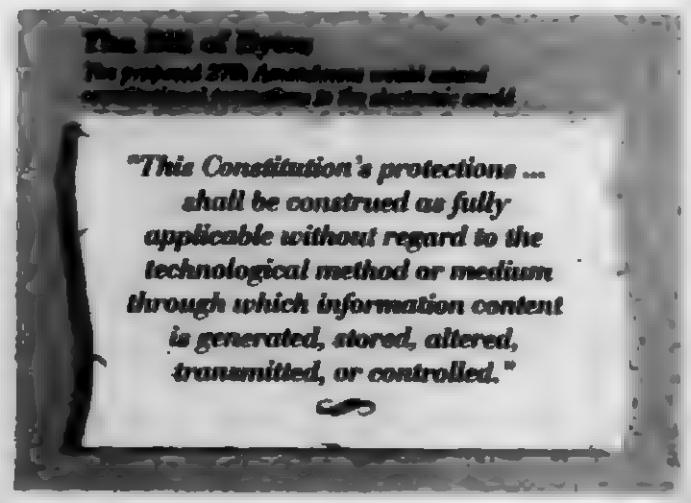
BURLINGAME, Calif. — One of the country's leading constitutional scholars called for a 27th Amendment last week to ensure that individual rights of privacy are offered adequate protection in the Electronic Age.

Laurence Tribe, professor of constitutional law at Harvard University, said his proposal would allow computer users to communicate freely and would ensure that the freedom of expression rights enjoyed by the print and broadcast media apply to the digital community.

"Constitutional principles should not vary with accidents of technology," Tribe said at the First Conference on Computers, Freedom & Privacy, a four-day symposium sponsored by the Computer Professionals for Social Responsibility. He said the amendment is needed because "the Constitution's architecture can too easily come to seem quality-irrelevant or at least impossible to take seriously in the world as reconstituted by the microchip."

The advent of electronic mail and bulletin boards has focused attention on the need to find a balance between computer security and civil rights. Tribe's proposition targets the electronic landscape where E-mail messages are stored and telephone conversations happen.

Although constitutional amendments are traditionally a tough sell — the last one occurred 20 years ago when 18-year-olds were given the right to vote — Tribe said his proposal would serve as an important "genesis for discussion."



The amendment states that the constitutional protections "shall be construed as fully applicable without regard to the technological method or medium through which information content is generated, stored, altered, transmitted or controlled."

Security officials maintain that legislation already exists to serve the electronic landscape. "We've got plenty of laws and a very orderly process of bringing law and order to the electronic community," said Donn Parker, a security consultant at SRI International, a consulting firm in Menlo Park, Calif.

Lawyers such as Mark Rasch, who prosecuted computer hacker Robert T. Morris for releasing the virus that crippled the Internet network several years ago, also said the Constitution protects civil liberties.

Tribe contended, however, that recent court decisions "have revealed a curious judicial blindness, as if the Constitution had to be reinvented with the birth of each technology."

A series of events in recent years have raised charges from civil liberties groups that the government is playing fast and loose with the rules: Austin, Texas-based Steve Jackson Games was put on the verge of bankruptcy after U.S. Secret Service officials raided its offices one year ago and seized computers and documents they said contained "a handbook of computer crime." The documents were later discovered to be a fantasy role-playing game.

NCR

FROM PAGE 1

that it would accept $110 per share, more than AT&T's current $90-per-share initial offer and the $100-per-share sweetener it offered investors if it received the 80% vote it needed to oust NCR's board of directors at a special meeting of NCR shareholders on Thursday. AT&T promptly rejected the offer, saying it would not bid against itself.

Robert Kavner, head of AT&T's Computer Systems Division, said he was "encouraged" by what he called NCR's "new attitude." Kavner did not seem confident of a rapidly negotiated deal but said that "after a four-month drought, you look at a glass of water and you want to start swimming."

An unexpectedly low vote at the special meeting could help NCR extract a higher price from AT&T. As Exley put it, "it's important for our side that it be as low a figure [as possible]." But the sources close to AT&T said AT&T was "heartened" by the vote because it appeared that some 20% of NCR's shareholders did not vote, and AT&T looks to have won as much as 75% of the votes cast.

Exley, meanwhile, said during the regular meeting that he anticipated further discussions with AT&T but that no resolution was likely over the holiday weekend. He also reiterated that he does not think the two companies should merge.

Analysts said they expect AT&T will grease the drawbridge chains by coming up with a higher offer. While one institutional investor who asked not to be named said he thought $107.50 per share in stock would be the final price, analyst David J. Schofield at Chicago's Duff & Phelps Investment Research Co. disagreed.

"Somewhere between $100 and $105 is very fair," said Schofield, citing $112 as a best-case value for NCR shares two years from now.

AT&T stated throughout its pursuit of NCR that NCR management would have complete control over the merger terms. If this is the case, analysts agreed, NCR management must move quickly to fold AT&T's Computer Systems Division into it to maintain the momentum of its Open, Cooperative Computing strategy, announced last September.

There is also some question as to what will remain of AT&T's Computer Systems Division. Kavner said more than 1,000 employees have left the firm. Bill O'Shea, the Computer Systems Division's vice president of systems marketing and development, said the division is losing people it wanted to keep.

Before the merger effort, observers generally believed NCR could pull off its open systems gamble. Today, most stick by their earlier statements.

"I still think the marriage will work, and it won't cause major hardships," said Bob Vautrain, an analyst at Infocorp/Gartner Group. "It's just a question of who gets laid off and where."

Midwest Bureau Chief Ellis Booker contributed to this report.



NCR

The Exley era

The last three years have been slow financially for NCR after solid growth in 1986 and 1987

Year	Revenue	Percent growth	Income	Percent growth
1990	$6.29B	6%	$369M	-10%
1989	$5.94B	-0.5%	$412M	-6%
1988	$5.97B	6%	$439M	1%
1987	$5.64B	16%	$419M	24%
1986	$4.88B	13%	$337M	7%

Source: NCR Corp. CW Chart: Tom Monahan

NEWS SHORTS

Sun offers new RPC version

Sun Microsystems, Inc. has announced an operating system- and transport protocol-independent version of its remote procedure calls (RPC). The company said last week it is making the RPC source code available free of charge to systems vendors and developers over the Internet network. RPCs enable distributed applications processing across mixed-vendor networks. The new RPC, co-developed with AT&T, is said to allow applications to be insulated from the underlying network transport protocols. For example, applications written for Transmission Control Protocol/Internet Protocol can run over Open Systems Interconnect-based networks. The announcement complements moves by five vendors to lay out a blueprint for a distributed computing environment based on Sun's RPC (see story page 55).

Prodigy users sue

Prodigy Services Co. was recently hit with a class-action suit that seeks damages and an injunction against the way the information service charges for electronic mail. The suit, filed by the law firm of Greenfield & Chimicles in Los Angeles County Superior Court, accuses Prodigy, which is jointly owned by Sears, Roebuck and Co. and IBM, of deceptive advertising and fraudulent conduct. "It's an old story from a tiny group that's angry at us for changing our prices," a Prodigy spokesman said.

Andersen plans utility system

Andersen Consulting and Texas Utilities Electric Co. said last week they will jointly develop an IBM DB2-based software system for power plants. The $15 million total plant solution project extends Andersen's existing software for utilities and will be the first commercially available DB2 software to integrate the maintenance, engineering and operations of a power plant, Andersen said. The system will be developed at Texas Utilities Electric's Comanche Peak nuclear power plant. Chicago-based Andersen will market the system as its modules are completed between now and 1992.

Novell claims copyright violations

Novell, Inc. filed seven copyright infringement lawsuits across the nation during the past month. A spokesman for the networking company, based in Provo, Utah, said the cases represent the largest single group of suits it has ever filed. The spokesman said the only thing the lawsuits have in common is that they all target the alleged pirating of Netware.

Bull reports 1990 loss

The board of directors of Compagnie des Machines Bull has reported net consolidated losses of $1.24 billion for the company in 1990, and net operating losses were posted at $500 million. The figures are consistent with projections the company made last November, when it announced a 13-month restructuring program that would eliminate as many as 5,000 employees and close several plants both in the U.S. and in Europe. Groupe Bull maintains that it has already reduced the number of plants from 13 in 1989 to six today and that the number of distribution centers will be trimmed from nine to two by mid-1992.

Computerland buys Nynex chain

Nynex Business Information Systems Co., which has been looking to sell its personal computer reseller business since January, found a buyer last week in Computerland Corp. Nynex's corporate accounts are the true plum in this deal, analysts said, while its retail storefronts are the least attractive element. Nynex's retail business, formerly IBM's business centers, has been struggling, although a company official said the firm was profitable at the end of 1990. Dataquest, Inc. analyst Douglas Kass questioned the fit between the two firms, noting that Computerland and Nynex have stores practically on the same block in some areas. The planned transaction, still subject to company approval, should be completed by June 1.

Amdahl forges plan to take on AD/Cycle

BY ROSEMARY HAMILTON
CW STAFF

While most application development software providers are aligned with IBM's AD/Cycle, Amdahl Corp. declared last week that it has a better way.

With the official rollout of Huron, a mainframe-based development platform, Amdahl said it will provide a new approach and new technologies to solve the long-standing problem of application backlogs.

Also last week, the company introduced the 6390, an IBM 3390-like disk drive. The new models, which will begin shipping later this year, offer more capacity per unit, a smaller footprint and improvements in the data transfer rate and seek time over the IBM drive. Certain configurations will also be cheaper than the IBM models.

Industry analysts last week said Huron appears to be a solid product offering. However, they raised two concerns. First, Huron is a comprehensive development platform with its own repository, relational database management system, language and generator. Its price tag reflects all these features. Licenses run from $525,000 to $1.4 million, depending on CPU size. Some customers may be reluctant to lock into such a full-blown solution at that price from a single vendor, analysts said.

Second, Amdahl has positioned Huron as distinctly different from AD/Cycle, which could cause concerns for users who do not want to drift too far from the IBM world, analysts added.

"They are going to need a little more adherence to the IBM camp," said Aaron Zornes, a vice president at Meta Group, Inc. "Once you get into the software game, you have to play by certain rules."

Amdahl's official Huron introduction did not include an AD/Cycle compatibility statement. In a subsequent interview, Amdahl President Joseph Zemke stressed the differences between Huron and AD/Cycle but added that Huron would eventually "interface to it."

"It's like having a train and a plane," Zemke said. "Both move people, but in a different way. We don't disregard the five phases [of the IBM development life cycle]; we just say you can move through it a lot more quickly."

Huron is based on a prototyping technique that would allow users to quickly write an on-line application prototype. Programmers would then consult with users and modify the code as needed. Since the prototype is on-line and not a mock-up, Amdahl claims users could immediately switch it to production once it meets user requirements.

This method is a sharp contrast to the five-step life-cycle methodology on which IBM's AD/Cycle is based. IBM's philosophy emphasizes the up-front work on software development and calls for modeling and designing software applications before actual code is written.

Huron's packaging is also unlike most offerings in the AD/Cycle world. While most AD/Cycle players have zeroed in on key functions, Amdahl is offering a soup-to-nuts alternative.

The Metastor repository will contain all master data about applications. The RDBMS has extensions that provide for hierarchical data management. The high-level language can be used both to write applications and to access data. The generator will produce Huron code that can access data in either the Huron database or existing DBMSs such as IBM's IMS and DB2.

"What they've done is woven together some old ideas and new concepts," said Frank Gens, a vice president at Technology Investment Strategies Corp. in Framingham, Mass. "It has the potential to be a very strong product."

Disk spin

Amdahl's latest high-capacity storage system, expected to be released during the third quarter, is reportedly faster and features greater capacity than IBM's 3390

	IBM 3390	amdahl 6390
Data transfer rate	4.2M byte/sec.	4.5M byte/sec.
Capacity	22.7G bytes	30.24G bytes
Average seek time	12.5 msec	10.7 msec
Platter size	10.8 in.	8.5 in.
Price for 60G bytes of storage	$772,350	$744,350

CW Chart: Doreen St. John

Sybase acquires Canadian CASE firm

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — Sybase, Inc. said last week it has acquired Deft, Inc., a $3 million Canadian computer-aided software engineering (CASE) tools firm.

The financial terms of the acquisition, which involves two privately held companies, were not announced.

Deft's CASE tools, based on the Apple Computer, Inc. Macintosh and targeted at relational database management systems running on Unix-based and Digital Equipment Corp. computers, are known for their strong reverse-engineering capabilities, industry analysts said.

"We have rounded out our tool set through our merger with Deft," said Bob Davoli, president of Sybase's SQL Solutions, Inc. systems integration subsidiary. He added that sales of tools to end users accounted for one-third of Sybase's 1990 revenue.

SQL Solutions, which paid about $600,000 to license Deft products last year, uses Deft tools to craft applications that run against multiple RDBMSs. Among the target RDBMSs are those made by Sybase competitors Oracle Corp. and Informix Software, Inc., Davoli said. Deft's CASE designs also work with DEC's RDB relational database.

Deft founder and President Eric Goldman said his 2-year-old firm has sold 1,600 development licenses to 400 corporations worldwide. After the acquisition, he was named director of CASE engineering at Sybase. Most of Deft's 22 employees will remain in Rexdale, Ontario, while its sales and marketing units will be based at Sybase's headquarters here.

Until now, Deft tools only ran on the Macintosh, but versions expected within 18 months will run under Microsoft Corp.'s Windows 3.0 and IBM's OS/2.

David McGoveran, a partner at Database Associates, Inc., a San Francisco-based consulting group, said the Deft tools provide extensive diagramming and graphical design capabilities as well as powerful data dictionary features.

However, McGoveran noted that there was a "danger" in relying on re-engineering tools to convert RDBMS applications wholesale because the behavior of databases varies so much from vendor to vendor in terms of locking, scheduling and transaction management.

Spies

FROM PAGE 1

bankruptcy court in 1985.

In 1987, federal bankruptcy Judge George Bason Jr. handed Inslaw a stunning victory, ruling that the Justice Department "took, converted, stole" Promis through "trickery, fraud and deceit" and then conspired to drive Inslaw out of business.

That ruling was upheld by the U.S. District Court in 1989. The Justice Department has since appealed the finding to the U.S. Court of Appeals in a bid to overturn a judgment that it pay Inslaw $6.8 million in damages and $1.2 million in legal fees.

> "IT'S NOT LIKE these people would just come out of the woodwork and make these claims, considering all the trouble they could get in."
>
> CONGRESSIONAL SOURCE

A congressional source knowledgeable about the Inslaw affair said judging the credibility involved is difficult. "When you're dealing with the fringes of the intelligence community, you can't just pick up the phone and confirm things. But it's not like these people would just come out of the woodwork and make these claims, considering all the trouble they could get in."

Ben-Menashe left the Israel Defense Forces in 1989 after a 12-year stint that concluded with a two-year job as intelligence consultant to Prime Minister Yitzhak Shamir. He was later indicted by the U.S. for attempting to sell transport planes to Iran but was acquitted. In another sworn affidavit filed earlier last month, Ben-Menashe said he attended a 1987 meeting in Tel Aviv at which American entrepreneur Earl W. Brian made a sales pitch for increased use of the stolen software by the Israel Defense Forces. Brian is a friend of former U.S. Attorney General Edwin Meese III.



Former Attorney General Meese *at center of Inslaw charges*

Inslaw alleges that Brian, Meese and another high-ranking Justice Department official conspired to appropriate Promis so it could be used in a "massive sweetheart contract" to install Promis throughout the Justice Department. It charges that the department continues to illegally use Promis, while it attempts to cover up its own wrongdoing.

In another affidavit filed by Inslaw last week, a scientist said he modified Promis for use by the Royal Canadian Mounted Police and the Canadian Security and Intelligence Service, where he said it is now installed.

The scientist, Michael J. Riconosciuto, said he got a copy of Promis in 1983 from Brian, who had obtained it from a Justice Department contracting officer.

Riconosciuto was research director at the time for a joint venture involving the Wackenhut Corp. and the Cabazon Band of Indians in California. The joint venture used the sovereign immunity protections of the Indian nation to shield it from view, Riconosciuto said. He said the venture was used by Brian in a plan to sell the software illegally for use in "law enforcement and intelligence agencies worldwide."

A senior executive at Wackenhut, a private security firm and Justice Department contractor, said the company had entered into a joint venture with the Indians but did not staff it and folded it when it did not win any contracts. He said Riconosciuto had never been employed by Wackenhut and that the company knew nothing of Inslaw's software.

Response by the Canadian government to Inslaw's queries has been conflicting and confusing, with officials first acknowledging that Inslaw's Promis was installed at 905 sites in Canada, then saying the software in question was from another vendor.

In another sworn statement filed last week, Iranian arms dealer Richard Babayan told of illegal sales of Promis to Iraq, Libya and South Korea and of the alleged involvement of Brian in the Iraqi and South Korean deals.

He also said former Air Force Maj. Gen. Richard V. Secord was present at a 1987 meeting with Iraqi officials in Baghdad at which Brian made a Promis sales presentation, although Babayan himself was not there to confirm that.

Both Secord and McFarlane were principals in the Iran-Contra arms scandal allegedly masterminded by McFarlane's subordinate, former Marine Lt. Col. Oliver North.

Brian's attorney, Lawrence Hirsh, said Brian denies everything in the three new affidavits. He said Brian does not know McFarlane or Secord and has no ties to the intelligence community.

Inslaw Chairman and President William A. Hamilton said he did not know what hidden agendas, if any, Ben-Menashe, Riconosciuto and Babayan might have in making their charges. "They are probably not doing it out of altruism for Inslaw," he said.

However, Hamilton insisted that he had independent corroboration of most of the charges from other sources, some of whom have given evidence to a U.S. House of Representatives committee probing the matter.

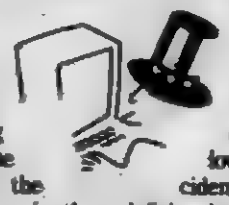
Babayan worked on behalf of the Justice Department in a highly publicized "sting" operation against politicians in Miami during the 1980s. He is in a Florida jail awaiting trial on security fraud violations. Riconosciuto could not be reached.

Justice Dept. neglects security

GAO says lax security measures may have compromised confidentiality

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Sloppy controls on the way the U.S. Department of Justice disposes of used computer gear may have compromised secret investigations and endangered the lives of government agents and witnesses, government auditors have found.



Computer security experts said disposal of computers and magnetic media without first erasing software and data — the apparent problem at the Justice Department — is the Achilles' heel of many computer security programs in both the government and private sector.

An investigation by the U.S. General Accounting Office (GAO) was sparked by an incident last summer in which a U.S. Attorney's Office sold used hardware and magnetic tapes to a Kentucky broker for $45. It was later discovered that the equipment contained improperly erased data on criminal investigations, secret informants and material sealed by court order. The gear was recovered, but it is not known whether any of the information was compromised.

Testifying before a congressional committee looking into the matter, GAO official Howard G. Rhile said a different U.S. Attorney's Office recently reported a similar incident.

"We found patterns of neglect and inattention nationwide that parallel the circumstances that allowed the Kentucky incident to occur — deficiencies that we pointed out to Justice in 1988 and 1989."

"I am disturbed by the findings," said Robert E. Wise Jr. (D-W.Va.), who requested the GAO probe. "We are spending billions of dollars each year to investigate and prosecute cases. It is money wasted if investigations are compromised because of security deficiencies, and irresponsible if people's lives are endangered."

Harry H. Flickenger, an assistant attorney general, testified that the Justice Department has adequate policies for computer security but that it had insufficient staff for security compliance reviews. He said he was taking steps to correct that.

Disposal of equipment and media without scrubbing files is widespread, said Robert P. Campbell, a computer security expert and president of Woodbridge, Va.-based Advanced Information Management, Inc. "It's more common to allow this to happen than not to allow it to happen."

An even more common but equally risky practice is letting computers go out for repairs without removing or erasing magnetic media, Campbell said.

Donn Parker, a computer security expert at SRI International, said the risk in sending out computer gear is often overlooked. "It's serious enough to be on checklists of security controls. But I don't see it as a checklist item at the companies I visit."

And justice for all

"The Department [of Justice] has been found to be guilty of trickery, fraud and deceit, and that finding was affirmed on review by a highly respected judge," Elliot Richardson, an attorney representing Inslaw, told *Computerworld* last week. "We have evidence that wrongdoing by the department goes far beyond anything found already by the courts."

Richardson, a former U.S. attorney general who resigned rather than carry out President Richard Nixon's order to fire Watergate special prosecutor Archibald Cox, said Inslaw has interviewed 30 people claiming to have knowledge of Justice Department wrongdoing, but the department has ignored all but one of them in its own investigations. Richardson also said several requests made by him directly to Attorney General Richard Thornburgh requesting the appointment of an independent counsel to investigate the matter have gone unacknowledged.

Now, the House Judiciary Committee, led by Rep. Jack Brooks (D-Texas), is conducting an investigation. For more than a year, the Justice Department has refused to produce some 200 documents Brooks said he needs for the investigation, and sources said he may spark a Watergate-style constitutional confrontation by issuing a subpoena for them.

"The evidence we have so far doesn't add up to conclusive proof of wrongdoing, but it adds up to a duty to conduct a full, fair and impartial investigation," Richardson said.

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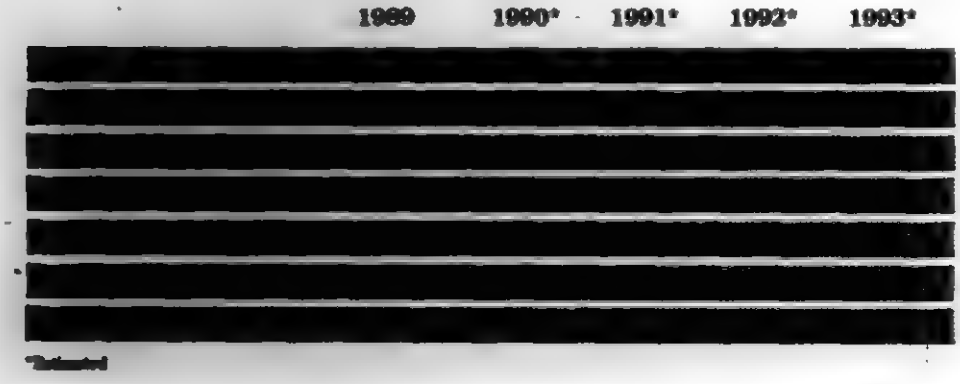
DISK STORAGE

[redacted]

Despite sluggish growth in the computer market, users are still buying higher capacity and denser disk drives

Magnetic rigid disk drives worldwide unit shipments
(in thousands)

3 1/2-in. disk drives lead the industry in unit shipments. Drives in the 30M- to 60M-byte range provide more than half of the 3 1/2-in. disk drive total. However, even large format drives show solid growth



*Estimated

Flexible disk drives worldwide unit shipments
(in thousands)

Microfloppy drives dominate the market, but smaller versions with heights of 3/4-in. or smaller will replace larger 1-in. configurations. By 1993, these newer versions will represent 71% of total worldwide shipments



*Estimated

Source: Disk/Trend, Inc., Mountain View, Calif.

CW Chart: Tom Monahan

INSIDE LINES

Sooner or later, it's got to emerge

Novell brought its System Fault Tolerance Level III product up for air again at a developers conference last week. The firm first announced development of the server-mirroring product years ago. Developers who witnessed the sighting said a separate Ethernet cable was strung between two servers, which were hooked up to three workstations on another Ethernet cable.

Racal Data ready for bad news

The Racal Data companies have been rumored to be on the brink of a major reorganization as fallout from the financial results of its March 30 fiscal year end. A spokeswoman for wide-area networking company Racal-Milgo in Sunrise, Fla., confirmed that there are "anticipated changes early in the fiscal year" that probably include staff reduction and a shuffling of responsibilities of Racal executives at more than one of the five U.S. Racal companies.

Anybody seen the IBM router?

Talk of a multiprotocol router coming out of IBM based on the firm's RISC System/6000 workstation led to rumors last week that Wellfleet Communications was partnering on the project and that The Travelers was actually beta-testing the product. However, two Travelers information services executives denied knowledge of the existence of the said router, although they noted they are router shopping. A Wellfleet spokeswoman insisted that "we have no agreement with IBM," and an IBM spokesman would say only that "obviously, routing is a key requirement that we haven't done a lot to address in our product line. And we think routers are a good thing."

Another AD/Cycle 'event'?

IBM plans to color in more of its AD/Cycle picture with an announcement tomorrow of additional business partners and their products. One addition will likely be Intersolv, the new entity based on the Index Technology and Sage Software merger. Index had been one of the core AD/Cycle business partners. A spokesman for Intersolv confirmed that the company would be represented at the briefing.

DEC and the 'vision thing'

The latest vendor "vision of the week" focuses on network systems management and hails from DEC. Some industry analysts say they smell more marketing smoke than fiery products in this "major systems management announcement" DEC has slated for this week. Yet others say they believe DEC will unveil a new version of its Enterprise Management Architecture, including a new VAX Performance Advisor that incorporates capacity planning and system performance monitoring missing from the current version.

Apple's new monitor not for US

Apple insiders say CEO John Sculley has moved to improve his rocky relations with third-party developers. Although Apple was planning to introduce a 21-in. color monitor this summer for about $4,000, the company realigned plans when Apple monitor makers such as Radius and Supermac Technology began to kick. Sources say the monitor will still ship on schedule but only outside the U.S.

HP in Posix catbird seat

Lynx Real-Time Systems will announce a pact this week to license its LynxOS to HP. A Posix-compliant system, LynxOS will be evaluated for potential use with HP's Precision Architecture RISC systems to address real-time and embedded applications.

Lawrence Walsh, the special prosecutor still investigating the Iran/Contra scandal, has been mightily frustrated over the prosecutions of Ollie North and his compadres. In light of our page 1 story this week, we can only hope he's not using the Inslaw case-tracking software package to manage the investigation. Bring those darkest secrets to the attention of News Editor Pete Bartolik, and we'll open them up to the light of public scrutiny. Call (800) 343-6474, fax the next set of Pentagon Papers to (508) 875-8931, or bug us on Compuserve at 76537,2413.

NEXT WEEK

It's data center consolidation time at **GTE Corp.** Not only is IS at the telecom giant integrating equipment acquired from its March 14 merger with Contel Corp., but the firm is also nearing the end of a four-year effort to cut its nine data centers to four. The consolidation project will save GTE $149 million in labor and operating costs. See In Depth.



Like it or not, faxes are becoming a major part of the corporate information flow. Manager's Journal examines the increasing role that IS executives should play in managing fax expenses and integrating fax with other information technologies. Many firms are saving money and gaining strategic benefits from LAN-based fax server applications.

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A leading registered stock broker/dealer decided to implement IBM's SAA strategy. The company used BACHMAN products to migrate databases that housed client statements and mailing lists into an enterprise model, by capturing and merging the data. New functionality was added and the model was forward engineered into a new DB2 design.

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COMPUTERWORLD

Vendor security chiefs cite LAN, laptop threat

BY MICHAEL ALEXANDER
CW STAFF

SAN DIEGO — Information systems security professionals at the nation's top computer firms are spending sleepless nights worrying about computer security, ironically as a result of the widespread use of personal computers, laptops and networks.

At the Information Systems Security Association's eighth annual conference here last week, security chiefs at Apple Computer, Inc., Digital Equipment Corp., Hewlett-Packard Co. and IBM talked about the challenges of protecting PCs and the networks that link them to each other and to host computers.

IBM has some 225,000 PCs and workstations in-house, primarily connected to host computer systems. "My biggest fear is someone will pick up [a PC or workstation] and walk off with it," said Phil Dolan, information security program director at IBM. The value of the information contained on a hard disk is apt to be considerably higher than the actual cost of the PC; thus, proprietary information should not be kept on any PC,

Continued on page 97

Assault tactics



•The use of computer viruses as weapons is under review by the U.S. military following the war in the Persian Gulf. Software-intensive battlefield systems are at the highest risk, according to experts.
See story page 97.

Pan Am to go outsourcing route

BY RICHARD PASTORE
CW STAFF

NEW YORK — To help shed some operating costs and pick up badly needed cash, Pan American World Airways, Inc. is negotiating what could be one of the largest outsourcing contracts ever. Within the next three months, the airline is hoping to award a contract worth $500 million over five years to one of several outsourcing vendors.

Vice President of Information Services Robert O. Wagner told *Computerworld* that the company is planning to sell its proprietary applications, software licenses and hardware and turn over its 500-plus-person information systems staff to one of several vendors. The possibilities include Electronic Data Systems Corp., IBM, Andersen Consulting, AT&T and SITI, a France-based airline association.

EDS confirmed that it has been approached by Pan Am, but no deal has been consummated. "It is our intent to be a major force in providing service to the airlines," said Nate Lanford, transportation division vice president. EDS is currently competing with IBM for the System One Corp. reservations system

Continued on page 96

Top outsourcing pacts

Firm	Value	Contract under
Enron Corp.	$750M	EDS
First City Bank Corp.	$600M	EDS
Eastman Kodak Co.	$500M	IBM
National Car Rental System, Inc.	$500M	EDS
Pan American World Airways, Inc.	$500M	?
First Fidelity Bancorp	$450M	EDS

Source: Merrill Lynch Capital Markets — CW Chart: Marie Haines

Firestone, Oracle trade contract suits

Tire maker charges missed deliveries scuttled national on-line system

BY ELLIS BOOKER
CW STAFF

AKRON, Ohio — Had all gone as planned, Bridgestone/Firestone, Inc.'s 1,600 service facilities would today have on-line access to a flexible customer and parts database and be the envy of the automotive repair industry.

However, the ambitious Mastercare Systems Project is up on blocks, with Firestone seeking $40 million in damages from its software vendor, and the vendor, Oracle Corp., suing to collect the remainder of its bill.

According to court documents obtained by *Computerworld* last week, the Firestone suit, filed Feb. 27 in U.S. District Court for the Northern District of California in San Jose, seeks at least $10 million in damages from Oracle for alleged breach of contract and other claims.

The nine-count breach of contract suit states that Oracle failed to deliver its SQL*Forms Version 3.0 and RDBMS Version 6.0 database products on time or with the required features. At the time of the Mastercare contract, neither product was commercially available.

Firestone also charged fraud and negligent misrepresentation, arguing that Oracle knew its products would not fit the Mastercare project's timetable or requirements.

Continued on page 95.

IBM plans OS/2 revival

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Its back against the wall, a determined IBM refuses to throw in the towel on OS/2. Next week, the computer giant is expected to reveal its latest and biggest effort to win over the so far mostly indifferent masses.

IBM is expected to offer a series of bundling and packaging options, including the option to purchase components of OS/2 Extended Edition separately.

In addition, IBM executives will reportedly provide insight into and assurance about how OS/2 will tie into future Personal System/2, multimedia and networking directions.

The basic song will remain the same: OS/2 is central to IBM's long-term plans. "It's important that we get out the message — what we're doing and where we're going — to clear up the confusion," an IBM source said.

Continued on page 8

DEC hatches alternative to Systemview

BY ELISABETH HORWITT
CW STAFF

MAYNARD, Mass. — Seven months after IBM made its Systemview announcement, Digital Equipment Corp. has entered the integrated systems management fray with its own offering, Polycenter.

The two vendors are locking horns over what both have identified as one of the decade's hottest markets: corporate users who want to centralize and automate systems management operations across distributed, multivendor hosts, with lights-out operations as the ultimate goal at remote sites.

Both vendors have promised to manage other vendors' systems via published application programming interfaces and support of common industry standards such as Open Systems Interconnect and the Open Software Foundation's Distributed Management Environment.

By 1995 or 1996, Polycenter is expected to provide fully integrated, multivendor, lights-out systems management, DEC group manager Patrick Mullen said.

Continued on page 6

Common ground

Both IBM's Systemview and DEC's Polycenter are anchored by similar features:

- Object-oriented data repository
- Graphics-based user interface
- Standards-based network interfaces
- Published application programming interfaces
- Integration with network management platform
- Centralized management, control and monitoring

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IBM fills in ES/9000 line at the top, updates AD/Cycle strategy. Page 6.

Wang reaches for future with work-group strategy but provides little detail. Page 95.

Latest consortium plots tool set for multinational, multivendor document transfer. Page 8.

Product Spotlight — Streamline or completely revamp sales procedures with sales force automation software. Page 59.

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14 Gilbert Hyatt, reigning single-chip microcomputer patent holder, may be dethroned by contender and former TI employee Gary Boone.

95 You can choose your friends, and you can choose your computers, but you may not be able to choose your friend's computer if it's a Wang — now that the VS operating system license is nontransferable.

Quotable

"We looked for someone who could run more plankton through the whale."

PAUL G. ADAMS
FIRST AMERICAN DATA SERVICES

On why the company chose to outsource with Perot Systems. See story page 96.

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The 5th Wave



"HELLO, SMART-HOME MAINTENANCE? CAN YOU SEND SOMEONE OUT - OUR DEN IS ACTING REALLY STUPID."

Rich Tennant

EXECUTIVE BRIEFING

■ **Pan Am is set to award** one of the largest outsourcing deals ever, with a total value that may exceed $500 million. The airline has not yet decided who will get the contract but says it hopes to sell its own applications to smaller airlines through the outsourcing vendor. **Page 1.**

■ **Fax technology is increasingly coming under information systems control** as more companies rely on it for mass distribution of information. No one expects IS groups to start managing individual fax machines in user departments, but experts say IS must take notice of the expanding role of faxes in corporate networks. Those who have done so say the economies of scale are tremendous. **Page 53.**

■ **DEC will go up against IBM's Systemview** in the market for integrated systems management. DEC's Polycenter entry manages computing and communications resources across an enterprise but is said to better accommodate other vendors' equipment. **Page 1.**

■ **GTE and Contel expect savings to reach $40 million** as a result of data center consolidation following their $6.6 billion merger. The two-year effort involves combining IBM and Honeywell hardware and telecom applications as well as closing Contel's four data centers by 1993. **Page 71.**

■ **Computer security worries plague even the giants** of personal computing. Security chiefs from Apple, DEC, HP and IBM say portable computers and proliferating local-area networks are making their headaches even worse. **Page 1.**

■ **Military officials are concerned** about the potential damage computer viruses could cause to computerized weaponry following the outbreak of several viruses during operations in the Persian Gulf. But they're also intrigued by the possibility of using viruses as a tactical weapon. **Page 97.**

■ **Don't look for an end to the Unix wars,** even though AT&T has sold off 22% of its Unix operation. Open Software Foundation adherents say AT&T's moves are too little, too late. **Page 12.**

■ **IBM introduces a five-way processor model** in its Enterprise System/9000 line and takes steps to encourage mainframe customers to move upward. **Page 6.**

■ **Wang will look to entice office work groups** with services, groupware technologies and multimedia. Customers are intrigued but want to see products to back up Wang's claims. **Page 95.**

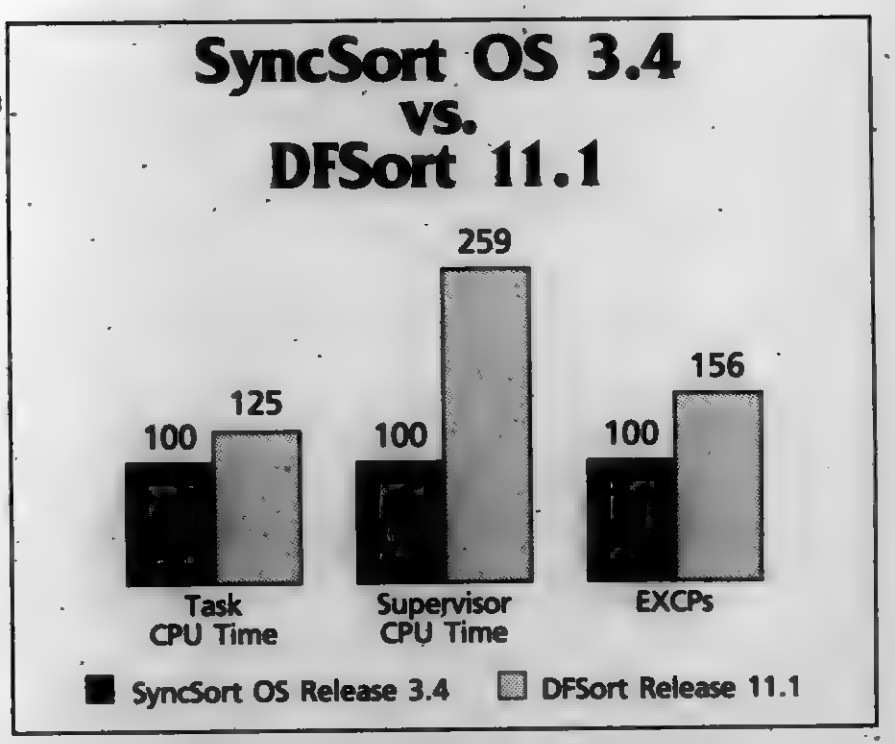
■ **"Impressive"** is what observers are saying about AT&T's forthcoming notebook PC, which is expected to be introduced this month. The Safari PC reportedly features an optional cellular fax/data modem, Windows Version 3.0 in read-only memory and up to 100M bytes of disk storage. **Page 84.**

■ **More than half of new Application System/400 installations** are replacing existing System/36s and System/38s, according to a survey by Computer Intelligence. **Page 27.**

■ **A very different Control Data** is trying to reassert itself in the computer industry. The new CDC has divested a lot of its businesses and is refocusing on open systems, manufacturing and engineering. **Page 77.**

■ **On-site this week:** A West Coast health maintenance organization turns to a DEC VAX 9000 and clustering to keep its database performance in the pink. **Page 29.** Rapid response is the driving force behind a Michigan bank's multifaceted PC program. **Page 35.** A California design house credits computer-aided design workstations and a commitment to creativity with its success in designing functional, easy-to-make products. **Page 37.** It took the clout of Los Alamos National Laboratory to get an 800M bit/sec. channel considered as an ANSI standard. But it worked. **Page 45.**

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Banyan opening up with Vines

Firm reacts to market, user demands to support OS/2, additional APIs

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — Stepping carefully amid the musical chairs atmosphere of the thriving local-area network market, Banyan Systems, Inc. confirmed last week that it will formally introduce today a more "open" version of its Virtual Networking System (Vines) network operating system, which has been in beta testing since November.

Market pressure and user demand have prompted Banyan to support OS/2 and further integrate Microsoft Corp.'s MS-DOS/Windows 3.0 as clients (CW, March 25) onto Vines Version 4.10, rolling out this week at the Association of Banyan Users conference in Montreal.

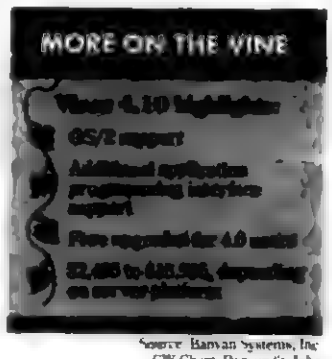
In addition, Version 4.10 supports several key application programming interfaces (API), software that allows applications programs to talk to communications software.

"The level of Windows integration in 4.10 is much improved over 4.0. Now we don't have to exit the Windows environment to mount file and print services; we can do it all with the Windows file manager and printer tool," said Jonathan Oski, a senior technical engineer at Boston's Bank of Tokyo Financial Corp. and a Version 4.10 beta tester.

However, Tom Thomison, technical director in the gas department at Houston-based Texaco Exploration and Producing, Inc., said Banyan still has steps to take with its level of Windows integration.

"For example, there are Windows network utilities Banyan needs to write," Thomison said. "Within Vines, you have utilities for maintaining users and managing the network. Banyan needs to make those functions available as Windows applications instead of only as DOS applications that appear in a DOS text window."

A stumbling block for Vines has been that the 55% market share garnered by competitor Novell, Inc. has made it more lucrative for third-party software developers to create products for Novell's Netware network operating system than for Vines.



Source: Banyan Systems, Inc.
CW Chart: Doreen St. John

The added API support aims to ease the Vines application development task and open up relationships between Banyan and third-party developers, according to a Banyan official.

Vines 4.10 supports electronic mail and network management APIs that allow third-party developers to write front ends to applications for Vines to suit users' environments of choice.

Support of APIs

The network now also supports Named Pipes and Mail Slots. This means programs can be concurrently developed for LAN Manager and Vines, which should attract some developers to Vines by default, according to Mark Leary, director of communications research at Technology Investment Strategies Corp.

"Banyan will never convince developers to create applications just for Vines," he said.

Oski said his Named Pipes API beta test "has been solid from the very first. It is important to us because now we're able to run OS/2 SQL Server, a key application for us."

Consortium backs plans for standard RISC box

BY JOANIE M. WEXLER
CW STAFF

Networking company Banyan Systems, Inc. is slated to make a guest appearance at tomorrow's unveiling of a blueprint for a potential "industry-standard" reduced instruction set computing (RISC)-based workstation by about 20 computer products vendors.

One industry analyst said he presumes Banyan's participation in the Advanced RISC Computing Architecture Consortium indicates that Banyan intends to port its Virtual Networking System (Vines) network to the resulting RISC architecture.

The firms invited to the briefing indicate that the leading consortium members are Compaq Computer Corp., Digital Equipment Corp., Microsoft Corp., Mips Computer Systems, Inc. and The Santa Cruz Operation.

A Banyan spokesman last week said only that "this is a Compaq-initiated effort; if the resulting workstation becomes a standard, it is in Banyan's best interest to support it." Compaq is Banyan's largest customer, and Compaq Deskpro 386 and Systempro computers are certified as Vines servers.

Unofficially official

The spokesman would not confirm whether Banyan is an official member of the consortium. However, Banyan's director of business development, Bill Johnson, said that the enterprise-wide-oriented networking company backs the concept of a standard RISC architecture for clients as well as servers.

If the RISC architecture does become standard, support could boost Banyan's and Microsoft's status in the local-area networking business vis-a-vis market leader Novell, Inc. There has been no indication of Novell's involvement in the consortium.

A "standard" compute-intensive chip in a Compaq computer would allow that computer to run either Microsoft's emerging, portable OS/2 Version 3.0 operating system or Unix.

The vendors participating in the consortium are said to be planning a single binary application interface for a Mips processor to ease applications development for the new-generation platform.

Compaq buys into Silicon Graphics

BY J. A. SAVAGE
CW STAFF

HOUSTON — Compaq Computer Corp. bought into the reduced instruction set computing (RISC) workstation market last week, but the first fruits of the deal may turn up in the form of more powerful Intel Corp.-based personal computers.

Compaq paid $145 million of a 13% equity stake in Silicon Graphics, Inc., a Mountain View, Calif.-based maker of high-performance workstations based on the Mips Computer Systems, Inc. RISC chip. Compaq also said it will invest another $50 million in joint research and development with Silicon Graphics.

Silicon Graphics also licensed its basic graphics software to Microsoft Corp. last week. Although Microsoft has yet to say where the software will fit into its product lines, its licensing of Silicon Graphics' Graphics Library is likely to set a graphics communication standard for PCs, according to analysts.

Predictions of power

Some observers said they expect Compaq will use the Silicon Graphics technology to boost the graphics power of its existing PC line. Tom Kucharvy, an analyst at Summit Strategies, said Compaq will probably offer its high-end Systempro with the Silicon Graphics three-dimensional add-in board.

A cooperatively produced Intel-based product is "very possible," said Lorie Strong, vice president of product marketing at Compaq. She said the deal allows the two firms to develop identical systems bundled differently for different markets.

Strong downplayed the idea that Compaq is buying into Silicon Graphics to get into the workstation market. "We're looking at graphics technology for broader business appeal. For instance, with Windows and multimedia, graphics will be a bigger part of the general business market," he said.

Some are skeptical of the PC's viability. Michael Goulde, an analyst at Open Systems Advisors, Inc., said an Intel platform is not likely to get far in the market. "The graphics won't perform well. You need the processing power of a RISC chip to do what Silicon Graphics does well."

Compaq is expected to announce this week that it will expand from Intel-based PCs and servers into the Mips Computer RISC architecture.

The graphics library being licensed by Microsoft allows real-time interaction between images and human manipulation, according to Karen Hargrove, business development group manager at Microsoft. Programmers Hierarchical Interactive Graphics Systems does not offer such interaction.

"We're investigating a variety of ways to use the graphics library," Hargrove said. "It could be on top of the operating system, in the operating system or in use with applications."

CORRECTION

The Trends chart on disk storage [CW, April 1] incorrectly identified the shipment forecast data as disk drive units. The chart should have read, "Magnetic rigid disk drives, capacity of worldwide shipments in terabytes."

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IBM boosts high-end ES/9000 lineup

BY ROSEMARY HAMILTON
CW STAFF

ARMONK, N.Y. — IBM last week expanded its large-system lineup with an additional high-end Enterprise System/9000, new upgrade paths to its premier mainframes and several systems software facilities.

Also last week, the company provided a progress report on its software development initiative, AD/Cycle, that included the addition of Easel Corp. as the latest member of the AD/Cycle inner circle.

The Easel addition resulted in another nod from IBM for MS-DOS and Microsoft Corp.'s Windows. Both Easel and IBM plan to market the Easel Workbench, an OS/2-based development tool kit that can produce code for other operating environments, including Windows, officials from both companies said.

The ES/9000 Model 860 is the third announced mainframe that uses the new-generation technology once known as Summit. The five-way processor, which carries a list price of $19.3 million, will be available in the second quarter of 1992. Four-way and six-way versions are on schedule for shipment later this year.

"It was a gap — and an important one," said Frank Gens, a vice president at Technology Investment Strategies Corp.

According to Gens, the five-way processor, along with additional high-end upgrade options, will provide users with more choices for taking the plunge from 3090 technology to the new generation. Previously, a user of the Model 720, which is based on the 3090 600J technology, could move up to a six-way Model 900 only. Users can now move from a Model 720 to a Model 820, a four-way, new-generation processor or a five-way Model 860.

IBM will also offer more upgrade options for its smallest mainframes, the 9370s. At the time of the System/390 announcement last year, IBM offered upgrade paths for 9370 users with high-end models. Last week, it extended the option to the entire 9370 line.

"What that tells me is IBM is trying to remove as many obstacles as they can for users to purchase ES/9000s," Gens said.

Last week, IBM also lowered the entry point to its fiber-optic channel architecture, Escon, to attract more users. Previously, a user was required to implement Escon with a minimum of 16 channels. The new minimum is eight channels.

The software announced last week included security and system availability tools.

Mike Satzinberg, vice president of technical services at Manufacturers Hanover Trust Co., said he took note of the Processor Availability Facility, which would automatically move an executing program on a failing processor to another operational one.

"As we put more critical work loads in a single basket, all those features improve the overall stability of the environment," Satzinberg said. Manufacturers Hanover has been moving from several smaller mainframes to two high-end ES/9000s.

Bull to use IBM's Escon scheme

IBM and Bull HN Information Systems, Inc. have announced an agreement that will allow Bull HN to supply its mainframe customers with IBM's Escon technology.

"For Bull's large-system strategy to be both competitive and cost-effective, [the company] can't afford to develop everything in-house," said George Lindamood, program director of computer strategies at Gartner Group, Inc., a Stamford, Conn.-based market research and consulting firm.

Lindamood added that IBM is trying to position Escon as a full-fledged standards architecture, and endorsement from nonplug-compatible vendors is important.

The Escon technology replaces traditional I/O connections with fiber-optic channels and allows peripherals, such as direct-access storage devices (DASD), to be located at distances of up to 9 km from the CPU.

According to Ray Frye, senior project manager at Bull HN, the proprietary GCOS 8 operating system will be able to support the IBM fiber-optic environment.

"We are looking to achieve an IBM 9035 architectural equivalent, and to do that, the I/O subsystem in GCOS 8 must be redesigned," he said.

The IBM Escon Director will be supported for use with Bull HN DASD subsystems on the DPS 9000 mainframe. Bull HN plans to extend the Escon technology to other peripheral subsystems on GCOS 8 platforms. The target date for project completion is the second quarter of 1992, a Bull HN spokesman said.

SALLY CUSACK

Onward and upward

IBM announced upgrades from ES/9370s to low-end ES/9000s as well as among high-end ES/9000s

ES/9000 air-cooled model upgrades

20	to	120	$75,000	Sept. '91
30	to	120	$70,000	Sept. '91
50	to	120	$70,000	Sept. '91
80	to	120	$80,000	Sept. '91

ES/9000 water-cooled model upgrades

720	to	820	$5,125,000	2Q '92
820	to	860	$2,775,000	3Q '92

*Conversions may require additional memory, channels and features, depending on the configuration of the "from" processors

Source: IBM — CW Chart: Tom Monahan

All quiet on AT&T/NCR front; users tap feet

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — AT&T late last week said NCR Corp. Chairman Charles E. Exley Jr. set a nonnegotiable figure of $110 per share as the price for AT&T to buy out the computer company.

AT&T said Exley met with AT&T Chairman Robert Allen on Thursday following a meeting of the NCR board of directors. According to AT&T, Allen said AT&T will not pay $110 but is open to further negotiations.

AT&T also said Exley indicated he does not want NCR and AT&T to jointly discuss a pooling accounting issue with the Securities and Exchange Commission, an issue that would allow a tax-free merger.

NCR late Friday issued a statement saying AT&T's comments were one-sided and violated an agreement not to issue any statements about the meeting.

The week following the anticlimactic shareholders meeting at NCR's Dayton, Ohio, headquarters was a bit too quiet for users, who said they would like to see things move along.

"I kind of wish they'd get it over with," said Terry Svacina, manager of electronic data processing at The Popular Dry Goods Store Co. in El Paso, Texas. Svacina was one of several NCR users contacted last week who indicated they would like to see a resolution to the takeover battle.

Several analysts predicted nothing would happen until after the final vote counts were in from the NCR shareholders meetings March 28. The count is expected to be completed this week.

"I think the longer [NCR] waits, the better value they create for themselves," said Kevin Morrow, an analyst at The Ohio Co. in Columbus.

DEC

FROM PAGE 1

"That's the nirvana users are screaming for now."

Armed with Polycenter, "DEC will be much better equipped to walk in and say, 'Hey, even if you didn't buy hardware from us, we have the best management solution for your hardware as well as our own,'" said Terry Shannon, an analyst at International Data Corp. However, Polycenter shares Systemview's amorphous status as a blueprint that will be filled in over the next few years.

Like IBM, DEC is providing some initial substance to this framework by basing it on a "portfolio" of existing systems management applications and an existing network management system.

Unlike IBM's Netview, the DEC Management Control Center (Decmcc) Director does already include a formal data structure. DEC's Network Applications Support (NAS) architecture will provide the common protocols for integrating third-party applications and systems.

However, it will take a couple of years for DEC to start providing fully integrated systems management for VMS, Ultrix, OSF/1 and Unix System V environments via NAS and Decmcc Director. Polycenter will begin managing other vendors' operating environments about one year later, DEC said.

On target

DEC's initial concentration on providing integrated management for its systems seemed to fit well with many users' agendas.

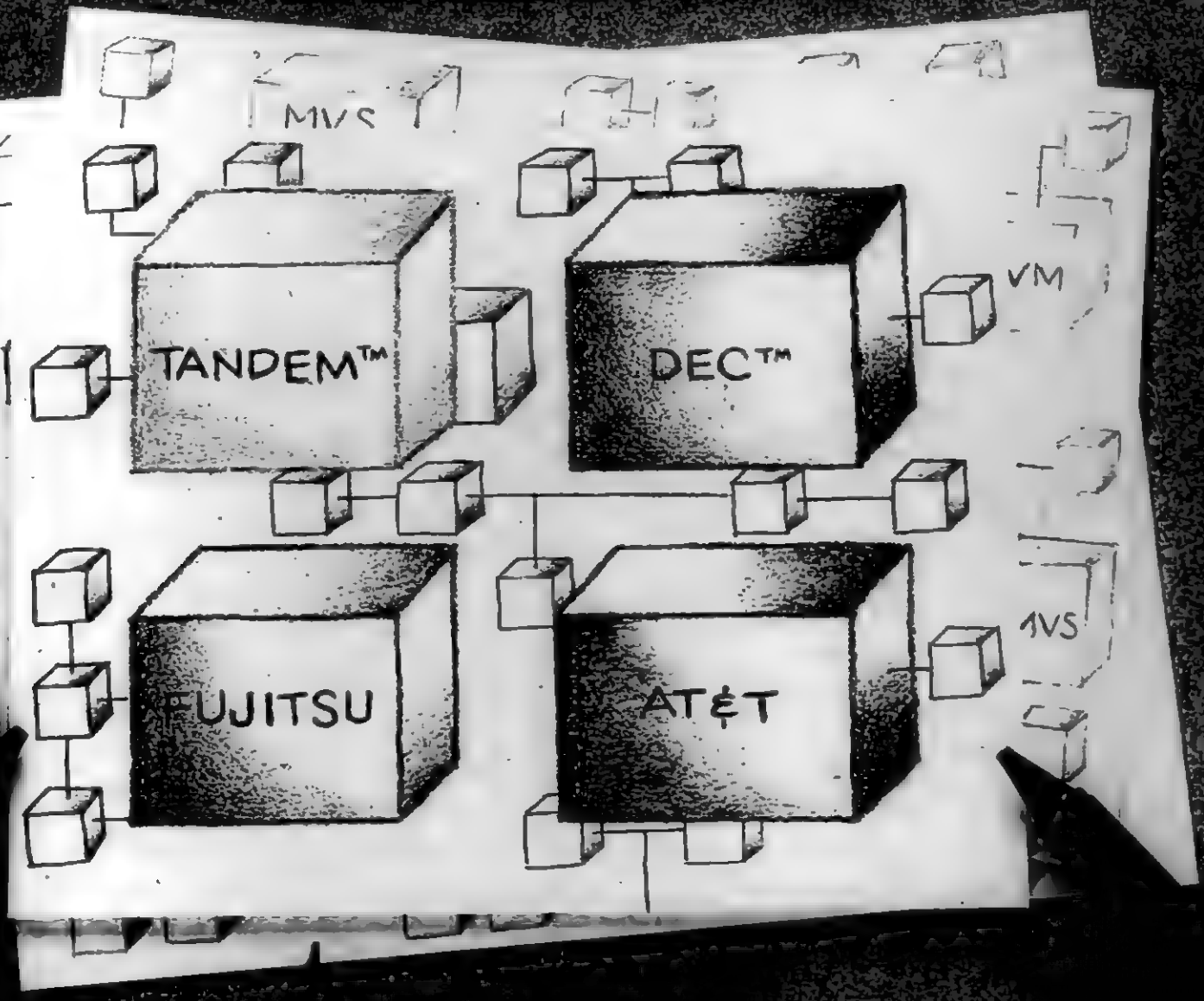
G. D. Searle & Co., for example, will probably start looking at integrated systems management in about one year, particularly for its overseas DEC sites, said Keith Addison, Searle's manager of network integration.

Right now, each remote site is responsible for disk management, minor applications development and ensuring that information gets shipped to a central site. With Polycenter in place, "users could enter transactions and data, and the rest we would take care of from across the pond," Addison said.

The Stevens Institute of Technology is eyeing Polycenter as a way to "improve productivity and offload a lot of tasks in an automated fashion" for managing Ultrix and VMS systems, said Leslie Maltz, director of computing and communications resources.

DEC began addressing users' demands for Ultrix/VMS systems integration last week with the following introductions:

- Remote System Manager Version 2.3 allows a centralized VAX/VMS system to back up centrally, install operating systems and distribute software to multiple remote VAX/VMS, VAX/Ultrix and — with the new version — reduced instruction set computing/Ultrix computers. Shipping is slated for May.
- A new version of DEC's Data Center Monitor for VMS and Ultrix, which introduces an expert systems component.
- Decinspect for VMS Version 2.1 implements and manages a security system across a distributed network of VAX/VMS computers.
- Decalert Software Version 1.1 consolidates alarm information from multiple VMS and Ultrix hosts.


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NEWS SHORTS

Apple realigns R&D

In a move designed to accelerate the development of new products, Apple Computer, Inc. has segmented its research and development efforts along product lines. The new divisions — including Macintosh hardware, Macintosh software, object-based systems, enterprise systems, consumer products and advanced technologies — will serve to sharply focus resources to speed the creation of breakthrough technologies, according to Apple Chairman John Sculley.

Medusa ported to Ultrix

Computervision, a Prime Computer, Inc. company based in Bedford, Mass., announced that it has ported its Medusa family of computer-aided design and manufacturing software to Digital Equipment Corp.'s Ultrix operating environment. The port will allow Medusa to run on DEC's Decstation and reduced instruction set computing-based platforms, in addition to DEC VAX and Vaxstation computers. Shipments are scheduled to begin in July, and configurations for the Decstation will start at under $70,000.

Lotus enhances 1-2-3 drivers

Lotus Development Corp. said it is now shipping enhanced printer driver support with 1-2-3 Release 3.1. New drivers have been written to support printers from Canon U.S.A., Inc., NEC Corp., Panasonic Corp., Texas Instruments, Inc. and Adobe Systems, Inc. Color Postscript-compatible printers. In response to customer requests, several existing printer drivers were also bolstered. Lotus added support for the landscape printing capability on Hewlett-Packard Co.'s Deskjet, Deskjet Plus, Deskjet 500 and Paintjet XL printers and an update to HP's Laserjet Series II printer driver.

More secure VM/SP killed

IBM announced it will consolidate its efforts to develop secure versions of the VM operating system, primarily for the U.S. Department of Defense (DOD), by developing a trusted version of VM/ESA 1.1 and Resource Access Control Facility (RACF). VM/ESA and RACF will come with options enabling them to meet National Security Agency criteria for either C2 or B1 levels of trust, IBM said. IBM said it had abandoned a plan to develop a trusted version of VM/SP, based on user feedback suggesting DOD security requirements are centered on VM/ESA.

Kimtron founder dies

John Y. Kim, president and founder of Kimtron Corp., died recently at the age of 48. Kim founded his firm in 1979 and shipped its first product, a VDT, in 1984. Fremont, Calif.-based Kimtron became a division of Inkel Technology, Inc. last June. Kim leaves his wife and two children.

DG closes sale of Japanese division

Finalizing a $46 million deal, Data General Corp. sold its Japanese subsidiary, Nippon Data General Corp., to Omron Corp. in Kyoto, Japan, last week. The two companies announced March 12 that they had reached an agreement in principle. DG expects to report a gain from the sale of approximately $13 million in its third quarter, which ends June 29. Net cash proceeds for DG are estimated at $35 million. Omron is a $2.6 billion electronics firm, which deals primarily in office and factory automation and electronic fund transfer systems.

Filenet, Tandem sign deal

Document imaging vendor Filenet Corp. signed a joint marketing agreement with Tandem Computers, Inc. last week, which will put the Filenet systems on its fault-tolerant computer platforms. Filenet, based in Costa Mesa, Calif., said the agreement with Cupertino, Calif.-based Tandem was signed under Tandem's "Alliance" applications development program.

More news shorts on page 96

Consortium unveils document standard

BY MARYFRAN JOHNSON
CW STAFF

BRUSSELS — Make room for yet another consortium.

This latest industry alliance brings together six international computer vendors, including IBM and Digital Equipment Corp., which last week announced their support for a document interchange standard that will eventually enable multinational companies to exchange documents containing text, images and voice over multivendor networks.

Based here, the Open Document Architecture (ODA) Consortium also counts among its initial members Groupe Bull, Unisys Corp., Siemens Nixdorf Informationsysteme AG and ICL, Inc., a subsidiary of Fujitsu Ltd.

By 1993, the group intends to produce a software tool kit — to be openly licensed to software vendors and other computer firms — for building applications to meet ODA specifications.

European companies and governments have been the most avid supporters of ODA thus far, industry analysts said, but U.S.-based multinational companies are beginning to awaken to its importance. The lack of consensus on how data should be stored, accessed and shared has made document interchange a frustrating task for global companies such as Wilmington, Del.-based Du Pont Co. and The Boeing Co. in Seattle.

"We want to swap documents back and forth, and the only way to do it is to define international standards," said Warren Hoffman, a principal consultant at Du Pont Information Systems. "For Du Pont, open systems means products based on widely implemented, vendor-neutral standards. ODA is an example of that."



Developed by the International Standards Organization, ODA is a set of standards for structuring and encoding documents for easy exchange between multivendor computer systems. The goal is to have both sender and receiver see exactly the same image without wasting time retyping or reformatting.

Raymond E. Cairns Jr., senior vice president of information systems at Du Pont, said ODA will become a standard for the firm. "We will soon ask our key software vendors to incorporate the ODA Consortium's software in their products such as word processors, drawing programs, image systems and electronic-mail systems," Cairns said.

At Boeing Computer Services Co. in Bellevue, Wash., testing is already under way on ODA implementations from DEC, Xerox Corp. and Groupe Bull.

"We have a very great need to move our information with suppliers, vendors and partners immediately and electronically. The mail is too slow," said Joanna Vanderwilt, compound document interchange product manager at Boeing. "This consortium coming together is a good start."

Industry analysts also applauded the consortium's determination to breathe life into the complex but incomplete ODA standard, which is missing such major pieces as the ability to handle voice transmissions, spreadsheets or tables of data.

The consortium's work will be divided among the initial members, with DEC supplying the base technology to build the software tool kit and IBM managing the project and testing the products.

At IBM, adopting the ODA standard means jettisoning its internal standard for revisable, networked documents, called Mixed Object Document Content Architecture. While some analysts said the switch may cause further delays in Officevision, IBM said its customers should see little impact because ODA is just one of the standards involved in Officevision.

IBM revival

FROM PAGE 1

"This is a major announcement designed to convince corporate America that OS/2 is alive and well despite whatever Microsoft has said," said David Hanna, a software consultant and former IBM vice president now based in Menlo Park, Calif. IBM said OS/2 is fundamental to its large account strategy and control, he added.

IBM will present its strategy in briefings for its top 200 accounts, consultants, security analysts and the press. The sessions will include a case study on Plano, Texas-based Frito-Lay, Inc.'s OS/2 implementation and user, developer and hardware OEM testimonials.

David Liddle, president of Patriot Partners, will take turns at the podium with James Cannavino, IBM's vice president and general manager of Personal Systems; Earl Wheeler, senior vice president of the Programming Systems Division; and a host of top company executives.

There had been internal debate over whether to hold OS/2 2.0 until the object- and graphically oriented OS/2 2.1 is completed; that could be by the end of the year, a consultant close to IBM said. However, IBM has decided it must release Version 2.0 on schedule, according to two large OS/2 accounts. "That date is now firm," a user briefed by IBM claimed.

IBM said it has rolled out OS/2 2.0 to about 50 user accounts so far, with plans to test the product in at least 1,000 sites. With an anticipated third-quarter shipping date just three months away, a source close to IBM said to expect a "significant ramp up very soon" in beta-test distribution.

> "THIS IS A major announcement designed to convince corporate America that OS/2 is alive and well . . ."
>
> DAVID HANNA
> SOFTWARE CONSULTANT

IBM did decide to fold the enhancements slated for OS/2 1.4, which extends support for Extended Edition components to third-party hardware [CW, Jan. 14] into OS/2 2.0. The end result is the Extended Services Program. Scheduled for availability in the fourth quarter, it will eliminate a separate OS/2 Extended Edition by giving users their choice of the unbundled Database Manager and Communications Manager.

IBM will also discuss plans to put some as-yet-unspecified pieces of Officevision's Common User Access application programming interfaces into OS/2 and its Presentation Manager interface. IBM has already moved Officevision's drop-and-drag functionality into Presentation Manager.

Also on the agenda are various OS/2 bundling strategies, sources involved in the planning said. Among the options IBM is mulling over are shipping OS/2 with every Intel Corp. 80386-based PS/2, bundling OS/2 with other applications and cutting the price of OS/2. "These would not be unfeasible," an IBM source said. IBM will also roll out developer support programs, including joint marketing and development efforts.

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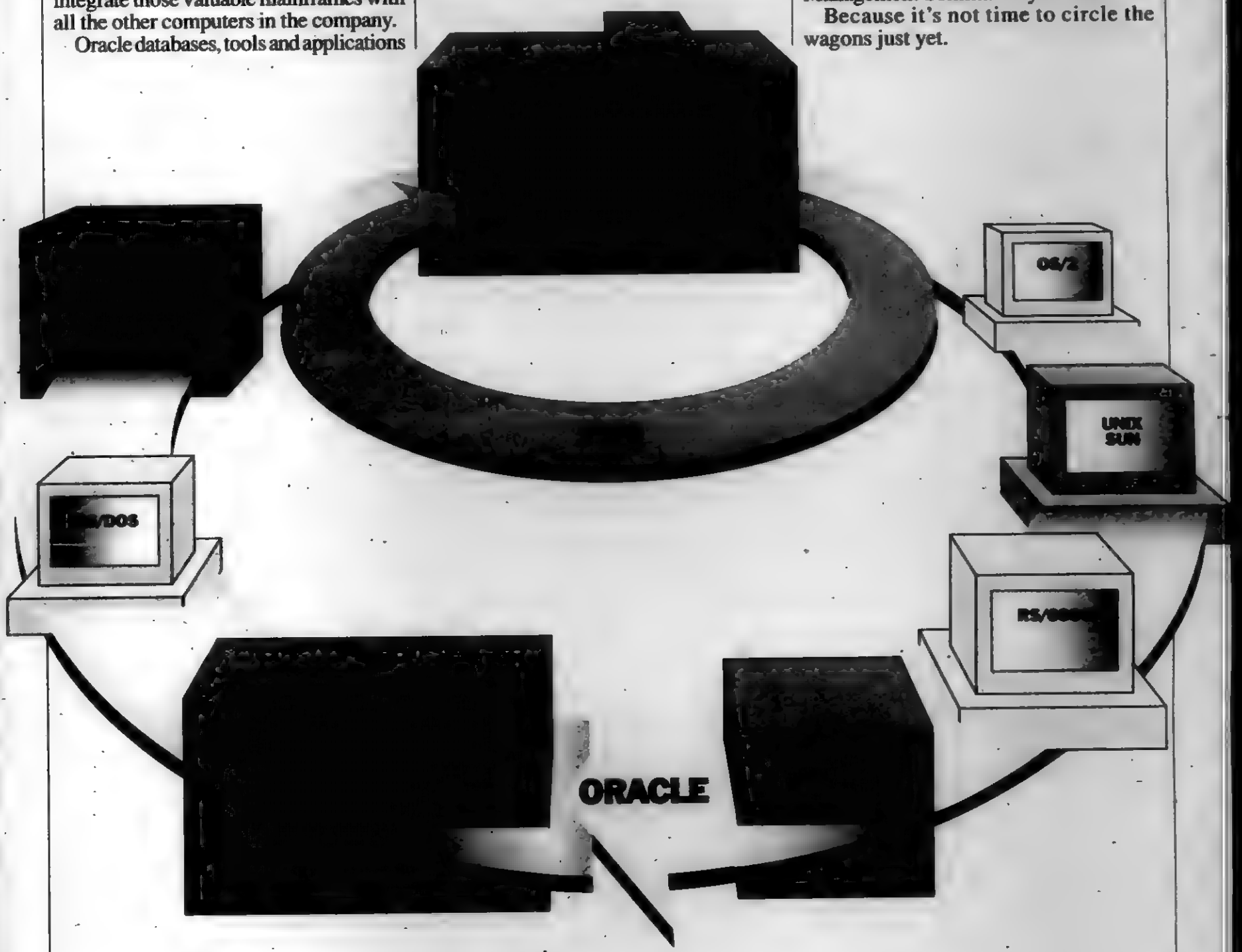
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Inslaw witness arrested

Computer expert nabbed for alleged drug distribution

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A shadowy figure in the long-running dispute between the U.S. Department of Justice and software developer Inslaw, Inc. has been arrested by agents of the U.S. Drug Enforcement Administration (DEA).

The arrest of computer expert Michael Riconosciuto near Tacoma, Wash., for alleged distribution of methamphetamines comes one week after Riconosciuto swore in a court filing that he had been threatened by a Justice Department official. The affidavit, filed on behalf of Inslaw, stated that Riconosciuto was warned in a telephone call from Justice Department official Peter Videnieks last February not to cooperate with a congressional probe into allegations that the Justice Department had stolen case-tracking software from Inslaw [CW, April 1].

Riconosciuto said Videnieks threatened that the Justice Department would prosecute Riconosciuto and his father for alleged wrongdoing in a California savings and loan case if he did not keep quiet about the Inslaw matter.

Riconosciuto said in his affidavit that he had received a copy of Inslaw's Promis software from Videnieks in 1983 and had modified it for use by intelligence agencies worldwide, specifically for the Canadian government, where, Riconosciuto said, it ended up.

Justice Department officials declined to comment on the allegations.

Two courts have upheld Inslaw's charges that the Justice Department misappropriated Promis, and an appeal by the agency is pending in the U.S. Court of Appeals in Washington, D.C. Meanwhile, the Judiciary Committee of the U.S. House of Representatives is locked in a struggle with the agency over 200 documents the committee said it needs for its investigation.

On the record

Riconosciuto is reported to have said he has several copies of a tape recording of the telephone threats, some of which were confiscated during his arrest.

The St. Louis Post Dispatch reported last week that Riconosciuto was arrested by more than one dozen DEA agents, one of whom allegedly advised him, "Keep your mouth shut."

"He said I was my own worst enemy and that I have a big mouth," the newspaper quoted Riconosciuto as having said in an interview from jail.

The DEA would not comment except to confirm the arrest.

Riconosciuto, who is a scientific tinkerer with reported ties to the U.S. intelligence community, was convicted of a drug charge in 1973.



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University puts Sonet in place

BY ELLIS BOOKER
CW STAFF

URBANA-CHAMPAIGN, Ill. — The University of Illinois has become the first end user to connect to a nationwide, high-speed research network using the Synchronous Optical Network (Sonet) standard.

The test began in mid-February and will run until May 1, according to Illinois Bell and AT&T.

Sonet is an international transmission standard for fiber-optic public networks. The international standards for Sonet range from 51.84M bit/sec. to 2.4G bit/sec.; the current North American standards go up to 45M bit/sec.

This is also believed to be the first time Sonet has been tried for customer applications using both a local- and a long-distance carrier, an AT&T spokesman said.

University testing

The test is being conducted at the university's Digital Computing Lab and involves a fiber link between the lab and an AT&T 5ESS digital central office switch. The switch is connected in turn to an AT&T central office and the Experimental University Network (Xunet).

Xunet is a high-speed research network connecting AT&T, participating local exchange companies and selected universities. It is being upgraded from a 1.5M bit/sec. to a 45M bit/sec. network.

Ameritech has not disclosed a Sonet delivery schedule for any of its local Bell operating companies. But at least one customer, Case Western Reserve University, wants to be ready when its local carrier upgrades its network to Sonet.

"The only way to make sense of campus networks long-term is that they flow naturally into the regional telecommunications grid," said Raymond K. Neff, the university's vice president of information services.

The University of Illinois trial uses DDM-2000 Sonet multiplexers from AT&T at the university lab, the Illinois Bell central office and the AT&T toll office. The applications in the university's computing lab are on a 45M bit/sec. link.

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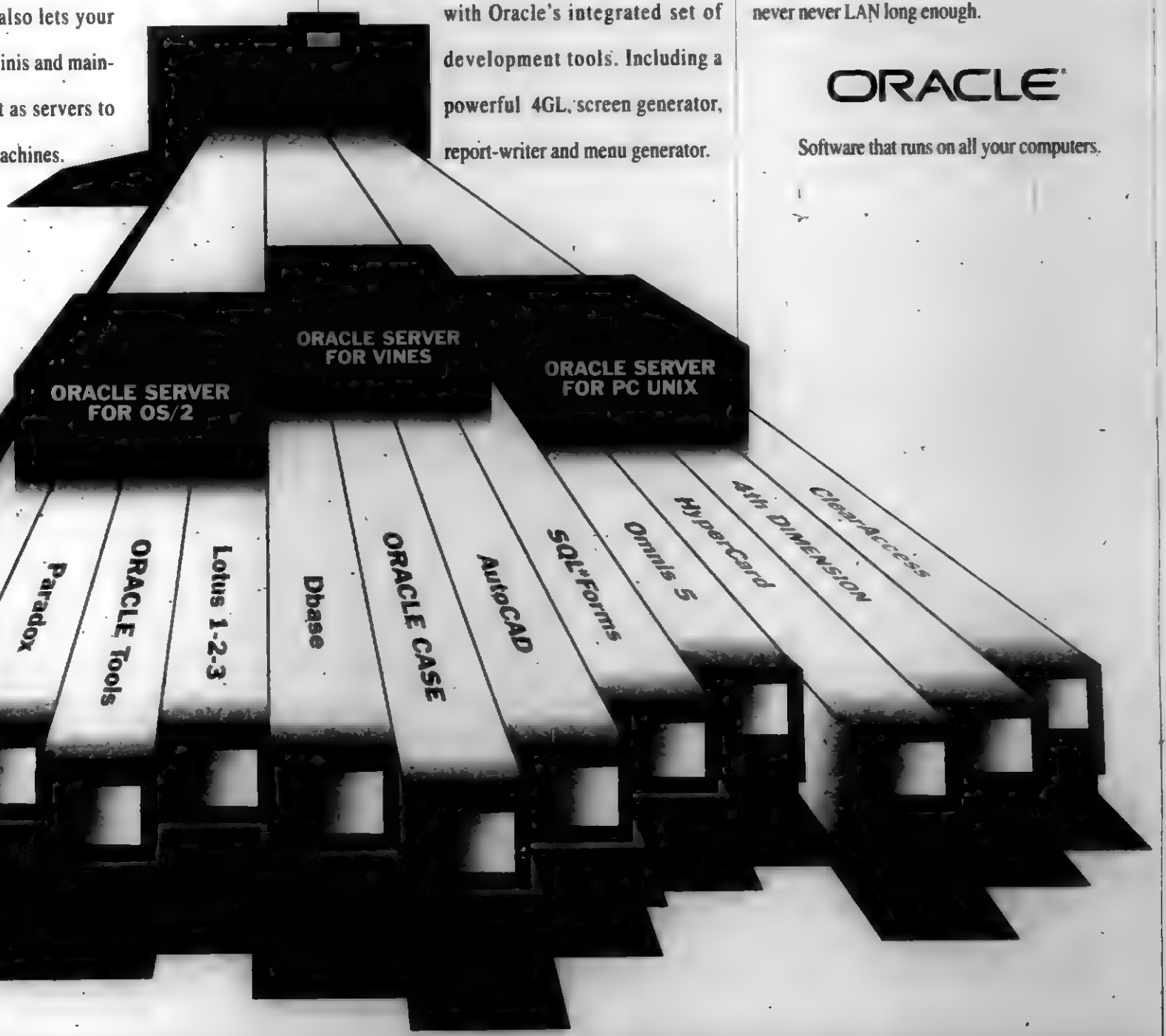
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AT&T's Unix sell-off won't sway OSF

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — AT&T announced last week the sale of approximately 22% of its Unix System Laboratories (USL) unit to outside investors. But observers said they do not believe the move will lead to closer organizational ties between USL and its chief rival, the Open Software Foundation (OSF), anytime soon.

As expected, the private-placement deal gave 11 computer vendors an equity position in USL and reduced AT&T's control over the unit that develops and licenses Unix System V and related products (CW, April 1). The long-term goal is to bring USL public within three years, executives said.

"This represents the creation of a new company which can independently focus on its customers and its business," said Robert M. Kavner, group executive at AT&T. Despite the fact that AT&T retains at least 60% ownership of USL, he added, "AT&T has no interest in controlling this company. Our best interest is in not controlling this company."

As a new entity, executives said, USL has 2,400 customers and 500 employees, with 1992 calendar year revenue estimated to be at about $100 million. USL's business plan calls for annual revenue growth of between 20% and 30%. Kavner also said USL has been profitable since 1989, but he would not provide details.

Furthermore, USL retains legal rights to Unix System V and related products, such as C++ and the Tuxedo transaction processing monitor, and maintains a relationship with AT&T's Bell Laboratories unit to be able to commercialize Bell Laboratories' Unix-related research.

The players involved

The USL investors include U.S.-based Amdahl Corp., Motorola, Inc., Novell, Inc. and Sun Microsystems, Inc. and European companies ICL PLC and Ing. C. Olivetti & Co. Other investors included Japan-based vendors Fujitsu Ltd., NEC Corp., OKI Electric Industry Co. and Toshiba Corp. Rounding out the group was the Institute for Information Industry, a Taiwan-based nonprofit organization that promotes the computer industry in that country.

The total value of the investors' equity stakes was said to be about $65 million, according to published reports.

Kavner would not comment on the deal's worth nor would he specify the stake held by each investor. But he did say that the individual equity positions range from 1% to 4.6%. About 10% of the equity is held for USL employees.

The breakdown of equity held by the European and U.S. companies is about even with that held by the Pacific Rim vendors, Kavner said.

Still, for some, this move comes too late. "This doesn't change anything for us," said Joe Menard, director of Ultrix marketing at Digital Equipment Corp. in Nashua, N.H.

"AT&T is three years late," Menard said, referring to when the OSF was established because of the perception that AT&T was controlling Unix development to the detriment of other industry vendors.

Reaction was not much more positive from the OSF. David Tory, president of OSF, said through a spokeswoman: "AT&T's selling off a minority interest to the 11 companies doesn't impact OSF whatsoever. It doesn't change the control of the company."

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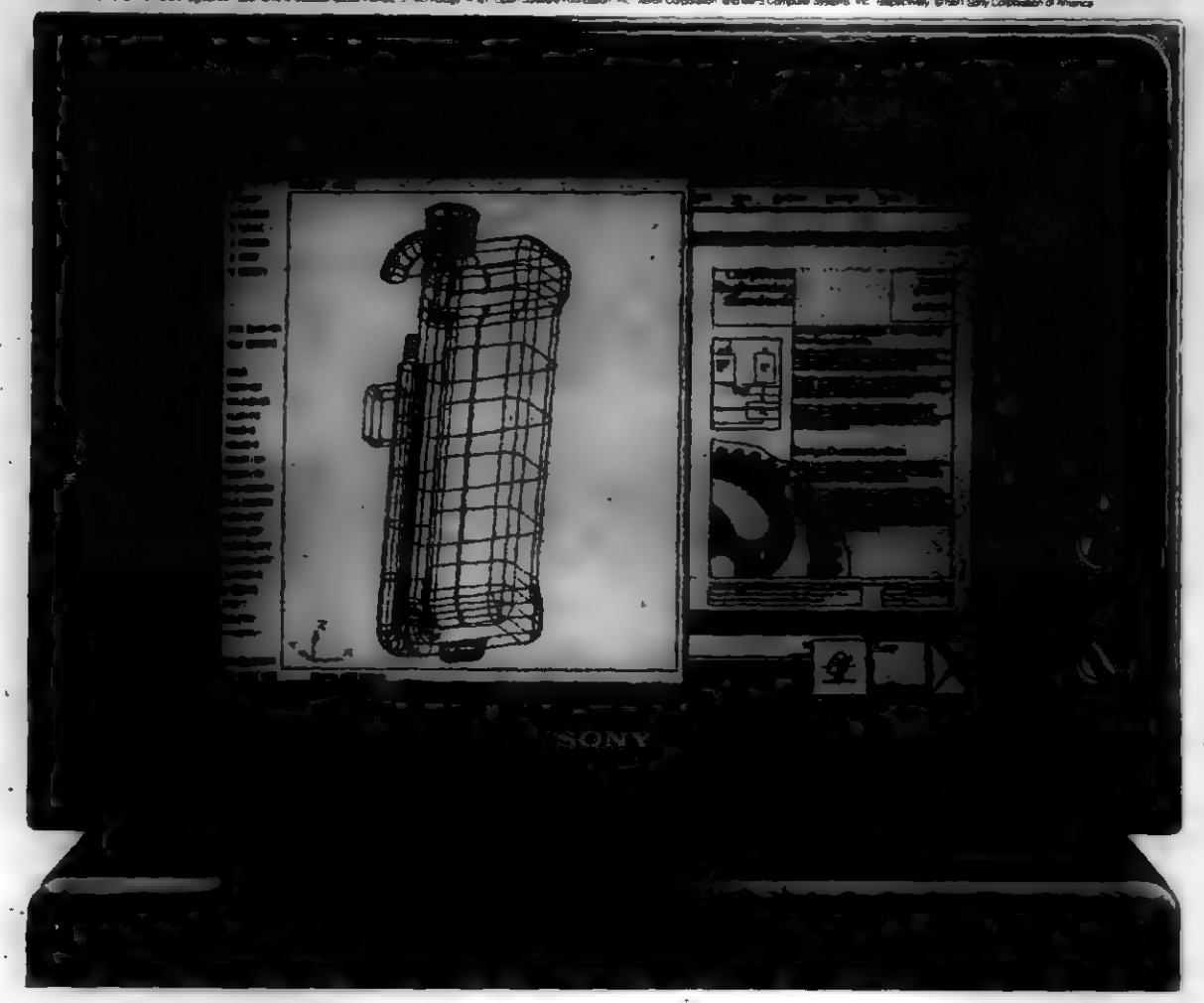
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Patent office reviews Hyatt chip filing

BY MAURA J. HARRINGTON
CW STAFF

WASHINGTON, D.C. — The dispute over who invented the single-chip microcomputer reignited last week when the U.S. Patent Office agreed to re-examine the patent it awarded to independent inventor Gilbert Hyatt last summer.

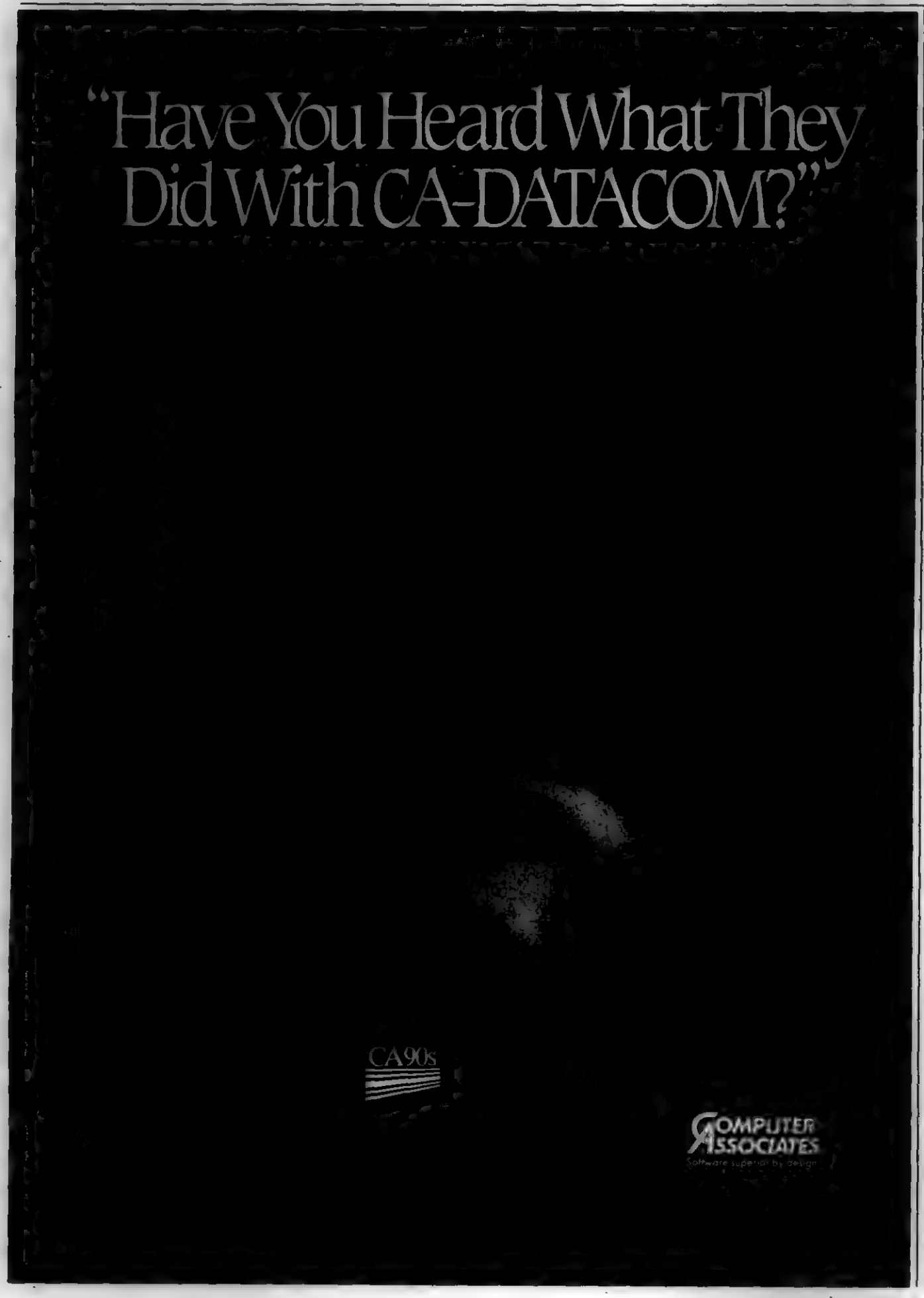
Texas Instruments, Inc. requested the Patent Office proceeding on the basis that Hyatt's original filing date, as recorded on Patent Office documents, goes back only as far as 1977, whereas a patent filed by Gary Boone, a former TI employee, dates back to 1971, according to a TI spokeswoman.

The Patent Office proceeding, called an interference, will focus on determining which party filed its patent first.

Hyatt said in a telephone interview at his home in La Palma, Calif., last week that he has been expecting opposition from TI over the patent and is ready to defend himself. He also claimed to have proof that his original patent filing date was in December 1970 and that the 1970 filing date is still valid.

"It's already been decided by the Patent Office and by the U.S. Board of Appeals that I have the 1970 filing date," Hyatt said, adding that TI "can try to get behind my 1970 [filing] date, but they can't get behind my 1968 invention date."

"There has been great dispute and controversy surrounding the issuance of the Hyatt patent . . . and it could take several years before the dispute is solved," said Gary Hecker, a partner at Los Angeles-based law firm Hecker & Harriman.



Microsoft ups support

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Windows 3.0 developers who have discovered that building applications for the much-vaunted interface is more complicated than they originally bargained for will now be able to beef up and custom-tailor support options with Support Advantage, a multitiered subscription service that Microsoft Corp. unveiled last week.

Although Support Advantage is targeted at developers, Microsoft officials said hardware manufacturers and corporate help-desk staffers could also benefit from the services it provides.

The new program replaces the one-size-fits-all Online support package that has been a mainstay of Microsoft developers since it was introduced more than two years ago, said Greg Goff, group marketing manager for product support.

Support Advantage includes three degrees of support: Solution, Professional and Premier.

The Solution level is a pay-as-you-go service for customers needing occasional technical assistance, while the Professional option provides unlimited service requests, a 24-hour callback and telephone support. Premier class service includes unlimited telephone support for developers, independent software developers and hardware OEMs.

"I'm glad to see that Microsoft has acknowledged that there are certain configuration problems that require a little more than Online was able to offer," said Howard Sobel, executive director of the National Windows Users Group Network in Media, Pa.

All three levels include the Online for Windows package, which allows developers to electronically query Microsoft's support staff. The service can also be used to access a database of technical product information.

The subscription price for the Solution level is $795 per year and includes five service requests. Professional service starts at $1,295 per user for six months of support. The Premier option ranges in price from $9,900 to $14,900 per year.



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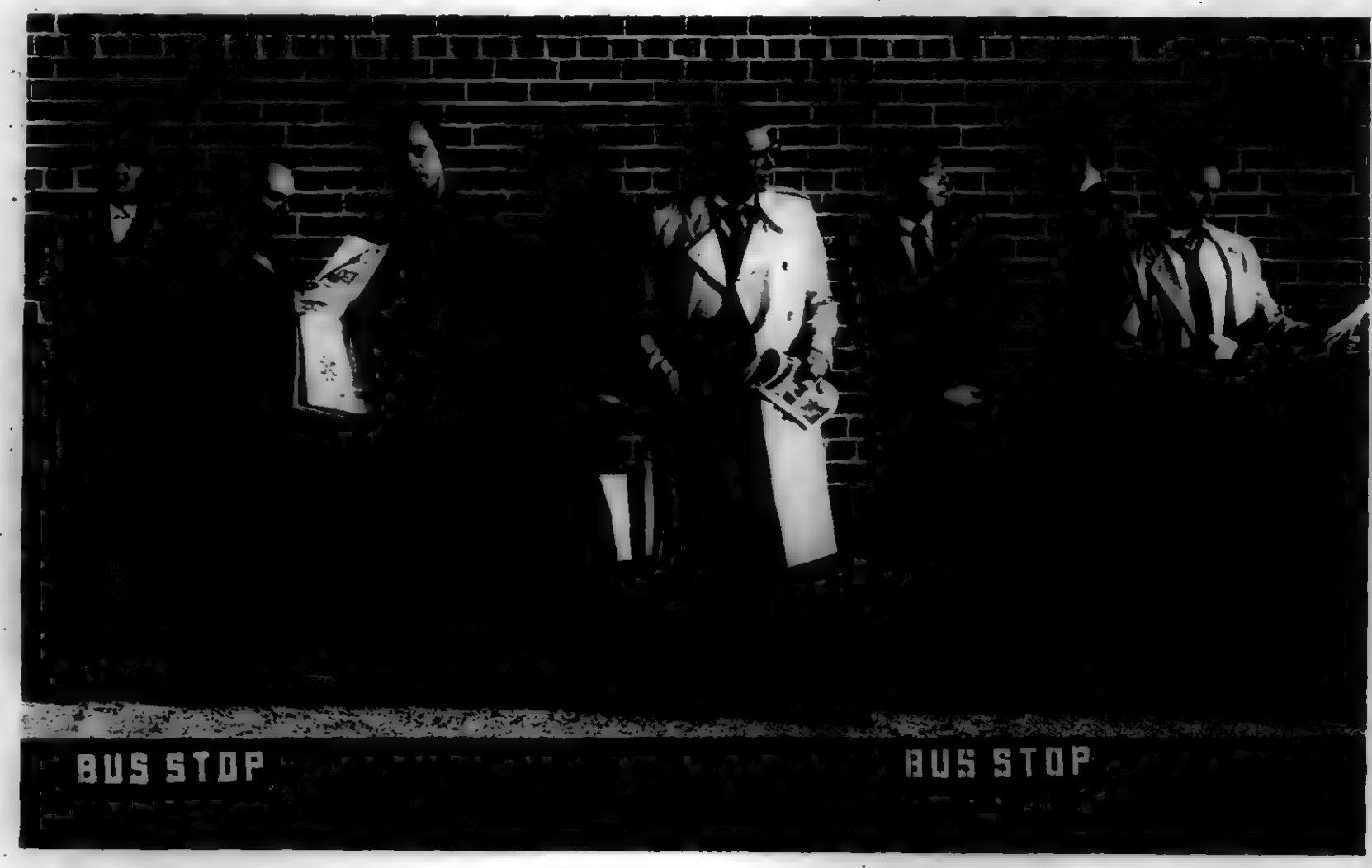
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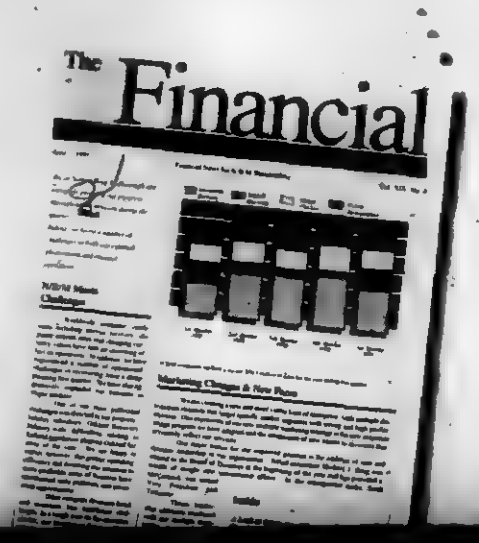


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Fed's document loss prompts security upgrade

BY JIM KASS
CW STAFF

The discovery that thousands of sensitive reports may have been lost has prompted the U.S. Department of Energy (DOE) to pursue a centralized, automated document tracking system and a general upgrade to security procedures at all DOE facilities.

General Accounting Office investigators issued a report late last year revealing that 12,000 classified documents could not be located at the DOE's Lawrence Livermore National Laboratory in Livermore, Calif. It was the latest in a series of internal and external government audits of the department's ability to track paperwork, at least some of which contains closely guarded military secrets.

"I would characterize this situation as extremely important and serious," said Malene Wagner, project manager of classified document control at Lawrence Livermore. It is not a crisis, she said, because "there is no evidence that anything has walked out the door."

Although all DOE facilities and laboratories are under increased pressure to locate their entire inventories of secret documents, the focus has remained on Lawrence Livermore. A spokeswoman for Argonne National Laboratory in Argonne, Ill., for example, said, "1987 was the last time we went looking for something and couldn't initially find it, but the document was located." She said she was not aware if regular audits are conducted on the Argonne laboratory's manual tracking system.

A DOE spokeswoman said that because such a large portion of work done at Lawrence Livermore is defense-related, it has the largest store of classified documents of all DOE facilities. She said it is not yet clear what form the automated tracking system will take. No such system — manual or computerized — currently exists for the DOE as a whole. Lawrence Livermore, however, is in the midst of setting up its own system.

Wagner said all new and existing documents are being identified with bar codes and recorded in a Hewlett-Packard Co. HP 3000 system running Speedware, an HP accounting application. Software developed in-house will soon begin correlating "fuzzy matches," she explained.

Lawrence Livermore had followed the DOE's model until about three years ago. Wagner said the lab had previously allowed each of its 108 departments to account for its own documents — a practice that played a part in the paperwork confusion. In the 38 years since the lab was established, Wagner said, some documents have been misfiled, misidentified or not returned to their proper home.

The 12,000 documents that were originally cited as missing represent 1% of the lab's total inventory of papers. To date, 2,000 have been accounted for, according to Wagner. About half of those were found to have been destroyed but were not recorded as such, and about 500 were misfiled. The rest, she said, were attributed to input errors.

Convex feels profit pinch

BY NELL MARGOLIS
CW STAFF

RICHARDSON, Texas — The worldwide economic slowdown will end a record 22-quarter streak of earnings gains for minisupercomputer vendor Convex Computer Corp., the firm announced last week.

However, one analyst who closely follows the firm said the record is the only thing about Convex that is broken.

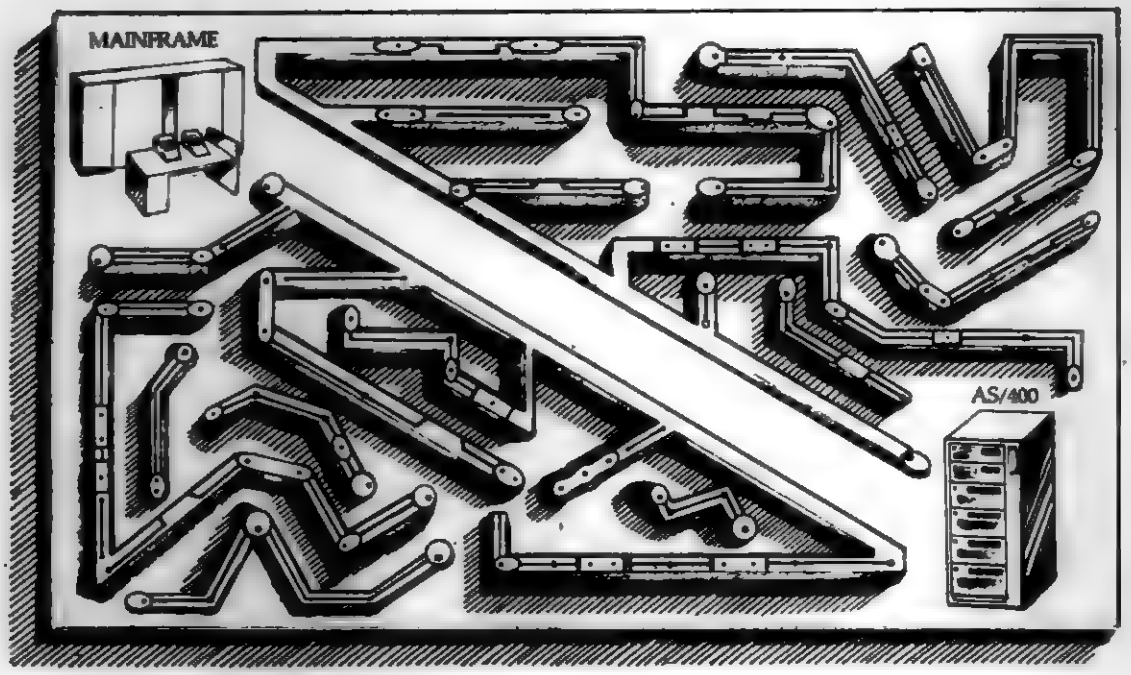
With revenue split roughly 50/50 between the U.S. and the international market, Convex Chief Executive Officer Robert Paluck said, "There is increasing evidence of pricing pressures and delays in the customer's decision-making process. We attribute the slowing of our growth to those macroeconomic conditions."

The firm, Paluck said, is likely to post first-quarter earnings in the 15 to 20 cents-per-share range, under the 20 to 23 cents per share projected on Wall Street. Quarterly revenue, Paluck said, will probably go down slightly or be flat.

"Convex is a superlative company with exemplary management and a product that is the best in its market," said Mardon Navalta, an analyst at Dallas Securities Corp., a regional brokerage firm. When the economy begins to recover, he said, Convex's quarterly increases will begin building again.

In fact, several analysts said, Convex may not have to wait for the economy. The company said that on May 7, it will formally announce its third-generation supercomputer system, the C3. The long-awaited entry, expected to be based on gallium arsenide semiconductor chips, is "a major reason for our optimism about our prospects for the future," Paluck said.

The C3 system is also expected to buck Convex from the minisupercomputer to the supercomputer market, a move that will likely increase the firm's competition with Cray Research, Inc.



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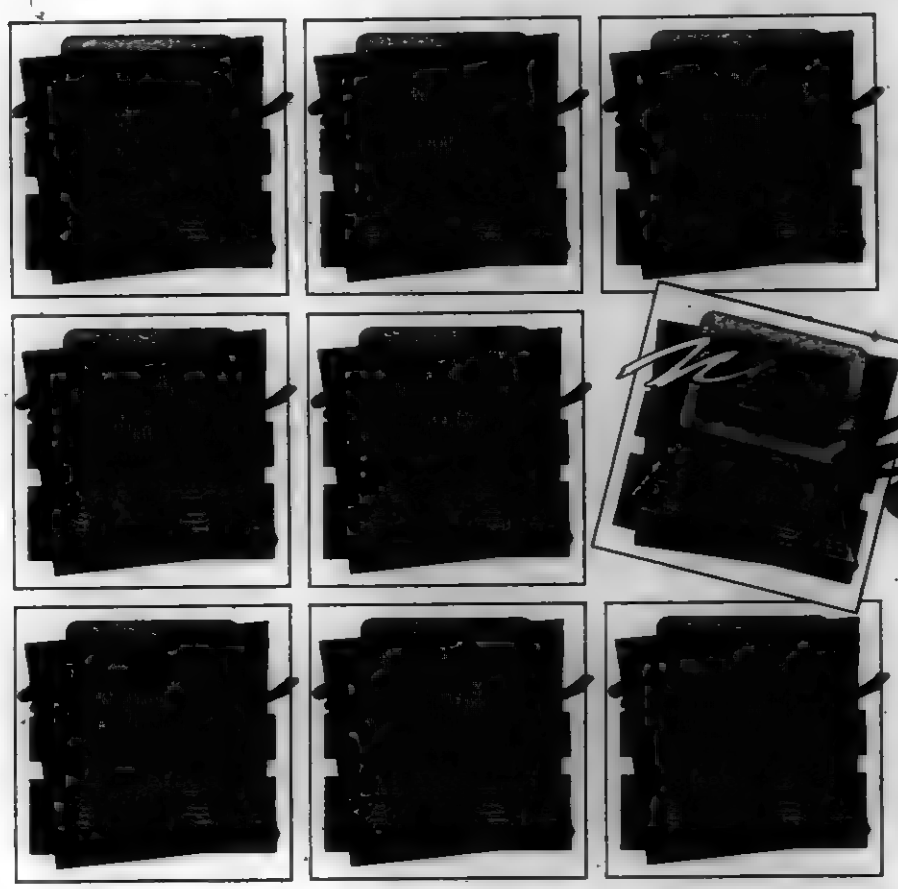
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TECH TALK

Programs for pacifists?

■ Dyna3D, a computer program developed at the University of California Lawrence Livermore National Laboratory for weapons research, is being put to use in more benign pursuits. The computer code models the stress caused by the impact of missiles and other ordnance on metal. However, bioengineers recently discovered that the program can also be used to model the stress of surgical procedures and injuries on human tissues as well as to design medical equipment.

Four-cylinder computers

■ Existing computer architectures are like four-cylinder engines running with only one spark plug, according to David Methvin, president of Davin Computer Corp. in Irvine, Calif. The solution, he said, is to add three more spark plugs to the engine. The company recently received a patent for what it calls "parallel byte processing," a technology that allows single processors to parallel process four bytes at a time. The technology could be used as a "midlife kicker" for older architectures, Methvin added.

Make mine multi

■ The typical corporation in the year 2000 will be based on seven "multis," according to Craig Fields, president of Microelectronics and Computer Technology Corp. It will be multisite, multicountry, multimedia, multiproduct, multicompany (with companies cooperating in some areas and competing in others), multi-industry (with companies linked to insurers, attorneys and many others who provide services and products), and multigenerational (with the continuing training and retraining of employees). Global networks will enable businesses to compete less on product quality and more on the ability to cope with financial, environmental and other intangible challenges, Fields said.

Mapmaker takes high-tech road

Newly developed software brings better visual graphics and greater accuracy to maps

BY MICHAEL ALEXANDER
CW STAFF

Mapmakers are heading in new directions thanks to computerized cartography. Hammond, Inc., a Maplewood, N.J., company that specializes in publishing world atlases, for example, has devised a cartography system that enables the company's mapmakers to automatically create eye-catching maps of anywhere in the world in any projection or scale.

"We created two major pieces of software: one that intelligently smooths data to keep details from crashing together [when a map is scaled down] and the other to enable us to set type in a dense manner and in a way that is aesthetically pleasing and technically correct," said Dean Hammond, president and chief executive officer of the company that bears his great-grandfather's name.

Computerized mapmaking also allows cartographers to create maps that are more accurate with less distortion, which is inevitable in maps depicting large areas. "When you take a spherical object [a globe] and squash it flat, you introduce linear, aerial and angular distortion," Hammond said. Computers enable the mapmaker to try out variations to determine in advance how much distortion is permissable.

Cartographers are still wrestling with developing a system that allows them to easily and precisely tag labels onto their maps. Most are still manually placing type on their maps, a task that can take days to complete.

Jim Mower, an assistant professor of geography and planning at the State University of New York at Albany, is working on an electronic mapmaking system that will enable cartographers to automatically label map features according to a predetermined set of rules. Often the label takes up more space on a map than the feature it is intended to identify, making positioning labels properly difficult and time-consuming.



Paul Pisch

Mower has developed a map-labelling program that places labels according to population density, the type of feature depicted and other criteria. "Assume that you have a discrete number of point features — each city is represented as a dot on the map," Mower said. "The first stab at it, you could set the defaults to place labels at the upper right of each point. From that point on, [the program] starts doing conflict resolution: If it finds labels overlapping based on the point symbol it has to determine which is more important."

The strategy of allowing labels to battle for position on a map is being examined by other researchers who believe the technique may allow them to do a better job of cramming circuitry onto a chip or board.

The program may also assist electronic mapmakers in developing maps for automobile and other mobile vehicle navigation systems. Instead of wrestling with a folded map, a motorist could simply refer to a computer display mounted in the automobile's passenger compartment, for example.

Consumers could use an automated mapmaking system "to design and produce maps on the fly," Mower said. At an airport auto rental counter, motorists could key into the system a destination, either a major hotel or the home of a friend, and create a map on the spot with detailed directions.

The program was originally written for a Unix-based minicomputer and was later ported to a Sun Microsystems, Inc. workstation. Even on the workstation, it took the program as much as 30 minutes to place a single label on a map of upstate New York. Mower rewrote the program for a parallel processing computer built by Thinking Machines Corp., and it is now able to place each label in three minutes.

Software keeps new workers out of the dark

BY MICHAEL ALEXANDER
CW STAFF

The first day on any new job is tough enough, but what if you walked into the middle of a massive construction project where every moment's delay cost thousands of dollars? That is basically what many military personnel in the U.S. Army's Corps of Engineers — who are shuttled to new assignments every few years — must contend with.

Researchers at the Georgia Institute of Technology in Atlanta have developed groupware software that is intended to help reduce the learning curve for newly assigned office workers managing the Army's $1 billion annual construction program.

"When a person comes into a new position in a fairly fast moving environment, he often finds that there are reports overdue, but he doesn't have a clue how to get the reports done," said George Olive Jr., senior research scientist at Georgia Tech's Construction Research Center at the College of Architecture. What was needed was a program that could be used "to keep track of projects until the new employee was up to speed," he said.

The program, which is called the Knowledge Worker System, was developed under a contract to the U.S. Army's Construction Engineering Research Laboratory.

Knowledge Worker System, which runs on an Intel Corp. 80386-based personal computer under Microsoft Corp.'s Windows, "captures institutional knowledge," Olive said. With information culled from his predecessors, the new employee is able to prioritize what tasks must be completed and gather the information needed to complete the tasks. The program is driven by a master calendar that lists major milestones and automatically links the assignments of every employee working on each project.

The program begins with a window that has a to-do list of key assignments or critical deadlines on a project. "Click on an item and up comes another window with more detail, perhaps a set of steps on how do an item, with forms, routing sheets and other supporting documentation," Olive explained. Because the package operates on a network, the worker can send electronic mail, route documents and query databases, among other tasks. Many steps can be automated and carried out with only a few mouse clicks, Olive added.

Knowledge Worker System, which took about two years to complete, will be installed next month on a network of 15 PCs at the Corps of Engineers office in Washington, D.C.

The researchers recently began working on a more sophisticated program based on an expert system that is closely tied to the jobs of information workers in the corporate world.

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EDITORIAL

Free enterprise

NOW LET'S SEE if we've got this straight. IBM and Microsoft have agreed to disagree and each go their own way in promoting the desktop operating system of the future. Microsoft will aggressively enhance and promote Windows and develop a portable version of OS/2. IBM will enhance and promote OS/2 and keep its options open on adopting Windows. Users will have two choices and will have to make up their own minds.

What in tarnation is wrong with that? Not much. Then why do so many people see this situation as disruptive to the industry?

It's because the PC software market has been living in a fantasy world for the last four years. It was a world in which everyone pretended to agree that the desktop was going in a single direction, despite every indication to the contrary. It was a world that Microsoft thankfully shattered two months ago when it declared that maybe OS/2 wasn't going to be the only game in town.

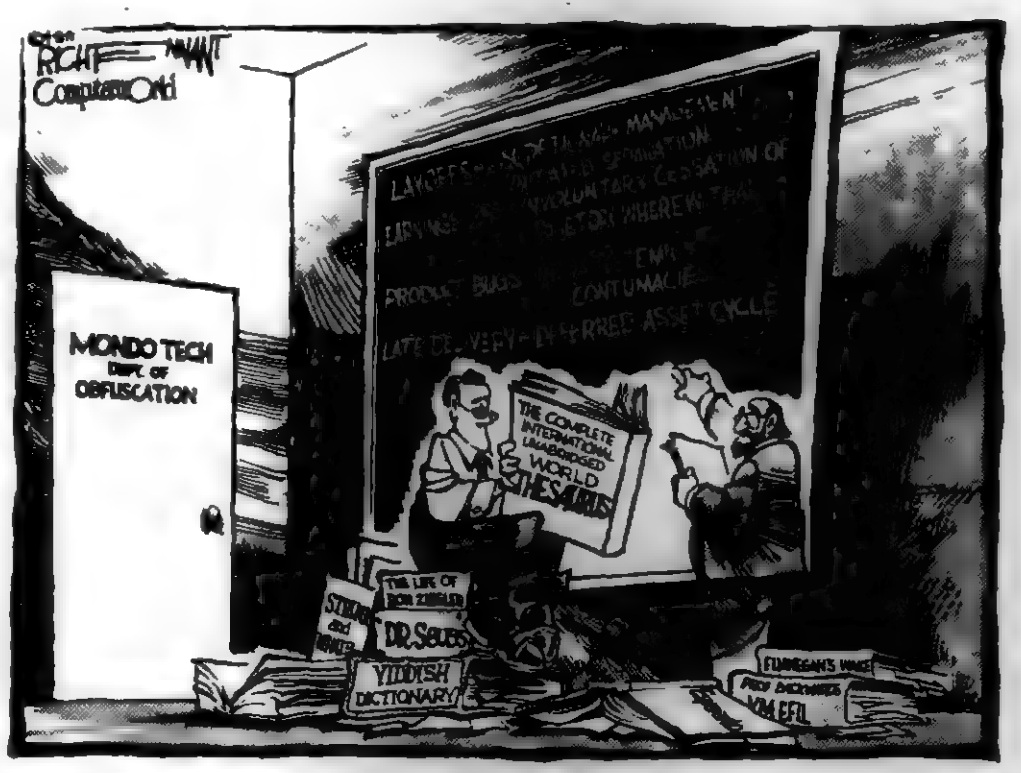
Now we've got a barn burner going. Since the split between the two PC giants became public, both have hit the road pledging to quickly fix whatever ails their products, promote the heck out of them and court independent developers. It's good old American competition at its best. Why did it take four years to happen?

Because for four years there's been no pressure. It has been enough for both IBM and Microsoft to release a "statement of direction" and pursue it on whatever time frame was convenient — no competition, no incentive.

That's been a popular approach with software vendors, who have plenty to gain by having only a single interface to write to. Not surprisingly, most of the pressure on IBM and Microsoft to kiss and make up is now coming from that same group. They cringe at the thought of spending extra time and money duplicating their software on two different operating systems.

Unfortunately for them, the world isn't quite that simple. If it was, then DEC never would have stood a chance when it wrote a non-IBM compatible operating system called VMS for its computers. But it did stand a chance because the strength of its products and enthusiasm of its customers attracted independent software vendors in droves. No one is seriously pushing DEC to make VMS IBM-compatible. Heck, no one is even pushing IBM to make its own Application System/400 IBM-compatible.

True, there will be effort duplicated and dollars wasted as a result of the desktop schism. But there will also be two very good companies competing vigorously to make their products better and market them more aggressively. Customers will ultimately choose which operating system they want to adopt, knowing that neither the OS/2 Presentation Manager nor the DOS Windows decision is likely to be a bad one. Software vendors will do what they do best and follow their customers' dollars. IBM and Microsoft will bring their technologies together if the market demands it. It's called competition — and it works.



LETTERS TO THE EDITOR

Not-so-expert

I feel that your readers are being misled by the comments of your so-called "experts" in the multimedia field. I refer specifically to the interview with John Diebold [CW, Feb. 25].

Multimedia is a concept, not a piece of hardware, and it *has* been available on "widespread and inexpensive machines" for years.

Furthermore, the current crop of "multimedia" hardware is a stopgap technology to a future — and far more useful — class of hardware.

Good interactive programmers are hard to come by. But when it all comes together, well, it's wonderful.

Russell Hoffman
P11 Enterprises
Los Angeles, Calif.

Windows warning

I couldn't help but be amused by your confused article titled "Complexity lurks for Windows programmers" [CW, March 18]. Certainly any programmer attempting to use icons to implement "a string of separate commands" is going to have a hard time. Icons are used to represent programs and data files. Graphic buttons are sometimes used to initiate an operation or change a mode (for example, selecting a brush style or color in a graphics program). Command strings generally emerge as menu selections.

As many programmers involved with the early days of the Macintosh can tell you, porting an existing program to an object-oriented environment is a surefire formula for disaster. Existing "procedural" programs are often poorly structured and attempting to shoehorn one into an object environment serves mainly to expose its design flaws. It is best to redesign the system to the object paradigm. Occasionally, it is possible to port code directly. However, this happens much less often than one might expect.

The best advice that one can give teams struggling to adapt to Windows and event-driven, object-oriented programming is "get expert help." After all the training classes, videotapes and code examples have been finished, swallow your pride and find an experienced Macintosh programmer to help you through the first difficult months. Remember, it was no easier for us to learn this new style of programming — but we've been doing it for almost seven years."

William L. Colsher
Stamp Computer Services
Eden Prairie, Minn.

Know thyself

Regarding "Fuzzy logic clarified" [CW, March 11], the early 1960s concepts of "pattern recognition," "heuristic programming," "computer simulation of thought processes," have re-emerged under the chest-pounding of fuzzy logic. With this revived interest in the notions of vagueness and ambiguity, we face the periodic opportunity to make decision-support applications really flourish through research aimed at understanding the process of decision-making.

A phenomenon is not apt to be discovered that is fuzzier than that of a human being arriving at decisions. Individuals are partially structured in terms of their preconceptions; hence, their strategies and judgments in a particular problem-solving and decision-making situation vary accordingly, not only between individuals but within oneself. A given stimulus may be ambiguous relative to the possible set of concepts which it could activate, but the relationship takes on clarity upon specification of the environment.

Its documented shortcomings not withstanding, the most fertile field in which to cultivate an understanding of an individual's decision-making process is the one of introspection. Who is in a better position to analyze the organization of mental processes involved in a problem solving situation than the problem solver himself? What is needed is a conceptual framework that combines introspection as the approach and fuzzy logic as the vehicle for providing a logical foundation and outline for guiding research toward the understanding of decision-making. The result should be the development of a series of fuzzy logic computer modules, each characterizing some fundamental aspect of an individual's process of making decisions — the substance of the modules to be arrived at through introspection.

John H. King
School of Computer and Applied Sciences
National University
San Diego, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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What you don't see can hurt you

Changes in the telecommunications sector may catch computer vendors off guard

VICTOR SCHNEE



Vital interests of computer firms are at stake in a massive restructuring that is about to take place in the telecommunications industry.

As I first pointed out in a study released late last year entitled "Taking Over Telephone Companies," the monopoly enjoyed by local telephone companies is about to crumble, unleashing forces that will completely destabilize the telecommunications industry.

While this change is likely to occur within the next two to five years, well within the range of any normal short- to intermediate-term planning cycle, the computer industry has not planned for it and is not yet prepared to take advantage of it. Nor is the computer industry, which recently learned from AT&T's pursuit of NCR that aggressive telecommunications companies view it as a target, ready to defend itself. Much ground must be covered quickly.

Local telecommunications service demand growth has been utterly anemic, generally only 2% to 3% per year, regardless of which measure is used. Plant modernization has failed to address the needs of an increasingly devices-driven future (many of the devices being supplied by the computer industry). And monopoly thinking vitiates any attempt by these companies to mount a credible market-driven approach to their future.

The days of local monopoly are clearly limited. Competitive incursions are already mounting. There has been an erosion of belief in the idea of "natural monopoly, long the industry's ideological bulwark. New technologies such as wireless networks reduce the value of telco access. Furthermore, just a short way down the road — two to three years — there looms the end to the AT&T consent decree restrictions on the regional Bell operating companies.

There is a vast amount of capital worldwide ready to jump into virtually any telecommunications services opportunities. Once legal barriers to full competition are dropped, truly competitive local networks are likely to evolve as a combined result of this availability of capital, new business strategies, new technological alternatives for provision of access and intelligence and new services growth opportunities.

The introduction of truly competitive local networks will constitute one of the most profound strategic changes ever in the information technology industry. Distinctions between "local" and "long distance" businesses will fall, as will prohibitions on telephone providers entry into CATV.

Moreover, ending telephone company monopolies is going to unlock a communications services growth potential that vastly exceeds common forecasts. This did not happen with the advent of purely long-distance competition because access to the broad customer base for advanced services capabilities remained largely bottlenecked at the local level. The services explosion will rebound to the great benefit of producers of all types of communicating devices.

This services proliferation is basically good for computer companies. However, sitting and waiting for it to happen is not a sound strategy. Aggressive, restructured telephone companies will, for example, not hesitate to take over computer companies.



Christoph Albrecht

Computer companies need to figure out which areas of growth resulting from telecommunications restructuring will offer them the most benefit. They also need to address the possibility of their own direct entry into the services and network markets, public as well as private.

I am well aware that by the late 1980s it became a rote response for computer majors such as IBM to state that they had no interest in entering "the telephone business." IBM, specifically, may have been overly discouraged about the results of its past telecommunications forays. The fact is, however, that IBM never addressed the most vital area of potential interest to it — the service-enabling local networks.

With telecommunications industry restructuring now in the offing, this disinterested posture can seriously work against the interests of computer companies. The opportunities and returns in the network business are likely to dwarf traditional computer business opportunities as advanced services markets soar over the next two decades.

Furthermore, it is very likely that during this time we will see the creation of one or more network-based, integrated information technology superpowers. The potential for such successful network companies to impede, exclude or acquire even powerful, entrenched computer companies will be very real.

Awareness, preparedness and boldness are all needed by the computer industry now. At stake is not only the issue of who drives the pace of telecommunications restructuring but who participates in and dominates new information technology markets that will result. If computer companies begin now and act aggressively, their role in the restructured telecommunications industry could range from being major device, software and system suppliers, to being coventurers in new services to becoming acquirers of telephone companies.

Schnee is president of Probe Research, Inc. in Cedar Knolls, N.J.

Japan's software threat: a U.S.-made paper tiger

CHARLES P. LECHT



The American Electronics Association (AEA) in Tokyo recently sponsored a talk by MIT Sloan School Associate Professor Michael A. Cusumano, famous for his work in analyzing software productivity in America and Japan. Cusumano was in Tokyo promoting his new book, *Japan's Software Factories*, which looks at software production skills in some 40 companies in the U.S. and Japan.

In his talk, Cusumano suggested that Americans have a misconception about Japanese software productivity skills. Contrary to popular opinion, he said, Japanese people are really skilled in software production. Their productivity is around 50% to 70% higher than their American counterparts, and the results of their work are about 33% to 50% more error free.

Although Cusumano admitted that the measurement methods he used to reach these conclusions are controversial at best, there was nothing ambiguous about his message.

Japanese programmers are better organized, less hampered by creative temperament and more willing to create reusable software modules than their American counterparts, according to Cusumano. Futhermore, he suggested, the reputed Japanese drive for efficiency has managed to move the task of programming from that of a craft to "a more productive fruitful factory approach."

Under attack

As a result, he said, there is no doubt that Japanese software companies will soon mount an assault on the U.S. marketplace. Exhibiting a sanguine if not morbid sense of humor, he suggested that when Japanese companies start to penetrate the U.S. software marketplace, their products will arrive like "Scud missiles."

This imagery no doubt stimulated the superpatriotic nervous systems of Tokyo's AEA membership, which is already disposed to believe that the Japanese have a sinister plot to undermine any U.S. lead in things technological.

I have my own suspicions, however, about the motives behind statements of this kind. I've heard this kind of thing before, almost always as prelude to a fund-raising effort of some kind.

In the early 1980s, we were informed by one expert after another of the "Japanese threat" to American supremacy in high technology. Back then, it was the so-called "fifth-generation" Japanese computer. We were told that unless more government money was invested in American research, the reputed Japanese industrial machine was going to white to capture America's lead in computer and communications technology.

What Americans were not told was that the entire fifth generation computer budget allocated by the Japanese government for over five years was not even a minuscule fraction of what the U.S. government was spending on U.S. Army research in the same area. Also absent from the experts' calculations was the fact that uniting Japanese industry in the manner envisioned was about as likely as a marriage between George Bush and Saddam Hussein.

But the campaign was effective. Incredible amounts of moneys were raised, semigovernmental organizations were created, and American taxpayers paid the bill.

Then there was the spectre of semiconductor dumping or underselling, which was used as a basis for creation of a taxpayer-funded consortium to thwart the Japanese. From over here, it appeared as though Americans were frightfully worried that the Japanese might wake up one day and decide to give away their semiconductor production free and thus blitz the U.S. computer industry in this nefarious way.

Empty threats

Now, after a number of other scares, including a brief flurry over the "Tron threat," we have the "software threat." This is despite the fact that there isn't one notable, commercially available, off-the-shelf, mass-published Japanese software product in the American marketplace.

Sure, there is the Nintendo game stuff and other custom software such as that found in the computer-aided software design and engineering and communications arenas, but give me a break. Every successful Japanese computer, from laptop to mainframe, is running basic software made and/or designed in the U.S. The only exceptions are packages for applications that are heavily dependent on the Japanese language or heavily oriented toward text manipulation, such as electronic publishing.

I mention all this not to demean Cusumano's work. Doubtless, it is packed with benefical information. What I am saying is, let's not overreact. No matter what the extent of improvement in Japanese software development skills, the only software threat U.S. companies may face from Japanese companies for the foreseeable future is the export of software previously imported from, you guessed it, America.

Lecht is an IDG News Service correspondent based in Tokyo.



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NEW DEALS

CDC finds takers

Control Data Corp. recently announced three new takers for its Cyber 2000 mainframe. The University of Western Ontario, Germany-based Volkswagen AG and aircraft engine supplier Garrett Engine have all signed orders for the firm's top-of-the-line Cyber product. The contracts are worth more than $20 million in total.

CDC will increase its presence south of the border with a contract in excess of $10 million to supply 179 CDC 4000 computers and peripherals to Mexico's national electric utility. The Comision Federal de Electricidad will use the reduced instruction set computing (RISC) workstations to automate distribution of the country's electricity.

Littleton, Mass.-based **Alliant Computer Systems Corp.** announced that Michigan Technological University has taken delivery of two FX/series RISC-based supercomputers for use in research on fluid dynamics and other fields. The supercomputers will be connected via fiber optics to all Michigan universities. Alliant also announced the U.S. Air Force has installed an FX/2800 for avionics research and flight simulation at Wright Patterson Air Force Base in Ohio.

Prime unveils Information SQL interface

Designed for use as a bridge between computer vendor's proprietary and Unix-based systems

BY SALLY CUSACK
CW STAFF

ANAHEIM, Calif. — Prime Computer, Inc. introduced a SQL interface for use with Prime Information and Prime Information Plus database software products at the International Spectrum show last week.

Called Information SQL, the software offers data query and update interface capabilities for Prime Information users on both the proprietary 50 series minicomputer and Unix-based Prime EXL system platforms.

The PI Plus database management program uses a Pick-like operating system architecture and is a C language implementation of Prime's Information fourth-generation language database software for Unix environments.

Kina Leitner, chairman of the National Prime User Group's (NPUG) Prime Information special interest group, said a large percentage of Prime Information users need SQL functions, particularly in multiple-vendor sites requiring a common software interface.

Safe bet

"It is safe to say that there are 20,000 Information users worldwide," noted Gerry Feeney, an information systems consultant at Milestone Systems, Inc. in San Francisco. Feeney, who is a former NPUG president, agreed with Leitner that the biggest draw for the Information SQL product will be in multi-architecture shops.

John Nakos, director of financial information systems at the University of Southern California (USC) in Los Angeles, has been beta-testing Information SQL and said he finds that "as a reporting tool, it works perfectly."

Nakos estimated there are approximately 100 users at USC who are "SQL literate" and said USC will use the product to bridge users on Intel Corp. 80386-based clones running Informix to the Prime 6650 minicomputer.

This will allow professors and other staff members who are familiar with SQL to directly access data residing in Prime Information on the minicomputer and create ad hoc reports.

"We haven't used the update features yet," Nakos said, "but the data retrieval functions are quick and effective. Whoever wrote the program did a good job."

The product provides four basic SQL data manipulation operations defined under the SQL standard: Select, Insert, Update and Delete.

The package also allows Information SQL users to treat each value in a multivalue field separately. Users will have the ability to read, modify and query PI Plus databases using standard SQL commands.

Prime's Information SQL is priced from $125 for the Prime EXL series and from $1,500 for the Prime 50 series, depending on number of users.

Shift from older minis to AS/400 increases

BY MARYFRAN JOHNSON
CW STAFF

LA JOLLA, Calif. — More IBM customers are tramping down the migration path from the System/36 and System/38 midrange families to the Application System/400, according to Computer Intelligence.

The market research firm, based here, recently reported that half of all newly installed AS/400s are replacing old faithfuls from the System/36 and System/38 world.

"Over the last 2½ years, the IBM AS/400 has proven to be a huge success as the follow-on to the System/3X family of midrange systems," said David Eulitt, an analyst at Computer Intelligence. He noted that as of July 1990, at least 16,000 of the 32,000 installed AS/400s were replacements for System/36s or System/38s.

The Computer Intelligence research, however, found that the 80,000 or more System/36 and System/38 users who have stayed put feel no pressing need for more processing power and are happy with the ease of maintenance on their older systems.

In analyzing the users who migrated and those who dug their heels in, Computer Intelligence found a heavier concentration of medical/education, process and discrete manufacturing industries among the migrators. Those keeping the old systems tended to fall into the wholesale/retail and financial/insurance industries.

The ideal candidates for migration, Eulitt said, are those with growing numbers of personal computers on the premises and those who must boost their storage capabilities. In the Computer Intelligence study, 47% of the users who migrated to the AS/400 had 4G bytes or more of storage capacity.

Bigger company, bigger system

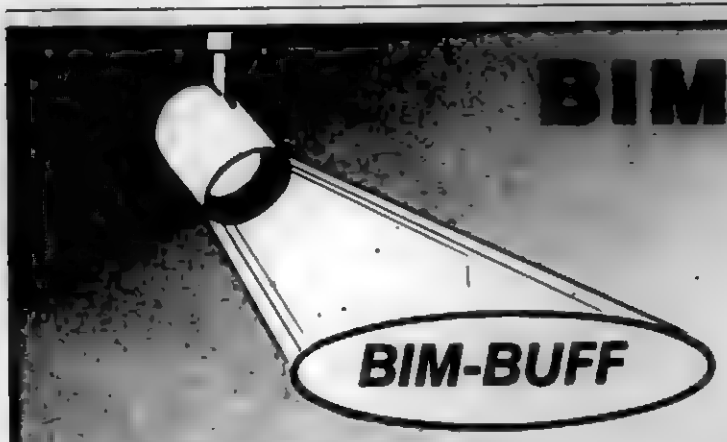
Application System/400s are more often located at companies with large personnel counts

Average number of employees at site



Source: Computer Intelligence

CW Chart: Doreen St. John



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VAX system helps HMO improve patient care

ON SITE

BY JEAN S. BOZMAN
CW STAFF

CYPRESS, Calif. — Tuning your database is a serious business. Pacificare Health Systems, Inc., one of the largest health maintenance organizations (HMO) in the U.S., has spent a lot of time and money doing just that largely because the nearly $1 billion HMO, with an information systems budget of more than $15 million, "lives and dies" on its relational database.

Maintaining patient profiles and billing information on Pacificare's Digital Equipment Corp. Vaxcluster requires vast amounts of data — including a main database of 6.3G bytes — and demands response times of three seconds or less. At the heart of the company's all-VAX computer room is the RDB 3.1 relational database management system, which is growing at a rate of more than 1% per week.

"The key to our shop is pushing performance," said Richard Kislowski, vice president of information services at Pacificare. "We want the hardware, the operating system and the database to squeeze every last ounce of performance out of our Vaxcluster." Peak loads on the production database have hit 40 transactions per second, and transactions total 200,000 or more per day.

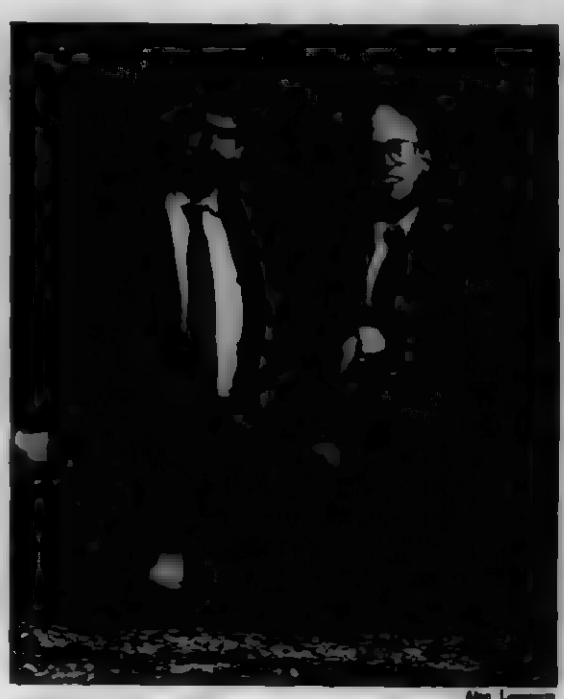
A system upgrade

The firm's quest to pare response times — with an ideal of subsecond response times somewhere in the long-term future — and greater capacity led it to install DEC's largest VAX system, a VAX 9000, in July 1990 and to upgrade that Model 210 to a Model 420 last fall. The VAX 9000 anchors a four-node Vaxcluster; the other nodes are two VAX 6540s and one VAX 6430.

Leo Collins, Pacificare's director of information services, noted that the Vaxcluster "sort of looks like trail mix at this point," with hardware of various sizes. However, each machine runs the same release of the VMS operating system and the same RDB 3.1 software. A fifth VAX is used offline to test new software, Kislowski said.

Fueling the processing demand is the fact that Pacificare has been growing at a fast clip during the last five years, boosting its membership to 700,000. Acting as an umbrella organization that operates HMOs throughout the West, Pacificare's revenue climbed from $169 million in 1986 to $976 million at the end of 1990.

The firm sometimes has 900 users logged onto its Vaxcluster, nearly 500 of them on the VAX 9000. An IS department of 110 employees, including 70 programmers, manages the data infrastructure.



Allen Levenson

McGinness (left) and Collins *are using RDB on VAX systems to speed Pacificare's database access*

New hardware, particularly the VAX 9000, pushed response times down from an average of four seconds in 1989 to three seconds or less. Running the primary RDB application entirely within the VAX 9000 machine helped to fine-tune the database performance.

By assigning different tasks to each of the four VAXs, Pacificare's IS department reduced the amount of intranode [illegible]tions. End users only have to log onto one machine, though, to access all Vaxcluster services, including RDB access, electronic mail and office automation packages. Custom Pacificare programs make the routing of data requests around the cluster transparent to the end user.

If the VAX 9000 failed, the RDB data would still be accessible by the other three attached VAX machines through the cluster's shared disk memory. Pacificare has more than 100G bytes of disk drive capacity, with 12G bytes of that storing mirrored copies of the production database.

On to 4.0

Pacificare plans to migrate the Vaxcluster to RDB 4.0, the latest version of the DEC RDBMS, later this spring, about a year after Pacificare migrated to RDB 3.1 from RDB 3.0.

"We're not banking on a performance increase," said David McGinness, database administrator for RDB. "But there probably will be one, due to enhancements in RDB 4.0's query optimizer."

Pacificare carefully built up its Vaxcluster systems off-line, starting in 1987, while it was still running its applications on two high-end Wang Laboratories, Inc. minicomputers, storing patient information in flat-file records. First, two VAXs were teamed up to develop the RDB applications. In the fall of 1989, the RDB system went on-line with a combination of VAX 6000s and VAX 8000s. Two VAX 8820s were changed out of the cluster when the VAX 9000 arrived, Kislowski said.

FPS unveils triple-architecture computer

BY ELLIS BOOKER
CW STAFF

BEAVERTON, Ore. — Purring under the hood of the new supercomputer introduced recently by FPS Computing, Inc. are not one, not two but three different kinds of processors.

The FPS 500 series Scalable Processor Architecture (Sparc) thus becomes the first supercomputer to deliver a triple-threat, "heterogenous" architecture able to handle scalar, vector and parallel-processing computations. It is also being billed as the first supercomputer based on the Sparc reduced instruction set computing (RISC) architecture from Sun Microsystems, Inc.

However, even with all that technology, the 20-year-old computer company will face a tough sell in the relatively small but fiercely competitive market for high-performance supercomputers, according to analysts. FPS has watched its revenue tumble from a high of $126.5 million in 1985 to $46.9 million last year.

What is more, analysts said, FPS will have only a short lead on the industry's two dominant players, Eagan, Minn.-based Cray Research, Inc. and Richardson, Texas-based Convex Computer Corp.

The choice of Sparc will enable FPS to focus its development dollars on applications and systems rather than the design of a next-generation RISC chip, according to FPS Marketing Vice President Stephen P. Campbell. In addition, he said, it opens the architecture to the 2,800 applications available for Sparc.

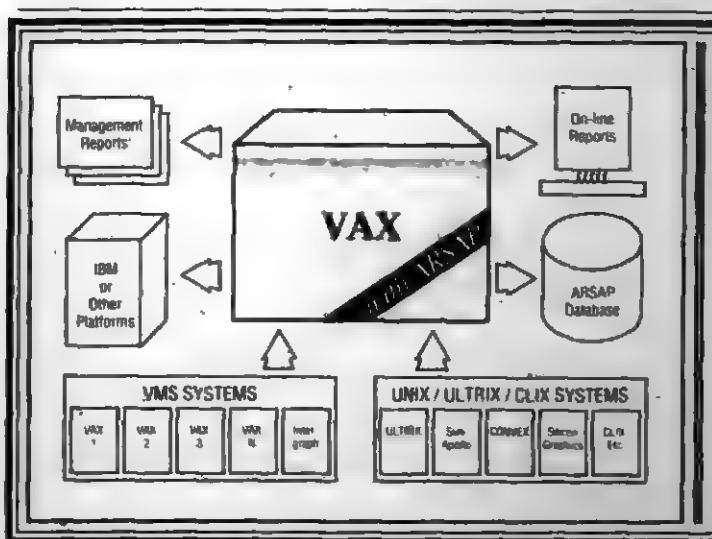
Another consideration

Another key choice, according to FPS officials, was the decision to attach the different chip types over a high-speed, 1G byte/sec. bus rather than connecting individual parallel, vector and scalar supercomputers over a high-speed local-area network. The centerplane bus, called the Scalable Interconnect Architecture, is a 1G byte/sec. pathway.

FPS also created a new compiler to accompany its high-performance computer. Jointly developed with Kuck & Associates, Inc. in Champaign, Ill., the compiler is said to take Fortran or C code at one end and optimize it for the FPS 500's scalar, vector and matrix/parallel processors. FPS has been talking about a migration from its proprietary RISC processor to the Sparc chip for more than one year, said Jeff Canin, a computer analyst at Montgomery Securities in San Francisco. "I think they'll do better than if they'd continued to push a strictly proprietary line," he said.

At the heart of the new FPS machine are three dissimilar types of processors: a 64-bit emitter coupled logic Sparc scalar processor from Sun, an FPS vector coprocessor and matrix coprocessors using up to 168 of Intel Corp.'s i860 chips.

The FPS system, which has already begun shipping, ranges in price from $450,000 to $4 million.



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IBM aims at financial services

IBM recently added six packages to its financial services arsenal including five applications packages and one that will facilitate electronic payments.

IBM also will make available OS/2 and AIX versions of its Consumer Transaction platform automation software this summer, said Thomas G. Hudson, vice president of IBM's Finance Industries Services Sector Division. IBM is also developing risk analysis and financial performance software designed to be used by global financial institutions, Hudson added.

The electronic payments package, called Netpay/MVS, was developed by Advantage Systems, Inc. in Waltham, Mass., and is based on the electronic data interchange standard. The software, for which IBM now has marketing rights, will help financial institutions generate fee-based services for existing and new customers, IBM said.

Netpay/MVS allows banks and other users to receive payment orders electronically and to prepare those orders for processing by the user's in-house payment system. The software is installed at the Royal Bank of Canada, among other institutions, Hudson said.

The other five packages are Profitability Management, Asset Liability Management, Customer Information System, Financial Accounting and Data Collection. All can be used with IBM's DB2 database management system.

Profitability Management provides information about income and expense performance, balance sheet levels, statistical volumes and performance indicators for business units. It was developed by Hogan Systems, Inc. and PNC Financial Corp. and is installed at PNC in Pittsburgh.

Asset Liability Management is a risk management and planning system for assessing the impact of interest rate movements. It allows users to project performance based on interest rate fluctuations and to do "what if" analysis. The software package was developed by Banking Decision Systems, a subsidiary of Logica Data Architects, Inc.

Customer Information System links all of a customer's different accounts and other information about the customer. Users can create multiple views of a given customer's accounts. Hogan Systems developed the software.

Financial Accounting is an interface with Dun & Bradstreet Software's general-ledger software. Data Collection allows users to gather and store data in a common format. The software was developed by Carleton Corp.

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Symbiosis for Storage Tek, CA

BY CAROL HILDEBRAND
CW STAFF

Storage Technology Corp. and Computer Associates International, Inc. recently announced a joint agreement that is aimed at improving interoperability between Storage Tek's 4400 automated cartridge system and several CA tape management systems.

Future hardware and software releases will be compatible, according to the companies. Mutual product testing as well as joint beta testing are also in the works as is the development of enhanced interfaces.

"We first started going after this agreement when we realized that, like it or not, CA had the vast majority of tape management systems, and Storage Tek had 95% of the robotic systems," said Gary Francis, manager of tape product marketing at Storage Tek. He said the agreement was basically a formalization of channels between the firms for contact points for support and engineering.

Some analysts expressed skepticism that CA would live up to its side of the bargain. "It sounds very good on paper, but whether or not it's actually going to work out for Storage Tek is a big question," said Alan Snitkof, vice president and director of operations and systems at New Science Associates, Inc. in Southport, Conn. "CA has been less than sterling in their ability to deliver timely software."

SOFT BITS

Pansophic airs on-line data tool

Easytrieve Plus, the flagship information retrieval and data management tool from **Pansophic Systems, Inc.**, grew with the times last month with an on-line version. Easytrieve Plus Online was described by Pansophic as a complement to the earlier batch product, now used by 7,500 companies worldwide. The software complies with IBM's Systems Application Architecture standards.

SAS Institute, Inc. in Cary, N.C., has announced that the SAS Applications System software will now support **Digital Equipment Corp.**'s DEC Real Time Test Integrator. Scheduled for availability this quarter, the DEC Real Time Integrator is a windows-based icon tool kit designed to allow users to create and run real-time applications by drawing them.

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NEW PRODUCTS — SOFTWARE

Applications packages

Computer Decisions International, Inc. has announced Version 2.5 of Microshop IV, a manufacturing management software package that runs on IBM RISC System/6000s or AIX-, Unix- or Xenix-based systems.

The software package includes an indented work-orders feature that reportedly enables users to track estimated and actual work-order costs within a job.

Pricing ranges from $50,000 to $100,000.

Computer Decisions International
39500 Orchard Hill Place Drive
Novi, Mich. 48050
(313) 347-4600

Diversified Software Systems, Inc. has announced Online Info, an operations job information product designed for IBM OS/MVS environments.

The product reportedly enables operations departments to immediately obtain information regarding what a particular job was designed to do. An on-line query facility allows users to display specific job data, such as what steps were executed and which disk and tape input files were used or created.

License fees range from $6,000 to $14,000, depending on CPU size.

Diversified Software
13630 Sutter Blvd.
Morgan Hill, Calif. 95037
(408) 778-9914

Computing Options Co. has announced Ofas/3000, a fund accounting system designed for educational institutions, nonprofit organizations and state and local governments.

Ofas/3000 includes the following modules: general ledger, budgeting, requisitions and purchase orders, accounts payable and accounts receivable. Its on-line processing feature can reportedly provide up-to-the-minute account balances and budget control information that includes data pertaining to transactions currrently being entered into the system.

The software runs on Hewlett-Packard Co. 3000 computers. A limited number of packages are priced at $25,000.

Computing Options
182 Thomas Johnson Drive
Frederick, Md. 21701
(301) 662-5592

Utilities

Polestar Software, Inc. has announced Pursuit, a Help desk software package that enables users of VAX/VMS computers to track job status, locate recurring problems and view detailed management reports.

The product's centralized database serves all support personnel, and its alert feature was designed to ensure that important problems are solved promptly, the vendor said.

Prices range from $5,000 to $40,000, depending on number of active support customers.

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NEW PRODUCTS — HARDWARE

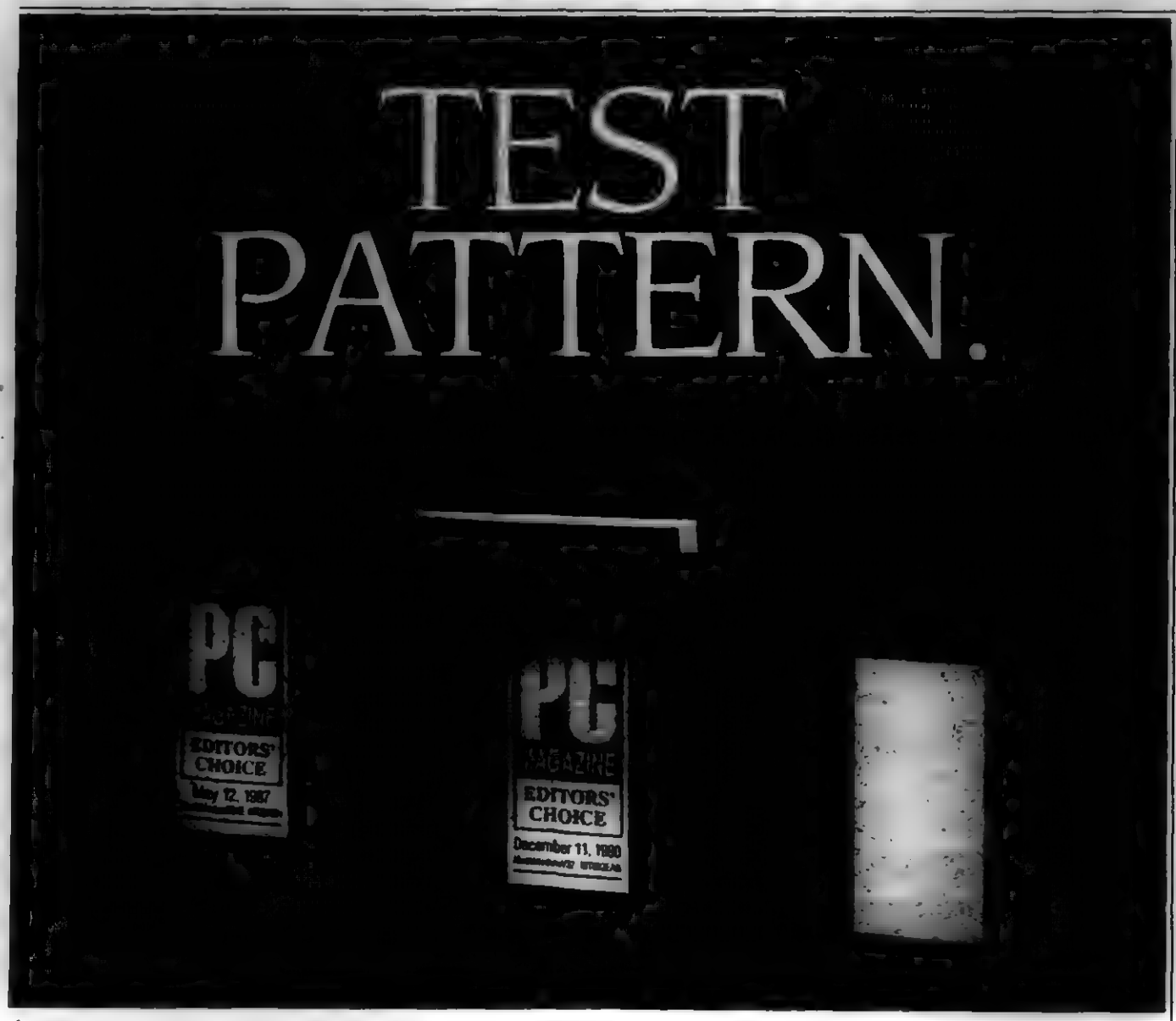
Processors

Stardent Computer, Inc. has announced the Stardent 750, a computer manufactured by Kubota Computer, Inc. in Japan.

The system includes the Stardent VX graphics subsystem, a 256M byte/sec. bus, a memory subsystem and an I/O subsystem. It also features up to 256M bytes of main memory and Ethernet connections.

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PC Magazine, 12.11.90 (Ziff-Davis Publishing) 9600-BPS MODEMS: Breaking the Speed Barrier-PC LAN Labs tests seven rapid-fire modems complying with V.32, V.42 and V.42bis standards."

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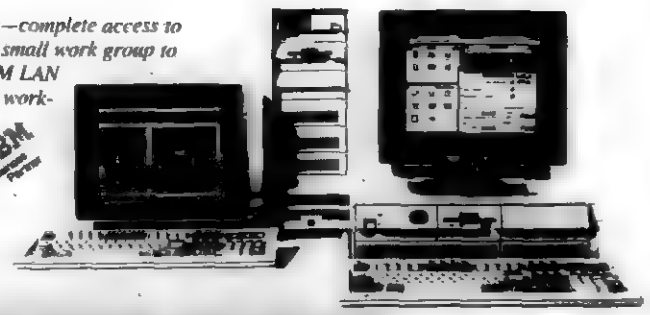
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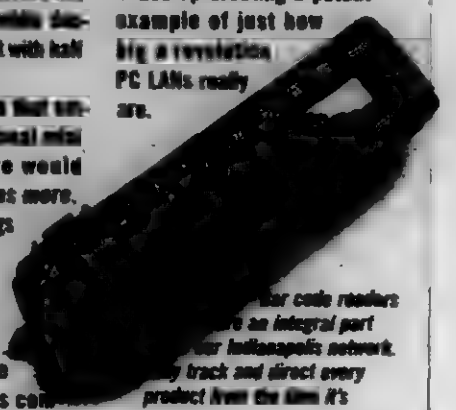
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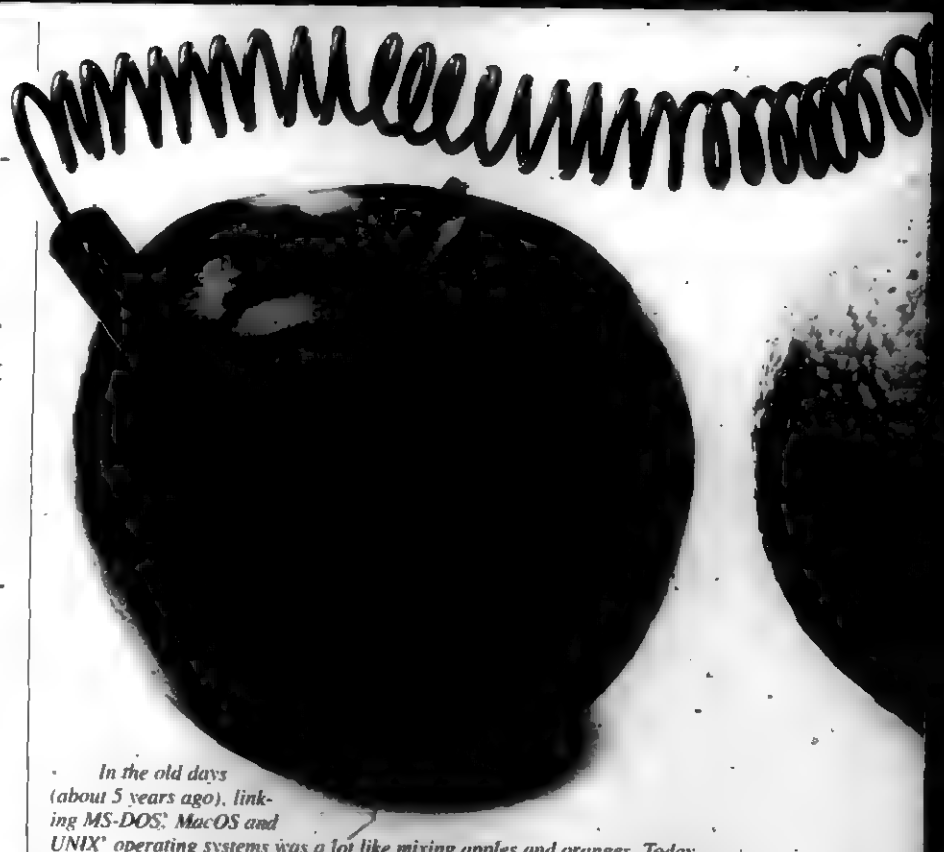
Building a network without

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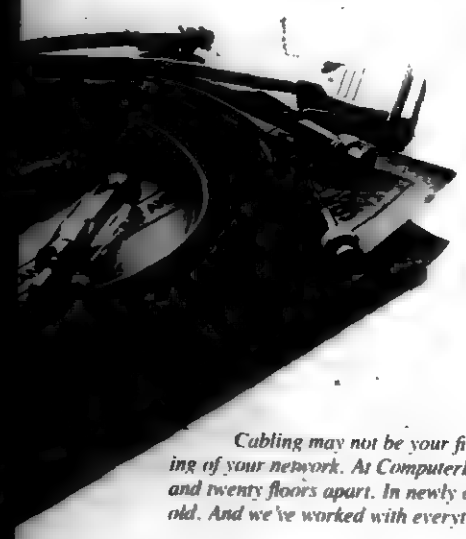
At ComputerLand, we've learned which hardware and software best support multi-vendor connectivity requirements. Especially when you want to link Apple computers, COMPAQ DESKPRO's and IBM PS/2's—an assignment we successfully complete virtually every day.

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In the old days (about 5 years ago), linking MS-DOS,® MacOS and UNIX® operating systems was a lot like mixing apples and oranges. Today, thanks to the maturity and stability of PC LANs, ComputerLand can provide elegant, reliable and low-cost solutions to interoperability problems.



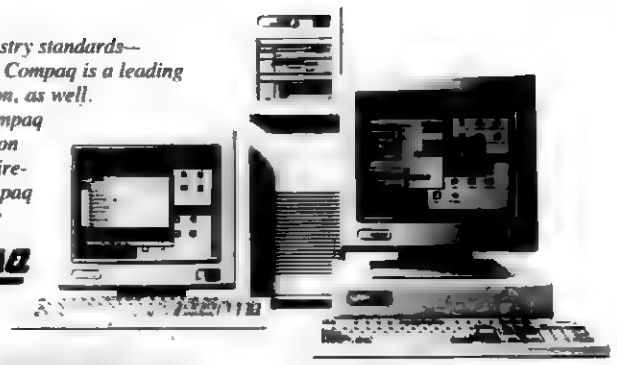
Cabling may not be your first concern, but it's critical to the functioning of your network. At ComputerLand, we've connected PCs two feet apart and twenty floors apart. In newly constructed offices and buildings a century old. And we've worked with everything from twisted pair to fiber optics.

COMPAQ products have always been built around open industry standards—designed to work powerfully in multi-vendor environments. Today, Compaq is a leading supplier of PC network servers and a leader in technical innovation, as well.

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to individual files. And since PCs now have sophisticated archival capabilities, data preservation can be ensured.



When the state-of-the-art Illinois Hazardous Waste Research and Information Center opened its doors, management turned to ComputerLand for state-of-the-art networking. Two interconnected Novell LANs were designed and installed. One to capture and share data from scientific instruments. The other to handle proposals, letters and other front office functions. Each using a COMPAQ SYSTEMPRO® as a file server. Now the agency is working effectively to map dump sites and define research funding priorities. And we can all breathe a little easier.

COMPUTERLAND CREATES A NEW PC LAN IMAGE FOR B.D.S. HEALTH PLAN.



medical insurance claims, resulting in a paper trail that, if laid end to end, would be many miles long. Their networking goal was to implement paperless image processing with a scanner in the mailroom, then electronically route each mailed-in claim through the company's process.

Bill Hockett is the Director of Data Processing at B.D.S. "In our industry, the mainframe is the backbone of claims processing. Then, for image processing, we chose the best software to electronically manipulate the [illegible]—and that runs on a mini. [illegible], to get integrated information to each claim representative's desk, a PC was the only answer.

"ComputerLand was not the lowest bidder—but it was obvious they had an incredible investment in technology and sales support. During a visit to the ComputerLand Technology Center in Portland, we met their systems engineers and service people, toured their local distribution center—including parts and inventory—and discovered a first-rate operation all the way.

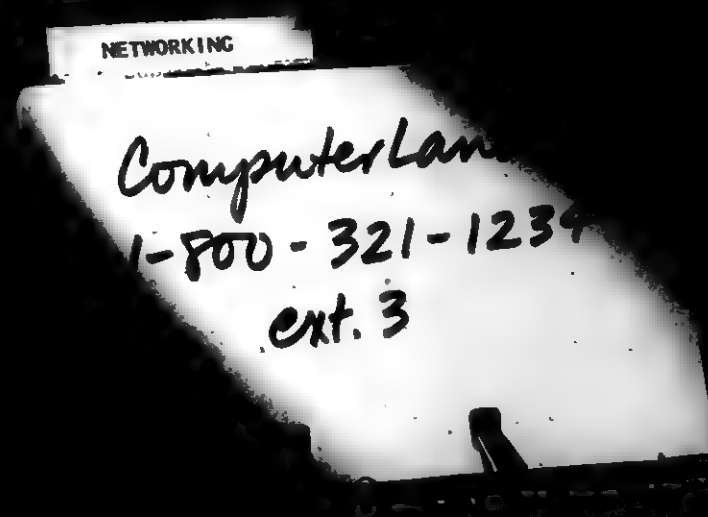
"The technology center perfectly replicated the environment we wanted. The systems engineer who designed that system is managing the project for us. What more could you ask for?"

Kevin Egan, ComputerLand's Marketing Manager in Portland says, "Our 5 full-time systems engineers—with over 25 years of data management/processing experience—have worked in many environments like the one at B.D.S."

Says Hockett, "They designed our network along with the OEM, and supplied technical expertise on connectivity. The power of the system comes from the fact that on every desk is a PC that has access to all resources on the network.

"ComputerLand is also configuring the PCs before they come to us—almost 50 of them—and doing it all, right down to unboxing and placing one on each desk.

"When it comes to PC LANs, I would highly recommend ComputerLand to anyone."



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Microsoft defends pen computer record

BY PATRICIA KEEFE
CW STAFF

Those who view Microsoft Corp. as akin to the "Evil Empire" are most vociferous when charging that Pen Windows is nothing but a vaporous preemptive strike aimed at nipping Go Corp.'s Penpoint operating system in the proverbial bud.

Of all the accusations hurled at Microsoft over the last few weeks, nothing raises its hackles more. Jeff Raikes, Microsoft's vice president of office systems, positively seethes at the suggestion. "We're damned if we do and damned if we don't."



Raikes: *'We're damned if we do and damned if we don't'*

In fact, he maintains, Microsoft has dabbled in pen-based computing off and on over the last decade, intensifying its efforts during the last 18 months. "People have the impression that Go announced something, and then we scrambled around and started to do some work," Raikes complained.

Microsoft Chairman Bill Gates is said to have first worked with Epson America, Inc. on a stylus-based machine in 1981. But, Raikes said, the technology was premature. Then three or four years ago, Gates had some discussions with Infa Corp., a pen-based start-up at the time.

Later, at Go's request, Microsoft and Go talked about working together. Go wanted Microsoft to develop applications for its then-planned shareware, Raikes said. (Go has since backed away from hardware.)

In the end, Go turned down Microsoft's suggestion that it build pen-based computing on top of Windows. Microsoft, in turn, rejected Go's suggestion that it relicense Penpoint.

"We made the right decision not to pursue that. At the time, we were being criticized for having too many operating systems, and we didn't think we should pick up on another one," Raikes explained.

The two firms went partially separate ways. Microsoft gave Go its Rich Text Format specifications, while Go has proposed that the two cooperate on an "inking" format or the way input is visually represented on the screen. "I think that is a good idea," Raikes said, adding he would like to see the two cooperate in other areas as well. He admitted it is "not likely" that "gesture" standards will be one of them.

Today, despite assertions to the contrary by detractors, work on Pen Windows is well under way, he said. "It is not vapor." Over 200 developers kits were distributed at a conference in February sponsored by Microsoft, and 21 OEMs have announced support plans.

Raikes said he expects to deliver software to hardware vendors by year's end, adding that a number of them plan to ship machines in early 1992.

"I did a demo at the Esther Dyson conference and got a positive response. Even [Go President] Jerry Kaplan said we were very far along," Raikes said.

He also dismissed some complaints that Windows is a less than ideal platform for a pen-based system. Microsoft's pen-based computing efforts fall into three areas:

- Pen-based extensions to the operating environment. This will include power management (to enhance battery life); ergonomic issues, such as how the menus drop down based on whether the user is left- or right-handed; and pen drivers to support the pen.

> "PEOPLE HAVE the impression that Go announced something, and then we scrambled around and started to do some work."
>
> JEFF RAIKES
> MICROSOFT

- Work on text recognition technology, particularly in the areas of cursive script, delayed strokes and stroke-order independence. Go and Microsoft are proposing different "gesture" standards.

Microsoft is backing an open application programming interface for plug-in recognition technology along with several other vendors. These include Wang Laboratories, Inc., Grid Systems Corp., CIC Corp., Momenta and Paragraph, a Moscow-based, partially U.S.-owned venture.

- Pen-enhanced applications. The main one, he said, is a notebook package that "relies heavily" on Microsoft's Object Linking and Embedding specification to allow objects from various applications to be embedded into the notebook. It will be bundled with Pen Windows.

Over the next 12 months, Microsoft will concentrate on completing work it is doing in outlining, increasing developer and OEM support to build a family of applications and working to get the cost of the technology down.

Bank takes its philosophy to heart

PCs join integrity, service and teamwork in contributing to bottom line

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

LANSING, Mich. — Michigan National Corp., one of the state's largest banks, counts on its philosophy to make the numbers add up right. Phrases such as integrity, world-class service, team and meritocracy appear in its one-page treatise entitled "The Michigan National Philosophy."

A metaphysical approach to banking has not hurt the bottom line — $11 billion Michigan National posted profits of $48 million in last year's tough climate.

The bank's operating paradigm also attracted Charles Kight, Michigan National's executive vice president of consumer banking and information technology, and has spurred information systems toward personal computer use to improve service by dropping cycle time through better communications.



Michigan National's Kight *focuses on reducing cycle time using PCs*

Reducing cycle time — the time it takes to accomplish something, be it resolving a customer problem or answering an employee question — is Kight's focus and one reason Michigan National is installing PCs.

"We're very committed to our values, and we've had a major program under way in terms of getting our customers the

Continued on page 38



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And even more amazing, these babies just keep getting bigger. Now, we're introducing the new RISC System/6000 POWERstation 320H. It runs 11.7 MFLOPS* and 32.4 SPECmarks.* If you already have the original POWERstation 320, you can upgrade it now to the even more spectacular performance of the 320H.

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Then there's the POWERgraphics GTO graphics subsystem. It can attach to any model in the RISC System/6000 family, to deliver super graphics performance previously available only in the POWERstation 730—990,000 3D vectors/second and 120,000 shaded polygons/second. That's more than enough to make your graphics look like a masterpiece.

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*SPECmark is a geometric mean of the ten SPECmark tests. MFLOPS and LINPACK double precision where n=100. AIX XL FORTRAN Version 2.1 and AIX XL C Version 1.1 compilers were used for these tests.

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Computer-aided design frees engineers' creativity

ON SITE

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Design engineering used to mean pencils and drafting tables, which were user-friendly and cheap. With computer-aided design (CAD), capital expenditures expanded exponentially, and even the hottest design houses, such as David Kelley Design, cannot support a workstation for every engineer.

Despite its success in designing Apple Computer, Inc.'s mouse, Metaphor Computer Systems, Inc.'s infrared mouse and Next, Inc.'s workstation shell, the firm still jockeys its engineers around its workstations in a game of musical chairs.

"In the Boston office, one engineer gets in about 4 a.m. and works until afternoon; then the second engineer comes in and works into the night," said Tom Kelley, director of marketing.

In the main office here, there are 18 workstations for 30 engineers. Although everyone has an Apple Macintosh, there are "some fights" over access to the CAD workstations, according to Dennis Boyle, senior engineer. "Everyone craves the speed," he added.

"It's not that costs are insurmountable, but it is possible to lose money," Kelley said. He estimated that the firm has invested $1 million in hardware and software in the last five years.



David Kelley Design *works such as the Jaminator guitar come from engineers who are free to create but compete for CPU time*

The company uses Hewlett-Packard Co.'s ME 10 (two-dimensional) and ME 30 (three-dimensional) CAD software on a range of HP's Apollo division workstations from Series 319s at the low end to Series 425Ss at the high end.

In a nondescript building, David Kelley Design engineers create functional, easy-to-manufacture products. On the inside, high-tech furniture, white-board walls and a fleet of balloon-tired bicycles for fun encourage engineers to explore their creativity, fashioning parts in the floating, light and shadowed space of design software.

Using CAD, designers said, greatly reduces time to market. For instance, an electric toy guitar, called the Jaminator, only took them from October to January 1990 to complete. Ordinarily, it takes between nine months and two years to get a product out, said Paul Barsley, chief operating officer at David Kelley Design.

"We work with industrial designers who know the limits of reality. We, in turn, know the limits of art," Boyle said.

For instance, Steve Jobs, Next's chief executive officer, wanted his company's sleek black monitor to "float in space," Kelley said. "They came up with a vision, and we detailed how to make thousands of them."

Manufacturing is made faster and more elegant with careful design. For instance, the company can figure out how to manufacture a part without turning it around on an assembly line, Barsley said.

Designers on leading edge

Suppliers and manufacturers have yet to catch up with designers in terms of technology. Only a few suppliers have the ability to take computer data and turn it into parts without traditional blueprints. "The technology does restrict choice," Kelley said.

When the company finds suppliers with the technical capability, "we send a tape to suppliers that describes parts. They do the necessary manufacturing and send the parts to us," Barsley said.

Although manufacturers and suppliers have yet to automate to David Kelley Design's level, their use of CAD still greatly speeds the time to market, and "time to market is everything," Kelley said. "With CAD databases, documents can go straight to tooling, but still, most customers insist on mechanical drawings because we're not a paperless society."

One day, manufacturers will just look at a database. But according to Barsley, "we're not there yet."

Laptop BIOS enters market

BY MICHAEL FITZGERALD
CW STAFF

As portable computers proliferate, BIOS vendors push into new fields by writing BIOSs especially for laptops.

Phoenix Technologies Ltd. recently followed last year's announcement of a BIOS specialized for laptops with Intel Corp.'s 80386SL chip set by revealing that it had 10 OEMs working with the BIOS.

Meanwhile, Phoenix got competition in the laptop BIOS marketplace from Award Software, Inc., another major BIOS maker. Award and Phoenix market their sets largely to Far Eastern makers of clone and compatible personal computers. The products are the major reason why clone portables are suddenly hitting a market that for years has had offerings from only a few firms.

"These kinds of products will make it that much easier for small vendors to enter this market," said Peter Teige, an analyst at Gartner Group/Infocorp.

Award's BIOS offers specialized power management functions to increase battery life. In addition, it features a suspend/resume function that allows users to turn off their machines in the middle of an application and come back to that point without rebooting.

Mips fills out low-end processor line

BY CAROL HILDEBRAND
CW STAFF

SUNNYVALE, Calif. — News of a workstation and two servers announced last week by Mips Computer Systems, Inc. solicited lukewarm enthusiasm from the analysts, with most seeing it as business as usual.

"It gives them a good product line, but I can't get too enthusiastic about it because three months from now, somebody else will do something else in the workstation area. It's just more of the same," said Sandy Gant, an analyst at Gartner Group/Infocorp in Santa Clara, Calif.

The workstation and servers, based on Mips' 33-MHz R3000A microprocessor, represent a bolstering of the firm's low-end family, said Michael Cohen, Mips' product marketing manager of entry systems.

In January, the company had announced 33-MHz models in the midrange and at the high end of its product lines.

Gant said it was a prudent move. "Mips is staying aggressive in its product life cycle," she said. "They're staying on the curve, doing what they need to do."

The workstation, the Magnum 3000/33, is rated at 25.1 Specmarks, the firm said. Memory capacity ranges from 8M to 128M bytes with disk space up to 6G bytes. The original Magnum 3000 was renamed as the 3000/25, and its price was cut by $1,000, to $7,990.

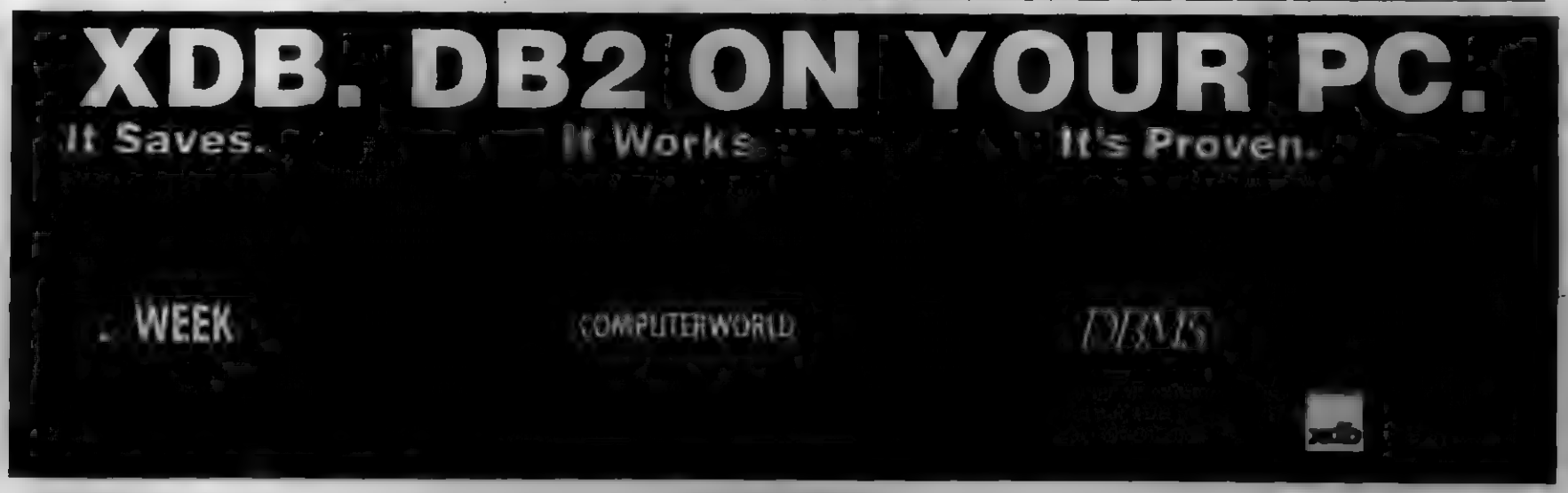
Geared for small groups

Mips said it has slated the RC3330 as an entry-level server for small work groups. The box delivers 25.1 Specmarks of performance and is configured with the same memory and disk capacity as the workstation. Cohen said its predecessor, the 25-MHz RC3230, will be reduced in price from $9,740 to $8,990.

The second server, the RC3350, is positioned for larger work groups with higher end needs. The RC3350 is rated at 26.5 Specmarks, the company said, and a base configuration includes 16M bytes of memory, 328M bytes of disk storage and 150M bytes of storage on ¼-in. cartridge tapes, with VME expansion capabilities extending the server's capacity.

The desktop workstation and server are also available as upgrade boards, the firm said.

Pricing starts at $10,990 for the Magnum 3000/33, $11,990 for the RC3330 and $36,500 for the RC3350.



Bank

FROM PAGE 35

quality they deserve," Kight said. The bank is installing IBM Personal System/2 Model 55SX PCs in its administrative offices and its branches to give key employees, such as managers and loan officers, easier access to mainframe databases.

For example, if a customer's query needs to be transferred to another employee, a screen full of information about that customer can be transferred right along with the call via IBM's Rolm Systems Callpathing, which hooks the telephone switch to the mainframe. Being able to perform such seamless transfers saves the second employee time and gets questions answered more quickly.

"We [in IS] don't measure our success on how many databases we go through . . . what I care about is how easy it is for the customer to get it done," Kight said.

The bank even wants to make sure customers can establish a long-term relationship with individual tellers and officers and is using its computers to track turnover trends — where turnover happens and the reasons behind it — so it can keep people in place longer.

The bank installed Allegro, an electronic mail interface it co-developed with Mozart Systems Corp. about 1½ years ago. Kight credits Allegro, a colorful, mouse-oriented graphical interface that runs in IBM's MVS/Officevision over IBM's Distributed Office Support System, with giving users much easier access to mainframe databases and greatly reducing cycle time on internal communications. Users include top management in Farmington Hills, Mich., and Kight and another senior vice president in Lansing, most of the administration and several layers of managers. The system is being implemented in all 188 bank branches and is on target for a third quarter completion.

"We're trying to make it easier for team members to talk and get answers. We want to get down the cycle time so people answer your questions in a hurry," Kight said.

Easier access

Kight said Allegro's ease of use has changed the way people work. Because it greatly simplifies access to the mainframe, users don't shy away from the system the way they did before. The system also keeps a log of what information people want and how they ask the system for it so the systems group can update the selection of commands available to the mouse.

One step toward reducing cycle time came six months ago, when Michigan National started using multimedia applications on PCs. The company makes its own customer presentations, training videos and internal communiques using a Sony Corp. Mavica MVC Model 2000 with a 2-in. floppy disk and running under OS/2 on an IBM PS/2 Model 80. Images are transferred from the camera to the PS/2's 80M-byte hard disk via a Sony still-video disk digitizer.

The presentation is edited on the PC, transmitted back to videotape and taken on-site or to a branch for playback on a VCR and television.

The video system eliminates the need to contract for entirely new videos when changes are necessary. "We never did that because you couldn't begin to have cost-effective video," Kight said.

The company had used videos for some purposes, but now it costs them less than $2,000 for a full-motion training video. "This is the first time we've ever communicated from every business unit," he said.

Michigan National has been bringing in PCs and automating branches for business purposes, Kight said. Technology purchases always have a business reason behind them, Kight said Michigan National is not after the latest and greatest but just what works best for it.

"We went out and got a business need and then found the technology to drive it, as opposed to the other way around," he said. "For instance, we're going to electronic bill-paying for our customers. We'll make money because we get a fee for it, but the real reason is to give our customers more convenience."

"The technology is off the shelf . . . ," Kight said. "And E-mail probably pays for itself just in the paper we save, let alone the reduction in cycle time."

MICRO NOTES

Lotus resets upgrade path

Lotus Development Corp. has extended its $49 Technology Guarantee Program to include all new or upgrade purchases of its personal computer-based 1-2-3, Symphony, Freelance Graphics and Ami Pro. The program protects users' investments by allowing them to upgrade for $49 if a new version of an application ships within six months of the date of purchase. It also replaces the previous upgrade policy, which varied by category and specific product release.

Deneb Systems, Inc., in conjunction with IBM, has produced a storyboard and videotape featuring the IBM RISC System/6000 family and Deneb's Construction Accounting and Estimating System software.

Microsoft Corp.'s Word for Windows Version 1.1a is now shipping. Registered users of Word for Windows 1.0 or 1.1 can upgrade to this version for $10. Separately, Microsoft announced an exclusive licensing agreement for its Multimedia Publishing Group to market and distribute a number of multimedia titles from The Voyager Co.

A TOAST TO THE SWEDISH S

COMMENTARY

Christine Comaford

Advice for GUI projects



Microsoft's Windows 3.0 has clearly caught the market's attention, and the pressure to move to the new environment is strong. The lure of application interface consistency, simplified access to corporate data via graphical user interface (GUI) front ends and easing users' dependence on support is powerful.

Although the siren song is sweet, developers are feeling justifiable anxiety over their ability to move to Windows.

The following are elements our firm has found to be critical for Windows development.

Some applications may be prohibitively expensive or simply unreasonable to move to Windows. For example, if your product is a graphics- and CPU-intensive molecular modeling tool, it might not make sense to port it to Windows. The performance of complex graphics rendering under Windows 3.0 is generally considered unacceptable.

It seems obvious, but sometimes developers don't pay enough attention to the status of the customer's technology investment. If the application requires users to make a major hardware upgrade (such as adding more memory or a math coprocessor), you need to consider what percentage of the user population is likely to find a GUI implementation worth the cost.

Also, corporate developers are often asked to cost-justify the development in hard dollars, an admittedly difficult task. While GUIs are expected to cut training costs in the long run, there is the initial educational investment. But training can be leveraged over many tasks, and related productivity increases should result from similarities between many different Windows applications.

It can also be argued that the investment in Windows is an investment in a technical infrastructure; there may not be quantifiable payback from Windows but rather from the new areas of work that Windows enables.

Experiment with various computer-aided software engineering and prototyping tools under Windows. The right tools can dramatically cut development time. Always look at tool decisions from both a technical and a business standpoint. If the vendor isn't stable, you could end up with an unsupported environment.

Windows development does not happen overnight — both commercial and corporate developers need to plan. The complexity of a port from another platform depends on what language the application is written in, how structured the existing code is and what tools in addition to the Windows Software Developers Kit (if any) will be used. A port can take six to 18 months. New development takes longer.

It is crucial that someone with intimate knowledge of the complicated Windows environment reviews the project's source code and creates a project plan before any coding begins. The plan, which should include development milestones, delivery dates and costs, will often take two to eight weeks to produce.

Inexperienced Windows programmers may be able to help with implementation, but programmers with three to five years of Windows programming experience are critical. Windows programming is complex, and its semiobject-oriented, event-driven structure requires a somewhat different mind-set from traditional programming.

Common User Access (CUA), IBM's Systems Application Architecture-based standard for application "look and feel," is limited in its current incarnation. You'll need to make interface choices beyond today's CUA specification. For example, some interface components such as tool bars, status bars, "ribbon" and caches of recently opened files are becoming de facto standards.

When developing a product capable of supporting multiple platforms, there are several issues to consider. If, for example, you want to support both Windows 3.0 and Apple's Macintosh, you need to decide whether it is more important to have the product look the same on both machines or whether it is better to capitalize on the unique capabilities of each platform.

If you're moving from DOS to Windows, decide how you will negotiate the trade-offs between making a Windows 3.0 product consistent with existing Windows applications vs. making it look and feel like your current DOS product.

Are you more concerned with making your old users comfortable or with attracting the new Windows fans? Should file formats across platforms be instantly compatible or would an import/export utility suffice?

Each choice you make results in altering the development schedule and costs.

If you do decide to support multiple platforms, consider whether to base your multiplatform product line on a foundation of common code or whether it makes sense to maintain two unique products.

It may initially take longer to develop common-code technology, but an investment in a sophisticated design may pay big dividends in decreased maintenance, enhancement and support costs later.

Be realistic about schedule slippages. If you've scheduled four days for each of 10 tasks and task No. 1 slips one day, the total schedule will probably slip not one day but 10 — you've probably underestimated all the tasks.

Comaford is a partner at consulting firm Kovera Associates, Inc., which has offices in Redmond, Wash., and Sausalito, Calif.

AFETY STANDARD.

IDEA

The intelligence to communicate better

Users test front-end tool

BY MAURA J. HARRINGTON
CW STAFF

EL SEGUNDO, Calif. — Information systems managers concur that it is tough to find experienced software developers who are familiar with the ins and outs of object-oriented programming languages.

So when Inference Corp. introduced its first windows-driven, front-end software application development tool for its 3-year-old proprietary database management system last month, customers expressed immediate interest.

The product, called Case Based Reasoning (CBR) Express, is a front-end tool for applications development designed for Inference's Automated Reasoning Tool for Information Management (ART-IM), a proprietary knowledge-based information management system based on object-oriented programming technology.

In addition to running under Microsoft Corp.'s Windows 3.0 for an easy-to-use graphical user interface, CBR Express features the ability for novice users to add to the ART-IM proprietary CBR-style database without any knowledge of the object-oriented language, according to Inference Chief Executive Officer Peter Tierney.

For example, Lynden Tennison, manager of the Knowledge Systems Division at American Airlines, uses ART-IM to develop applications ranging from sales support information management systems to end-user Help service systems. American Airlines has been an Inference customer for three years.

"We're getting ready to bring in CBR Express for our internally developed applications, including our help desk, maintenance and marketing systems," Tennison said, citing CBR Express' ease of use. He added that the new product will probably run on Intel Corp. 80386 and I486-based personal computers, running Windows 3.0 under DOS and eventually OS/2 platforms.

At Intervoice, Inc., an automated voice systems firm in Dallas, CBR Express is expected to be used in conjunction with an ART-IM help desk system to make it easier for technical analysts to field questions from customers, according to Walter Elkins, field service manager at the Real Care Help Systems Department there.

"We have about 1,700 customized voice systems worldwide ... and that means my help desk people have to deal with a lot of diversity when people ask questions," Elkins said.

Current ART-IM users can buy CBR Express for $4,000. For new Inference customers, CBR Express will be packaged with ART-IM for $40,000. Network versions start at $40,000 for 10 users, Tierney said, adding that at least 4M bytes of memory are suggested for running CBR Express on a PC.

Study ranks Mac first in class

BY JAMES DALY
CW STAFF

How does Apple Computer, Inc.'s Macintosh stack up against personal computers running Microsoft Corp.'s Windows 3.0? The Macintosh wins hands down, according to a report recently prepared for Apple by an independent testing laboratory.

The benchmark study conducted by the Ingram Laboratories found that the Macintosh offered swifter applications performance than similarly configured IBM and Compaq Computer Corp. PCs as well as a better price/performance value. "The Macintosh computer's unified architecture — with the hardware and operating system designed together from the chips up — performs better than a computer whose graphical interface is added to an existing operating system," the report stated.

Researchers in the Apple-commissioned study compared the time it took applications running on the Macintosh to complete a series of functions with an identical applications function suite running on comparable Intel Corp. 80286-, 80386- and I486-based systems using Windows 3.0. Among the packages were Aldus Corp.'s Pagemaker, Informix Software, Inc.'s Wingz and Microsoft's Excel, Microsoft Word and Powerpoint.

The results showed that the Macintosh line, from the entry-level Classic to the high-end Macintosh IIFX, consistently outperformed its PC competitors — often by as much as 70%. For example, an information systems management application on the Macintosh Classic took just over three minutes.

The Macintosh scored its biggest leads in graphics and publishing applications, while its narrowest victories — and occasional defeats — occurred in productivity applications such as Wingz, Microsoft Word and Excel.

Apple advantage
Apple says its Macintosh beat Compaq and IBM PCs in benchmark tests

Performance on application mix

System	Total time (in minutes)
Apple Macintosh IIFX	7.15
Apple Macintosh IICI with cache card	9.22
Compaq Desktop 486/25	9.70
Apple Macintosh IICI	9.76
Compaq Deskpro 386/33	11.40
Apple Macintosh IISI with math coprocessor	11.61
IBM PS/2 Model 70 486	11.97
Apple Macintosh IISI	13.36
Compaq Desktop 386/25E	15.25
IBM PS/2 Model 70 386/25	15.40
Apple Macintosh SE/30	17.35
Apple Macintosh LC	17.61

Source: Apple Computer, Inc. CW Chart: Marie Haines

BRAND SYSTEMS PERFORM IN CONCERT.

NEW PRODUCTS

Systems

Epson America, Inc. has announced a computer equipped with a 20-MHz Intel Corp. 80386SX processor and 2M bytes of random-access memory.

The Equity 386SX/20 Plus features zero wait-state performance and a 32K-byte memory cache running at 25 nsec.

The company claims that the system is among the first to support Edsun Laboratories, Inc.'s Continuous Edge Graphics, a digital-to-analog converter that reportedly blends colors between abutting pixels to eliminate jagged edges that usually appear on a monitor's display.

A 3½-in. floppy drive-based version costs $2,299; a version configured with a 100M-byte hard drive and a single floppy drive lists at $3,449.

Epson America
20770 Madrona Ave.
Torrance, Calif. 90509
(213) 782-5161

Software applications packages

Macola, Inc. has announced an enhanced version of its modular, personal computer-based accounting software package.

Version 5.0 of Macola Accounting Software features a user interface equipped with menu bars, pull-down menus and pop-up windows. Other features include password protection for all the product's applications and full-screen editing facilities that allow users to move up or down entry fields.

The product includes five accounting modules, four distribution modules and eight manufacturing modules. Pricing ranges between $795 and $1,595 per module.

Macola
333 E. Center St.
Marion, Ohio 43301
(614) 382-5999

Cognos, Inc. has announced an enhanced version of Powerplay, a reporting and analysis tool designed for Microsoft Corp. Windows 3.0 and Hewlett-Packard Co. New Wave environments.

Powerplay 2.0 ($850) can display data from any database in graphical forms, such as pie charts or bar graphs. Users are reportedly able to access, manipulate and visualize business data via a series of graphical, mouse-driven steps.

Other features include a reporting utility that allows users to sort data by rows or columns, correlation graphs that can be superimposed on top of other graphs and a display definition window that explains how computations were calculated in each cell.

Cognos
67 S. Bedford St.
Burlington, Mass. 01803
(617) 229-6600

Storage

Peripheral Land, Inc. has announced Infiniti 88 Turbo, a removable cartridge drive designed to accommodate 88M-byte cartridges.

The product features 85.3M bytes of formatted storage capacity, an average access time of 20 msec and support for ANSI's SCSI-1 and SCSI-2 small computer systems interface (SCSI) standards, according to the vendor.

A SCSI controller card is required. Infiniti 88 Turbo is priced at $1,799. Shipments began last week.

Peripheral Land
47421 Bayside Pkwy.
Fremont, Calif. 94538
(415) 657-2211

Interpreter Tape Back Systems, Inc. has announced a 160M-byte version of Tapexchange, a tape backup system designed for IBM Personal Computer XTs, ATs and compatibles.

Tapexchange Model 160TX ($1,595) attaches directly to a PC's standard parallel printer port without requiring any controller cards. Features include individual drive, directory and file tagging; prompts for multiple tapes and appended sessions; and command line functions.

The company also unveiled Discxchange ($1,649), a portable, external hard drive that attaches to an IBM Personal Computer XT, AT or compatible.

The product incorporates Syquest Technology's SQ555 and 44M-byte SQ400 Winchester-based cartridges.

Interpreter
11455 W. 48th Ave.
Wheat Ridge, Colo. 80033
(303) 431-8991

Peripherals

Videologic, Inc. has begun shipping a portable computer graphics-to-video scan converter.

Mediator ($2,995) was designed to convert a personal computer or Apple Computer, Inc. Macintosh system display output signal into a composite or S-video signal.

The product can automatically determine whether an input source contains PC- or Macintosh-generated graphics and make appropriate adjustments.

The product can be used with nearly any PC or Macintosh display adapter or a digital video adapter.

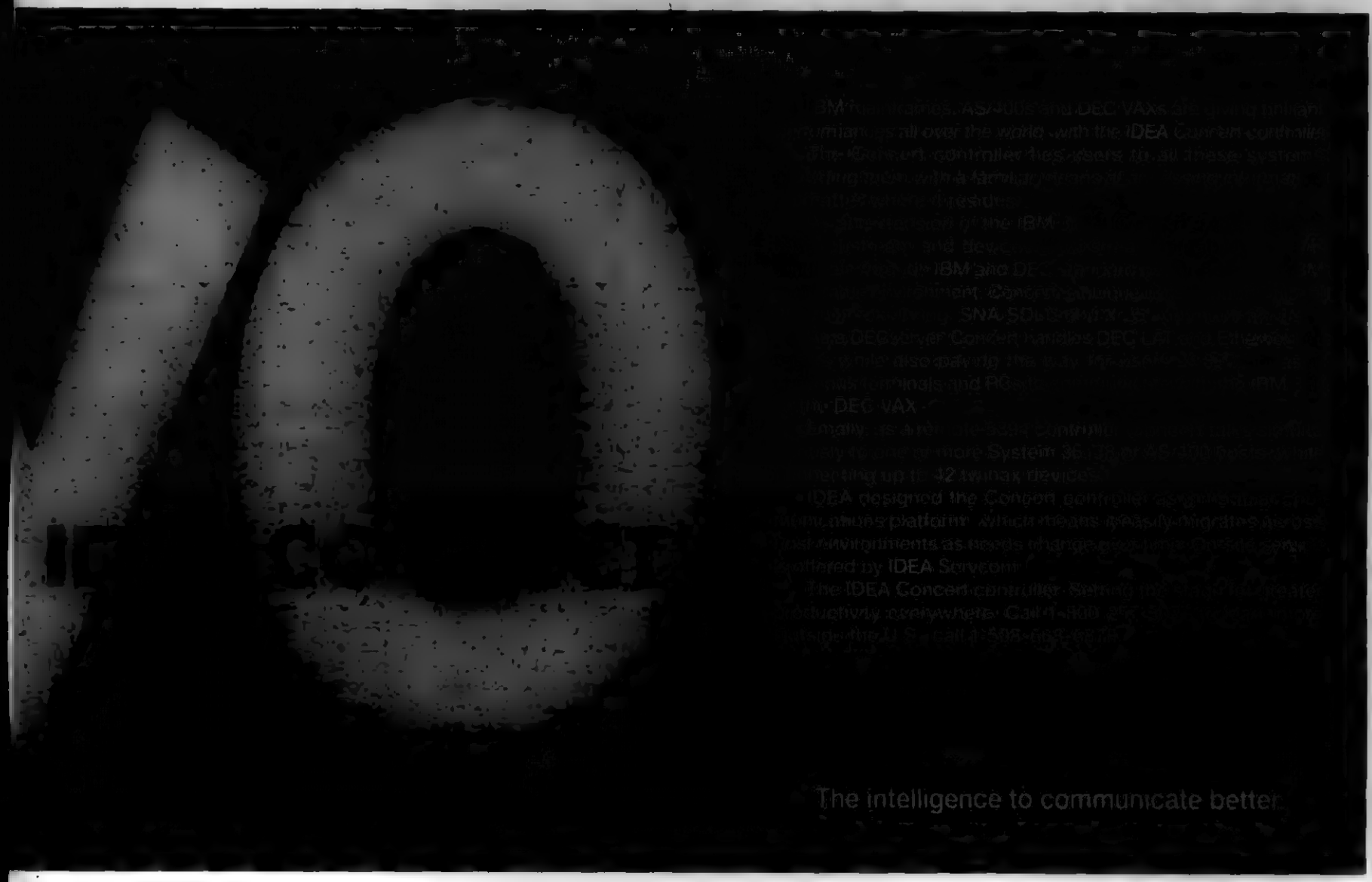
Videologic
245 First St.
Cambridge, Mass. 02142
(617) 494-0530

Viewsonic, an affiliate of Keypoint Technology, Inc., has unveiled a noninterlaced, 14-in. ultra Video Graphics Array color monitor that features a 248mm by 186mm display area.

The Viewsonic 6 is a multisynchronous device that automatically adjusts to horizontal scanning frequencies ranging from 30 KHz to 50 KHz or vertical frequencies from 50 Hz to 90 Hz, according to the vendor.

The monitor can operate within an IBM Personal Computer XT, AT or compatible; Apple Computer, Inc. Macintosh II; or Sony Corp. C1304. The product is priced at $699.

Viewsonic
12130 Mora Drive
Santa Fe Springs, Calif. 90670
(213) 946-0711



Paradox 3.5: More than meets the eye

Borland International's Paradox Version 3.5

Reviewers	Ease of use	Data integrity	Multiuser support	Performance	Application development	Documentation	Service & support	Value	Score
Byte 10/90	Virtually unchanged	NC	Easy	Dramatic improvement	Allows customizing	NC	NC	Good	One of the most feature-rich
Infoworld 11/12/90	Very good	Very good	Good	Excellent	Good	Excellent	Poor	Excellent	7.2*
PC Week 12/10/90	Needs improvement	Satisfactory	Good	Satisfactory	Good	NC	NC	NC	Improves performance
Users									
Kevin Smith USA Today	■■■■	■■■	■■■	■■■	■■■■	■■■	■■■■	■■■	Very good
Michael Irwin, Washington, D.C. Metro Police Department	■■■	■■■■	■■■■	■■■■	■■■■	NC	■■■	■■■■	Could improve syntax
Penny Oldsteder Bank of America	■■■	■■■	■■■■	■■■	■■■	■■■	■■■■	■■■	Easy to use
Analysts									
Dean Miller, D.L. Miller & Associates	■■■■	■■■	■■■■	■■■	■■■■	■■■■	■■■■	■■■■	Good
Jerry Caron, Faulkner Microcomputer Reports	■■■	■■■	■■■■	■■■■	■■■	■■■■	■■■■	■■■	Good
David McGovern, Alexander Technologies, Inc.	■■■	■■■■	■■■■	■■■■	■■■■	■■■	■■■■	■■■■	Short on multi-user features

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey.
*Infoworld score based on 1 to 10 ratings where 10 is excellent NC: No comment

Key: ■■■ Very good ■■■■ Good ■■■■ Fair ■■■■ Poor

Vendor financial ratings

Analysts	Long-term stability	Short-term performance	Average*
Peter Rogers Robertson, Stephens & Co.	■■■■	■■■	■■■
W. Christopher Mortensen Alex. Brown & Sons, Inc.	■■■■	■■■	■■■

*Rounded. Borland's net revenue for 1990 was $133 million, compared with $90.5 million in 1989. Net income was $11.8 million in 1990 compared with a $2.8 million loss for 1989.

***Technology Analysis** — a roundup of expert opinions about new products. Summary written by staff member Derek Slater.*

On the surface, Version 3.5 of Borland International, Inc.'s Paradox relational database adds very little in the way of new user functions. The primary improvements are SQL Link, a separate software package that allows Paradox to act as a front end to SQL databases, and a speed boost from the addition of Borland's proprietary virtual real-time object-oriented memory manager (VROOMM). Those are very significant advances that help Paradox stack up well in the database competition, according to reviewers.

Ease of use: Though the Paradox user interface is fairly old, reviewers said it is extremely intuitive. The query-by-example feature, now mimicked by most competing products, simplifies data retrieval.

Data integrity: Protective functions in Paradox include passwords, encryption and automatic screen updating. Data entry by one user automatically locks others out of editing the same record (but not other records in the same table) in a multiuser environment. There are several other levels of table locking. However, *PC Week* found potential data integrity problems in the use of multitable [illegible].

Edits performed on an individual table instead of through the multitable form did not produce corresponding changes in linked tables.

Multiuser support: Paradox showed speedy performance in multiuser querying. Reviewers said the program's multiuser features are fairly basic, though. One flaw is that when a user selects to edit rather than coedit a table, other users cannot even view the same table.

Performance: Borland's VROOMM system breaks the program into very small code objects and swaps them to the cache or hard disk according to a least recently used algorithm. VROOMM also uses extended memory where available and gives Version 3.5 a big performance boost over the previous version of Paradox — up to 77% improvement in one casual sorting test, according to *Byte* magazine.

With the addition of VROOMM, Paradox is now based on the same core engine as Borland's Quattro Pro spreadsheet. Reviewers said interaction between the two programs is simplified.

Application development: *Infoworld* said Paradox provides a "highly productive" environment for developers. The Paradox Application Language (PAL) simplifies development. Reviewers compared PAL to an extended macro in its ease of use and ability to automate many user-defined functions.

Documentation: In addition to the standard user's guide, Paradox includes separate manuals covering data presentation formats and PAL.

Reviewers reported that annoying spelling errors and factual mistakes found in the documentation of Version 3.0 have been corrected for the new release. Within the program, users have access to context-sensitive, online Help screens.

Service and support: Infoworld described Borland's telephone support for Paradox Version 3.5 as "uncharacteristically lacking." Users also verified that calling with technical questions often involves a long wait.

Value: Version 3.5 is priced at $795, which is standard for databases. There is also a competitive upgrade price of $175 available to users of other databases. Upgrading from Version 3.0 costs $135 — high for a product with so few added functionalities and features, according to reviewers. However, the SQL front-end capability is a significant advance. With its combination of speed, ease of use and practical features, Paradox impressed reviewers as an excellent value.



"IT HAS BEEN difficult to get technical support on the line. It's usually a minimum of a 20-minute wait. But once you get them, they're very competent and friendly."

Kevin Smith
Business Systems Analyst
USA Today

Borland responds

Comments from Ken Hertzler-Walters, senior product marketing manager:

Service and support: One of the main reasons we had support problems is that a whole lot of Version 3.5 hit the market all at the same time. We have new telephone menu systems to automatically fax information to the customer and a completely new system to improve communications before the customer reaches a live support person. Lastly, we are planning some personnel increases. But we feel our real gains will be found by increasing support in the channel. We are initiating new training programs and developer support programs that will be announced in the near future.

Value: Reviewers tend to look at menu commands as the basis to judge a version change. What we did change, and what the user will notice, is performance, both in the engine and in memory handling. The user will also notice significant changes in form and report design options. Paradox will also be developed for the Windows environment, and it will not simply be a port.

NEXT WEEK

▶ Fox Software, Inc.'s Foxpro Version 1.02 offers an easy-to-use windowing interface and solid performance, according to reviewers.

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PC MAGAZINE EDITORS' CHOICE November 27 1990

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Mellon Bank revives ISDN plan

BY ELISABETH HORWITT
CW STAFF

PITTSBURGH — Recent encouraging developments in the Integrated Services Digital Network market have brought back into the fold at least one ISDN apostate: Mellon Bank Corp.

Mellon got interested early in the switched digital standard, participating in an ISDN trial put on by Bell Atlantic Corp. approximately two years ago. "Mellon Bank is for us a lead user, an innovator and early adapter of technology," said Larry Plumb, a Bell Atlantic spokesman.



Mellon Bank's Graham *now feels confidence in ISDN*

That made it even more of a comedown for Bell Atlantic when Mellon officially put its plans for a corporatewide ISDN network on hold six months ago.

"I was a very strong advocate of ISDN for a couple of years," said Patricia Graham, the bank's vice president of voice and data networking. "We had identified in the pilot several competitive-edge things and cost-beneficial things we could do with ISDN; we know what we want to do with it from an application standpoint. But we were just spinning our wheels."

Plan put on hold

Mellon decided to back off ISDN, at least for the moment, because it got tired of waiting for the technology to take off, Graham indicated.

"It got too frustrating" to keep hearing that viable vendor offerings would appear "any day now, and then nothing happens," she said.

In particular, Mellon grew frustrated with Bell Atlantic's inability or unwillingness to talk ISDN turkey. The local carrier, which currently offers ISDN lines on a per-customer, non-tariffed basis, would give Mellon no specifics on the costs of an ISDN installation, Graham said. Furthermore, Bell Atlantic said it would need six months after receipt of order to begin delivering ISDN lines, and substantial ISDN service would not be deliverable in Mellon's home state of Pennsylvania until 1997, she added. "And again, in terms of available equipment, facilities and vendor understanding of applications, a lot was lacking. I think [Bell Atlantic] is more advanced in the Baltimore and Washington, D.C., area but not in Pittsburgh."

Another factor in the bank's decision was a court battle still going on in Pennsylvania to rule automatic number identification services as unconstitutional and therefore illegal. While Mellon had additional competitive applications in mind for ISDN, the ability to use incoming caller identification as a way to call up host files would have had "immediate cost and service benefits," Graham said.

The developments that caused Mellon to come back to ISDN came in rapid succession. The most telling was a meeting Graham had with Bell Atlantic representatives late last month, during which the local carrier assured her that ISDN tariffs were coming later this year, she said.

Tariffs to come

Plumb said an ISDN Centrex service will be tariffed in late spring and an ISDN single-line service for non-Centrex customers by year's end. Both of those services will support the ISDN Basic Rate Interface that defines two 64K bit/sec. B channels and one 16K bit/sec. D channel.

Bell Atlantic also expects to file a tariff by year's end for an ISDN Primary Rate Interface service, which supports 23 ISDN B channels plus one D channel.

Bell Atlantic offered Graham slim hope of being able to install "thousands of ISDN lines" in Pittsburgh by the end of next year, Graham said. However, "they led me to feel it is possible to get a significant number" within that time frame, particularly since Mellon's initial installation will be limited to one Bell Atlantic central office, she added.

Graham is also "hoping that automatic number identification gets resolved in Pennsylvania this year, [even though] it is still prohibited and still in the courts."

At least one vendor has hinted at imminent ISDN equipment reductions, she added. "Based on all of this, I'd say we'll be into ISDN big time in 1992."

The networking group at Mellon, which is a $31.4 billion bank holding company, serves not only Mellon users but also smaller banks.

Europe yet to offer all U.S. telecom comforts

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

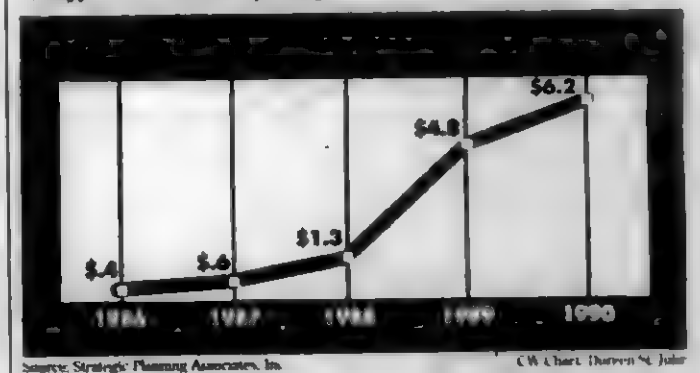
The looming 1992 merger of 12 countries into a common European Economic Community conveniently parallels the trend of U.S.-based companies to expand globally. However, companies may have to wait years for the array and flexibility of telecommunications services they have enjoyed in the U.S. since the 1984 divestiture of AT&T.

While the European Commission has issued clear-cut directives on standards for interoperability among the disparate networks of the now monolithic Postal Telephone and Telegraph (PTT) authorities, those mandates have no influence on intra-country telecommunications regulations. It also remains unclear what entity or entities will be in charge of coordinating intercountry communications and smoothing out the potential result of billing nightmares.

In terms of service, each PTT will need to adjust its offerings to respond to the dynamics of an open market — a situation that has user groups such as the International Telecommunications User Group (Intug) already lobbying for changes.

Global gusto

The need to break down monolithic telecommunications entities into an integrated worldwide communications infrastructure is boosting away-from-home carrier spending



Source: Strategic Planning Associates, Inc. CW Chart: Doreen St. John

One point of contention is the prohibition of connecting private and public networks in all European countries except the UK. "This has been a pain in the butt forever," commented George McKendrick, executive director of Intug in London. "Users are all naturally critical of such restrictions that deny them the benefits they have had in the competitive environment in the U.S. and the UK. We're making headway, but the process is a

Continued on page 52

'Hippi' means speed for lab users

ON SITE

BY CAROL HILDEBRAND
CW STAFF

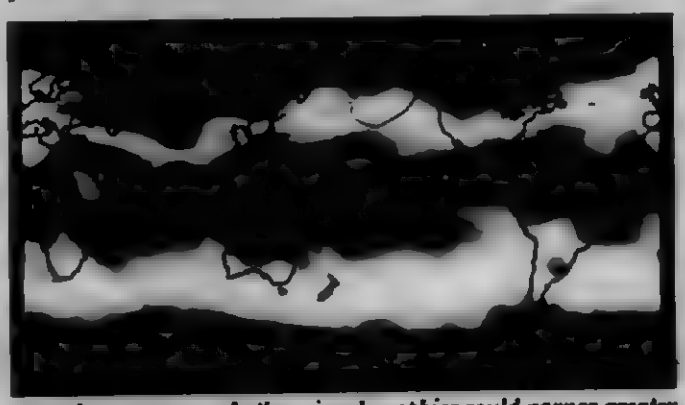
LOS ALAMOS, N.M. — As a federal research laboratory, Los Alamos National Laboratory attracts its share of eccentrics. Blue jeans and relaxed hairstyles are more the norm than the exception. So it seems fitting that the laboratory named its fledgling supercomputing channel standard "Hippi."

Hippi, or High-Performance Parallel Interface, is Los Alamos' answer to a chronic problem: answering the rarified needs of a handful of users who were running scientific problems with very high-speed requirements beyond the reach of commercial networking vendors at the time of Hippi's inception.

With one of the most powerful data centers in the world and thousands of users nationwide, Los Alamos has over a dozen supercomputers from the likes of Cray Research, Inc. and Thinking Machines Corp.

Scientists run applications ranging from state-of-the-art graphics projects to visualization, in which a computer draws a moving picture of, for example, an astrophysics problem that would normally print out in thousands of printer pages of binary numbers. About 10 hours of Cray computational work may translate into a 30-sec. movie.

So the laboratory defined an 800M bit/sec. channel and proposed it to the American National Standards Institute (ANSI) X3T9.3 committee in March 1987. Los Alamos based its work on an existing internal channel standard, called the high-speed parallel interface, that had been developed in-house during the mid-1970s.



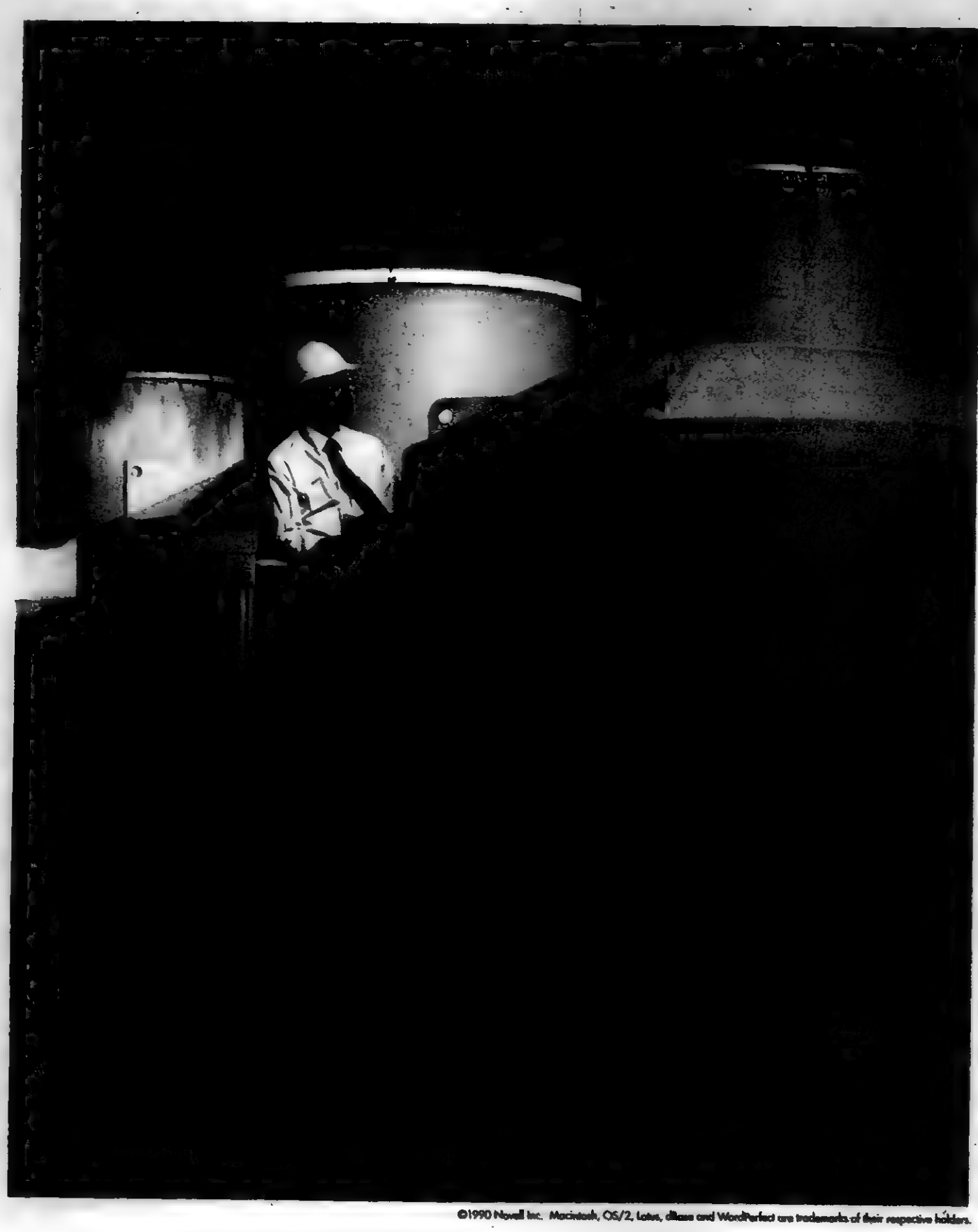
Weather maps *and other visual graphics could garner greater benefits from the Hippi standard*

"We were designing our own interfaces internally, and we didn't want to have to rebuild anymore," said Donald E. Tolmie, technical coordinator and leader of Los Alamos' standards committee at C-division, Los Alamos' internal computing division. "We thought, 'If it's a standard, we can get the vendors to spend their own nickel.'"

Tolmie said he received a "My gosh, this is the lunatic fringe" reaction when he first brought the Hippi prototype before the committee, but the laboratory mustered up enough vendor interest to convince the committee that there was a need for such high speeds. "We more or less overwhelmed the committee," he said.

Continued on page 48

NetWare Solves Issues At



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ENVIRONMENTAL THE EPA.

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But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

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NOVELL

The Past, Present, and Future of Network Computing.

'Hippi'

CONTINUED FROM PAGE 45

Hippi, with a bandwidth of 800M bit/sec. on a single copper cable and 1,600M bit/sec. with two cables, is really a point-to-point high-speed channel rather than an interface, said Wally St. John, a Los Alamos systems scientist involved with the project. The physical layer, which has been through two design reviews since it was submitted in March 1987, should be accepted as an ANSI standard soon, he said.

The channel is made up of shielded twisted-pair copper cabling. The maximum distance is 25 meters, although St. John said they have successfully run data at Hippi's lightning speeds at twice that distance, and at least two companies have products that will extend it onto fiber optics.

Los Alamos, which is using Hippi on a limited basis, has plans for the channel on several levels. It will be the basis for a local-area network for those scientists and users with a need for high-speed data transmissions, including researchers in the visualization laboratory, and will also serve as a backbone supporting such functions as data storage and archiving. "We handle such an enormous amount of data around here that we need those sorts of speeds to move it around," St. John said.

Los Alamos, which is "one of a tiny handful" of centers nationwide that has Hippi, hooks together its file system, data archival and visualization centers to supercomputers via what it calls a multiple crossbar network.

Using an internally developed crossbar interface, the laboratory can interconnect a fabric of crossbar switches to make the network arbitrarily large. The interface acts as a go-between from host to switch and between switches. According to St. John, "it takes what is a connection-oriented topology and turns it into a packet switch so the host doesn't have to worry about connections." St. John said users benefit because the ability of a source to deliver a package is based only on the destination being busy rather than anything in between.

The crossbar switches, which are circuit switches, were originally developed by Los Alamos. But St. John said Minneapolis-based Network Systems Corp. became interested in the technology and developed its own flavors from scratch.

Los Alamos is also part of a test bed that was put together by the Corporation for National Research Initiative to research high-speed networking at long distances. In the short term, the four participants of the program will have their Hippi-based LANs hooked via gateway to Synchronous Optical Network. "The immediate goal is 1G bit/sec. networking across the four sites," St. John said.

In the long term, the project will hook into the National Research and Education Network, a proposed high-speed backbone to hook together universities and research institutes nationwide.

BIT BLAST

Chipcom touts Token Ring

Smart-hub vendor Chipcom Corp. entered the Token Ring market last month when it announced a $1,195 module for its Online System Concentrator that supports 4M or 16M bit/sec. Token Ring networks running over shielded or unshielded twisted-pair wiring. The module joins Chipcom's existing Ethernet module. A company's Ethernet and Token Ring networks can be managed together using the existing Ethernet Management Module, according to Chipcom.

Videoconferencing equipment vendor Videotelecom Corp. and regional telecommunications carrier Bellsouth Corp. have inked a three-year agreement to jointly market Videotelecom's personal computer-based equipment and Southern Bell and South Central Bell digital transport services. Targeted applications will include "teletraining," business meetings and remote medical diagnostics.

Ram Mobile Data, Inc., which operates a nationwide mobile data communications network in the U.S., recently said it has selected Sears Business Centers as the systems integrator for the packet-switched radio network, providing systems design, training and support for turnkey private networks. In a separate agreement, Ericsson GE Mobile Data, Inc. said it has picked the Sears unit to market its mobile data products.

The first two commercial on-line information services to be available through an Integrated Services Digital Network (ISDN) connection were announced last month by Mead Data Central, Inc., which will offer its Lexis and Nexis text databases via Illinois Bell Telephone Co.'s Basic Rate Interface ISDN service. Illinois Bell ISDN customers will be able to access the databases at 9.6K bit/sec., conduct research faster and cut on-line charges, the firm said.

SANDRA KURTZIG, CEO OF ASK COMPUTER SYSTEMS

"If GUI application developers could be ten times more productive, what would that do for client-server computing? We're about to find out."

In December, 1990, ASK Computer Systems acquired Ingres, the acclaimed manufacturer of intelligent relational database products. Here, CEO Sandy Kurtzig discusses the dramatic productivity increases reported by developers using INGRES/Windows 4GL, the first complete application development environment for graphical user interfaces:



"I don't see how anyone can keep from getting as excited as we are about client-server computing. The amount of information it puts at the fingertips of the end user is just phenomenal.

"You'll drastically reduce the code you now have to write."

"Of course, that much information can be frustrating—even useless—without an easier way of viewing it. That's where graphical user interfaces are coming into their own. They make vast amounts of data easy to work with, and quick to comprehend.

"But writing GUI applications using a conventional programming language is incredibly tedious. It requires hundreds of thousands of lines of code—60 percent of which do nothing but

Sniffer takes on distributed network analysis

BY JIM NASH
CW STAFF

MENLO PARK, Calif. — Network operating systems makers will not integrate their management products any time soon. At least, that is what Network General Corp. is banking on.

The maker of hardware-independent network monitors and analyzers announced its Distributed Sniffer system late last month. The system was designed to analyze network activity from the application down to the physical level using 120 protocols. Despite noting some shortcomings, network managers said they were happy with what they have seen of the product.

Distributed Sniffer combines features of Network General's Sniffer analyzer and Watchdog monitor with wide-area network capabilities, which both products have lacked. A spokesman for Network General said the company intends to take advantage of the fact that despite a great degree of heterogeneity among hardware on networks, few integrated management products have surfaced.

Scheduled for shipment in June, Distributed Sniffer is a server version of portable Sniffer and a central personal computer console. Servers were designed to sit on each segment of a network, monitoring events continuously. With the console, the company said, managers can view analyses compiled by each server. Servers will be priced from $4,995 to $10,995, depending on configuration; consoles will cost $7,995. Network administrators may find the console more troubling than any other feature of the product.

Joe McGrath, manager of corporate telecommunications at Millipore Corp. in Bedford, Mass., said only the console will be able to tap the screenless and keyboardless Sniffer servers. That means technicians with portable sniffers will be sent out to each segment having problems, McGrath explained. He said he would like to see at least some console features transferable to local workstations. Another administrator said he wants console abilities given to a Unix workstation as well as a PC.

Keep on running

With a large installed base of Sun Microsystems, Inc. workstations, Unix users may lose some capabilities by being forced to adopt a PC platform, said John Thomas, technology and development engineer at a Houston oil firm. Both Thomas and McGrath said Distributed Sniffer will aid them in keeping their networks running. They currently use Sniffers that only work on one network at a time.

After working with an alpha version, McGrath said, Distributed Sniffer "matches with what we are doing in a couple of ways. I have 10 Ethernet segments all over the country . . . with all kinds of hardware." He said that "even with Network General's current products, it's been tough [to manage]."

McGrath said he must now send a network engineer equipped with a Sniffer to each faltering segment. Each Sniffer costs $30,000, he explained. Distributing the analysis will be more cost-effective and less labor-intensive, McGrath said.

Thomas agreed, saying that with or without Distributed Sniffer, his company is cutting back its computer maintenance staff. Based on a preliminary evaluation he gave, he said the product could pay for itself in six months.

RS/6000 users gain fiber link

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — Users whose applications need the combined punch of reduced instruction set computing (RISC) and the speed of an optical network can now turn to a high-speed communications interface from Network Systems Corp.

The interface, which was developed in conjunction with IBM, works with the serial optical channel converter on IBM's RISC System/6000 workstations and servers and is the first attachment of its kind for the IBM boxes, according to Network Systems.

The interface provides eight connections, and an additional eight are offered as an option. It comes in two pieces: one for the workstation and one for the host. The preconfigured interface for the RS/6000 includes a Fiber Distributed Data Interface port and runs Transmission Control Protocol/Internet Protocol (TCP/IP) under IBM's AIX Version 3 Unix operating system.

A channel interface, to connect to a System/370 or System/390 host, is also available. On the host, the interface is supported by IBM's TCP/IP running MVS, VM or AIX.

In addition, the interface comes with Simple Network Management Protocol (SNMP) agent software, enabling the unit to be managed by IBM's host-based Netview network management system, which supports SNMP.

According to Network Systems, both the workstation and the host interfaces will be available in the fourth quarter.

INFORMATION SYSTEMS FOR BUSINESS

produce the GUI itself. Add that to the problems of accessing data from multiple sources, a shortage of developers, and a steep learning curve for existing GUI tools, and you're talking a huge investment of time and money. No wonder client-server applications have been so slow in coming.

"A product that makes programmers up to ten times more productive."

"Well, all that's going to change once developers get their hands on INGRES/Windows 4GL—a tool that helps programmers be up to ten times more productive. At least, that's what some of our customers tell us.

"For starters, INGRES/Windows 4GL allows you to use a mouse to interactively build windows and menus without writing a line of code. Then you assign functions to those components using a very elegant fourth generation language, which a good 3GL programmer can learn in a week or less.

"So, applications that once required thousands of lines of code now take far fewer.

"Unlike simple screen painters and HyperCard-like tools, INGRES/Windows 4GL is designed for full-scale production applications. It helps you manage and coordinate multiple development teams. It even tracks different versions of your applications throughout the company. No wonder it's now being used to create sophisticated applications like shop floor control and critical care medical systems.

"Portability is one of this tool's most profound breakthroughs. An application you create in, say, OSF/Motif will be able to run flawlessly on Windows 3.0, Open Look and other popular systems. With the appropriate look-and-feel in each environment. With full interoperability with other applications. And with no rewriting.

"Your applications will also link seamlessly to the whole range of Ingres products, and—thanks to INGRES/Gateways—to other leading databases.

"Think about it: Client-server applications with GUIs and full portability, in a fraction of the time. This could be the product that finally opens up the workstation for mainstream commercial applications.

"I think it's fair to call it revolutionary."

INGRES/Windows 4GL supports Sun SPARC, DEC VAXstation/VMS, DECstation/ULTRIX, HP 9000/300, IBM RS/6000, and other major workstation platforms. To learn more about INGRES/Windows 4GL, call 1-800-4-INGRES.

Ingres

In December, 1990, Ingres Corporation was acquired by ASK. For more than ten years, Ingres has been a worldwide technology leader in database management systems. The family of Ingres products includes: the first intelligent relational database; the first Windows 4GL development toolset; gateways to the most popular non-Ingres systems; powerful desktop solutions; and global customer support. Ingres' reputation for technological excellence was most recently confirmed by Digital Review—the magazine's 1990 Editor's Choice, Best Database Management Software, and Best Database Tools awards went to Ingres—as did the Sun Observers' excellence award for Best Database Management System.

ASK
SOLUTIONS AT WORK

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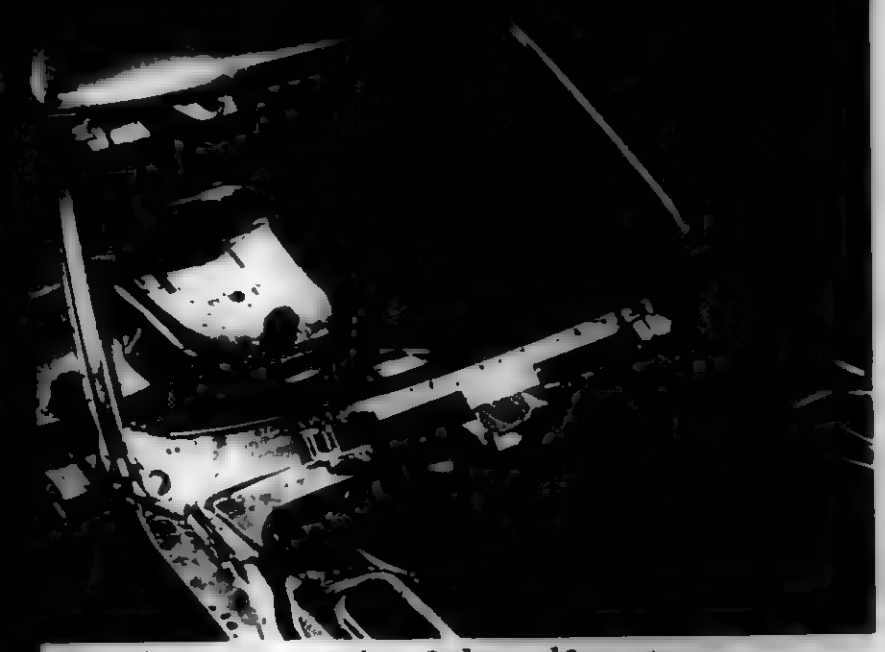
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Europe

FROM PAGE 45

long way from being finished."

The private/public interconnection issue could carry an expensive price tag for firms such as Munich-based Daimler-Benz, which is currently implementing a private 14-node fast-packet network [CW, March 18]. The network will initially link five Daimler-Benz firms and ultimately provide commercial services as well. That venture could be more cost-effective if the German PTT would allow hybrid private/public link-ups, said Claus Weier, network planning engineer at Daimler-Benz's computing services branch.

More restrictions

Another common telecommunications restriction in Europe is the prohibition of the integration of voice and data in the public network. This means that firms must pay for separate lines to run different types of network traffic. This situation takes a big bite out of the cost efficiencies of service integration that have spurred many U.S. firms to embark on new applications.

"The European countries are all going digital, which means that there is no technical reason you can't intermingle [voice, data, video and facsimile] services," said Phil Evans, director of telecommunications at Dallas-based FMC Corp. and president of the 2,000 member-strong International Communications Association. "However, most PTTs see service integration as a deterrent to their well-being rather than as a stimulus."

Evans noted that in the U.S., FMC is turning to video, computer-aided design and engineering and other bandwidth-hungry applications because of the cost efficiencies of combining several services on common networks.

"While we're saving money overall, this situation allows us to offer the network much more massive amounts of data," he noted. By virtue of integrated services, FMC can expand its applications while giving its carrier a larger volume of business. FMC operates facilities in several European countries, where Evans said it may not be cost-justifiable to run those applications over separate networks.

"The PTTs are going to have to shrug off their 'lumbering giant' image and tidy up their operations into efficient marketing bodies," commented Richard Mitchell, associate director at Dataquest Europe, a research firm headquartered near London. While the PTTs and other carriers worldwide are committing serious dollars to network upgrades and worldwide telecommunications ventures (see chart page 45), "the PTTs are accustomed to being complacent and sluggish. They'll have to change their monopolistic thinking as they expand outside of their own borders," he said.

Mark Leary, director of communications research at Framingham, Mass.-based Technology Investment Strategies Corp., likens the situation to the regional Bell operating companies' (RBOC) struggle to be responsive to customer needs after a century of monolithic status.

"Like the PTTs, the RBOCs had always existed in a monopolistic vacuum and never had to think about what the consumer needed," he said. "Users simply got what the carriers provided."

NEW PRODUCTS

Local-area network software

CAL Emeritus Technologies Corp. has announced a local-area network archival software package designed to perform backup procedures from a file server without requiring any workstation intervention.

Tapeware Version 3.0 can operate on any workstation on a LAN that has received proper access rights. The product's Open Protocol Technology allows loadable network drivers to support various protocols, including Transmission Control Protocol/Internet Protocol and IBM's Netbios, simultaneously on a network.

The software package is available in versions for PC-DOS and Novell, Inc. Netware 286 and 386 operating systems. Pricing ranges from $325 to $995.

Emeritus
2750 N. Clovis Ave.
Fresno, Calif. 93727
(209) 292-8888

Ungermann-Bass, Inc. has announced an enhanced software package designed for its Maxtalk router.

The product supports Apple Computer, Inc.'s Appletalk Phase 2 protocol. It can also be used to search for names, locations or other data pertaining to single or multiple Macintosh systems, the vendor said.

The software is included with the Maxtalk multiport router ($4,695) and is scheduled to begin shipping in the second quarter. The product is offered free to Ungermann-Bass support customers and is priced at $250 for nonsupport customers.

Ungermann-Bass
3900 Freedom Circle
Santa Clara, Calif. 95054
(408) 562-7938

Revelation Technologies, Inc. has unveiled a software product that features configuration options for performing Revelation's Advanced Revelation applications on a Banyan Systems, Inc. Virtual Networking Software (Vines) network.

Advanced Revelation Lock Service for Vines ($295) is a personal computer-based software package that includes file- and record-locking services that allow network management procedures to be spread among multiple processors. The product also permits lock handling to be relocated from overloaded Vines servers to other, less overburdened servers on multiserver networks, according to the vendor.

Revelation Technologies
Two Park Ave.
New York, N.Y. 10016
(212) 689-1000

Customer-premises equipment

VMX, Inc. has introduced VMX 300, a platform that integrates voice messaging, call processing, interactive voice response, local or host database interaction, fax applications and electronic mail.

The product supports from 200 to 2,000 users, features between four and 32 ports and includes up to 350 hours of voice storage. It can operate as a single system that is integrated with a private branch exchange or a Centrex telephone system.

Pricing ranges from $50,000 to $395,000, depending on number of ports, size and number of disks available as well as number of software options.

VMX
2115 O'Nel Drive
San Jose, Calif. 95131
(408) 441-1166

Gateways, bridges, routers

Newport Systems Solutions, Inc.'s Lan²Lan/768 router is a device designed for Novell, Inc. Netware-based local-area networks that reportedly operates at speeds ranging from 9.6K bit/sec. to the highest fractional T1 speed of 768K bit/sec.

A basic version includes two ports and supports RS-232, V.35, RS-422 and X.21 line interfaces. The product can reportedly interconnect Ethernet, Token Ring or Arcnet LANs into a single internetwork.

The Lan²Lan/768 runs on a Netware file server or within a workstation as a dedicated or nondedicated external router. The basic version costs $2,695.

Newport Systems Solutions
4019 Westerly Place
Newport Beach, Calif. 92660
(714) 752-1511

Persoft, Inc. has announced Passage, a product that enables workstations on a Token Ring network to access host systems on an Ethernet local-area network.

The product can be used to connect a Token Ring workstation to Digital Equipment Corp. VAX/VMS or Unix-based hosts.

Passage comprises Token Ring and Ethernet network cards and runs on a dedicated IBM Personal Computer AT or compatible.

The product is priced at $5,995 for a 20-workstation license and $9,995 for a 50-workstation license.

Persoft
UW Research Park
465 Science Drive
Madison, Wis. 53711
(608) 273-6000

Micro-to-host

Visionware Ltd. has announced Version 4.0 of Xvision, its personal computer-based server for X Window System-based systems.

The product allows PCs networked via Transmission Control Protocol/Internet Protocol to one or more hosts to display multiple X clients alongside local Microsoft Corp. Windows programs. It also supports copying and pasting between DOS- and X-based systems, the vendor said.

Xvision Version 4.0 is priced at $449.

Visionware
57 Cardigan Lane
Leeds, UK LS4 2LE
(011 44) 53-2 78-88 58

Equinox Systems, Inc. has announced Megaplex-96, an I/O subsystem designed to connect terminal users to Unix-based AT or Extended Industry Standard Architecture bus-based computers.

A basic unit features a CMX-24 24-port cluster multiplexer designed to connect up to 24 terminal users to a host via a four-wire link. As more users, printers or modems are added to the network, Megaplex-96 can be expanded by adding additional CMX-24 devices to support up to 96 users, according to the vendor.

An entry-level 24-port configuration is priced at $2,395. Additional CMX-24 multiplexers may be purchased for $1,495 each.

Equinox Systems
14260 S.W. 119th Ave.
Miami, Fla. 33186
(305) 255-3500

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- ☐ Hardware/Software Contracts Administrators
- ☐ Manufacturing Systems Analysts

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MANAGER'S JOURNAL

EXECUTIVE TRACK



Walter F. DuPont has been promoted to vice president of information services at Cooper Industries, Inc., a diversified manufacturer based in Houston.

DuPont had been director of information services at Cooper's corporate headquarters in Houston since 1979. Before moving to headquarters, he was director of information services at Cooper's Hand Tools Division in Raleigh, N.C.

Prior to that, DuPont was director of systems and data processing at scissors manufacturer J. Wiss & Sons, which was acquired by Cooper in 1976. He attended St. Anselm's College in Manchester, N.H.

.....

W. R. Berkley Corp. in Greenwich, Conn., has announced three appointments in information services at its subsidiary companies.

At Union Standard Insurance Co. in Dallas, **Curt Lyons** was promoted to vice president of information services, and **Greg Perkins** was named assistant vice president of information services. Union Standard developed the Dial-Us insurance agency interface system that is used by several other Berkley companies.

At Berkley Information Services, Inc. in Luverne, Minn., **James Burkett** was promoted to vice president of systems engineering. Berkley Information Services provides processing, support and internal technical consulting for Berkley companies.

.....

David O. Harper was named associate director of the Automotive Industry Action Group (AIAG), a Southfield, Mich.-based organization working to standardize business practices and technologies in the motor vehicle and automotive supplies industries.

Harper is General Motors Corp.'s executive-on-loan to the AIAG. He was most recently superintendent of material control at GM's Lansing Automotive Division. He is a graduate of the General Motors Institute.

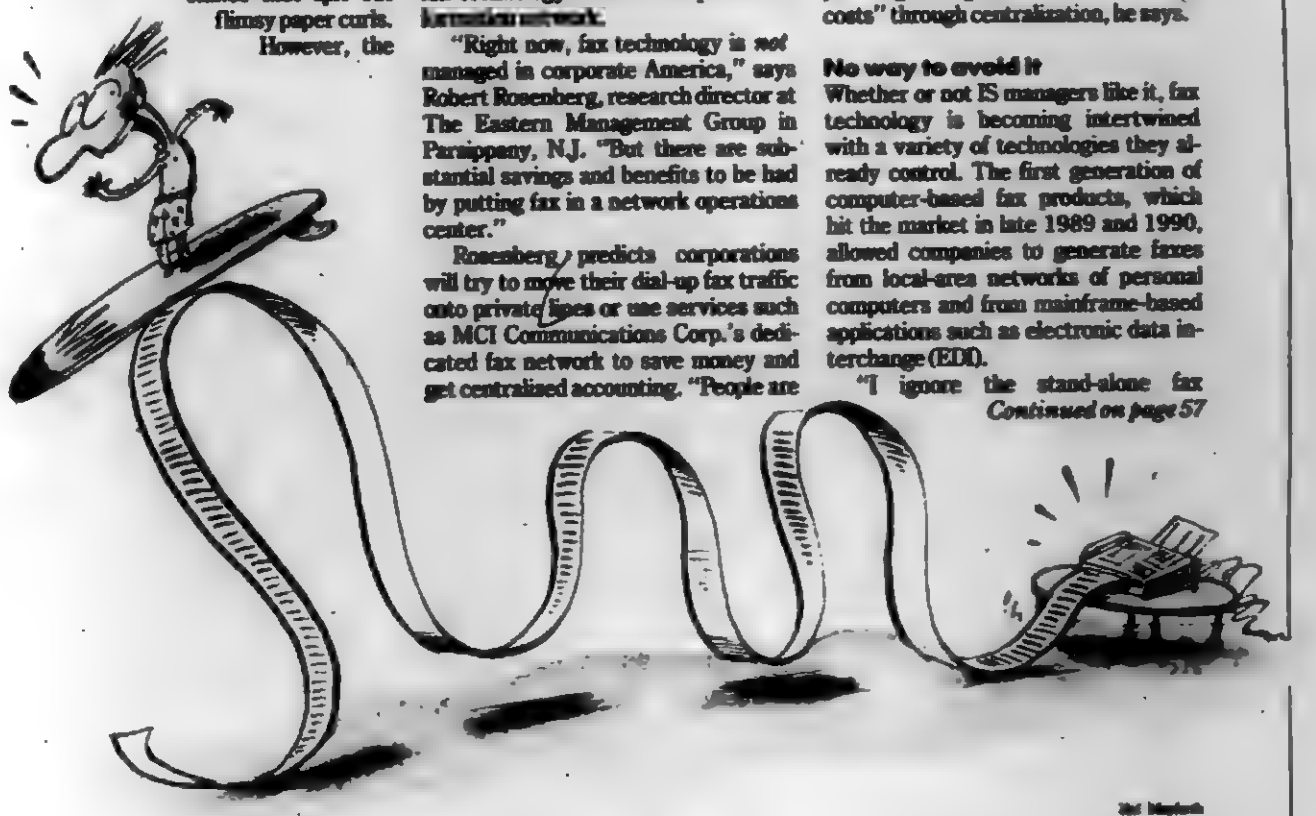
Catch a ride on the fax wave

Computer-based fax services are challenging some IS managers to roll with the tide

BY MITCH BETTS
CW STAFF

The fax machine will probably never be an information systems manager's favorite technology. After all, IS professionals delight in enabling electronic file transfers and eliminating paperwork, not worrying about machines that spit out flimsy paper curls.

However, the tremendous growth in fax traffic and a new breed of computer-based fax technologies may force IS managers to start paying attention to the fax revolution.



While no one claims IS executives will wind up buying stand-alone fax machines — that will always be done by the same person who buys the office photocopier — experts say the IS department will have a role in integrating fax technology with the corporate information network.

"Right now, fax technology is *not* managed in corporate America," says Robert Rosenberg, research director at The Eastern Management Group in Parsippany, N.J. "But there are substantial savings and benefits to be had by putting fax in a network operations center."

Rosenberg predicts corporations will try to move their dial-up fax traffic onto private lines or use services such as MCI Communications Corp.'s dedicated fax network to save money and get centralized accounting. "People are just starting to realize how expensive fax can be," says analyst Judith A. Pirani at BIS Strategic Decisions in Norwell, Mass.

Charles Kropac, MIS director at New York-based Morrow & Co., a Wall Street proxy service firm, is a big fan of putting fax under the IS department's control. "When a company is sending out hundreds of thousands of faxes, you've got to get control of those fax costs" through centralization, he says.

No way to avoid it

Whether or not IS managers like it, fax technology is becoming intertwined with a variety of technologies they already control. The first generation of computer-based fax products, which hit the market in late 1989 and 1990, allowed companies to generate faxes from local-area networks of personal computers and from mainframe-based applications such as electronic data interchange (EDI).

"I ignore the stand-alone fax

Continued on page 57

Sears fights back with 'smart store' showcase

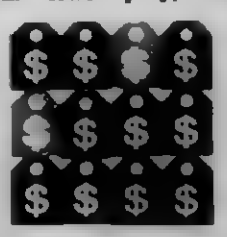
BY MICHAEL FITZGERALD
CW STAFF

The Merchant, as employees call the retail side of Sears, Roebuck and Co., has seen better days. This year, discounters K Mart Corp. and Wal-Mart Stores, Inc. will both move more goods than Sears.

Worse, Sears' nonretail subsidiaries — Allstate Insurance Co., investment firm Dean Witter Financial Services, Inc. and Coldwell Banker Real Estate Group, Inc. — now provide almost half of the firm's revenue and most of its profits, as the Merchant has been mired in a slump since the late 1980s. With $32 billion in revenue, the Merchant contributed just 21% of Sears' 1990 operating profit. Allstate, by contrast, brought in 58% of the profit on only $18 billion in revenue. There's even talk that the next Sears chairman will not come from the retail side for the first time in company history.

The sliding fortunes of the retail stores have created a morale problem, but Sears is battling back in a number of ways, one of which came from Robert J. Ferkenhoff, vice president of information systems.

After a tour of Andersen Consulting's Smart Store, a "what if?" store designed to show grocers what they could do with technology, Ferkenhoff decided to create a version of the store for Sears. But instead of being a store of possibilities, his store would use actual Sears technology.



Ferkenhoff's brainchild became the Sears Advantage, and it resides on the 51st floor of the Sears Tower in downtown Chicago. The Advantage replicates an actual Sears store, except you cannot buy anything there. What you can do is see the technology Sears uses to collect and process 1.4 trillion characters of data per month.

Ferkenhoff said he decided to implement the "store" to combat two myths: "the impression that the competition has all this stuff — and the second myth that we don't."

"This happens throughout the company, at every level, and I wanted to dispel the myths and to show people that we're real well-positioned and that our [information technology] is a competitive advantage," he said.

Since the Sears "smart" store went live in September, some 3,000 Sears employees have toured it. "It's terrific," said Pete Rector, manager of the Orland Park, Ill., Sears store. "As an end user, I knew what was there, but I had no idea how it originated, where the process took place or how it was stored. I got to see how it was used."

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Get your daily fax — interactively

Corporate and government departments that field public inquiries are finding more and more that people want to get information by fax. But that means having the staff repeatedly run to the fax machine to feed it.

To automate the process, some organizations are deploying technology that allows the public to dial into an interactive fax system and retrieve information from a computer database. Following a series of voice prompts, the customer can select a needed document and receive it via fax.

For example, the U.S. Department of Agriculture in



Bill Mayhew

Washington, D.C., is using a system from Spectrafax Corp. in Naples, Fla., to provide press releases to the news media. Reporters can get a daily fax list of the agency's news releases and select the items they want, or they can automatically get every release at the end of the day, according to Diane O'Connor, deputy chief of the news division.

Hewlett-Packard Co.'s technical support desk is using the same technology to provide customers and dealers with the most sought-after fact sheets on the company's laser printers. The system is handling 5,000 calls per month and paid for itself in about nine months, says Susan Copple, customer support manager in Boise, Idaho.

MITCH BETTS

CALENDAR

APRIL 28 - MAY 4

Boyle & Babbage User Group Conference. San Jose, Calif., April 28-May 1 — Contact: BBUG '91, Sunnyvale, Calif. (408) 720-0331.

Bull Users Conference. Phoenix, April 28-May 1 — Contact: Bull Users Society, Cherry Hill, N.J. (609) 429-0775.

Human Resource Systems Professionals Conference. Chicago, April 28-May 1 — Contact: The Association of Human Resource Systems Professionals, Dallas, Texas (214) 661-3727.

International Languages Conference. San Francisco, April 28-May 1 — Contact: Berlitz International, Sierra Valley, Calif. (408) 429-1013.

Human Factors in Computing Systems (CHI '91). New Orleans, April 28-May 2 — Contact: Toni MacHaffie, Conference Administrator, (503) 591-1981.

Power Users Group '91. Anaheim, Calif., April 28-May 3 — Contact: Rosemary Mauro, Pure, Inc., Marlboro, N.J. (201) 780-2100.

Downsizing the Corporate Information Systems. London, April 29-30 — Contact: Boston Systems Group, Boston, Mass. (617) 423-1670.

Systems Communications Forum. Washington, D.C., April 29-May 1 — Contact: National Engineering Consortium, Chicago, Ill. (312) 938-3500.

Association for Information and Image Management Show and Conference. Washington, D.C., April 29-May 2 — Contact: AIIM, Silver Spring, Md. (301) 587-8202.

ISA Education '91 Spring Symposium. Edmonton, Alberta, April 29-May 3 — Contact: Ian Verhappen, Committee General Chairman, Edmonton, Alberta (403) 790-7917.

MIS Training Week East '91. Atlanta, April 29-May 3 — Contact: Pamela Bimett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Bring Technology to Market. Palo Alto, Calif., April 30 — Contact: Nancy Fullerton, Regis McKenna, Palo Alto, Calif. (415) 354-4501.

Image Processing in Insurance. Dallas, April 30 — Contact: Infonort, Dallas, Texas (214) 746-3500.

Federal Computer Conference West. Anaheim, Calif., April 30-May 2 — Contact: Stephen O'Keeffe, National Council for Education on Information Strategies, Silver Spring, Md. (301) 587-9344.

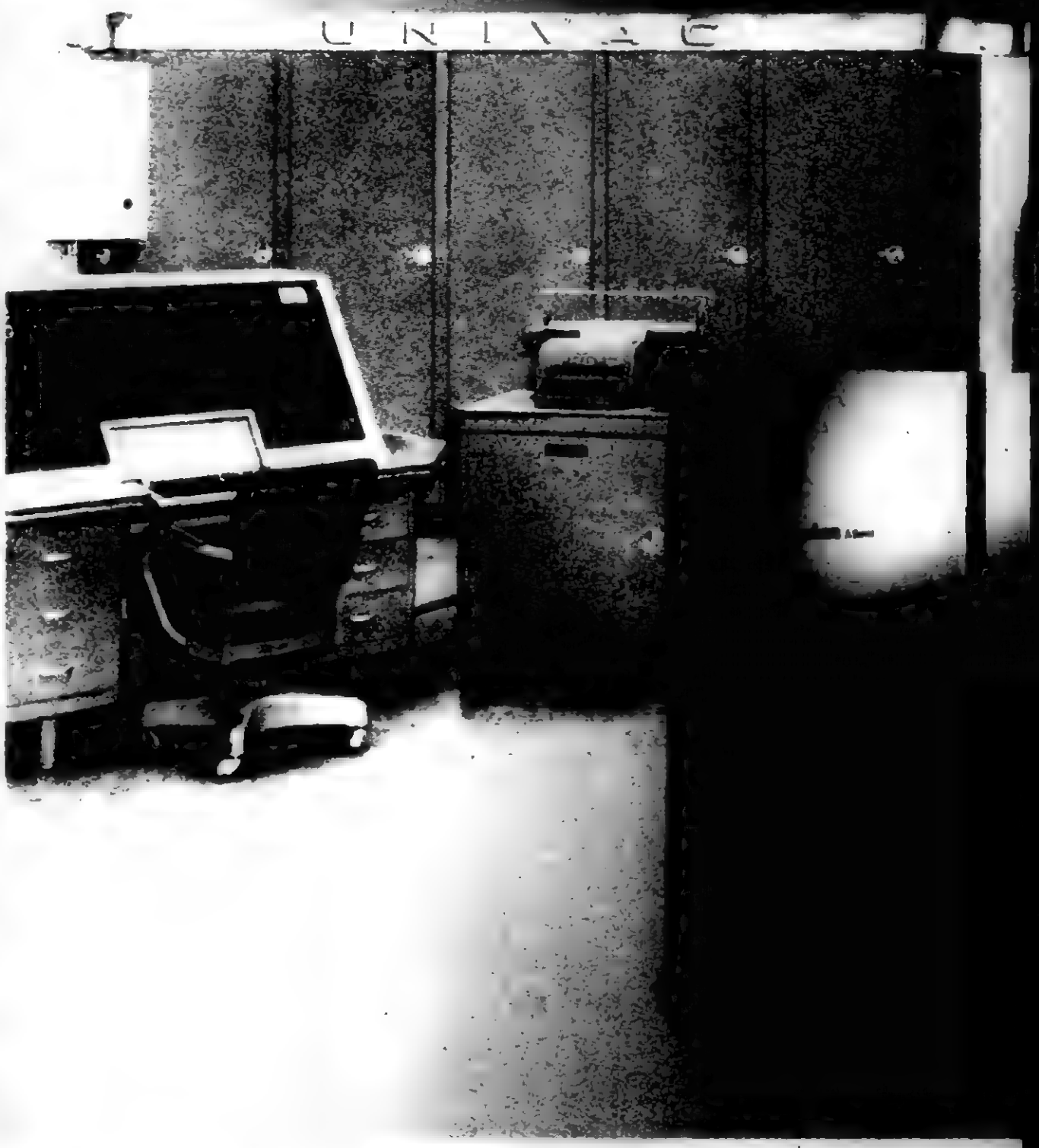
Monterey Software Conference. Monterey, Calif., April 30-May 2 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Network. Hartford, Conn., May 1 — Contact: Daniels Professional, Hartford, Conn. (203) 561-3558.

Achieving 'Lights Out' Data Centers. May 2-3 — Contact: International Research, New York, N.Y. (212) 826-1200.

Instructional Computing Conference. Baltimore, May 2-3 — Contact: Lesley Rehearn, Maryland Instructional Computer Coordinators Association, Denton, Md. (301) 479-1460.

From First. To Fastest.



Fax

CONTINUED FROM PAGE 53

machine, but when you hook up fax to my computers, then it becomes my property because I want to make sure it works for the user," says Warren Fay, director of IS at Vie De France Corp.'s Culinary Division in Alexandria, Va.

Vie De France uses a LAN-based fax server to broadcast 250 price quotes per week to the restaurants that buy its imported foods. Fay calls it "an elegant solution to a stupid problem," namely that it used to take more than five hours for a team of well-paid salespeople to manually feed the fax machine.

Fay adds that the fax application is also quite inexpensive: A $2,500 investment paid for itself in just eight weeks by reducing labor costs and making the salespeople more productive.

The computer-based fax market, however, is still in its infancy, and many IS managers seem unaware of the technology, according to a survey of 62 corporations taken by International Data Corp. (IDC) in Framingham, Mass. The products are sold by such little-known firms as Biscom, Inc. in Billerica, Mass.; Brooktrout Technology, Inc. in Needham, Mass.; Gammalink in Sunnyvale, Calif.; Spectrafax Corp. in Naples, Fla.; and Optus Software, Inc. in Somerset, N.J.

Some users in the IDC survey even showed an aversion to computer/fax connectivity. According to the study, "There was almost an attitude of fax being in a different sphere entirely from MIS. Numerous respondents felt fax purchase decisions were best left at the departmental level 'where they belong.'"

Fay explains the resistance to fax technology this way: "MIS managers, like most people, don't like change. How long ago was it that MIS managers looked at PCs and sneered?"

Many of the pioneering users say that automated faxing has become an integral part of the way they do business and may even provide a competitive advantage:

• The Canadian insurance operation of American International Group uses a LAN-based fax server to distribute 20,000 faxes per month to insurance brokers. The faxes include such critical documents as price quotes, policy terms, invoices and confirmation, according to Reg Monaghan, the business systems manager in Toronto.

• Miami-based Royal Caribbean Cruises Ltd. transmits reservations information from an IBM Application System/400 database as well as fare and itinerary changes and marketing information to 3,000 travel agents using computer-based fax technology, says David Hancock, director of field sales. He says competitors are building similar fax systems.

• The Optoelectronic Division of Siemens Components, Inc., based in Cupertino, Calif., uses a LAN gateway to fax production information to its factory in Malaysia, according to Ernie Burgos, production control manager.

In at least one industry niche — issuing truck permits — automated fax technology is a competitive necessity, according to Art Sahlstein, director of network operations at Cummins Cash & Information Services, a unit of Cummins Engine Co. in Columbus, Ind.

Cummins has a network of 3,000 fax machines at North American truck stops and uses a fault-tolerant mainframe to send truck permits to them automatically, "sometimes while the truck driver is still on the phone with us," Sahlstein says. The task was handled by telex in the 1960s, but "fax put Western Union out of the business of trucking permits," he said.

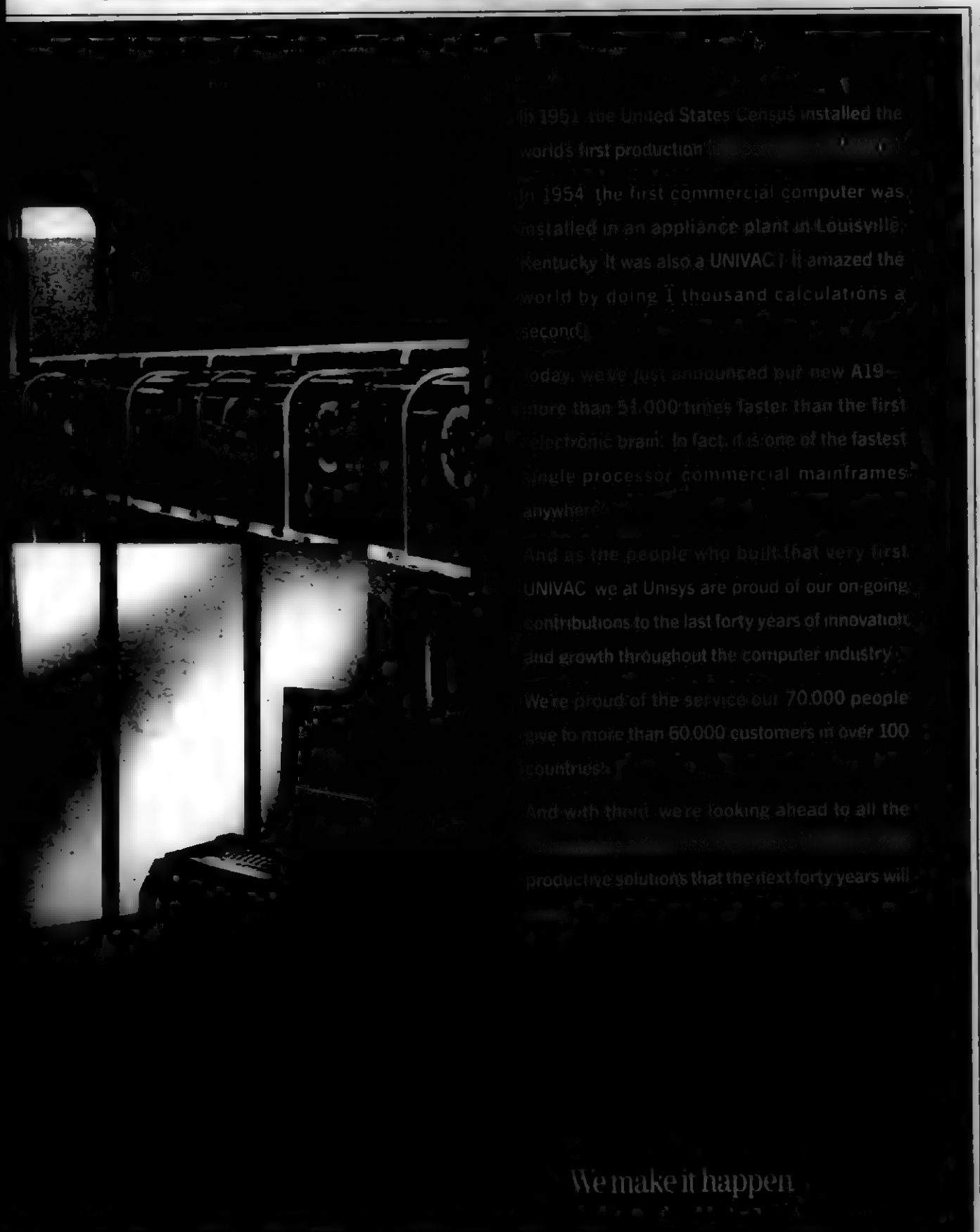
Whether or not IS managers like it, fax technology is becoming intertwined with a variety of technologies they already control.

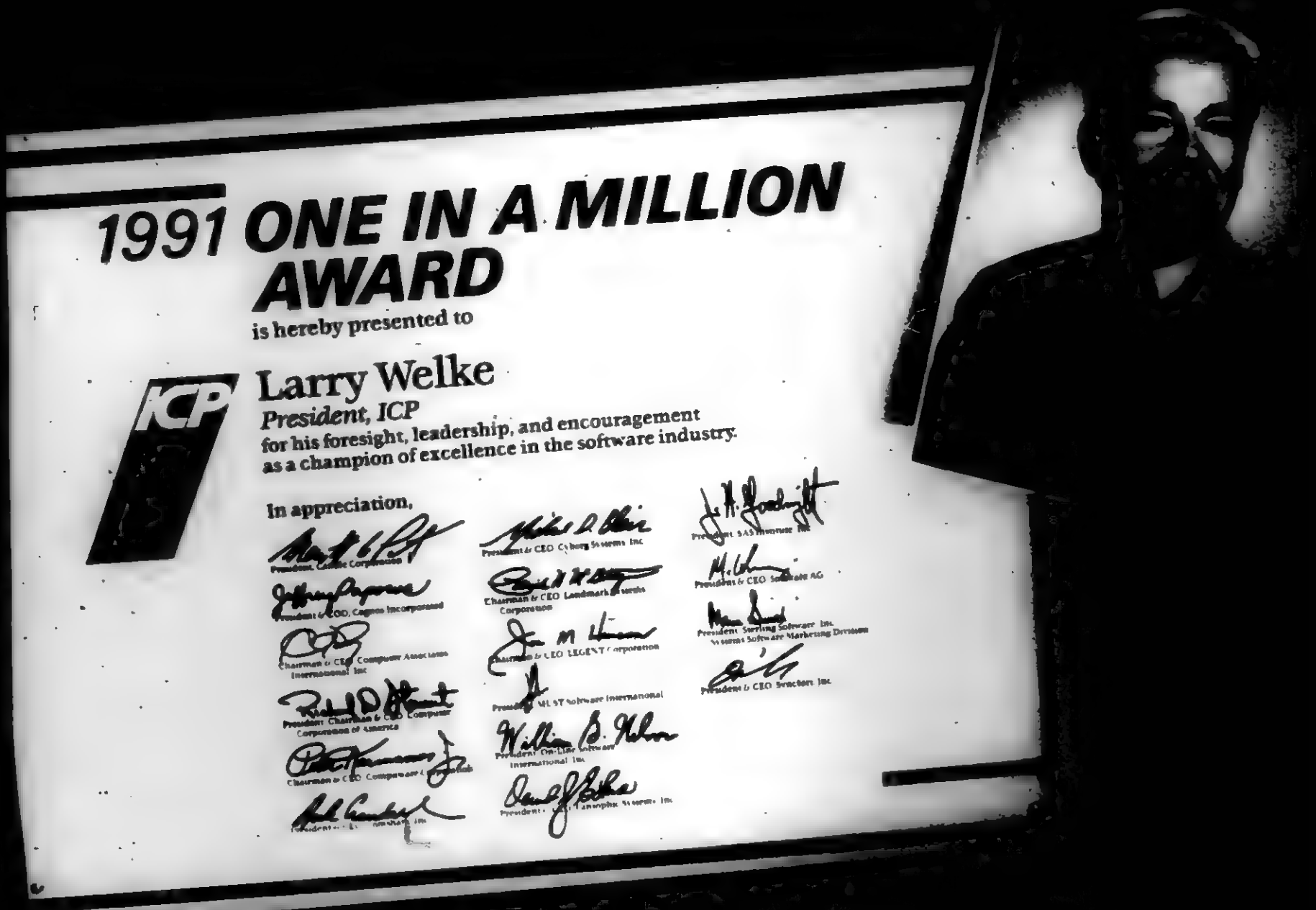
The ability to send faxes from electronic mail and EDI systems can make it possible for small customers or suppliers that lack computer resources to be part of a corporation's communications universe. For example, Citgo Petroleum Corp. in Tulsa, Okla., uses a mainframe-based fax system to send information to about 100 small distributors that do not participate in its EDI network.

Ideally, Citgo would like all of its business partners to be part of the electronic network, "but that's not going to happen in a lot of places because we're customer service-oriented, and we don't force them to computerize," says Rick Chern, a Citgo systems engineer. "We'll always be dealing with someone who hasn't implemented EDI."

Automated faxing can even create a rudimentary EDI-like network. Dow Chemical Canada, Inc. in Fort Saskatchewan, Alberta, uses its fax system to send E-mail, purchase orders and shipping information to its suppliers, totaling 70,000 messages per year, says Bob Wozney, a telecommunications specialist.

The computer-based fax products can also receive fax transmissions, but users complain that there are technical limitations at the receiving end, such as the difficulty of automatically routing the incoming faxes on the LAN, according to the IDC survey. Kropac says that "the ultimate fax product" would take an incoming, confidential fax with an electronic signature and route it to the recipient's electronic mailbox.





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SAS Institute Inc. • *SAS® Applications System*
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SALES FORCE AUTOMATION

Metamorphosis of the salesperson

Current offerings run the gamut from efficiency improvers to job changers

BY ALAN J. RYAN

Forty-five minutes in a telephone booth with your ear pressed to a telephone receiver is, by most standards, a long time. And if you're a salesman awaiting information on the status of an order for your largest client, it can seem like forever.

For many of the sales representatives at The Pfaltzgraff Co., a tableware manufacturer in York, Pa., memories of the bad old days of "wait and you shall receive" are quickly fading.

By using sales force automation software running on their Grid Systems Corp. laptop computers, sales representatives can access the company's database to check on order status at their own convenience and in a lot less time.

Cutting down sales representatives' telephone time, which allows them to close more deals and cover more ground, is probably the most important benefit the company has derived from the system. But efficiency was not the main reason Pfaltzgraff invested in this software.

"We wanted to distinguish ourselves from all of our competitors," says Bill Bomberger, manager of sales marketing information services.

A representative toting a sleek laptop with software that provides access to product listings is much more impressive than one who fumbles through folders, price sheets and order books and then heads to the telephone to check on product availability.

The desire to improve sales force efficiency on some level is driving many companies to invest in sofware and systems for sales force automation. With more than 600 sales force automation products available, there is a package for just about every budget and every type of improvement.

Products sold under this label can be as simple as an off-the-shelf, single-function package running on a laptop or as complex as a vendor-customized, multifunction networked system.



David Diao

Some were designed simply to streamline portions of the sales process; others transform it, giving the salesperson the ability to act as a consultant also.

Because Pfaltzgraff wanted to revamp its entire selling process, it selected a package from Modatech Systems, Inc. in Vancouver, British Columbia. Modatech, which tailors products for specific industries, customized the system for the sale of hard goods, which takes into account a seasonal selling period.

Such multifunction, multiuser packages that are customizable by the vendor or user are considered to be at the high end of the scale, selling for as much as $7,500 per sales rep for the software alone.

Once you add in training, hardware and support, typical prices range from $4,000 to $15,000 per sales representative.

These packages can encompass everything from lead generation to accounting, order entry, electronic data interchange, report generation and production planning. They also tend to reside on a minicomputer or mainframe. Sales reps access the system via a network with laptops or with personal computers.

At the opposite end of the scale are off-the-shelf, single-user, single-function packages that run on PCs or laptops and cost as little as $100 or less. Personal information managers and sales lead-generation software are typical packages that fall into this category.

Straddling the fence

What makes things confusing are products that fall in the middle ground. These offer any combination of functions typical of sales force automation software and tend to target medium-size businesses in terms of functionality and price. (For a complete list of typical functions on either high- or low-end and midrange packages, see page 60.)

Some of these middle-ground products are customizable, while others can be used off the shelf. A rule of thumb is that users can add flexibility and functionality by paying an accordingly higher price.

Another distinguishing factor of sales force automation software is whether it is built modularly or ready-made. With modular packages, the vendors (or a consultant) and the potential user piece together a system that best fits the needs of the sales organization.

Ready-made software builds in all the available functions, which can often be further customized for the customer. Both types can be found in all levels of the sales force automation software spectrum.

Like Pfaltzgraff, L.A. Gear, Inc. in Los Angeles also chose a high-end system to automate its 275-person sales force. The sports shoe manufacturer is installing software from Brock

Continued on page 60

Ryan is a *Computerworld* senior writer, features.

INSIDE

Carry What You Will
From laptops to palmtops to pen-based systems. Page 61.

Product Guide
A list of function-heavy sales force automation packages. Page 64.

Don't Expect Perfection
Even vertical packages require some tinkering. Page 70.

High interest rate

Automating the sales force does not appear to be a passing trend. In fact, it is a top-rated concern among information systems executives surveyed last fall by Index Group, Inc. in Cambridge, Mass.

The study polled 394 senior IS executives in large North American organizations. Forty-four percent of the respondents said they will make major information technology investments in the sales function and will make nearly equal investments in presale and postsale customer service at 43% and 48%, respectively.

Meanwhile, worldwide revenue for U.S. sales force automation will reach $103 million this year, a 39% increase compared with 1990's $75 million in sales force automation revenue, according to International Data Corp. in Framingham, Mass.

And that's a market in its early stages, the market research firm says. By 1994, annual revenue is estimated to reach $211 million.

Continued from page 59

Control Systems running on NEC Technologies, Inc.'s Ultralite laptops equipped with internal modems.

Mary O'Neill, financial/PC support services manager at L.A. Gear , says she expects the firm will save thousands of dollars with the software just by eliminating weekly mailings to the sales reps. She predicts the project to be paid off in its second year.

Aside from cost savings, however, the sports shoe manufacturer had two other goals in mind when it chose a high-end system.

First, it wanted to provide customers with more timely information and quicker turnaround on order placement. Second, it wanted to improve production cycle planning by having order information entered in a timely manner, tracking types and quantities of products ordered and being able to compare current demand vs. seasonal or historical trends.

At some point, O'Neill says, the system will be expanded to include interactive order placement with error checking as well as the capability to send new product specifications — including color line drawings of products — to representatives as soon as the new footwear products are released from the research and development laboratories.

Armed with this information, the sales rep can anticipate a customer's needs rather than simply reacting to them. He can alert clients to products not yet available for shipment and arrange for the items to ship automatically as soon as they are available.

In the event of an out-of-stock or otherwise unavailable item, the representative has access to a database to suggest an alternative product, possibly protecting the sale from a competing supplier.

Some companies are taking the advisory role a step further. At Hanes Hosiery, Inc. in Winston-Salem, N.C., a customized package working in tandem with a high-end, vertical industry system is turning sales reps into display consultants.

Hanes replaced an out-of-date sales system with high-end software from Envoy Systems Corp. in Waltham, Mass. A separately developed system called Planagram allows the sales representatives to help retailers design effective store displays for Hanes products, says Steve Jolley, systems manager for field sales and automatic reordering systems. Planagram, designed for Hanes by a private consultant, can also help in the planning of store promotions.

Envoy's approach to sales force automation is to build products for specific industries, including petroleum, apparel, speciality chemical and packaged goods (see story page 70).

Financial considerations

Although some companies want very much to provide better customer service, they don't want to break the bank to do so: "We wanted more than just sales information," says Craig Kendall, controller at Renex Corp., a manufacturer of computer data communications equipment in Woodbridge, Va. "We wanted information about our customers, products out there, their past purchasing history, their system environments, the Renex products already purchased, maintenance contracts and expiration dates."

The company did look at high-end offerings, but none fit Kendall's price range. Kendall shifted his focus to the midtier vendors and selected a product called SalesCNTL2 from Sales & Marketing Systems, Inc. in Vienna, Va. The product was a good fit because with only 11 salespeople throughout the country, Renex wanted a medium-price package with some of the functionality found in the more sophisticated sales force automation software.

Having all this information compiled in one place has helped the sales force win more contracts, Kendall says. When one customer wanted to upgrade all of its Renex units, the sales rep prepared the bid in two days, Kendall says, compared with what would have taken a couple of months on the old system. That order alone paid for the system, he says.

Further down the road, Kendall says, he would like to use the system to help customers measure the effectiveness of their advertising and marketing efforts.

Siemens-Nixdorf Printing Systems Ltd. in Boca Raton, Fla., also chose a midtier package, from Snap Software, Inc.

Domenick Caputo, vice president of sales at the high-end printer firm, says the $50,000 to $60,000 he spent on software plus $150,000 for hardware was well worth the price; many members of the 45-person sales team say they cannot live without the hardware and software.

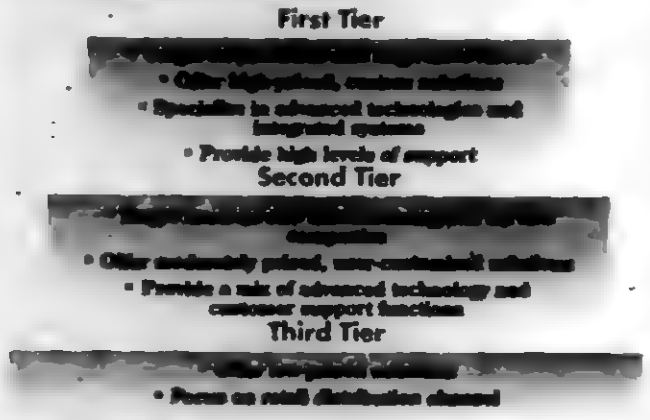
Snap worked with Siemens to incorporate a database from Computer Intelligence into its package. This database provides information such as installed bases of printers and companies with plans to buy printers.

No matter what technology they wield, however, salespeople will still need to be equipped with sales mentalities and the basic principles of sales, says Jack Criswell, executive director at Cleveland-based Sales and Marketing Executives International, a 10,000-member sales executive organization.

Salespeople "still have to sell and understand the fundamentals of selling," Criswell says. Automation merely allows them to maximize their efforts. •

Levels of automation

IDC divides sales force automation software vendors into three tiers, with most falling into the middle group



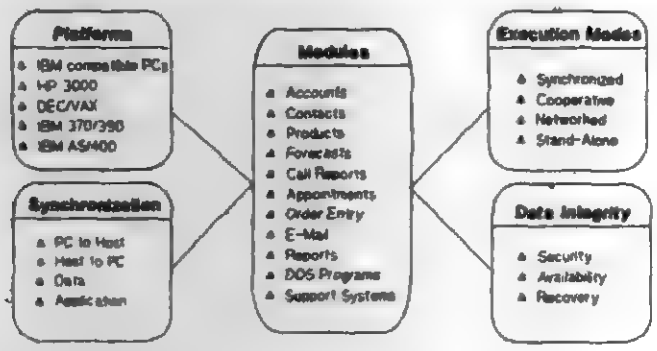
Source: International Data Corp. CW Chart: Doreen St. John

Common features

While it is difficult to label any sales force automation software "typical," some of the most frequently available options in either modular or ready-made software include any combination of the following capabilities:

- Tracking of sales leads, expenses, inventory, historical customer information and production dates.
- Remote order entry via modem.
- Access to financial data and electronic product catalogs, which can either be downloaded to the laptop on a regular basis or accessed online as necessary.
- Sending and receiving electronic mail, reports, follow-up or query letters, product updates, etc. among representatives and their managers and others in the home office.
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Hardware, from lap-size to hand-size

BY MEL MANDELL

The laptop computer is the dominant platform in field sales force automation, but it isn't the only one. From one-pounders to pen-based systems, field agents have a wide range of choices.

• **Electronic organizers.** One of the smaller options is the electronic organizer, which fits in a jacket pocket. This device is favored by insurance agents, such as the 10,000 Prudential Insurance Co. field agents who store their rate databases in the Wizard from Sharp Electronics in Mahwah, N.J.

Read-only memory cards for each category of insurance can be inserted into the Wizard to display rates on the little LCD. The 10-oz. device is currently selling at a discount in stores for $200.

• **Handheld transaction computers.** Another popular device is the handheld transaction computer, which is used by route salespeople serving supermarkets and other food outlets. These sales agents need a computer they can hold in one hand so they can walk aisles and key in data at the same time.

Handheld transaction computers resemble walkie-talkies and are loaded with custom software.

They are typically configured to plug into a printer mounted in the salesperson's vehicle to generate a copy of the order for the customer.

Manufacturers of small-screen handheld transaction computers include Norand Corp. in Cedar Rapids, Iowa, Symbolics-MSI in Bohemia, N.Y., and Telxon Corp. in Akron, Ohio.

• **Pen-based computers.** A device currently receiving a lot of attention from users and vendors is the pen-based computer. Sales agents at Kellogg Co. are early users of the stylus-based Gridpad from Grid Systems Corp. in Fremont, Calif.

Kellogg field personnel visiting supermarkets not only gather orders but also report how their own and competing products are displayed.

Agents enter most information by touching fields on preset screens on the stylus display. Handwriting is used only to enter short notes or exception information not included on a programmed screen.

Grid currently dominates the pen-based market, but other pen input computers are expected to be introduced before the end of this year by such firms as IBM and NCR Corp.

Envoy Systems Corp. in Waltham, Mass., is adapting its sales force automation software to work on future pen-based computers using the Penpoint operating system currently under development by Go Corp. in Foster City, Calif.

Similar in function and appearance is the Datellite from Canadian-based Microsolate, Inc.

Instead of a stylus, users activate fields on the display of this 6.7-pound device with their fingertips. They enter variant data by calling up a representation of a standard keyboard and touching the appropriate letters.

• **Palmtop computers.** Palmtop computers from Poget Computer Corp. and Atari Corp. are being adapted to gather orders and other sales-related information, but so far, there are no packages available.

Because their keyboards are so small, data is entered by two-finger keyboarding. Palmtops offer much less data storage than notebook or laptop computers, but it may be enough storage for those who sell limited lines.

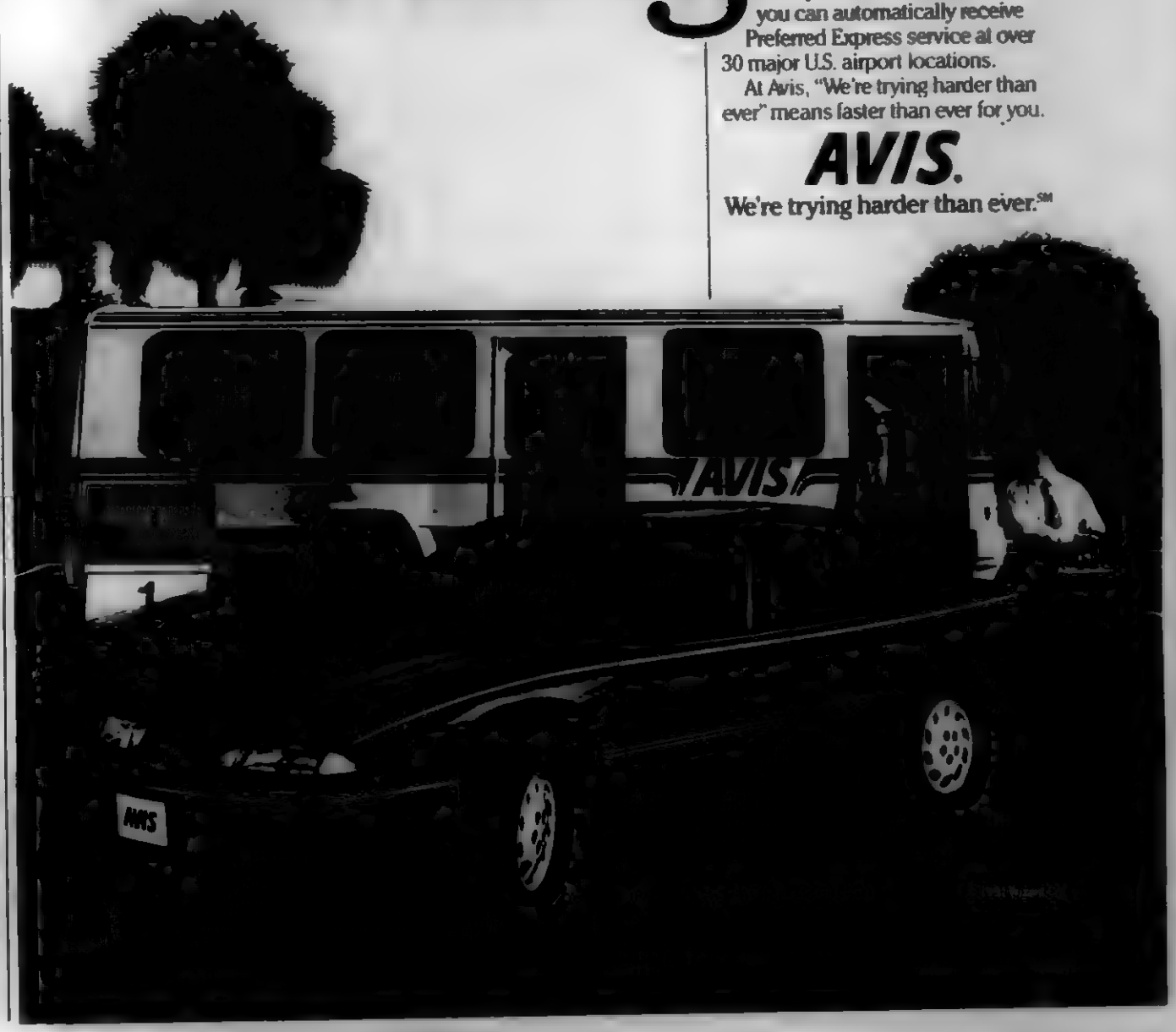
The one-pounders are also too small to accommodate internal modems; instead, agents can use external, cigarette package-size modems, such as the Worldport 9600 from Touchbase Systems, Inc. in Northport, N.Y.

The next trend will no doubt be wireless transmission of urgent orders or queries via radio-equipped portable devices. Handheld transaction computers already offer short-range, two-way radio communications. •

Mandell is a New York-based free-lance writer.

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Allard Associates, Inc. (619) 569-0560	Outlook 4.1	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, territory/account management, trouble tracking, bulletin capacities, user-definable fields for easy customization	All Oracle supported platforms	Dependent on platform and number of users	Central host	Modular	Oracle required	No	Optional	Yes	Optional	Word processing, spreadsheets	Training at customer site, phone support	Varies
Advanced Marketing Systems Corp. (949) 362-0266	Computer Aided Selling	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	DEC VAX, IBM PCs and compatibles, LANs	640K/20M, hard disk required	Stand-alone, central host, LAN	Custom	Interfaces with any database	Optional	Optional	Optional	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support	NA/$30,000 (10 users)
Argonaut Systems (408) 985-8520	Field Sales Manager	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, order entry	IBM PCs and compatibles	512K/1.5M, hard disk required	Stand-alone	Modular	None	No	No	No	No	Word processing	Phone support	$180
Arlington Software & Systems (303) 230-2722	FCAT Version 5.2 and 6.0	Customer database, mail merge, reporting, scheduling, problem tracking, call scheduling, contact history, word processor, report generator	IBM PCs and compatibles	512K/1M, hard disk required	Stand-alone, LAN	Modular, custom	Btrieve	No	No	Yes	No	None	Training at customer site, phone support	$195/$595 (4 users, Version 5.2), $695/$1,395 (4 users, Version 6.0)
Bartol Software, Inc. (908) 906-0544	Bartol Manager Version 2.10	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry/processing, customer billing, market plans, exposure tracking	IBM PC AT, Intel 80386-based machines and compatibles	640K/1.2M, hard disk required	Stand-alone, LAN	Modular, custom	Dbase III+	No	Yes	Yes	No	Word processing, spreadsheets, graphics	Training at customer site, phone support	$498/$1,986 (5 users)
Breakthrough Productions (916) 265-0911	Market Master for the Macintosh	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, territory/account management, automatic follow-up, updating	Apple Macintosh	2M/Hard disk required	Stand-alone, central host	Modular	Double helix	No	No	No	No	None	Phone support	$395/$495 (4 nodes) plus $150 each additional node
Bruck Control Systems, Inc. (408) 431-1200 (800) 228-0775	Field Activity Manager (part of Bruck Activity Manager suite)	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, sales reference library, productivity tools, reports via "query by example"	All Unix platforms	2M/150M, hard disk required	Central host, LAN	Modular, custom	Informix	Yes	Optional	Yes	No	Word processing, spreadsheets, graphics, other off-the-shelf packages	Training at customer site, phone support	$1,500 - $2,800 (per user), 3-user minimum
Contact Plus Corp. (508) 851-3223	Contact Plus Professional 3.0, Contact Plus LAN	Customer database, activity planner, mail merge, reporting, problem tracking, tickler, appointment manager, call history, correspondence management	IBM PCs and compatibles	512K/1M, hard disk recommended	Stand-alone, LAN	Modular	None	No	No	No	No	Dbase, Wordperfect, Wordstar, Xywrite, Calendar Creator Plus	Optional training, free phone support during business hours	$250/$895 (5 users)
Contact Software International, Inc. (214) 418-1048	ACT! Version 2.0	Customer database and purchase history files, activity planner, mail merge, custom reporting, scheduling, territory/account management, contact information management	IBM PCs and compatibles	640K/2M, hard disk required	Stand-alone, LAN	Modular	Proprietary	No	No	Yes	No	None	Phone support	$306/$886 (ACT Server Plus Own/ $1,295 (ACT 5-user network)
Creagh Computer Systems (619) 793-1367	Personal BizTime 2.1	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, complete inventory tracking and invoicing	IBM PCs and compatibles	640K/2.5M - 3.5M, 20M, hard disk recommended	LAN	Neither	Internal database	Optional	Optional	Yes	No	Word processing	Phone support, fax	$69.95/NA
	BizTime Gold 2.1	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, complete inventory tracking and invoicing	IBM PCs and compatibles	640K/2.5M - 3.5M, 20M, hard disk recommended	Stand-alone, LAN	Custom	Internal database	Optional	Optional	Yes	No	Word processing	Phone support, fax	$395/$995 (4 users), $1,495 (8 users), $1,995 (9 - 99 users)
Daylo Software Corp. (714) 470-2001 (800) 367-8300	Daylo Tracker 1.0	Customer database, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, client, prospect and contact tracking, good notes capabilities for long-term sales	IBM PCs and compatibles	384K/2M, hard disk required	Stand-alone	Custom	Daylo is a database	No	Optional	Yes	No	Word processing, spreadsheets	Training at customer site, phone support	$195/$486 (4 users)
Eighty/20 Software (507) 345-8020	Eighty/20 Advanced Version 2.23	Customer database and purchase history files, activity planner, mail merge, quoting, reporting, scheduling, territory/account management, prospect customer tracking, calendar, telemarketing scripts, expense tracking	IBM PCs and compatibles	480K/1M, hard disk recommended	Stand-alone, LAN	Modular	Clipper, Dbase	No	No	Yes	No	None	Training at customer site, phone support	$395/$1,295 (unlimited users)
	Eighty/20 Professional Version 3.0	Customer database and purchase history files, activity planner, mail merge, reporting, scheduling, territory/account management	IBM PCs and compatibles	450K/1.5M, hard disk required	Stand-alone, LAN	Modular, custom	Clipper, Dbase	No	Yes	Yes	No	Word processing, spreadsheets	Training at customer site, phone support	$595/$1,395 (5 users)
Endpoint Marketing Information Systems (408) 737-3831	Lead! 1.1	Customer database, activity planner, mail merge, reporting, scheduling, problem tracking, contact and follow-up management, lead and source analysis, literature and fulfillment tracking, volume lead capture and entry functions	Macintosh SE/30 and above	1M/4M, hard disk required	Stand-alone, LAN	Modular	4th Dimension included	No	No	Yes	No	Word processing	Training at customer site, phone support	$1,795, $500 each additional copy
Envoy Systems Corp. (617) 890-1444	The Envoy Salesmate Entry Level System	Reports request and distribution, electronic forms, flexible data query, data compression and error checking, on-line access, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/20M, hard disk required	Stand-alone, central host, distributed system	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics optional	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$500,000 - $750,000 (complete system for 100 users, depending on level of customization and functionality)
	The Envoy Salesmate System for the Petroleum Industry	Customer database and purchase records, activity planning, electronic reporting, scheduling, territory/account management, special price agreements, product price look-ups, customer notes and contacts, call plans and call reporting, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/20M, hard disk required	Stand-alone, central host, distributed system	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics optional	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$500,000 - $750,000 (complete system for 100 users, depending on level of customization, and functionality)

[1]Most vendors listed correspond to the second and third tier of International Data Corp.'s definitions of sales force automation software from the market research report "Sales Force Automation Software" (December 1990). Definitions appear on page 60. Vendor names were compiled from that report and Information Systems Marketing, Inc.'s 1990/1991 Guide to Sales and Marketing Automation.

For information on Telemagic from Remote Control International, call the vendor at (619) 431-4000, as product information was unavailable at press time. The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	FEATURES	HARDWARE PLATFORM	MEMORY/DISK REQUIREMENTS	MODE OF OPERATION	CONFIGURATION	DATABASE INTERFACED WITH	INTEGRATED E-MAIL	INTEGRATED FAX BOARD	REPORT WRITER	CUSTOM GRAPHICS FOR PRESENTATIONS	APPLICATIONS INTEGRATED WITH	SERVICES	PRICE (SINGLE USER/MULTIUSER)
Envoy Systems (cont.)	The Envoy Reference System for the Specialty Chemical Industry	Customer database and purchase records, activity planner, electronic reporting, scheduling, problem tracking, territory/ account management, technical service and sample tracking, call plans and call reporting, customer notes and contacts, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/20M, hard disk required	Stand-alone, central host, distributed systems	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics files	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$500,000 - $750,000 (complete system for 100 users, depending on level of customization, and functionality)
	The Envoy Reference System for the Packaged Goods Industry	Customer database and purchase records, activity planner, forecasting (individual and consolidated), electronic reporting, scheduling, territory/account management, order entry, stock and claim supplier profiles, fund allocation, call plans and call reporting, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/20M, hard disk required	Stand-alone, central host, distributed systems	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics files	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$500,000 - $750,000 (complete system for 100 users, depending on level of customization, and functionality)
	The Envoy Reference System for the Apparel Industry	Customer database and purchase records, activity planner, electronic reporting, scheduling, territory/account management, order entry, promotion orders, inventory stock counts, product price and promotion look-ups, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/20M, hard disk required	Stand-alone, central host, distributed systems	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics files	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$500,000 - $750,000 (complete system for 100 users, depending on level of customization, and functionality)
Excalibur Sources, Inc. (404) 956-8373	Excell 3.05	Customer database and purchase history files, activity planner, mail merge, quoting, reporting, problem tracking, territory/ account management, customer billing, automated tickler file, complete contact management capabilities	IBM PCs and compatibles, all networks	512K/1M, hard disk recommended	Stand-alone, LAN	Modular, custom	None	No	No	Yes	No	Word processing, spreadsheets	Training at customer site, phone support	$395/$1,495 (5 users)
Fairfield Management Resources, Inc. (708) 705-0161	Relationship Management System	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, territory/account management, sales planning, pipeline reports, call history	IBM PCs and compatibles, PC LANs	512K/Minimum of 1M, hard disk required	Stand-alone, LAN, WAN	Modular, custom	None	Yes	Optional	Yes	No	None	Training at customer site, phone support	$800 - $1,000/ $400 - $1,200 per user, depending on volume and customization
Fastech, Inc. (215) 565-3405	Sales Information System	Customer database and purchase history files, reporting, scheduling, territory/ account management, order entry, retail conditions, promotions tracking	DEC VAX, IBM mainframes, laptops, handheld, pen-based systems	Varies	Central host	Modular, custom	Adabas, DB2	Yes	Optional	Yes	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support	NA, $100,000 +, depending on volume and customization
Follow-Up Software Co. (218) 829-9788 (800) 328-8407	Follow-Up Version 4E	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, letter writing, report generator, calendar, contact manager	IBM PCs and compatibles	384K/700K, hard disk recommended	Stand-alone, LAN	Modular	None	No	No	Yes	No	Word processing	Phone support	$399.95/$995 (8 users)
Gateway Systems Corp. (317) 349-7740	Synergist Sales Portfolio	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, reminder directory, time-management, support systems	DEC VAX, HP 3000, IBM 370/390, AS/400, PS/2, PCs and compatibles	640K/2M, hard disk required	Stand-alone, central, LAN, synchronized, cooperative processing	Modular, custom	R:Base, db-Vista required (for PC), KSAM, Image, HP-SQL, Turbo Image, RDB, RMS, SQL/DS, DB/2, AS/400 Native DBMS	Yes	Optional	Optional	Optional	Word processing, spreadsheets, graphics, any ASCII files	Training at customer site, phone support, one-year warranty, updates provided	NA/Variable, depending on host/server and number of users
GE Information Services (301) 340-4000	Sales Marketing Communications System	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, inventory management, control bulletin boards, databases	IBM PCs and compatibles	640K/4M +, hard disk required	Stand-alone, LAN, integrates into existing system	Modular, custom	Btrieve	Yes	Optional	Yes	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support, 24-hour, seven-day hot line, international/ multinational support	Dependent on volume
High Caliber Systems, Inc. (212) 684-5553	People Base Version 3.2	Customer database and purchase history files, activity planner, mail merge, reporting, territory/account management	IBM PCs and compatibles	512K/1M, hard disk required	Stand-alone, LAN	NP	Dbase III compatible files	No	No	Optional	No	Word processing, spreadsheets	Training at customer site, phone support	$199/$695 (unlimited users)
Information Resources, Inc. (617) 890-1100	Express Sales Management System	Customer purchase history files, forecasting, reporting, problem tracking, territory/account management, distributed application, automatic update, output to files and spreadsheets	IBM PCs and compatibles, LANs, DEC, HP, IBM, Prime mainframes and minicomputers	8M/16M recommended, 120M hard disk required	Stand-alone, central host, LAN	Modular, custom	Access database through embedded SQL	Optional	No	Yes	No	Word processing, spreadsheets	Training at customer site, phone support, installation consulting and documentation	NA/$30,000 (5 users)
Information Systems Experts, Inc. (202) 363-6966	SAM	Customer database and purchase history files, activity planner, mail merge, reporting, scheduling, territory/account management, order entry	IBM PCs and compatibles, DEC, AT&T, HP	640K/20M, hard disk required	LAN	Modular	None	Yes	Yes	Yes	No	Word processing	Training at customer site, phone support, 24-hour, seven-day hot line	NA/$5,000 - $25,000
Intelligent Information Systems, Inc. (412) 995-9000	Intellitrak Version 1.0	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, total database query, integrated correspondence and report generation	DEC VAX, NCR, Sun Microsystems, IBM PCs and compatibles	Varies, hard disk required	Central host, LAN	Custom	SQL-compliant databases required	Yes	No	Yes	No	Word processing, spreadsheets, user-defined	Training at customer site, phone support, business hours hot line	NA/$15,000 (10 users), $1,000 - $1,500 per user, depending on platform and customization
JEB Systems, Inc. (803) 883-4662	MMS/Plus, MMS/Remote, MMS/PT	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, problem tracking, territory/account management, order entry	DEC VAX, IBM PCs and compatibles	Varies	Stand-alone, central host, LAN	Modular, custom	Informix, Oracle, RDB, Powerhouse	No	No	Optional	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support	$595 - $2,500/ $6,000 - $20,000 (100 users)
JKL Marketing (314) 291-1567	Sales/ Marketing Solution System	Customer database, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, qualification tracking, telemarketing, statistical management reporting	IBM PCs, PS/2 (either under DOS or Unix)	640K/80M, hard disk required	Stand-alone, LAN	Modular	Dbase, Dataflex, ASCII	Optional	Optional	Yes	Optional	Word processing, spreadsheets	Training at customer site, phone support	$1,495 (DOS)/$3,495 (User-based systems)
Key Systems, Inc. (502) 897-3332 (800) 227-0376	Prospecting Plus Release 8.3	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, scheduling, built mail manager, extensive free-form notes	IBM PCs and compatibles, LAN, Unix, Xenix	400K/1.5M, hard disk recommended	Stand-alone, central host, LAN	Modular	None	No	No	No	No	None	Phone support	$495/$1,685 + (8 users on LAN, 25 users on Unix)
Los Altos Software (415) 941-6020	Network 2000	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, territory/account management, order entry, customer billing, lead tracking, telemarketing	HP 3000 Classic and Spectrum	Dependent on number of leads	Central host	Integrated solution	Internal database	No	No	Optional	No	MCBA's order entry/accounts receivable software	Optional training at customer site, phone support	Available on request
LSW, Inc. (301) 459-2322	Cats 2.1	Customer database and purchase history files, activity planner, mail merge, reporting, scheduling, problem tracking, territory/account management, lead tracking, call reports, tickler file, automated correspondence	Intel 80386-based machines, PC LAN, IBM AS/400, any Unix-based minicomputer	8M/3M, 300M hard disk recommended	Stand-alone, central host, LAN	Shrink-wrapped	None	Optional	Optional	Optional	Optional	Word processing, spreadsheets, graphics, report writer	Training at customer site, phone support, eight-hour, five-day hot line, consulting	$2,500/ $10,000 (8 users)

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	FEATURES	HARDWARE PLATFORM	MEMORY/DISK REQUIREMENTS	MODE OF OPERATION	CONFIGURATION	DATABASE INTERFACED WITH	INTEGRATED E-MAIL	INTEGRATED FAX BOARD	REPORT WRITER	CUSTOM GRAPHICS FOR PRESENTATIONS	APPLICATIONS INTEGRATED WITH	SERVICES	PRICE (SINGLE USER/MULTIUSER)
Market Power, Inc. (713) 268-6000 (800) 488-1227	Market Information Technology Version 1.60	Customer database and purchase history files, activity planner, mail merge, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	Intel 80286-based PCs and higher	1M/20M, hard disk required	Stand-alone, LAN, modem for remote communications	Base package plus custom features	Btrieve	Optional	No	Yes	No	Spreadsheets, graphics, other DOS-based packages	Training at customer site, phone support	$6,000 plus $1,000 per user
Marketing Information Systems, Inc. (760) 431-3085	MSM 4.0 with optional remote	Customer database and purchase history files, activity planner, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, client relationship management system	IBM PCs and compatibles, AS/400, System/36, System/38	512K/1M (to load), 20M, hard disk recommended	Central host, remote version integrates with host	Custom	Proprietary	No	No	Yes	No	Word processing	Training at customer site, phone support, consulting	$950 + (laptop version)/ $15,000 (5 users), volume discounts available
Micronage Systems, Inc. (610) 265-6618	Account Manager	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, territory/account management, optional order entry	IBM PCs and compatibles	640K/10M, hard disk required	Stand-alone, central host, LAN	Modular, custom	Pervasive 2.0	Yes	Yes	Yes	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support	Laptop ($1495), headquarters ($1,995)/ $4,995 (unlimited users)
Mackintosh Systems, Inc. (804) 726-6806	Sales Force Automation System	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, order entry/invoice status, E-mail, sales history reports and graphs, call reporting and planning	IBM PC AT and higher	640K/20M - 100M, hard disk required	File server, remote stations access information via modem	Modular, custom	Informix C-ISAM required	Optional	No	Yes	Yes	Word processing, spreadsheets, graphics	Training at customer site, phone support, implementation support	NA/$1,000 per user
Mainsail Management Systems (703) 827-0707	Sales Manager's Workstation	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	IBM PCs and compatibles	640K/2M, hard disk required	Stand-alone, LAN	Custom	None	No	No	Yes	No	Word processing, spreadsheets, graphics and DOS applications	Training at customer site, phone support	NA/$25,000 - $60,000 for site license
Profit Management Systems, Inc. (913) 579-9190	Outcome 7.23	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, time management, secures distributed data	DEC VAX, HP 3000, IBM PC, Apple Macintosh (optional)	400K (PC only)/10M, 40M, hard disk recommended (PC only)	Stand-alone, central host on-line or distributed	Modular, custom	C-Tree	No	No	Yes	Yes	Import/Export merge files will work with any word processor	Training at customer site, 8 to 6 phone support, on-site installation, continued enhancements	Available on request
Realworld Corp. (603) 224-2260 (800) 678-8326	Sales Management Solutions Version 6.0	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, lead tracking, statistical management reports	IBM PCs and compatibles	2M/10M, hard disk required	Stand-alone, LAN	Modular, custom	None	No	No	Yes	No	Realworld Accounting System	Authorized training centers nationwide	$695 plus $195 for System Manager/ $1,295 plus $695 (4 users)
Richmond Technologies & Software, Inc. (804) 290-3121	Maximizer Version 2.1 with Messenger	Customer database and purchase history files, activity planner, mail merge, quoting, reporting, scheduling, problem tracking, territory/account management, financial calculator, different language versions	IBM PCs and compatibles	512K/2M, hard disk required	Stand-alone, LAN	Modular	Btrieve	No	No	No	No	Word processing	Training at customer site, phone support	$395/$895 (unlimited users)
Salesmaker Corp. (603) 668-3422	Salesmaker 3.4.1	Customer database, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, lead management, telemarketing	All Oracle supported platforms	Dependent on number of users	Stand-alone, central host, LAN	Modular	Oracle required	Optional	Optional	Yes	No	Word processing, spreadsheets, graphics	Training at customer site, phone support	$995/$5,000 - $50,000 (depending on number of users)
Sales & Marketing Systems, Inc. (800) 333-0030	SalesCTRL2	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, up to 91 fields for contact information, direct mail capabilities, automated upload/download of contact data	IBM PCs and compatibles	384K/2M - 5M, hard disk required	Stand-alone LAN	Modular	Proprietary	Yes	No	Yes	No	Word processing, spreadsheets	Training at customer site, phone support, monthly courses off site, on-site installation and customizing services available	$795/$3,195 (5 users), $4,495 (unlimited users)
Salesfish Technologies (708) 895-0400	Salesfish for Windows	Customer database and purchase history files, activity planner, mail merge, forecasting, optional quoting, reporting, scheduling, problem tracking, territory/account management, optional order entry, personal information management capabilities	Intel 80286-based, 80386-based PCs and compatibles	1M/20M (minimum), hard disk required	Stand-alone, LAN	Modular, custom	Host database independent	Optional	Optional	Yes	Optional	Word processing, spreadsheets, graphics, all Windows 3.0 applications	Training at customer site, phone support, 24-hour, seven-day hot line, consulting and systems design services	$795 (bundled with Windows 3.0 and IBM Current 1.1, Windows Productivity Pack)/site license available
Salespro International (615) 371-6187	Sales Producer	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, correspondence, sales management reporting	IBM PCs and compatibles, LANs, Xenix, Unix, AIX, VAX/VMS	640K/3M, hard disk required	Stand-alone, central host, LAN	Modular, custom	Dataflex	No	Optional	Yes	No	Word processing, any that will accept ASCII text	Training at customer site, phone support, customized training services, video training	$495 - $695/ $2,200 (5 users on LAN), $2,975 (5 users on Unix)
Sales Technologies (404) 841-4000	Sales Force Automation System	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	Any DOS-based machine	1M/20M, hard disk recommended	WAN	Modular, custom	RDB, Informix, Oracle, Ingres	Yes	Yes	Yes	Yes	Word processing, spreadsheets, graphics	Training at customer site, phone support, 24-hour, seven-day hot line, hardware support and replacement	Typically $5,000 - $8,000 per user (including laptop)
Salmon Systems (206) 637-7070	Sales Management System Version 3.0	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, call reporting management	IBM PCs and compatibles	410K/10M, hard disk required	Stand-alone, LAN	Modular, custom	Clipper	Yes	No	Optional	Optional	Word processing	Training at customer site, phone support	$3,000 + (single user)/$5,000 (5 users)
SBT Corp. (415) 331-0900	SBT Corporate Contact Manager Version 6.35	Customer database and purchase history files, mail merge, reporting, order entry when linked to SBT sales orders, keeps detailed records of incoming/outgoing calls, generates user-defined lists	IBM PCs and compatibles	640K/20M (for one to three modules), hard disk required	Stand-alone, LAN	Modular	Pervasive + Version 2.1, Pervasive Version 1.02	No	Optional	Optional	No	SBT database accounting library	Training at customer site, phone support (provided by reseller), bulletin board system	NA/$1,395 (limited only by network)
Scherrer Resources, Inc. (215) 836-1830	Sales Ally Version 3.10	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	All DOS-based machines	380K/2M, 20M hard disk recommended	Stand-alone, LAN	Modular	None	No	No	Yes	No	Word processing	Training at customer site, phone support, 24-hour, seven-day hot line (for a fee)	$395/$1,895 (unlimited users)
Scott Computing Systems (404) 432-7000 (800) 241-7576	Scott Customer Manager	Customer database and purchase history files, mail merge, forecasting, reporting, territory/account management, lead tracking	IBM PCs and compatibles, PS/2	640K/10M, hard disk required	Stand-alone, LAN	Modular	None	No	No	Yes	No	Word processing, spreadsheets	Training at customer site, phone support, update service	$995/$2,995 (30 users)
Select Marketing, Inc. (512) 345-1145	Marketing Management System Version 3.2	Customer database and purchase history files, mail merge, forecasting, reporting, scheduling, territory/account management, sales forecasting, return on investment reports	IBM PCs and compatibles, Unix Platforms	512K/1M, hard disk required	Stand-alone, central host, LAN	Modular	None	No	No	Yes	Yes	Word processing, spreadsheets, graphics, database	Training at customer site, phone support	$149/$995 - $1,995 (unlimited users)
Snap Software, Inc. (603) 623-8877	Snap Version 4.0	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, distributed database capability, lead tracking, lead fulfillment, customer service	IBM PCs and compatibles, PS/2, laptop and portables	440K/2M - 4M, hard disk required	Stand-alone, LAN, WAN	Modular, user-defined configurations	Btrieve	Optional	Optional	Yes	No	Word processing, spreadsheets, E-mail	Phone support, regional training seminars, Snap 900 phone number	$1,200 per concurrent user, $2,000 minimum, volume purchase plan available

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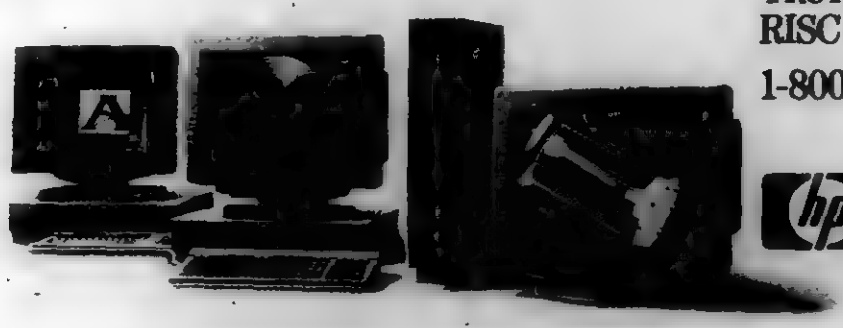
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PRODUCT SPOTLIGHT

VENDOR	PRODUCT	FEATURES	HARDWARE PLATFORM	MEMORY/DISK REQUIREMENTS	MODE OF OPERATION	CONFIGURATION	DATABASE INTERFACED WITH	INTEGRATED E-MAIL	INTEGRATED FAX BOARD	REPORT WRITER	CUSTOM GRAPHICS FOR PRESENTATIONS	APPLICATIONS INTEGRATED WITH	SERVICES	PRICE (SINGLE USER/MULTIUSER)
Software of the Future, Inc. (516) 364-9000 (800) 700-7000	Sale Maker Plus Personal Version 3.0, Professional Version 4.0	Customer database and purchase history files, mail merge, forecasting, quoting, reporting, problem tracking, territory/account management, order entry, unlimited notes, to-do lists, telemarketing, direct marketing	IBM PCs and compatibles, PS/2, LANs	640K/20M, hard disk recommended	Stand-alone, network host, LAN	Info typical; optional with database	Internal database	No	Optional	Yes	No	Word processing, spreadsheets	Training at customer site, phone support, hot line, annual service contracts	$395 (Version 3.0), $695 (Version 4.0)/$1,495 (Version 3.0, 5 users), $2,495 (Version 4.0, 5 users) plus $995 per each additional 5 users
Softworks, Inc. (201) 888-4221	Maxim 4.2	Customer database, activity planner, mail merge, forecasting, reporting, territory/account management, tracks advertising effectiveness	IBM PCs and compatibles	192K/1M, hard disk recommended	Stand-alone, LAN	Shrink-wrapped	None	No	No	No	No	Word processing	Phone support	$389/$1,500 (5 users)
Target Microsystems, Inc. (508) 988-0700	Mikado Version 2.0	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, territory/account management, prospect tracking, call scheduling, telemarketing database management	IBM PC XT, Intel 80286, 80386, 80486-based systems and compatibles	640K/20M, hard disk required	Stand-alone, LAN, distributed system	Modular	None	Optional	Optional	Yes	No	Word processing	Training at customer site, free phone support	$495/$1,495 (unlimited users)

Why remodeling often beats building

BY ALAN J. RYAN

Most companies that tried and failed in the early 1980s to grow their own sales force automation systems have begun moving to packaged wares.

Some claimed success with the "build your own" approach, but many others found themselves entrenched in systems that were not always user-friendly, difficult to modify as needs changed and sometimes ignored by users.

THE TEMPTATION TO build your own can be strong. There is rarely a perfect fit between a client's needs and a commercial package.

KEVIN CARSON
SALES AUTOMATION

Meeting the needs of many departments was the problem with 3M Co.'s homegrown attempt. The firm tried installing mainframe terminals at the homes of sales representatives to give them access to corporate mainframes via telephone lines. In 1987, 3M replaced the system with a package from Sales Technologies running on laptops from Toshiba America, Inc. and Compaq Computer Corp.

Each 3M division has a different system, says Joan Bircher, manager of sales support systems. "Even though they are using the Sales Technologies software, each division decides which modules best fit their business, how they want the modules to look and the information they want to collect and distribute through the system."

The temptation to build your own can be strong. There is rarely a perfect fit between a client's needs and a commercial package, says Kevin Carson, president of Sales Automation, Inc., a consulting firm in Downingtown, Pa.

Most companies either search for a close fit in commercial products and learn to adjust or shop for products that can be tailored to their needs, analysts and consultants say.

At Sales Automation, clients can discuss which desired functions can be discarded and the consequences of using software that won't meet particular needs.

At Allstate Insurance Co. in Northbrook, Ill., the answer was somewhere in between.

Allstate developed a hybrid system by linking the functionalities of four off-the-shelf sales force automation packages in 1985. That system served as a prototype for the design of a proprietary system currently in place for more than 15,000 users, says Fred Allegretti, assistant vice president of sales distribution technology in the agent education and development area.

Still, Allegretti says, improving the sales system product is an ongoing effort.

"From our prototype, we were able to put together a system very quickly," he says, but the system is continually modified. In the first year, there were as many modifications to the system as there were days, Allegretti says.

Time frame alone can push a company toward packaged software. Gil E. Cargill, president and founder of The IDK Group in Culver City, Calif., says it takes two or three months to get salespeople up and running with off-the-shelf packages vs. one to two years for custom-built applications.

While typical companies show productivity gains of anywhere from 10% to 34% by using any sales force automation tool, "if you build your own and get another 2% to 3%, it doesn't offset the cost of building the system," Cargill says. •

Software that knows the business

You may be able to find software that already sells it your way. Some companies purchase packages already tailored for their vertical market. General-purpose software is more prevalent, but some vendors have spotted industries or companies large enough to justify writing and then selling specialized software.

This software does not entirely eliminate customization. However, vertical industry packages do include required features and are written in the industry's jargon. This tends to set at ease salespeople threatened by computerization, says Leon A. Wortman, chief executive officer at Success Analysis Corp. in Palo Alto, Calif.

For instance, Philadelphia-based Sherrer Resources, Inc.'s Realty Ally offers real estate-specific features.

According to Coldwell Banker Real Estate Group, Inc. real estate agent Don Horne, who has whittled his work time by at least four hours and upped his productivity by 30%, this specialized software has its rewards.

Horne has used Realty Ally in his Cherry Hill, N.J.-based office since February 1990. The $395 package runs on a Compaq Computer Corp. LTE laptop that cost $4,700. Because he was able to take on paperwork formerly handled by a part-time secretary, Horne's investment paid for itself in only six months.

In the packaged goods industry, vendors such as Envoy Systems Corp., located in Waltham, Mass., include modules that specifically treat chain stores.

Fastech, Inc. in Broomall, Pa., also targets the packaged goods market. Its IBM mainframe or Digital Equipment Corp. VAX-based system targets direct sales manufacturers, broker sales manufacturers and retailers, and modules include Retail Conditions, Order Management and Report Distribution.

Atlanta-based Sales Technologies offers Package Goods, which helps gather pricing information on competitors' products for the benefit of sales managers. Sales Technologies also has a package for the pharmaceutical/health care products industry.

In the petroleum industry, Envoy offers Lubricant Sales, which takes into consideration the rapid fluctuation of fuel prices. The product includes a special price agreement function that enables field salespeople to receive quick approval for prices customers have accepted.

Another advantage of specialized software is training, a service that is usually part of the package. These vendors claim they are better at motivating field salespeople because they are familiar with industry practices.

Another approach to meeting special needs is through templates. High Caliber Systems, Inc. in New York provides specialized templates for various industries with its Peoplebase software. The company targets wholesalers, real estate agents, stockbrokers, bankers, fund-raisers and advertising salespeople. A single-laptop version costs $199, and a networked personal computer version is priced at $699.

MEL MANDELL

GTE, Contel get it together

With merger finalized, GTE's task is to consolidate and integrate data centers

BY JOSEPH MAGLITTA

On Thursday, Feb. 28, a crated IBM 3090-600 was wheeled onto an 18-wheeler at Contel Corp.'s headquarters in Atlanta. A few moments later, the mainframe was rumbling south to a GTE Corp. data center outside Tampa, Fla.

So began the first major move in an effort to merge the information systems operations of GTE, the Stamford, Conn.-based telecommunications and lighting giant, with Contel.

Finalized on March 14 after nine months of talks, the $6.6 billion merger created the nation's largest local telephone company — serving 40 states with 18.6 million lines. With 50 million potential customers, the combined firm now ranks as the nation's second largest cellular phone company.

The pact also gave IS departments at both companies the green light to begin in earnest the complex work of translating paper partnership into a computing reality built on hardware, software and networks.

On the surface, the plan is simple. "As the telephone operations of the two companies merge, Contel users will migrate to GTE systems and be processed there," explains William R. Wofford, vice president of operations services at GTE Data Services, Inc., GTE's data processing subsidiary.

However, it will take the next two years to handle the myriad details involved in integrating GTE's mostly IBM-based MVS systems with Contel's minicomputer and Honeywell, Inc. operations.

Magiitta is a *Computerworld* senior editor, executive report and integration strategies.

When the first phase is completed at the end of this month, hardware and various customer service applications at Contel's Atlanta data center will have been shifted to GTE information processing centers in Temple Terrace, Fla., and Fort Wayne, Ind. Other hardware cabinets will be shipped out in July.

The second phase will consist of a state-by-state migration of other Contel applications, such as billing, toll, service orders and operational applications, to GTE data centers during the next 24 months. Contel facilities in Winsville, Mo., Bakersfield, Calif., and Chantilly, Va., will be combined with GTE centers and then closed by early 1993.

While the costs are still being calculated, company officials said they expect savings from the Contel consolidations to reach $40 million.



Skip Comb

GTE's Wofford: *Contel users to be processed on GTE systems*

Integration efforts

The task of handling the Contel integration will fall to GTE Data Services, the 4,200-person data processing, telecommunications and service arm of the company's telephone operations.

Based in a $30 million software development facility located in Temple Terrace, GTE Data Services serves operations in the U.S., Canada and Dominican Republic. With 1990 revenue of $480 million, the unit ranked as the third largest information management company in the nation.

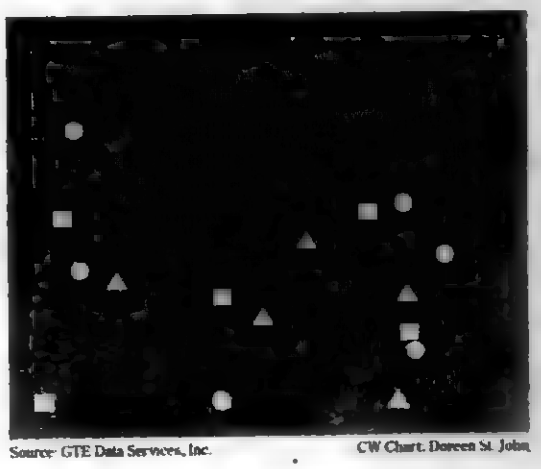
GTE Data Services is well versed in the nuances of consolidations: The GTE/Contel project comes hot on the heels of a four-year GTE effort to combine and integrate nine of its regional data centers into four (see story below).

"We thought that we might rest for a while" between projects, laughs Ralph E. LeMeur, director of GTE's information processing center in Sacramento, Calif., and a key member of the consolidation team for both projects. "But I think we're learning that the business is moving so fast that we don't have any time to rest anymore."

Ironically, Contel was in the middle of its own consolidations when the GTE merger was finalized. "Some of the project team members were frustrated" at not being able to finish the work, says Ron Kindland, vice

Continued on page 76

GTE to save $149 million



Source: GTE Data Services, Inc. CW Chart: Doreen St. John

BY JOSEPH MAGLITTA

How much money would it take to convince you to shut down half your data centers, truck and fly the hardware plus tens of thousands of tapes across hundreds of miles in snowstorms and fog and set up again in a new location — doing it all over two years' worth of weekends and without disrupting user service?

How does $149 million sound?

That's how much GTE Corp. expects to save in labor and overhead costs by 1992 as a result of consolidating and integrating nine regional data centers into four.

Now entering its final weeks, the four-year project by Stamford, Conn.-based GTE is finishing four months ahead of schedule and below budget. Moreover, company officials say, projected savings are $18 million more than was originally expected.

"The project has been very, very successful," says William R. Wofford, vice president of operations services at GTE Data Services, Inc., which coordinated the consolidation efforts with GTE networking, field service and facilities groups.

The big challenge for GTE now, says Dennis Saputo, a senior analyst at Moody's Investors Service, Inc. in New York, will be to find new ways of keeping the savings. Federal regulations limit the amount of profit telephone companies can make.

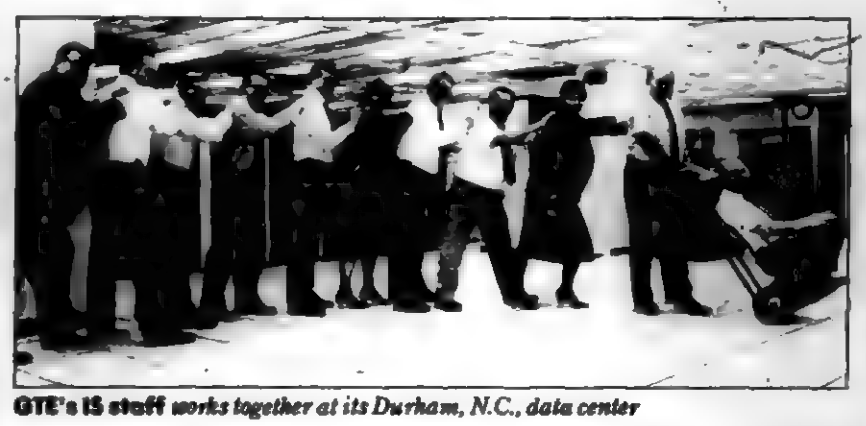
GTE says savings from the project already hit $49 million in 1990, the first full year of the consolidation/integration. The moves will also let the division reduce data

Continued on page 72

Continued from page 71

center head counts by nearly 300, or 25%, by 1992 and eliminate 87,316 sq ft of expensive data center floor space, according to company officials.

Other payoffs include a minimization of duplicated efforts and improved information systems control, Wofford says. "We now can manage four centers as one" because of increased integration, he says.



GTE's IS staff *works together at its Durham, N.C., data center*

Success factors

Planning for consolidation and subsequent integration began in early 1987. At that time, GTE management identified data center efficiency and software as key factors in the future success of the company's telephone operations.

Soon after, GTE's board of directors approved a feasibility study, and the company established a planning team. Planners considered 115 options, ranging from maintaining the status quo to combining all nine data centers into one huge "megacenter," says Mac Dunn, director of operation services.

Eventually, planners settled on four centers because this option lets GTE keep a presence in each region, minimizes the risk of jeopardizing 99.5% uptime and makes the best use of its computing assets.

According to the plan, GTE data centers would be closed in Marina Del Rey, Calif., Raleigh-Durham, N.C., Erie, Pa., Tampa, Fla., and Everett, Wash., and their contents integrated with centers in Temple Terrace, Fla., Sacramento, Calif., San Angelo, Texas, and Fort Wayne, Ind.

Furthermore, the centers in Temple Terrace, Fort Wayne and Sacramento would be more than doubled in size from a total of 156,000 sq ft to 396,000 sq ft to handle the additional equipment. The fourth center in San Angelo would stay at 48,000 sq ft.

"There really weren't any rules to follow about how to do it," says Tom Kaczmarek, Fort Wayne consolidation manager. "We had to create guidelines at every step of the process."

During five weeks in mid-1987, the team devised an implementation plan, financial estimates and preliminary schedules, Kaczmarek says. The biggest challenge was the enormous job of planning, he says.

The plan was approved in late 1987. Core teams were then formed to coordinate consolidation from a national and local perspective. The 12-member teams represented each of the affected data centers, which developed individual approaches for each of their sites. Some opted for a "flash cut," and others for a more gradual transfer.

"We spent months and months creating our 'bible,'" consolidation manager Robert C. Taylor says, referring to the detailed playbook that guided his team's efforts. The book described actions that needed to take place every 15 minutes for the entire 96-hour move.

To keep things organized, data center directors worked with four area consolidation managers. Directors met monthly with Wofford to ensure that individual plans wouldn't conflict with each other and to share ideas.

The first consolidation work began in Erie in July 1988. More followed, continuing through November 1989 (see story page 74). Integration efforts have continued throughout the project and are scheduled to conclude on May 12 in Sacramento.

The price tag for the GTE consolidation/integration effort was $61 million. Roughly two-thirds of that amount was for enlarging existing centers; the other third was for the move. But GTE planners say the hefty cost will be more than offset in the first two full years of the consolidation.

Besides helping GTE trim costs and standardize, the project has also paved the way for a smooth computer merger with Contel Corp., which the company acquired in March (see story page 71).

'War stories'

Each of the moves produced its own "war stories," which have become part of company lore.

For example, during the move from Erie, "the plane landed at 3 a.m. with consolidation data, and the charter service area was closed," Kaczmarek recalls. "[The area] was located far from the main terminal, so staff handed boxes over a 7-ft-high security fence to crew on the



other side." The consolidators then climbed a radio antenna and jumped the fence themselves.

There's also the story about how a rare snowstorm hit Durham in February 1989 while tapes were being loaded for shipment to Temple Terrace. After towing a stuck truck, GTE Data Services staff members raced to a chartered corporate airplane that was in a hangar to be de-iced in preparation for the flight. The plane was the last to leave before Raleigh-Durham Airport was closed for two days because of 18 inches of snow.

Some staff members participating in the largest move — from downtown Tampa to Temple Terrace — worked for 70 straight hours.

Network traffic

The consolidations greatly increased networking traffic because they required more data transfers between the various locations, GTE's backbone network manager Gary Wiest explains. "Availability is a major issue," he says, "because with only four [data centers], we've got a lot of eggs in one basket."

To build in safety, the T1 backbone network was built with lines from AT&T, MCI Communications Corp. and U.S. Sprint Communications Co. feeding into each location to provide backups in case of line failure, Wiest says. Consolidation teams did most of the work, supported by the networking group.

Each center was in turn served by three networks: an IBM Systems Network Architecture network to handle interactive traffic, a channel extension network for large print volumes and an X.25 network to serve minicomputer operations. The majority of this work was done in 1988, before the consolidation began.

With physical consolidation completed, the teams began integrating the equipment at each site. Work done at the Sacramento center is a good example of the complex nature of the postconsolidation tasks.

Maximum flexibility

After examining CPU images from Everett and Marina Del Rey, the Sacramento team established an architecture that maximized availability and flexibility, says Ralph E. LeMeur, director of GTE's information processing center in Sacramento. Work loads for billing, trouble administration and other functions were moved around and consolidated to one console spanning an Amdahl Corp. 1400 and two IBM 3090 Model 600 systems.

Time-consuming details

Beginning in June 1990, three Sacramento center staff members devoted between 40% and 50% of their time handling the time-consuming, nonprogramming details that comprise integration, including wiring and cabling CPUs, merging catalogs and tape library systems and writing minor utility programs. Much of the work is tedious.

"A programmer up in Everett may name a data set XYZ. A programmer in Marina Del Rey may name another data set XYZ. There you have a problem because you can't merge catalogs as long as you have duplicate data set names," LeMeur explains.

Despite the myriad details, GTE Data Services officials say there's no doubt the headaches are worth the trouble.

Wofford says that from the start of consolidation until now, total IS costs have gone up less than 5%, while the work load has increased 38%. "In previous times, [IS costs] were running 10% to 12% a year," Wofford explains, chalking up the benefits to more efficient operations.

During the same period, he adds, cost per billable CPU unit fell 43% in 1989 and 51% in 1990 to $117 and $83, respectively. "That's the most significant drop we've had in some time," Wofford adds.

The savings frees up money for future data center automation, which will in turn produce more savings, he says. In fact, the project has been so successful that IBM and Texas Instruments, Inc. have visited to take a closer look.

Probably the biggest problem now, Wofford says, is figuring out what to do with the vacated data centers in Erie and Marina Del Rey. "It's not inexpensive to walk away from a building," he says, noting that air-conditioning, heating, security and other costs add up.

GTE would like to sell the empty buildings and is exploring the possibility of making the structures more attractive to the market by converting them to general-purpose use. •

Master plan

- **The plan:** Consolidate and integrate nine GTE regional data centers into four to reduce operating costs and position company for future growth.
- **Schedule:** Initial planning, 1987; consolidations from February 1988 to November 1989; integration from early 1988 to May 1991.
- **Cost:** Approximately $61 million. Two-thirds for enlarging existing centers; one-third for actual moves.
- **Benefits:** Savings of $149 million in labor and overhead by 1992; data center head count reduced by 25%, or about 300 people; 87,316 square feet of data center space eliminated; duplicate efforts minimized; overall control of operations improved; cost per billable CPU unit down 51% in 1990.

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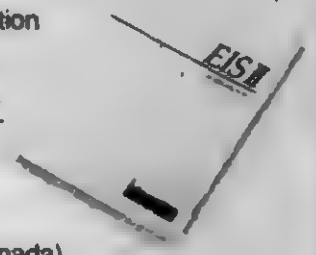
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Moving experience: Capsule summaries of GTE's efforts

BY JOSEPH MAGLITTA

Erie, Pa., to Temple Terrace, Fla., and Fort Wayne, Ind., July 1988 to August 1989:
GTE Corp.'s kickoff consolidation project began in July 1988 with the company's largest production on-line systems, which resided in Erie.

The firm moved the first systems to the Tampa Technology Center in Temple Terrace over the July 4 weekend. Consolidation planners had decided to do gradual cutover to Temple Terrace and Fort Wayne to avoid disrupting customer service, consolidation manager Robert C. Taylor says. The idea, he explains, was to set up fully functional systems in the new center prior to the physical moves. Then key operating data could be quickly moved and dropped onto the new system.

Taylor describes the process this way: "We shut the on-line systems down at midnight. Then we dumped the databases onto 400 or so tapes, crated them up at the data center and drove them to the airport at Erie and onto the chartered plane for Tampa airport."

After a two-hour flight arriving at 3:30 or 4:30 a.m., the volumes were rushed to the data center and loaded onto waiting IBM 3090-600s. "We then started loading the databases, and at 5 or 6 in the morning, we were running live. When the user came in at 6 and logged on, he didn't see any specific change," Taylor says.

The firm relocated other production systems to Temple Terrace on Labor Day 1988. The rest of Erie's applications were moved one by one to Fort Wayne between October 1988 and August 1989. "All the networks and terminals were pretested," Taylor says. "You just throw the switch, and that's it — a very simple move."

Durham, N.C., to Temple Terrace, May 1988 to February 1989:
The movement of GTE's Southern region billing, payroll and other batch and some on-line systems from Durham to Temple Terrace took place between Labor Day 1988 and Feb. 16, 1989.

Using a similar approach to the one used in Erie, the team set up a "mirror image" IBM 3084 system and storage devices in Temple Terrace, consolidation manager Thomas Kessling says.

Two moving vans and a chartered jet carried the 60,000 data tapes and 400 application and systems dump tapes the 600 miles to Temple Terrace.

To avoid the extra labor of boxing the 20,000 to 30,000 cassette tapes, team members wrapped Saran Wrap around the tape storage racks, which were loaded onto a climate-controlled truck and driven away.

Both trucks were loaded only half full so that if one vehicle broke down, cargo could be quickly loaded onto the other truck. As an extra precaution, a mechanic rode with the trucks, which stayed in contact with headquarters via a cellular telephone. Employees with cellular phones also monitored vans carrying equipment to Temple Terrace from Durham at checkpoints along the route.


Skip Gandy

GTE's Taylor: *"You just throw the switch — a very simple move."*

Staff prelabeled all cartons to help truck drivers place equipment in the right spot. "When the truck driver wheels the carton onto the floor, the label and mark on the floor says A-1-5, and he puts the rack right there," Kessling says. "That way, he doesn't have to move it again."

The first batch systems, residing on an IBM 3083, were moved in September 1988. Production on-line systems and test systems followed. Testing began in October 1988, and the last data was transferred in August 1989.

Despite a rare snowstorm, the 60-hour move went flawlessly, Kessling says. "We unloaded both trucks, put everything on the floor, and we were rock and rolling. We got calls from customers who were sure we had called it off. They didn't even know we had moved."

Marina Del Rey, Calif., and Everett, Wash., to Sacramento, Calif., May 1989 to May 1990:
Because of the size and number of customers, these moves were the most difficult to date. Work began over Labor Day weekend in 1989 and took most of 1990. A 40,000-tape library was shipped from Everett to Sacramento on Veteran's Day 1989.

To avoid getting stuck in the notorious Sacramento fog, planners found two alternate locations into which airplanes could fly, consolidation manager Matt Mesplou says. In addition, the first two floors of the Sacramento center had to be reconfigured for incoming tapes and equipment.

Downtown Tampa to Temple Terrace, February to November 1989:
The 18-mile move from a GTE office tower in downtown Tampa to suburban Temple Terrace over a Thanksgiving holiday was the most complex.

Because the data was heavily meshed between systems, planners decided a flash cut would be the only way to avoid missing any disk sets.

Between February and November 1989, two full-time information systems staff members and two others spent a total of 12,000 hours planning the move.

In the weeks preceding the physical moves, the team conducted several dry runs and simulations. Dummy on-line systems were set up and network switches were rerouted. Then staffs brought in end users to make sure they could easily access their data and applications.

GTE hired IBM field service staff members to do the moving of hardware and peripherals from the 11-story tower.

Some 300,000 magnetic tapes and cassettes were packed, along with 450 pieces of hardware, including 100 tape drives and "several hundred" boxes of IBM 3380 direct-access storage devices.

IBM, Memorex Corp., Storage Technology Corp. and Bull HN Information Systems, Inc. each moved its own systems.

To coordinate the project, the company established a 24-hour message and control center. GTE also set up a telephone hot line, giving end-user callers a three-minute project update every hour.

Team leaders worked for 70 hours straight, catching catnaps in a motor home driven into the parking lot.

"The on-line systems came up Thanksgiving morning" on a new IBM 3080-600S already in place, Taylor recalls. "We went home and had turkey that following Sunday." ●

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Continued from page 71

president of information services for Contel's telephone operations.

Nonetheless, Contel IS staffers, led by Kindland, dug in and played a major role in consolidation planning with GTE.

Both the data center consolidation and the Contel merger come amid massive corporate cost-cutting and restructuring at GTE. The firm is now in the fourth year of a five-year program to shave $1 billion from annual overhead, partly by shedding 14,000 employees.

By and large, those cost-containment efforts have been successful, according to Dennis Saputo, a senior telecommunications analyst at Moody's Investors Service, Inc. in New York.

Now, GTE will have to speed up the actual work of merging with Contel while "pausing to digest," he says.

October brainstorm

Groundwork for the Contel consolidation actually started months before the merger was finalized. Beginning last October, teams from GTE and Contel began meeting to discuss plans in anticipation of final approval. In November, four staffers from each company met to firm up details. Drafting a final plan "didn't take that long," says Wofford, a 35-year company veteran. "But we had to go through different what-if scenarios and take those into management to see what they thought. So it kept changing."

Initially, the plan called for slowly integrating systems by the end of 1994. The idea was to save money by "forklifting everything to one location," closing the Contel sites immediately and gradually integrating from there, Wofford explains.

However, GTE's systems people devised a faster, "much better" plan to integrate all systems by 1992, Wofford says. Planners decided that, except for the IBM 3090 trucked from Atlanta, the Contel computers would be left in their original locations during migration until GTE decided what to do with them.

GTE Data Services officials are confident that lessons learned from their recent consolidations will serve them well in the Contel project. "It's almost like we did this last year, and I think we have a very good plan," Wofford says, calling the initial planning "duck soup."

No one is suggesting that the effort will be a total romp, however. For one thing, Contel centers won't simply be moved to the nearest GTE center. Instead, applications such as customer billing and service will go where they make the most sense, regardless of location. Some of the work now done at Contel's Dulles Airport center in suburban Virginia, for instance, will go to Fort Wayne, and the rest will go to Temple Terrace.

Another sticky wicket will be Contel's use of Honeywell, Inc. systems. At the time of the merger, Contel was moving toward IBM-based enterprise systems. However, most of the company's applications still run on various Honeywell DPS8 and DPS90 series systems and are different from GTE's.

Besides being more complex, the IBM/Honeywell migration will require many man-hours to make any necessary changes. Company officials estimate that it will take until June 1992 to write all the conversion systems needed.

On the networking side, GTE plans to move Contel's network control center out of Atlanta by the end of 1991. Then, as individual states are converted, Contel's IBM-based network will be integrated.

Dwindling data centers

IS staff members, however, won't have much time to rest on their laurels; the Contel consolidations may not be the last for GTE. Thanks to a continued move to a distributed architecture, GTE officials predict the number of data centers will continue to dwindle into the next century despite sharply increasing work loads.

"By the year 2000, we project that we will probably have three centers, though it could go down to two," Wofford says. "We see a substantial reduction in mainframe MIPS all through the 1990s."

Besides cutting costs and improving efficiency, GTE also looks on the data center consolidations and integration as the foundation for future growth.

For instance, the integrated environment has already made possible such ambitious projects as GTE's new, handheld computer-based automated work administration system as well as a Storage Technology Corp. automated tape library system.

Maria Monnes, a senior associate at Pyramid Research, Inc. in Cambridge, Mass., says Contel is aggressively pursuing expansion in Europe and Latin America. Cost-cutting and automation efforts will benefit its position against the regional Bell operating companies and other competitors, she says.

For now, however, team members are focusing on the work at hand. "We're eager to be getting on with it so that we can gain some of the synergism that the merger is all about," LeMeur says. •

Tips for blending data centers

Thinking about consolidating and integrating your data centers? Keep in mind the two Ps — people and planning — experienced consolidators at GTE advise.

The following are tips for consolidation success:

• **Keep everyone informed.** The most important thing, GTE consolidators agree, is to keep all those involved well-informed. "People are much more understanding and much more willing to be team players if they know that management is telling them everything they know," says Ralph E. LeMeur, a veteran information center director who played a key role in the two recent GTE consolidations.

The company practices what it preaches. For the GTE/Contel consolidation, the companies developed a newsletter, and in late March, thousands of employees got a thick packet of information detailing the merger. Top company executives meet regularly with employees to discuss the issue.

• **Involve users and suppliers.** Good communications extends to end users and vendors as well, says consolidation manager Robert C. Taylor. "You have to involve the customer," he says. "Let them know what's going on. Get buy-in by showing them [how] the process works." As for vendors, they attended all consolidation meetings.

• **Give plenty of notice.** It's important to give as much notice as possible of what is going to happen, which helps reduce anxiety. For example, workers affected by recent consolidations knew two years in advance. "You've got a lot of people out there wondering what's going to happen to them and their lives," LeMeur says. "I think we owe it to them" to keep them informed.

• **Work with human resources.** During GTE's last consolidation, IS staff members worked closely with GTE's human resources department to help affected employees. Human resources representatives met individually with every person affected by the moves and discussed career plans, options and relocation benefits.

Outplacement, counseling and, when necessary, letters of introduction to other employers were provided. Displaced workers were offered retention bonuses to induce them to stay on the job for as long as they were needed. In addition, periodic bulletins and articles in internal publications offered updates on progress.

GTE considers its approach successful: In the recent consolidation, 243 employees relocated, 49 took early retirement, 34 were reassigned, 40 transferred and 141 were laid off.

Currently, GTE and Contel are working together "to make sure we provide jobs to anybody who wants them," LeMeur says. Contel workers will be given preferential treatment in filling vacancies.

• **Have a structured plan.** The best informed and motivated employees are wasted unless used wisely, GTE consolidators warn. Thus, good, structured planning is key, they say.

"Write down even the obvious, then go through and make sure that even the obvious works. Do dry runs to ensure that every detail is taken care of," LeMeur says. "You don't want anything to happen by accident."

Part of good planning, Taylor says, is doing as much up-front work as possible.

"Preinstall everything you can to make up for short windows," he advises. "Get your DASD in place, and set up an on-line operating system. Get all the network in place and test it, and make sure users can access it. Then, all you have to do on zero day is to lower live data onto existing DASDs."

Taylor also recommends pretesting everything and letting vendors prepare the data center.

In this way, IS staff members can concentrate on supervising.

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NATIONAL BRIEFS

Sometimes the twain meet

▶ In 1987, Torrance, Calif.-based database maker **Ashton-Tate Corp.** made a 20% investment in Bedford, Mass.-based **Interbase Software Corp.** Two years later, it upped its stake to 51%. Late last month, Ashton-Tate acquired the remaining 49% of Interbase, and Interbase, which will operate as an independent, wholly owned subsidiary, acquired a new president: industry veteran **Paul Bergeron**, most recently international sales director at **Stratus Computer, Inc.** Bergeron replaces Interbase founder James Starkey, who said he is headed back down the entrepreneurial road.

Sign of the times . . .

▶ The **Digital Dealers Association**, a 9-year-old trade association of firms doing business in used **Digital Equipment Corp.** computers, hired a DEC veteran technologist as the first executive director in the association's history.

Prime Computer, Inc. hired a veteran financial manager to establish and man an internal audit function in the firm.

Software and services trade association **Adapso** voiced concern over its finding that minority-owned enterprises are being slighted in the Kuwait reconstruction effort and called on all "involved in the process of soliciting, recommending, obtaining and awarding" contracts and subcontracts for the Kuwait project to keep qualified minority candidates in mind.

Mipro III, a Redwood City, Calif.-based disk drive repair and data recovery firm, is extending its services to Europe and Japan.

Two-timer

▶ **Banyan Systems, Inc.** cofounder Anand Jagannathan is at it again: His latest venture is Sunnyvale, Calif.-based **Reach Software Corp.**, which is positioning itself to tackle electronic mail-enabled work-flow applications for personal computer local-area networks. Starting up with 25 employees, Jagannathan as chief executive officer and private funding — including joint venture capital from HCL America — Reach is promising its maiden products by the end of 1991.

A leaner Control Data ready to play ball

CDC has had an active past few years, realigning business units and reducing its work force

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — The Control Data Corp. that steps up to the plate this baseball season will be a smaller, leaner, more confident player than it has been in years.

It has taken a bruising few years for CDC — a firm once ranked among the top old-guard mainframe computer companies — to rethink its future and exit half a dozen lines of business.

The divestments have been in both profitable units (CDC's Imprimis Technology, Inc. disk drive unit sold to Seagate Technology, Inc. in 1989) and unprofitable ones (its money-losing ETA Systems supercomputer unit folded in 1989). The divestments have shrunk the company from $3.5 billion in revenue in 1985 to $2.9 billion in 1989 and $1.7 billion last year. It has also meant cutting the work force from approximately 10,000 employees two or three years ago to about 4,700 today.

At the same time, CDC has pursued a two-pronged strategy of reorienting toward open systems architecture and finding hardware and software partners who can help it deliver these offerings to the marketplace.

"Worldwide, I don't think there will be more than a handful of general-purpose computer companies," said James E. Ousley, president of the Computer Products Group. "CDC will not be one of them.

"By 1995," Ousley continued, "Control Data will be a company that is very focused on two major markets: manufacturing [specifically automotive and aerospace] and information management for technical and engineering [environments]."

According to Ousley, at least some of CDC's challenges in recent years have reflected the systematic changes in the computer marketplace, in particular the increasing importance of distributed and open systems.

CDC, he reasoned, was hit early by these changes because its traditional markets have been engineering and scientific computing. "If you look at the engineering and scientific segment, those are the ones to try new solutions . . . so the move to open systems began there," Ousley said. In contrast, it takes a payroll group a lot longer to decide to make this transition, he said (see story page 79).

Last hurrah

A banner event for the Computer Products Group — which along with CDC's various business and computer services represents 37% of overall firm revenue — was the 1989 introduction of the Cyber 2000, probably the last hurrah in CDC's proprietary mainframe line. CDC has stated it will continue to support the Cyber line through the end of the decade. In light of this, last year it introduced Empower, an open systems architecture designed to migrate existing Cyber users to a distributed Unix environment.

The company's 1992 business plan calls for revenue from open systems to surpass those from proprietary ones.

Still, analysts only partially accept Ousley's perspective on CDC's past troubles.

Prior to Lawrence Perlman's becoming president and chief executive officer last January, "this company had totally inadequate controls and no sense of mission at the top," said Frederick A. Wise, an analyst at Bear Stearns & Co.

"Would a better managed CDC 10 or 15 years ago be facing these same issues? Undoubtedly," Wise said. "But would they be in better shape now? Undoubtedly."

But Wise, who calls CDC a "turnaround," joined other investment analysts in giving CDC generally favorable reviews. Bear Stearns, for example, estimated that CDC will show earnings of $1 per share this year, up from 74 cents per share last year. Moreover, Wise's preliminary figures project the company earning $1.25 to $1.50 per share from operations in 1992.

One benchmark will be how

Continued on page 79



"By focusing on its historical strengths . . . [the CDC Computer Products Group] can succeed and grow as a provider of applications and integrated solutions."

Lawrence Perlman
President and CEO
Control Data Corp.

Six strikes, you're . . . in?

Once a major force in the computer industry big leagues, a battered Control Data came up with a new game plan that it hopes will see a leaner, meaner firm driving the profits once again:

- During the past three years, CDC has exited some half a dozen businesses — slashing immediate revenue as well as work force count — in order to [illegible]
- By 1996, CDC intends to be concentrating on two markets: manufacturing and technical/engineering information management
- CDC is counting on a team of hardware and software allies to help it score in the open systems arena



Source: Control Data Corp. CW Chart: Doreen St. John

Troubled firms get short-term executive aid

BY MITCH BETTS
CW STAFF

BETHESDA, Md. — In one more sign of the industry's volatile state, a new business launched last month provides "interim executives" for specific assignments at high-technology companies faced with some sort of crisis.

The crisis may be the sudden departure of a chief financial officer, a merger or acquisition, a turnaround situation, a big contract award or the launch of European operations, said Robert F. Ryan, president of the new firm, Dahl-Morrow International.

The company draws from a pool of nearly 500 senior-level executives, including chief executive officers, CFOs, marketing vice presidents and information systems executives who are eager to take challenging assignments of short duration — usually three to 12 months, Ryan said. Dahl-Morrow's initial clients include Contel Corp. (which recently merged with GTE Corp.) and several defense contractors.

Hiring temporary executives allows companies to solve a critical problem quickly with a seasoned manager suited to the task without having to pay fringe benefits, Ryan said. The executives tend to be financially secure from long and successful business careers, he added, so they are not worried about pension benefits.



Dahl-Morrow's Ryan *helps unemployed executives*

Ryan is a prime example of an interim executive, although he takes an equity position in each company he runs. He was recruited by Dahl-Morrow's investors to organize and manage the company through its start-up phase, a period of up to three years. Then, he said, he will move on to manage another start-up [illegible]

During the past two decades, Ryan has repeatedly done just that. In 1970, he launched Dialcom, Inc., which began as a computer service bureau and evolved into an international electronic messaging firm that is now part of British Telecom. Ryan also launched Source Telecomputing Corp. (recently absorbed by Compuserve, Inc.) and TCOM Services, Inc.

Western Digital sells off network product line

BY JOANIE M. WEXLER
CW STAFF

IRVINE, Calif. — A long-anticipated move by Western Digital Corp. to exit the networking business was confirmed late last month when the company signed a letter of intent to sell its network adapter card product line to Standard Microsystems Corp. for $33 million.

Pending approval by the board of directors at each firm and Standard Microsystems' success in securing financing, the deal should be a *fait accompli* within three months, according to a Western Digital spokeswoman.

In the meantime, she said, customers will be doing business as usual with Western Digital for sales and support of the company's Ethernet and Token Ring network adapter cards. For one year following the close of the deal, Western Digital will reportedly continue to produce the boards for Standard Microsystems while the buyer sets up manufacturing facilities.

One local-area network industry analyst indicated that because the move complements the strategic goals of both vendors, the two customer bases should benefit. Western Digital intends to focus its resources on its core disk drive and controller businesses. Dataquest, Inc. analyst Shirley Hunt pointed out that "the way you sell those products and networking products requires completely different distribution strategies."

Having a separate group of people to manage the two areas "is not very efficient, even though the network adapter card business has been profitable for Western Digital," Hunt said.

Networking products account for about 8.5% of Western Digital's annual $1 billion revenue, which translates into about $92 million, according to the company.

Hauppage, N.Y.-based Standard Microsystems has been expanding its business of producing Arcnet adapter cards — a flat market — into the Ethernet arena. To stay viable, "all Arcnet vendors must move toward Token Ring as well," Hunt said.

INTERNATIONAL BRIEFS

Taking it to Taiwan

▶ **IBM** plans to increase cooperation with Taiwan-based software developers and may decide to invest directly in local software firms, IBM Taiwan general manager Henry Chow recently told the Taiwan business press. Through the end of May, he said, IBM will solicit proposals from software developers throughout Taiwan.

Unix in Hungary

▶ Unix for personal computers has arrived in Hungary, according to a news report from Budapest. **The Santa Cruz Operation** (SCO), the Santa Cruz, Calif.-based supplier that reportedly dominates the Unix-based PC market, recently set up an authorized distributorship with Hungary's **Areco Kft.** The agreement will help spread Unix throughout Hungary, local analysts said, given that Areco will also profit from the background support of SCO's worldwide network. Areco will offer SCO's entire product range.

Down the slippery slope

▶ Italy's **Ing. C. Olivetti & Co. SpA** recently reported that it will post 1990 pretax profits of approximately $100 million on sales of about $7.5 billion. That makes 1990 the fourth consecutive year of falling profits for the computer and business machines firm.

E.T., phone Pakistan

▶ Four major telecommunications equipment suppliers have submitted bids to install 500,000 telephone lines as part of **Pakistan Telecommunications Corp.**'s efforts to install 1 million telephone lines in Pakistan during the next two years, a news report from Islamabad said. The four contenders are Japan's **NEC Corp.**, Germany's **Siemens AG**, Swedish telecommunications player **Ericsson, Inc.** and France's **Alcatel.** The Pakistani Postal Telegraph and Telephone authority opened the bidding March 16 at its Islamabad headquarters.



Control Data

CONTINUED FROM PAGE 77

well CDC can manage its existing and future partnerships, these analysts said. For example, in addition to a relationship with Mips Computer Systems, Inc., CDC has repackaged workstations from Silicon Graphics, Inc. since 1988.

The company also has joint marketing agreements with Convex Computer Corp. and Cray Research, Inc. for supercomputing alternatives.

"We are outsourcing the architecture because of the open systems move," Ousley said. "But our strategy still requires we add value to the hardware. What we're doing is not designing the CPU but embellishing around it."

The philosophy applies not only to the CPU but also to the chips. Last October, CDC sold its VTC, Inc. bipolar semiconductor operation to a VTC management team. In January, it sold the remaining VTC CMOS integrated circuit operation to Cypress Semiconductor Corp.

Meanwhile, Japan's CSK Corp. picked up the Micrognosis trading-room systems unit.

Moving to strengthen its financial position, CDC sold its common stock in Seagate and Silicon Graphics earlier this year, generating $153 million in cash.

The first product to come from CDC's joint technology development agreement with Mips Computer will be announced imminently, Ousley said.

In addition, he said, CDC is actively seeking software partnerships. Last year, the company announced an alliance with Wolfsburg, Germany-based Volkswagen AG to develop and market computer-aided design, manufacturing and engineering systems. Ousley said talks with other "data management and communications" companies are under way.

"We hope to have some additional alliances by midyear," he said, adding that these discussions include both Japan- and U.S.-based companies.

Asked if CDC will suffer more reductions in staff, Ousley answered, "We believe [we're] as lean as we're going to get, assuming our strategies are effective."

Changing hats?

According to CDC, its traditional markets — engineering and scientific computing — have been in the vanguard of the shift from proprietary mainframes to open systems and distributed computing. This is a trend that, in turn, has spurred CDC to rethink its focus and replot its future.

A case in point is CDC customer Asea Brown Boveri Ltd., a large engineering company that until very recently was a 20-year user of Cyber mainframes.

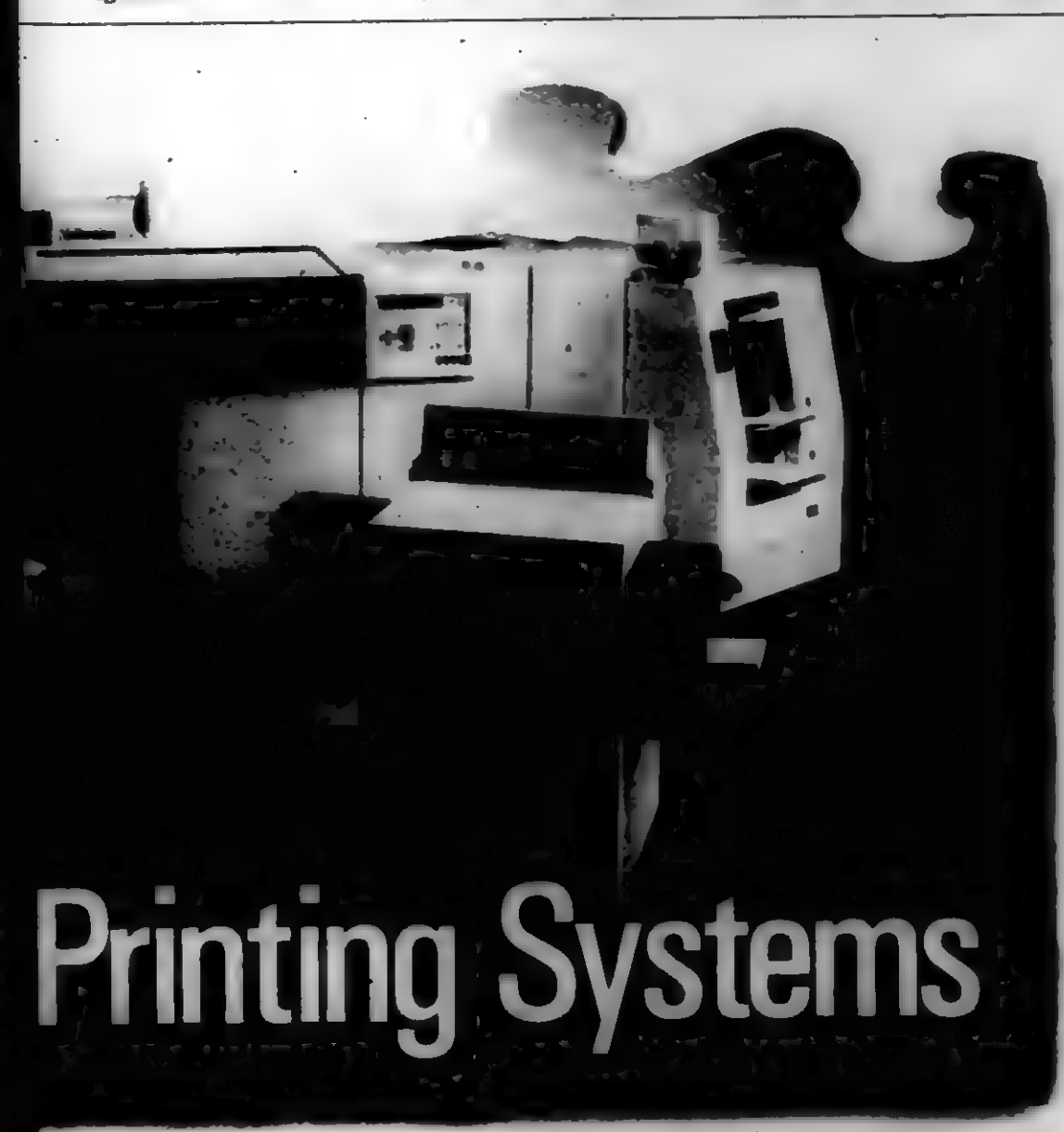
According to senior technologist Bob Kirkman, Asea made a dramatic and strategic choice to retire its top-of-the-line Cyber 990 mainframe in favor of a network composed of 80 workstations and four Unix servers.

"The big mainframe could do about 30 million instructions per second . . . The network will have 1,600 MIPS," said Kirkman, who works in the Zurich-based firm's Windsor, Conn., office. The price of the Hewlett-Packard Co. Apollo Division workstations was approximately $15,000 to $20,000 apiece, compared with $3 million to $4 million for the Cyber four years ago, he added.

Nevertheless, Kirkman did not abandon CDC. The four servers are CDC 4360-300s, reduced instruction set computing systems from Mips Computer that CDC introduced earlier this year. The server includes Awbus, an automated workstation backup system, another product offered by CDC this year.

CDC is ahead of [illegible] migration curve of the Cyber customer base of about 1,500 mainframes worldwide, "but not by much," according to Kirkman. Nevertheless, he said that from a technology and service standpoint, the company is far better suited to address the needs of data-intensive applications like his own than are workstation or start-up open systems vendors.

ELLIS BOOKER



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Efficiency not weapons provides defense jobs

BY CHRISTINE CASATELLI
SPECIAL TO CW

Despite the allied forces' victory in the Persian Gulf war, U.S. defense companies are not experiencing a boon in new contracts. However, specific areas of technology that can increase the efficiency of U.S. Department of Defense (DOD) information services are providing new opportunities for defense industry specialists.

Even after the high-technology showcase of Operation Desert Storm, hard times at home are forcing the DOD to curb weapons development. Defense contractors that can translate business applications to DOD operations will receive the biggest windfall.

The DOD has resolved to manage its glut of information more like a Fortune 500 company. To back up its claim, the department has set aside roughly $9 million each year for information systems, with nearly half of the money being allocated to new systems.

The DOD estimates this plan will save $847 million over four years through the Corporate Information Management program, which will eliminate duplicate systems and set computing standards for the Defense Department, according to Pentagon spokeswoman Susan Hansen.

Another area within the DOD that is doing well is technology research and development. R&D is actually getting a financial boost at a steady annual rate of 5%, according to Brett Lambert, research associate at Defense Forecasts, Inc.

New technologies favored by the military include computer-aided logistics support, which will help the DOD transmit digitized design information over networks, and geographic information systems, which allow screens of graphic data to overlay one another.

In addition, the U.S. House of Representatives designated Ada as the premier programming language for the Pentagon late last year. The Defense Appropriations bill for fiscal year 1991 specified that all DOD software would be written in Ada when it would be cost-effective, beginning in June.

Some defense contractors are making a gradual shift into these technologies and others, which can be adapted to civilian or commercial applications, according to Robert Dornan, vice president at Federal Sources, Inc. in Vienna, Va.

Because specialties in geographic information systems and computer-aided design and manufacturing are in high demand throughout the high-tech marketplace, anyone with experience in either technology should be able to sell that skill to agencies and corporations alike, Dornan says.

The tight job market also means that defense firms can be more selective about whom they hire. "What I'm seeing is that defense contractors are looking for people with degrees in the sciences — engineering and computer sciences — not just experience in office automation," says Jim Lauducci, director of membership services at the Armed Forces Communications and Electronics Association in Fairfax, Va.



Job seekers with technical degrees have more clout in today's competitive market, and their salary levels will reflect their level of specialized education, according to Lauducci.

"People that have experience in managing computer systems but don't have the right degree may be in for trouble," he warns.

Future in defense

The following summarizes the hiring outlook at some major defense companies:

Computer Sciences Corp.

About one-third of Computer Sciences Corp. (CSC) business depends on defense contracts, compared with close to 40% just two years ago. Although it has played a support role in weapons systems, CSC has made a bigger name for itself in the area of DOD administrative and logistics systems.

"Of the seven computer systems used in the Gulf war, four of them had CSC as the prime contractor," says Gus Siekierka, director of human resources at CSC's Systems Group in Falls Church, Va. CSC information systems handled battle simulations, materials management, airlift processing and personnel logistics for the U.S. forces in Operation Desert Storm, according to Siekierka.

Despite its success with Defense Department information systems, CSC has been moving aggressively into geographic information systems for corporate clients as well as for the Environmental Protection Agency and the National Weather Service.

United Technologies Corp.

United Technologies has reduced its percentage of DOD business from nearly 50% in the mid-1980s to approximately 25% today. "United Technologies has been increasing its amount of international and commercial revenues over the last 10 years," says Lyle French, manager of IS at the United Technologies office in Washington, D.C. "We're trying to become more diversified.

"There's not going to be a big refueling of the stockpile of weapons that were used in Operation Desert Storm," French says. Though the shift in defense spending seems to be toward IS, United Technologies is opting to concentrate its efforts on big-ticket DOD aircraft contracts and on jet engines and automotive applications in the commercial sector.

French suggests that IS professionals interested in defense work gain some experience in computer-aided design. "More and more of our work in design and manufacturing processes involve computers," he says. "There are also Tempest facilities we use when working on projects for the Defense Department, so some knowledge of that is helpful."

Grumman Corp.

The uncertainty of the defense budget has halted hiring at Grumman in Bethpage, N.Y., for the time being, says Gerry Kennedy, director for systems and standards at the aircraft company. But when more DOD contracts start hitting the streets, Grumman will be recruiting people with expertise in Ada and computer-aided software engineering, according to Kennedy.

Diversifying into different industries is not in the cards for Grumman, which relies on the DOD for more than 80% of its business. According to Kennedy, Grumman's attempts to move to other markets have not met with much success. The defense contractor has dabbled in the nonmilitary arena with an order for 100,000 U.S. Postal Service vehicles, but the DOD will continue to be its biggest customer.

"I think the key is to stick with what you do best," he concludes.

Casatelli is a free-lance writer based in Washington, D.C.

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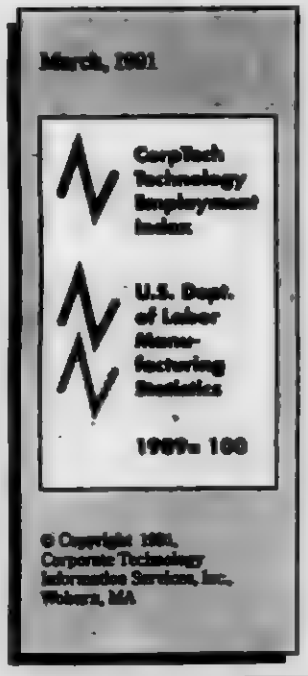
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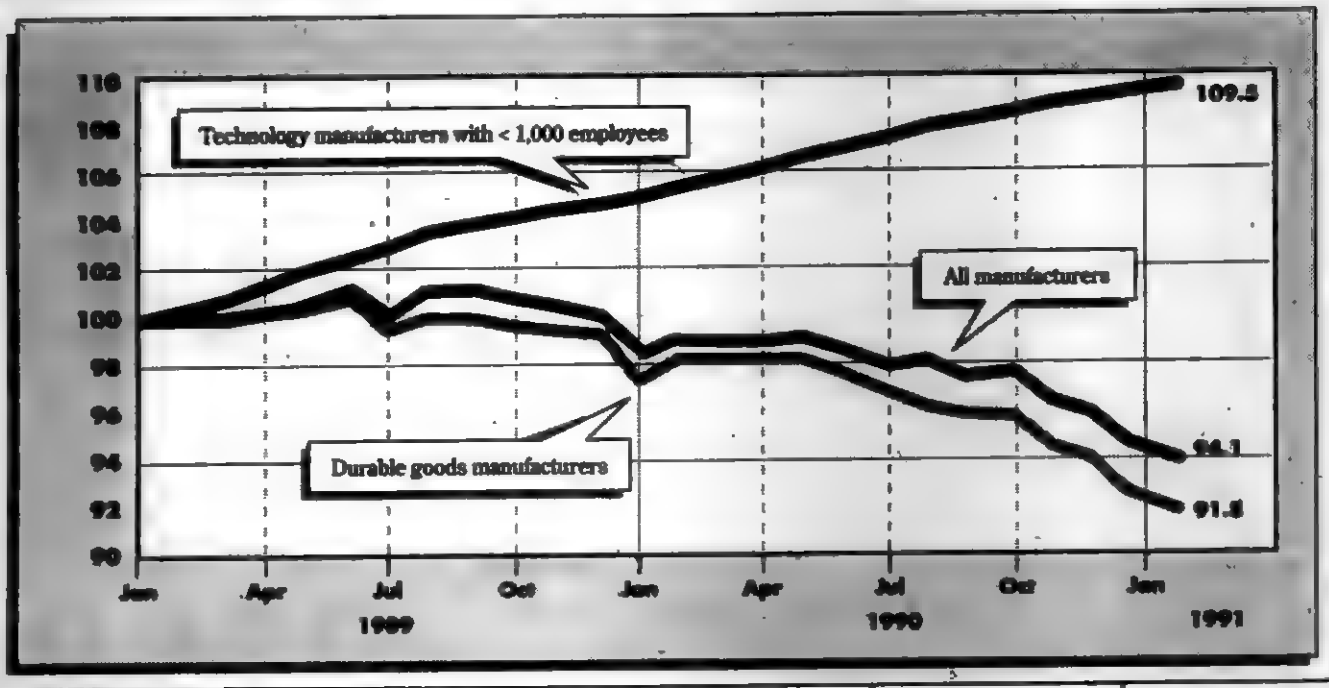
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System Software Engineer, WIN/NT Group Systems Division. By 5/8/91 please send resume to: Employment Security Department, ES Division, Att: Job #253101-J, Olympia, Washington 98504. Job Description: Designs, implements and tests complex and high level systems and software for micro computers. Works with other engineers to perform functional verification and system design review of components of message-driven graphical user interface for an advanced PC-based operating system, utilizing segmented memory architecture, database management algorithms, "C" language and MS-DOS and Windows operating systems. Assumes major project responsibility including: 1) requirements and analysis of project specifications, 2) product design, and 3) implementation schedules. Requirements: B.A. or B.S. in Electrical Engineering, Computer Science, Mathematics or Physics. Six months of work experience in programming or computer software design utilizing MS-DOS operating system, "C" language, segmented memory architecture, database management algorithms, and design and implementation of message-driven graphical user interface for a PC-based windowing operating system including graphic device drivers. Must have legal authority to work in the United States. Job location: Redmond, Washington. Salary: $29,000-35,000 per annum, depending on experience. 40 hours per week, flex time. EOE

Principal Software Engineer to participate in research and development of new distributed software systems technologies. Conduct search for advanced technologies for evaluation and dissemination within the company. Work as part of a team or leader of a major project section to design, implement, document and transfer to product development new tools, services and applications for constructing distributed software systems. Requirements are a Ph.D. in Computer Science and a background in theoretical analysis of distributed systems, knowledge of temporal Epistemics, Logical Routing Specification in Distributed Information Systems, Networking Architectures, Communication Protocols, Design and Synthesis of Algorithms, and Design and Implementation of Distributed Systems. No experience required. Salary $86,576.00 per year 40 hrs. per week. If you are interested in, and qualified for the above position, please forward your resume to: Massachusetts Division of Employment and Training, Special Programs Department, 19 Stanford Street, Boston, Ma. 02114, Case #1348.

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OPPORTUNITIES AT THE UNIVERSITY OF WISCONSIN-MADISON

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All positions have these general requirements: bachelor's degree, preferably in computer science or a related field; excellent oral and written communications skills and fluency in English; good organizational skills and ability to work independently.

ASSOCIATE INFORMATION PROCESSING CONSULTANT

This is a full-time vacancy in the Social Sciences Facility microcomputing laboratories (SSML). This position will provide systems and operations administration and consulting support for SSML.

Duties: Supervise the operation and maintenance of all lab hardware and software. This includes administering both Novell Netware and IBM PC LAN networks, ensuring software and disk backups are performed, performing diagnostic tests on lab hardware, installing peripherals and adapter boards, and making necessary arrangements for equipment repair; provide software usage consulting support for selected packages, organize and maintain lab software library and assist the lab project leader in evaluating and acquiring new software and hardware; provide second level systems and operations consulting support to faculty, graduate students, and other staff for all lab hardware and software.

Specific requirements: 2 years experience with MS/DOS and 1 year experience with Apple Macintosh systems, including systems and application software installation and maintenance; 1 year experience with IBM PC hardware maintenance, including troubleshooting failures, internal component installation, and hard disk preparation; familiarity with the Novell Netware network operating system; Ability to learn from manuals and through experimentation; experience with VAX/VMS, Unix, or statistical packages is desirable.

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Duties: Install and maintain VMS systems and layered products on DEC VAX mainframes and VAXStations in stand-alone or networked environments; maintain, expand or develop local system utilities; assist with INFOServer support for Consolidated Distribution of Digital Software; consult with faculty, staff, and students to assist in the analysis of hardware and software problems.

Specific requirements: Strong Operating System background, preferably VAX/VMS; strong programming background in either Fortran, C, or Pascal; understanding of operating system fundamentals.

Annual salary is between $26,000 to $36,000 depending on qualifications and experience.

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Duties: Network planning; day-to-day operational problem-solving; faculty, staff, and student consulting and education; documentation and integration of Madison activities with national networks, including Internet, NSFNet, CICNet, WiscNet, and BITNet.

Specific requirements: Experience in network support, or VMS system support, or Unix systems support; experience in teaching/consulting on the use of network hardware, access to resources, and extension of services to new locations, team problem solving experience; the ability to assist individuals who have varying skill levels; course work or experience with Local Area and Wide Area network hardware; TCP/IP, DECNet, or Unix is a plus; a bachelor's degree in Computer Science, Electrical or Computer Engineering is preferred.

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Nominations and applications, including c.v.'s and lists of referees, should be sent by 25 April 1991 to: **UNU/IIST Search Committee, c/o Personnel Services, United Nations University Headquarters, Toho Seimei Building, 15-1, Shibuya 2-chome, Shibuya-ku, Tokyo 150, Japan. (Fax: 03-3499-2828)**

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SOURCE: Stat Survey of Computerworld's Audience, May 1990.

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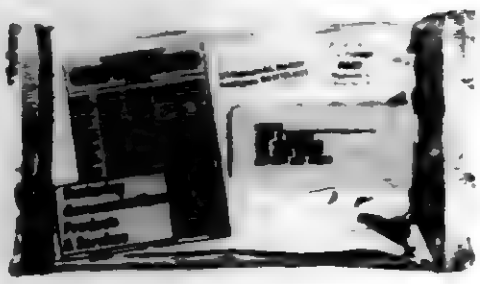
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COMPUTERWORLD
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Don't get caught holding the bag

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY ERIC A. SAVAGE
SPECIAL TO CW

Consultants can be worth their weight in gold when it comes to swaying upper management on expensive IS proposals, but taking some simple, often overlooked precautions is essential to keeping them from becoming a legal problem.

• **Rule No. 1 — Put contracts in writing.** This is the first and most important rule. The nature and scope of a consulting engagement must be spelled out as precisely and objectively as possible so that the client and consultant know what to expect of each other.

This advice may seem almost insultingly simplistic. Unfortunately, the courts are replete with disputes between users and consultants triggered by the lack of a contract or by one that was poorly drafted.

Perhaps the most significant computer case in the past few years — and a powerful illustration of this rule — was *Diversified Graphics Ltd.* v. *Groves*, in which Ernst & Whinney was found to have failed to meet a professional standard of care in carrying out a consulting job.

The decision of the federal court of appeals edged very close to permitting a claim for computer malpractice (a theory that federal and state courts had rejected until then) and sustained a large monetary award.

However, the parties had never signed a retainer agreement spelling out whether Ernst & Whinney was supposed to review proposals and recommend a system, as it claimed, or supervise the installation, as the customer argued.

Such a fundamental disagreement is entirely avoidable with a written contract.

• **Rule No. 2 — Pin down fine details of the contract.** Specify the deliverables, define key terms, set deadlines and formulate the objective criteria by which the project will be assessed. This may seem simplistic or a waste of time, particularly when the project is on an expedited basis, but problems are far more likely to arise for IS managers who spend first and ask questions later.

• **Rule No. 3 — Decide who will retain the copyright.** As a general rule, the copyright to works prepared by employees in the course of their employment belongs to the employer under what is known as the "work for hire" rule set forth in the Copyright Act.

The rules governing copyright of works prepared by outside consultants are less clear and create only a presumption that the copyright will be owned by the client. This presumption can be defeated if the consultant can show that the express or implied terms of the contract reserve the copyright to the consultant. A specific contract provision allocating the copyright can prevent a costly dispute later.



As is typically the case, the ultimate decision is a business matter rather than a legal issue. These questions become legal problems when incomplete contracts force parties into court.

• **Rule No. 4 — Link payment of consultant to successful installation of project.** Another commonsense technique for ensuring maximum attention to client satisfaction is to have a significant percentage of the consultant's fee held until after the system is up and running for a specified period of time. Tying payment to objective performance criteria and successful installation is the best way to guarantee that a consultant will not disappear before the last acceptance test is finished.

• **Rule No. 5 — Determine consultant accountability.** In other words, find out who will be responsible if the consultant recommends the wrong equipment or writes a software package that doesn't work. There are two issues to be aware of: Many consulting engagements begin with a vendor's recommendation of a particular consultant to perform a job, but that doesn't mean you can hold the vendor accountable for the referral.

A federal court of appeals decided in *Electro-Matic Products, Inc.* v. *Prime Computer, Inc.* that a vendor's recommendation by itself does not make the vendor in any way responsible for the conduct of the consultant.

Clients that are seeking greater protection should try to directly involve the vendor in the project, either through a written guarantee of performance or by having the vendor review the consultant's plans and the company's IS needs.

The second issue to consider is that most consultants do not carry insurance for their work, especially if they are truly independent consultants. It's better to find out before the hiring stage if there is an insurance policy than it is to find out after the fact.

• **Rule No. 6 — Make provisions to obtain source code from the consultant if he goes out of business.** If you hire a consultant to develop a program for you, part of his responsibility is to update and modify it. If he suddenly goes bankrupt or is unable to continue performance for any reason, you'll need to access the source code.

A popular way to handle a situation like this is to deposit the source code in escrow with a third party subject for release upon specific events such as filing of bankruptcy, assignment of benefit for creditors or closing of [redacted].

This should be done through a written escrow agreement, preferrably directly through a third party.

Obviously, each consultant engagement is unique. Nonetheless, an IS manager would do better to take the time to iron out the details now rather than later, when it may be too late.

Savage practices law at the Newark, N.J., and New York law firm of Hellring, Lindeman, Goldstein & Siegel.

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The BoCoEx index on used computers
Closing prices report for the week ending March 29, 1991

	Closing price	Recent high	Recent low
IBM PC Model 170	$250	$450	$200
XT Model 089	$450	$550	$400
AT Model 099	$650	$775	$500
AT Model 239	$725	$925	$700
AT Model 339	$875	$1,000	$800
PS/2 Model 30-286	$1,100	$1,300	$1,000
PS/2 Model 60	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,300	$3,500	$3,000
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,350	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$2,200	$2,500	$1,900
Deskpro 286	$750	$1,000	$700
Deskpro 386/20	$2,150	$3,000	$2,000
Apple Macintosh Plus	$750	$975	$700
SE	$1,070	$1,250	$1,000
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Marketplace Section:
Legal eye column
Executive Report: *Workforce Education*
Close: *April 9*
15

Marketplace Section:
Should you maintain spare parts for your own repairs?
Product Spotlight: *CASE Tools*
Close: *April 16*
22

Marketplace Section:
Purchasing through retail channels
Executive Report: *How CEOs and CFOs Evaluate IS*
Close: *April 23*
29

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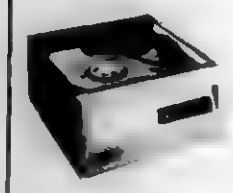
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Managers roll up their sleeves, get involved

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BY ALICE LAPLANTE
SPECIAL TO CW

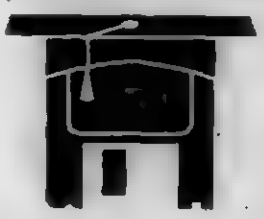
If information systems managers could make three wishes about the graduates they hire from top IS programs, they'd most certainly ask for the same old stuff: business brilliance, crisper communications skills and more relevant technical training. But today, many IS managers aren't waiting for dreams to come true. They're providing the finishing touches themselves through training programs, college advisory boards and more selective hiring.

In an effort to more closely match what businesses want with what IS schools deliver, many managers are becoming more finicky in their hiring processes.

Hershey Foods Corp.'s systems development manager Kent Stapleton searches for graduates who elected to take more IS-oriented classes over those who concentrated on pure computer science. Students who focused entirely on technical issues are usually suitable only for systems programming positions, according to Stapleton.

"There's nothing wrong with systems programmers — we couldn't get along without them — but the number of those kinds of jobs is limited, whereas the number of jobs for business applications development is much larger," Stapleton says.

Other managers look carefully at the kind of technical training graduates receive. Randy Johnson, manager of an IS management training program at General Electric Co. in Bridgeport, Conn., says he looks for graduates with a strong grounding in traditional IS areas.



"Some of the programs at the schools are so state-of-the-art-oriented that they focus on technologies just arriving. For practical everyday use, it's not always a good match," Johnson says.

Well-developed interpersonal skills are also placed high on managers' selection lists. As a result, the managers prefer IS programs that encourage students to work in groups to solve problems or complete projects.

"It's essential that the students have had a chance to work on a team and that they are able to communicate well with coworkers," says Bard White, director of MIS at Spalding Sports Worldwide in Chicopee, Mass. "We'll take someone who works well with others over a technical wizard any day."

Kurt Green, manager of IS at Eli Lilly & Co. in Indianapolis, says Indiana University's IS program is especially good because the students spend a lot of time in teams of four or five people working on projects in an atmosphere that is comparable to the workplace.

Once they hire a graduate, many IS managers find it helpful to sharpen the new recruit's business and interpersonal skills by rotating him through different areas of the company to learn the business.

At Spalding, the new IS graduates are rotated through different positions within the entire company to learn about the culture — and the business — they will be designing systems for, according to White.

"We expose them to users right away, even before they begin coding," White says. "Then we send them outside of Spalding to make customer visits, attend trade shows and learn about our products and the competition."

Spalding hires four or five MBAs with specialization in IS per year and starts them as programmer/analysts in one of the firm's computing centers, but not before they learn about the business environment, something they simply don't get from school.

Joining the universities

For some managers, the best plan of action to get the types of IS graduates they want is to roll up their sleeves and join college advisory boards. Although it takes time, becoming involved in helping to shape an IS program ultimately helps managers because the graduates are better prepared when entering the work force.

As a member of an advisory committee at Pennsylvania State University at Harrisburg, Stapleton volunteered to help structure the curriculum so graduates would be better qualified for jobs within corporate IS.

"Recently, they sent out their proposed curriculum and asked us for our input," Stapleton says. "I told them it seemed like there was an awful lot of emphasis on computer programming, computer architectures and things like that. I thought they should increase their emphasis on business analyses and on the systems development life cycle."

Green, who received an IS degree from Indiana University 16 years ago, is active on the corporate advisory council at Indiana's computer science department as well as a similar committee that advises the business school. He says the school is "very responsive" to suggestions from the business community.

"We've seen some very good changes implemented recently and are eager to see how they will work out," Green says. A recent change to the IS undergraduate degree in the business school was to shift the program from being quantitatively based to having a greater focus on the application of technology to address business objectives.

"If your company does not get involved with the schools you recruit from and take an active role, you have to take what you get," says Jim Carlson, manager of human resources at K Mart Corp. in Troy, Mich. Carlson is very involved with several universities' IS programs.

However, the managers stress that there is simply no way any school — no matter how brilliant the teaching staff or well-endowed the facilities — can approximate the range and complexity of a corporate IS department.

"Compared to the variety of hardware and software we use here, what they learn in college is approximately 10% of the real world," says Paul Summer, MIS supervisor at Owens-Corning Fiberglas Corp. in Amarillo, Texas. "If the schools provide a solid grounding, we can do the rest."

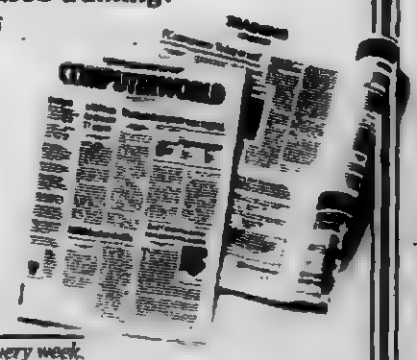
LaPlante is a free-lance writer based in Palo Alto, Calif.

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April Training Editorial Topics

15 A former Saudi Arabian-based IS trainer describes the difference between there and here.
Executive Report: *Workforce Education*
Close: April 9

22 What's new with computer-based training?
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INDICATORS

Fiscal first-quarter financial statements are slated to start tumbling in next week, but the full impact of the current economic downturn remains unclear. Meanwhile, Clifford Friedman, large-systems analyst at Bear Stearns & Co. in New York, is trying to put the current recession obsession in perspective.

The U.S. and other countries are moving through a "global, rolling recession," Friedman said. The U.S. and the UK sank first and will emerge from business depths just as the German, French, Italian and Asian economies become increasingly sluggish, he added.

Thus, his investment strategy targets smaller hardware companies with strong domestic franchises that rely on international sales for less than 50% of their total revenue.

Another factor to consider is what Friedman called the "technology food chain," which indicates that large-systems vendors were pounded first and hardest by the business slowdown, while sectors such as semiconductors, peripherals and networking have suffered least.

RECOMMENDATION CHANGES

UPGRADED FROM HOLD TO BUY: Electronic Data Systems Corp. (EDS) (Prudential Securities, Inc.). Reason: Previous cautious opinion stemmed from reversals on two business deals, but EDS has done an excellent job signing up new long-term customers. EDS is the outsourcing vendor of choice in the 1990s.

UPGRADED FROM HOLD TO BUY: Linear Technology Corp. (Prudential). Reason: Firm profits from solid management and long product cycles for its analog semiconductors; 12-month target price is $21.

UPGRADED FROM NEUTRAL TO OUTPERFORM: Xicor, Inc. (Shearson Lehman Brothers, Inc.). Reason: At Shearson Lehman Brothers' Selected Growth Stock conference, Xicor executives said erasable programmable read-only memory chip orders were up and implied that the company will return to profitability by year's end.

UPGRADED FROM OUTPERFORM TO BUY: Integrated Device Technology, Inc. (Shearson). Reason: Stock valuation is now low; buy shares until they reach $7.50.

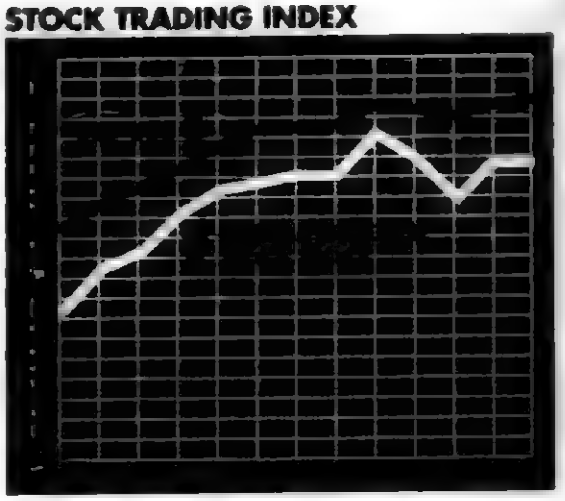
DOWNGRADED FROM STRONG BUY TO BUY: Equifax, Inc. (Bear Stearns). Reason: Acquisition of Telecredit, Inc. makes earnings unpredictable; current quarter will likely be flat compared with the same period last year.

DOWNGRADED FROM BUY TO NEUTRAL: Software Publishing Corp. (Alex. Brown & Sons, Inc.). Reason: North American shipments of flagship product Harvard Graphics below company's expectations, cutting into current quarter profits; predicates more conservative view of business for the remainder of the year.

DOWNGRADED FROM BUY TO HOLD: Advanced Micro Devices, Inc. (AMD) (Prudential). Reason: Stock price tripled since October 1990, pushed up primarily by excitement over the firm's clone of Intel Corp.'s 80386 chip. Although AMD has already started shipping the clone, it will not significantly contribute to profits for another few quarters.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Microsoft Corp. rocketed 7⅝ points to 113¾ after news spread last week that it had signed a graphics licensing agreement with Silicon Graphics, Inc. However, Silicon Graphics lost 3 points to close at 36⅝. Compaq Computer Corp., which now owns 13% of Silicon Graphics, fell ⅛ of a point to 62½.
- NCR Corp. slipped 1⅝ points last week, closing Thursday at 97¾, as its standoff with AT&T continued. AT&T, meanwhile, inched up ¼ of a point to 34½.
- Other technology shares bounced around. Digital Equipment Corp. sank to 64⅝, losing 3½ points, while Apple Computer, Inc. stepped up 3½ points to 71½. Pyramid Technology Corp. rose 3 points to 27.
- Among semiconductor firms, Dallas Semiconductor Corp. and Exar Corp. reached new highs. Dallas closed Thursday at 11⅛, up one point, and Exar jumped 2¾ points to 18¾. Texas Instruments, Inc. also picked up 2¾ points, closing at 42⅝.

Computerworld Stock Trading Summary

CLOSING PRICES FRIDAY, APRIL 5, 1991

TOP PERCENT GAINERS

Masstor Systems	38.38
Ariel Communication Corp.	23.53
Oracle Systems	18.08
EMC Corp.	17.72
Seagate Technology	17.19

TOP PERCENT LOSERS

Datapoint Corp.	-30.43
MAI Systems Corp.	-21.37
Intellicorp Inc.	-20.00
Wang Labs	-18.94
Fibronics Int'l Inc.	-18.66

TOP DOLLAR GAINERS

Novell Inc.	6.88
Adobe Systems Inc.	5.00
Matsushita Electronics	4.75
Symantec Corp.	4.75
Microsoft Corp.	3.88
Silicon Graphics	3.13

TOP DOLLAR LOSERS

Legent Corp.	-6.00
Digital Equipment Corp.	-4.25
BMC Software Inc.	-3.75
Wang Labs	-3.13
Cray Research Inc.	-3.13

Exch	52-Week High	52-Week Low		April 5 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Up 0.23%
OTC	19.00	5.38	3 COM Corp.	9.50	0.25	2.70
NYS	69.75	52.50	American Info Techs Corp.	66.38	-0.63	-0.93
NYS	44.13	29.00	AT&T	34.00	-0.25	-0.73
OTC	8.63	0.88	Ariel Communication Corp.	2.63	0.50	23.53
NYS	58.25	39.50	Bell Atlantic Corp.	48.75	-1.63	-3.16
NYS	57.63	48.00	Bellsouth Corp.	51.50	-1.75	-3.29
NYS	41.25	13.13	Cabletron Systems	37.63	1.63	4.51
OTC	25.88	9.25	Compression Labs Inc.	23.63	0.63	2.72
NYS	41.25	23.38	Contel Corp.	41.00	0.00	0.00
OTC	5.13	1.88	Data Switch Corp.	4.38	-0.25	-5.41
NYS	28.75	8.88	Digital Comm. Assoc.	19.50	1.88	10.64
OTC	25.25	12.25	Dynatech Corp.	21.25	1.00	4.94
OTC	12.88	5.50	Fibronics Int'l Inc.	9.25	-2.13	-18.66
OTC	4.00	1.75	Gandalf Technologies Inc.	3.13	0.13	4.17
NYS	4.50	1.63	General Datacomm Inds.	2.63	-0.25	-8.70
NYS	34.13	23.50	GTE Corp.	32.00	0.38	1.19
OTC	0.25	0.75	Inacom Systems Corp.	1.75	0.00	0.00
NYS	60.88	40.25	ITT Corp.	57.88	1.25	2.21
OTC	44.13	17.88	MCI Communications Corp.	26.25	0.63	2.44
OTC	21.00	2.75	Microcom Inc.	8.25	0.00	0.00
NYS	18.25	4.00	Network Equipment Tech.	7.50	-0.50	-6.25
OTC	14.63	4.00	Network General	8.00	-0.50	-5.88
OTC	15.50	8.13	Network Systems Corp.	12.38	-0.38	-2.94
NYS	32.00	22.13	Northern Telecom Ltd.	31.75	0.38	1.20
OTC	57.38	17.25	Novell Inc.	57.38	6.88	13.61
NYS	69.50	57.00	Nynex Corp.	72.13	-0.38	-0.52
NYS	47.88	38.25	Pacific Telesis Group	41.50	-1.50	-3.49
ASE	15.13	4.75	Peritl Corp.	14.63	1.00	7.34
NYS	29.13	8.88	Scientific Atlanta Inc.	15.38	-2.13	-12.14
NYS	69.50	47.25	Southwestern Bell Corp.	53.38	-2.75	-4.90
NYS	46.38	30.63	United Telecom	24.75	0.75	3.13
NYS	40.75	32.38	US West Inc.	39.00	-0.13	-0.32
Computer Systems						Off 0.55%
OTC	8.75	0.59	Alliant Computer Sys.	1.63	0.00	0.00
ASE	18.88	10.00	Amdahl Corp.	15.88	0.25	1.60
OTC	72.75	24.25	Apple Computer Inc.	69.38	1.38	2.02
OTC	13.88	4.25	Archive Corp.	7.75	-0.88	-10.14
OTC	31.75	7.50	AST Research Inc.	29.50	2.25	8.26
NYS	7.38	3.88	Bolt, Beranek & Newman	7.00	0.00	0.00
NYS	20.88	4.50	Commodore Int'l	20.88	2.50	13.61
NYS	74.25	36.50	Compaq Computer Corp.	62.50	-0.13	-0.20
OTC	2.50	0.13	Computer Automation Inc.	1.00	0.00	0.00
NYS	21.63	6.75	Control Data Corp.	12.13	0.13	1.04
NYS	20.88	8.38	Convex Computer	15.38	-1.38	-8.21
NYS	51.25	20.00	Cray Research Inc.	35.50	-3.13	-8.09
NYS	14.38	3.50	Data General Corp.	14.38	1.25	9.52
NYS	3.25	0.75	Datapoint Corp.	2.00	-0.88	-30.43
OTC	30.38	7.63	Dell Computer Corp.	28.75	0.25	0.88
NYS	96.13	46.50	Digital Equipment Corp.	63.88	-4.25	-6.24
NYS	36.13	13.75	Harris Corp.	28.50	1.13	4.13
NYS	51.75	24.88	Hewlett Packard Co.	50.00	0.00	0.00
NYS	130.75	99.25	IBM	113.13	-0.88	-0.77
OTC	14.00	7.75	Information Int'l	8.75	0.50	6.06
OTC	28.50	10.50	Intergraph	28.50	1.25	4.59
NYS	3.13	0.50	MAI Systems Corp.	0.88	-0.19	-21.37
NYS	149.88	114.00	Matsushita Electronics	128.75	4.75	3.83
OTC	26.00	9.00	Mentor Graphics Corp.	16.63	1.38	9.02
NYS	100.50	44.50	NCR Corp.	98.88	-2.63	-2.64
OTC	35.50	11.00	Pyramid Technology	28.50	2.50	10.42
OTC	34.00	9.75	Sequent Computer Sys.	16.00	-1.75	-9.86
NYS	47.25	18.00	Silicon Graphics	36.75	-3.13	-7.84
NYS	35.13	14.63	Stratus Computer Inc.	33.00	-1.25	-3.65
OTC	37.25	15.00	Sun Microsystems Inc.	31.75	0.00	0.00
NYS	29.88	8.88	Tandem Computers Inc.	14.13	0.38	2.73
NYS	38.50	23.50	Tandy Corp.	33.25	0.88	2.70
OTC	33.25	6.75	Teradata	19.00	1.00	5.56
NYS	7.88	1.38	Ultimate Corp.	4.88	0.25	5.41
NYS	15.88	1.75	Unisys Corp.	5.13	0.13	2.50
ASE	5.75	2.00	Wang Labs Inc. (a)	4.00	-0.38	-8.57
Software & DP Services						Up 0.50%
OTC	59.00	17.00	Adobe Systems Inc.	39.00	5.00	9.26
OTC	36.75	16.75	Atlas Corp.	66.75	3.38	8.57
OTC	25.50	12.00	American Mgmt. Systems	25.50	0.50	2.00
OTC	16.25	7.50	American Software Inc.	11.50	-1.25	-9.80
NYS	4.63	1.38	Anacomp Inc.	4.13	0.00	0.00
OTC	23.50	10.00	Analysts Int'l	16.00	0.00	0.00
OTC	13.25	4.88	Ashton Tate	9.00	0.38	4.35

Exch	52-Week High	52-Week Low		April 5 Close	Wk Net Change	Wk Pct Change
OTC	10.25	4.00	ASK Computer Sys.	7.75	0.00	0.00
NYS	87.00	46.25	Auto Data Processing	86.00	0.63	0.87
OTC	80.25	32.00	Autodesk Inc.	49.75	-0.75	-1.49
OTC	31.50	13.50	BGS Systems Inc.	28.50	-1.00	-3.39
OTC	43.88	17.75	BMC Software Inc.	38.50	-3.75	-8.88
OTC	21.50	11.00	Boole & Babbage Inc.	14.75	-0.75	-4.84
OTC	61.50	14.00	Borland Int'l	60.25	2.25	3.88
NYS	9.88	0.88	Businessland Inc.	1.88	-0.25	-11.76
OTC	18.63	5.13	Cognos Inc.	15.88	0.88	5.83
NYS	18.88	4.38	Computer Associates	9.25	0.38	4.23
OTC	17.75	10.25	Computer Horizons	14.00	1.50	12.00
NYS	68.25	38.75	Computer Sciences	66.25	-0.25	-0.38
NYS	11.75	6.63	Computer Task Group	10.13	0.25	2.53
OTC	25.25	13.00	Comshare Inc.	21.25	0.50	2.41
OTC	15.00	3.75	Corporate Software	9.75	-1.50	-13.33
NYS	47.13	27.88	General Motors E (EDS)	47.13	3.25	7.41
OTC	18.75	7.25	Goal Systems Int'l	14.25	-0.75	-5.00
OTC	5.88	1.88	Hogan Systems Inc.	5.38	0.25	4.88
OTC	19.75	7.75	Information Resources	18.88	0.00	0.00
OTC	17.50	2.63	Informix Corp.	5.75	0.50	9.52
OTC	7.88	1.38	Intellicorp Inc.	2.00	-0.50	-20.00
OTC	8.00	2.50	Interleaf Inc.	7.75	1.13	16.98
OTC	40.50	10.00	Knowledgeware Inc.	40.25	0.38	0.94
OTC	45.00	16.75	Legent Corp.	33.00	-6.00	-15.38
OTC	39.25	12.50	Lotus Development	28.00	1.75	6.67
OTC	32.00	13.88	Microgrids	18.00	0.25	1.41
OTC	113.00	80.75	Microsoft Corp.	110.00	3.88	3.65
NYS	10.50	4.00	On Line Software Int'l	8.25	-0.13	-1.30
OTC	24.00	4.88	Oracle Systems	10.63	1.63	18.08
NYS	18.13	7.00	Pansophic Systems	11.25	-0.50	-4.26
OTC	8.88	1.25	Phoenix Technologies	8.88	0.50	5.97
NYS	52.00	31.88	Policy Management Sys.	50.75	1.75	3.57
NYS	23.63	11.50	Reynolds & Reynolds	20.00	0.75	3.90
OTC	16.13	6.88	Sage Software Inc.	10.38	0.00	0.00
OTC	35.50	14.75	SEI Corp.	24.50	-0.25	-1.01
OTC	19.13	12.25	Shared Medical Systems	16.50	-1.00	-5.71
OTC	36.25	12.00	Software Publishing Corp.	20.75	0.38	1.22
NYS	14.38	6.50	Sterling Software	13.75	0.38	2.80
OTC	26.00	9.50	Sungard Data Sys.	16.25	0.25	1.57
OTC	53.00	17.75	Symantec Corp.	53.00	4.75	9.84
NYS	24.50	4.50	System Center Inc.	7.50	0.75	11.11
OTC	37.25	12.75	System Software Assoc.	17.25	-2.50	-12.66
OTC	27.38	4.75	Wallach	13.38	-3.13	-18.94
Semiconductors						Up 2.50%
NYS	25.88	19.38	Advanced Micro Devices	23.88	1.88	8.52
NYS	11.88	5.50	Analog Devices Inc.	11.25	0.00	0.00
OTC	21.75	6.25	Chips & Technologies	10.50	-0.25	-2.33
OTC	62.75	28.00	Intel Corp.	46.25	1.50	3.21
NYS	13.00	5.13	LSI Logic Corp.	9.00	-0.50	-5.26
NYS	17.38	6.75	Micron Technology	17.00	0.88	5.43
OTC	23.25	7.25	MIPS Computer Systems	19.75	2.00	11.27
NYS	69.38	46.75	Motorola Inc.	57.75	0.50	0.87
NYS	8.63	3.00	National Semiconductor	7.38	0.25	3.51
NYS	46.75	22.50	Texas Instruments	41.50	1.63	4.09
OTC	12.25	3.00	VLSI Technology	8.75	0.50	5.41
ASE	14.88	4.00	Western Digital Corp.	5.13	-0.25	-4.66
Peripherals & Subsystems						Up 3.92%
OTC	1.38	0.09	Alloy Computer Prod.	0.50	0.00	0.00
OTC	2.50	0.88	Ampitus Technologies	2.38	0.13	5.56
OTC	24.00	7.50	Banctec Inc.	13.25	0.00	0.00
ASE	10.75	4.13	Cognitronics Corp.	10.75	0.25	2.38
NYS	31.25	14.63	Conner Peripherals	23.88	-1.13	-4.50
ASE	22.00	7.00	Datarem Corp.	10.50	-0.38	-3.45
NYS	11.63	4.25	EMC Corp.	11.63	1.75	17.72
NYS	47.25	33.75	Eastman Kodak Co.	42.38	-1.25	-2.87
OTC	10.00	4.38	Emulex Corp.	8.25	-0.25	-2.93
OTC	34.50	14.00	Evans & Sutherland	21.00	-0.50	-2.33
OTC	8.50	3.75	Iomega Corp.	5.94	0.56	10.47
OTC	28.25	6.75	IPL Systems Inc.	23.25	0.00	0.00
OTC	1.75	0.13	Masstor Systems	1.13	0.31	38.38
OTC	17.88	2.63	Maxtor Corp.	5.25	0.00	0.00
OTC	14.00	3.88	Micropolis Corp.	14.00	1.63	13.13
NYS	93.75	73.63	3M Corp.	88.63	0.13	0.14
OTC	14.50	6.00	Pyramid Inc.	9.25	-1.25	-11.90
NYS	22.75	8.50	QMS Inc.	22.75	0.88	4.00
OTC	27.25	12.38	Quantum Corp.	24.13	-0.38	-1.53
NYS	8.13	4.38	Recognition Equipment	5.88	0.00	0.00
OTC	9.88	4.00	Reson Inc.	9.50	1.25	15.15
OTC	18.75	5.63	Seagate Technology	18.75	2.75	17.19
NYS	37.00	11.00	Storage Technology	37.00	3.75	11.28
OTC	4.00	1.25	Tandon Corp.	3.31	-0.06	-1.84
NYS	24.50	11.63	Tektronix Inc.	24.50	1.25	5.38
OTC	0.63	0.19	Televideo Systems	0.38	0.00	0.00
NYS	69.25	29.00	Xerox Corp.	57.00	0.00	0.00
Leasing Companies						Off 1.09%
OTC	16.88	8.88	Amplicon Inc.	16.25	0.00	0.00
OTC	4.38	0.31	Capital Associates	0.44	-0.06	-8.27
NYS	28.38	14.63	Comdisco Inc.	26.00	0.25	0.97
OTC	16.25	9.25	LDI Corporation	13.75	0.25	1.85
OTC	5.00	2.38	Selectarm Inc.	4.00	0.00	0.00

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Wang to focus on work groups

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. unveiled its Office 2000 strategy last week, drawing a faint outline of future directions and singling out the departmental work group as Wang's target customer.

Richard W. Miller, Wang's chairman and chief executive officer, issued a six-page letter to customers that outlined the strategy's "building blocks."

The letter gave little mention of the future of the VS system, but Miller said in an interview last week that Wang would continue to upgrade VS in terms of both price and performance and that users could expect significant announcements in terms of connectivity.

While specifics are not yet available, Miller said there will be subsequent announcements and distribution of materials "as we go forward" with the next mailing scheduled for mid-April.

"The purpose of the letter was to describe a process for rolling out a strategy," Miller said.

At this point, the Office 2000 focus is on targeting work groups within defined strategic markets, including financial services, government, legal and professional services, manufacturing and health care.

Wang's document said the company will aim to bridge the gap between enabling technologies and work-group reorganization by building work flows tailored to business processes, but it provided no specifics.



Customers are waiting for Wang to sketch in further details. "Office 2000 is very broad at this point," noted Matthew J. Gillman, president of the U.S. Society of Wang Users. "Getting strategy in place is a good thing, but we need more details."

John T. Crawford, vice president of information management at The Hartford Insurance Group, observed that the policy could prove beneficial to users if Wang can provide the same price, performance and CPU capacity on its open systems products that are currently offered in the VS domain.

Crawford added that he is waiting for the next wave of Office 2000 announcements and is eager to learn the specifics on upcoming plans for the VS line. The Hartford has approximately 100 VS systems installed nationwide.

A Wang customer at a large VS installation on the West Coast who did not want to be identified viewed the announcement favorably.

"Wang has finally stated a direction toward open systems and open architecture, which was absolutely 'essential,'" the customer said. "They had no choice."

Ann Palermo, an industry analyst at International Data Corp. in Framingham, Mass., said Wang has realistically relinquished enterprise-oriented business to Digital Equipment Corp. and IBM.

"Wang's recognition of the work group puts them into the land of opportunity," Palermo said, adding that the field is wide open, and there are no other definitive, existing solutions.

Office 2000 will be implemented in phases during the remainder of 1991.

Upgrade uproar

Wang Laboratories angered the third-party/used equipment community last week by stating that its proprietary VS operating system has a nontransferable license policy.

The action could make it difficult for customers to buy and sell used Wang computers. VS operating system licenses used to be transferable for a $1,000 fee, sources said.

Wang maintained that transfer licensing fees for the VS operating system range from $2,000 for a VS 5 to $100,000 for a top-of-the line VS 10000 machine.

Wang officials contended the company is clarifying policies that have been in place since 1987, but both users and used equipment dealers disagreed.

"What I know about it gives me concern as a user, as it takes money directly out of my pocket," said Stanley C. Hatch, a principal at Hatch & Parent, a law firm in Santa Barbara, Calif. The firm is a seven-year Wang customer and has always been pleased with Wang technology.

"As soon as Wang starts enforcing this policy, people are going to protest, and Wang is going to see what a truly poor policy it is," Hatch said.

Titled "A Simple Message to Customers," Wang's recent communique said that if a user buys a complete, used VS CPU from a third party, the former owner can ask Wang to transfer the license to the buyer, and if said owner has a valid operating system license, Wang will conduct the license transfer.

The former owner is prohibited from selling any Wang applications with the VS computer. Also, if a customer buys a board-level upgrade from a third-party vendor, the customer must purchase a complete new operating system license.

In either case, according to Wang, customers must acquire the necessary operating system licenses before Wang will install or support the procured hardware.

SALLY CUSACK

Firestone

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Various software components and documentation either were delivered late or not at all or did not work well with Firestone's computer platforms or the private, integrated voice and data network it created for the project, the suit charges.

Firestone officials declined to comment on the lawsuit or the status of the Mastercare project last week.

Oracle's court memorandum began by asserting that "Firestone seeks to expand a straightforward breach of written contract claim ... into a multifaceted donnybrook."

The Belmont, Calif.-based software firm has asked the court to dismiss certain claims in the suit and strike what it calls "excessive damage claims."

Oracle initiated the legal action. On Feb. 21, it filed a complaint in Superior Court in San Mateo, Calif., for $1.358 million, the balance of the $2.05 million contract.

The case could hinge on whether the court sides with Firestone in believing that the written contract was predicated on the representations made in earlier Oracle oral statements and written presentations.

The written contract, Oracle maintained, contains language stating that the written contract supersedes all previous agreements, written or oral.

Even if the court finds in favor of Firestone for all its allegations, an addendum to the written contract limits Oracle's liabilities to $2 million, Oracle corporate counsel Cynthia Greco Herr said.

Blameless

According to Herr, one pillar of Oracle's defense will be that the fault lies not with Oracle's products but with Chicago-based TSC, the onetime systems integrator on the project. TSC is not named in either the Firestone complaint or the Oracle memorandum.

"TSC designed this project," Herr said, adding that the plans for the system changed repeatedly and that TSC did not know how to use Oracle software or work with Oracle technicians.

TSC's plans, Herr said, included the use of beta-test versions of Oracle software for development, a strategy that Oracle would never have used, she added.

TSC President Albert D. Beedie Jr. said his company, which was hired by Firestone in October 1988, worked well with Firestone. By the time the project was shelved, he said, 400 of Firestone's 1,600 service stations were on the network, and the system was showing benefits.

TSC left Firestone in August 1990, two months after the departure of John Rooney, general manager of the Mastercare unit, Beedie said.

Rooney, who left Firestone in May and is now vice president and treasurer at Chicago-based Ameritech, supports TSC's version of events.

"TSC had nothing to do with the problem," he said, adding it was "hogwash" to put the blame on the systems integrator.

If the applications software was a problem, so was the communications package Firestone expected, according to the lawsuit.

Oracle was required to provide a version of SQL*Net able to work efficiently on telecommunications lines, but the version that was delivered worked well only on a local-area network, according to the Firestone suit.

In addition, Firestone complained that Oracle never delivered DB2-Connect, software designed to access Firestone's DB2 database from SQL*Forms 3.0.

AT&T set to unveil upscale notebook PC

BY RICHARD FASTORE
and MICHAEL FITZGERALD
CW STAFF

AT&T will announce an Intel Corp. 80386SX notebook personal computer later this month that will propel the vendor from a portable no-show to the forefront of notebook PC technology, according to users who have seen the system or have been briefed by AT&T.

The features that set the Safari notebook apart are its optional, cellular 2,400 bit/sec. fax/data modem, six-hour battery life and read-only memory-resident version of Microsoft Corp.'s Windows 3.0. The modem allows data and fax transmission without a telephone connection, while the chip-resident Windows will provide instant Windows execution, sources said.

The product, which costs about $5,500, will debut the week of April 22, sources said. It will weigh slightly over 7 pounds with battery and will feature a 10-in., nonreflective IBM Video Graphics Array (VGA) screen and a minimum of 2M bytes of memory. The dimensions are 9½ by 12 by 1½ in.

AT&T acknowledged it has a notebook in prototype stage but would not discuss details.

The unit will first ship with a 40M-byte hard disk, sources said, but AT&T has promised users an 80M- or 100M-byte drive as early as June.

Users who have seen Safari said they were impressed. "I wasn't even going to talk to them until I heard it had an 80M-byte hard disk," said one information systems manager who asked not to be identified. "We're already pushing the 60M-byte capacity" in current laptop PCs, the manager said.

Another IS director said he was very impressed with the 10-in. VGA screen, which had extremely sharp contrast.

However, some analysts were put off by the chip-resident Windows. Upgrading the operating system will be expensive, inefficient and slow in comparison with disk-resident versions, said Will Fastie, editor of "The Fastie Report" in Baltimore.

Safari, which has been described as resembling fine luggage, "has some really distinctive styling, which will set it apart from other vendor entries," one analyst said.

Users added that AT&T will offer a docking station for the PC and said the firm will sell Safari directly via its sales force.

NEWS SHORTS

New Wave Office 3.0 due

Hewlett-Packard Co. will announce New Wave Office Version 3.0 this week. The new version features more connectivity to the Unix platforms of several other vendors, including IBM and NCR Corp. The software, which includes more than 20 modules — such as mail and graphics — will also reach out to the Apple Computer, Inc. Macintosh "initially for terminal emulation," according to Michael Goulde, an analyst at Open System Advisors, Inc. in Boston.

HP re-reorganizes

HP realigned its computer businesses by methods of sale last week. This is the third reorganization since last fall. Products sold through dealer channels, such as personal computers and calculators, are now under the new Personal Systems Group, headed by Bob Frankenberg. Most computers and systems software are now under the Networked Systems Group and Wim Roelandts. Frequent HP reorganizations have left analysts nonplussed by such news. "So what, other than it's disruptive," said Sandy Gant, an analyst at Santa Clara, Calif.-based Gartner Group/Infocorp. "They still have workstations and PCs sold by different groups. It should be on a continuum."

Phone companies consider alliance

Three of the world's largest telephone companies said last week that they are considering an alliance to offer integrated telecommunications services to multinational corporations. British Telecommunications PLC in the UK, Nippon Telegraph & Telephone Co. in Japan and the Deutsche Bundespost Telekom in Germany would offer one-stop shopping for network services, including network planning and management. A spokesman for BT said the partners hope to make further announcements later this year. IBM confirmed it had been approached by BT to become one of the first customers of the service but said it did not have plans to join the group.

First arrest in Sundevil case

Arizona law enforcers announced last week the first arrest in Operation Sundevil, a year-long federal and state investigation into illegal computer hacking. Baron M. Majette, 19, was arrested on six counts of fraud and conspiracy. Authorities said Majette, who reportedly used the moniker Doc Savage, set up two unauthorized conference calls worth about $8,100 with hackers in several states, used a stolen credit-card number to ring up more than $50,000 in unauthorized charges and illegally accessed a TRW Corp. database to obtain personal credit history and credit-card numbers.

ATM networks plot debit system

Twelve regional banking networks are considering interconnecting to form a nationwide debit-card network, which would allow consumers to instantly deduct purchases from their checking accounts at the point of sale, according to John B. Benton, the project's consultant in Torrance, Calif. The proposed network is not expected to run into antitrust problems, as did a 1989 joint venture by Visa International, Inc. and Mastercard, because it will provide competition for the on-line debit systems that Visa and Mastercard are now planning separately, said Mark Brohan, editor of the newsletter "Bank Network News."

Federal IRM posts filled

The federal government has filled two new and powerful information resource management (IRM) positions. Information systems expert Paul Strassmann has become director of defense information at the Pentagon, where he will oversee IRM for the entire U.S. Department of Defense, including the massive new Corporate Information Management program with which the Pentagon hopes to eliminate redundant computer systems. He is a former Xerox Corp. IS executive. At the U.S. Department of Justice, Roger M. Cooper has become deputy assistant attorney general for IRM. Cooper has held similar posts at several other agencies and is recognized for his knowledge of computer security.

Salomon Brothers loses top IS exec

BY CLINTON WILDER
CW STAFF

NEW YORK — Salomon Brothers, Inc. changed top information systems executives last week as Francis A. Dramis Jr. departed after two years to return to the vendor world.



Dramis *seduced to head Network Management, Inc.*

Dramis, formerly president of Salomon Technology Services, Inc., was named president and chief executive officer of Network Management, Inc., a fast-growing systems integration and consulting firm in Fairfax, Va.

Dramis, who headed a small network software firm before joining Salomon in 1989, will begin his new job later this month.

Salomon named Peter L. Bloom, senior operating officer, as acting head of the technology division. A spokeswoman refused to comment on whether Bloom's appointment was temporary or if the firm would commence a search for a permanent replacement. Bloom, a nine-year veteran at Salomon, could not be reached for comment.

Network Management Chairman Howard Frank said he wanted to hire Dramis two years ago and called the appointment "a matter of seduction more than anything else. I don't think we could have attracted him" two years ago, he said. "At that point, we still had some proving to do."

Dramis has been on the firm's board of directors for the past two years; Salomon is a Network Management customer. Network Management has about $60 million in revenue and 500 employees.

Dramis worked at AT&T for several years, both in internal IS and on the product side. He was vice president at American Transtech, the AT&T stock trading system subsidiary. He left AT&T to head Telic Corp., a Rockville, Md., developer of network management software.

The transition to Bloom is not the only change in the wind at Salomon. The firm plans to move 700 operations jobs by 1993 to Tampa, Fla., where it is building a new technical center.

Pan Am

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used by Continental Airlines.

Pan Am, which filed for Chapter 11 bankruptcy protection in January, is strapped for cash. Although it recently sold several routes to United Airlines, it was hit last week with a federal court order to pay $33 million owed on leased planes or give up the aircraft. Analysts said the outsourcing deal could fetch Pan Am at least that amount.

The plan would have Pan Am contracting its present IS services and future development from the outsourcing group, which would remain located in Pan Am's site in Rockleigh, N.J. Among those services are voice and data communications, microcomputer support, applications development and maintenance, data center operation and maintenance of all equipment worldwide.

Pan Am also hopes to benefit from economies of scale once its software and services are marketed to second- and third-tier airlines. "Pan Am having such significant software is a wonderful thing to leverage," Wagner said. "It's a very comprehensive, complete system that could provide [other airlines] with better service than they have today."

Among the applications Pan Am's systems handle are marketing impact analysis, crew management, reservations and departure control as well as financial reporting.

The deal would rank among the largest half-dozen outsourcing contracts ever closed, according to Stephen McClellan, vice president of securities research at Merrill Lynch & Co. in New York.

"It makes eminent sense for Pan Am," McClellan said.

Continental Airlines' bid to outsource its data center and that of Eastern Airlines, which also uses the System One reservations system, is now hung up in bankruptcy court. EDS and IBM are both bidding on that contract, which has been estimated to be worth billions. A hearing on the contract is scheduled to take place April 19.

Perot wins 10-year outsourcing deal

BY GARY H. ANTHES
CW STAFF

Beating out IBM and a number of other systems integration giants, Perot Systems Corp. won one of its largest contracts ever last week: a 10-year, $400 million outsourcing deal with First American Bankshares, Inc.

Perot Systems will take over all the information systems functions of the bank, including applications development and maintenance, data center operations and telecommunications.

Paul G. Adams, chairman of First American Data Services, Inc., the bank's IS subsidiary, said all of the subsidiary's 200 employees will be hired by Perot Systems if they pass a drug screening test. Adams is also chief financial officer at the parent bank and will remain with it. First American Data Services, with $11 billion in assets, operates eight banks in Washington, D.C., as well as in Virginia, Georgia, New York, Maryland, Florida and Tennessee.

Adams said the outsourcing arrangement stemmed in part from having "a huge data center with much more capacity than we need." The Reston, Va., data center, which contains an IBM 3090 Model 600 mainframe and a number of Digital Equipment Corp. VAX boxes, was built in 1985 to meet growth goals that were never met, Adams said. Perot Systems will use the extra capacity to serve other customers, he said.

Although Adams talked to a number of outsourcing vendors, the choice ultimately came down to Perot Systems and IBM because they were the two vendors that needed additional capacity in the Washington area. "We looked for someone who could run more plankton through the whale," Adams said.

Another impetus to outsource was the bank's need to substantially upgrade its loosely coupled applications, which include commercial and installment loan processing, a deposit system, branch automation (including automatic teller machine systems) and more than 50 others, Adams said.

Perot Systems will develop an "information architecture" that will integrate the applications through a new relational database while providing better integrity and auditability. Adams described the current applications as "a variety of jury-rigged systems difficult to prove at the end of the day." The deal is expected to save the bank 10% to 15% per year, Adams said.

Military sees problems, promise in viral strikes

BY MICHAEL ALEXANDER
CW STAFF

The notion that computer viruses could be used to wage electronic warfare is getting a hard look by the U.S. military following the war in the Persian Gulf.

Along with the military's ever-increasing reliance on electronic weaponry and command-and-control systems has come the prospect that computer viruses could be used to wage electronic warfare, said Myron Cramer, a senior associate at Booz, Allen & Hamilton, Inc.'s technology center in Bethesda, Md.

"Viruses are a significant threat because software is what is directing the next-generation systems that are being built today," Cramer said. "Target acquisition, battlefield management and related networked computer systems are at greatest risk."

Thousands of personal computers at army installations have been infected with Jerusalem-B, Stoned and other viruses in recent months. Computer security specialists checking PCs that were destined for the Persian Gulf during Operation Desert Shield uncovered three strains of computer viruses.

"Luckily, the viruses were found before the war started," said Jim Dimler, automatic data processing security officer at Defense Systems Management College in Fort Belvoir, Va. "I wonder what would have happened if any of the systems were involved in the war."

Guarding against viruses

Dimler instructs high-ranking officers responsible for acquiring weapons systems, computers and other equipment and representatives of government contractors about the potential problems of viruses and how to guard against them. "I am also telling them that there should be a clause in their contracts that requires products that are delivered to the military to be virus-free."



"With Desert Storm, people are much more aware of their dependency on computer systems," said Jim Christy, chief of the computer crime division at the Air Force Office of Special Investigation. The number of virus-infected military computers has "increased dramatically," and military security experts are "exceedingly motivated" to combat the problem, Christy said.

The military is also exploring the possibility of adding viruses to its own arsenal as well as defending against those launched by aggressors. The U.S. Department of Defense, through its Army Small Business Innovation Research (SBIR) program, is currently funding two projects, worth $50,000 each, aimed at determining the vulnerability of weapons systems software to viruses and whether it is feasible to develop a virus that can be transmitted by radio into military command-and-control systems.

The primary goal is to develop "virus-proof" code, said Doug Price, division manager for the research and development group at Sparta, Inc., a technical research firm based in McLean, Va., that was awarded the two SBIR contracts.

Creating so-called "assassin viruses" that could take out enemy systems, however, is "harder than it sounds," Price said. "If you don't care what the target is, and all you want to do is cause havoc, that is one thing; but that is not a reliable weapon."

It is the third such project funded by the SBIR program in the past year, according to Joseph Forry, program manager, U.S. Army C-Com, SBIR. If results of the feasibility studies pass muster, Sparta will become eligible for additional funding worth $500,000 per project for further research and development work, Forry said.

Application Configured Computers, Inc., a small software developer in Baldwin, N.Y., has been experimenting with viruses and other programs that could be used in a strike against high-technology weaponry, according to Thomas Sobczak, the software developer's vice president and technical expert.

The result of the company's research into what it calls "psycho-electronics" includes a program that causes video screens to flicker imperceptibly, triggering headaches in unsuspecting radar screen operators and others who use displays.

Another sort of virus could jiggle the clock rates of critical computer chips, causing the chips to heat up to a point where they would self-destruct, according to Sobczak.

Security

FROM PAGE 1

Dolan said.

Portable computers, which are selling briskly, also pose new security challenges. Not only can portables and the information they contain be easily stolen, but users can also tap into corporate databases on the road or siphon information through the serial port of desktop systems, perhaps without authorization.

Local-area networks, which too often lack adequate security features, are probably the weakest security link, according to these and several other security experts. It is relatively simple to connect an unauthorized terminal to a LAN that could be used to intercept passwords and data, for example. It is also easy for some departments to install LANs without security involvement, Dolan said. "Our challenge is knowing where the LANs are," Dolan said.

One worrisome trend is that increasing numbers of employees are taking computers home for telecommuting or after-hours work, the experts said. In addition to having to secure the added entry points into the corporation's systems, there is no way to monitor how the information is secured once it is downloaded.

About 25% of Digital Equipment Corp.'s 116,000 employees have computers at home, said James Schweitzer, corporate manager of information security. "The PC is the responsibility of the individual user in the office or at home," he said.

"Telecommuting will unquestionably increase our risk," said Jane Paradise, manager of corporate information security at Apple. Impending transportation restrictions in California aimed at curbing the number of commuters are forcing many companies to offer employees the option of telecommuting. Apple will launch a telecommuting pilot program next month "with legal and safety rules from a security standpoint," Paradise said.

Three of the four security chiefs said their companies rely on end users to determine the value of information that resides on their desktop computers and file servers and be responsible for securing it. Dolan, the fourth chief, said his company's managers were charged with the ultimate responsibility for safeguarding company information.

HP has 55,000 PCs and 16,000 workstations, according to Sam Miller, information technology engineer at HP. About 20% of the PCs and virtually all of the workstations are tied into LANs.

"Information security is new at HP; it has not been in existence but a year and a half," Miller said. "Before that, it was a free-for-all where everyone did their own thing." Today, the IS department handles security, but that "leads to problems in engineering and marketing, [which] may not recognize IS' authority in handling this."

IBM Japan's notebook offers preview

BY MICHAEL FITZGERALD
CW STAFF

The Personal System/55 Model 5523-S, a notebook computer released in Japan by IBM, offers a preview of the notebook IBM will offer to U.S. buyers some time later this year.

Announced by IBM Japan one day after the PS/2 Model L40SX officially hit the U.S. market, the PS/55 notebook weighs 5.5 pounds and offers a 9½-in. IBM Video Graphics Array display, 2M bytes of random-access memory upgradable to 6M bytes, the option of a 3½-in. floppy disk drive or a 40M byte hard drive and runs Japanese DOS J4.0/V. It has a 32-bit architecture and is based on a 12-MHz Intel Corp. 80386SX chip. Japanese pricing equals $1,669 to $2,647 in current U.S. dollars.

An IBM spokesman said IBM Japan's personal computers were similar but not identical to its U.S. models, and he said the same would probably hold true for the U.S. notebook due out before the end of 1991. Analysts predicted that the machine will reach the U.S. market sometime late this summer. IBM would only confirm that it plans to introduce a notebook PC in the U.S. before the end of the year.

Users who heard the specifications were lukewarm. "We'd look at it," said Bob Peterson, director of sales and marketing information systems at Coors Brewing Co. in Golden, Colo. "We're getting into a lot of applications where it's going to require a lot of data storage."

Budget to join data centers

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — Budget Rent-A-Car Corp. will consolidate its three regional data centers into one national data center by the end of 1991.

Budget, a $2.5 billion firm, is building a 20,000 sq-ft data center in Lisle, Ill., outside of Chicago, on land acquired as part of a headquarters move. Budget will also switch from a decentralized system of data management to a centralized, cooperative processing approach.

Currently, the company uses 12 IBM System/38s and Application System/400 Model B70s with dumb terminals at all its counters. When the move is complete, all Budget counter workers will use personal computers hooked into a mainframe-class machine, according to Kevin McShea, senior vice president of Budget's technical services group. McShea declined to say whether the mainframe and PCs would be IBM machines.

Budget was making the data center move because "we're going to be far better serviced by having central control of information," McShea said.

The shift in processing has not been budgeted, nor is there a set timetable for shutting down the regional operations, McShea added. Total information systems employment will probably fall from 160 employees to between 65 and 120 as a result of the consolidation.

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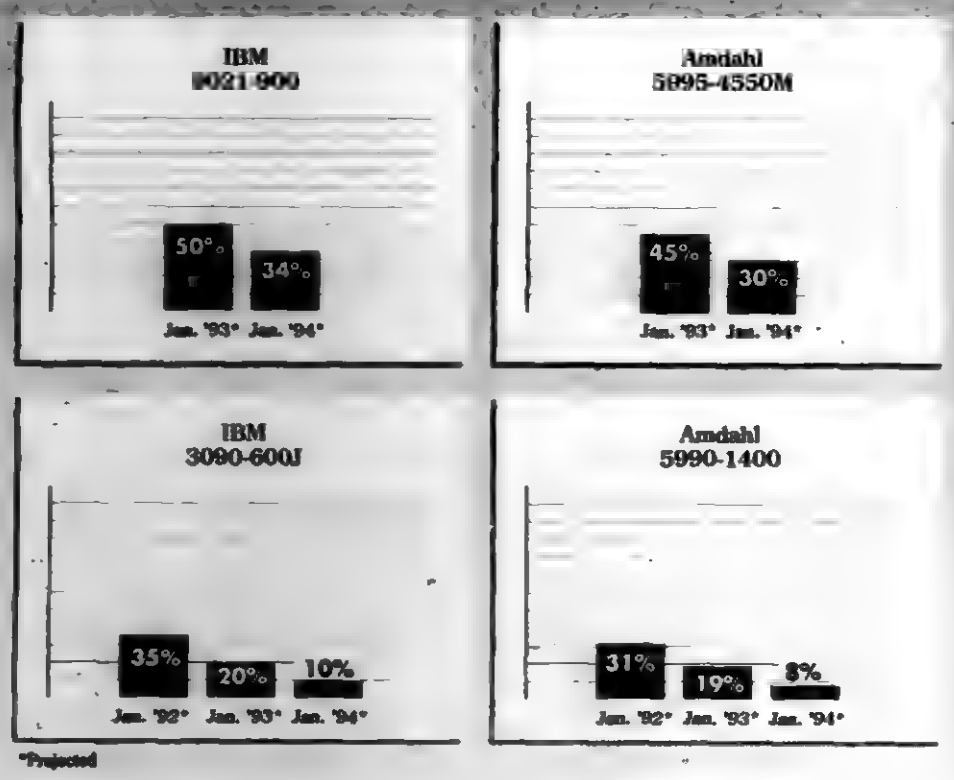
IBM and Amdahl Mainframes

IBM's high-end mainframes are expected to hold an edge in value over Amdahl's competing systems

Retail residual value
(in thousands)

Model	Announced	List price	Jan. '92*	Jan. '93*	Jan. '94*
IBM 9021-900	Sept. 1990	$22,568	—	$11,284	$7,673
Amdahl 5995-4550M	Sept. 1990	$18,900	—	$8,505	$5,670
IBM 3090-600J	Oct. 1989	$13,490	$4,721	$2,698	$1,349
Amdahl 5990-1400	May 1988	$12,220	$3,788	$2,322	$978

Retail retail value as a percentage of list price



*Projected

Source: Technology Investment Strategies Corp., Framingham, Mass.

CW Chart: Tom Monahan

NEXT WEEK

User empowerment is more than just a buzzword at PHH Homequity, a relocation firm in Wilton, Conn. Under the guidance of **Bradley Calcagni**, director of business systems development, technology management and consulting, Homequity has developed LAN-based applications that improve business processes. See Manager's Journal.



Randall Snyder

End-user training in many companies gets mediocre grades for performance and effort. The reasons: poorly prepared IS trainers, lack of teamwork with human resources and indifference. However, Executive Report looks at IS executives such as Dave Pitts at Hills Pet Products who are taking innovative approaches to end-user training.

INSIDE LINES

5.0 is really ready to go

A source tells us that Microsoft's DOS 5.0 is now slated to ship in June, and when it does, it will — surprise! — become "very Windows-like" in behavior. A Microsoft representative confirmed the date and said the characterization is not inappropriate. One can only hope this does not mean an endless assault of the ubiquitous UAE — unrecoverable application errors — that are plaguing Windows users. In the span of a few hours last week, one reporter talked to three Windows users who had felt the sting of UAE — one woman had lost five pages of a speech.

A mini vendor's dream come true

Sources at Allstate Insurance say the big insurer, daunted by PC upgrade costs for its nearly 15,000 agencies, has chosen to install Application System/400s at the rate of 50 to 100 agencies per week until all of its agencies run off the IBM minicomputers. Allstate, in keeping with its tradition of not talking to the press, refused to comment.

Is Mumps getting more contagious?

Mumps, the application environment originally developed for medical systems, has spread to about 75,000 users worldwide, including nonmedical companies such as Chase Manhattan, a Mumps User Group spokeswoman tells us. Next week, Mumps will officially take on an "open systems architecture" to allow data sharing among different Mumps systems — in particular, PCs and VAXs. Sounds like the start of an epidemic.

Through the looking glass

Users and various industry sources have been telling us that 1-2-3/Windows was supposed to go into beta testing in early, then mid-March. But then we heard it was a no-show, mysteriously pulled back for three weeks. Lotus responded that it is not in beta testing and that it is not supposed to be. In fact, everything is "tooling right along" on schedule, Lotus says. So we pointed out that Lotus won't be able to ship in June unless it moves into beta testing soon. Sayeth Lotus: "Stay tuned."

That report not from any Ami of his

"They don't have the facts right." That's the response of Said Mohammadioun, vice president of Lotus' Word Processing Division and formerly president of Samna, to a published report last week charging that Lotus has fallen behind on shipping free copies of the Ami Pro word processor to purchasers of 1-2-3 Release 3.1. Mohammadioun said there are no Ami orders in the system more than two weeks old.

Please don't say we're ISDN!

One industry consultant recently acknowledged that some "full-service" vendors who have added Integrated Services Digital Network (ISDN) equipment to their product lines have actually requested that the consultant *not* recommend their ISDN products to clients. The reason, the consultant says, is because the price of servicing and supporting the products costs the vendor more than the sale is worth in an anemic ISDN market.

The wonders of the computer age

Panelists and attendees at the Information Systems Security Association were not a bit shy about blasting LAN makers and other vendors for what they said are inadequate security features. One speaker, only half jesting, suggested that some products should come with a warning label: "Caution, use of this product could be hazardous to the health and welfare of your organization because of security and control deficiencies."

Observers sometimes have a rough time separating the reality from the dream of DEC's grander schemes, and last week's Polycenter systems management platform is no different. It didn't help that a DEC business unit head made a slip of the tongue and referred to the product as "Polyester." We prefer to rely on our readers to separate the wheat from the chaff. You're always welcome to contact News Editor Pete Bartolik at (800) 343-6474, send a fax to (508) 875-8931 or reach out electronically on Compuserve at 76537,2413



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COMPUTERWORLD

Compaq, DEC lead bid to trump Sun with ACE

BY MARYFRAN JOHNSON and RICHARD PASTORE
CW STAFF

NEW YORK — Like a new religion rolling into a town full of churches, the Advanced Computing Environment initiative has a lot of preaching to do before it will win converts to its proposed standard for multivendor networked computing, users and analysts said last week.

Led by Compaq Computer Corp., Digital Equipment Corp. and Mips Computer Systems, Inc., 21 firms joined in a pact to develop dual standards for personal computers and reduced instruction set computing systems.

Microsoft Corp. will provide OS/2 Version 3.0 — a version of OS/2 that is portable to RISC platforms — and The Santa Cruz Operation will incorporate DEC's Ultrix and the Open Software Foundation's OSF/1 operating systems into its Unix-based Open Desktop software.

Along the way, the group hopes to derail the momentum of Sun Microsystems, Inc.'s Scalable Processor Architecture and corner the commercial RISC market by making shrink-wrapped, off-the-shelf Unix and OS/2 software widely available.

While many users are watching the effort with keen interest, others are unhappy about the

Continued on page 6

RISC factors

- Support for Intel Corp.'s 80386/1486 and Mips Computer Systems, Inc.'s RISC chip.
- New Technology OS/2 from Microsoft Corp. and an Open Desktop Unix based on OSF/1 and DEC's Ultrix.
- Standardized boards and peripherals based on EISA or DEC's Turbochannel.

More details, reaction, pages 6–7.

Microsoft probe broadens

BY CLINTON WILDER and JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. disclosed Friday that the Federal Trade Commission has expanded its investigation into the company's business practices, apparently in response to complaints from competitors and developers.

Microsoft was notified by the FTC Wednesday that the commission will examine "third-party allegations that Microsoft has monopolized or attempted to monopolize the market for operating systems, operating environments, computer software and computer peripherals for personal computers."

THE FTC INVESTIGATION will "be substantially broader" than its ongoing probe into "an alleged horizontal agreement between Microsoft and [IBM]."

In a letter to Microsoft, the FTC said the subject area of the investigation would "be substantially broader" than its ongoing probe into "an alleged horizontal agreement between Microsoft and [IBM]." The FTC's original focus was on a 1989 agreement between Microsoft and IBM to cooperate on OS/2 and Windows [CW, March 18].

The FTC has broad investigative purview and the power to institute a cease-and-desist order for specific business practices it judges unfair. "If they were to decide that there has been a legal violation, they generally try to negotiate toward a consent decree," said Jonathan Feil, a software attorney at Simburg, Ketter, Sheppard & Purdy in Seattle.

Continued on page 8

IBM Credit's giant shadow chills foes

BY NELL MARGOLIS
CW STAFF

STAMFORD, Conn. — IBM Credit Corp. marked its 10th anniversary this year bigger, bolder and, in the view of some competitors, badder than ever.

The wholly owned finance and leasing subsidiary of IBM has attained giant status in its own right, building an asset base of $11 billion mainly by providing financing options for customers who buy the expensive mainframes built by its parent.

However, the firm's rapid rise, blue-blooded pedigree and occasional reminders of the power implied by both make it a constant source of speculation and controversy. Most recently, ICC launched lawsuits against members of the third-party subleasing market over the alleged practice of stripping IBM equipment and reselling the parts.

Big credit

The financial power of IBM Credit Corp. accounted for more than $10 billion in computer purchases in 1990

(In millions)

Products purchased for lease to users	Receivables purchased from IBM	Industry remarketer financing revenue	Government installment purchase obligations, bought from IBM
$3,402	$455	$3,670	$3,354

CW Chart: Marie Rainey

ICC accounted for about 67% of all new equipment leasing contracts as of 1989 and has only gained since then, according to Gartner Group, Inc., located here.

An estimated 50% of all

Continued on page 103

PC lineup set for 486 'SX'

BY MICHAEL FITZGERALD and RICHARD PASTORE
CW STAFF

Intel Corp.'s 20-MHz low-end 1486 microprocessor, set to debut next week, may offer enough of a price/performance value to finally draw significant numbers of users to the 486 processor family, a sluggish seller so far.

With system announcements expected to follow hot on the heels of the chip's release date, some users are eager for an SX-like 486-based system they can cost-justify for desktop use, but others wonder how they will use the power.

"Most people today are using the 486 as a server; it's hard to justify putting a 486 on a desktop," said James Sutter, vice president and general manager at Rockwell International Corp.

Continued on page 105

Encryption pact in works

Six vendors to standardize on common scheme

BY MICHAEL ALEXANDER
CW STAFF

REDWOOD CITY, Calif. — At least six major computer vendors are preparing to endorse a public-key encryption system developed by RSA Data Security, Inc., a move that will allow the private sector to shuttle scrambled data among different platforms.

The group includes Novell, Inc., Lotus Development Corp. and Digital Equipment Corp., which have already signed licensing agreements in the past year to use RSA's encryption system. Sun Microsystems, Inc., Apple Computer, Inc. and Microsoft Corp. are also expected to endorse RSA's system.



A number of other major players are expected to follow suit, according to Jim Bidzos, president of RSA.

"They are standardizing on RSA in a way that allows them all to interoperate," Bidzos said. The standard would allow an end user on an Apple Macintosh to encrypt a word processing file and transfer it over a network to a DEC workstation, where it could be decrypted, he said.

Some security experts are skeptical that the vendors' endorsement of public-key cryptography will be enough to make RSA's version a standard. The industry will not adopt a standard until the federal

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IBM bites the bullet with a onetime pension benefit write-off that pulled an already dismal quarter into the red. Page 8.

Borland previews Paradox for Windows. Page 4.

NCR, AT&T execs weary of takeover battle. Page 105.

Executive Report — End-user training needs improvement, but there are some bright spots. Page 73.

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Quotable

"Compatibility is something you have to work with a bit."

JOE ARCHER
COLONIAL MANAGEMENT

On the challenges facing the ACE consortium. See story page 1.

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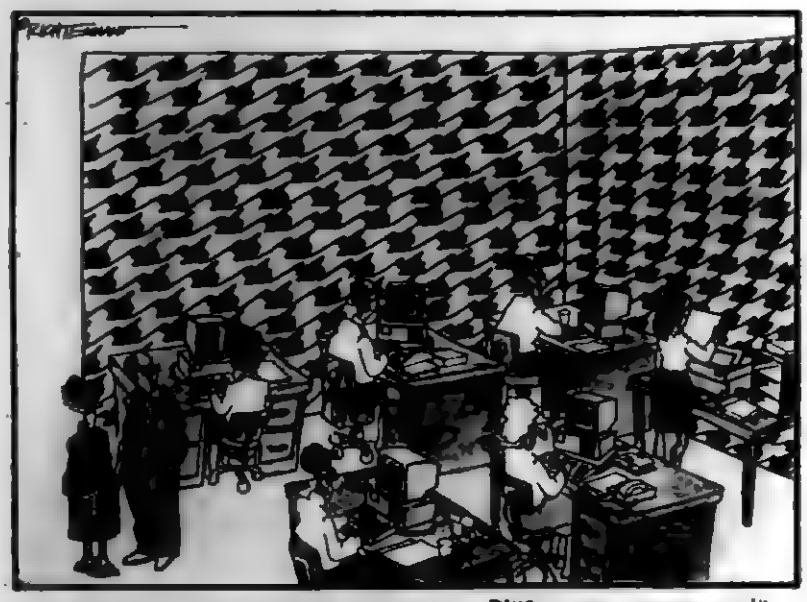
IN DEPTH

77 Calculating the value of IS to the business starts with knowing what to measure and how to measure it. By Howard Rubin.

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The 5th Wave



"YEAH, MY PEOPLE ARE STILL GETTING HEADACHES – DANG THESE VDT SCREENS!"

EXECUTIVE BRIEFING

■ **There may finally be a way for users to encrypt data** and have authorized users on other hardware platforms decipher it. At least six major computer vendors plan to endorse a public-key encryption system developed by RSA Data Security. That endorsement could help business users tighten security on their various systems. However, security analysts warn that a true standard may not emerge until the federal government decides to back an encryption/decryption technology. **Page 1.**

■ **While the security coalition may be just taking shape,** months of speculation about another gathering of vendors came to a head when DEC, Compaq, Mips Computer Systems and others announced their Advanced Computing Environment initiative. Those computer makers hope to work together to produce compatible workstation products. **Pages 1 and 7.**

■ **Distributed computing may now be a reality in the business world.** While IS managers still find fault with current distributed computing technologies, more and more managers are exploring the potential of transparent access to data and computing functions spread across multiple platforms. **Page 49.**

■ **End-user training in many organizations is hobbled** by poorly trained IS teachers, indifference and poor coordination with human resources departments. However, several forward-thinking firms are trying a variety of new approaches to combat this. **Page 73.**

■ **Gauging the business value of technology** consists of using the appropriate metrics to measure key indicators of IS performance. **Page 77.**

■ **The mood of the NCR takeover tiff** has shifted from combative to frustrated. Executives from both NCR and rival AT&T indicate that they should be much closer to settling their dispute. **Page 105.**

■ **The mainframe as a server** may not be a new concept in the computer industry or the user community. However, it won fresh backing from IBM last week when company executives outlined their plans for the ES/9000 family. **Page 27.**

■ **Portable computers based on the Intel 80286 chip** may be fading into obsolescence, at least for applications that use some of the more recent technical developments. **Page 37.**

■ **Attention CASE wannabes:** Your ship is coming in, but it won't be ready to set sail for another three to five years. For now, CASE advocates who can coax the technology into a company are in the most demand. **Page 87.**

■ **It's tax day,** and the IRS is on many minds. According to a federal report, however, IRS systems flaws may allow some wealthy tax delinquents to worry less about being caught. **Page 104.**

■ **In-house systems repairs are helping** IS managers slash service budgets, minimize downtime and increase worker productivity. **Page 97.**

■ **On-site this week:** The success of a single PC application was enough to convince one of the largest U.S. construction companies, Turner Corp., that downsizing was the way to go. **Page 37.** "Book 'em, micro" may be the order of the day in Sunnyvale, Calif., where the police department is testing a PC-based fingerprint identification system. **Page 39.** A different kind of network — the local-area variety rather than one of TV's big three — helped a CATV station find its place in the sun. **Page 49.** Rather than handing their car keys to a parking attendant or roaming through lonely garages, drivers in Barcelona, Spain, will be able to entrust their cars to a computer in an automated parking facility. **Page 31.**

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HP unveils modular New Wave Office 3.0

BY J. A. SAVAGE
CW STAFF

Merging its office automation package with the latest version of Microsoft Corp.'s Windows software for the personal computer, Hewlett-Packard Co. released New Wave Office Version 3.0 last week.

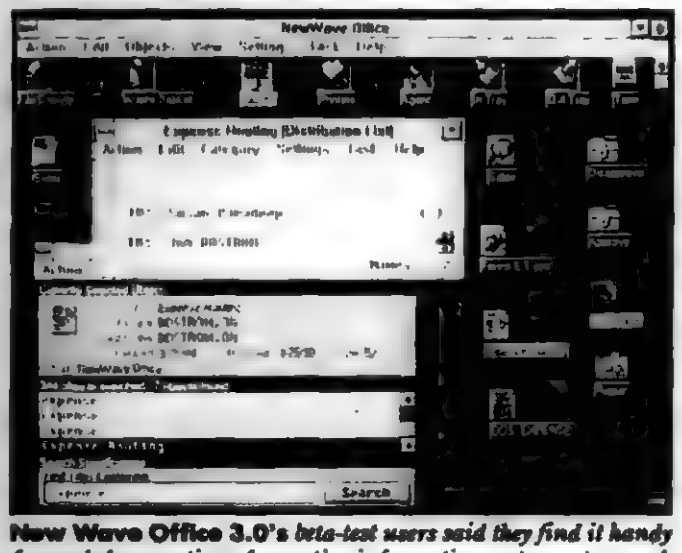
Beta-test users said they are finding the release handy in building executive information systems (EIS) in a modular and low-cost way.

"Until six or eight months ago, the only option for an executive information system was to buy the full product at $200,000," said Peter Stromboni, vice president of IS at Meriter Health Services, Inc. in Madison, Wis. "New Wave allows smaller shops like ours to progressively manage data much cheaper."

Stromboni and other New Wave Office users said the major part of their systems so far is not New Wave Office, per se, but a couple of the 28 New Wave Office modules on top of the New Wave PC product, which has been running on Windows 3.0 for about one year.

"We're primarily using the base New Wave software [on PCs]," said John Bullock, director of IS at Valley Presbyterian Hospital in Van Nuys, Calif., which is also building an EIS. "As we move further along, we will get into word processing and mail. We're looking at how it fits into place," he said.

The new release includes support for Microsoft's LAN Manager and Novell, Inc.'s Netware and also incorporates Windows' memory manager, according to Jim Grant, HP's product line manager for New Wave.



New Wave Office 3.0's *beta-test users said they find it handy for modular creation of executive information systems at a much lower cost than that of purchasing a full EIS product*

The release also has New Wave Access for image or SQL databases, which extracts data and enters it into PC application formats such as Lotus Development Corp. spreadsheets, said Mike Kelley, product manager for New Wave Office. There is also the addition of mail on PCs, whereas before, the mail module resided on servers.

The office modules range in price from $200 for network services (which give PCs Network File Transfer, terminal access and connections to HP's minicomputers, along with complimentary LAN Manager software) to $56,000 for HP Deskmanager (a distribution and messaging service).

In case New Wave users think they have missed something, there was no New Wave Office 2.0 release. Version 3.0 is actually the second release of New Wave Office — the company skipped a number to coincide with Windows 3.0, according to Grant.

TI seals James Martin deal

BY SALLY CUSACK
CW STAFF

LONDON — Texas Instruments, Inc. and James Martin Associates tightened their six-year working relationship last week when TI agreed to buy James Martin Associates' European information engineering business.

John W. White, president of TI's Information Technology Group, said the agreement will forge "closer working relationships and better meet the growing needs of the global CASE community."

The deal culminates a relationship between the two firms, whereby James Martin Associates' has participated in the development, marketing and distribution of TI's computer-aided software engineering (CASE) product, the Information Engineering Facility (IEF).

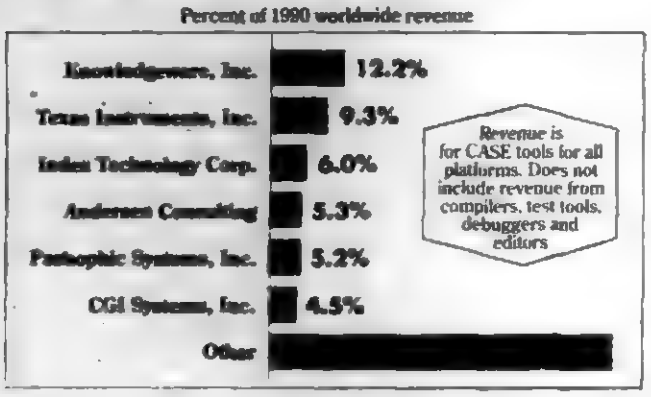
Since 1988, more than 100 multinational, Europe-based companies have purchased IEF, which was developed by TI and based on an information engineering methodology that was developed by James Martin Associates' founder James Martin.

"No one industry is using CASE more than any other industry," Martin said. "The market for IEF has grown rapidly in Europe, with product sales exceeding $50 million and consulting services exceeding that."

The agreement provides for an initial payment of approximately $30 million, with subsequent payments based on performance during the next two years.

Fractured market

The top six CASE vendors accounted for less than half of the estimated $750 million market for CASE tools last year



Source: Strategic Focus

CW Chart: Marie Haines

Paradox demo puts Borland right in Windows limelight

BY JAMES DALY
CW STAFF

SCOTTSDALE, Ariz. — Borland International, Inc. President Philippe Kahn demonstrated an early version of the Paradox for Windows relational database last week, offering users a surprise peek at a product analysts said could eat up the still-unclaimed Microsoft Corp. Windows database market.

Although Microsoft and Ashton-Tate Corp. have both promised a Windows-based database, the potentially lucrative market is still relatively untapped and serviced by products such as Superbase 4 from the smaller Precision Software, Inc.

"The Windows database world is open territory; the turf is there for Borland to own," said David Bayer, an analyst at Montgomery Securities in San Francisco.

Officials at Scotts Valley, Calif.-based Borland said they hope Paradox for Windows will follow in the slipstream of the character-based version, which has made strong gains against entrenched rivals. Ashton-Tate, for instance, has stumbled badly during the past three years trying to update its once-impregnable Dbase program. Consequently, Paradox's market share has gone from 9% in 1989 to approximately 35% in 1990, according to Dataquest, Inc. analyst Marshall Moseley.

While neither the shipping date nor the price for Paradox for Windows was available, Kahn's run-through at the International Paradox User's Conference here highlighted several major additions to the package.

The graphics-rich application, code-named "Tsunami," will feature a new database engine architecture that allows applications to share data by snapping into a common "object layer." Such data exchange now requires traversing the Paradox database engine.

Current Paradox users were anxious to get their hands on the Windows version. "This is what DOS users have been dreaming about for years: a database that looks like the Mac," said Thomas Shasheen, director of information resources at the University of Michigan's School of Business Administration.

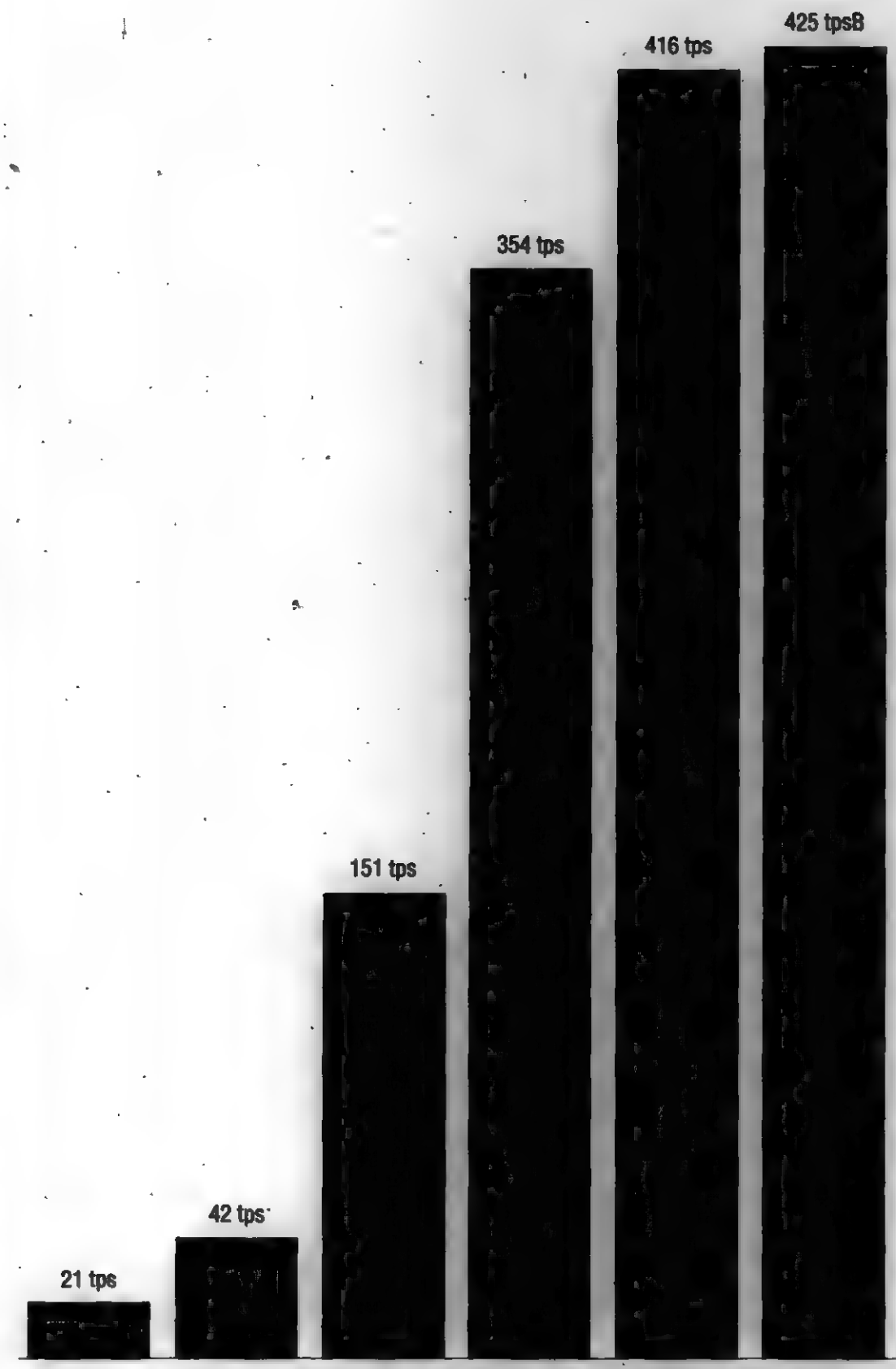
The new design will also allow users to directly access SQL Link, a Paradox Version 3.5 companion product that allows users to access remote SQL data without learning complex SQL programming. Currently, SQL Link must be accessed through the Paradox Engine, said Rob Dickerson, vice president and general manager.

Kahn said Borland plans to eventually extend the object layer concept to its character-based Paradox but would not say when.

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Ace

FROM PAGE 1

prospect of yet another choice of RISC and Unix platforms.

"We already have two or three major efforts at standardization. This doesn't make it any easier for end users to understand where all this is going," complained James Sutter, vice president and general manager at Rockwell International Corp.

By mid to late 1992, the unlikely bedfellows hope to offer a RISC platform that can coexist on a network with Intel-based computers and run virtually identical versions of applications under either Unix or OS/2 Version 3.0, which will be based on Microsoft's New Technology kernel.

The ACE standard will be based on two hardware platforms: Intel Corp. 80386 and I486 personal computers and Mips Computer Systems, Inc.'s reduced instruction set computing architecture.

The main job of the coalition is to provide a set of specifications for programming interfaces and systems components that any interested vendor can use as the basis for its own design. The lure for customers is supposed to be the wide swath of ACE-compliant applications that will run on either of the chosen platforms or operating systems with transparent interoperability.

"That is very exciting. I have a strong conviction that RISC is the long-term way to go," said Jerry Weinstein, director of corporate MIS at General Instrument Corp. in Lyndhurst, N.J. "I'd really like to see a good alternative to Intel's more conventional scheme."

The task ahead

A key hurdle, users and analysts agreed, will be attracting enough software developers to write applications for the Mips RISC platform. Yet that should be an easier job because the ACE specifications call for source-code compatibility across the Intel and Mips platforms.

"I really like the idea of being able to order shrink-wrapped software and know it can run on a lot of different platforms," said Joe Archer, vice president of applications development at Colonial Management, an investment firm in Boston.

Archer noted that the Unix porting work he has done between Ultrix applications and SCO's Open Desktop is more work than vendors admit. "They don't spring out of the box and run everywhere," he said. "Compatibility is something you have to work with a bit."

Analysts expressed doubt that the group would pose any short-term threat to Sun, IBM, Hewlett-Packard Co. or any other well-established vendor in the RISC workstation market. They noted that ACE has no formal organization, no visible funding, a host of potentially conflicting agendas and a fuzzy time frame.

"They'd better have a machine in '92, or it's not going to matter much," said Amy Wohl, president of Wohl Associates in Wynnewood, Pa. "Sun's not planning on standing still."

"The end of '92 is a heck of a long way away," agreed Tom Pettibone, senior vice president at New York Life Insurance Co., which is moving forward with development on SunOS systems, IBM's AIX Unix variant and AT&T's Unix System V. "A lot of us are deciding on RISC architecture as we speak."

While the consortium aims to establish a new desktop standard, users are a lot less willing to leap into new technologies without a careful analysis of the costs involved.

"I'm always skeptical when they say they're going to maintain your investment in whatever you have," said William Tignanelli, vice president at Federal Reserve Bank in Baltimore, a Compaq customer.

ABCs of ACE

The technical foundation for ACE is a dual hardware architecture with two distinctly separate operating systems. Yet the 21 companies in the ACE initiative are pledging a high degree of interoperability through software written in the portable C language.

With the goal of producing a broadly supported, open computing environment and initial products hitting the market in 1992, the ACE specification will encompass the following:

- Two hardware platforms. On the personal computer side, the platforms are the industry-standard Intel Corp. 80386 and I486 machines. On the workstation side, there is a RISC system from Mips Computer Systems, Inc., based on Mips' R3000 chip but later moving to the R4000 chip.
- Two operating systems with source-code compatibility that enables both to run on either ACE platform. One operating system will be Microsoft Corp.'s OS/2 Version 3.0, based on the New Technology kernel. The other will be the Unix-based Open Desktop from The Santa Cruz Operation, based on the Open Software Foundation's OSF/1 operating system and Digital Equipment Corp.'s Ultrix operating system.
- Connectivity with customers' existing environments through Unix connectivity services; support for Novell, Inc. Netware, Microsoft LAN Manager and Banyan Systems, Inc. Virtual Networking Software networking services; and links to IBM's Systems Network Architecture and DEC's Decnet.
- Support for third-party PC expansion boards and peripherals; the standard 101-key keyboard; storage media and file formats. Both the Extended Industry Standard Architecture and Turbochannel buses will be supported on the ACE platforms.

MARYFRAN JOHNSON

Consortium conundrum

The Advanced Computing Environment is headed by diverse groups of executives, each with their own agendas:



Bill Gates
Microsoft

"I'm not saying IBM will like [illegible] doing here. But this should give a boost to OS/2."



Robert Miller
Mips

"I believe at last count IBM has 12 different architectures they're supporting now. It's easy to add a 13th."



Rod Canion
Compaq

"This will be the predominant system for advanced computing within this decade."



Doug Michels
The Santa Cruz Operation

"SCO and other key industry leaders are making a commitment to a unified Unix operating system."



Ken Olsen
DEC

"I don't think Compaq has ever worked with anyone before, have they?"

DEC, Compaq stand to gain the most

BY RICHARD PASTORE
and MARYFRAN JOHNSON
CW STAFF

While the user benefits of the Advanced Computing Environment (ACE) coalition are debatable, the potential gains for the two co-founding box builders are clear. For Digital Equipment Corp., the coalition's clout could finally establish DEC's Mips Computer Systems, Inc.-based architecture as an industry standard. Compaq Computer Corp., meanwhile, will have something to offer power-hungry users who will not take Intel Corp.-based systems for an answer.

When DEC chose the Mips reduced instruction set computing (RISC) processor over its own in-house-developed RISC chip, it was gambling that it could turn Mips into an industry standard. That has not happened yet, but it may with the added weight of the coalition members.

With some 2,000 Ultrix applications already running on the Mips R3000 chip, according to analysts, DEC may also have a much-needed leg up on the applications side in the market for ACE-compliant systems.

The genesis of the coalition came in talks between DEC and Mips, top officials at both companies confirmed last week. Once they had agreed to push the Mips chip as a RISC standard, the next hurdle was gaining Microsoft Corp.'s support, which in turn brought in Compaq and The Santa Cruz Operation.

If the coalition should fail, however, DEC's reputation in the Unix workstation field will suffer a crippling blow, analysts warned.

Compaq stands to gain the attention of potential customers that may disdain Intel architecture in favor of Sun Microsystems, Inc., Hewlett-Packard Co. and rival IBM. Indeed, IBM's successful RISC System/6000 is butting heads with Compaq's high-end Systempro for some server duties, observers noted.

There is a perception among some users that RISC-based systems offer better performance. "Customers seem enamored of it," said Lorie Strong, Compaq's vice president of marketing. There is also a bias among corporate developers that Unix is a stronger development platform.

In addition, most Compaq sites have a mixed RISC/complex instruction set computing environment, which could benefit from ACE's proposed interoperability, Strong said.

Spin control

On the outside looking in at the Advanced Computing Environment group are [illegible] with their own competing stakes in the RISC and Unix markets:



Ed Zander
Sun

"It's a Unix vs. Microsoft issue. When the dust settles, no one will care about Mips."



David House
Intel

"If we fail on our face like Sun thinks we will, it will have a big impact. But that's not our game plan."



Franz Nierwetl
Hewlett-Packard

"If they can pull it off, fine. But I have seen how long it takes for a group like this to agree on a common set of criteria. Look at OSF."



Peter Cunningham
Unix International

"Gates and Canion are saying, 'The PC marketplace is out of gas – but if you wait four or five years, we'll have a replacement.'"



Doug MacEwen
Sailboune

"Compaq will eventually find that DEC is going in a direction that they don't want to go."

Outsiders don't fear ACE

BY J. A. SAVAGE
CW STAFF

In the wake of the heralded Advanced Computing Environment (ACE) announcement, a peculiar calm permeated workstation vendors that were not party to the event.

Often mentioned by the ACE group but notably absent was Intel Corp., whose personal computer architecture will continue to be offered by Compaq Computer Corp. — which joined Digital Equipment Corp., Microsoft Corp. and others in an endorsement of the reduced instruction set computing (RISC) chip offered by Mips Computer Systems, Inc.

David House, president of Intel's Microcomputer Components Group, said the company supported the software announcements that apply to Intel's architecture.

"There's a great need for an OS/2 that's 32-bit and supports multiprocessing, like Microsoft is promising with [New Technology] OS/2," House said.

Hewlett-Packard Co., IBM and Sun Microsystems, Inc. are believed to be most at risk from the ACE consortium. Nevertheless, both the Open Software Foundation (OSF) — pioneered by HP, IBM and DEC — and Unix International, which is closely affiliated with Sun, were associated with the ACE announcement, and as such, appeared to be turning against their founders.

The OSF was not involved with any of ACE's decision-making, according to an OSF spokeswoman, but its application environment specification (which is a programming interface to the OSF/1 operating system, the Motif graphical user interface and distributed computing environment) represents a key component of the Unix software strategy in the ACE plan.

"Our charter is to provide vendor-neutral enabling technologies," the spokeswoman said. "In the hardware world, the equivalent would be a 'design win.' "

HP downplayed any notion of an OSF schism. "We're working with Sun already," said Franz Nawratil, vice president of worldwide sales and marketing. "We're working right now with System V.4," the operating system under the control of OSF rival Unix International.

Unix Systems Laboratories (USL) announced a reference product last week and defined an application binary interface for the Mips microprocessor. That, according to a statement from the group, "will go a long way toward establishing the Mips chip as the standard architecture for high-performance, open commercial computing in the '90s."

Sun originally worked with USL, "but the development partners are different now," according to a USL spokesman. "It does advantage and disadvantage everyone equally. It's not set up to advantage or disadvantage Sun," he said.

The announcement indicated there would be several operating systems for the basic Mips RISC architecture, accordingly, both ACE and non-ACE vendors said numerous parts of the software part of the deal had to be ironed out.

"So many areas besides the operating system are necessary for binary compatibility of applications across hardware," said Doug MacGregor, president and chief executive officer of Solbourne Computer, Inc., whose products are based on Sun's architecture.

"You need compatibility at the graphics level, networking and look-and-feel. Those are big issues that have not been resolved [by Mips] in the past, and I'm skeptical they will be resolved in the future," he added.

Bill Coleman, vice president of systems software at Sun, said the confusion may lead independent software vendors into deeper quagmires; thus, they may develop few applications. "If you are an [independent software vendor] and looking at four or five different versions of the software and no big volume on any of them, what will you do?"

Non-ACE vendors also offered the opinion that the mere presence of ACE could boost the RISC market in general by endorsing RISC architecture.

The ACE lineup

Other computer firms participating in ACE include the following:

- The Acer Group
- Control Data Corp.
- Kubota Corp.
- NEC Corp.
- NKK Corp.
- Olivetti USA.
- Prime Computer, Inc.
- Pyramid Technology Corp.
- Siemens AG/Energy and Automation, Inc.
- Siemens Nixdorf Information Systems, Inc.
- Silicon Graphics, Inc.
- Sony Corp.
- Sumamoto Electric Industries Ltd.
- Tandem Computers, Inc.
- Wang Laboratories, Inc.
- Zenith Data Systems



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NEWS SHORTS

DEC plans 250 layoffs . . .

Digital Equipment Corp. last week confirmed it will lay off 250 more employees as part of its cost-cutting effort to trim 6,000 employees from the payroll by June. The Maynard, Mass.-based firm is disbanding its media communications group in favor of contracting out for those services.

. . . . . .

. . . also eyes parallel processor

DEC is expected this month to announce a joint venture in massively parallel computing. DEC reportedly will unveil an agreement to sell software running on massively parallel systems from Masper Computer Corp. DEC will provide a Pascal compiler, computer-aided software engineering tools and a front-end workstation.

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CGI to ship repository tools

CGI Systems, Inc. said last week it will soon ship tools that work with Repository Manager/MVS, the core piece of IBM's AD/Cycle. CGI Systems is not a key AD/Cycle business partner. However, it is one of the few third-party providers to announce tools for direct use with the IBM repository. Of the several AD/Cycle inner circle vendors, only Knowledgeware, Inc. offers a tool that links to the IBM core software.

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EMC introduces AS/400 add-ons

EMC Corp. last week unveiled a range of storage products for the midrange IBM Application System/400, along with remote maintenance and performance analysis services. The products are an advanced hard-disk subsystem, the EMC SL/936 and an 8mm tape backup subsystem. EMC claims its products store more data and outperform comparable devices from IBM, such as the 9335 and 9336 disk drives.

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Ashton-Tate ships Macintosh tool

Apple Computer, Inc. Macintosh database users got another ally last week when Ashton-Tate Corp. began shipping Dbase IV Runtime Plus, a product that runs most Dbase IV Version 1.1 applications without modification on the Macintosh. The $195 program gives Macintosh users access to thousands of Dbase applications created in Dbase IV for DOS, Unix or DEC's VMS, according to Ashton-Tate officials.

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HP plans MPE upgrade

Hewlett-Packard Co. last week revealed that it plans to release the next version of its MPE XL operating system at the end of next month. MPE XL 3.0 will include 25 new products, including automatic backup and retrieval and systems management that will run on any PC in the network, according to Richard Sevcik, general manager of HP's Commercial Systems Division.

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Compaq bows out of Comdex

Compaq Computer Corp. will give up its booth at Fall/Comdex '91. The Comdex show, because of its size, clutter and expense, is not the most effective way for Compaq to reach users this year, a Compaq spokesman said. Compaq will exhibit at smaller, narrowly focused trade shows, he said. Compaq will maintain an equipment-testing room for its independent vendor partners as well as press briefing rooms at Comdex.

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Lowrance resigns from Amex

American Express Co.'s chief technology planner is leaving to take a job in the consulting field. Roy Lowrance, vice president of technology strategy at American Express, plans to begin his new job next week. He will work at Boston Consulting Group, Inc.'s New York office. "The allure of consulting is that it provides a chance to effect positive change in a variety of organizations," he said. Before joining American Express three years ago, Lowrance was at McKinsey & Co. as director of systems consulting for financial services firms.

More news shorts on page 104

Windows in Unisys' CASE plan

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Unisys Corp. last week announced its very own grand strategy for computer-aided software engineering (CASE), a repository-based scheme similar to IBM's AD/Cycle that includes products and strategic alliances with third-party vendors.

The Advanced Solution Development (ASD) framework spans the breadth of Unisys' product lines.

In the short term, ASD promises users the ability to update Unisys applications with graphical user interfaces and provides enhanced versions of Unisys' Ally, Mapper and Linc development tools.

In the long term, ASD calls for an object-oriented repository, which can reside on a workstation, server or mainframe but does not require the mainframe to operate, said Scott Miller, program marketing manager. That plan is set to come to fruition in 1995, and Unisys' repository will "interoperate" with those from IBM and Digital Equipment Corp., he said.

Unisys will make available in August a personal computer-based tool called Designer Workbench, which runs under Microsoft Corp.'s Windows 3.0 and is the company's first implementation of its object-oriented repository, Miller said. Unisys will offer repository products for its A series and 2200 mainframes in the next few months.

The mainframe and PC products differ in that the mainframe repositories are not object-oriented. Miller said the need for repository products for Unisys' Unix line will be addressed during the next few years.

Unisys' ASD plan will also take into account applications written in Cobol, and the company is providing interfaces to some popular third-party CASE tools such as Index Technology Corp.'s Excelerator and Knowledgeware, Inc.'s Information Engineering Workbench.

Users and analysts reacted positively to Unisys' plan but said there are some issues to be addressed, such as the transition problems that may be encountered as users move from current repository products to what Unisys will be developing during the next several years.

John DiFronso, vice president of information services at Westinghouse Broadcasting Co. in Milford, Conn., said that the announcement "allows us to put an updated user interface on our existing applications. We'll be looking at Designer Workbench and also at their planning and maintenance tools."

IBM posts first quarterly loss in history

BY NELL MARGOLIS
CW STAFF

ARMONK, N.Y. — Worldwide economic woes and a onetime accounting charge last week dealt IBM the first quarterly loss in its history. Numbers posted for the first quarter of 1991 showed a net loss of $1.7 billion in contrast with last year's $1 billion first-quarter profit, on revenue down 4.5% to $13.5 billion.

The loss was an accounting anomaly, however, as the firm took a nonrecurring, $2.3 billion charge against earnings in connection with adoption of an accounting principle that requires U.S. firms to reflect on their balance sheets the fair market value of nonpension retirement benefits for all employees.

On a pure operations basis, IBM showed a $500 million profit for the quarter.

While firms can opt to amortize the huge expense over 20 years, IBM "chose to bite the bullet up front — a smart move," said Martin Reisinger, an analyst at Duff & Phelps Investment Research Co.

The operations-related figures fell within the range IBM cited last month, when it sent the stock market south with the warning that first-quarter results would underperform Wall Street expectations by 50%.

Chairman John Akers reiterated last month's statement that the dismal numbers are attributable to the economic slowdown.

Reisinger differed, saying, "They keep emphasizing that all product lines, geographies and customer categories are impacted as evidence that none of the problems are coming from inside. But what I see is that IBM doesn't seem to be outpacing the market anywhere."

All hardware product lines "were impacted," an IBM spokesman said. However, he added, "the RISC System/6000 workstation line was impacted somewhat less than the others."

John Jones, an analyst at Montgomery Securities, took a more upbeat view. "Software was up 14%, support, 19% and rentals up 16% — those are fairly healthy gains, especially during a recession," he said.

Microsoft

FROM PAGE 1

The FTC letter, released by Microsoft, indicated the agency would require access to documents dated prior to the January 1988 cutoff date the FTC had apparently set earlier. The agency directed Microsoft not to destroy any original documents.

Although no company contacted last week would acknowledge that it had complained to the FTC, several Microsoft competitors, including Lotus Development Corp. and Digital Research, Inc., said they have been contacted by FTC investigators.

"We're pleased and will support the authorities as they request," said Dick Williams, president and chief executive officer of Digital Research, which sells an alternative to MS-DOS. "Microsoft competes unfairly and has been doing so for a lengthy period of time," he charged.

Microsoft was "surprised and disappointed" at the expanded probe, but it will continue to cooperate, said Marianne Allison, a public relations representative. "It has been noted that the FTC has not had a good track record of successfully prosecuting monopoly cases," she added.

But the probe is likely to drag on for several months. "It will take us at least until the fall to produce all the documents that are required for this," Microsoft spokesman Marty Taucher said.

The overarching issue for the software development community is whether Microsoft unfairly uses its position as purveyor of the standard PC operating system to seek dominance in applications as well.

"It's clear that Microsoft wants to be the IBM of the software industry," said Carole Patton, editor of "Acknowledge, the Window Letter," a Mendham, N.J.-based newsletter. "It's a super strategy; it's just that they don't implement it with sensitivity."

Last November, a small Pomona, Calif.-based firm called Z-Nix Co. filed antitrust charges against Microsoft, claiming the software giant was trying to muscle Z-Nix out of the mouse input device market. The case was settled.

"A lot of companies feel that Microsoft competes unfairly because they have firsthand information when it comes to Windows development," said Frank Yeh, vice president of sales and marketing at Z-Nix.

West Coast correspondent Jim Nash contributed to this report.

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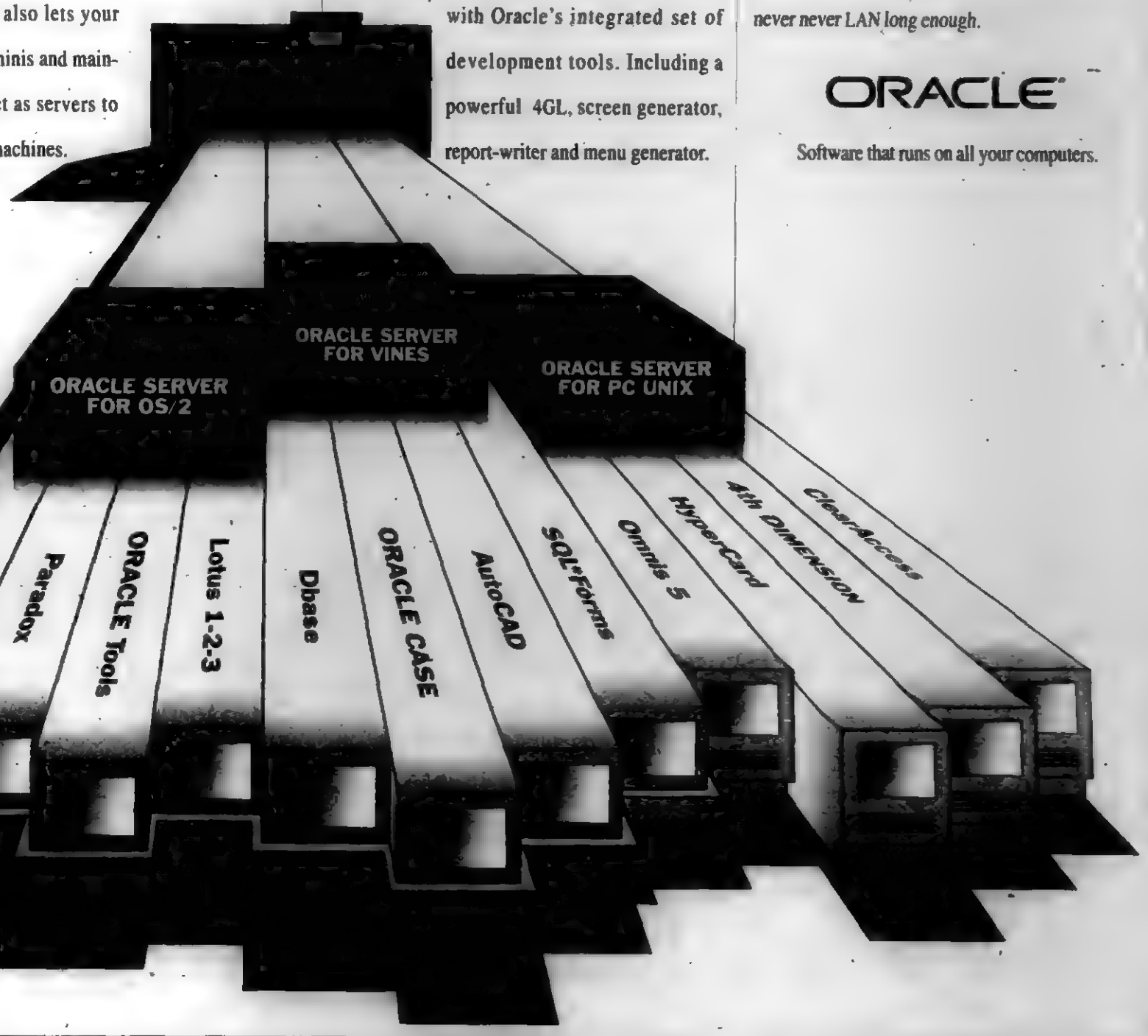
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DEC airs low-end LAN connector

BY JOANIE M. WEXLER
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. introduced a wiring concentrator last week that could make networking palatable to anyone handy enough to hang a print of "Whistler's Mother."

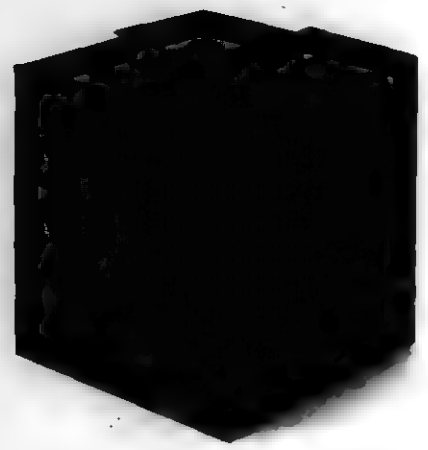
Based on an $890 portrait-size hub backplane that hangs on two screws in a wall, the low-end product line interconnects and centrally manages work-group-size Ethernet local-area networks. The hub and its terminal server, bridge and repeater modules are targeted at companies looking for simple LAN connectivity with network management capabilities but that are unwilling to pay for full-blown smart hubs supporting other LANs and functions.

Janet Hyland, director of network strategy service at Forrester Research, Inc., said Forrester surveys indicate that most companies are buying hubs for their manageability, not for all of the extra functions. "That means that with high-end products, customers pay quite a premium if all they want is management," she said.

One beta-test user said DEC's products will probably make some hay with neophyte LAN administrators. "A large percentage of Ethernets consist of 25 workstations or less," said Paul Parker, supervisor of network services at Carnegie Mellon University in Pittsburgh.

"Those LANs probably don't have a network guru dedicated to them," thus the appeal of the simplicity, he said.

DEC's hub backplane can be installed in about 30 seconds. The initial modules that plug into it include a $1,450 eight-port terminal server, two $1,590 repeaters for operation over unshielded twisted-pair or thin coaxial wiring and a $2,890 manageable bridge slated to house a Simple Network Management Protocol (SNMP) agent within six months.



Room to play

DEC is reaching beyond its installed base to the growing market for Ethernet connections requiring SNMP management

Low-end managed hub* U.S. revenue projections (in millions)



Source: Forrester Research, Inc.

Open support

Coming support of the widely used SNMP was lauded by users and analysts for making DEC more "open." However, one remaining question about the product's popularity in non-DEC shops surrounds the new terminal server's support of only DEC's proprietary Local-Area Transport (LAT) protocol. LAT was originally designed for DEC terminal servers to provide communications among DEC terminals across an Ethernet LAN.

While DEC is now licensing LAT to about 40 other vendors, many terminal server users — including Parker — require Telnet, a terminal emulation utility for Transmission Control Protocol/Internet Protocol networks.

Rather than taking the traditional form of printed circuit boards, all the hub modules are videocassette-size devices that can be removed from the backplane and placed wherever is convenient. When purchased as hub modules, the price of the units drops slightly.

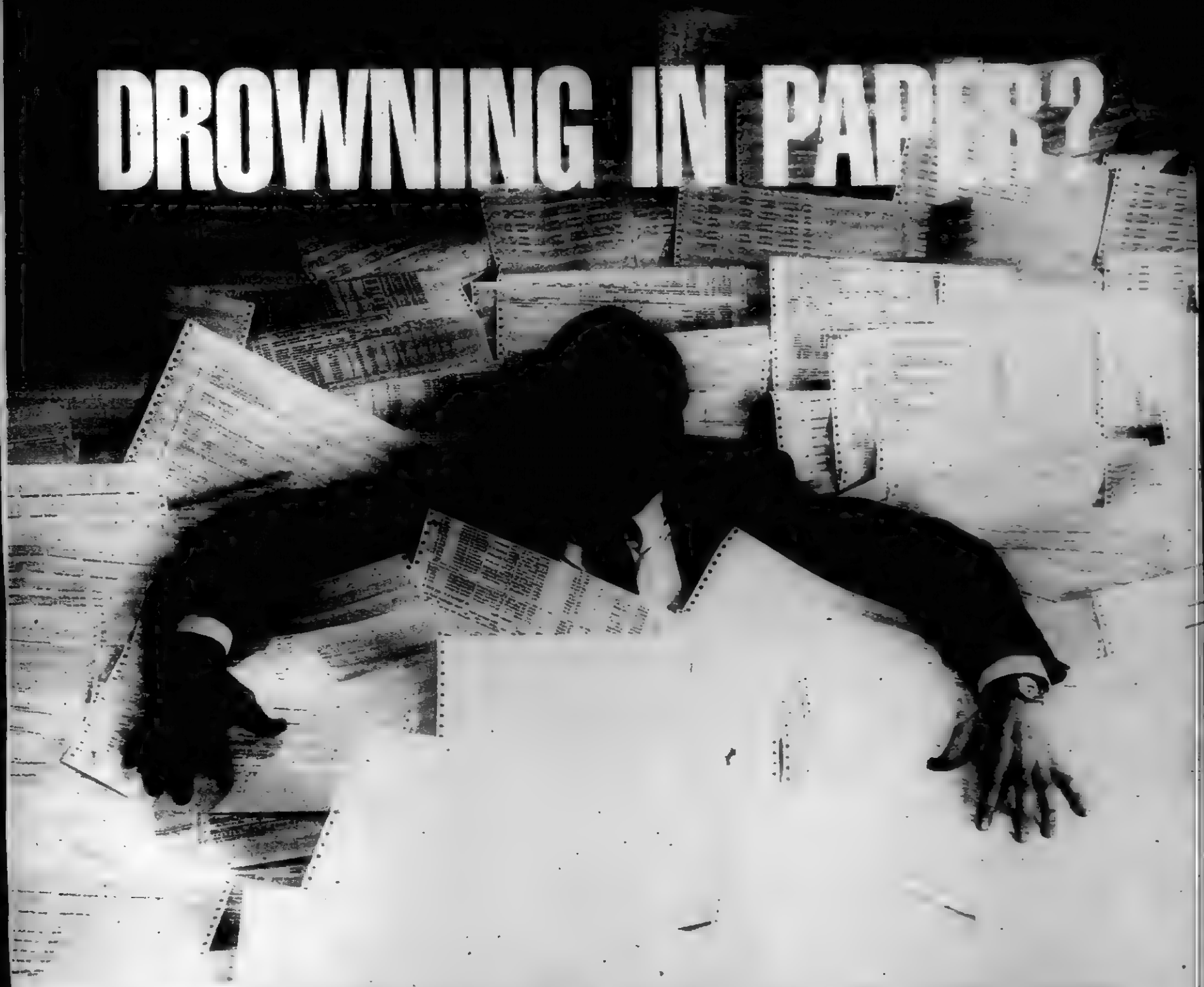
The Dechub 90, Decbridge 90 and Decserver 90L are available immediately; the Decrepeaters are scheduled to ship in three months, DEC said.

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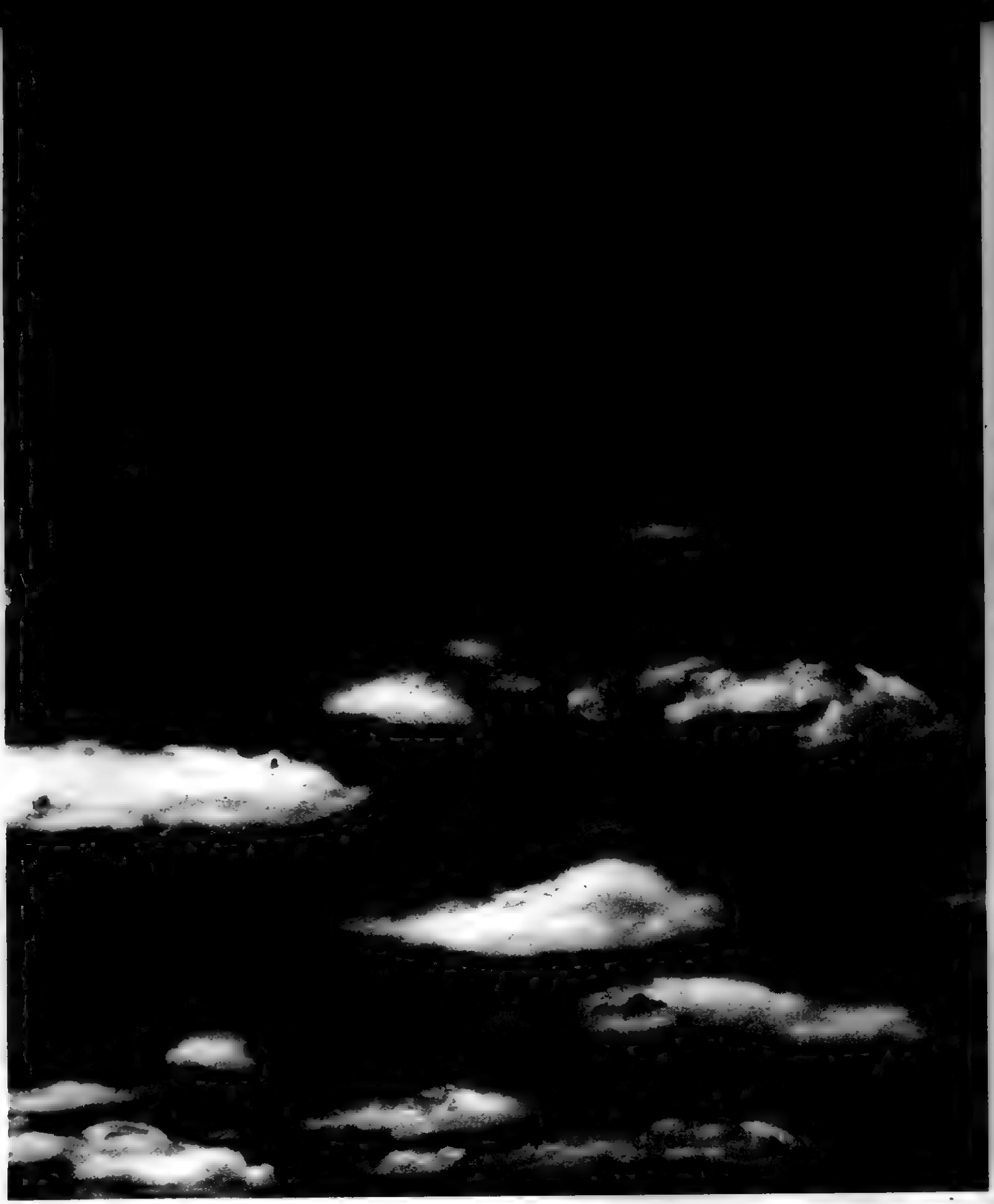
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Wang reinforces VS operating system

Offers additional storage, connection enhancements to proprietary line

BY SALLY COSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. rolled out a new operating system and several storage and connection enhancements for the VS line, to the relief of some of its principal customers.

"This is a direct response to our client needs — as long as customers want to be on VS, we will be there to build and support them," said Gerry Paul, vice president of systems and communications at Wang.

The latest version of the VS operating system, designated 7.30.04, enables as many as 998 workstation devices to be connected to the VS 8000 and 10000 families of systems. The previous version, 7.30.02, supported 512 devices.

Additional support

The operating environment also supports up to 512 active workstation tasks on a high-end VS.

Jim Holsopple, manager of data processing at Goshen Rubber Co. in Goshen, Ind., characterized the announcement as "timely."

"We are sitting at approximately 230 tasks right now and have already maxed out our VS 10000 Model 50," he said.

Goshen Rubber runs Wang imaging applications for blueprint and documentation quotations and currently has 105 users connected to the system.

At the Gas Research Institute in Chicago, Peter A. Cangelosi, manager of data processing services, said the organization has evaluated the operating system and is in the process of developing a conversion plan.

Cangelosi said the Gas Research Institute has "hit the limit," running the VS 7.21 operating system on a VS 10000 Model 50 machine.

"The new versions will allow us to manipulate memory better and give us significant upgrades in terms of connectivity," Cangelosi said.

> "THIS IS A direct response to our client needs — as long as customers want to be on VS, we will be there to build and support them."
>
> GERRY PAUL
> WANG

Wang also announced Extended Serial Device Support and the VS Mass Storage I/O Subsystem. The Extended Serial Device Support software doubles the number of physical and logical devices that can be configured on serial I/O controllers in a high-end VS environment.

The subsystem includes two I/O controllers, two small computer systems interface (SCSI) tape drives and four SCSI disk drives.

These announcements follow Chief Executive Officer Richard Miller's six-page letter to customers earlier this month, which was billed as the first installment of Wang's Office 2000 strategy.

While the letter made little mention of the VS base, Miller stated in an interview that VS customers could expect more in terms of "price/performance upgrades and connectivity."

John Hosanna, manager of technical services at Natural Gas Pipeline Company of America in Houston, uses the VS in conjunction with Wang's newer Open/Server products to connect personal computer local-area networks to five large VS systems.

Hosanna said he is pleased with Wang's proprietary and open product lines. He plans to look at the vendor's Dynamix series of Unix-based PCs eventually, he said.

More Office 2000 announcements are expected this week.

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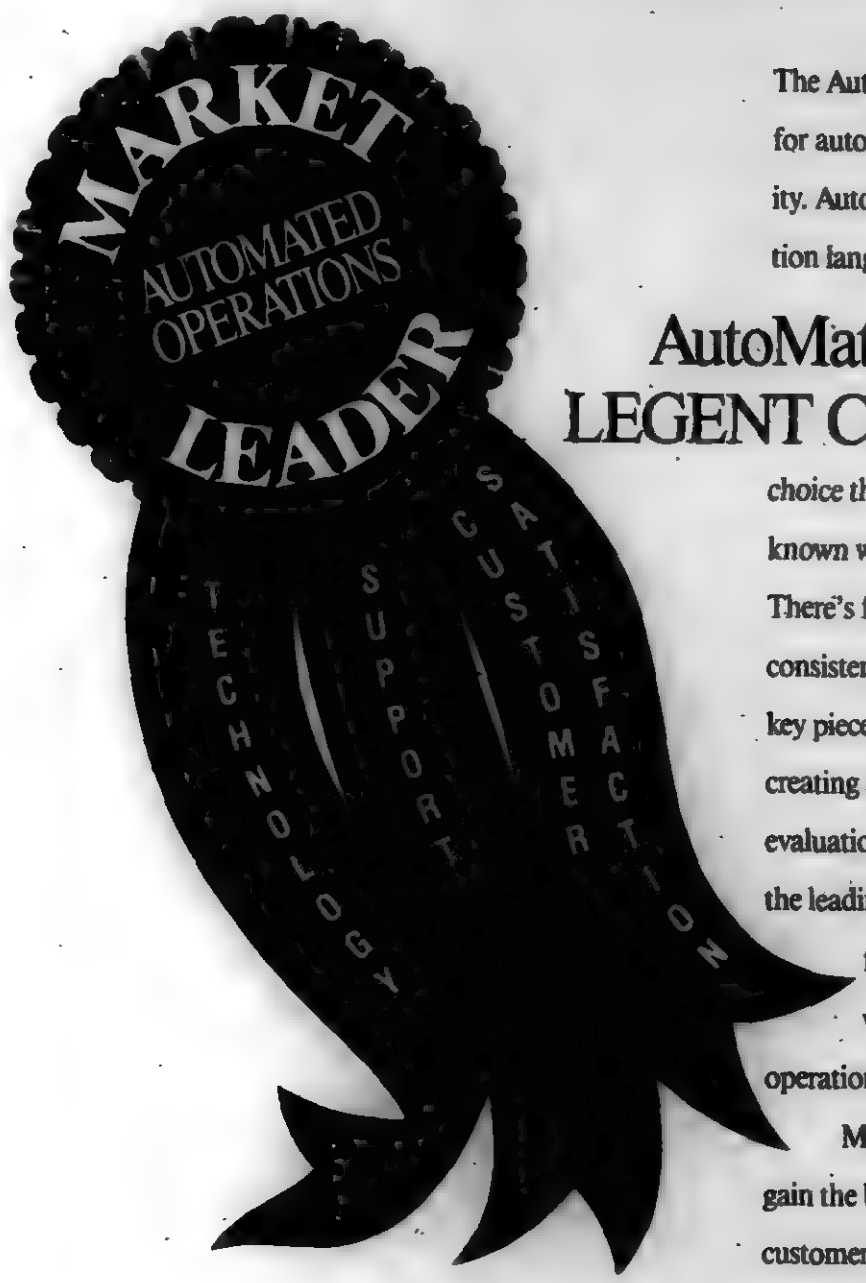
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*Gartner Group's *Software Management Strategies*, P-480-866, "LEGENT's ASO Products Take the Lead," 8/29/90.

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A high-tech salute to vets

Country Joe McDonald starts on-line, interactive memorial

BY J. A. SAVAGE
CW STAFF

BERKELEY, Calif. — *Gimme a V! Gimme an E! Gimme a T! What's that spell? What's that spell?*

That slightly different version of Country Joe McDonald's most famous antiwar cheer from Woodstock could be the theme for his latest project: a veterans war memorial. But this memorial is not carved from granite. It is a veterans database residing on publicly accessible terminals for interactive use.

Set to be completed by Veterans Day, Nov. 11, the Veterans Memorial project will contain the names, ranks and death information of approximately 2,000 Alameda County service people killed in World War I, World War II, the Korean War, the Vietnam War and the Persian Gulf war.

"In the '80s, I got reinvolved with war after requests from veterans' groups to provide entertainment," said McDonald, a Navy veteran who currently sports a straw hat with a yellow ribbon and enamel flag pin. He started planning for a physical memorial, along the lines of the typical statue to be erected in a new park in the city.



Rytodac USA

Country Joe *helped create an interactive veterans memorial*

"But there were problems: People would have to physically go to it to participate, and it cost a lot of money," McDonald said. He hooked up with a community database outfit called Community Memory [CW, Oct. 8, 1990], which provides publicly accessible terminals in laundromats, senior citizen centers and libraries.

With the help of 10 volunteers, information about veterans is being entered into the community database. Users can add their thoughts, additional information on the dead, poems or whatever.

Community Memory, a nonprofit group, was one of the first developers of relational databases in the early 1980s. The organization has an Intel Corp. 80386-based IBM Personal Computer clone running AT&T Unix System V as a server and 10 diskless clones in the field for user access. I/O and database management are done on the server, while the PCs manage screens. Leased lines provide data transfer with a packet-switched network through limited-distance modems to increase efficiency.

While McDonald came up with the idea of the Veterans Memorial Project, he left it to Community Memory to set up the program. "I'm not a computer person," he said. He is continuing to pursue a physical memorial in the park, but his new design includes a public terminal.

A plethora of promises

Among the developments Banyan officials promised the Association of Banyan Users at their conference last week in Montreal were the following:

- LU 6.2 IBM host connectivity to Vines servers within 60 days.
- "Imminent" Vines support of Macintosh clients.
- Eventual support of Unix clients.
- A restructuring of the Vines developers' conference to attract more applications development for the network.
- Third-party subscription service for Banyan technical bulletins.

Vines users worry about Banyan

BY JOANIE M. WEXLER
CW STAFF

MONTREAL — Vendor viability worries tempered user enthusiasm for the rollout of Version 4.10 of Banyan Systems, Inc.'s Vines local-area network last week at the Association of Banyan Users meeting.

Marketing and political concerns voiced by the fiercely loyal and technically adept Vines community drowned out the pros and cons of Banyan's Virtual Networking System (Vines) capabilities. Several users agreed that large-customer-oriented Banyan must shift to a "bottom-up" approach and be willing to sell into smaller accounts to grab market share and collect the cash it needs for continued product development.

This is a tactic that has accumulated about 55% market share for major competitor Novell, Inc. and ironically has seen some large Novell users complain they are often shortchanged for the needs of smaller customers.

However, "Novell has a huge presence and is getting the products out that their customers need," said Carol Ann Feder, LAN systems consultant at the University of Michigan.

In contrast to the publicly held, resource-rich Novell, the $100 million Banyan is a private company garnering about 5% market share. While the 6-year-old firm's account list reads like a "Who's Who" of corporate America, the fact that "it's 1991, and Vines doesn't have more market share is incredible," said Jim U'Ren, LAN services manager at Jet Propulsion Laboratories.

Vines users expressed to Banyan executives the difficulty they experience selling the Vines concept to upper management because of Novell's widespread "mind share."

One Banyan customer has elected to use a third party's electronic mail package on Vines rather than Banyan's E-mail package "so that if Banyan doesn't make it, the E-mail interface won't change," said Gary Wilson, a network manager at Ortho Pharmaceuticals Corp.

In addition, some users want direct service and support from Banyan rather than from resellers who often "are not trained to remedy problems and install software patches," said Alois Morhart, vice president of the Banyan Users Group in Germany.

Banyan is scrambling to be responsive. President David C. Mahoney stressed the importance of imminent strategic alliances with other companies to allow Banyan to gain the resources it needs to satisfy customers.

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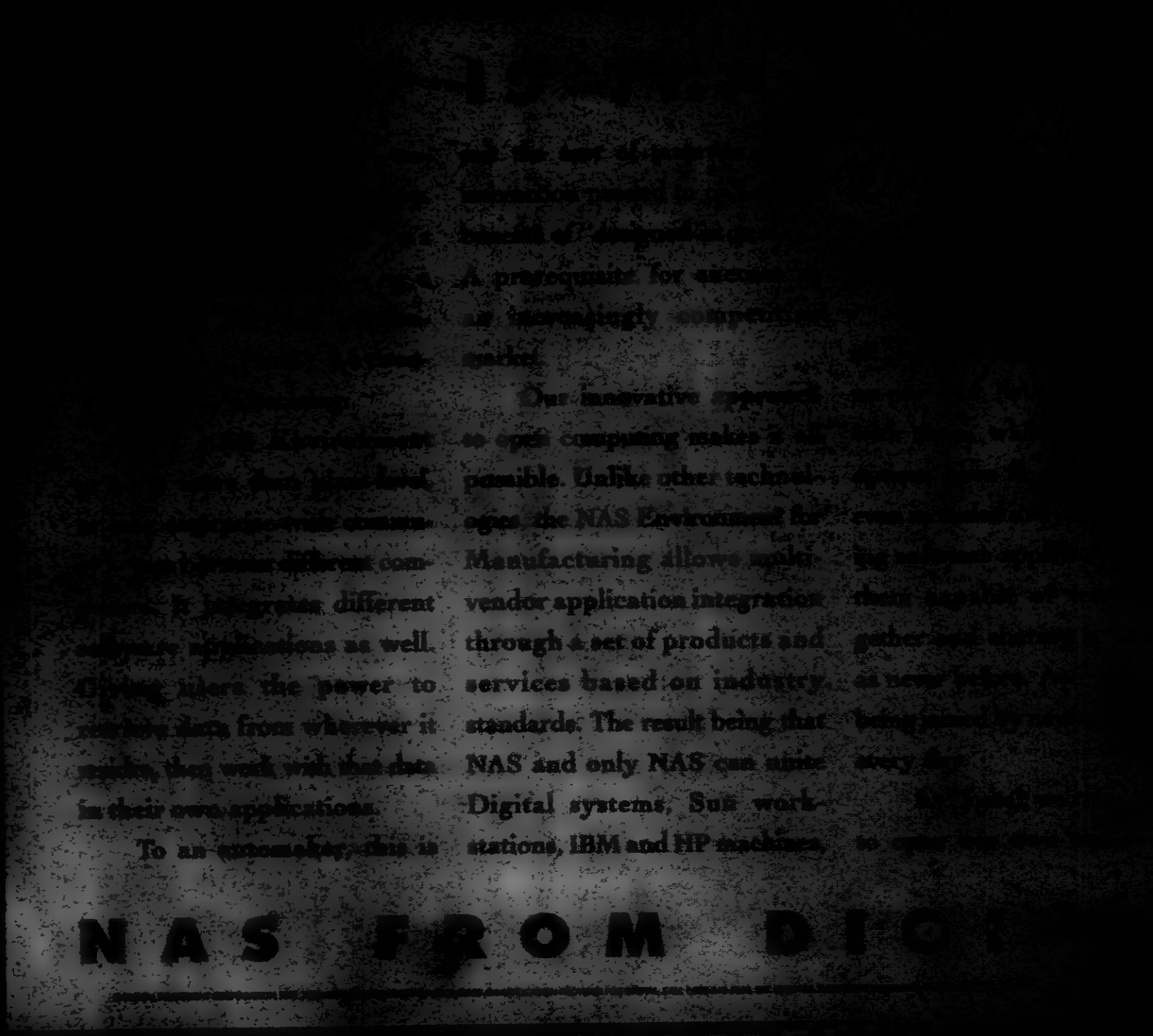
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ADVANCED TECHNOLOGY

Who is liable? Just ask the experts

Damage caused by knowledge-based systems could lead to lawsuits that target everyone involved

BY MICHAEL ALEXANDER
CW STAFF

Here is a quick multiple choice test:

If a knowledge-based or expert system failed in some way and caused personal or economic injury to an individual or organization, who would be the likely target of a liability lawsuit?

A. The developer who created the system's shell.

B. The expert who supplied the system's knowledge base.

C. The user who placed too much faith in the system's output.

D. All of the above and probably a number of others to boot.

The correct answer is D, according to several legal experts.

"I would sue everybody, jointly and severally," said David Newman Jr., an attorney and associate professor of electrical engineering and applied science at George Washington University.

A lawsuit based on injury caused by a knowledge-based or expert system has yet to make it into court, but the legal community "is just waiting for a case to happen," Newman said.

Unaware of risk

Designers of expert systems and end users who rely on their efforts are unaware of the risk they face should the system fail. Vendors who create the system's shell are also at risk even though they have little control over how the system is used or who uses it, the legal experts said.

"If you're designing a system that is going to be used for an application that has significant exposure to damage or loss, you have a degree of responsibility of identifying how the knowledge system is put together," said Richard Bernacchi, an attorney and computer law expert at Irell & Manella in Los Angeles.

The system designer and users can protect themselves to some extent by documenting the care they take in selecting a product before putting it to use. That care should include a complete evaluation of the product and a reference check with current users. " 'Let the buyer beware,' applies in this area like any other," Bernacchi said.

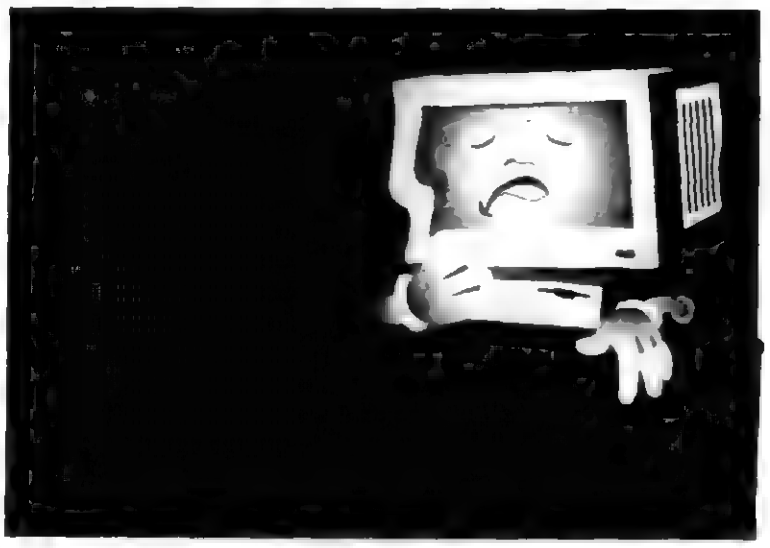
Despite the liability risk, sellers and buyers are not particularly cautious when working with expert systems, said Larry Harris, founder and chairman of AI Corp., a Waltham, Mass.-based developer of knowledge-based system tools.

"Someone has to get burned first" with legal action before attitudes change, he said.

The liability issue is a concern to the industry in general but probably affects designers of vertical applications more than the developer of the tools used to create the system, Harris said.

"It is not different than writing a medical book," Harris said. "I don't think that a doctor can sue the author of a medical book; it is still the responsibility of the doctor who makes the diagnosis."

Such disclaimers would probably not prevent a lawsuit or hold up in court, legal experts said. The vendor could be liable in ways never before imagined: End users could attempt to use the product in unforeseen ways or simply decide not to take training courses offered by the vendor, for example. In either case, the vendor could be in the docket alongside the other defendants, according to legal opinion.



Ray Vella

Take precautions

There are precautions that vendors should consider, Bernacchi said. "One thing that would help considerably is to document the testing process." A show of reasonable precaution will help offset any legal action.

Even so, legal experts said, it is only a matter of time before a malfunctioning knowledge-based system triggers a lawsuit. When that happens, everyone involved in the creation of the knowledge-based system could face the prospect of legal action.

The suit could be on several grounds, ranging from breach of contract to negligence. "Would I win on every ground?" Newman asked. "It doesn't matter. If I win on one, I would get whatever I went after for my client."

The liabilities will also vary according to whether a knowledge-based application is determined by the court to be a good, a service or a combination of the two.

"That can make a difference in the sense that some jurisdictions have different ground rules whether certain legal principles apply in case of service as opposed to product," Bernacchi explained.

Carrier device makes for supercool conductivity

BY MICHAEL ALEXANDER
CW STAFF

Carrier Corp. has introduced what may be the coolest technology yet for advanced electronics and superconducting devices. The company recently unwrapped a compact cryogenic cooler capable of maintaining a chilly -321 degrees Farenheit.

The cryocooler makes it possible for computers, communications equipment and manufacturers to use superconducting devices in a wide variety of applications, according to Carrier. Superconductivity is a phenomenon that occurs in many electric conductors when chilled to extremely low temperatures. The electrons undergo a transformation that causes the resistance to the flow of electric current to vanish, among other effects.



The amount of cooling is *determined by the size of the cold head shown here*

Computer and defense industries are the most immediate and largest markets for the device, said Gerald Robertson, director of advanced electronics cooling at the Carrier Transicold Division in Syracuse, N.Y.

The unit could be used to cool complementary metal-oxide semiconductor chips in minicomputers, for example, Robertson said. "You can get a speed increase of a factor of two." The cooled chips have also been found to be more reliable.

Researchers working on high-speed computer technology are attempting to develop computers with circuits based on superconductivity and a technology called the Josephson effect. Modern high-performance synchronous computers have operating cycle times between 12 and 60 nsec. Superconducting and Josephson technologies could reduce the cycle times to below 4 nsec and eventually to subnanosecond cycle times. Reliably cooling the computer to temperatures as low as -452 degrees Farenheit is one of several challenges that researchers are now trying to resolve.

Satellite and other communications equipment could use superconductivity to boost the performance of communications switches, transmission lines, filters, parametric amplifiers and other related components.

The technology is also being explored for use in space, defense, medical instrumentation and magnetically levitated trains, among other areas, Robertson said.

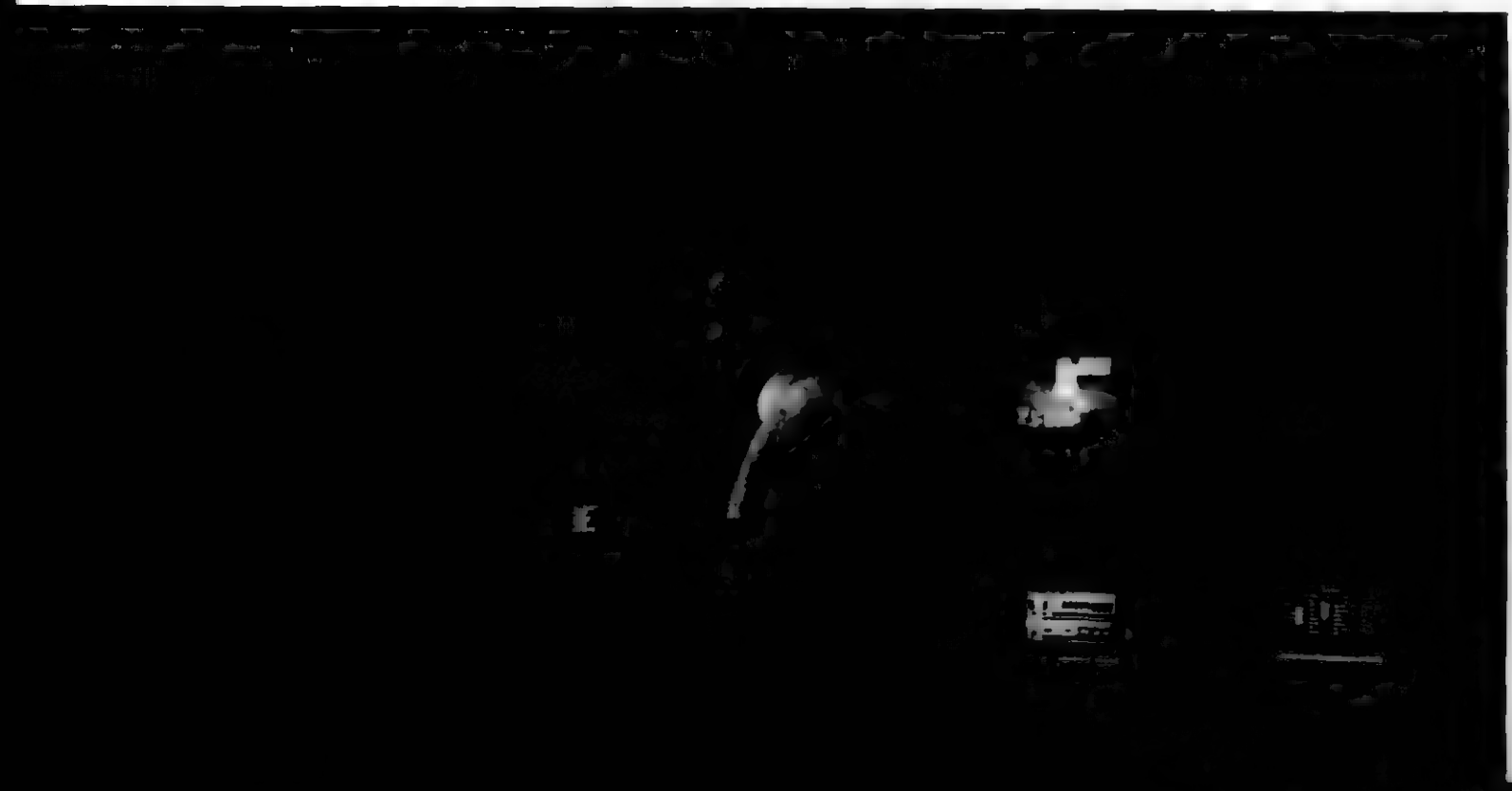
"We see the market for the cryocooler to be fairly large," Robertson said. "We're anticipating a $100 million market to emerge by 1996."

The cryocooler, which has been in development since 1989, employs a Stirling cycle compressor that uses helium as its refrigerant rather than chlorofluorocarbons.

The cooler's base measures about 17½ by 29 inches. Its height varies according to the size of the cold head, where the cooling takes place.

The cooler will sell for approximately $20,000.

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EDITORIAL

United they fall

IF THERE IS anything to be said for the historical performance of computer industry consortia, it is this: Either they fall far short of the tremendous hype that greets their introduction, or they just plain fall.

This is not an opinion as much as it is an observation. Remember Trilogy? If you don't, that's because it died so quickly, but not before several big vendors poured a quarter of a billion dollars into an effort to rewrite the book on processor chip design. Almost symbolically, the prototypes flamed out.

How about Sematech, the purported American answer to Japan, Inc.? That effort even dipped into tax dollars before fizzling last year.

And while it may be considered unfair to utter the Open Software Foundation (OSF) in the same breath as these chip blips, one could certainly make a case that the OSF is still leagues away from all the promise that was suggested at its grand unveiling, which featured the likes of Ken Olsen, John Young, John Akers et al holding hands onstage for the cameras and talking of the brave new world of Unix that the OSF would foster.

Enter now yet another consortium, the Advanced Computing Environment (ACE), which promises nothing less than to redefine and recast the hottest hardware market in the computer business, the RISC workstation market.

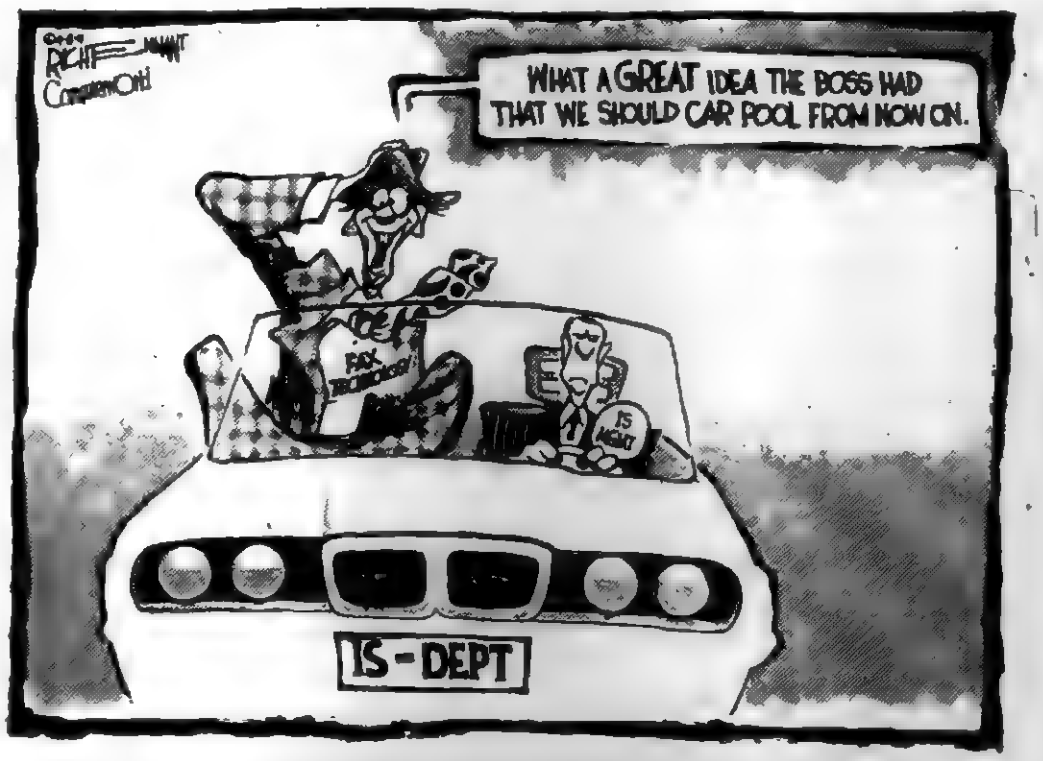
The group is led by some mighty big names — Microsoft, DEC and Compaq. Microsoft is supposed to build the software bridge between the Intel and RISC worlds. Today, it has no presence in the workstation market. Neither does Compaq, though it would like one. And DEC's workstation market share is falling.

But there is a plan: Through their collective strength, the consortium members will rope the software developers into the ACE camp, maybe even away from Sun, HP/Apollo and IBM (which collectively sell three out of four workstations today). There are a few catches, such as the fact that ACE won't have all the component parts of its systems for a few years. But what's a few years in this business? A lifetime maybe for some customers.

And what about the customers? Has anyone asked what they want? No one asked them what PC standard they wanted 10 years ago, but they cast their dollar votes for the IBM standard, and all those other great PC solutions, save Apple's, went away.

Therein lies one of the probable seeds of demise of so many joint efforts. They purport to be acting on behalf of the customer, yet clearly the attempt is to serve individual market share needs first, ignoring the implicit customer demands the market has reflected.

No matter what the final outcome of ACE's efforts, one fact will remain perfectly clear: Customers set standards, not vendors — not IBM, not Compaq, not Microsoft. If ACE's goal is in fact to "set a computing standard," the group is doomed as fast as you can say "Sematech."



LETTERS TO THE EDITOR

Trial and error

The March 11 editorial, "Rule of law," misstates what happened in the Lotus/Paperback 1-2-3 copyright case. The Lotus ruling was not based on "usurpation of program code." Paperback, in fact, revised an existing spreadsheet program to be compatible with 1-2-3 by incorporating most of the menu text and the abstract command hierarchy that ties the menu actions together. Had the case merely involved the copying of code — or even the modification of code — it would have been much simpler. Rather, like the Apple/Microsoft case, it involved whether and to what extent copyright law extends to "nonliteral" elements, going beyond the program itself to what the program produces and how it behaves when it is executed.

My concern is that the court may not be able to find that "elusive win-win" to which you refer. In fact, more and more people in my profession are coming to the view that we may need a broad legislative re-examination of the underlying fundamental principles in order to sort out this and many related issues.

Ronald Abramson
Hughes Hubbard & Reed
New York, N.Y.

Academic IS

The comments of Miami-Dade Community College's director of computer services, Albert L. LeDuc [CW, March 11], concerning the stresses and responsibilities in computing in higher education were right on the button. Computing in academia is very similar to that in private industry. Those of us dedicated to our missions spend many long days at the office (and later at home). The pressures of projects, fire fighting and personal efforts to achieve valuable results for our institutions belie the perceived idea of a laid-back respite in an "ivory tower." Whether in administrative computing, networking or academic computing, we work with many of the same vendors as our counterparts in business and do the same strategic planning and daily operations. Such things as chargeback, project cost/benefit analysis and the normal budget process are all handled by those of us in academia.

We devote our professional lives to this occupational choice for varied reasons. As with some faculty and university administrators who could make more money from employment in private industry, many of us do it for the less tangible rewards of helping the educational system and the future embodied in our students and to be challenged in an environment of ideas and activities that abound on both small and large campuses.

John Neubert
Director, Academic Computing
Drew University
Madison, N.J.

Closed minds

The comments attributed to William Joy in your "Inside Lines" column [CW, March 11] are typical of those from many individuals who have learned to use one particular computer operating system or architecture and no other. These comments demonstrate an extremely poor understanding of the relative merits of the diverse tools available for solving computer-related tasks. Imagine asking a contractor, "Which is the 'best' hammer?" The answer should vary according to the task at hand. Mr. Joy's comments display the narrow-minded view that so frequently leads end users to be saddled with a sledgehammer when more appropriate tools may be more commonly or economically available.

Among the computers available for my use are high-powered mainframe computers running the Unix operating system, minicomputers (yes, Bill, even Sun Sparc servers with lots of RAM and multigigabyte drives), Intel-based PCs of all persuasions and Macintoshes.

The provincial attitude displayed by Mr. Joy is one that I have often encountered among my peers, some of whom are DEC VAX gurus, Macintosh gurus, Unix gurus, PC gurus, ad nauseum. And it makes me sad, particularly for the less experienced user who may seek out the advice of these "experts."

No one is born knowing about this stuff, but those who seek to expand their horizons in this complex field would do well to take the advice of such computer bigots with less than a grain of salt.

Michael W. Lurie
Computer-Aided Design
Systems Engineer
CAE-Link Corp.
Binghamton, N.Y.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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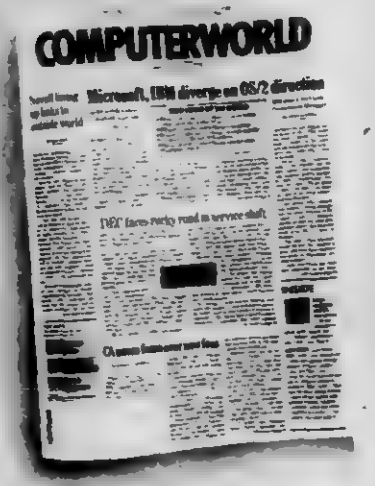
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Where the public draws the line

Consumers are learning they can say 'no' to invasions of privacy

JANLORI GOLDMAN



A targeted mailing arrives at your door: "Congratulations, Ms. Jones, on your new raise. You'll be needing it since you've just bought a new home and a car and had a baby last year. Wondering how you'll afford your third trip to Barbados? Or how you're going to pay that huge mortgage? Have we got a deal for you."

The core principle of privacy laws is that information collected for one purpose may not be used for another purpose without the individual's consent. Thus, a detailed financial history you provide to obtain a mortgage should not be used later by a marketer unless you give your permission. However, in areas not yet regulated by privacy law, such as most marketing activities, personal information obtained in one transaction is routinely sold for a second profit without the person's knowledge or permission. The information travels from database to database, eventually making up what one commentator dubbed "a womb-to-tomb dossier."

Catching the fever

Everyone's catching database fever, and the consequences can be severe.

Employers are running credit and criminal history checks of employees to assess trustworthiness. Landlords can now access a database to learn if a tenant has ever filed a complaint against a former landlord. Doctors can check to see if a patient has brought a malpractice suit against another doctor.

Although these databases are notoriously inaccurate, they are used to make decisions affecting people at critical junctures in their lives. And in the near future, genetic testing will make it possible for insurance companies and employers to weed out people who seem likely to develop a physical or mental illness.

The good news is that consumers are catching on. They're learning that information about them is being bought, sold and exchanged by the private sector and the government, and they're beginning to insist on the opportunity to say "no" to secondary disclosures.

Recently, for example, the Social Security Administration was forced to stop matching and verifying millions of social security numbers for TRW, Inc. after the practice was made public.

Consumers are demanding privacy protection in the development of information products and services, and the industry is responding. Privacy is emerging as a critical factor that can determine the rise or fall of certain products.

The recent decision by Equifax and Lotus to abandon Lotus Marketplace was in direct response to intense and widespread opposition to the product, a database that would have contained names, addresses, buying habits and income levels of 80 million households. Much of the information came from Equifax's consumer reporting databases. Outraged that such a vast amount of personal information was to be available without their permission, thousands of people insisted that their names be removed from Lotus Marketplace.



James Yurk

In withdrawing the product, the companies conceded that the privacy problems could not be fixed. This session, Congress will consider a sweeping reform of the outdated law that regulates the credit reporting industry.

Digging deep

Caller ID is another product that taps people's deeply rooted sense of privacy and another area where public response has altered industry policy.

Early on, a number of telephone companies decided to market Caller ID to automatically display the number from which a call is placed, regardless of the privacy concerns of the person making the call.

These telephone companies soon realized, after intense public pressure, that people want control on both ends of a telephone call — people on the receiving end want to see who's calling before they pick up the telephone, and callers want to decide when and to whom to give their number. Legislation is pending to require that, where Caller ID is offered, telephone companies must give callers the ability to block the display of their number on the receiving end. In the meantime, however, the public is demanding blocking and, with the exception of a few holdouts, they are getting it.

Blocking actually serves the privacy interests of both callers and call recipients, who are often the same people. It actually provides more information for call recipients. For instance, people who are on the receiving end of abusive or harassing telephone calls may decide never to answer a call from a blocked number.

People who care about their privacy are a powerful constituency. In the past few years, a number of companies and trade associations have actively supported federal privacy legislation as a good way to assure the public that personal information is safe with them.

After the disclosure of ex-judge Robert Bork's video rental list, Erol's video stores, the Video Software Dealers Association and the Direct Marketing Association came forward to press for a tough law prohibiting video stores from releasing rental information without a person's consent. The resulting Video Privacy Act of 1988 won the unanimous approval of Con-

The Bork bill, as it is known, is not about having something to hide. It is about the freedom to view movies in the privacy of your own home, shielded from the prying eye.

Right to decide

The right to decide what people know about you strikes at the heart of our constitutional values of liberty, autonomy and freedom. Without the ability to retreat into our private world, we will lose our freedom to step boldly into public life. Privacy protection allows people to actively and openly participate in our society.

Unfortunately, in its recent decisions, the Supreme Court has lowered constitutional privacy protection to fit what is technically possible. For example, the court has ruled that since high-tech helicopters can hover over backyards, we should expect the Feds to be there. The court has also decided that, since cordless telephones operate on a radio-based, easy-to-overhear frequency, we should expect all of our conversations on them to be public. As a result, privacy advocates have learned that we must turn to Congress to write privacy expectations into the

Privacy advocates are not Luddites who are trying to smash the computer state. We are insisting that progress be measured by technology's ability to preserve privacy. In this area, progress must be defined by new technologies designed to meet — not undercut — society's legitimate expectations of privacy.

Goldman is director of the American Civil Liberties Union Project on Privacy and Technology.

Mainframe programmers and the V-8 mentality

MARC S. SOKOL



A recurring scene in the Danny DeVito/Richard Dreyfuss movie *Tin Men* says a lot about what's happening in information technology today. DeVito and Dreyfuss play two aluminum siding salesmen in the early 1960s. They drive around Baltimore in huge Cadillacs, but Dreyfuss starts noticing Volkswagen bugs zipping around all over the place.

By the end of the movie, he realizes that those peppy little cars represent the future and that the lumbering hulks he and his colleagues drive are headed for near-extinction.

Today, something similar is going on in IS shops around the country. Not only have personal computers become more powerful; but a whole range of PC-based application development tools now exist — Cobol compilers, CICS emulators, debuggers, compression utilities, screen editors and programming shells.

Machine machismo

These products do more than enable PCs to build full-scale mainframe applications. In many ways, they do a better job of building those applications than mainframes do. Yet there remains a strong degree of resistance to using PC workstations this way.

There are hard-core mainframe programmers determined to hold their ground against the incursion of smaller systems. They seem to feel that PCs just don't have "the necessaries" — the capacity, the sophistication, the power — to perform mainframe programming and maintenance.

Much of this reflects the unique mainframe programmer mentality. It's well known that many of us who come from a mainframe programming background view ourselves as a kind of high-tech elite. We often distinguish ourselves by our language, style of dress and eccentric working hours. But most of all, some mainframe programmers pride themselves on the sheer size and power of the machines at their command. Within this group, the idea of programming on a PC is demeaning — like asking Mario Andretti to drive a Ford Escort in the Indy 500.

The user has a choice today: Work the graveyard shift to get development time on the mainframe or work normal hours on the PC.

IS managers also have a choice: Let programmers hog mainframe resources to build applications at the expense of current operations and end users, or let them use separate, less costly and nondisruptive PCs to perform the same job.

Get the message?

The message for the mainframe programmer is clear: Adapt, or go the way of black-and-white television and monaural recordings.

Today's hard-core mainframe loyalists are like American carmakers in the 1960s. They too firmly believed that nothing would replace their hulking, supercharged monsters.

In a sense, the carmakers were right — there is nothing like the size and power of those big cars. There is also nothing like their gas guzzling, their jackrabbit starts, their lack of maneuverability or their inability to get into small parking spaces.

Mainframes are already being used differently in the new IS environment, more as information repositories and large-scale batch processors. It is the less progressive, less realistic IS shops that will continue to buck the trend toward using PCs for these programming tasks. Such shops will pay a high price in the form of relatively low productivity, less effective applications and continued unresponsiveness to end-user needs.

Sokol is executive vice president at Realia, Inc., a Chicago-based producer of Cobol compilers and other application development tools for PCs.

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Jones, DBA:

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phenomenal growth we are undergoing," Jones concluded.

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COMMENTARY

Johanna Ambrosio

Users look at themselves

Attending a meeting of the User Alliance for Open Systems in Dallas last month was a little like being a fly on a therapist's wall. Users spoke among themselves about the real reasons why open systems are not yet widespread in IS shops, and they blamed themselves as much as the vendors.

You remember the User Alliance. They're the people who originally billed themselves as the Atlanta 6, then got to be the Houston 30. They started out as a bunch of users who just wanted to talk to other users about the issues and problems surrounding open systems. In January, they joined the Corporation for Open Systems (COS), which provides organizational support, but the User Alliance remains a group of volunteers. And, boy, are they still talking.

The 100-plus people who showed up in Dallas (official numbers were not disclosed, but guestimates put about half of them as real users) lamented the fact that no truly "open" system — that is, vendor independent — exists yet. But equally as important, the users said, are politics and other internal goings-on at IS organizations.

Rick A. Barron, a business interface specialist at McDonnell Douglas Aerospace Information Services in St. Louis, perhaps summed it up best. "We are part of the problem. Even if we had all the open systems software and hardware, we couldn't implement them. We'd still not know how to sell management and deal with all our internal issues. We're saying we want one thing, and we are buying another. We're sending very mixed messages to the vendors."

Another participant was Carl L. Terrell, senior engineering associate at Tennessee Eastman in Kingsport, Tenn. "The technology is here. The biggest problem is the lack of acceptance in user organizations. It's not a technical issue; it's political. It's just as much the users' fault as the vendors'," he said.

Finally, David Judson, who's with the U.S. Air Force at Wright-Patterson Air Force Base, said, "Getting technology to work is the easy part. The

Continued on page 32

IBM satisfied with ES/9000 progress

Company positions product line for server role and moves away from traditional mainframe slot

BY ROSEMARY HAMILTON
CW STAFF

IBM said last week it is making big strides with its Enterprise System/9000, claiming it has met 70% of recent user group requirements with the products related to this new generation.

Nicholas Donofrio, an IBM vice president who took over as president of the Data Systems Division three months ago, based that number on requirements presented by both the Share and Guide user groups. "But that's not enough," Donofrio said. "We are a bit humble. While we are proud of our ES/9000, we have a long way to go."

Frank Gens, a vice president at Technology Investment Strategies Corp. in Framingham, Mass., said that while "IBM has done a good job, the user requirements are a moving target. That list grows daily."

Industry consultants and the press were given separate large systems briefings last week. Gens said IBM is continuing to position mainframes as corporate servers and is staying away from large systems discussions revolving around "dollars per MIPS and transactions per second."

In the press briefing, Donofrio presented the ES/9000 as a server with several "enabling" technologies. This positioning was first made public by IBM last summer, when company executives provided a briefing on the changing role of the mainframe.

Sudden impact

Installations of new IBM 3090s fall off almost immediately after IBM announced the Enterprise System/9000 machines

Number of new U.S. installations

	First half 1990	Second half 1990
3090	176	50
ES/9000	–	218

Source: Computer Intelligence
CW Chart: Doreen St. John

Donofrio said the ES/9000 could provide a number of server functions, such as enterprise data management, networking, systems management and security. He also suggested it would continue to play a hub role for such activities as applications development, transaction processing and technical computing.

Company officials also said delivery of Systemview, IBM's grand strategy for enterprise-wide systems management, is on track. As with its other major Systems Application Architecture initiatives, IBM insisted Systemview is "far more than a concept," although most Systemview-compliant products are not yet shipping.

The company restated plans to release documentation on the Systemview data model this year. IBM also intends to provide another guide with more information on how to conform to Systemview by year's end. The first conformance guide was released recently.

Kathy Howell, director of systems management for the Enterprise System business line, said this data model documentation would be released "in a few months" and later clarified that time frame as "this year."

Howell suggested that Systemview may get more of an AD/Cycle spin in that IBM will likely forge closer alliances with select third-party software companies to serve as key Systemview business partners. Since its introduction, AD/Cycle has had a key group of inner-circle business partners that have remained distinct from other vendors that have traditional marketing relationships with IBM.

> "WE ARE A bit humble. While we are proud of our ES/9000, we have a long way to go."
>
> NICHOLAS DONOFRIO
> IBM

On the hardware side, Donofrio said, the company has shipped 14 of the 18 ES/9000 processors announced in September 1990. Of the 90 software products announced then, nearly half have shipped, he added.

Publisher uses software to improve distribution

BY MARYFRAN JOHNSON
CW STAFF

INDIANAPOLIS — Addison-Wesley Publishing Co. was poised on "the eve of a great adventure" last week as it fired up new warehouse management software and launched a complete renovation of its national distribution center.

"We are involved in a broad-gauge overhaul of all our bread-and-butter systems, focusing first on the customer-oriented ones," said Bob Smallman, vice president of operations at the publishing firm. "Hopefully, what our customers will see is better service time from us."

Anchoring the change is The Warehouse Boss Version 2.0, an automated warehouse management system from Panophic Systems, Inc. running on an Application System/400 Model B45 at Addison-Wesley's national distribution center here. A new order-processing system from Cambar Software will also be joining the renovation, running on an IBM 3090 mainframe at Addison-Wesley's corporate headquarters in Reading, Mass.

Orders will be processed on the mainframe and then downloaded to the AS/400, which manages the distribution process and passes data back to the mainframe.

Worth its weight

With sales in excess of $300 million in 1990, Addison-Wesley specialises in college and school textbooks and a variety of trade books and publications. Its distribution center last year shipped more than 16 million units, 1 million mail and UPS packages and 25 million pounds of truck freight, Smallman said.

"We've enjoyed considerable growth. In the last four years, we've literally doubled in size," he noted. "With the new software and the new AS/400, we think we'll cut our in-house cycle time in half and improve productivity by 25%." Reducing errors in picking and shipping should be another windfall of the new system, he added.

Last November, Addison-Wesley completed the addition of 137,000 sq ft to bring the size of its distribution center up to 400,000 sq ft. "We are totally changing our material handling systems, with all new conveyers and freight [sorting devices]," Smallman explained. "Boss is making the physical side of it all hang together."

Panophic announced this new version of Warehouse Boss earlier this month, adding an order pool management module to the six other key warehouse functions: inventory control and management; receiving; locating with confirmation; pick planning and confirmation; packing and shipping; and replenishment.

Lower costs, greater inven-

Continued on page 32

New boss

The Warehouse Boss by Panophic Systems, Inc. is going on-line this week at Addison-Wesley Publishing Co.'s distribution center



- Version 2.0 of The Warehouse Boss, an automated warehouse management system on the IBM Application System/400 platform, has been released.
- Enhancements in Version 2.0 include interfaces with a wide range of warehouse tools and equipment, such as bar coding systems, radio frequency terminals and other manufacturing business planning systems.
- Boss also interfaces with The Panophic Resource Management System, an integrated business planning and operations system now offering Electronic Data Interchange capabilities.
- Addison-Wesley expects fewer errors in the picking and shipping process and especially likes the ability to integrate with other manufacturing packages, such as order processing software that resides on its corporate IBM mainframe in Reading, Mass.
- One notable lack: There is no module in Boss 2.0 for handling returns, so Addison turned to an outside vendor to custom design one. Panophic claims over 50,000 installations at more than 15,000 mainframe and midrange sites.

CW Chart: Doreen St. John



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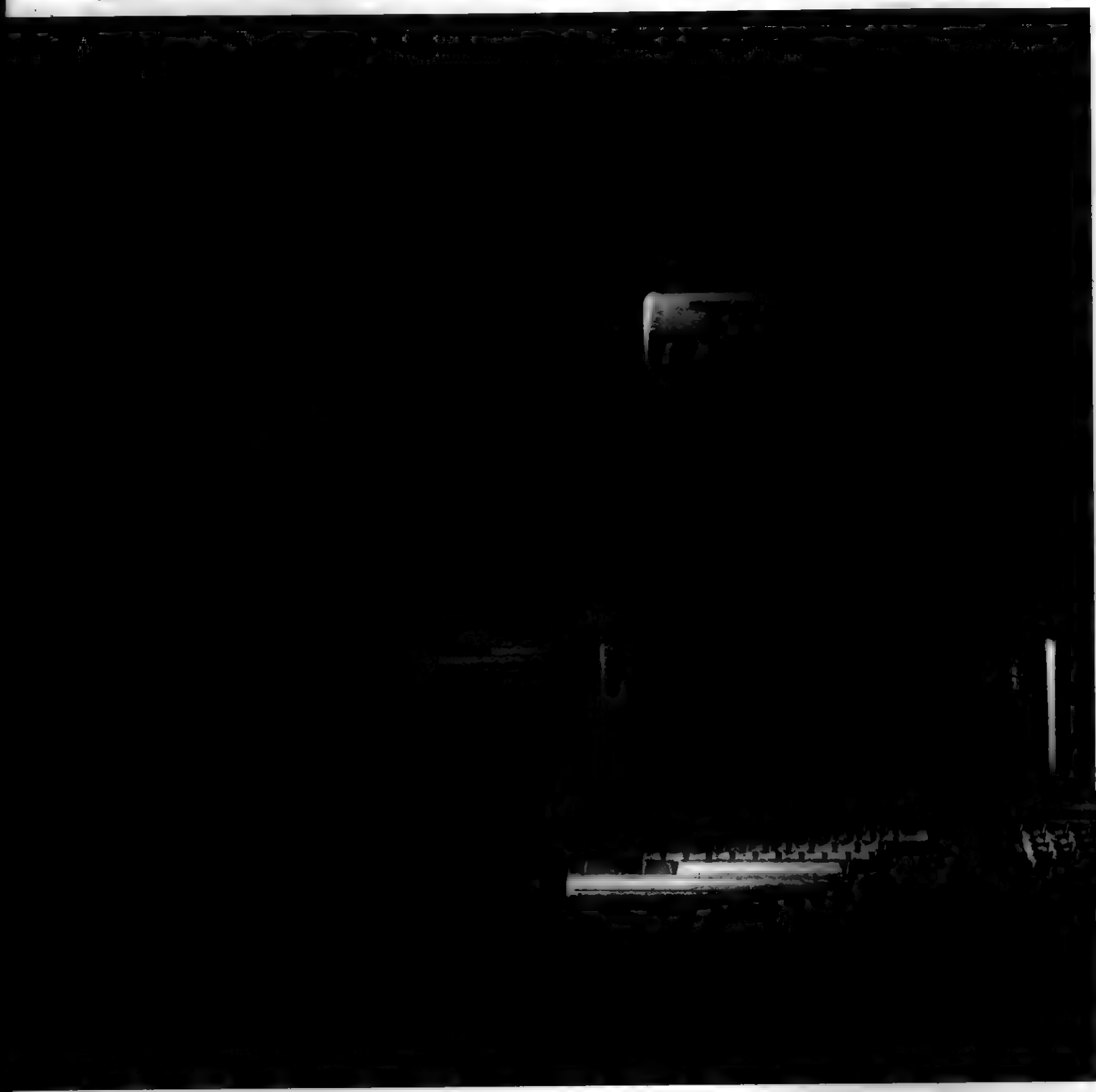
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[1] Mar[illegible] '[illegible] [2] Warranty applies to HP Vectra 486 25T and 486 33T PCs. Warranty offer available only in U.S. and Canada. © 1991 Hewlett-Packard Company CPP0011

Optical library in IBM plans

BY SALLY CUSACK
CW STAFF

IBM will soon announce an optical jukebox library storage subsystem, according to a report from Technology Investment Strategies Corp., a market research and consulting firm based in Framingham, Mass.

The write-once read-many optical library will be controlled by an IBM Personal System/2 and will support hundreds of gigabytes of data on 14-in. removable optical discs that will each store more than 6G bytes of data, the report said.

The most appealing aspect of the system will be its ability to operate on all IBM hardware platforms, said Robert J. Callery, a senior analyst at Technology Investment Strategies.

The system will be targeted toward personal computer local-area networks, Application System/400s and the S/370 and S/390 processor family. No VM or VSE support is expected.

"By putting an IBM logo on it and selling and supporting it on IBM platforms, it will automatically establish the product as credible in the user community," Callery said.

No competition

Noting that optical technology cannot compete with tape in the pricing arena, Callery pointed out that the next major challenge for general-purpose optical storage designers is to make it erasable for a reasonable cost.

While erasable optical discs do exist, current pricing prohibits most people from buying into the technology.

The cost issue is also expected to prevent the IBM optical library from cannibalizing IBM 3490 tape sales to any large degree, Callery said.

Three different optical jukebox systems are expected to be announced. The smallest unit will be slightly larger than a two-drawer file cabinet, while the larger will be about the size of an IBM 3390 disk drive. Access times are estimated to be in the 50-msec range with average disc changing times of under 10 seconds.

System models will be differentiated by number of optical discs and disc drives.

With first shipments scheduled for late this year, the new library is expected to appeal to specific archival-type applications, including blueprints, X rays, fingerprinting databases, maps, engineering drawings and manuals.

Automated garage set to deliver

No more aimlessly searching for cars in dark, crowded parking garages

ON SITE

BY SALLY CUSACK
CW STAFF

BARCELONA, Spain — Ever wandered aimlessly around a large garage, having forgotten where you parked your car? A project is under way here to build a parking garage capable of automatically delivering automobiles to their waiting owners in less than two minutes.

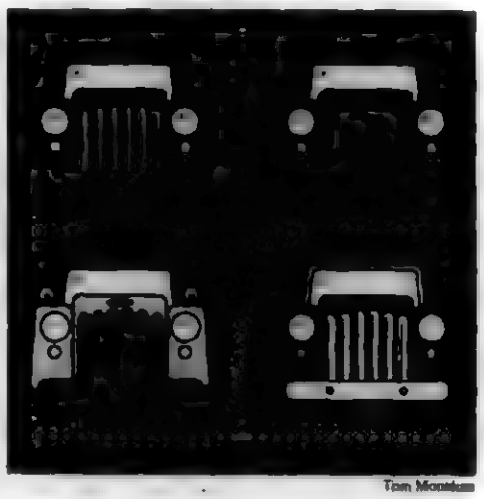
Camunsa Manutencion SA, an industrial-automation company based here, hopes to have the facility fully operational in time for the 1992 Summer Olympics. The project is the first of its kind in Europe.

Several computer technologies are incorporated in the project, including G2, a real-time expert software system from Gensym Corp. in Cambridge, Mass. Pyramid Integrator programmable logic controllers from Allen-Bradley Co. will operate the elevators.

DEC involvement

The software and controller system will run on two Digital Equipment Corp. Vaxstation 3100s.

On completion, the unstaffed, 10-story, underground garage will house 800 cars in the same amount of space that would accommodate 300 vehicles in a traditional parking area.



Tom Monteum

"Imagine a big warehouse with moving palettes," said Jordi Cruz, product manager at Allen-Bradley. "We needed a software with flexibility features in order to move the palettes. The expert system, G2, allows us to use knowledge rules to move each palette."

Six Pyramid Integrators — one to control each elevator — are connected to the DEC VAXs running the G2 program.

The software makes intelligent decisions about where the car should be stored and how it should be retrieved.

Parking in the garage will be 90% subscribed and 10% open to the general public, giving the G2 system the ability to learn about individual parking habits.

Customers will be issued a ticket, or card, for their car. They will insert it into a card reader for interpretation and delivery. The software will also control fire and theft alarms within the structure, Cruz noted.

Cruz described G2 as easy to work with. Objects created within G2 will automatically refer to a value in the programmable logic controller.

The software allows developers to establish arbitrary relationships between objects in a knowledge base, and icon regions can be defined to allow an icon to be composed of different colors.

The Pyramid Integrators have the capacity to gather thousands of variables in less than a second, Cruz said, and G2 provides a bridge code to gather information from the controllers to insert into the knowledge base. The G2 bridge code is written in C language.

"Working with the expert system and the Pyramid Integrators allows for a rapid transfer of data," Cruz said.

Cost considerations

The total cost of the project is estimated at $25 million, and the building planned above the garage will be "intelligent," too, with similar elevator control and G2 applications.

"The garage offers great economics," said Robert Moore, president of Gensym.

"In a typical parking facility, lots of space is given over to the physical maneuvering required to get in and out of the lots. This plan more than doubles the capacity of space used — a very valuable commodity in major cities," Moore added.

The G2 expert system has been available since 1988 and runs on DEC VAXs and Unix platforms as well as systems from IBM, Hewlett-Packard Co. and Sun Microsystems, Inc.

The system is compatible with X Window System, Transmission Control Protocol/Internet Protocol and Decnet networking environments.

IAAI winners reflective of mainstream trend

BY CAROL HILDEBRAND
CW STAFF

Like an art buyer who prefers a black velvet Elvis painting to an abstract expressionist work, artificial intelligence applications are veering away from the exotic and into the mainstream, a trend echoed by the choice of winners at this year's Innovative Applications in Artificial Intelligence (IAAI) Conference.

The conference, which will be held in conjunction with the American Association for Artificial Intelligence National Conference July 15 to 17 in Anaheim, Calif., showcases 21 applications.

IAAI tends to be more business-oriented than other AI conferences, according to Dave Blanchard, editor of Atlanta-based "Intelligent Systems Report," a newsletter covering AI and neural networks.

"It focuses more on business rather than academic applications," he said. "It's a good sampling of the types of things that are making companies big money."

Blanchard said he has seen AI applications "absolutely going in a more mainstream direction." For example, he said, the first conference highlighted such projects as an application that could help a rescue team calculate the amount of people in the water in the event of a problem at an offshore oil rig. Now, "for every application like that, you probably have 10 where it's a big company that's getting an edge on their competitors by streamlining procedures or putting a lot of information on-line or coming up with an angle to save money."

Opening doors

With the commercialization of AI has come the transparency of the AI component to users.

"Those two trends are very, very relevant right now," said Neera Buck, director of AI research at New Science Associates, Inc. in Southport, Conn. "What's happened is that this technology and the tools that have come on the market have become very pragmatic and easy to use." That, she said, has allowed automation projects that were previously out of the question.

The applications being honored were judged on criteria such as significance, innovation and payoff.

Following is a sampling of IAAI winners:

- An expert system started at the State of California Health and Welfare Agency processes 400,000 travel expense reports annually and has significantly reduced audit time and errors in paperwork.
- Nynex Corp. reportedly saved $6 million per year by using an expert system that diagnoses customer-related telephone problems.
- An AI-based maintenance scheduling system has increased fleet yield by 10% at American Airlines, Inc., which is using the system to juggle constantly changing flight schedules with such variables as weather conditions and federal regulations.

SOFT NOTES

Pick-Unix combo offered

Systems vendor General Automation, Inc. recently announced a hardware and software combination that allows users to concurrently run Unix applications and General Automation's R91 enhanced Pick environment. Prices for the new Advantix Operating Environment, which is available as an add-on for the company's Advantage Series systems, begin at $29,995.

Hall-Mark Electronics Corp. has been authorized by **Hewlett-Packard Co.** to distribute HP 9000 series 800 multiuser computer systems to value-added resellers. This is the first time HP has agreed to sell its large multiuser, reduced instruction set computing-based systems through industrial distributors. Hall-Mark is a privately owned distributor of electronic components and computer systems products.

ZPS, a software vendor in the Soviet Union, has signed a cooperative agreement with SAP America, Inc. in Philadelphia, a subsidiary of SAP AG, a European software developer. Under the terms of the agreement, ZPS will market SAP's R/2 System within the Soviet Union. The R/2 System is for on-line, real-time mainframe business applications.

Ambrosio

CONTINUED FROM PAGE 27

tough part is working the infrastructure: changing how we do business, dealing with the culture chasm. We're affecting the organizational structure, and we're trying to figure out how to do that."

How are these users dealing with their companies' internal issues? Well, just like users anywhere, they get together to share what has worked for them and what hasn't. At the Dallas meeting — the User Alliance's first meeting to be open to the general public — the organization formed work groups to address such areas as education.

Sally Jenkins, leader of the task group on education and research, said one of her group's goals is to help users get away from brand loyalty (buying something because it's made by vendor X) to buying products based on the user's corporate standards. "Some of the companies in the Alliance are already there; some are not," she said.

Jenkins' group is collecting information about open systems pilot projects, names of knowledgeable people in the user community who are willing to speak about their open systems experiences, studies and standards groups that deal with open systems and business-case information about why open systems are advantageous from the user corporation's viewpoint (in other words, tools to help convince upper management).

Jenkins said some of this information will be available to Alliance members at the next general meeting, which is scheduled to be held in the fall somewhere on the West Coast.

In the meantime, discussion goes on among the users. They're continuing to talk about such things as the following: how much users should define open systems at the risk of stifling vendor creativity; the differences between interoperability and interchangeability and between a standard product and a standard interface; how the User Alliance should work with existing standards bodies; and how all this affects IS budgets.

The idea here is that the more parts that are interchangeable, the more expensive the systems will be — at least initially.

So, users recognize that they have to articulate what they want, prioritize their needs and determine how much they're willing to pay for all this openness.

These are important issues, and they affect or will soon affect every IS organization in the country. But so far, the User Alliance has just 22 members, and nine of these were already members of the COS. That makes a grand total of 13 new members, although perhaps an additional 50 user organizations are actively participating in the alliance's work groups, even though they are not formally members.

Still, that's not a lot when you consider there are more than 11,000 organizations in the U.S. with a mainframe installed.

So, what are you going to say when your kid (or maybe the kid who works for you) asks, "What did you do when the open systems movement was happening?"

Ambrosio is Computerworld's Mid-Atlantic senior correspondent.

Publisher

CONTINUED FROM PAGE 27

tory accuracy and better customer service are the aim of the enhancements made to Boss 2.0, company officials said.

"Slot level" inventory control was a key attraction for Addison-Wesley. "That allows us to get rid of our annual physical inventory," Smallman said, explaining that stock will now be inventoried more frequently, keeping a kind of running tally on where everything is located.

"It gets rid of that operational disruption. Customers don't like to hear they won't get their shipment for three or four days while we count," he added.

The only missing piece in Boss was a module to handle returns, so the publishing firm had one custom-designed by another vendor. Aside from the hardware and software, however, the biggest challenge in such a far-reaching renovation is managing the change from the users' perspective, Smallman said.

"I've had a number of calls from other IS departments that are thinking of installing Boss, and it occurs to me that if the push is coming from the IS part of the organization, that company may be in a lot of trouble," Smallman said. "This is a product that very much has to be user-driven from the distribution side because it's going to re-engineer the way you do business."

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Open systems vendor Sequent moves to Pick

BY J. A. SAVAGE
CW STAFF

Sequent Computer Systems, Inc., maker of multiprocessing computers based on the Unix operating system, said last week it is entering the Pick market.

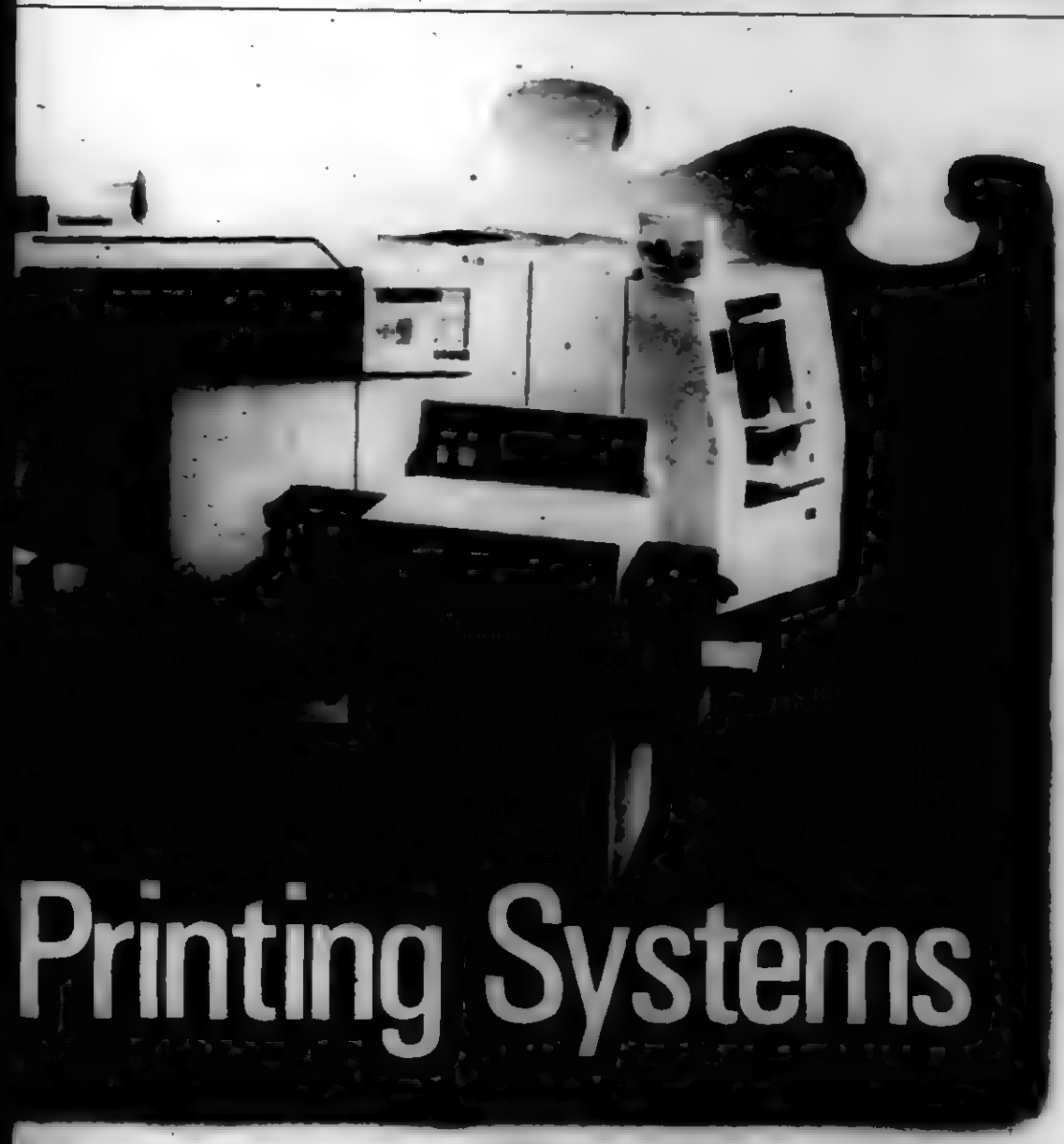
By putting Pick business environment applications on top of Unix, Sequent hopes to broaden its appeal in the commercial relational database arena. "Ninety percent of our systems are in the relational database market, and our sales guys were tripping over Pick deals right and left," said Al Dei Maggi, vice president of Pick operations at Sequent.

The Pick system, more than 20 years old, has remained a hit with its users, despite the industry's move to open systems. By putting Pick on top of Unix, Sequent hopes to keep Pick's current users as well as add new ones.

"We want to be in the market because it's big, and no one owns it," Dei Maggi said. For instance, McDonnell Douglas Corp. and Ultimate Corp. are two of the largest Pick vendors.

Dei Maggi said he assumes one-third of the Pick market consists of die-hard Pick operating system users, but the rest probably will not care whether Pick applications run on the Pick operating system or on another operating system.

Pick applications will be available on Sequent's Symmetry 2000 computers. Symmetry, based on Intel Corp.'s 1486 processors, can be configured with up to 30 processors in one system. They range in price from $190,000 to $2.5 million.



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Real-time EDI comes to CICS

WHITE PLAINS, N.Y. — IBM recently announced a data translation and document management program designed to allow customers with IBM CICS applications to send and receive electronic data interchange (EDI) transactions in real-time mode.

IBM Datainterchange/MVS-CICS is intended to support just-in-time systems and reportedly can be tailored to different application data formats, trading partners and networks through on-line customization.

The product can convert a customer's internal data formats to and from standards such as ANSI X12 and Edifact. According to IBM, allowing EDI transactions to flow interactively between an electronic mailbox and a CICS application without user intervention means customers and their business trading partners can exchange information in real time.

At the same time, IBM announced functional enhancements for the existing basic Datainterchange/MVS product, including a transaction store designed to separate translation and enveloping functions and thus provide flexibility and control over sending and receiving transactions. IBM also added on-line document management tools. Scheduled to be available in June, Datainterchange/MVS-CICS is priced at $18,410 and up.

NEW DEALS

Customs gives contract to CA

The U.S. Customs Service has awarded a five-year software services contract to Computer Associates International, Inc. in Garden City, N.Y. Under the contract, worth up to $27 million, CA will help support the U.S. Customs data center in Newington, Va.

The Los Angeles County Office of Education has selected a Bull HN Information Systems, Inc. mainframe computer to expand and upgrade its administrative systems. The $4.1 million DPS 9000 system will serve more than 100 school districts and other agencies and will process payroll and other administrative functions for the county's 130,000 teachers, administrators and staff members.

NEW PRODUCTS — SOFTWARE

Database management systems

Interactive Software Systems, Inc. has integrated its User Data Management System (UDMS), a user-oriented data management system designed for Digital Equipment Corp.'s VAX/VMS machines, with Ross Systems, Inc.'s business software.

Integration is accomplished via a predefined data dictionary. The amalgamated product features enhanced report writing capabilities across all Ross Systems business applications. It also provides links to other applications with diverse databases, such as Oracle Corp.'s Oracle and DEC's RDB.

Pricing for UDMS ranges from $4,500 to $54,000, depending on VAX CPU size. The Ross UDMS data dictionary is included with the product free of charge until June 1, 1991.

Interactive Software Systems
7175 W. Jefferson Ave.
Denver, Colo. 80235
(303) 987-1001

Development tools

Ask Computer Systems, Inc.'s Ingres Products Division has announced a terminal-based applications development tool designed to automatically generate high-level code that assists terminal users in developing business applications.

Ingres/Vision offers Frame Flow Diagram, a software component that lets users create applications visually by specifying frames to be used within an application, a process similar to making organizational charts. The product's Visual Query Editor allows users to define data to be accessed and operations to be made available within a certain frame, the vendor said.

The product is available for the Digital Equipment Corp. VAX/VMS environment. Pricing for a standard version equipped with a Microsoft Corp. Windows fourth-generation language, application code generator and other development tools ranges from $1,500 to $50,000.

Ask Computer Systems
2440 W. El Camino Real
Mountain View, Calif.
94039
(415) 969-4442

Objective Interface Systems, Inc. has announced a Unix version of Screen Machine for Ada, an Ada user interface development system that enables users to interactively create interfaces and use them from their Ada programs.

The product allows interfaces to be created with pull-down menus, action buttons and complex data entry forms. It includes a copy of Panedit, an interactive software utility package that facilitates interface building, and package libraries for writing Ada applications behind user interfaces.

Pricing ranges from $1,095 for an Intel Corp. 80386-based personal computer to $4,300 for a large Sun Microsystems, Inc. server. The product began shipping last month.

Objective Interface Systems
1875 Campus Commons Drive
Reston, Va. 22091
(703) 264-1900

Applications packages

Software Engineering of America, Inc. has announced an interactive job scheduling system that includes a TSO/ISPF interface with split-screen capability.

Computer Scheduling and Reporting (CSAR)/MVS Release 3.1 features job control language preprocessing that supports Restructured Extended Executor-style functions. Cross-memory services, flexible frequency standards and tape pull list reporting are also provided.

CSAR/MVS runs on all levels of MVS, MVS/XA and MVS/ESA as well as on VM- and VSE-based machines.

Pricing ranges from $12,500 to $29,500.

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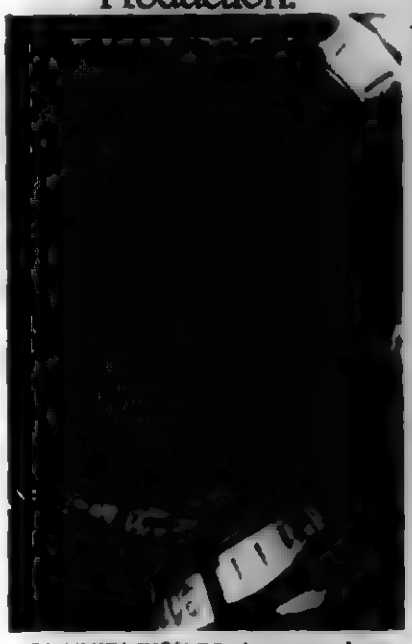
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It's by far the best way to maximize your investment in storage and resource management. Unlike IBM's solution, CA-UNIPACK/ASM works in *both SMS and non-SMS environments*, and addresses both tape and DASD management.

Some of the benefits include: automated tracking of tape library inventory, early warning and recovery facilities, DASD performance measurement, chargeback, destruction protection and automated volume cleanup.

It's the most effective solution for managing both tape and DASD resources.

Erdas, Inc. has announced Erdas Revision 7.5, an integrated software package designed for such geographic information system applications as urban and regional planning, natural resource management, oil and mineral exploration.

Features include the ability to import data from raster- or vector-based statistical packages; the capability to convert Erdas files to Adobe Systems, Inc. Postscript format for outputting to Postscript-compatible devices; and a Descriptor script language that enables users to write Descriptor macros.

The product is priced from $2,500.

Erdas
2801 Buford Highway
Atlanta, Ga. 30329
(404) 248-9000

Computer-aided software engineering

System Software Associates, Inc. has announced that its IBM AD/Cycle line of computer-aided software engineering tools can now run on IBM Application System/400s.

AS/Set Version 2.0 includes change management facilities, bidirectional referential integrity and templates designed to store screen and program functions as specifications.

The product is offered free to AS/Set clients who have maintenance contracts. First-time buyers may purchase it for $15,000 to $70,000, depending on AS/400 configuration and type of model.

System Software Associates
500 W. Madison
Chicago, Ill. 60606
(312) 641-2900

HARDWARE

I/O Devices

Sprinter, a series of stand-alone printer-sharing devices recently announced by Belkin Components, allows multiple serial port-based computers to share two parallel printers.

The series includes Model 6 x 2 ($695), which has six serial input and two parallel output devices; Model 7 x 2 ($849), which is equipped with six serial input, one parallel input and two parallel output devices; and Model 10 x 2 ($995), which features 10 serial input devices and two parallel output devices.

All models feature a data buffer that queues computer outputs. The printers also can send documents to printers chosen by users from a pop-up menu.

Sprinter works with any Epson America, Inc. or Hewlett-Packard Co. Laserjet printers or compatibles equipped with standard parallel ports.

Belkin Components
14550 S. Main St.
Gardena, Calif. 90248
(213) 515-7585

Xpoint Corp. has announced a printer that features a maximum print speed of 15 page/min and 300 by 300 dot/in. resolution.

The XP 1500 can be attached to IBM System 36s, 38s or Application System/400s via twinaxial cable. It emulates an IBM 3812 Model 1 and 5219 and enables users to create applications ranging from simple memos to mortgage origination forms, store them in an on-line library and then print them.

The product ($6,495) began shipping in February.

Xpoint
3100 Medlock Bridge Road
Norcross, Ga. 30071
(404) 446-2764

Power supplies

Exide Electronics Group, Inc. has introduced a pair of uninterruptible power supplies (UPS) that include input filters that yield a power factor correction rate of more than 0.95.

The 80ES and 150ES systems feature remote monitor emulation, which enables users to monitor a UPS from any location within their facility.

A 60-Hz version of the 80ES costs between $34,650 and $40,600. A 60-Hz version of the 150ES ranges from $42,400 to $57,400. The products began shipping this month.

Exide Electronics
5608 Spring Court
Raleigh, N.C. 27604
(919) 870-3339

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Administration.



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Screaming 1-year-old rattles industry.

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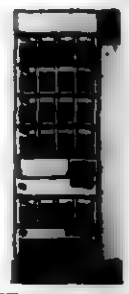
	Hardware Price	MFLOPS	SPECmarks™
POWERstation 320H	$17,972	11.7	32.4
SPARCstation 2	$14,995	4.2	21.0
DECstation 5000	$19,395	3.7	18.5

My How We're Growing.

And even more amazing, these babies just keep getting bigger. Now, we're introducing the new RISC System/6000 POWERstation 320H. It runs 11.7 MFLOPS* and 32.4 SPECmarks.* If you already have the original POWERstation 320, you can upgrade it now to the even more spectacular performance of the 320H.

Yet Another New Addition To The Family.

Our POWERserver 950 is also brand spanking new. It gives you the performance of the POWERserver 550—25.2 MFLOPS and a SPECmark of 56.3—but in a rack-mounted system, to share more disk storage, power and expandability with others. And all the models in the UNIX®-based RISC System/6000 family can now add disk expansion units for up to quadruple their previous maximum fixed disk storage. This yields up to 22.2GB on the POWERserver 950.



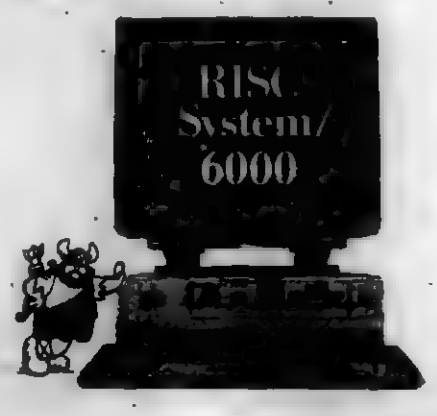
A New Box Of Crayons.

Then there's the POWERgraphics GTO graphics subsystem. It can attach to any model in the RISC System/6000 family, to deliver super graphics performance previously available only in the POWERstation 730—990,000 3D vectors/second and 120,000 shaded polygons/second. That's more than enough to make your graphics look like a masterpiece.

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And now you can get more memory for less. The more memory you buy, and the bigger the increments, the less you pay per MB. After all, just because we're a year old doesn't mean we don't know the value of money. Especially yours.

To find out more about the RISC System/6000 family, call 1 800 IBM-6676, ext. 878. And if you think this one-year-old is a handful now, just wait until the terrible twos.



For the Power Seeker.

IBM

*SPECmark is a registered mark of the tool SPECmark tests. MFLOPS are LAPACK double precision software—100. AIX XL FORTRAN Version 2.1 and AIX XL C Version 1.1 compilers were used for these tests.

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COMMENTARY

Patricia Keefe

On the OS/2 warpath



Money talks. Another measure of IBM's seriousness when it comes to OS/2 is a report that the computing giant has increased its 1991 OS/2 research and development budget 32% over what it spent the previous year. On the flip side, there is said to be "some banter" among IBMers about cutting deals on OS/2 just low enough to cover costs. "It wouldn't be a bad idea," one consultant said. "Developers are out there saying, 'Show me the installed base,' while IBM is out there charging an exorbitant price for OS/2."

Can you handle this? OS/2 Version 2.0 isn't even out of beta testing, yet sources said work is well under way on OS/2 Version 2.1, which is described as "a major enhancement." Principally, the goal is to produce an object-oriented Presentation Manager, sources within the consulting community and IBM said. "Users will be able to manipulate the system through movement of icons," one source explained. In addition to better icon management, users can look forward to more three-dimensionality and better inter-

Continued on page 45

80286 laptops go obsolete — almost

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

If you are the kind of person who stays up nights worrying that the Intel Corp. 80286 laptop you bought last year may now be obsolete, relax: It is.

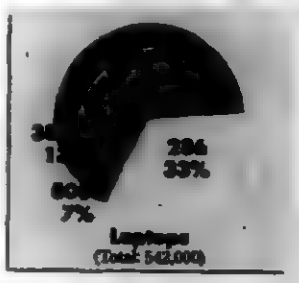
Well, sort of obsolete.

Different worlds

A comparison of the CPUs shows more powerful 80386s dominating the portable market

Percent of U.S. market share by shipments (1991 projections)





Source: International Data Corp.

"It is, and it isn't," said Gib Hoxie, director of Booz, Allen & Hamilton, Inc.'s Information Industry Practice in San Francisco. "If you're going to run a character-based application and that's your only need for the thing, then buy a 286. If people are thinking about [new portables], especially if they're going to [Microsoft Corp.'s] Windows, it's crazy to go with a 286."

Other analysts agreed that 286-based portables are by no means unusable or unsalable. Most also said they believed price will drive the 286 market.

"It'll be a price thing," said Bill Lablonde, an analyst at BIS Strategic Decisions in Norwell, Mass. "[The 286] is not a long-term market, but 386 systems are really coming onto stream this year."

A low supply of Intel 386SX-based systems may also slow the decline of the 286-based portable, analysts said.

"The SX is definitely overshadowing the 286, but a lot of the products available are 286-based," said Bruce Stephen, director of personal computer hardware research at International Data Corp. in Framingham, Mass. "For the price-conscious, you've got notebook systems now for under $2,000, and it's reasonable to assume by the end of year it'll be $1,500."

Users confirmed analysts' projections. The Timken Co. in Canton, Ohio, plans to take advantage of the increased power available from 386SX-based portables, specifically with Windows 3.0, said Gene Wheeler, office technology programmer.

However, at Hyundai Motor America, whose sales, parts and service representatives carry Compaq Computer Corp. LTE/286s, more advanced technology is not of interest. Carrie M. Ulvestad, national manager of dealer communications at Hyundai, said 386-based machines figure in the plans for the desktop but not for laptops.

"For what they're doing — very basic Lotus [Development Corp. 1-2-3] work, file transfer and E-mail — they wouldn't see any benefit from [386-based machines]," Ulvestad said.

Users with 286-based portables who are moving to 386SX-based notebooks are not dumping their investments in the older machines, by and large. At Coors Brewing Co. and Blue Cross/Blue Shield of Massachusetts, for instance, most portables are 286s, but they are being phased out in favor of more powerful machines on an as-needed basis.

Caisse Nationale de Credit Agricole U.S.A., the U.S. branch of the French international bank, will follow a similar strategy, according to Paul Nelis, microcomputer specialist at the bank, which currently uses Compaq LTE/286s but will buy SX-based notebooks in the future.

Turner rebuilds on PCs

ON SITE

BY RICHARD PASTORE
CW STAFF

NEW YORK — Construction firm Turner Corp. traces its downsizing decision to the success of one personal computer software package. The financial software was first implemented five years ago when Turner had only 50 PCs company-wide. Today, the firm has close to 2,000 PCs; its IBM Series 1 minicomputers are history, and its IBM 4341 host will join them by year's end.

Turner, a $3.25 billion construction firm with 3,000 professional staff members, was having trouble collecting and consolidating general ledger data from its 28 distributed offices in a timely, accurate manner. It took three weeks to pull the monthly task together with a mainframe package and transmit it from the remote Series 1s to the 4341 at headquarters here.

Often, Anthony Breu, vice president and chief financial officer, could not wait out the lag time. "I had to call up and ask



Turner's Breu *cut IS budget using PCs*

Continued on page 41

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Database aids identification process

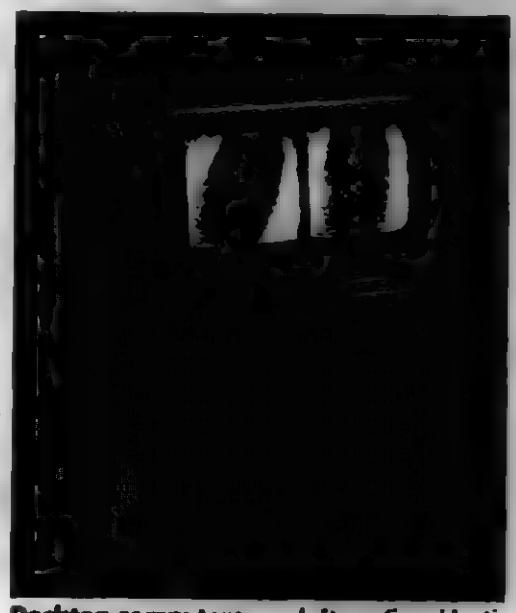
ON SITE

BY JIM NASH
CW STAFF

Crime suspects in Northern California who in the past might have stood with loathing in a police lineup have something else to dread: the desktop workstation. The personal computer is trying to nab them.

Meanwhile, applicants for welfare in Southern California will be dealing with PCs, too. The two groups will be among the first people in the nation to find their individual identities stored on desktop computers. The computers will scan their fingerprints, match them against a database of prints and, in most cases, confirm their identity.

Mainframe storage of fingerprints tied to civil and criminal records is commonplace in many major U.S. cities, but similar systems designed for the more flexible and affordable desktop are virtually nonexistent. That may change in the near future.



Desktop computers *can help confirm identities with the storage of individual fingerprints*

Deep in Silicon Valley, Wally Briefs, crime analysis coordinator at the Sunnyvale Police Department, is testing a software-based system that combines Hewlett-Packard Co.'s newest workstations with Cogent Systems, Inc.'s applications and fingerprint-scanning hardware. Together, they "blow the doors off" existing hardware-based systems, which require minicomputer or mainframe platforms, Briefs said.

Curtis Williams is a project director at Electronic Data Systems Corp., the winner of a five-year, $9.6 million Los Angeles County contract to build and maintain a desktop fingerprint-identification system. EDS will use the same HP/Cogent combination this summer to identify citizens applying for benefits from the county's Department of Public Social Services in Norwalk, Calif.

Both projects are based on Cogent's Live-ID software, which is written in C language and runs on HP 9000 series workstations. Briefs and Williams said that Live-ID is unique in that it runs on workstations and that it is software-driven.

"If you give [the workstation] more processing power, Live-ID takes advantage of it," Briefs explained. The hardware-driven systems available today, such as those produced by NEC Corp., Briefs said, are proprietary and must be upgraded with each new hardware iteration.

A spokesman for Cogent said the number of prints the company's software can hold is limited only by the number of hard drives clients use. The company, based in Alhambra, Calif., initially developed the application for Sun Microsystems, Inc. workstations but ported it to HP for Sunnyvale because the department has standardized on its machines.

Right now, the department has dedicated an HP 9000 Model 400S running at 12.5 million instructions per second to the task of absorbing eight fingerprints from each of 20,000 people. Briefs said he uses an Identix, Inc. print scanner. A spokesman for Cogent said the Live-ID software used in Sunnyvale costs $250,000. It captures prints, extracts unique features, compresses each image in order to maximize memory and compares new prints with those in the database.

When the system is fully operational, Sunnyvale will use it to check each booked suspect's prints immediately.

Portable gear

With hardly a pause, Cogent Systems is moving Live-ID, its fingerprint-matching software, from the desktop to the portable computer. The Immigration and Naturalization Service (INS) has purchased a version of Live-ID for use on Sony Corp.'s News portable.

This is only a pilot project with no commitment to outfit the entire service with portable identifiers, said Tim Biggs, chief of the INS' identification section in Washington, D.C.

He explained that the INS will store 65,000 individual prints on the system. If it works well, Biggs said, and the News machines can be ruggedized, the INS would like to install them in vehicles and pack them on mounted patrols.

JIM NASH

OS/2 popular choice over Windows, SAS exec says

BY SALLY CUSACK
CW STAFF

The debate between Microsoft Corp. Windows and IBM OS/2 factions may be a bit like grade-schoolers playing Red Rover, Red Rover: Each side wonders if members of the other side will "come over" to stay.

While there will probably never be a clear winner, a significant block of personal computer users have recently lined up behind the OS/2 environment.

"We think we have ample evidence to suggest that OS/2 is alive and well in corporate America," said Randy Betancourt, workstation marketing manager at SAS Institute, Inc., a software firm based in Cary, N.C.

SAS has invoiced $3 million in first-year fees since it started shipping the SAS System for OS/2 last November, Betancourt said. The SAS Application System is a modular suite of software products that runs on most vendor platforms, including those of IBM, Digital Equipment Corp., Hewlett-Packard Co. and Data General Corp.

Of 600 site licenses, between 240 and 250 were issued in the U.S., with the remaining 350 in Europe and Asia. Fifty percent of all licenses are IBM mainframe sites, Betancourt said, adding that of those sites, most run OS/2 on a local-area network-based connection to the host computer.

A satisfied user

Frank Mantha, information center supervisor at Niagara Mohawk Power Corp. in Syracuse, N.Y., first saw the SAS for OS/2 product when his company beta-tested it six months ago.

The company has an IBM 3090-400J but is putting SAS for OS/2 on LAN environments via IBM Personal System/2 Model 95 servers. Mantha anticipates 125 users per server when all is said and done.

"We considered Windows, but I have 3,500 machines to link up over the next several years. Windows as it is today is just too difficult to manage in a network environment," Mantha said, adding that he hopes to see Windows running under OS/2.

Niagara Mohawk currently has 600 SAS System users on the mainframe. Mantha said 88% of the jobs running through the host computer are end-user jobs, and approximately 50% of those are accessing SAS.

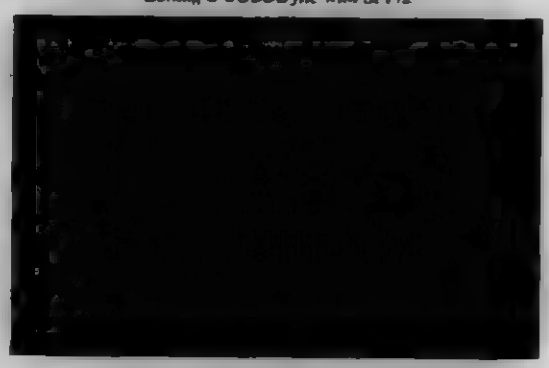
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SPF/2 takes advantage of OS/2's powerful features. It uses virtual memory to handle very large files. HPFS (High Performance File System) long file names are supported. And **SPF/2** uses OS/2's REXX for its macro language—75 mainframe-compatible ISREDIT edit sub-commands provide the interface.

SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. **SPF/2** processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. **SPF/2** even displays the same status indicators.

Editing a COBOL file with SPF/2



You will also enjoy features not available on the mainframe. For example, **SPF/2** supports 48 PF keys, automatically adapts to the various OS/2 video modes (full-screen or windowed), and scrolls the file as you move the cursor. And, you will appreciate OS/2's virtually instantaneous response time.

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Foxpro: Packs power, lacks built-in query

Fox Software, Inc.'s Foxpro Version 1.02

Reviewer	Ease of use	Data integrity	Multiuser support	Performance	Application development	Documentation	Service & support	Value	Score
Infoworld 11/12/90	Very good	Poor	Good	Very good	Very good	Good	Poor	Very good	6.5*
LAN Times 11/19/90	Excellent	Good	Good	Excellent	Complete	Excellent	Satisfactory	NC	Recommended for network
PC Week 10/1/90	9	NC	NC	NC	9	7	NC	NC	7.8*
Users									
Robert Davies, SBT Corp.	■	■	■	■	▙	▙	■	■	Fast and reliable
Y. Alan Griver, Flash Creative Management, Inc.	▙	▙	■	■	■	▙	■	■	Top-notch tool
George Gobey, Micro Endeavors, Inc.	▙	▘	▙	■	■	▙	▙	■	Best performance
Analysts									
Dana Hiller, D. L. Hiller & Associates	▙	▙	▙	■	▙	▙	■	▙	Good
Jerry Caron, Faulkner Microcomputer Reports	■	■	▙	■	▙	▘	▙	■	Good
Adam Green, Adam Green Seminars, Inc.	▙	■	▙	■	■	▘	▙	▙	Good

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey.
*Infoworld and PC Week ratings are based on 1 to 10 ratings where 10 is best NC: No comment

Key: ■ Very good ▙ Good ▘ Fair ▪ Poor

Technology Analysis — a roundup of expert opinions about new products. Summary written by free-lance writer Suzanne Weixel.

Foxpro Version 1.02 from Fox Software, Inc. brings the pull-down menus, mouse support and windowing of the Apple Computer, Inc. Macintosh to DOS database management systems users. While reviewers said that Foxpro's integrated approach makes it easy to use, they criticized the package's data integrity features and lack of a built-in query engine.

Ease of use: Reviewers credited Foxpro Version 1.02's mouse-based interface, pull-down menus and windows with making a powerful, sophisticated program intuitive and easy to use. With a mouse, they said, tasks such as report design have never been simpler. Keyboard operation is possible, although learning the key combinations may take some time. Most, but not all, commands can be executed from pull-down menus.

However, some components of the program can be confusing, reviewers said. Without a built-in query engine, users must rely on browse windows and filter expressions to perform file queries. Other modules, such as the screen generator and the editor, are command-driven and inconsistent with the rest of the program.

Data integrity: With Foxpro 1.02, users must assume much of the responsibility for data integrity. For instance, according to *Infoworld*, Foxpro's file- and record-locking features are useful and reliable but not automatic, except during interactive use.

Also, according to *PC Week*, data entry validation checks are available but must be programmed at the command line, which can be difficult and time-consuming. Foxpro also lacks support for transaction logging and rollback as well as field-level security in a multiuser environment.

Multiuser support: Foxpro does well in a multiuser environment, with users experiencing little performance degradation, according to *Infoworld*. In addition, each user on a network can have a customized Foxpro environment, including colors, menus and macros.

The trade-off is that network set-up time may be longer than for conventional systems. Data integrity is the only significant multiuser drawback.

Performance: For raw speed, Foxpro is unmatched in the personal computer database management arena, reviewers said. The system, which requires a minimum of 512K bytes of memory, can take advantage of both expanded memory and a math coprocessor. Because it uses a runtime interpreter to execute programs, Foxpro provides faster programming than conventional databases.

Application development: Behind its flashy interface, Foxpro 1.02 includes a form and screen generator, editor, macro language and compiler as well as a documentation generator and template language. According to reviewers, these tools and an excellent source-level debugger give developers everything they need. There is limited mixed-language programming, however, and *PC Week* said it found some functions not as well integrated as might be desired.

Documentation: Foxpro's documentation is extensive. An index, reference manual and separate book for network use are included. On-line Help, however, is not context-sensitive and is geared primarily to developers.

Service and support: Telephone support is free, although not toll-free, and there is a 30-day money-back guarantee.

Value: Foxpro 1.02 costs $795. The local-area network version, which supports an unlimited number of users, costs $1,095. The runtime module, which costs $500, allows distribution of unlimited application programs.

According to reviewers, with Foxpro 1.02 you get a fun, easy-to-use database system that is powerful enough to tackle complex, multiuser database projects.



"FOXPRO IS A GREAT development environment, with excellent debugging and interface capabilities. Applications can be mouse-driven with multiple windows, and you don't need Windows to do it."

George Gobey
Senior Partner
Micro Endeavors, Inc.

Vendor financial information

Foxpro is currently third in total market share among personal computer-based database management system software packages, according to the company. Fox Software, Inc. is privately held and does not release financial information. According to President and Chief Executive Officer David L. Fulton, the company has no long-term or short-term debt and is profitable. Fox employs 200 people worldwide.

Fox responds

Comments from David L. Fulton, president/CEO:

Ease of use: In the next release of Foxpro — Version 2.0, due out next month — we will completely integrate all functions, such as screen generation. The new version will include a query-by-example module that provides a nonprocedural interface for defining queries and links to SQL.

Data integrity: Features such as transaction logging and rollback will be more efficient in Version 2.0, but they will not be automatic until we release a server product.

Performance: We try to use available memory to boost performance as much as possible.

Documentation: In Version 2.0, on-line Help will be completely context-sensitive, down to the dialog level.

Service and support: We know we cannot provide immediate turnaround on technical support, but if we can get back to everyone within 24 hours, we are happy.

Value: We have tried in Version 2.0 to address all of the shortcomings of Version 1.02. The price will be the same.

NEXT WEEK

▶ Reviewers find Microrim, Inc.'s R:Base Version 3.1 a smoother performer than Version 3.0, but the product still lacks speed.

Turner

FROM PAGE 37

them 'what's the bottom line?' " he said. If the data had not yet been consolidated and checked, it was likely to be inaccurate, Breu added.

To solve these problems, Turner tried IRMS, Inc.'s Micro Control financial reporting and consolidation package.

The package cut consolidation time to 15 minutes and monthly report lag to five days. With the PC network, Breu can now review any portion of the data the following month.

Couldn't get enough

Not only the results but also the implementation process left Turner hungering for more PC applications. The firm got Micro Control up and running in six weeks, and "the beauty of it was we didn't use any MIS people," Breu said. From that initial success, "we established a policy companywide to migrate completely to PCs," he added.

In the last two years, all but a pair of linked applications have been migrated down from the 4341. And Turner has already found two store-bought packages to take those applications to the PC by the end of the year, Breu said.

The benefits have been cost savings and improved efficiency. "There used to be a lot of downtime," Breu said. Because the remote-site Banyan Systems, Inc. networks run independently on their Compaq Computer Corp. servers, the entire company does not come to a halt when one network shuts down.

Over the same period, the information systems staff, which Breu formerly headed, has been cut in half to 25 people. The IS budget has also been halved at a savings of millions of dollars. To help with support, Turner contracts with an outside vendor for remote-site maintenance.

The small staff is possible because the firm chooses to follow a buy-rather-than-build software philosophy, Breu said. However, that strategy has perpetuated the company's biggest downsizing hurdle — finding suitable packages.

Turner's problem is finding PC-based applications capable of handling business transactions as large as the $50,000 to $200 million contracts the firm lands. The typical $495 shrink-wrapped product cannot accommodate that. Turner has to look toward less mass-market products such as the $95,000 IRMS Micro Control.

Turner also has a policy of minimizing change in operational procedures. That means persuading vendors to tweak packages to accommodate Turner's way of doing things. "Nine times out of 10, [the vendor] makes changes for us," Breu said.

Digital F/X updates video editing features

MOUNTAIN VIEW, Calif. — Digital F/X, Inc. has announced major software enhancements to Video F/X, a desktop video production system designed for in-house and broadcast-quality presentations.

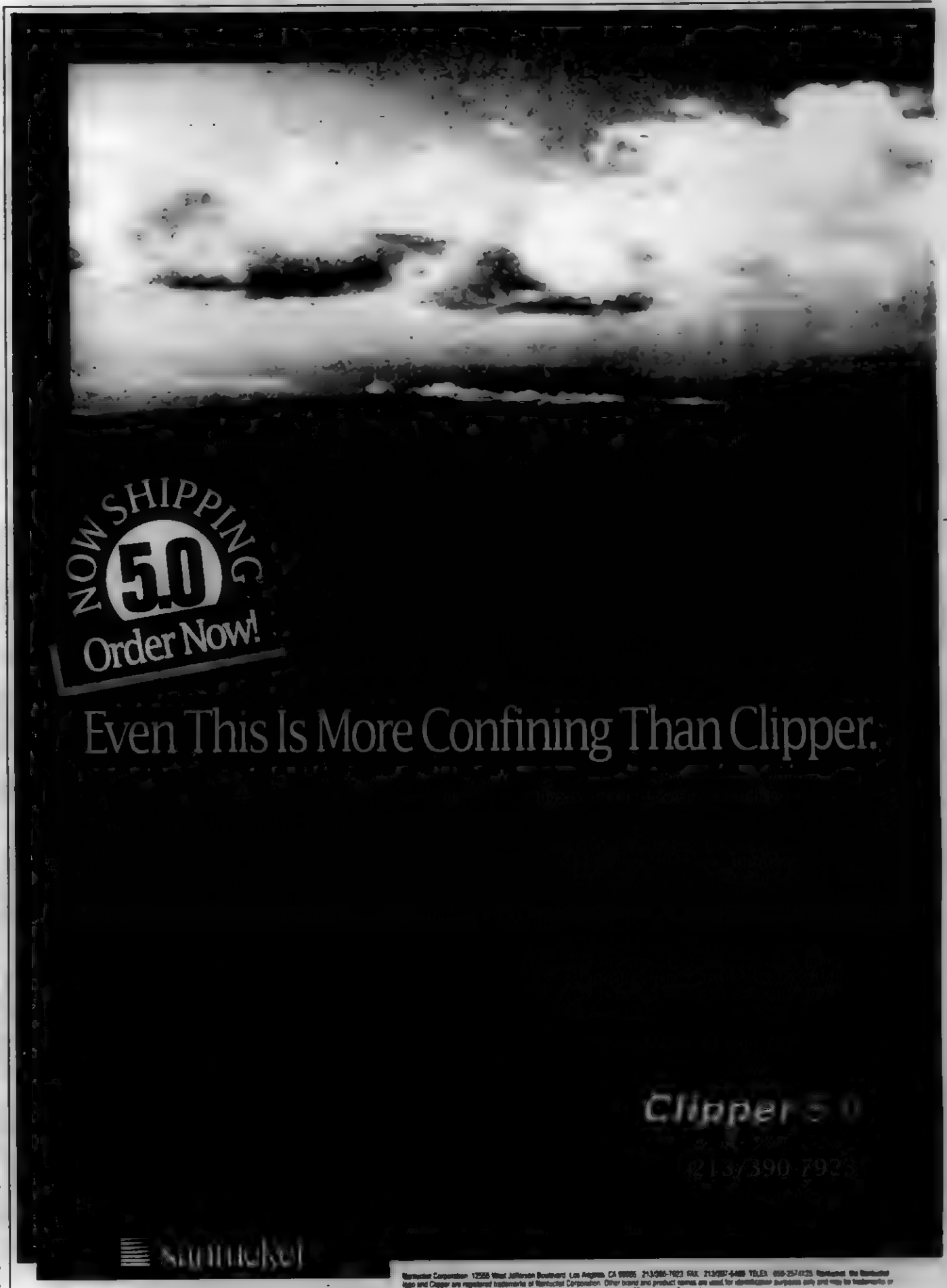
Video F/X Release 2.0 is an Apple Computer, Inc. Macintosh-based system that harnesses live video, audio and graphics into a final broadcast tape. The new release eases the editing and transition processes, President Rolando Esteverena said.

The central additions to Release 2.0 are the inclusion of nonlinear editing, which allows users to digitize video onto a hard disk where it can then be edited in real time, and A/B roll, a production feature that allows smooth dissolves from one full-motion video scene to another.

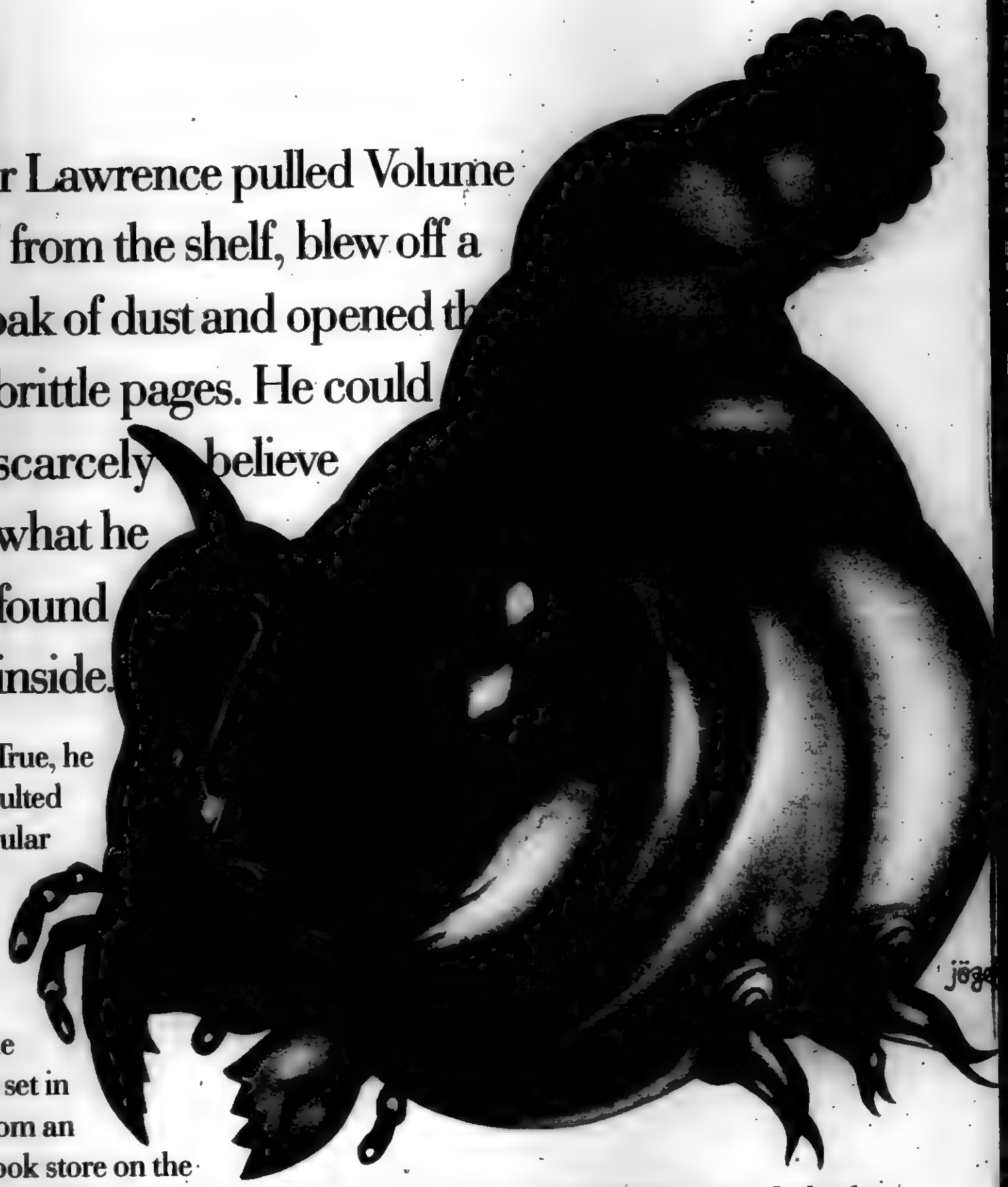
In addition, the update provides PICS animation support, which lets users record animation onto videotape. Video F/X also offers enhanced Adobe Systems, Inc. Postscript for video, letting Macintosh users overlay any Macintosh graphic or title into the video.

Release 2.0's nonlinear editing feature is included in the product's $9,995 price. A/B roll and PICS animation support will be offered as options.

JAMES DALY



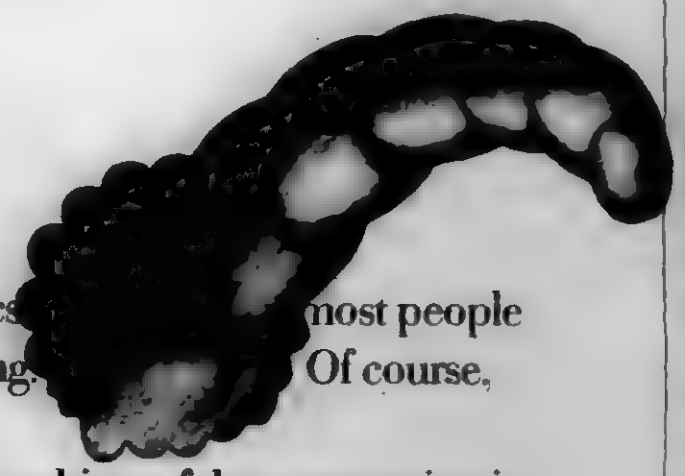
Sir Lawrence pulled Volume IV from the shelf, blew off a cloak of dust and opened th brittle pages. He could scarcely believe what he found inside.



True, he hadn't consulted these particular journals in years and, admittedly, he had acquired the ten-volume set in his youth from an odd little book store on the Thames, but still! Holes!? A bookworm had eaten clean through the pages. Indeed, to Sir Lawrence's considerable chagrin, he found the ravenous little bugger had chewed, in a straight line, from the front cover of Volume I to the back cover of Volume X.

All of which brings us to our seemingly simple question: If each book is exactly two inches thick, how far did the bookworm travel?

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In tussling with this type of cerebral aerobics most people make a simple but serious error: They *assume* something. Of course, this happens without realizing it. But still, it happens.

As you'll see in a moment, the way to avoid making a false assumption is to work things out methodically. Carefully thinking through each step.

For instance, consider this question. A company makes one of the broadest lines of computer terminals in the world. They have for years. In fact, they've delivered over three million of them.

If you needed terminals you'd probably think of them. But what if you needed PCs? Would you assume that, since this company is so dominant in terminals, they must not do a real number in PCs?



Tsk, tsk. Have you learned nothing?

Well, as you may have *correctly* assumed, the company in question is Wyse. And if you've been assuming we don't have an impressive array of powerful, priced-right PCs it would be a shame. For both of us.

Consider our new Decision Series. Four models that offer a rich set of features. Generous power supplies, three styles of ergonomically advanced chassis, multiple configurations, popular Wyse-designed keyboards, aggressive pricing and bundled DOS 4.01.

The Decision Series PCs: 386sx/16s (shown), 386sx/20, 486/25, 486/33e (shown). Advanced ergonomics, finicky attention to detail, exceptional power for the dollar.

For starters.

Of course we realize there's a good chance some of you may have read this far because you're more interested in the answer to our puzzle than in our products. You've *assumed* we'd bury the answer down here somewhere. Well, you're wrong again. At least partially. So go look on page 84.

To learn more about our Decision Series PCs call us. We'll send you complete specs plus a poster of additional Cerebral Aerobics. To help keep your original equipment personal computer in top form. 1-800-GET WYSE.

Now that it's clear we make an impressive line of PCs, you might be tempted to assume we stop there and don't get into the even more sophisticated products like super fast multiprocessing systems for the UNIX environment. With speed in the 100 MIPS range.

But you wouldn't assume that after all this. Would you?

WYSE

Ha' ye doing it again. Just become this little type is down here and printed upside down you assumed you'd find the answer this easily. No way. San Jose. Refer back up to the ad and your patience will be rewarded.

Roadshow puts deliveries on track

BY GARY H. ANTHES
CW STAFF

Bank of America, Nynex Corp., *The New York Times* and Marriott Corp. would seem to have little in common, but they share at least one key characteristic: They own fleets of vehicles that move daily over complex routes making pickups and deliveries.

They all have something else in common: They have licensed Roadshow, a personal computer-based software and hardware package for optimizing routes and schedules. The only product of Vienna, Va.-based Routing Technology Software, Inc., Roadshow combines least-cost routing optimization with high-quality video map displays.

Bank of America uses Roadshow to help plan pickups and deliveries of checks and interoffice mail among some 850 bank branches and data processing centers — and an unspecified number of customer sites — in California. The bank's 500 cars and vans cover between 2,000 and 3,000 routes per day in ever-changing patterns and schedules that would be nearly impossible to optimize manually.

According to bank Vice President Hank Thomas, Roadshow replaced a manual system in which proposed routes had to be test-driven. Now, Roadshow determines the feasibility and cost of new routes in minutes and with great reliability, he said.

Thomas said Roadshow's precise routes and timing offer another advantage: "It's taken the slack out of the system. No more stops for McDonald's."

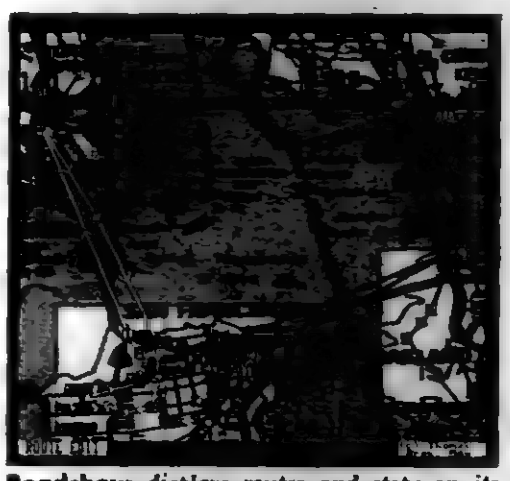
Reality check

According to Routing Technology Software's Chief Executive Officer Donald J. Soults, Roadshow is the only automated routing tool to use full-color video images of commercial maps rather than stick-figure maps painted on a computer screen. At the click of a mouse, Roadshow can zoom to successive levels of detail, from a view of the interstate highway system to block-level detail in a specified city. Routes and stops are displayed on the maps in bright colors, while delivery schedules, mileage, costs and other tabular data are displayed on an adjacent computer screen.

Routing Technology Software recently added a database that maps nearly all street addresses in the U.S. to geographic coordinates with an accuracy of 3 meters. A user can enter an address and see the location precisely pinpointed on the video map.

Unlike other routing packages that find the least mileage route and then compute the cost of traveling that route, Roadshow finds the least cost route. That avoids mistakes such as routing trucks through downtown during rush hour when taking a bypass around the city makes more sense. Roadshow considers vehicle costs per mile, vehicle costs per hour and driver and crew costs per hour. It then considers distance, travel time and on-site delivery time in computing the total cost of a route.

Roadshow also considers a myriad of real-world factors and constraints, such as time-of-day influences on traffic patterns and speeds, temporary construction delays, customer-specified delivery times and time required at each stop.



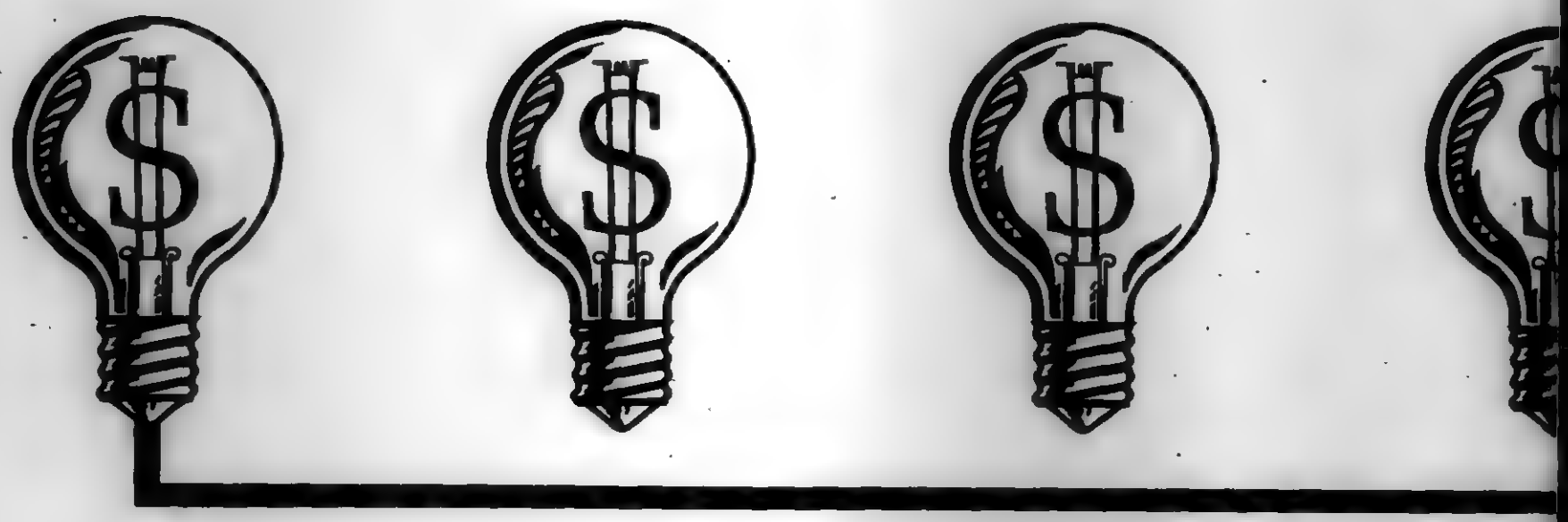
Roadshow *displays routes and stops on its map in bright colors*

Illinois Armored Car Corp. runs 60 routes per day in the Chicago area, each with 50 to 60 stops. Roadshow is used by both operations and sales personnel to analyze potential route changes, company President Alex Christopher said. For example, a customer might call and ask if his delivery schedule can be moved to another time of day. Roadshow can check the feasibility of doing that and compute any extra cost.

Christopher said one company was willing to pay a 33% premium over one of his competitors to get the reliable delivery times that Roadshow helps ensure. "There's no question it has improved customer service. I was considered crazy to spend so much [$75,000] for Roadshow. Everyone said the computer couldn't do it," he said.

Roadshow runs on PCs assembled by Routing Technology Software. The minimum configuration has an Intel Corp. 80386 processor and 8M bytes of memory. The large memory allows Roadshow to do its number-crunching optimizations with no disk I/O. Hardware packages, which include a 100M-byte hard disk drive, color monitor, 60M-byte tape backup unit, a laser videodisc unit and other pieces, cost between $9,630 and $12,190. Software is priced at $50,000 and up, depending on features.

Soults said the software underlying Roadshow has taken 20 years to develop, but it is paying off in spades: Last year, Routing Technology Software was ranked No. 319 on *Inc.* magazine's list of the 500 fastest growing private companies in the U.S.



Keefe

FROM PAGE 37

face layout. We're told a fourth-quarter release is possible.

Speak softly and carry a big stick. New Technology OS/2 Version 3.0 has been designated as the portable OS/2 platform. However, there have also been reports of IBM porting OS/2 Version 2.0 to other platforms, but sources contacted last week said the effort is currently confined to a "laboratory experiment" and will probably see the light of day only in the event that Microsoft and IBM diverge on product vision for New Technology OS/2 3.0. IBM Vice President Joe Guglielmi has said IBM will withdraw from OS/2 Version 3.0 development if that happens [CW, April 1].

Taking a page from Novell. A user source tells us to look for segmentation of OS/2 LAN Server, much as Novell packages Netware. Users will have a choice of Basic, Advanced and Super LAN Server, we're told. The Advanced and Super models are supposed to be add-ons to the Basic and will be made up of many of the "Superserver"-related products IBM has been showing at trade shows.

These products include a high-performance file system, a device driver for the Bus Master Token Ring, mirroring, duplexing, "pigtailing" disk arrays and, of course, the two-processor LAN Server. This user, however, notes that he much prefers IBM's pricing of LAN Servers to either Novell's or Microsoft's.

OS/2 VERSION 2.0 isn't even out of beta testing, yet sources say work is well under way on OS/2 Version 2.1.

Thank you for your support. We've noticed a tiny trend among some disillusioned Windows users: Some, mostly power users, have switched to Quarterdeck Office Systems' character-based Desqview.

A cost accountant at an electronics component maker said he found Windows harder to get up to speed on and somewhat slower than Desqview. "Windows is harder to understand how to manipulate," he said. "Desqview is simpler. You just load it in, and the menu is right there." The accountant also found it easier to switch among programs under Desqview.

That's because Desqview is a true multitasking system and has better memory management, says a field service engineer at the same firm. He says power users of processor-intensive applications, such as spreadsheets, may prefer Desqview because of its ability to simultaneously run multiple programs. But when automating an office, the engineer says, Windows is still the best choice. "Because it is graphically oriented, all you need is one person who can set applications, so the users can just click on an icon and get into them."

Still no takers. Lotus Development Corp. is still scouring the continent for a buyer for its CD-ROM division, says a source who cites a recent rumor that Lotus was talking a few months ago to a Canadian firm about buying the division. However, Lotus must have gotten the CD-ROM division mixed up with the Red Sox. Its asking price was said to be out of the ballpark; hence, no sale.

Unisys steps up to the 80386SX starting line

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Joining the crowd offering Intel Corp. 80386SX-based computers, Unisys Corp. unwrapped a diskless 80386SX-based local-area network workstation and an introductory 386SX personal computer two weeks ago.

The PW² LAN Workstation/386SX follows on the heels of an 80286-based version introduced by Unisys in May 1990.

Exclusively designed for networked applications, the PW²'s electronics module includes 10M bit/sec. conventional, thin-wire and twisted-pair Ethernet LAN adapters. Token Ring and Omninet interfaces are available as options.

The 16-MHz CPU comes with 2M bytes of memory expandable to 8M bytes and a network boot in read-only memory. Unisys is also offering an optional 80387SX math coprocesaor.

The monochrome system, which includes an IBM Personal System/2-style mouse port with mouse and Microsoft Corp.'s MS-DOS and Windows 3.0, sells for $2,710. A 14-in. Video Graphics Array (VGA) color monitor system costs $3,070.

Snappy personality pack

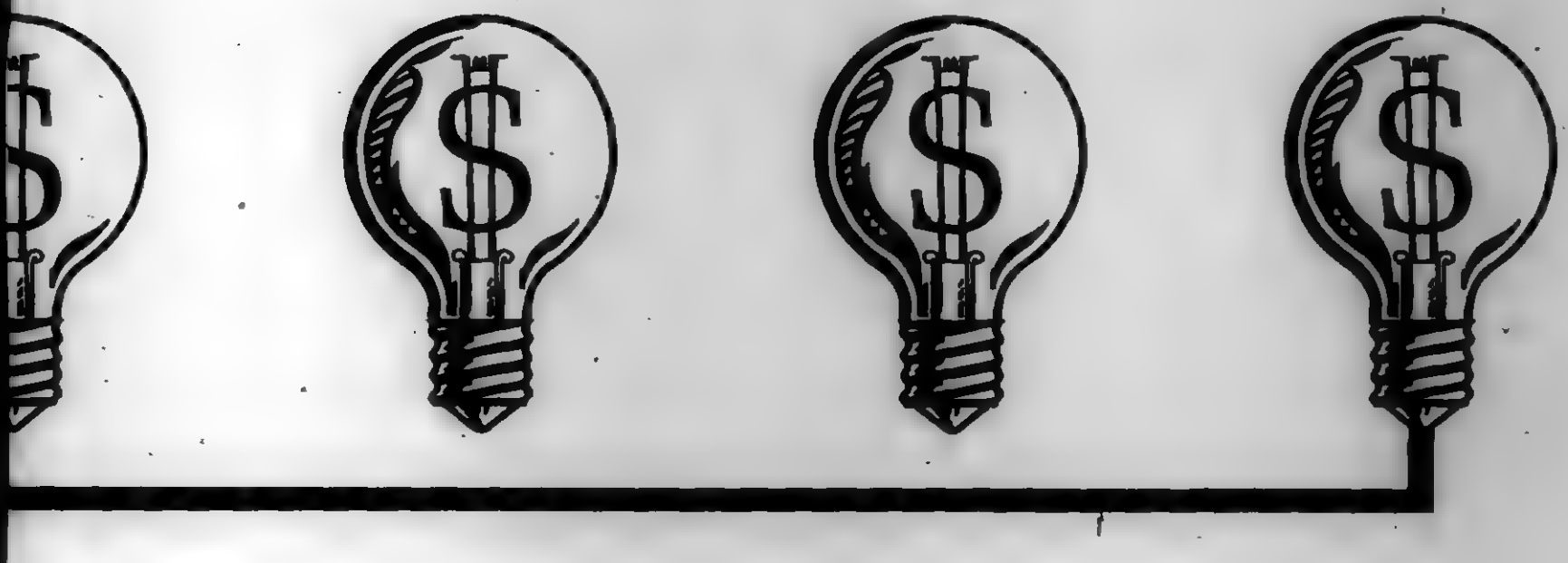
Like the 286-based model before it, the newest PW² uses a snap-on "personality pack" docking module that attaches to the back of the system's color or monochrome VGA monitor. Users of the earlier machine can upgrade by exchanging personality pack modules.

A more conventional CPU design is offered in the PW² 3163 PC, a 32-bit, 16-MHz, 386SX-based CPU. The system supports up to 32M bytes of total memory or up to 510M bytes of small computer systems interface (SCSI) disk storage.

VGA graphics, memory, disk and SCSI hard disk control are integrated on the motherboard, which has three 16-bit expansion slots.

Pricing ranges between $2,500 and $3,400, depending on configuration.

With Hardwired Internetworking,
Connecting Your Entire Enterprise
Is Prohibitively Expensive.



Tandy shows multimedia gear

BY RICHARD PASTORE
CW STAFF

NEW YORK — At Tandy Corp.'s product briefing earlier this month, a dramatic side-by-side comparison of a conventional cassette player and a prototype digital audio cassette player rocked the house far more than news of upcoming computer products.

Nevertheless, Tandy provided previews and plans for pen-based computing, multimedia and home and education markets. The products shown are "days to months away" from introduction, Chairman and Chief Executive Officer John Roach said.

Tandy subsidiary Grid Systems Corp. already said it will support both Microsoft Corp.'s and Go Corp.'s pen-based operating environments. However, Grid President Alan Lefkof said IBM Personal Computer compatibility will remain the core of the firm's pen-based hardware.

Lefkof also differed with Microsoft and Go by espousing far fewer pen gestures and lower minimum memory specifications than other companies have proposed. Grid claimed 10,000 users for its Gridpad tablets.

On the new product front, Grid is developing a notepad PC that will feature a true hard disk rather than the CMOS cards currently employed. Grid is working with Conner Peripherals, Inc. and Prairietek Corp. to design a drive that will operate while the user walks around and will deliver the fast spinup time required for pen applications.

Other offerings

Following up its multimedia partnership kickoff with Microsoft, Tandy promised several 1991 introductions that will meet the specifications set forth last fall. Both a native multimedia-equipped PC and PC upgrade kits will be launched soon, said Howard Elias, vice president of computer merchandising.

Last month, Tandy opened a Multimedia Technology Center in Fort Worth, Texas, to serve as a resource for developers.

The Tandy 1000RL, Tandy's answer to IBM's Personal System/1 home computer, is in store for a face-lift. The machine's Intel Corp. 8086 chip will be boosted to a 10-MHz 80286 chip, and the IBM Color Graphics Adapter will be upgraded to IBM's Video Graphics Array.

In the PC software arena, Tandy is now testing enhancements to its Deskmate application suite that will allow voice recording and playback and PC-based home-appliance control.

With the addition of a microphone and voice-processing utility, a Deskmate Home Organizer Companion user can record messages on his PC, which will play them back on demand in the user's slightly mechanized voice.

Using the common power-plug modules sold in electronics stores, users will also be able to control their lights and other household appliances via an icon-based household blueprint program.

In the education market, Tandy announced a new version of the Schoolmate networked system. For $1,500, Schoolmate Plus will link PCs located beyond a single classroom.

The distributed network now supports multiple servers and remote printing as well. The network interface was designed to facilitate transparent access by nontechnical administrators.

Opus offers add-in board

Tool allows PC to operate Unix with MS-DOS

MOUNTAIN VIEW, Calif. — Opus Systems, Inc. recently announced an add-in board that further blurs the distinction between workstations and personal computers. The board allows a PC to run Sun Microsystems, Inc.'s version of the Unix operating system concurrently with the MS-DOS operating system at 15.8 million instructions per second.

"We assume you have an existing PC that you're not going to throw away, but [you] want access to Unix speed and applications," said John Chun, director of marketing at Opus.

For high resolution, a second monitor can be added to the PC, according to Chun. It can support Sun's graphical user interface in the Microsoft Corp. Windows 3.0 environment.

Pricing for the board, called the Opus Series 500 Personal Mainframe, starts at $6,495 without memory.

It can support up to 64M bytes of memory.

Iris series upgraded

Silicon Graphics, Inc. recently announced new high-end systems that, according to the company, top out at 286 million instructions per second.

The company announced faster versions of its Iris Power series, which incorporate three-dimensional graphics and movement.

The Iris 4D/400 line goes from one to eight 40-MHz processors. It has a Specmark (the System Performance Evaluation Cooperative, a benchmarking consortium) multiprocessor Thruput rating of 159 and a single processor Specmark speed rating of 26.6.

The new computers can be used either as high-performance workstations or as multiuser graphics servers, according to the company.

Priced from $64,900 to $224,900, the computers can also be board upgrades for Silicon Graphics 4D machines.

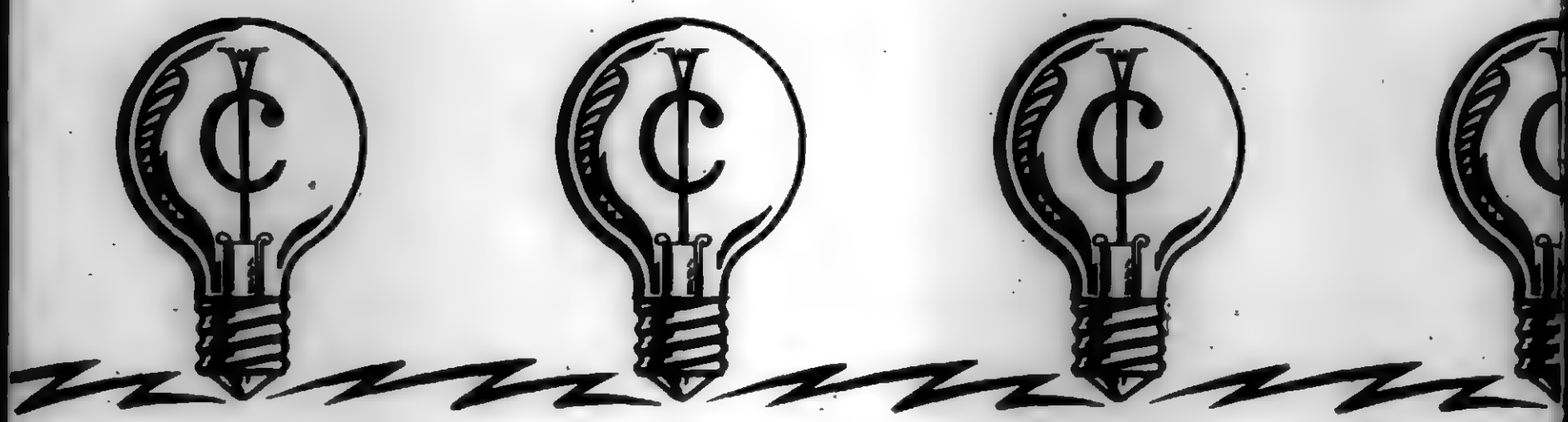
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Conventional internetworking lets you connect widely-separated workgroups into a single, enterprise-wide network. But only at a very expensive price.

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Dial-Up Internetworking is the most cost-effective way to extend your enterprise network to the smaller, remote workgroups that comprise the bulk of the internetworking market. It uses the general switched telephone network, limiting the need for the high-performance T-1 lines and high-speed routers that drive up conventional internetworking costs.

Dial-Up Internetworking is made practical by another Telebit® first – a powerful automated dial-up router called NetBlazer. NetBlazer provides low-cost



NEW PRODUCTS

Software applications packages

Applix, Inc. has announced a Unix System Laboratories, Inc. Open Look version of Asterix, its suite of desktop productivity applications for Unix workstations and X Window System terminals.

The applications enable users to create compound documents such as memos, letters, reports and presentations. Users of Sun Microsystems, Inc. Sun 03 or Sparcstations or Digital Equipment Corp. Decsystem, Decstation or reduced instruction set computing-based Ultrix systems can reportedly integrate Asterix with other applications.

The complete product suite is priced at $995; a version that does not include spreadsheets costs $695. The suite began shipping last month.

Applix
112 Turnpike Road
Westboro, Mass. 01581
(508) 870-0300

QQQ Software, Inc. has unveiled an enhanced version of TP Tables, a personal computer program that enables users to generate presentation-quality tables with only a few keystrokes.

TP Tables allows projects that previously would have to be performed on a mainframe to be run from a PC. It runs on PCs under DOS or Unix and on IBM RISC System/6000s under AIX. Single-user license fees for DOS versions cost $895.

QQQ Software
302 N. Irving St.
Arlington, Va. 22201
(703) 528-1288

Wordperfect Corp. has announced Wordperfect 2.01 for Macintosh, an enhanced version of its software package for Apple Computer, Inc. Macintosh systems.

Version 2.01 enables users to transparently import documents created with Microsoft Word 3.0 or 4.0 from Microsoft Corp. Exports for Claris Corp.'s XTND and Wordperfect 4.2 for DOS have also been added.

Users of Wordperfect 2.0 can upgrade to Version 2.01 for $17.50.

Wordperfect
1555 N. Technology Way
Orem, Utah 84057
(801) 225-5000

Welcom Software Technology Corp. has released an upgrade to its Open Plan project management software package.

Open Plan 4.0 ($4,200) features project executive, a graphical interface that enables users to view data from three perspectives: Work Breakdown Structure view, Project Network view and Barchart and Histogram view.

The Adobe Systems, Inc. Postscript-compatible package reportedly allows users to schedule up to 10,000 activities, 256 calendars and unlimited resources per project.

Welcom Software Technology
15760 Ventura Blvd.
Encino, Calif. 91436
(818) 990-1235

Development tools

Alpha Software Corp. has announced a development language designed to allow users to create memory-resident applications, integrate diverse DOS applications and automate complex or repetitive tasks.

Alpha RPL is a resident programming language that is positioned between an application, screen and keyboard. It can intercept keystrokes and read screens. The product's symbolic debugger, librarian and editor are all memory-resident.

Alpha RPL for DOS runs on an Intel Corp. 8088-based IBM Personal Computer XT, AT or compatible equipped with hard disk. It costs $595.

Alpha Software
One North Ave.
Burlington, Mass. 01803
(617) 229-2924

Data storage

Computer Modules, Inc. has announced an IBM Personal Computer AT bus-compatible nonvolatile memory board designed to emulate a hard disk.

Flash Disk can be programmed and erased in a personal computer and features the following data transfer rates: 2M byte/sec. (read), 128K byte/sec. (write) and 40K byte/sec. (erase/write).

The board can be equipped with four, eight or 16 single inline memory module sockets. Pricing ranges from $695 to $995, depending on version.

Computer Modules
2348C Walsh Ave.
Santa Clara, Calif. 95051
(408) 496-1881

Board-level devices

Datem Ltd. has announced a 100mm by 160mm Bitbus II to small computer systems interface (SCSI) bus module that can be mounted on a desktop system.

The DDCM2240 SCSI Bus to Bitbus II Interface Module incorporates an Intel Corp. 80C152 microprocessor and features 32K bytes of random-access memory.

The product costs $1,995.

Datem
16 Concourse Gate
Nepean, Ontario
Canada K2E 7S8
(613) 225-5919

Tekstar Systems Corp. has introduced Costar, an IBM Personal Computer AT bus add-in accelerator/coprocessor board designed for Intel Corp. 80386-based systems.

The board's interface architecture is said to enable the product to transfer data between Costar and an 80386 CPU at rates of up to 33M byte/sec. while both CPUs are running at full speed.

Costar is available at an introductory price ranging from $4,000 and $6,000, depending on type of CPU.

Tekstar
2415 Parview Road
Middleton, Wis. 53562
(608) 836-7890

WAN capability on TCP/IP networks, supporting dial-up lines. It's the first product to combine the full suite of open systems standards in high-speed modems with those of TCP/IP internetworking.

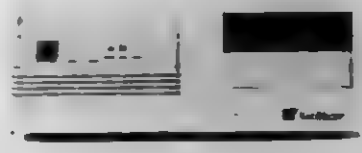
NetBlazer uses the complete Telebit family of high-performance modems to connect remote locations in your organization together in a virtual wide area network, giving remote users transparent access to all network computing resources at a far lower cost than is possible with conventional internetworking technology. It complements the high-speed routers that move information over the corporate backbone.

Additionally, NetBlazer acts as a terminal server or modem pool. It can route Ethernet to Ethernet. And can even use 56K leased lines.

WAN IP routing over dial-up is incredibly fast, thanks to NetBlazer's support for standard SLIP and PPP protocols combined with advanced techniques like TCP/IP header compression.

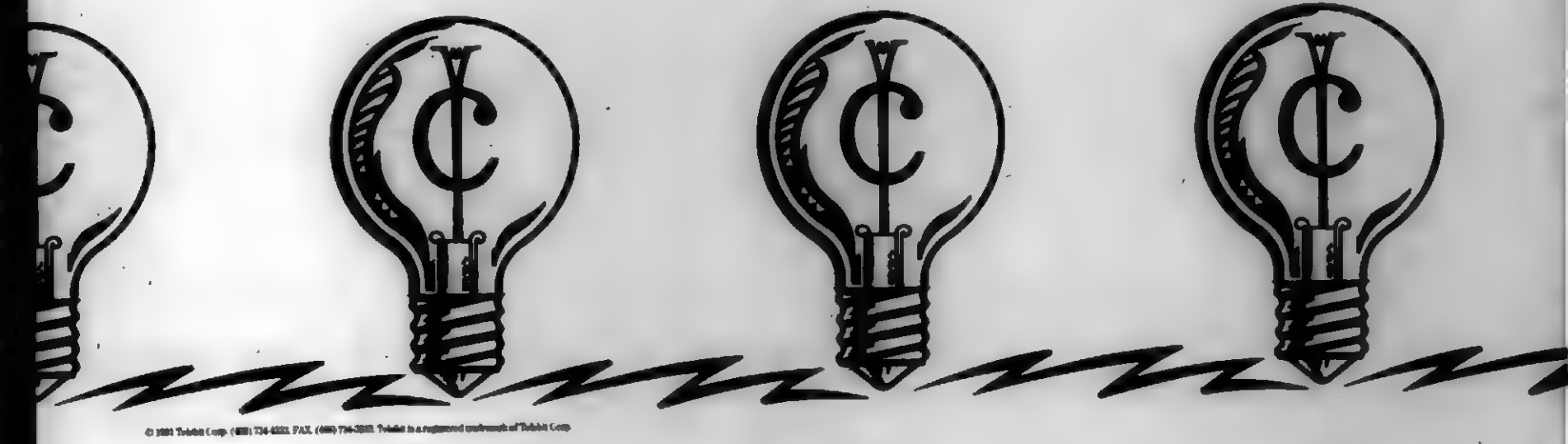
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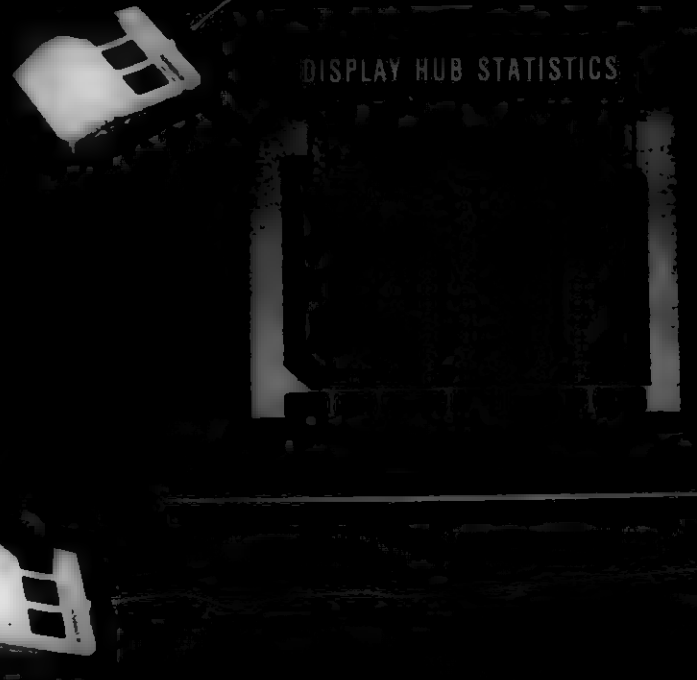


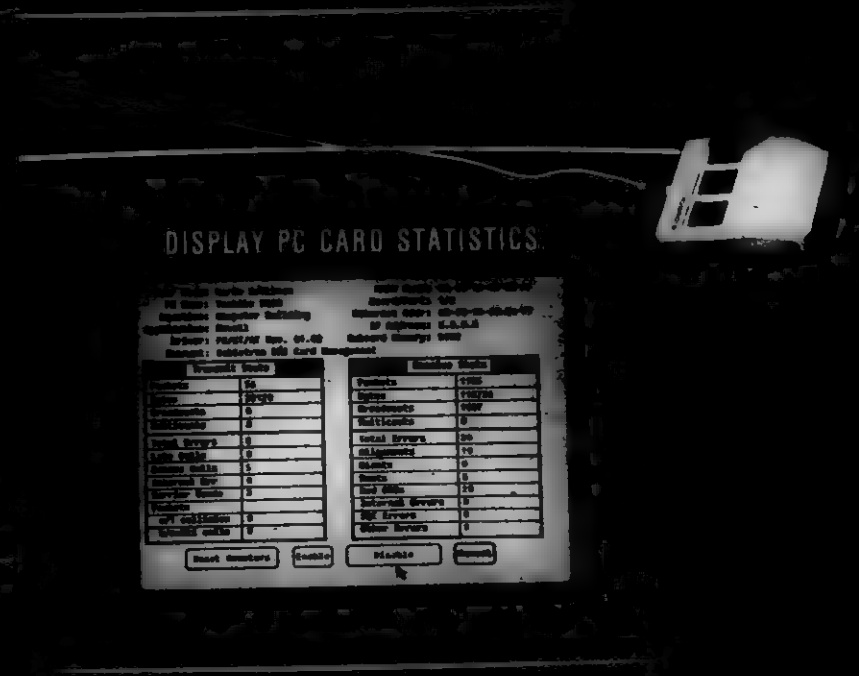
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Ethernet *Token Ring*

CIRCLE 205 ON READER SERVICE CARD

Distributed computing arises

Business world begins to buy into a once-esoteric systems philosophy

BY ELISABETH HORWITT
CW STAFF

Distributed computing may finally be breaking out of academic and scientific enclaves and into the business world. While information systems managers still see major difficulties in moving their corporate applications and systems to the innovative technology, more and more of them are starting to explore its potential benefits in limited or pilot installations.

McDonnell Douglas Corp. is working toward a corporatewide distributed environment that ideally would allow the user to "sit down at the workstation suitable for the job and get any data and function he needs, wherever it is within the network and whatever vendor platform it resides on, hopefully transparently," said Jack Jones, director of distributed computing services at McDonnell Douglas Aerospace Information Services Co.

McDonnell Douglas has a long-range plan in place for rolling out distributed computing systems corporatewide, Jones said. However, the pace at which this rollout will proceed will vary from year to year according to the business needs of individual business units and discretionary funding available for the project, he added.

The aerospace firm is looking forward to the emergence of standards for implementing the technology across multivendor platforms and tying existing applications to the new platforms, Jones said. However, lack of standardization and other technical barriers have not impeded McDonnell Douglas' progress toward distributed computing and will not do so as long as the business demand and financial resources are in place, he added.

Historically, business users have avoided distributed computing because of the need to hire specialized programmers to build applications platforms from scratch, primarily on Unix systems, analysts at The Yankee Group and CIMI Corp. agreed.

However, the esoteric technology has recently shown signs of entering mainstream corporate America, particularly in the investment and manufacturing sectors. Eastman Kodak Co. said it is working on distributed computing applications but added that the area is too competitive to be discussed publicly. Salomon Brothers, Inc. reportedly started looking at distributed computing several years ago and recently went so far as to pur-

Continued on page 56

To each its own

Distributed computing is an object-oriented technology that allows applications to be broken up into subtasks, which are then distributed to whichever system on the network is best suited to a given task. What follows is an explanation of the different elements that make this possible:

Remote procedure call (RPC): A mechanism that allows a program residing on one system to execute a task or access data on a remote system transparently, as if it resided on the same system. Different systems working on the same application collaborate via RPCs.

Directory/naming service: Keeps track of various data, applications and service resources on a distributed computing network.

Location broker: Automatically matches a client query with whichever server has the most suitable services, data and computing resources to accomplish the task.

Object-oriented: A concept that treats applications, data, networks and computing systems as objects that can be mixed and matched flexibly rather than as components of a system with built-in relationships. As a result, an application need not be tied to a specific system nor data to a specific application.

ELISABETH HORWITT

Cable channel discovers wonders of PC networks

ON SITE

BY JIM NASH
CW STAFF

BETHESDA, Md. — For some people, it is difficult to believe that anything on television is more popular than the ubiquitous MTV, but as of last month, The Discovery Channel had more subscribers than the metal-and-lace station.

That is not bad for what some consider to be a relatively highbrow format of science and educational programs running 18 hours per day. This June, Discovery will turn a precocious six years old. Perhaps the only aspect of the company that has grown as quickly as its subscriber base — it was cited in 1988 by A. C. Nielsen as the fastest growing cable station in history — is its personal computer network.

"When I started [at Discovery] 3½ years ago, we had five typewriters and three PCs," recalled Gary Smith, manager of the station's network operations. "Today, we have five typewriters and about 400 computers."

Smith and his boss, Systems Development Vice President Fred Bonner, were hired when management at Discovery decided they would need linked computers to control and nurture the explosive growth the company was experiencing. "Everyone [in the computer industry] recommended that I go out and buy a minicomputer in a hurry," Bonner said.

Either because of or despite their advice and the years of experience he had working with minicomputers and mainframes, Bonner began to build a nationwide PC network running Novell, Inc. Netware. "The writing was on the wall," he said. "Networks were becoming more affordable and dependable."

Smith said it is no coincidence that the station began to boom in 1988, the same year PC networks were installed. Discovery's commitment to office automation almost requires PC networks. "I can write software and build databases much quicker for PCs," Smith said. Equipment is easier to update and replace, reducing maintenance and support costs, he added.



Bonner: *Networks support major growth*

The transition from typewriters to PCs was not always smooth, however. Smith said that during one conversation with Bonner and other information systems employees about network security, someone put his hand down on a server and accidentally shut down the entire headquarters system.

Continued on page 56



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CA takes steps to embrace DEC's Polycenter

Multivendor systems management platform gains support from software supplier

BY ELISABETH HORWITT
CW STAFF

Computer Associates International, Inc. has announced plans for its systems management products to complement, extend — and to some extent, compete with — Digital Equipment Corp.'s multivendor systems management platform, Polycenter.

CA, along with several other systems management application vendors, promised at the Polycenter introduction earlier this month to support the platform via DEC's Network Application Support (NAS) protocols and application programming interfaces.

NAS is a portfolio of various protocols that form DEC's platform for integrating its own and other vendors' systems and applications.

CA announced several NAS-compliant DEC systems management applications last April, as part of its Computing Architecture for the '90s strategy. Those products, now in beta test, will be part of CA's strategy for providing systems management across IBM and DEC systems. The applications include CA-PMA/Chargeback for VAX, which provides resource accounting and chargeback; CA-1 for VAX, which provides tape library management; and CA-7 for VAX, which does job and resource scheduling.

CA intends to support DEC's Polycenter and IBM's Systemview systems management platforms as future industry standards, according to Kurt Seibert, the software vendor's vice president of research and development. CA's applications will complement those offered by the two host vendors, Seibert said. However, CA is also offering its own multivendor systems integration product line to users who are not willing to wait for IBM's and DEC's strategies to become commercial reality.

Indeed, CA is already beginning to provide some degree of integrated management across IBM and DEC systems, Seibert said. "Users can control a VAX/VMS from an IBM mainframe, collect VAX security alarms and send alerts up to the IBM side via our products," Seibert said. CA also offers a repository for security information and is moving toward integrating scheduling products across DEC VMS and IBM MVS systems, he added.

CA is also developing Hewlett-Packard Co. HPUX systems management software, which eventually will be integrated with the DEC and IBM products, Seibert said. "The goal is to manage, control and monitor all system-related activities across IBM MVS, VSE and VM, DEC VMS and HPUX systems."

California vision

The California legislature is one organization that has "invested in CA's vision for integrated systems management," said Joe Papa, a systems software specialist for the legislature. CA's promise to provide systems management across DEC and IBM "is exactly why we went with them," he added. "When we went with IBM, they said they had this vision, too, but it stops where the IBM line is drawn, and the same is true of DEC."

The legislature has implemented CA tools for scheduling jobs and automating operations. "The whole point is to use them to integrate standardized functions that all big data centers have, under one umbrella," Papa said.

CA's promise to integrate its applications with Polycenter is of interest to the legislature, particularly if it means that CA applications will feed into Polycenter's information repository, Papa said. "We are looking for a centralized information base, and we can have it both ways if CA supports both Systemview and Polycenter."

CA has yet to commit to that level of integration with Polycenter, although it is evaluating such a move, Seibert said. However, the company's VMS products all support the Open Software Foundation's Motif front end and SQL-based querying that DEC supports with its management platform, he added.

Polycenter also picked up the following third-party allies:

- Applied Information Systems, Inc. in Chapel Hill, N.C., announced it will extend Polycenter's systems management capabilities to a variety of Unisys Corp. hosts, via its Burcom and Ulysses lines of Unisys gateway products. Applied Information Systems also intends to enhance its products so DEC Management Control Center Director can manage Unisys network environments.
- Raxco, Inc. in Rockville, Md., announced Polycenter support for its Clydesentry, Security Toolkit and Prosupport security management products. Raxco also committed to moving the products to the Ultrix platform.
- UIS, Inc. in Lexington, Mass., announced that it will support NAS and Ultrix with its VAX-based accounting and chargeback systems. These include UIS-PACS for resource management accounting, UIS-Archive for file retrieval and storage management and the UIS-Manager systems management environment.





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Third-party software helps maximize RS/6000 power

BY JOANIE M. WEXLER
CW STAFF

MONTREAL — A seemingly innocent piece of software from a third-party vendor is allowing a large credit union to leverage the IBM RISC System/6000 workstation as the cornerstone of a half million dollar file transfer project set to go into production next month.

La Confederation de Caisses Populaires et d'Economie Desjardins du Quebec is a $40 billion computer services bureau that manages 20 million accounts for customers of 1,400 independent credit unions in the province.

Electronic payroll deposits currently funneled to the company's IBM MVS mainframe-based data center through two IBM Personal System/2s are now peaking at 350 transactions per second, according to Leslie Satenstein, the project's leader.

The burgeoning dial-up traffic requires the transfer of about 2M bytes of data per second, which consumes more processing power than the PS/2s can handle, Satenstein said. La Confederation has chosen an RS/6000 running at 27.5 million instructions per second (MIPS) to replace the PS/2s.

In addition to the workstation's horsepower and Unix base, the platform was chosen because of the emergence of software that allows fast, unattended bidirectional RS/6000-to-mainframe file transfers.

Advanced communications

Since December, La Confederation has been testing the MLINK Advanced Program-to-Program Communications System (Macs), which officially started shipping last month from $1.5 million company Computer Microsystems, Inc. in Lebanon, N.H.

Although it represents a tiny percentage of the dollars invested in the file-transfer upgrade project, Satenstein said, Macs was the first domino to fall in allowing the firm to choose the RS/6000 as its security liaison between dial-in customers and the data center's multiple IBM 3090 mainframes.

Macs allows the disparate computers to initiate a session, transfer files and submit commands for execution by a remote system. Communications can flow in either direction and are unattended. To date, no similar product is available from IBM, Satenstein said.

Although he hears such a product is in the offing, "IBM announcements generally precede availability, and of course, IBM pricing is much different," Satenstein commented. "This you can't beat for the price."

The bidirectional communications utility is available from Tandem Computers, Inc. to allow its Cyclone mainframe-class minicomputer to intercommunicate with IBM mainframes. However, the Cyclone runs at just 9 MIPS, according to Satenstein.

The bidirectional flow, he added, is key because file transfers are tracked and logged every step of the way throughout the network. Once an electronic payroll deposit reaches the banking application on a mainframe, the mainframe must be able to communicate the status of the job that was executed for the customer back to the RS/6000.

In addition to the RS/6000 and the Cyclone, La Confederation considered an IBM mainframe, X.25 packet switch and OS/2-based local-area network as PS/2 replacements.

However, "these would have been too costly for our clientele and for us," Satenstein explained. "If you ask customers to transmit via X.25 or [Systems Network Architecture], they have to buy a $1,000 card for their computer and spend $1,000 for a special type of modem. With a LAN, we'd have to equip all the PCs with the largest possible hard disk to handle all the customers.

"With this system," Satenstein continued, "we just give our customers the communications software free, and the most they have to invest is $150 for a modem if they don't already have one."

Modem manager

The electronic file transfers reach the RS/6000 over dial-up telephone lines front-ended by a Digital Pathways, Inc. Defender "callback box."

Defender manages modems running the gamut of speeds up to 19.2K bit/sec. The box receives a call, checks a database on the RS/6000 and dials back the customer.

When the callback is complete, communications begin, and file transfers are tracked and logged at every juncture.

Satenstein said the RS/6000's Unix base was important because "we were looking for a Unix-to-Unix data transfer capability to satisfy 500 potential Unix customers. We know the market is there; it's just waiting for us."

Satenstein added that the 500 would-be Unix customers are above and beyond the minimum 2,000 customers the credit union expects to be serving within the year — more than 10 times the 200 customers it now serves.

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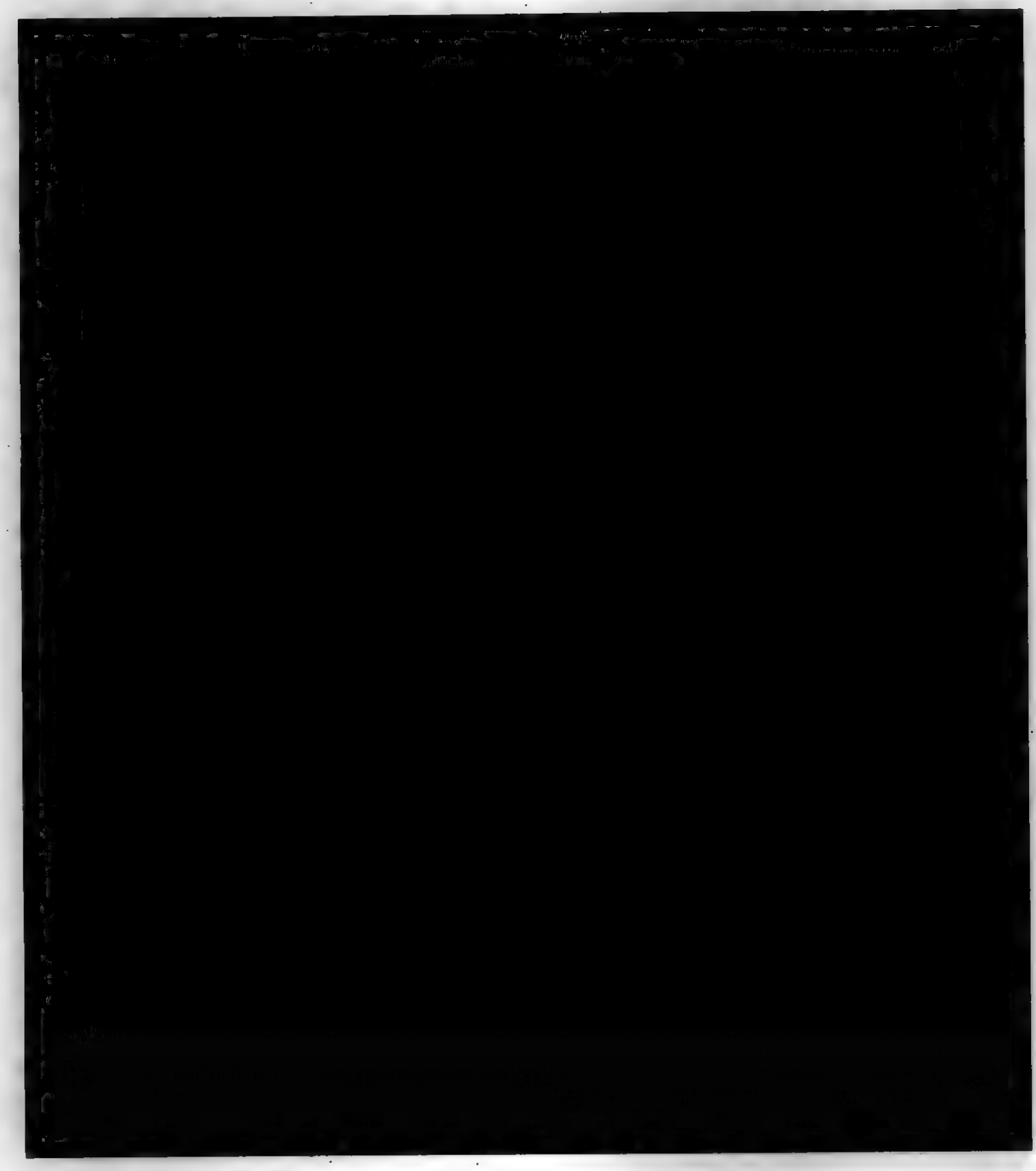
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An offer they couldn't refuse

Local agency plans for private network made Centel answer with FDDI

BY MARYFRAN JOHNSON
CW STAFF

TALLAHASSEE, Fla. — As the city and county governments in this muggy, sprawling capital city were getting ready to install their own fiber-optic network last year, bells began ringing loudly at nearby Centel Corp.'s Central Telephone Company of Florida — and it wasn't Avon calling.

Here were Centel's biggest customers gearing up to bypass the local phone company with their own Fiber Distributed Data Interface (FDDI) network and planning to install $140,000 worth of network hardware from Digital Equipment Corp.

"Then Centel stepped in and made us an offer we more or less couldn't refuse," said James Hines, geographic information systems coordinator for Leon County, which bought several Decstation 5000 workstations but canceled its FDDI equipment orders from DEC.

Instead, the city and county became the ground-breaking customers last November for Centel's FDDI metropolitan-area network — the first such tariffed offering of an FDDI network by a local exchange carrier in the U.S. Centel is Florida's fourth-largest phone company.

More than half the state's computer power is concentrated around Tallahassee because of the presence of state government, universities and the Florida State University supercomputer research institute. Until last year, though, Centel had nothing to offer customers who needed the wider bandwidth of high-speed data networks.

"People were going off doing their own thing," Hines said. "DEC was putting in fiber, AT&T was in town putting in fiber, and Florida State University was running its own fiber, mostly because Centel didn't offer any kind of reasonable deal. They didn't even seem interested."

Centel's about-face on the issue came about through a concerted effort by transmission engineers Bill Price and Jay Westmark and their boss, Ken Bazo, who convinced upper management that offering FDDI services was a critical step forward for the company.

"Centel knew where the market was heading, and we had prepared ourselves with two years of research into FDDI," said Bazo, manager of engineering transmission. He estimated that the new service will make a profit for Centel within three years.

"It was in our best interests. If we didn't do this, someone else would have," said David Farmer, general operational planning manager at Centel.

"This makes the phone company more attuned to the customer and his needs," Price added. "It's a good alternative to putting in microwave towers at enormous expense or pulling your own fiber."

Hines agreed. "I didn't want to be in the communications business," he said. "We ended up saving the $140,000 on the front end, and our monthly bill from Centel is just about what our monthly maintenance would have been on that DEC hardware we didn't have to buy."

Although the cost will increase for a customer if Centel has to lay additional fiber in the ground, the average customer pays a onetime installation fee of $1,057 and a monthly FDDI service fee of $368.

"Our goal is to offer the service at such a reasonable price, the customers can't afford not to sign up," Westmark said. "Potential customers are the hundreds of LANs already in place in Tallahassee."



Centel's MAN team: *Westmark (left), Bazo (center) and Price find a way to keep local customers from building their own network*

Leon County and the city of Tallahassee needed the 100M-bit/sec. speed of FDDI for a geographic information system from Geovision, Inc., which runs on networked DEC workstations. Ethernet, with its 10M bit/sec. transmission speed, was too easily bottlenecked by the high volume of images, data and bulk files that had to move on the network between city hall, the county courthouse and the city's electrical department several miles away.

Centel was able to provide a relatively low-cost way to connect the three government buildings via single-mode fiber-optic cable. That allowed the FDDI to be deployed as a wide-area network rather than merely as a backbone for local-area networks.

The key to the project's success for Centel was finding converter devices that could take the customer's multimode signal — which can travel a maximum of 2 kilometers between nodes — and turn it into a single-mode signal with the ability to stretch 40 to 50 kilometers between stations.

With multiple counterrotating, self-healing FDDI rings that extend from the central office to customer sites, the network was designed to reroute the data flow automatically and without interruption if a cable is cut or damaged. The rings are bridged to a series of backbone rings, each with major hubs located in geographically strategic Centel offices. Network security is not an issue, Price said, because only Centel is allowed to attach equipment directly to the FDDI rings.

Cable

FROM PAGE 49

Bonner and Smith chose Novell's Netware as the operating system for the shielded twisted-pair Token Ring network in Bethesda with Proteon, Inc. Pronet-10 Token Ring interfaces. As Discovery offices opened in New York, Chicago, Los Angeles, San Francisco and Detroit, they were connected with Proteon routers and T1 links. Today, Discovery uses five servers running Netware Version 3.1 and two with Version 2.15, Smith said.

Here, too, Discovery learned inadvertent lessons. While installing the Proteon equipment for the first time, Smith said, the network showed repeated errors. While they eventually tracked the problem down to a wiring fault, Smith said it took three or four weeks of wiring before they got it right.

"We basically run the company on the back of a PC network," Bonner said. "We knew we were going to have a database-heavy network" and built accordingly, he said. The Pronet-10 transmits data at 10M bit/sec., and the company is moving up to a 16M bit/sec. version this year.

"It's not huge by [IS] standards, but we have 20 or 30 users at a time querying 10 to 15 specialized databases from their workstations," Bonner explained. One heavily accessed database — the master program schedule listing every commercial, program and promotion to be broadcast — weighs in at 90M bytes. However, not all the data transmitted is strictly for in-house work.

"We're a very marketing-oriented company. We are doing more and more with our own publications," Bonner said. For instance, Discovery has published its own monthly program magazine since 1986. That magazine, according to the station, briefs its 200,000 subscribers on programs.

From articles to advertisements to ad contracts, the magazine is generated by Discovery employees sharing information across the country. The same goes for the planning, building and broadcasting of its program schedule, Smith said.

Traffic during the day is highly interactive, Smith said. At night, automated archiving is conducted. When not querying the databases, he said, employees are transmitting contracts, solicited and unsolicited program proposals, program updates and other information.

Distributed

FROM PAGE 49

chase object-oriented networking tools from Netwise, Inc.

"Our users are practically nowhere [with distributed computing applications], but all of them are telling us that they want to start kicking tires on this," said Wayne Kernochan, a senior analyst at The Yankee Group. Developers that are keeping up with the Open Software Foundation's (OSF) development of the Distributed Computing Environment (DCE) should begin introducing DCE-based applications by the middle of next year, he added. By 1993, he continued, "there should be a real ground swell of distributed, object-oriented applications."

The technology has recently gained some much-needed credibility — and publicity — through the involvement of leading network and computer vendors in standards bodies such as the OSF. In addition, users of early distributed computing installations have had time to realize significant paybacks from their systems.

Allied-Signal, Inc.'s Autolite Spark Plug Division, for example, used Netwise's Remote Procedure Call product to set up real-time links between factory-floor collection systems and Oracle Corp. database servers [CW, Nov. 19, 1990]. The system played a key role in Autolite's 13% productivity increase in 1989, making it the most productive unit in Allied-Signal's automotive sector.

The Equity Investments Group at Putnam Cos. in Boston recently implemented a distributed computing platform on Sun Microsystems, Inc. workstations that allows the development of applications to evaluate the performance of client accounts in one week instead of a few months, as formerly, said Steve Levy, who worked on the project.

However, while these success stories may encourage other companies to experiment with distributed computing, they have yet to persuade the parent firms to extend the technology to other parts of the enterprise.

In an earlier interview, Carole Pritchard, Allied-Signal's automotive sector director of IS, told *Computerworld* that her group will look at adapting parts of Autolite's system for its own use. However, this will depend in part on whether various aspects of the systems can be supported by IBM Application System/400s, which are a major part of the sector's current systems strategy, she indicated.

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NEW PRODUCTS

Local-area networking hardware

Chipcom Corp. has announced a fault-tolerant Token Ring module designed for its Online system concentrator.

The Token Ring Multistation Access Unit Module is a single-slot device that connects eight desktop computers, servers or other network resources operating at 4M or 16M bit/sec. The product can reportedly integrate multiple Token Ring and Ethernet networks in a single Online System Concentrator. It also supports shielded and unshielded twisted-pair cabling. The product is priced at $1,195.

Chipcom
118 Turnpike Road
Southboro, Mass. 01772
(508) 460-8900

Local-area networking software

Information Presentation Technologies, Inc. has introduced a software package designed to allow Apple Computer, Inc. Macintosh and Sun Microsystems, Inc. Sparcstation users to access one another's respective files.

Sun-Partner ($695 per Sparcstation) features a bidirectional, peer-to-peer connection between the Macintosh and Sun environments. The product reportedly enables Macintosh and Sun users to access networked devices such as printers and database servers simultaneously via Sun's Open Look or a Macintosh interface.

The company has also announced Ushare 2.0, a network application that creates an Appleshare server on a Unix workstation. Ushare 2.0 costs $1,195 per desktop package. A deskside version is priced at $1,595.

Information Presentation Technologies
5000 N. Parkway Calabasas
Calabasas, Calif. 91302
(818) 347-7791

Dayna Communications, Inc. has announced Novell, Inc. Netware 386 drivers for its DL2000 and DL/2 Localtalk adapters that were designed to support Netware for Macintosh Version 3.0.

The DL2000 standard bus and DL/2 are both Novell-certified adapters for Apple Computer, Inc.'s Localtalk. They are both equipped with a workstation IPX driver that allows personal computer workstations to access Netware management software, printing and file security utilities via Localtalk.

The DL2000 and DL/2 are priced at $299 and $399, respectively.

Dayna Communications
50 S. Main St.
Salt Lake City, Utah 84144
(801) 531-0600

Network management

Boole & Babbage, Inc. has announced a network operations and fault-management system that features a single point of monitoring and control for enterprisewide and small information networks.

Net/Command Version 2.1 includes real-time network maps, local-area network diagnostic tool management features, user-defined alerts and host-alarm management. The product also emulates a control terminal, thereby allowing network managers to monitor and control the performance of complex networks from a single workstation.

Pricing begins at $55,000.

Boole & Babbage
4600 Oakmead Pkwy.
Sunnyvale, Calif. 94086
(408) 720-0231

Novell, Inc. has announced the Lanalyzer 4/16 network analyzer, a personal computer-based network analysis tool for 16M bit/sec. Token Ring networks.

The product features predefined testing applications for Token Ring environments, such as automatic mapping, real-time error analysis and network optimization. It can be configured for 4M or 16M bit/sec. Token Ring networks by switching software in its setup menu, according to the vendor.

The Lanalyzer 4/16 lists at $11,980. Users of the 4M bit/sec. version can upgrade to the 4/16 version for $1,995.

Novell
2180 Fortune Drive
San Jose, Calif. 95131
(408) 434-2300

Codex Corp. has introduced a low-cost network management system for small- to medium-size networks and a low-end T1 multiplexer to work with it.

The 9800 LE Network Management System, a scaled-down version of the 9800 series NMS, offers users an easily upgradable way to manage a wide-area network. The product manages Codex fast-packet and circuit-switch T1/E1 multiplexers, X.25 packet switches and packet assemblers/disassemblers as well as an Etherspan T1/LAN bridge. It is currently available in the U.S. and costs $20,000.

The 6250 Network Multiplexer is a digital circuit switch interfacing with T1, E1, fractional T1 and n x 64 services. Pricing begins at $4,000, with average price per node ranging from $8,000 to

Continued on page 58

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information resources inc

*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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Continued from page 57

$18,000. The product is currently shipping.

Codex
20 Cabot Boulevard
Mansfield, Mass. 02048
(508) 261-4655

Customer premises equipment

Themis Computer has announced a wide-area network controller designed for the Sun Microsystems, Inc. Sparcstation bus.

Sxcm is an intelligent X.25 data communications front-end processor for Sun's Sbus. It supports T1 and Conference on European Postal and Telecommunications, or CEPT, communications rates and features three on-chip serial channels that can be independently programmed to support synchronous and asynchronous protocols, the vendor said.

Pricing begins at $1,800.

Themis Computer
8551 Owens Drive
Pleasanton, Calif. 94588
(415) 734-0870

Modems

Hayes Microcomputer Products, Inc. has announced a 3-oz., 3-in. modem that can be connected to laptops or portable computers.

Pocket Edition 2400 includes a standard 9-pin RS-232 serial port and features 300, 1.2K or 2.4K bit/sec. data communications rates.

The product is priced at $179.

Hayes Microcomputer Products
705 Westech Drive
Norcross, Ga. 30092
(404) 449-8791

Gateways, bridges, routers

Jupiter Technology, Inc. has unveiled enhancements and additions to its NP 9600 family of communications servers.

The product line now features four new server models; interactive software support tools and local-area network interfaces.

The four servers include NPS models 9651, 9652, 9658 and 9659.

Pricing ranges from $8,000 to $48,000, depending on type of server model.

The company also announced 4M- and 16M-byte Token Ring interfaces that were designed to work on all NP 9600 servers. The interfaces cost $1,000 each.

Jupiter Technology
2402 W. Beardsley Road
Phoenix, Ariz. 85027
(602) 869-3778

Systems Strategies, Inc., a subsidiary of Nynex Corp., has announced Express IP Router, a software package that allows Unix workstations running Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate over packet-switched wide-area networks.

The product runs in conjunction with the firm's Express X.25 public data network access package. Express IP Router users can extend TCP/IP services to remote locations at speeds of up to 64K bit/sec. without the expense of a dedicated line. The product is currently available for Unix 386 systems using Intel Corp.'s *Unix System* V/386, The Santa Cruz Operation's Unix and Interactive Systems Corp.'s Unix.

Express IP Router costs $700.

Systems Strategies
225 W. 34th St.
New York, N.Y. 10001
(212) 279-8400

Micro-to-micro

Server Technology, Inc. has announced a telephone-activated power control unit that allows users of personal computers to control programs, files and printers from a remote, unmanned location, even when power for their remote systems has been turned off.

Remote Power-On/Off includes remote computing and file-transfer software that is bundled with a telephone-activated power controller that allows users to access a central PC and control its operations from a remote site.

The product can be installed on an IBM Personal Computer XT, AT or compatible. A bundled package that includes the controller and communications/control software costs approximately $220.

Server Technology
2332-A Walsh Ave.
Santa Clara, Calif. 95051
(408) 988-0142

Front ends, multiplexers

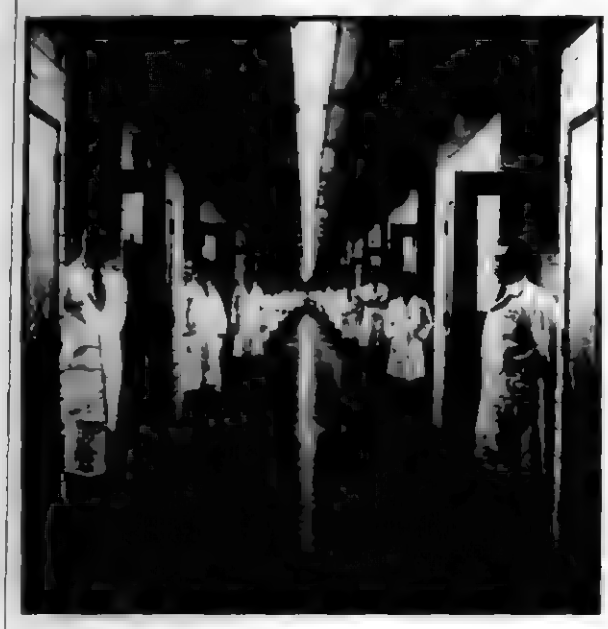
Pacific Communication Sciences, Inc. has announced the CS8000 in its Clarity series voice/data multiplexer line.

The product, available now, has eight expansion slots, allowing voice, fax or modem transmission across low-cost digital lines. The CS8000 uses a proprietary voice coding algorithm that yields compression rates greater than 9-to-1. However, it delivers toll-quality voice reproduction, according to the company.

Voice channels may be equipped with Pacific Communication Sciences' Fax III fax option, allowing combination voice/fax transmissions through a single channel.

The base price is $3,995, including four data channels in addition to the eight expansion slots. Voice cards cost $1,595 each. Fax III cards cost $2,195.

Pacific Communication Sciences
10075 Barnes Canyon Road
San Diego, Calif.
(619) 535-9500



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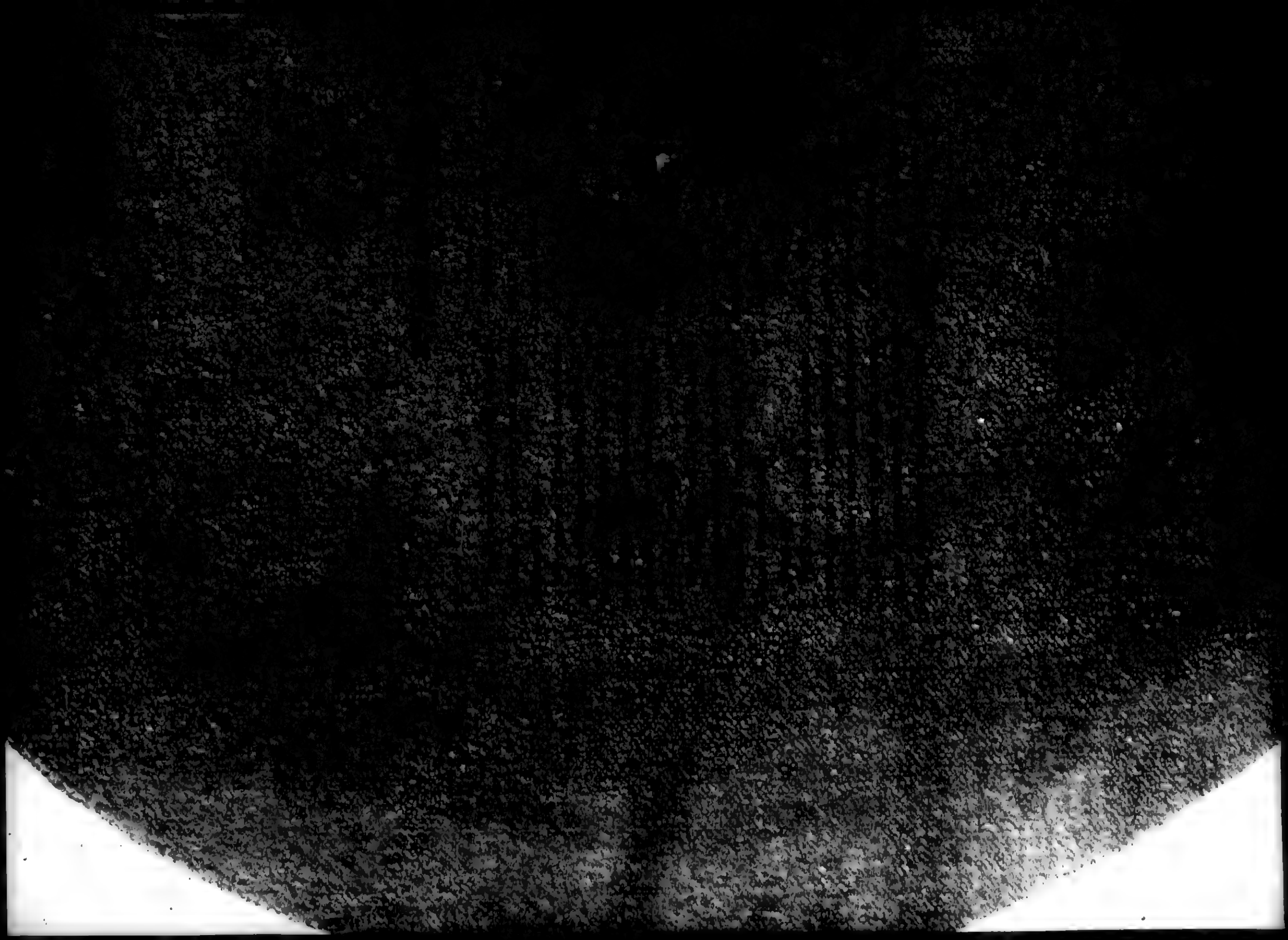


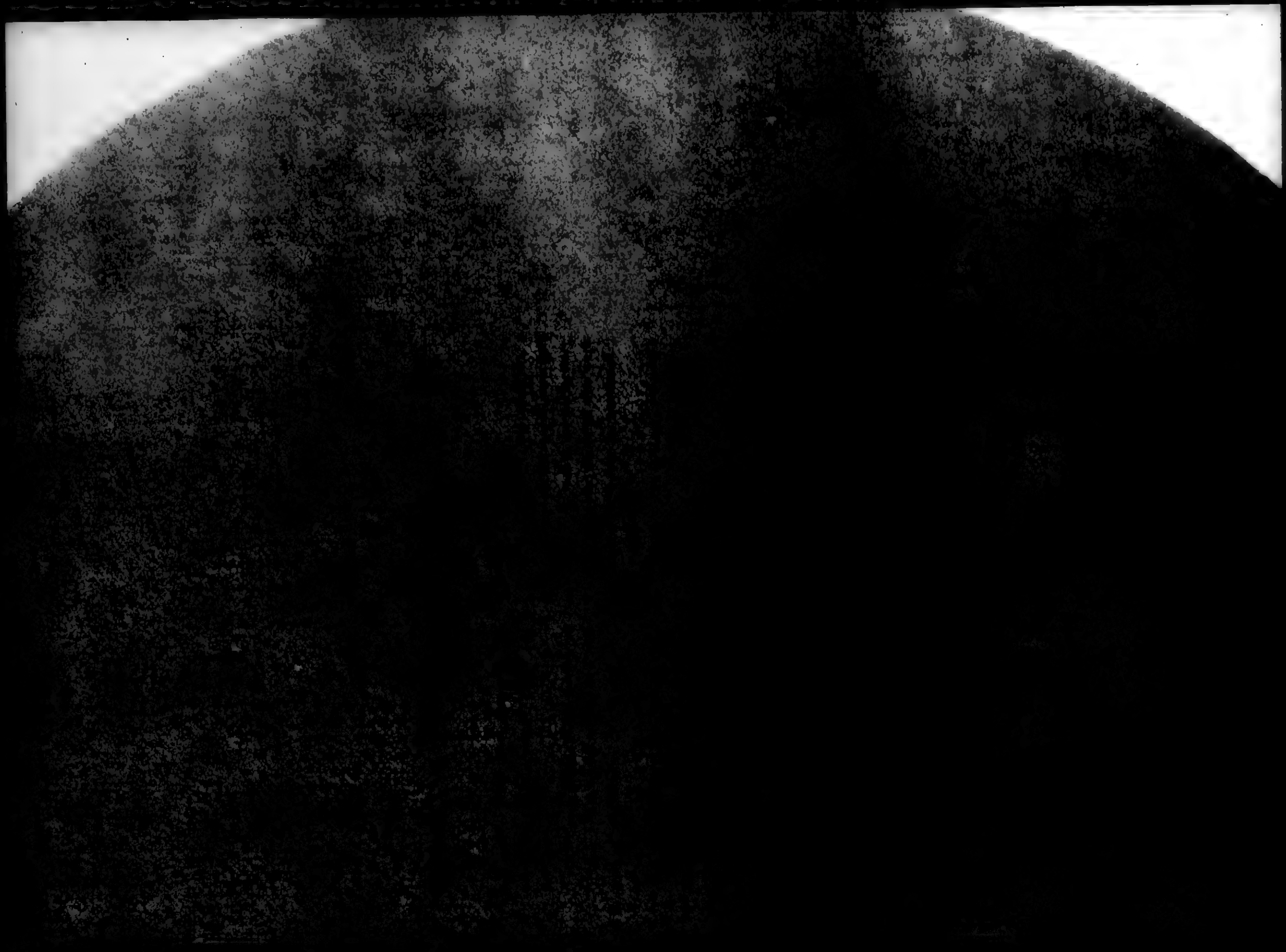




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open hardware platform, most
and most complete

we discovered
operating system, most
flexible network architecture,
graphical interface.







MANAGER'S JOURNAL

EXECUTIVE TRACK



Jonathan J. Burbank has been promoted to vice president of U.S. information services at **Bull HN Information Systems, Inc.** in Billerica, Mass.

Burbank will develop and direct business and technical information systems for Bull in North America. He will also be responsible for aligning Bull's strategic IS direction in the U.S. with the overall IS strategies of its French parent Groupe Bull.

He reports to Sy Kraut, executive vice president of manufacturing and corporate services, with dotted-line reporting to Robert J. Elliott, vice president of information services.

Burbank was most recently Bull's director of application development systems and support. He joined the computer vendor in 1989 as director of information planning and technology.

He holds a bachelor's degree from Williams College in Williamstown, Mass.

.....

Howard Van Valkenburgh has been named director of MIS at **GF Office Furniture Ltd.** in Gallatin, Tenn. He is responsible for all computer operations, applications development, communications and personal computing at the firm.

Van Valkenburgh was most recently a project manager at Service Merchandise, Inc. in Nashville. Before that, he was a project manager at First American National Bank, also in Nashville. He also worked for 10 years as a senior systems analyst at Consolidated Freightways, Inc. in Portland, Ore.

He holds a bachelor's degree in business administration from Memphis State University.

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Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Homequity puts users in control

A bent for decentralization is having an impact on technological 'balance of power'

BY ELISABETH HORWITT
CW STAFF

While a lot of companies talk a good game about decentralizing information systems operations and putting more computing tools in the hands of users, PHH Corp.'s Homequity division is one organization that seems to be making it work.

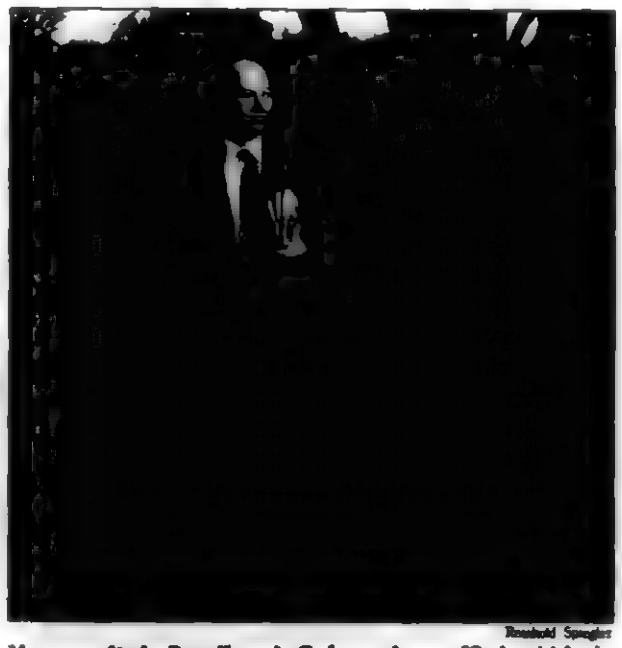
The Wilton, Conn.-based corporate relocation and real estate management firm has been pushing user empowerment for the past couple of years, wreaking some fundamental changes in the balance of power between IS and end users.

"It's up to IS to make a system available, and then it's up to each business unit to decide whether it wants that system and justify the costs," says Bradley J. Calcagni, Homequity's director of business systems development, technology management and consulting. "We're not pushing it down their throats."

"Under the old way, IS would say to users, 'Here is the new system. You paid for it, use it,' " says Stephen Pratt, project leader of departure applications systems. "Now we can only say, 'Here's a tool; this is what you'll be buying.' "

In the past 18 months, management has demonstrated its commitment to user empowerment in two concrete ways. First, it has backed the development of two highly strategic systems that move crucial database and application resources off the centralized hosts onto personal computer local-area networks — and effectively into users' hands.

Second, management is giving users the chance to say no to those new systems, despite the fact that they are both key components of an organizational strategy that targets two crucial business areas: customer reporting and property management.



Reinhold Spengler

Homequity's Bradley J. Calcagni *says IS should be in the business of making a system available to end users, not 'pushing it down their throats'*

Homequity handles the residential properties of corporate employees who are being relocated to another part of the country. One way for the firm to keep its competitive edge as a "high-end" business, management decided, was to provide clients with exactly the information they want about the status of their properties, what measures are being taken to sell them, and why a given marketing strategy was chosen.

Into users hands

Homequity concluded that it would have to find a replacement for the current Wang Laboratories, Inc. VS reporting system, which lacked the flexible data structures and reporting tools that were needed to tailor reports to clients' needs. A group appointed to evaluate possible solutions had gotten as far as looking at SQL-based LAN servers when users took matters into their own hands.

Homequity's research analyst department, which generates customer reports for business unit managers, had been working with Pratt to develop a PC-based database server for pricing and statistical analysis. The system runs on Novell, Inc. Netware Token Ring LANs.

The research analysts realized that this system could also support customer reporting and told Pratt they wanted to use it that way. "What sold

Continued on page 68

Boss rating flies high at Pratt & Whitney

BY CLINTON WILDER
CW STAFF

Supervisors in the information systems department at Pratt & Whitney have to please a tough group of critics: their staffs.

Staff members at the East Hartford, Conn.-based jet engine manufacturer get to evaluate their bosses once per year under the auspices of the 2-year-old Leadership Evaluation and Effectiveness Program (LEEP). Inspired by Vice President of MIS Doug Lewis as a tool to stem employee attrition, the concept has been successful enough to be adopted by other Pratt & Whitney departments — and to be considered by other divisions of its $22 billion parent, United Technologies Corp.

Lewis said he felt that part of the attrition problem lay with supervisors' employee reviews, which failed to adequately challenge staff members. Lewis wanted an upward evaluation process that would, in effect, challenge supervisors to be more challenging.

"People who work for the supervisor are a better judge of his performance than his boss," Lewis said. "They look at supervisory skills, while bosses look at goals achieved."



Lewis *was looking for a way to cut down IS turnover*

Rate your boss

LEEP, designed by a team assembled under Pratt & Whitney's corporate quality program, enables IS employees to rate their supervisors (about 100 people in total) in 18 categories, while also rating the importance of each category to them.

To make the evaluation nonthreatening, the results are not tied to the supervisor's performance review. "I don't want it to be a club over their heads," Lewis said. "But if I consistently scored poorly, I'd begin to question whether I should be a supervisor."

Although influenced by many other factors, including the economic downturn, the attrition rate at Pratt & Whitney's IS department has dropped to almost zero since LEEP was implemented. Lewis and the human resources department are now looking at two years of results to try to form a set of model characteristics for top-notch supervisors.

"Being gung ho and proactive with good communications skills and a very open style — those are the things that seem to pop out," he said.

Homequity

FROM PAGE 67

them was the improved performance," Pratt says.

Indeed, analysts on the PC-based system were generating reports five to six times as fast as they did with the centralized Wang system, Pratt says. "Things taking three to four days were now done in half an hour's time," he says.

One big time-saver was the PC-based ad hoc querying tools; another was the fact that the new system was updated daily. The Wang system was updated only once per week, forcing users to recheck all their numbers to make sure they were current.

Business unit managers across the company quickly got wind of the benefits realized by the research analysts, and "the system sold itself pretty much within a month," Pratt says.

"The system is fantastic," says research analyst Patrick D. Moore, who worked on it with Pratt. "People can create their own stuff the way they work. Before, if you wanted information not on a report you had to fill out a form and get on a waiting list, so you'd usually try to talk the client out of" requesting additional information.

A second system that management wants to implement across Homequity's 22 business units was designed to help inventory managers market clients' properties more effectively.

Management began by training inventory managers to collect complete, detailed information about the properties they handle because a lot of that information "just wasn't there," says Joan Zawacki, director of one Homequity business unit.

The training program — definitely not optional — is about halfway completed.

Calcagni recently shepherded the system out of prototype and is now preparing to bring it to those business units that want it.

More work up front

Selling this system to the user population will not be an easy task, however. "The new methodology actually adds work up front," Calcagni says. Not only are users expected to learn a new, systematized way to enter daily reports, they also must learn how to deal with PC packages such as Lotus Development Corp. 1-2-3 and Borland International, Inc.'s Paradox.

Although many inventory managers already have PCs, not all have taken to technology enthusiastically. "We hire people with people and phone skills, many of whom have a preference for pencil and paper" over keyboards, Calcagni says.

IS paved the way to an easy sales job for the properties marketing system by getting a Homequity business unit involved early on in the development process — in effect creating a system "champion" even before the project was finished.

Users in that unit, which is part of Homequity's Eastern region, are now boasting to other units about the benefits they have gained while testing the new system in prototype. The system's in-depth data and ad hoc querying tools have improved inventory managers' ability to turn over properties, Zawacki says. Sales within the unit are 20% higher and costs per client 2% lower than in the rest of the company, she adds.

"We are making better decisions quicker, turning properties around faster at less cost," Zawacki says.

Zawacki's unit seems to have done a good sales job on the rest of Homequity. As the time draws near for IS to start implementing the system in real business environments, business units are actually competing to be the first to implement the new system, Calcagni says.

> "UNDER THE OLD way, IS would say to users, 'Here is the new system. You paid for it, use it.' Now we can only say, 'Here's a tool; this is what you'll be buying.' "
>
> STEPHEN PRATT
> HOMEQUITY

"IS will have to go out and work with each unit to tailor the system, so they'll have to wait their turn," he says.

Granted, not all units have bought into the system: "Some are saying, 'We know how to do our business,' or, 'Not another system,' " Calcagni says.

In particular, those units with seasoned inventory managers may not need the system, at least until those managers leave the company. "This system doesn't do much for experts, it just brings people up to speed faster" in effective marketing skills, Zawacki says.

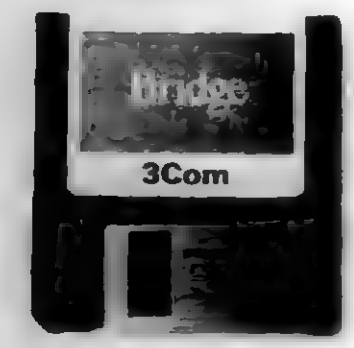
Based on the way demand is growing, IS hopes by fall to have user commitments to fund migration in all units from the Wang VS to the new LAN system. "These are tough times and money is tight, but people are already digging for the money to get the system," Calcagni says.

The IS department is also enthusiastic about the user empowerment represented by both new systems. Now that users can, in Pratt's words, "do their own ad hoc querying instead of being spoon-fed by MIS," programmers can spend a lot more time doing their main jobs of systems development.

The new IS/user relationship also fosters more intelligent interaction between the two groups, Pratt says. IS now has a better sense of how the business works, and users can ask questions like 'Why do numbers appear this way?' " Pratt says.

And how does IS feel about giving away some of its power? "I could feel threatened that a lot of control is going to the user," Calcagni says, "but in fact I'm relieved. A lot of complaints are going away."

Ch



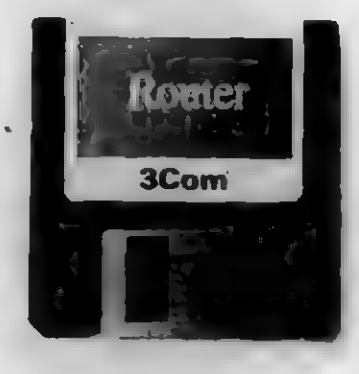
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COMMENTARY

Les Gilliam

Getting the job done right



Many departments and business units are not satisfied with the IS department's services. The complaints heard most often are about high costs and products that are late or incomplete. As a result, some users think that by installing a minicomputer, LAN and/or PCs, they will cut costs and gain control of their computing destinies.

To those departments, senior management should say, "If you think you must become your own IS department, fine. But you will do it right!"

User-based computing is in vogue. With the onslaught of PCs, LANs and minicomputers, IS departments are agreeing, some even voluntarily, to the deployment of distributed or departmental computing in the company.

But are the users doing it right? Have you ever eavesdropped on some of the conversations in these distributed computing groups? The subjects include such topics as unreasonable users, missed deadlines on applications projects, lack of management understanding and inadequate budgets.

To some of us, these are familiar subjects. I am beginning to wonder if today's departmental and personal computing users are making some of the same old mistakes that the mainframe folks made when they started.

What are some of the painful lessons learned by centralized IS over the last several years? What are some of the areas most often overlooked or left unattended in operating an IS function? Here are some of the common elements that should be addressed by users who want to do it right.

• **Informed management.** In the early days of computing, many managers professed ignorance of computing and turned it over to the techies. This abdication of responsibility led to an overemphasis on technology, rather than a business decision approach to the use of computing. The department manager who assumes responsibility for computing must become just as informed about it as he is about any other aspect of the business, if wise business decisions are to be made.

• **De-emphasize technology.** If technology is just a tool that provides increased productivity and enhances profitability, then it must be managed accordingly. Management must be sure employees place more importance on applying the technology than on acquiring the newest or fastest gizmo on the market.

• **Methodology.** If management is to maintain control and ensure that the staff produces the best business solutions, a methodology is a necessity. Otherwise, each employee will do his own thing, and project management will be, at best, a dart game.

• **Requirements.** Shooting at a moving target can be difficult, but having no target at all guarantees failure. The wise manager will demand a determination of requirements before solutions are proposed and pursued.

MANAGEMENT MUST BE SURE employees place more importance on applying the technology than on acquiring the newest or fastest gizmo on the market.

• **Justification.** No manager would approve the construction of a new plant or factory without a complete, documented justification based on sound assumptions. But how many computer projects are started with no justification or even a feasibility study?

• **Tools and training.** The more productive computing groups have selected a limited number of tools and have ensured that employees are well trained to use them. Changing software should be done very carefully and only after considering all costs, including the lost productivity during the learning period.

• **Documentation.** How long is it going to take management to realize the foolishness of creating computer applications without sufficient documentation? No one would dare think of building a plant or an office building without the proper blueprints to guide construction and provide for ongoing maintenance. Yet it is done every day in computing.

• **Security.** Management has a responsibility to protect and control all company assets under its direction. Yet in many cases, computing tools do not receive the proper attention regarding backup, recovery and the protection of an asset on which the company's business depends. How many departmental computing resources have no documented contingency plan?

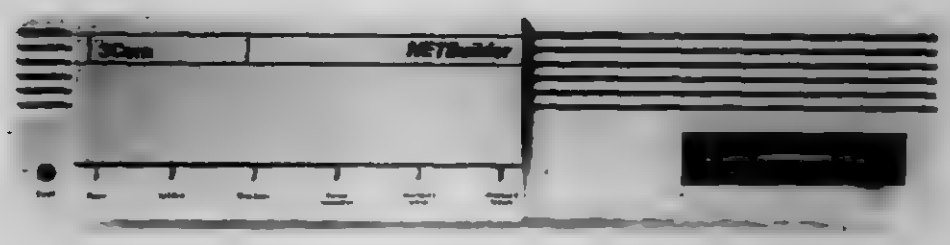
• **Acquisition procedures.** The acquisition of computing resources requires careful consideration of product suitability, quality, cost, conversion and vendor dependability. Management must give the same consideration to acquiring computing resources as to any other product on which the company's future relies.

• **Careers.** It is not uncommon to see user departments turning engineers, accountants and even lawyers into computer programmers. Business managers would do well to consider long-range career opportunities for those who become primarily computing employees.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Ponca City, Okla.

Ch Changes.





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CALENDAR

MAY 5-11

Microsystems Integration & Workshop Connectivity Conference. Dallas, May 5-7 — Contact: G2 Research, Mountain View, Calif. (415) 964-2400.

AIM Information Systems Conference. Las Vegas, May 5-8 — Contact: Association for Systems Management, Cleveland, Ohio (216) 243-6900.

Semiconductor Forum. Phoenix, May 5-8 — Contact: In-Stat, Scottsdale, Ariz. (602) 860-4318.

Connectivity Day '91. Media, Pa., May 6-7 — Contact: Real World Systems, Glen Mills, Pa. (215) 358-5345.

International Conference on Desktop Manufacturing: The Rapid Prototyping Revolution. Minneapolis, May 6-7 — Contact: CAD/CIM Management Roundtable, Boston, Mass. (617) 232-8080.

Mobile Data Report Conference and Exposition. Cambridge, Mass., May 6-7 — Contact: Waters Information Services, Binghamton, N.Y. (607) 770-8535.

Managing Networks in Times of Change and Uncertainty. Hilton Head, S.C., May 6-8 — Contact: Applied Computing Devices, Terre Haute, Ind. (812) 232-6051.

Paper Industry Management Association's International MIS Conference. San Diego, May 6-8 — Contact: Scott Baumeck, PIMA, Arlington Heights, Ill. (708) 956-[illegible].

Computer and Management Show for the Design and Construction Industry. Washington, D.C., May 6-10 — Contact: Sharon Price, A/E/C Systems '91, Norwalk, Conn. (203) 666-6097.

Enabling Work Teams to Reach High Performance. Indianapolis, May 7-8 — Contact: Indiana Labor and Management Council, Indianapolis, Ind. (317) 293-4101.

The Future of World Telecommunications: Corporate Strategy and Public Policy Toward Interconnectivity. New York, May 7-8 — Contact: Julie Terfanova, Business Week Executive Programs, New York, N.Y. (212) 512-2184.

Bexpo Spring. Atlanta, May 7-9 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

North American MAP/TOP Users Group Spring Conference. Nashville, May 7-9 — Contact: Steve Sichels, COS, McLean, Va. (708) 883-2704.

National Online Meeting. New York, May 7-9 — Contact: Learned Information, Inc., Medford, N.J. (609) 654-6266.

Today's Software, Tomorrow's Heritage. Bedford, Mass., May 8-9 — Contact: Judy Dayon, Billerica, Mass. (508) 663-6600.

Financial Networks Conference. New York, May 8-10 — Contact: Digital Consulting, Andover, Mass. (508) 470-3870.

Intelligent Mapping. Washington, D.C., May 9 — Contact: Conference Director, Intelligent Mapping, Birmingham, Ala. (205) 980-8297.

MAY 12-18

Named International Users Conference. Las Vegas, May 12-16 — Contact: Chris Palomas, Must Software International, Norwalk, Conn. (203) 845-5000.

The Hammer Sales, Marketing and Service Conference. Boston, May 13-15 — Contact: Hammer & Co., Cambridge, Mass. (617) 354-5555.

Office Systems and Networks Dialogue. Washington, D.C., May 13-15 — Contact: TTI, Santa Monica, Calif. (213) 394-8305.

Telecom Developers '91. Dallas, May 13-15 — Contact: Telecom Library, New York, N.Y. (212) 999-0345.

Micro Focus Users Conference. Orlando, Fla., May 13-16 — Contact: Micro Focus Users Conference, Palo Alto, Calif. (415) 856-9817.

Entity Modeling: Techniques and Application. Washington, D.C., May 13-17 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Legent Corporation's Users Conference. New Orleans, May 13-17 — Contact: Legent, Pittsburgh, Pa. (412) 323-2600.

Video Expo. Los Angeles, May 13-17 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Data Administration Management Association Annual Symposium. Gaithersburg, Md., May 14-15 — Contact: Andrea Tyndall Norris, DAMA, Washington, D.C. (202) 453-1790.

Distribution/Computer Expo. Chicago, May 14-15 — Contact: C. S. Report, Exton, Pa. (215) 827-7436.

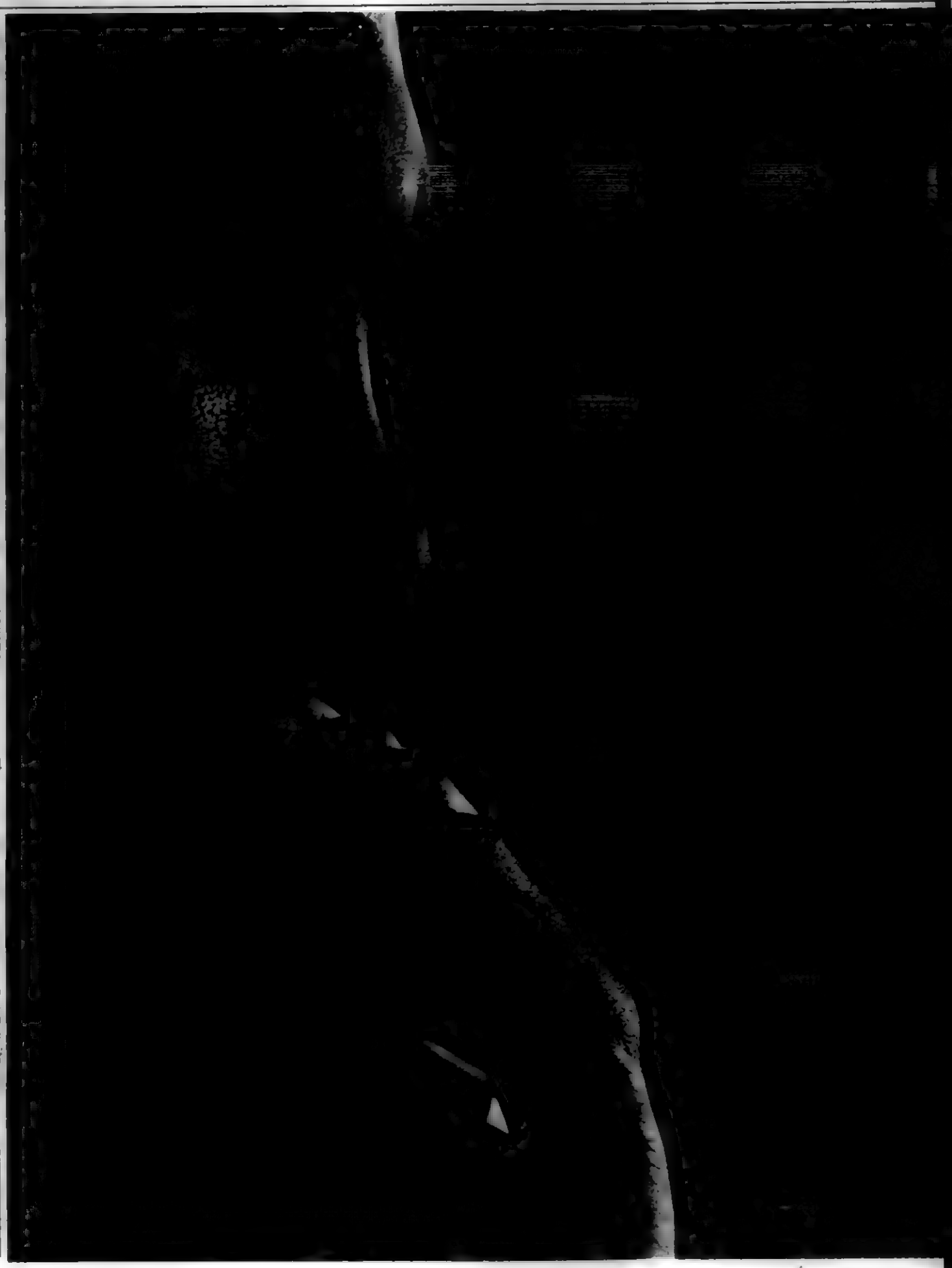
3D Expo. Chicago, May 14-16 — Contact: Expocon Management Associates, Trumbull, Conn. (203) 374-1411.

Multimedia Expo. New York, May 14-16 — Contact: American Expositions, New York, N.Y. (212) 226-4141.

Software Research Quality Week. San Francisco, May 14-17 — Contact: Software Research, San Francisco, Calif. (415) 957-1441.

National Energy Software Center. Argonne, Ill., May 15-16 — Contact: NESC, Argonne, Ill. (708) 972-7250.

Business Continuity Planning Conference. Atlantic City, May 15-17 — Contact: Sungard Planning Solutions, Wayne, Pa. (215) 341-8790.



FDA abandons VDT screen testing

BY J. A. SAVAGE
CW STAFF

Some screens that reduce VDT glare are also touted as reducing electromagnetic fields associated with the monitors, but initial testing by the U.S. Food and Drug Administration indicates they may not work.

Ed Dawson, acting branch chief for the Television, Acoustic and Microwave Products Branch of the FDA, said preliminary tests — done to gauge whether formal testing is warranted — showed that some devices reduced electric fields, but not magnetic fields. "While it looks like the products don't do what they say they do, the FDA decided it is not a priority," he said. The FDA will not proceed with formal testing.

The FDA's current testing budget is being used for medical equipment, according to Dawson. He said his office proposed formal testing for VDT screens, but there was not enough money available to begin such a pro-

Some studies indicate that electromagnetic fields from VDTs and other appliances, such as electric blankets, affect health. The Environmental Protection Agency released a report in December 1990 indicating there may be some link between cancer and extra low frequency (ELF) electromagnetic fields.

However, a National Institutes of Occupational Safety and Health study released last month said very low frequency electromagnetic fields (in a higher range than ELF) do not affect reproductive health in female VDT workers. Both fields emanate from most VDTs.

"It's clear that nothing you can put on the outside of a computer will reduce magnetic fields," said Louis Slesin, editor of newsletter "VDT News."

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MANAGEMENT BRIEFS

ASM picks officers

Paul R. Saunders will take over as president of the Association for Systems Management June 1. He is president of Saunders Systems Corp. in Louisville.

Linda J. Menard-Watt was chosen president-elect and will be president in 1991-92. She is manager of administrative information systems at the University of Windsor in Ontario.

Also taking over new offices June 1 are: as vice president, William D. Munch, an information systems consultant in Pleasant Hill, Calif.; as treasurer, Ross A. Flaherty, director of information resources at Texas Wesleyan College in Fort Worth, Texas; and as secretary, Ann M. Parr, manager of systems and information processing at Life Office Management Association in Atlanta.

Cause, the associationfor IS in higher education, has issued a call for papers for its annual conference, scheduled for Dec. 3-6 in Anaheim, Calif. The deadline is May 15. To send a proposal or to receive information, contact Cause at 4840 Pearl East Circle, Suite 302E, Boulder, Colo. 80301 (303) 449-4430.

Roger S. Siboni has been named national director of KPMG Peat Marwick's high-technology consulting practice. Siboni, a Peat Marwick partner, succeeds Tom Moser, who has been named managing partner of the firm's North and South Carolina offices.

CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"Integrating distributed databases into the information architecture"

By Michael D. Krasowski

Journal of Information Systems Management Spring 1991

■ Senior executives are driving their corporations to be more responsive to changing business needs and customer service, while cutting out levels of management and giving employee work groups total control over work processes.

Information systems managers will need to respond to these trends by ensuring that each work group has local control of its database, can easily access remote databases and can share data with other groups. Distributed database technology, which enables data to be physically dispersed but logically centralized, can make this happen.

IS managers should evaluate vendors' offerings by checking how well they match E. F. Codd's 12 rules for relational database management systems. The key is to make the distributed database appear nondistributed to the end user.

Even though the technology is immature and vendors offer only some of the ideal functions, investments in distributed database systems are still worthwhile. IS managers will be able to integrate the company's older, stand-alone databases, while building new databases on networked workstations rather than on costly mainframes. — *Mitch Betts*

"It is time for MIS to change the image of fax"

By Ralph D. Loftkin

Babson College Center for Information Management Studies Working Paper Series: 90-03

■ Labor intensity, compromised security, costliness, breakdowns and documents of poor quality are problems associated with fax machines; still, the market is expected to grow through 1994.

Some companies implement additional fax machines to compensate for overburdened ones. Instead, they should incorporate fax into the information systems infrastructure.

IS managers seeking to provide an integrated fax capability have three options:

- Mainframe-attached network servers. Faxes can be sent without printing the document, but all received faxes must be printed and routed manually. This option is suited to some volume applications.
- Individual personal computer fax boards. Limited to single PCs, they will not operate on local-area networks, are not directly programmable and require sophisticated user intervention and dedicated telephone lines.
- LAN servers. The best option, they allow networked PCs to exchange fax messages with fax machines and documents to be sent as electronic mail messages. Combined with a powerful user interface, they let users assemble documents consisting of text, graphics, spreadsheets and images and send them as integrated messages to fax machines or other corporate users.

From the corporate standpoint, LAN-based fax servers can increase user productivity and smooth work flow while cutting costs. — *Jodie Naze*

"Micro Capitalism: Eastern Europe's Computer Future"

By Esther Dyson

Harvard Business Review January/February 1991

■ The personal computer industry in Central Europe and the Soviet Union is comparable to the U.S. market of 15 years ago — a wealth of potential waiting to be realized.

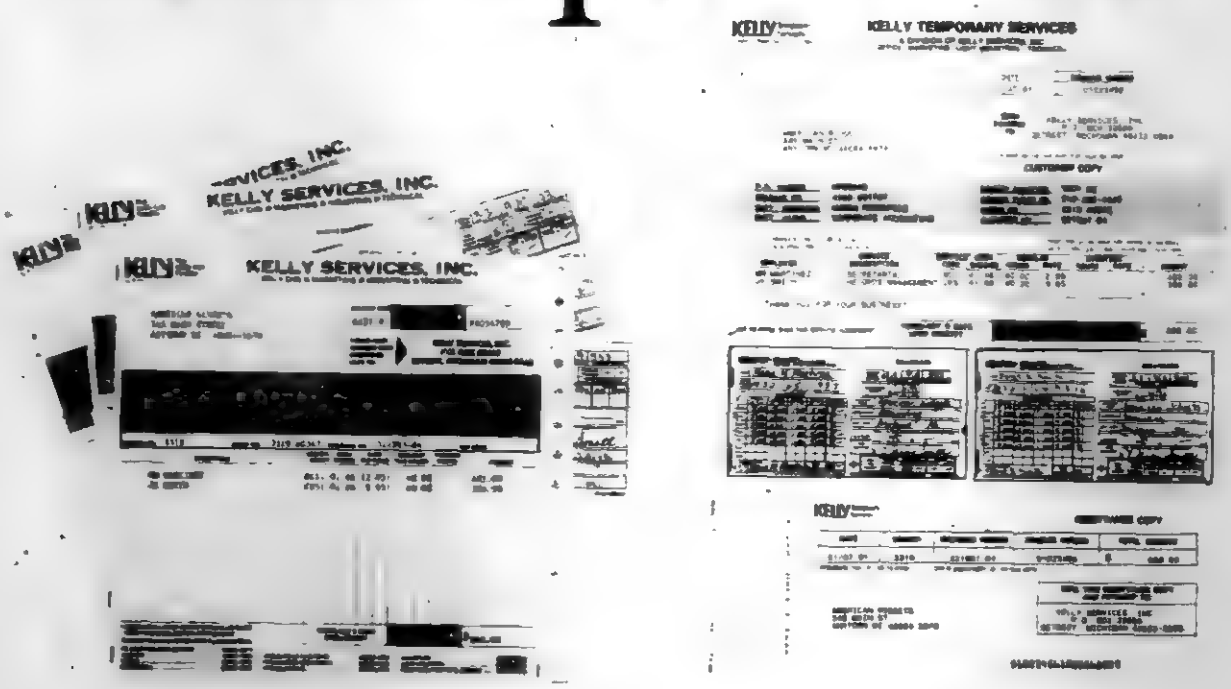
Successful computer entrepreneurs in those regions have identified market needs of service, distribution and support and have satisfied them.

However, Easterners say it is exploitive to pay for service or distribution of a product; entrepreneurs will be challenged to convince them that there is value in these types of intangibles.

Entrepreneurs will also find distribution channels and establish and sell through authorized dealerships, with the capability of providing support.

The computer market is only beginning to evolve in Eastern Europe and the Soviet Union; many small companies without established reputations lack financial backing. However, Western companies that provide backing may find that by helping to automate small firms and taking advantage of the human capital, they will be rewarded with the fruits of the business. — *Kelly E. Dwyer*

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End-user training: Needs improvement

But a few standout IS groups are tackling the problem head-on

BY GLENN RIFKIN

At Hills Pet Products, Inc., a major corporate education initiative is under way that originates from an unlikely source: the IS department.

Dan Pitts, vice president of information services at the $600 million Topeka, Kan.-based pet supply company, wants to educate Hills employees about technology and business issues. He's spending 4% of his information systems budget on training to do it. "The company has held education as a value for quite a while," Pitts says, "and [IS is] at the forefront of that."

That kind of take-charge commitment to education by IS is rare. Training of corporate end users continues to be a conundrum for most companies, consultants say, and most training offerings are either limited, poorly structured or ineffective.

Poor job

Observers blame several factors — ranging from budget pressures, poorly qualified IS trainers and lack of interest — for the poor job done by many IS departments in training end users (see story page 74).

"IS is still bogged down doing the '80s style of support; it's demand-driven and reactive," says Naomi Karten, head of Karten Associates, a Randolph, Mass.-based consulting firm that specializes in IS training. "Not enough of the right training is being provided to end users."

A big part of the problem, says Chuck Winslow, managing partner at Andersen Consulting's Change Management Service, is that IS isn't equipped to train end users about technology.

In most cases, Winslow says, IS lacks skills, such as instructional design and organizational behavior, needed to train end users. Thus, human resources and training departments have taken up the task, leaving IS the odd man out.

"Companies spend millions of dollars on software development, but training is an afterthought," adds Ruth Clark, an IS training specialist based in Phoenix.

The problem is not lack of spending: Recent estimates place the amount shelled out by U.S. companies on employee training last year at $45.5 billion.

Nor is interest or awareness lacking. For the first time in *Training* magazine's annual survey, "technological change" topped the list of important challenges. Concern was especially high in business services, education and public administration (see chart page 74).

Similarly, a recent survey of IS executives in large U.S. and Canadian companies conducted by Andersen Consulting found that 87% of those polled considered training and educating the organization's work force "extremely" or "very" important.

"There's an awareness of the need for good training but not a lot being done," Karten says.

Despite the generally bleak picture, many IS groups are finding ways to tackle the end-user education issue. A look at some of the more interesting and successful approaches follows:



Bob Barrett

Pitts *(shown with his furry friend, Chump) spends 4% of his IS budget to educate Hills Pet Products' employees about technology and business issues*

- **Wide course offerings at Hills.** Pitts spent all of 1990 organizing a broad strategy for end-user training and support. This year, he's implementing that strategy. Both internal and external courses and programs initiated by IS are being offered at Hills to train all levels of end users, from top executives to veterinarians.

The offerings aren't limited to technology. Pitts has even set up a "mini-MBA" course with the University of Kansas to help IS staff members and end users get a solid grounding in business.

- **Multimedia learning at Steelcase, Inc.** The Grand Rapids, Mich., office equipment manufacturer has opened a multimedia-based learning center called The Learning Curve. In a single year, the number of students trained in a variety of applications increased by more than eightfold at a sharply reduced cost.

The approach has reduced the per-student training cost from $200 to just $20, according to Phil Camillo, head of training at Steelcase, the world's largest maker of office furniture.

- **Outsourcing and user liaison programs at TRW, Inc.** Don Logan, TRW's vice president of information resources in Cleveland, decided to seek outside help as a way to handle cutbacks in the central IS staff.

"We moved from managing and controlling training to coordinating the training," Logan

Continued on page 74

KEY POINTS

- A few innovative information systems departments are taking a lead role in teaching technology to end users.
- Training at many companies remains limited, poorly structured or ineffective.
- Greater cooperation with human resources and training departments is needed.
- Computer-based training offers great promise and opportunity for more IS involvement.

Rifkin is a free-lance writer and a former *Computerworld* features editor.

Continued from page 73

explains. "It's easier to get [trainers] outside, and you get superior training for equal or less cost."

TRW also set up a formal end-user liaison program. According to Gwen Callas-Miller, program head and manager of consulting services, the original idea was to get end-user experts in various personal computer applications to serve as ad hoc liaisons to IS.

During the past year, however, IS set out to formalize those relationships. Two categories were set up: technology coordinators (end users who help plan for hardware and software acquisitions) and product facilitators (end users who are experts in specific areas and who teach their colleagues).

"As we cut staff, the concern was how do we take on more with all we have to do?" Callas-Miller recalls. "This program helps solve the problem."

Thus far, company officials say, 50 to 60 end users have joined the program. The biggest concern now for the program's long-term success is time: How much will it take from the end user/liaison's schedule? Callas-Miller says participation generally requires 5% to 10% of a person's work time.

Who trains these liaisons to be trainers? Either a functional analyst in IS or an outside consultant, Callas-Miller says. According to Logan, the program has been set up in 10 units within corporate headquarters, and if it is successful, it will be expanded to the rest of the company.

• **Users train users at Rogers Group, Inc.** The Nashville-based mining company runs an information center that handles in-house training for DOS-based word processing, spreadsheets, graphics and other applications.

However, Rogers Group also has 35 field sites between Birmingham, Ala., and Sandusky, Ohio, and must offer training to employees at those locations. The company is downsizing its entire computer operation, moving from a centralized IBM 4381 to decentralized AT&T Unix workstations that will be hooked to a wide-area network.

According to Tom Gmitter, director of information services at Rogers Group, IS is developing courses and training 10 operations people from field sites to serve as trainers for colleagues.

Although field users are expected to continue in their regular jobs, Gmitter says, time conflicts are eased by the seasonal nature of mining.

Gmitter says end users are more responsive to training provided by their colleagues than by someone from IS. "A user has more empathy and awareness of the problems in the field than someone from IS," he says.

• **Federal Reserve Bank of Minneapolis keeps training in-house.** Though end-user groups are free to use outside educators, training manager Mary Texer recommends keeping the process inside.

"Outside training can't be customized to our environment," she explains. "You can't bring a departmental assignment with you to an outside class, for example, so that the exercise is really relevant."

Texer, a professional trainer who oversees training for both IS and the end-user community, finds teachers from within the 140-member IS group. She works closely with her charges to design courses, learn instructional delivery techniques and get classes up and running.

IS personnel seem eager to teach, Texer says, adding that the biggest obstacle is time. While students are given time to attend classes if needed, it's tougher to free up instructors.

• **End-user focus at Twentieth Century-Fox Film Corp.** Not every organization can get trainers from within IS. At Twentieth Century-Fox in Los Angeles, Daniel Bittner, manager of personal computing, finds that outsourcing yields "better training and is more cost-effective."

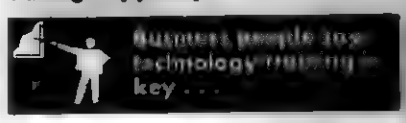
"We're in support mode all the time; we know how to work with and communicate with the end users," Bittner says.

Bittner described various departmental transformations within Twentieth Century-Fox, all of which used outside training for the end users: putting 80 users in the legal department on a local-area network, scanning 50 years' worth of scripts for the story department onto optical disc and installing 33 Apple Computer, Inc. Macintoshes onto a network for the feature production department.

"I'm concerned about the quality of the training, but we keep a close eye on the courses and work closely with the training supervisors," Bittner explains. "We make sure we get what we want." •

Everyone agrees: Training is key

Independent surveys of business executives and IS managers showed that both groups considered technology training a top priority



Technological change	16.2%
Customer service	14.9%
Quality improvement	14.4%
Corporate culture	9.1%
New market strategies/ Organizational missions	8.1%

Percent of respondents, partial survey results
Training magazine survey of 2,645 business executives in U.S. companies with over 100 employees



Getting functional managers involved in using information technology to reshape business processes	88%
Training and educating the workforce in the use of information technology to expand their capabilities	87%
Integrating information technology into corporate strategy	82%
Managing and mastering change	81%
Developing a corporatewide information technology strategy	79%

Percent of respondents, multiple responses allowed
Andersen Consulting survey of 125 IS executives in U.S. and Canadian companies with assets over $500M

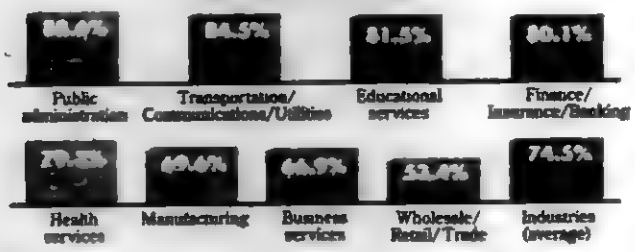
CW Chart: Doreen St. John

Teaching the troops technology

Public administration firms are most likely to provide computer training for employees; wholesale and retail firms are least likely



Percent of firms providing each type of training
Total sites surveyed: 2,814

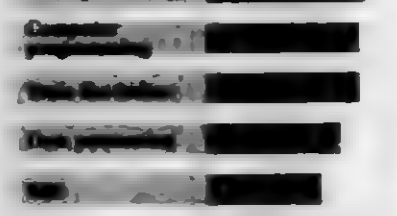


Source: *Training* magazine survey CW Chart: Doreen St. John

Basic training

While more than 60% of large firms offer basic personal computer training, far fewer offer more advanced computer skills. Most use a mix of in-house and external trainers

Percent of firms providing each type of training



(Base of 2,645 organizations with 100 or more employees)

Source: *Training* magazine survey CW Chart: Doreen St. John

The trouble with technology training

Why is much of the technology training offered by information systems departments either ineffective or downright lousy? Experienced training consultants give the following reasons:

Style differences. A big gulf remains between the way IS staff members and end users work and think, consultants say. "The buyer is buying one thing, and the CIO is delivering something else," says Chuck Winslow, managing partner at Andersen Consulting's Change Management Service. This gap can render many training programs ineffective or useless, consultants say.

Too-independent users. End-user expertise has become a two-edged sword. While self-sufficiency is good, lack of a broader systems perspective can be a problem for IS as well as for the whole company.

"Many users are solving today's problem by developing applications, but often they don't know what they are getting into," says Naomi Karten, head of Karten Associates, a Randolph, Mass.-based consulting firm. "When they've exceeded their capabilities, they run to IS." What's needed, Karten says, is a "big systems" mindset, which she says has not yet been delivered by IS.

Karten and others agree that IS must balance the need to instill a broader vision in end users with the recognition that many don't want long, detailed technical explanations and training.

Ill-prepared IS trainers. Another basic problem is that many IS professionals lack the qualifications or background needed to be teachers and instructors. Yet well-meaning instructors continue to be thrown unprepared into classroom training settings, says Ruth Clark, an IS training specialist based in Phoenix. Inevitably, "little or no learning results," she says.

Even when IS professionals are properly trained to teach, they may be perceived as having a poor grasp of user needs. "IS has a reputation as being draconian, of setting up a heavy-handed 'do it our way' kind of training," says Ted Klein, president of consultant firm Boston Systems Group.

Over-reliance on outside trainers. The scores of commercial training providers do a good job designing courses, IS managers say, provided there is heavy input from the organization. The problem, Winslow says, is that outside providers are often "not locked into the issues users have — deep vertical issues about the business they are in."

Budget pressures. The current gloomy economy hasn't helped end-user training, consultants say. In a poor economy, training programs are often the first budget items to go.

Backward thinking. IS rarely designs training into a system, which is a mistake, according to Winslow.

"Training should be brought up at design time, not right before conversion," he says. •

GLENN RIFKIN

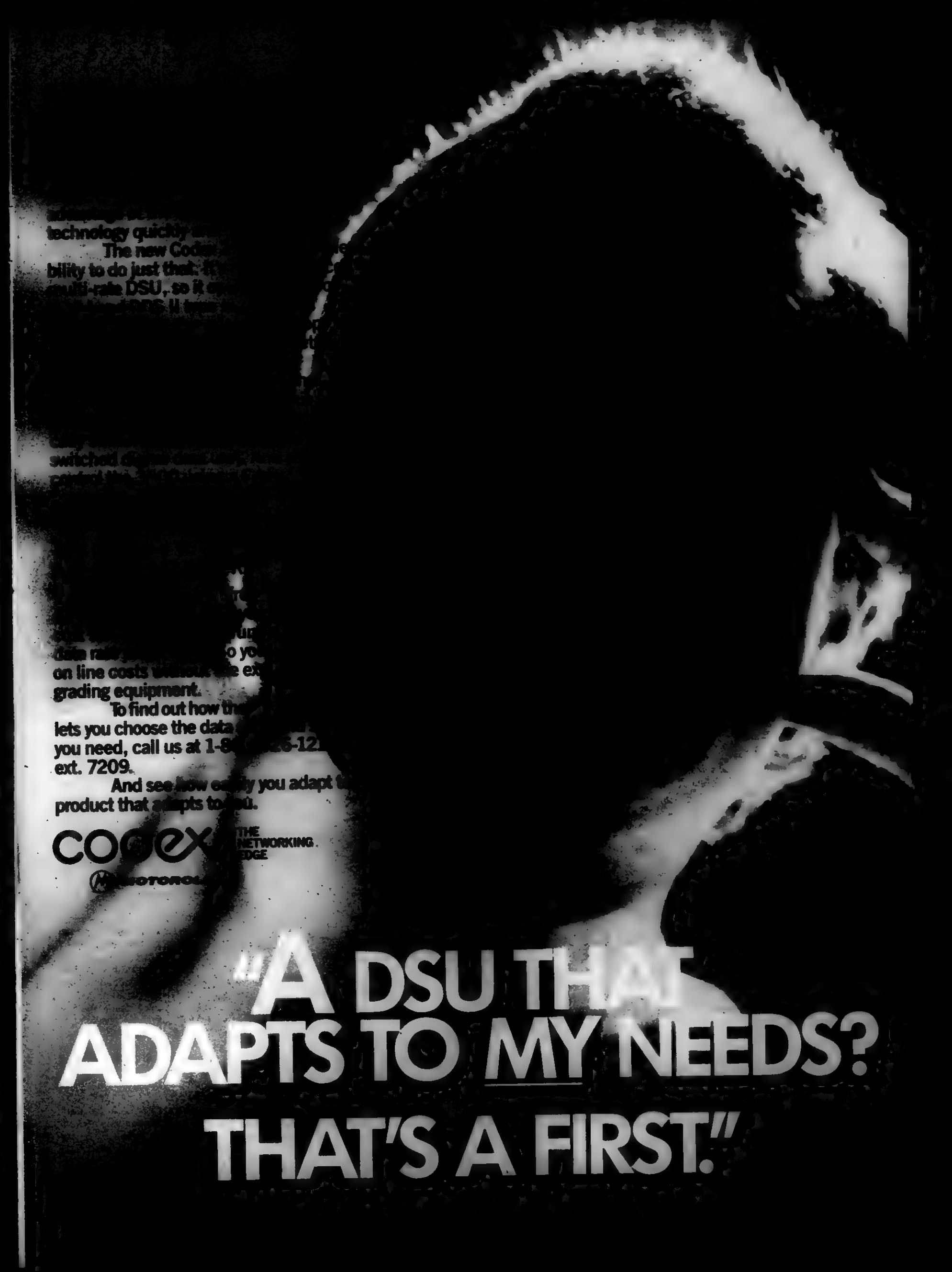
Training the trainers

According to Tom Gmitter, director of information services at Rogers Group, Inc., a Nashville-based mining company, there are three keys to making a "train the trainer" program work:

1) IS must know where to add value to the end user by understanding what is important to the business.

2) IS must know its customers. "You have to walk in their shoes: Find training that really fits their needs," Gmitter says.

3) IS must realize that training is not rocket science. "It's a cop-out when an IS manager says he doesn't have people inside who can handle training," Gmitter says. "If you don't find the people, you have to develop them."


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ADAPTS TO MY NEEDS?
THAT'S A FIRST."

Chase lets computers do the teaching

BY MARK FRITZ

Computer-based training (CBT) is the next best thing to being there — or in some cases, better than being there, say information systems officials at The Chase Manhattan Bank NA.

While training end users occupies more and more of IS departments' time these days, smart organizations are exploiting new technologies to keep their own rank and file technologically well-educated.

Pat Coglianese, bank vice president and manager of IS training at New York-based Chase Manhattan, says a new CBT system for the bank's data center managers has helped improve staff mobility and efficiency by giving worldwide employees a common base of knowledge.

Coglianese says CBT was the only viable solution for the project, which began early last year. Her task was to develop a training program for about 500 data center managers at 60 locations worldwide. The managers needed some standardized guidelines to follow for tasks such as customer service, change management and handling emergency situations.

The decision to use CBT was clear-cut, although Coglianese says Chase Manhattan doesn't use the technology widely because "it's often difficult to justify the high up-front cost."

Close-up

Organization: The Chase Manhattan Bank NA.
Problem: Train 500 data center managers at 60 locations worldwide.
Solution: Develop computer-based training and distribute to all locations.
Benefits: Improved staff efficiency and mobility.

In this case, however, more traditional options were simply not feasible. Bringing all the data center managers to New York for training would have cost too much money and time. Ditto for sending instructors to the various sites. And the idea of teleconferencing was nixed by the time zone differences between the various offices. CBT was the only answer. "For us, it was an option of training by CBT or no training at all," Coglianese says.

Even so, Coglianese faced some big challenges. A major one was devising a program that would work on the bank's diverse systems. "We had to go with the lowest common denominator in terms of hardware," Coglianese says.

This meant she couldn't draw on her team's creativity to produce appealing, eye-catching graphics; she had to limit the course to graphics simple enough to work with IBM Color Graphics Adapter (CGA). "That's hard," she says. "How do you keep it interesting?"

That problem affected even minor details of the project, such as choice of screen colors, according to Coglianese. "Sky blue in CGA isn't necessarily sky blue in VGA," she says.

Coglianese also notes that setting up CBT takes a lot of planning. "You really have to scope out the problems in advance," she says. "The entire design had to be done on paper first. We wanted to make sure there wouldn't be last-minute changes that would require us to recode the whole course."

Completed last June after about six months of work, the course was created using the Sam authoring system from Technology Applications Group in Troy, Mich. The course consisted of two modules covering four general topic areas: administration, customer service, quality and operations.

Called "The 39 Elements of Data Center Management," the course fit on one high-density disk and was shipped to Chase Manhattan data centers around the world.

"Supervisors will be able to move internal staff around more easily and deal more effectively with turnover problems," Coglianese says. Indeed, trainees' initial reaction to the course has been so positive, she reports, that work is already under way to add a new local-area network management module.

It's still too early, however, to evaluate the course's ultimate effectiveness, Coglianese says. "The course teaches data center managers what to do, not how to do it," she explains. "We can ask them whether they have their plans in place, but how and when they implement those plans is up to them." •

Fritz is a free-lance writer based in Dedham, Mass.

If CBT fits, use it

Experts say you should use computer-based training when:

- You're training a lot of people at different levels.
- The trainees are geographically dispersed.
- The cost to develop CBT is less than the cost of using human trainers.
- Trainees are reluctant or unable to attend classes.
- Trainees need to learn at their own convenience.

Expanded training role crucial for IS groups

INSIDE EDGE

BY JACK E. BOWSHER AND NANCY S. MENGEL

The leading organizations of the 21st century will be distinguished by their ability to blend superior technology with a talented work force. Attaining a top competitive position will demand that information systems groups take a new, greatly expanded role in work force education.

Specifically, IS staffs must:

- **Exploit training technology.** Many of the skills-building and management development courses now held in corporate classrooms can be delivered through personal computers and interactive videodiscs.

Working with the company's instructional designers, the qualified IS professional can help develop software to provide computer-based training (CBT). Technology should be embraced as a training delivery mechanism to ensure that education is delivered in the most timely, effective and economic way — on demand at point of need.

Many IS department heads already recognize the role their staffs must play in designing and explaining applications that will tangibly improve an employee's ability and performance.

In a recent Andersen Consulting study, 79% of IS executives surveyed said the need to educate the work force in the effective use of applications is one of the most critical issues in the 1990s.

Smart IS managers will also realize that success ultimately depends less on the technical skills of the IS staff than on the ability of IS to educate users.

- **Build "sociotechnical teams."** IS must develop close working relationships with line managers and the company's human resources and training functions. Technical teams must become part of broader sociotechnical teams whose efforts are focused on building the architecture for a re-engineered, customer-driven, highly competitive organization.

IS partnership with other functions must begin before new technology is created. Starting with software design, the IS staff should work closely with the appropriate operations head and his staff. The only way to create technology that improves an employee's performance is to understand the tasks involved in the particular job.

The software should be designed with commands and features that accurately reflect the worker's — not the developer's — computer background and operational expertise.

To maximize the effectiveness of both the worker and the technology, the team of IS and operations managers needs to fully assess the impact of the new technology on the user and on the department's functions. Members of the team need to determine whether workers' jobs can be simplified via technology to improve productivity and the quality of work.

- **Join forces with trainers.** Historically, IS development staffs and education planning departments have operated independently. Only after systems were designed did the issue of employee education arise. The result was systems that rarely spoke the workers' language. Training was provided haphazardly, if at all.

As training is planned, the IS staff should be prepared to help the education department communicate not only the commands of the new system but also, more importantly, the tangible advantages the technology delivers.

- **Offer "just-in-time" training.** Taking the educational uses of technology one step further, the IS staff should help develop "just-in-time" training programs. This type of instant access support is becoming critical in today's environment, which fosters rapid changes in job responsibilities and places a premium on quality service and doing things right the first time.

For example, a reservations clerk who seldom performs a given task can tap into on-line instructions that would guide him through the task without keeping the customer waiting.

A pharmaceutical salesperson can check a product's price and availability to quote an accurate cost and delivery date to the buyer. Also, using multimedia hardware and technology, an aircraft mechanic can call up instructions for replacing a certain part and can view a video showing the process step by step.

Through partnerships with corporate training department and human resources staffs and by focusing on the end user, the IS organization can make a critical contribution toward helping the company use technology not only to compute but also to compete in the years ahead. •



"TECHNOLOGY SHOULD be embraced as a training delivery mechanism to ensure that education is delivered in the most timely, effective and economic way — on demand at point of need."

Jack E. Bowsher
Consultant



"SMART INFORMATION systems managers will also realize that success will ultimately depend less on the technical skills of the IS staff than on the ability of IS to educate users."

Nancy S. Mengel
Associate Partner
Andersen Consulting

Bowsher, author of *Educating America: Lessons Learned in the Nation's Corporations*, is a consultant to Andersen Consulting. Mengel heads Andersen's Change Management Services practice in the Hartford, Conn., office.

Measure for measure

Measurement is shifting from metrics that focus on IS output to those that focus on the business outcomes of IS actions

BY HOWARD RUBIN

The awareness of and need for information systems measurement is reaching a feverish level, yet the mortality rate for most measurement programs is about 80%. These failures can be traced to betting the whole program on a single metric and then trying to figure out what to do with it.

IS input — investments in tools, techniques, people, environment, architecture, the workplace — has no meaning unless it is connected to business outcomes — improved quality, shorter cycle times, increased shareholder value, enhanced customer satisfaction and so on.

Good metrics answer the question: What is the value of (add here any technology you like) to the business? Effective measurement programs take concerns in both IS and the business as their basis.

To evolve to business-oriented measurement, an organization typically goes through three stages of measurement evolution:

■ **Stage 1: Internal IS measurement.** At this stage, IS organizations focus on designing a meaningful measurement program from a technical vantage point. IS develops operational definitions for IS performance at the organizational, application and project level. In this way, it can define key measures for assessing its technical and software processes in terms of quality, productivity and impact on customer satisfaction.

Typical measures at this stage include productivity-oriented I/O ratios (such as function points per team-month), defect and/or failure densities and intensities, software process maturity ratings and technical quality.

■ **Stage 2: Linking to the business.** At this point, the IS organization focuses on linking these key technical indicators to business performance.



Jon Levy Liberman

For example, the IS organization should be able to make assertions about its performance in business terms: "If we show a productivity increase of N% this year, the business will be able to lower product costs by Y% or produce Z new products and revamp M old products."

A shift in measurement occurs at this stage, going from output/input to outcome/input. Typical measures include functional quality and those metrics used in Stage 1.

■ **Stage 3: Business-oriented measurement.** At this stage, the IS organization can directly express changes in its performance. The measurement focus shifts to outcome — business value, cycle time, quality, profitability, shareholder value, process improvement and yield.

Measurement dashboard

What kinds of measures should a company implement throughout these three stages? IS can set up a measurement program (see story page 79) based on 10 metric categories that provide a reasonable universe for measuring an IS organization, its projects and its applications. Each category is a gauge that shows current performance, baselines, directional trends and target improvement areas.

These 10 gauges form a "dashboard" from which a company can gather all the information it needs to measure the IS organization. The IS department can select from these 10 the individual metrics appropriate for what it is trying to measure.

Just as a car's gauges can range from simple colored lights to detailed gauges calibrating units of temperature for water, oil and other factors, these dashboard gauges can vary in the level of detail they track and amount of information they convey.

For example, an IS director may want a general gauge to view organizational performance at the product or application level, while a project manager might need a cluster of detailed gauges for assessing internal project performance at the process level.

In the following list, gauges 1 through 9 are the more technical metrics typically used during Stage 1 of a company's measurement evolution. Gauge 10 takes a company through Stages 2 and 3:

1) Productivity metrics. These measure the software delivery rate and ability to support software.

2) Quality metrics. These measure the technical quality of the software produced and maintained, the software's functional quality in the context of meeting business needs and the quality of the software engineering process as practiced by IS.

3) Delivery metrics. These measure the organization's ability to meet time and cost commitments.

4) Penetration metrics. These measure the extent to which tools and techniques have been successfully disseminated.

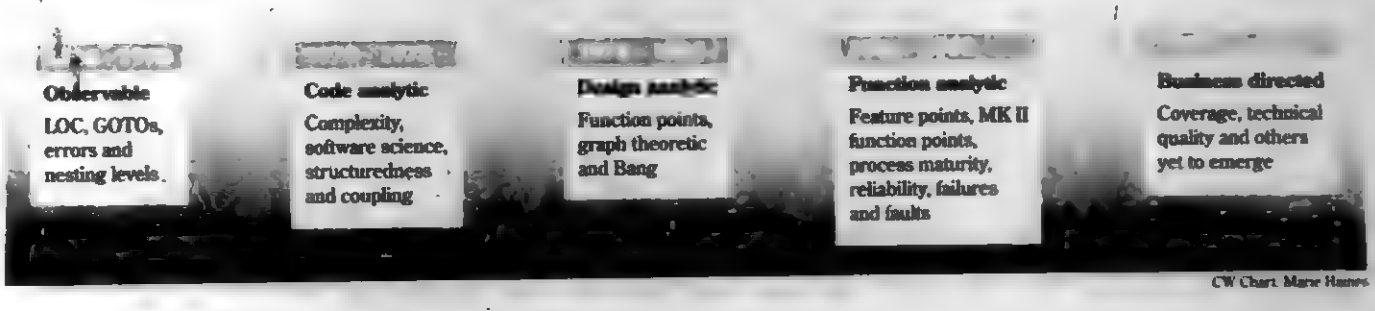
5) Work profile metrics. These measure the effort and elapsed time it takes for work to progress through life cycle stages.

6) Demand metrics. These measure request backlogs and the IS organization's ability to service them.

Continued on page 78

Rubin is chairman of the department of computer science at Hunter College in New York. He is also a Nolan, Norton & Co. research fellow and president of consulting company Howard Rubin Associates, Inc. in Pound Ridge, N.Y.

Generations of metrics



CW Chart: Marie Hanes

Continued from page 77

7) Technology assimilation metrics. These measure the organization's ability to adopt and assimilate promising new software engineering technology.

8) Work distribution metrics. These measure the balance between maintenance and development.

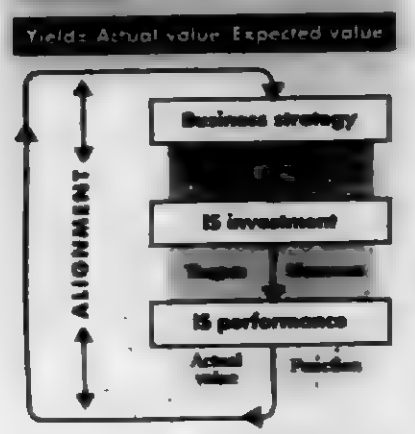
9) Capability metrics. These measure the ability of the IS organization to manage, measure and improve itself.

10) Business-oriented metrics. These link IS functions to the success measures used by the business to gauge business performance.

All of this good stuff sets the stage for a shift from the current output/input view of IS measurement to a more meaningful outcome/input view.

Business value framework for a money center bank

The main driver of IS investment is increasing the actual value IS delivers to the business



Source: Howard Rubin Associates, Inc.
CW Chart: Doreen St. John

Business measurement

To measure IS in business terms, companies need to build a business value framework for figuring out what IS yields. Yield is the actual value delivered to the business vs. what the business expected the benefits to be. Increasing the yield of IS to the business is the main driver of IS investment in an organization.

Yield is calculated using the following equation: Yield = f (delivered value/expected value x customer satisfaction). This equation translates into "yield is a function of the ratio of delivered value to expected value weighted by customer satisfaction (0% to 100%)."

That's how it looks; here's how it works: At the start, the customer specifies the project's business value in quantifiable terms (expected value). At the end of the project, the customer states the value as delivered (actual value). Yield is this ratio of actual value to estimated value.

However, yield must be adjusted for customer satisfaction, which ranges from 0% to 100%. Therefore, while a delivered product can be almost exactly what the customer requested (0.9), if the customer was only 50% satisfied with the process that created the product, yield is 0.9 x 50%, which equals 0.45.

A money center bank, for example, wanted to assess IS contribution to its business — in other words, its IS yield. It set up a framework that showed the relationship between business strategy, IS investment and IS performance (see chart above). Using the framework provided the bank with a clear path to implementing business-oriented measurement.

The bank's framework indicated multiple aspects of IS alignment at the institution. There is alignment between the business strategy and IS investments in projects and infrastructure, alignment between IS investments and actual IS performance and alignment between IS performance and the business strategy. Alignment can be measured thusly: alignment = f (strategy, capacity, capability, technical performance).

IS performance has three other measurable components besides alignment: capability, capacity and technical performance. These key indicators can be measured as follows:

- IS capability = f (process maturity, skills, tools, technology, tool use, knowledge).
- IS capacity = f(productivity, staff availability, backlog of old work).
- IS technical performance = f (productivity, quality, cost of quality, meeting commitments).

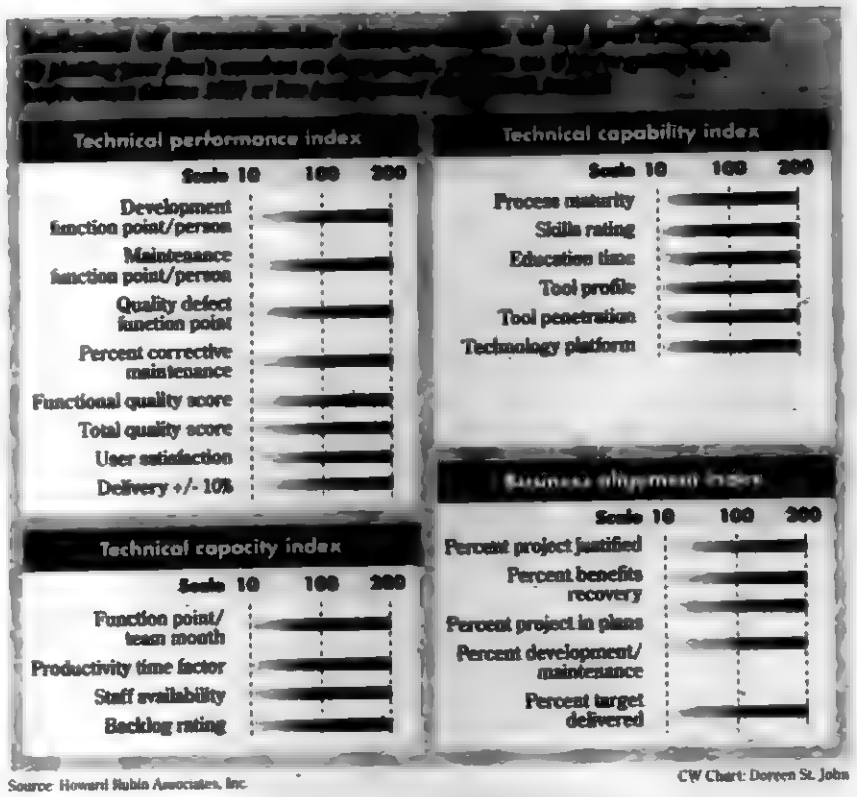
The point here is that alignment, capability, capacity and technical performance are dependent on a number of functions IS can measure. These key indicators are so intertwined, however, that even if an organization is an exemplar of technical performance and has outstanding capability and ample capacity, it will not contribute any business value unless it is aligned to the business. Alignment channels IS energy into useful work.

Create indexes

To make these abstract "equations" real, they can be turned into indexes (see chart at right): technical performance index, technical capability index, technical capacity index and business alignment index. These are analogous to a consumer price index or market basket and contain those items that should be measured.

The scales work this way: For each index component, the 100 point represents the 1980 industry benchmark. A 10-point movement to the right or left of this point indicates one standard deviation from the 1980 value. Numbers above 100 indicate high performance; numbers below 100 indicate low performance.

While the indexes shown indicate industry performance, an individual company can use them to start tracking its rate of improvement.



Source: Howard Rubin Associates, Inc.
CW Chart: Doreen St. John

Viewing these indexes together creates a first approximation framework for assessing the value of IS to the business: Business value = f (alignment, capability, capacity, performance).

Roughly translated, this measure means the business value of computing is a function of being able to channel performance, capability and capacity into the right work categories through proper alignment. The interpretation of the indexes is that superior performance, capability, capacity and alignment translate into high business value for IS.

True productivity can then be measured as the change in business value resulting from an investment that impacts alignment, capability, capacity and technical performance.

This framework forces a realistic connection between IS actions and business outcomes. It also provides a basis for adding value to many of the measures being used today by establishing the links between the five key business indicators: technical performance, capability, capacity, alignment and business value.

Finally, it provides a context for IS investment analysis and assessment of the impact of investments on each indicator.

The companies that will win the competitive battles of the 1990s and beyond are those that leverage their technology investments to create new possibilities and major changes in the economics of doing business.

The IS mission is (and will continue to be) to provide increasing value to the business. Business-oriented measurement is the entry point for those ready to take on the challenge. •

A tale of two companies

Bank and insurance firm give business value concept a whirl to redesign IS

Recently, two major New York financial institutions — a money center bank and a large insurance company — used business value measurement concepts to drive the redesign of key components of their IS groups.

At the bank, senior management was concerned about the cost associated with its human resources administration systems group. A business-oriented measurement analysis revealed that the supported administrative systems provided value to the enterprise by lowering staff support costs and improving overall staff retention as well as by providing flexible benefits packages.

This analysis led to a technical measurement-based assessment of systems support productivity and quality. Metrics used included function points supported per person, lines of code supported per person, maintenance and enhancement cost per production cost, technical quality and defect density.

Recommendations focused on increasing business value and further streamlining support costs and fell into three categories: technology infrastructure improvements, modifications to the work priority process and business process redesign.

The result was a decrease in the systems budget from $4 million to $2 million through the introduction of new tools, techniques and work practices. Furthermore, support personnel was reduced 50%, IS staff was reallocated to work in business units, the work flow between IS and the business unit was reordered and effective end-user computing was introduced.

The insurance company was plagued by maintenance overload. More than 200 IS professionals were tied up in rudimentary maintenance tasks, while the organization was in need of an additional 60 staff members for new strategic development activities.

Here, too, the company took a business value measurement approach. The company applied a business value analysis to the maintenance request cycle.

These measures yielded an amazing insight. Fifty percent of the maintenance requests being executed had no business value. In addition, a technical measurement analysis revealed that support ratios were only about one-third of industry benchmarks.

As a result of this analysis, the firm put in place a process in which IS acted only on maintenance requests with clear business value. The insurance firm further introduced new maintenance support tools to help bring support loads up to industry standards.

The result? Seventy-five IS people were freed up for new development, 100 were assigned to maintenance, and 25 were assigned to a maintenance "surge" pool to rebuild the application base while being "bid out" to work on large maintenance projects.

HOWARD RUBIN

The metrics behind the dashboard

BY HOWARD RUBIN

When choosing from the 10 possible gauges to form your metrics dashboard, it is important to know the specific types of measures that fall into each category:

1) Productivity metrics. Typically expressed as ratios of size to time. Ratios of size/total effort allow productivity to be assessed per hour, per man-month and so on. Ratios of size/team-months provide a basis for assessing cycle time productivity. Common size metrics in use today include:

- Function points. A score derived by counting system inputs, outputs, files, interfaces and inquiries, weighting them for complexity and adjusting based on system characteristics.
- MK-II function points. Based on counting input/process/output transactions and then applying a scoring scheme similar to that of function points.
- Bang. Based on counts of functional primitives in a system specification.
- NCSS (Non-Commented Source Statement), DSI (Delivered Source Instructions) and KLOC (Thousands of Lines of Code). Sizing measures based on actual code size.
- Volume. Based on software science techniques that consider code and the operators and operands present.

2) Quality metrics. Cover a range of quality attributes from measuring defects to design/code complexity to customer satisfaction:

- Defect. Defined as a deviation between desired and observed results. Measurement is typically expressed as a ratio of defect/size.
- Failure. Defined as a departure of program operation from user requirements. Measurement is typically expressed as failure "intensity" — failure/time period.
- Fault. Defined as a defect in a program that causes a failure. Measurement is expressed as fault/size.
- Technical quality. Composite metric derived by a combination of subjective and objective measures relating to design strength, maintainability and operational performance (such as failures). Scored on a 0-to-100 scale.
- Functional quality. Composite metric that rates an application from a customer's viewpoint — its reliability, accuracy and integrity. Scored on a scale of 0 to 100 and weighted for user perception of importance.
- Customer satisfaction. Composite metric that relates to product, development process, customer/developer relationship and service delivery. Most companies develop their own metrics.
- Complexity metrics. Used as a surrogate for quality. Works on the basis that the higher the complexity rating of the software, the more prone to errors and difficult to maintain it is. Metrics include McCabe Complexity.

3) Delivery metrics. Track "actuals" and "estimates" at the project completion level and subproject level (deliverables phase). Typically, companies try to determine: "What percent of projects are delivered to the customer within +/- 10% of estimated time and cost and at an acceptable level of customer satisfaction?"

4) Penetration metrics. Evaluate the actual end use of a company's entire suite of tools and techniques. Computed for individual tool or technique (such as front-end computer-aided software engineering) as a ratio of "number of professionals applying CASE in the intended manner at the intended time" vs. "total number of professionals that should be applying it." Some companies have extended this metric by tracking the number of professionals knowledgeable in a particular tool or technique vs. those actually using it effectively.

5) Work profile metrics. Track the amount of effort and time an organization spends as it moves through a project life cycle. By analyzing the work breakdown as a percentage of total time and effort, an organization can get a profile of where it is spending its time. When used with other metrics, it can pinpoint identity deficiencies in analysis, coding or testing.

6) Demand metrics. Focus on tracking the backlog of work generated for the IS organization by the business, the size of the backlog in effort and dollars and the type of work within the backlog.

7) Technology assimilation metrics. A multidimensional rating of an organization's ability to recognize and assimilate appropriate technology into the systems process. Results in a visual "footprint" assessment of the skills inventory, educational inventory, culture, motivation, willingness to invest, technology platform, support for innovation and work focus.

8) Work distribution metrics. Consider the balance between maintenance and new development in terms of spending, effort and personnel allocation.

9) Capability metrics. Based on the use of a Software Process Maturity Scale. An organization is rated/certified at one of five levels of process maturity: initial, repeatable, defined, managed or optimizing.

10) Business-oriented metrics. New class of metrics. Basic measures involve the computation of "yield" measures such as actual vs. expected benefits and "impact" measures that relate change in IS performance and cost structure to business-critical performance indicators such as profitability, cycle time and product quality.

Inch into measurement

Steps for organizations beginning measurement program

An organization getting started in measurement should follow these basic steps, which form the requirements gathering and design process for ensuring measurement success:

- Identify all audiences for measurement and measurement stakeholders. An audience is an individual or group that will be using measurement for decision-making. A stakeholder is an audience that must buy in to make the measurement program work.
- Analyze the measurement needs of each audience and stakeholder. Determine how they would assess productivity and quality improvement — do they focus on a business or technical perspective or both?
- Produce a map that cross-references audiences to needs (see chart below).
- Produce a map that cross-references needs to possible metrics (see chart below).
- Decide which candidate metrics to use.
- Establish priorities and a phased implementation plan.

You may want to consider using a joint application development approach for mapping and a rapid prototyping approach for validating the chosen metrics and their use.

HOWARD RUBIN

Matching audience to need

Audience feedback focuses on customer satisfaction as well as IS effectiveness and efficiency

Desired feedback	President	Senior vice president and business officers	Senior vice president of IS	Vice president of IS	Assistant vice president of IS	System managers of IS	Project managers and system leaders of IS
• Responsiveness to user needs	X	X		X	X		
•• Time and cost to deliver service	X		X	X	X	X	X
• More user participation				X	X	X	X
• Staff capability	X	X					
•• Right infrastructure investments	X		X	X	X		
• Alignment with the business	X	X	X	X	X		
• Quality of the asset					X	X	X
•• Lower support costs and better operations	X	X					

• Purposes most related to customer satisfaction •• Purposes most related to IS effectiveness and efficiency

Matching audience need to possible metrics

Metrics cover user, IS staff and technical areas

Needed measurement (metrics)	Responsiveness to user needs	Time and cost to deliver service	More user participation	Staff capability	Right infrastructure investments	Alignment with the business	Quality of the asset	Lower support costs and better operations
• Functional quality	X							
Systems performance								
•• Function points		X						X
•• Lines of code		X						X
• Benefits audits	X					X		
• Service request tracking	X					X		
•• Actual project effort and schedule	X	X						X
•• Planned project schedule and effort								
Computer resource accounting								
• User satisfaction survey	X		X	X			X	X
•• Technical quality							X	
•• Application code quality							X	
•• Defect tracking			X				X	X
•• Applications portfolio demographics								X
•• Staff time accounting		X						X
• Staff skills inventory			X					
IS staff database								
•• Tool penetration				X				
• Applications spending levels					X			
•• Level of rescue maintenance							X	X

• Metrics most related to customer satisfaction •• Metrics most related to applications effectiveness and efficiency

Source: Howard Rubin Associates, Inc. CW Chart: Marie Hattar

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NATIONAL
BRIEFS

Many happy returns

▶ Computer industry pioneer **John Cullinane**, founder and several-time head of the former **Cullinet Software, Inc.** (now a part of Computer Associates International, Inc.), is back from a year's fellowship at Harvard's Kennedy School of Government and ready to resume his place as an outspoken industry executive. In this incarnation, Cullinane appears as head of **The Cullinane Group, Inc.**, a consulting firm based in Westboro, Mass. Already afoot is a plan to hatch a joint venture with neighboring **Sentry Publishing: the Coalition for Information Technology Executives**, a subscription service intended to bring chief information officers closer to the boardroom by giving them videos, seminars, books, research and an annual conference.

Soldiers of Fortune 500

▶ *Fortune* magazine's list of the 500 largest industrial corporations in the U.S. is out, and this year's ranking packs a surprise in the computer category: while **IBM** still reigns supreme (first among computer firms, fourth on the list at large), **Digital Equipment Corp.** was edged out of the number two spot by **Hewlett-Packard Co.**; this time, HP weighs in at number 29, DEC at 30. Rounding out the computer industry's top five are **Unisys Corp.** (49), **NCR Corp.** (79) and **Apple Computer, Inc.** (95).

'IBM compatibles' step out of the clone zone

BY RICHARD PASTORE
CW STAFF

Even as you read it here, the term IBM-compatible may be becoming a misnomer. Clone vendors seem less eager to follow IBM's technological lead than they did as recently as one year ago. The compatible makers pride themselves on their differentiation, although their departure from the IBM mold may owe as much to IBM as did their former adherence.

Last week's Advanced Computing Environment announcement is the latest case in point. Rather than copying IBM's proprietary RISC System/6000 reduced instruction set computing (RISC) architecture, compatible makers are forging their own RISC path. Compaq Computer Corp. has been joined by other personal computer cloners Acer America, Inc. and NEC Technologies, Inc. to define its own RISC standard based on Mips Computer Systems, Inc.'s processors.

"If I just copied IBM's hardware, then I could be no better than IBM. That wasn't our intent at all," said Gary Stimac, senior vice president of systems engineering at Compaq. One of the first compatible systems vendors, Compaq has built a premium-priced reputation for designing systems that consistently outmuscle comparable IBM boxes. It has also forged its own lead in the portable computer

Continued on page 85

Not just cloning around

IBM compatibles makers, once content to follow IBM's lead, may be moving into leadership positions of their own

- **Advanced Logic Research, Inc.**
  Headquarters: Irvine, Calif.
  Founded: 1984
  Employees: 550
  Sales: $172 million
  Net income: $11.5 million
- **AST Research, Inc.**
  Headquarters: Irvine, Calif.
  Founded: 1980
  Employees: 2,300
  Sales: $586.5 million
  Net income: $52.5 million
- **Compaq Computer Corp.**
  Headquarters: Houston
  Founded: 1982
  Employees: 10,000
  Sales: $3.6 billion
  Net income: $455 million
- **Wyse Technology**
  Headquarters: San Jose, Calif.
  Founded: 1981
  Employees: 2,000
  Sales: $450 million
  Net income: Not available

Wang climbs on consulting bandwagon

BY PATRICIA KEEFE
CW STAFF

LOWELL, Mass. — It is a couple of years late, but last month, Wang Laboratories, Inc. played catch-up by rolling out a consulting services group designed in part to move the firm closer to what remains of its customer base.

The Professional Services Group will be responsible for coordinating the company's worldwide presales support, consulting services and customer training.

Wang Chairman and Chief Executive Officer Richard Miller said the organization was created to help customers maximize their computing investments and to achieve improvements in productivity and quality.

Several analysts were quick to point out that before that can happen, Wang will have to overcome its longtime reputation for shoddy service.

WANG

Heading up the Professional Services Group will be William T. Wilde as vice president of professional services. He reports to William P. Ferry, senior vice president of applications and professional services.

Wilde was previously responsible for business development and customer enterprisewide integration projects at Digital Equipment Corp.

George Colony, president of Forrester Research, Inc., said he is skeptical of the overall trend toward vendor-run consulting arms. "It's still not proven that a vendor can make money in the consulting business," he said. "Users tend to be quite suspicious when a vendor says, 'Consulting costs $100 an hour, but if you buy the systems from us, we'll [consult] for free.'"

He ticked off three reasons behind the launch of the Professional Services Group:

- To compete with consulting arms of competitors such as IBM and DEC. Because of declining hardware margins, Wang "really needs to look to service to improve their margins," said Julie Schwartz, assistant director of professional services at Ledgeway/Dataquest.
- To put together a group of people capable of building business processes, "which involves helping users figure out how information flows and then, of course, providing the systems to help with that," Colony said.
- To get closer to the user. According to Judith Hurwitz, editor of Patricia Seybold's "Unix in the Office" newsletter, Wang has already been providing consulting services through individual business groups. A single unit, however, could be more effective and cost-efficient.

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INTERNATIONAL BRIEFS

Where's it at?

▶ **First, Ashton-Tate Corp.** expanded the company with the purchase of long-term ally **Interbase Corp.** [CW, April 8]; now Ashton-Tate is expanding its turf. Early this month, the Torrance, Calif.-based database software vendor opened doors at its Tuas, Singapore-based Asia Manufacturing Centre, created both to turn out products and to serve as a distribution hub for the firm's international division. The new facility, now fully operational with a 70-person employee roster, joins Ashton-Tate manufacturing plants in Puerto Rico and Ireland.

April in Paris

▶ **The European Commission** said it is likely to launch an investigation into the **French government**'s plans to pump more than $1 billion into French electronics giant **Thomson SA** and computer maker **Groupe Bull**. According to a commission spokesman, it would be normal practice to check whether the support constituted a legitimate commercial investment as opposed to unfair state aid in disguise, once Paris normalizes its plans in June. The investment plan could reopen wounds from past clashes between Paris and Brussels over the right to spend money on state-owned firms.

Israel aims at $1 billion

▶ **Israel**'s information technology market is expected to reach $923 million this year and top the billion-dollar mark in 1992, according to a research report issued by Israeli firm Kasaleman Management Services Ltd. In 1990, Israel's information technology market totaled $840 million. According to the report, the 1991 market will break down into $393 million in systems sales, $375 million in services, $85 million in equipment and $70 million in maintenance.

Stretching a yen

▶ **IBM Japan** has announced a sales hike of 1.1% and a net income decline of 18.8% in the fiscal year ended December 1990. In making the announcement, the company cited a series of adverse factors, including a sluggish worldwide economic environment and rising Japanese interest rates.

Alcatel dialing up lots of francs

▶ French telecommunications company **Alcatel** announced that its 1990 net profit climbed 24% to $749 million, from $506 million in 1989. Revenue inched up 5% to $17 billion, according to a report in the European financial press. Operating profit in public network systems jumped 58% to $800 million, boosted partly by switch sales to former East Germany and sales of Alcatel's System 12 exchanges to Australia, the report said.

Meet the new boss

▶ **Hitachi Ltd.** named a successor last week to current president **Katsushige Mita**, who will be promoted to chairman of the Tokyo-based firm. Effective following Hitachi's June 27 board meeting, Executive Vice President **Tsutomu Kanai** will step up into the presidency.

ICL: Two out of five ain't bad

BY ELIZABETH DE BONY
IDG NEWS SERVICE

BRUSSELS — The Management Board of the Joint European Submicron Silicon Initiative (JESSI), the European semiconductor research project, decided last week to allow Japanese-owned computer vendor International Computers Ltd. (ICL) further participation in two programs in the computer-aided design (CAD) field but to deny it access to three other programs.

Following Fujitsu's acquisition last year of 80% of ICL from UK-based STC PLC, JESSI has been reviewing the role of ICL in five of JESSI's almost 70 projects.

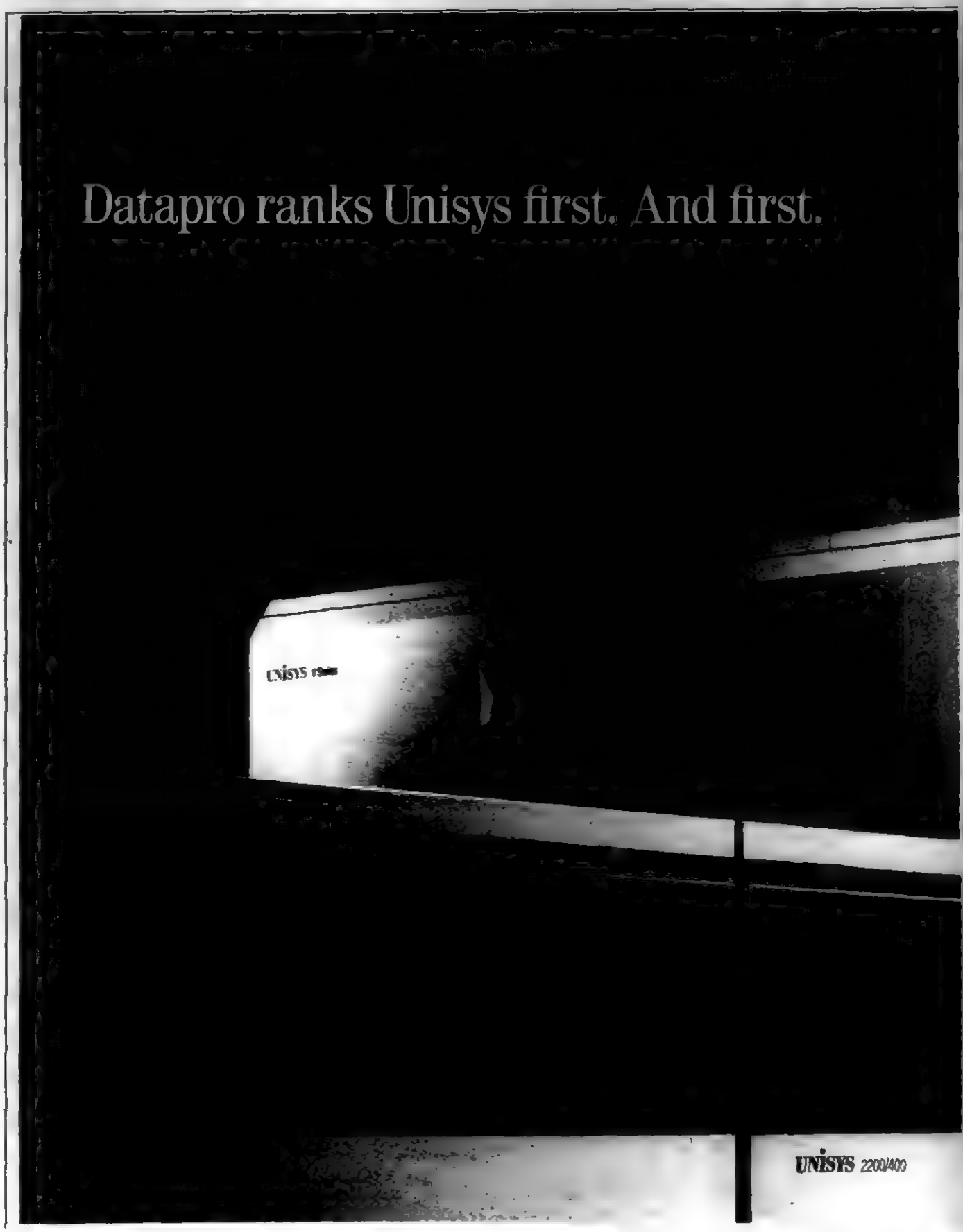
The board said it "has invited ICL as a non-European-owned partner to take part in two projects under the subprogram auspices. These two projects are the CAD Frame project and a Euro-CAD project for board design. Three other requests were turned down."

An ICL spokesman said his firm "regretted the board's decision" but explained that because ICL participated only as a semiconductor user and not as a manufacturer, participation "has never been central or crucial" to the firm's survival. The spokesman also explained that ICL is already participating in the two projects and that the decision simply curtails plans for an extension of the company's activities in JESSI.

He also said the decision raises "a further argument over ICL's ownership." He explained that "ICL is still European according to the European Commission's definition: ICL's headquarters are in Europe, its laboratories are in Europe, and the vast majority of its employees remain in Europe."

The spokesman pointed out that although ICL's "majority shareholder is Japanese, it still has a minority European shareholder and that under company law, ICL has clear obligations to protect the interests of all shareholders."

De Bony is Brussels correspondent for the IDG News Service.



Users fear support loss as result of dealer consolidations

BY RICHARD PASTORE
CW STAFF

With dealer consolidations now spreading to household names in the reseller community, users are beginning to sweat. They fear that recent mergers will inject more chaos into the customer-dealer relationship without solving any of the problems of poor support and rapid turnover.

The latest case of consolidation is Computerland Corp.'s planned acquisition of Nynex Corp.'s Business Centers, announced late last month. Although the firms have not released all of the details, reports said Computerland will pay $150 million for Nynex's 77 stores, formerly IBM's Business Centers. In a smaller deal, Compucom Systems, Inc. is expected to shortly consummate its $39 million buyout of 63 of The Computer Factory Store, Inc. stores.

Users at many large corporate sites said traditional personal computer dealers have failed to provide adequate support for their complex PC networks and mission-critical systems. The recent mergers and restructurings will not help and may actually exacerbate the problems, they added.

The PC buyer often gets caught up in the bureaucratic chaos that comes with mergers, users said. In addition, promised changes for the better rarely materialize.

"We have had many of our dealers bought out, and it usually gets worse," said Andrei Chivvis, first vice president at Financial Guaranty Insurance Co. in New York.

For example, after JWP, Inc. bought dealer NEECO, Inc. one year ago, the firm promised customers extensive improvements in support capabilities. "That [promise] rapidly fell apart," said John Geyer, Financial Guaranty's vice president and director of systems. "We have high-end Compaq equipment here that they can't repair."

Confusing the customers

Other users complained that following a merger, resellers downsize and often close convenient store locations. Good technical staff people may quit or be let go.

Businessland, Inc.'s restructuring in December has caused some confusion. Although the dealer split its business into four sectors, there was to be a single point of contact. But one user received four cold calls in January from different Businessland representatives claiming they would be his exclusive contact person.

"They didn't quite have their act together," said Gerard Nussbaum, director of MIS at Premier Hospitals Alliance, Inc. in Westchester, Ill. Nussbaum showed Businessland the proverbial door.

Consolidation takes over:

Nov. 1990 Compucom Systems, Inc. airs plans to buy 63 Computer Factory, Inc. stores.

Dec. 1990 After one year of losses, Businessland, Inc. slashes nearly 25% of work force and segments itself into four business units.

March 1991 Computerland, Inc. says it will buy 77 Nynex Corp. Business Centers.

Manufacturers take matters into their own hands:

Dec. 1990 AST Research, Inc. adds Saturday to its weekday toll-free telephone and 24-hour fax support.

Feb. 1991 Compaq Computer Corp. offers direct toll-free support and telephone contract service; also segments specialized dealers.

CW Chart: Marie Hames

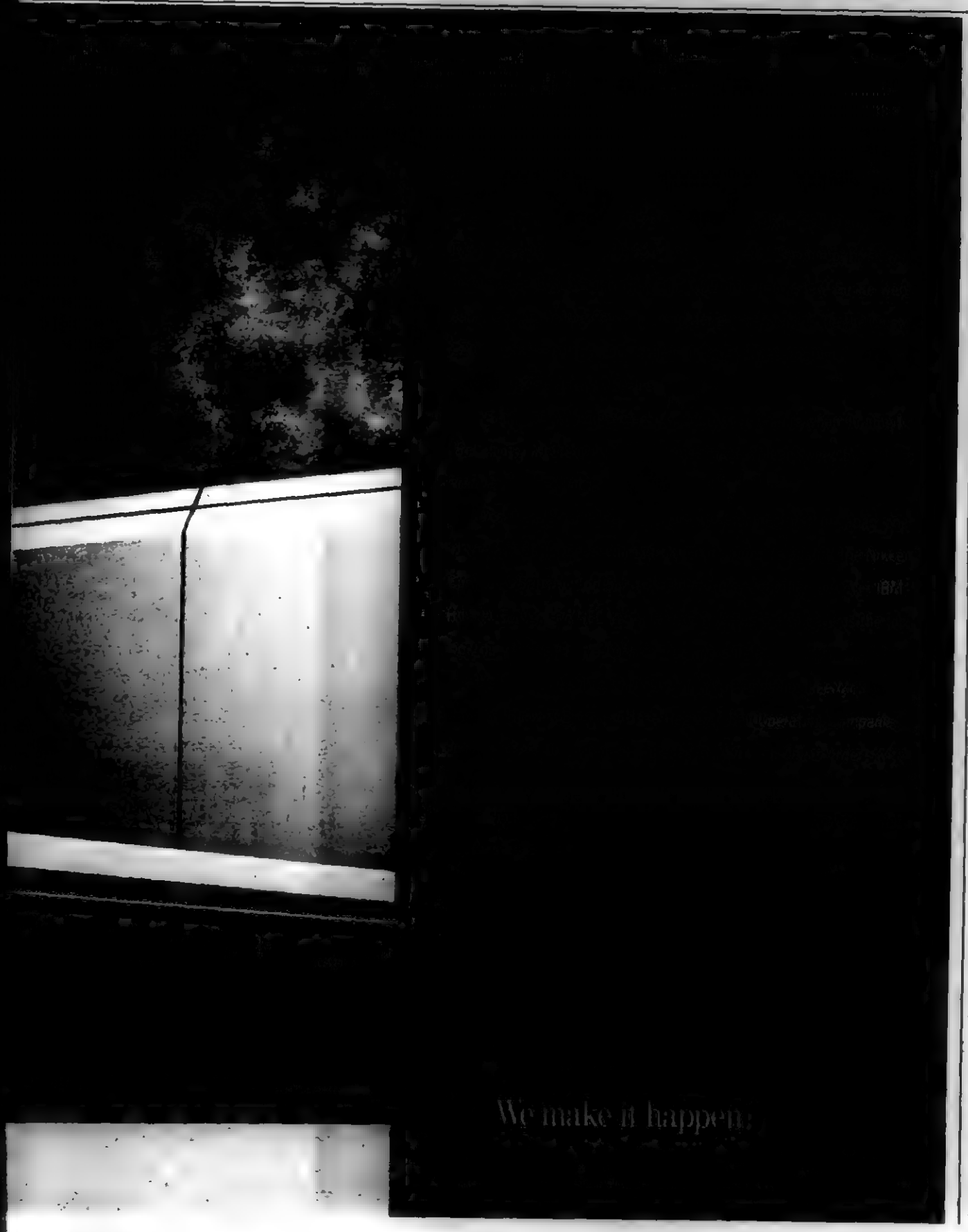
In Computerland's case, analysts said, it is still unclear whether the firm will manage to improve the struggling Nynex operation, which suffers from unfocused management left over from its IBM days.

"They'll have to get rid of layers of totally useless management and focus on making money," said Seymour Merrin, president of Merrin Information Services in Palo Alto, Calif.

Computerland USA President and Chief Operating Officer Ed Anderson said while some mergers have been handled poorly, his firm has made successful acquisitions in the past. The consolidation will create a greater number of reliable suppliers. "They won't be stuck with service contracts from people that go broke — the industry will be healthier," Anderson said.

In light of the mergers and continued spilling of red ink, users who once looked at dealer fiscal woes with indifference are now nervous.

"We're looking at alternatives in case Businessland collapses," said Robert McLaughlin, assistant vice president in charge of microcomputer procurement at New York Life Insurance Co. Ten months ago, McLaughlin joined Businessland in announcing its Solution Line Plus support service, which he touted as an early user. Today, he says he is not sure the dealer will even survive.



Microsoft plans Hong Kong strategy

BY DON TENNANT
IDG NEWS SERVICE

HONG KONG — Citing the conservative nature of his company, a Microsoft Corp. executive has affirmed that it may be another 18 months before Microsoft opens an office here, despite his assessment that the local market is ready for the move.

For now, the firm will rely on its newly established dual distributor arrangement to market and support its products here — an arrangement Microsoft is counting on to drive local sales of its Windows and LAN Manager packages, said Steven Husband, the company's Asia Pacific business development manager.

Husband shed light on his company's plans for Hong Kong during a visit to the territory last month to formally announce the appointment of local firm ACA Pacific as the territory's second Microsoft distributor.

Husband discussed Microsoft's intentions in light of a statement issued for the occasion by Asia Pacific regional manager Rick Tsang: "We added a second distributor in Hong Kong because of its importance as a market to Microsoft, its central location in the Asia region, Hong Kong's growing information technology market, communications facilities and the high number of personal computers per capita."

Responding to an observation that it is just those factors that other vendors cite as reasons for opening an office here, Husband indicated that Microsoft is apprehensive because some companies that have taken that step have flopped.

"We come in for the long term," he said, adding that the company will only establish a local office when it is certain that local market conditions can sustain one. "We are a very conservative company," Husband said.

Making the move

Asked when Hong Kong would be able to sustain a Microsoft office, Husband said frankly, "I feel Hong Kong can sustain an office now." But he added that it could be as early as June or as late as a year and a half from now before Microsoft decides to make that move.

For now, Microsoft is content to operate through its two distributors, Gilman Business Systems and newly appointed ACA Pacific. According to Husband, the firm has no plans to name any additional Hong Kong distributors. Asked specifically whether hopeful contender Imagineering was still under consideration, given Imagineering general manager Edward Li's contention that the appointment of his company as a third distributor is imminent, Husband stated categorically that Microsoft has no intention of adding the company to its distributor list.

When asked how Microsoft will prevent channel conflicts now that it has two distributors here, Husband indicated that rather than assigning territories or preferred platforms, he is depending on the distributors to police themselves.

Tennant writes for Computerworld Hong Kong, *an IDG publication.*

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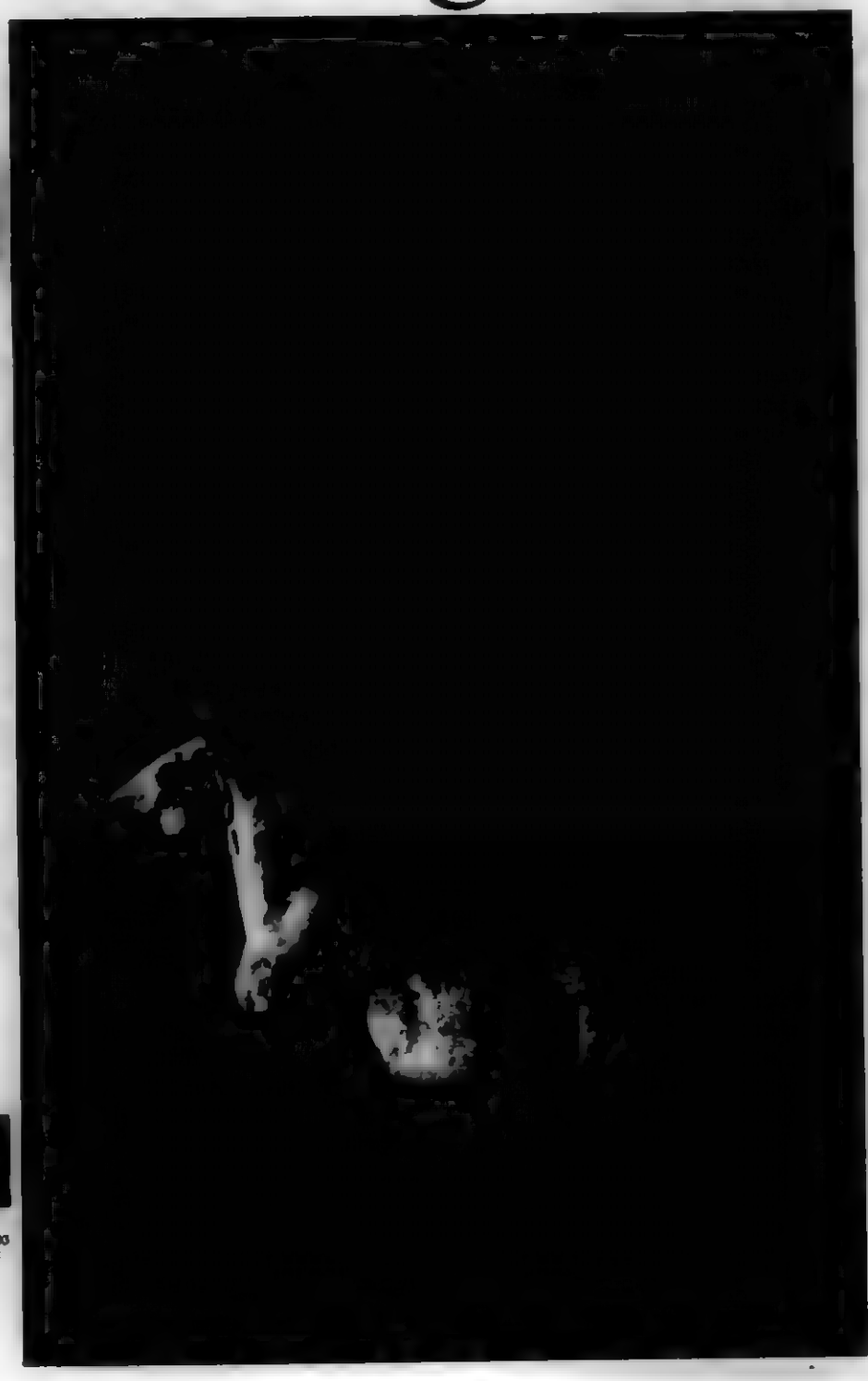
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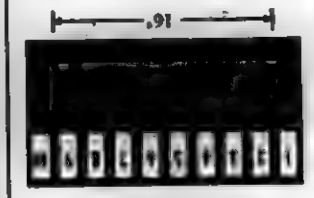
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Program kicked off in Japan

BY GARY H. ANTHES
CW STAFF

A small but politically significant program to help U.S. companies penetrate Japanese markets has been kicked off in Tokyo. Commerce Secretary Robert A. Mosbacher traveled to Japan with the chief executives of 14 handpicked U.S. companies, and he delivered a blunt warning to "blow the whistle" on any unfair trade barriers the companies meet.

Twenty firms — including computer industry entries Oracle Systems Corp., Electronic Data Systems Corp., Masstor Systems Corp. and Compaq Computer Corp. — were selected from a pool of more than 120 applicants for participation in the U.S. Department of Commerce's Japan Corporate Program. The companies were chosen in part for their "long-term commitment to compete aggressively in the Japanese market," Mosbacher said. To his reported embarrassment, however, officials of six of the companies failed to show up in Tokyo.

The program is as close as the Bush administration has come to embracing elements of industrial policy, often derided by free-market thinkers as "picking winners and losers." The 20 companies picked to win in Japan will get help from the Commerce Department in the form of market data, marketing and distribution advice, introductions to key Japanese buyers and other types of hand-holding. They are also likely to benefit from the spotlight reflected off them onto Japanese officials sensitive to charges of unfair trade practices.

In return, the companies have made minimum five-year commitments to go after Japanese business in a serious way, including frequent visits by senior company officials, modification of products for Japanese buyers and the establishment of service units in Japan.

"It certainly does give us a competitive advantage in Japan," said Charles Griffis, chief financial officer at $50 million-per-year Masstor. "It's the only way a company our size can enter that market." Masstor, which sells 80% of its data storage devices and systems in Europe, was picked for the program for its exporting capabilities, Griffis said. The company will sell, install and maintain its products in Japan, most likely through an agency or joint venture, he said.

The company will face competition from much larger firms including IBM, Hitachi Ltd. and Fujitsu Ltd. but hopes Masstor will have $50 million in Japanese business annually after five years, Griffis said. "It will either be a success or it won't. It will be either zero or $50 million-plus," he added.

Asked if the arrangement offers Compaq a competitive advantage, Compaq spokesman Rick Scott said, "It's impossible to say at this point. We didn't view the program as a way to get a competitive advantage."

Calls to competitors of those companies selected turned up a surprising lack of interest and knowledge about the program. A spokesman for an EDS competitor said his firm had little interest in doing business in Japan and so had not applied. A spokesman for the Commerce Department said the agency has not yet made plans for the next round of competition for the program. However, in a written statement, Mosbacher said, "We expect the number of American businesses involved in this initiative to quickly escalate."

Commitment to fair trade

Companies selected have made five-year commitments to:
- Make four visits to Japan annually, including two by the chief executive officer.
- Publish product literature in Japanese.
- Participate in one or more Japanese trade shows annually.
- Modify products as needed for the Japanese market.
- Provide after-sales service.
- Provide Japanese sales figures to the Commerce Department.

The Commerce Department has pledged to:
- Develop market data and five-year sales projections for participants.
- Introduce companies to senior Japanese corporate managers.
- Help solve problems involving patents, trademarks and standards.
- Recommend marketing strategies and business structures.

IBM compatibles

CONTINUED FROM PAGE 81

and multiprocessor systems markets.

"People aren't looking at IBM to lead the way anymore," said David Kirkey, vice president of marketing at Advanced Logic Research, Inc. (ALR). "We have to do something different than the big guys and offer more value."

ALR, along with AST Research, Inc. and several other clone makers, was among the first to incorporate CPU-upgradable architectures. IBM did not design an upgradable PC from the ground up until last year. ALR has also joined Compaq and a handful of other compatible vendors in the multiprocessor architecture market.

While vendors such as Compaq and ALR said they are diverging from IBM to succeed in a crowded marketplace, many pointed to IBM as the instigator of the split.

In the formative years of the PC industry, IBM's every action amounted to a desktop standard, observers noted. IBM lost this clout four years ago when it introduced its Micro Channel Architecture (MCA) bus, which was incompatible with the AT-style bus and add-in boards present in all IBM-compatible PCs at the time. In effect, "IBM thumbed its nose at the entire industry. It tried to force MCA down our throats," said Michael Krieger, senior manager of advanced systems at AST.

The Gang of Nine, which included Compaq, AST and seven other compatible makers, responded by collaborating on the Extended Industry Standard Architecture bus, which remains compatible with IBM's original AT bus design.

IBM's latest video graphics technology, Extended Graphics Array (XGA), does not appear to be catching on as a standard, as its Video Graphics Array (VGA) did before.

"We're not quite convinced XGA will become a standard. We see other ways to do [XGA-like] graphics better than that spec," said Ron Okamoto, director of PC/graphics product marketing at Wyse Technology.

Compaq is already working on its own non-XGA-compatible graphics implementation. According to Stimac, it will be announced soon and will provide considerably higher performance. AST also has no plans to adopt XGA.

"IBM was very slow getting the VGA specs out," Krieger said.

The divergence extends beyond hardware. While IBM had hoped the industry would embrace its OS/2 as the new PC operating system standard, the software has experienced a resounding lack of acceptance among users. Several compatible vendors have given their tacit endorsement to OS/2's rival — Microsoft Corp.'s Windows/DOS environment — by bundling Windows with off-the-shelf PCs. No one is bundling OS/2 this way.

IBM may take the matter into its own hands, however. Reports said the firm is considering bundling OS/2 Version 2.0 with every Intel Corp. 80386-based PC it sells.



Compaq's Stimac: *'If I just copied IBM's hardware, then I could be no better than IBM'*

Making a choice

For users, the divergence between IBM and PC clone vendors may mean more choices and greater innovation. But it also injects a good deal of confusion into the once simple universe of the IBM PC compatible.

The differentiating moves of some compatible makers are in large part beneficial to users. As more third-party developers embrace non-IBM architecture such as Extended Industry Standard Architecture (EISA) and multiprocessor implementations, competition among these developers will increase, product choices will proliferate, and prices will drop, said Ben Rose, senior analyst at Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

However, many users said they feel burdened by the divergence. "It was easier when IBM called the tune, and everybody had to dance to it," said Stephen Anderson, an information systems architect for the state of Washington. "For someone in my position, the more diversity you get, the tougher it gets."

Many users first saw evidence of divergence when IBM developed its MCA bus. "IBM made a mistake with the Micro Channel because of the incompatibility. If you go with Micro Channel, you're talking all new equipment, all new boards," said Fred Fisher, president of Surplus Risk Services/The Fisher Associates, a Los Angeles-based insurance adjuster.

Now, users are caught in a rivalry between MCA and the competing EISA.

"You've got to make a choice between them. There's too much difficulty in maintaining two sets of [incompatible] network boards and add-in cards," Anderson said.

If anything, in the eyes of analysts and users, IBM is becoming less committed to open standards than are compatible vendors.

"Lately, IBM's product implementations have gotten more and more specific to the Micro Channel," said New York-based network consultant Brian Livingston.

"The whole industry is talking about open architecture, but you've got two standards in competition," Fisher said. "I'd hate to think that schism will broaden even more."

RICHARD TRISTCHLER

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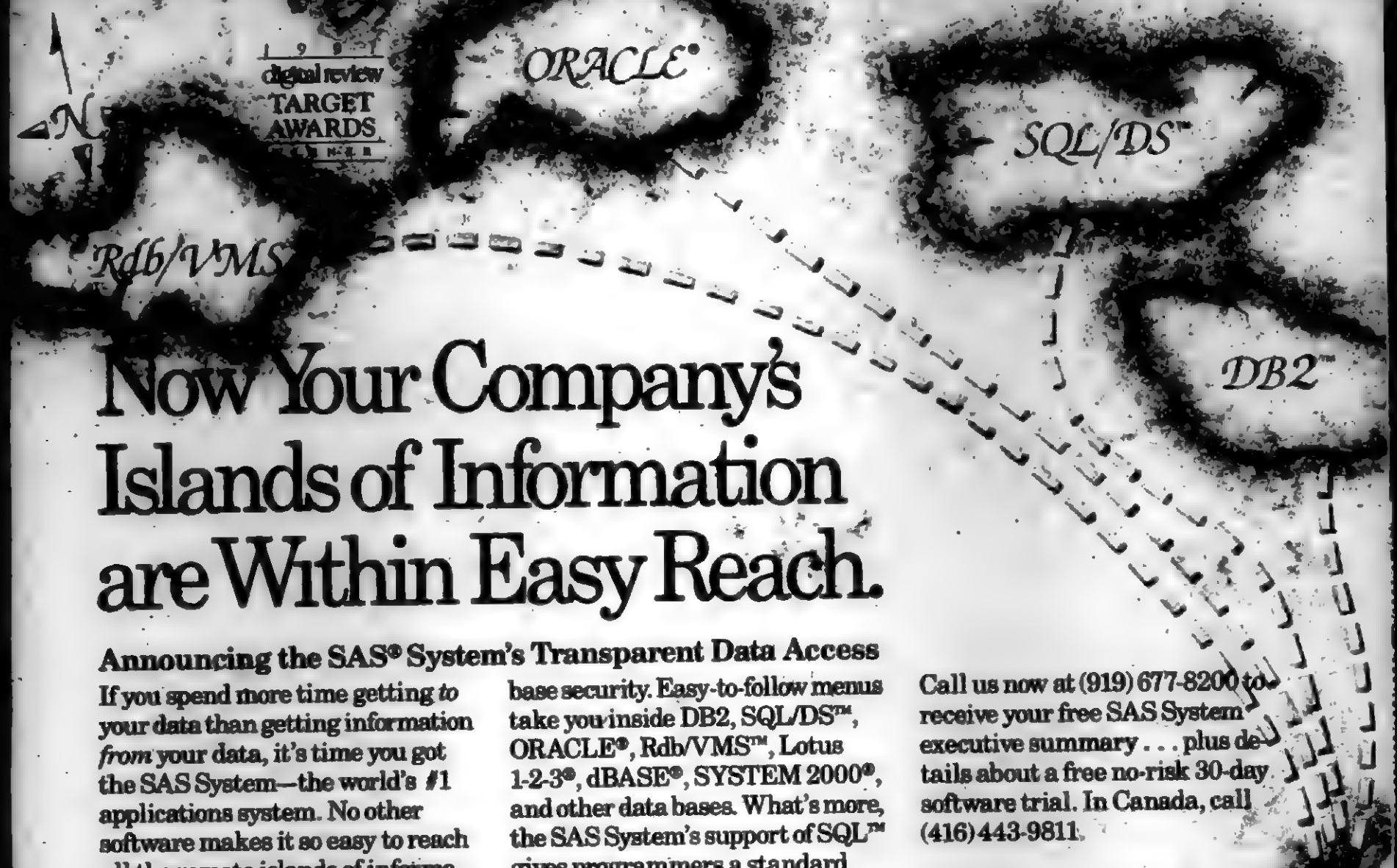
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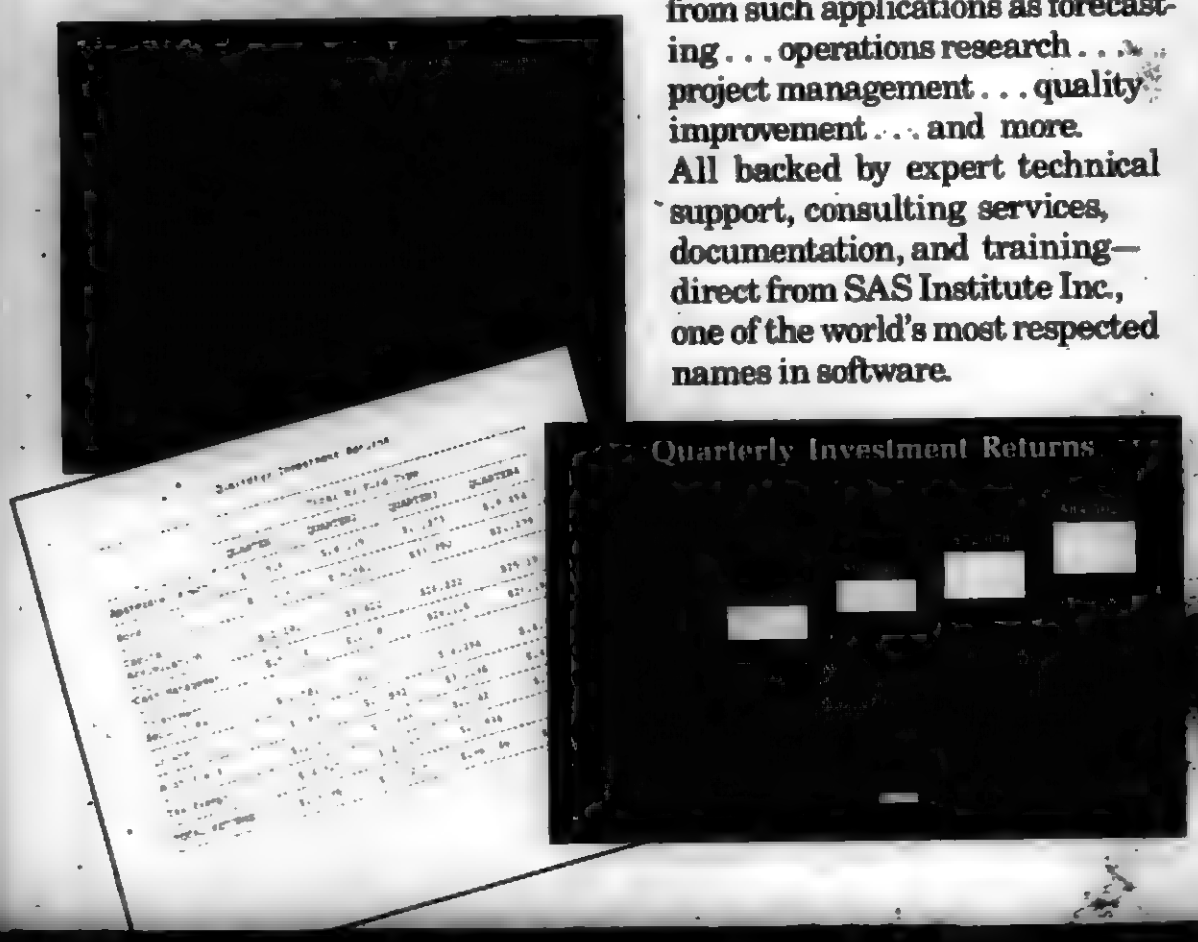
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SYSTEM 2000®

CASE 'change agents' to light path for others

BY CARMEN D. WISEMAN
SPECIAL TO CW

What do you get when you cross a software developer with an information systems professional who has a flair for business strategies? A strong candidate for computer-aided software engineering (CASE). But don't get too excited: Demand for this unique IS developer will not ignite for a few more years. For now, companies are looking for CASE workers who not only possess strong marketing and interpersonal skills but also play a large part in getting the technology into the company in the first place.



CASE has penetrated only 15% of U.S. organizations, the bulk of which are Fortune 100 financial service and insurance firms, says Vaughan Merlyn, a partner at Ernst & Young's Center for Information Technology and Strategy in Boston. Although other industry watchers note the technology's steady inroads into airlines, health care institutions and government agencies (such as the Library of Congress), they warn that growth is very gradual.

"CASE is so new it has to be sold to many companies. That's why the biggest current need is for CASE advocates, strategists and implementors," says technical recruiter Norm Sanders at Norm Sanders Associates in Hazlet, N.J.

Such individuals are what Kurt Wilkinson, vice president of the advanced technology practice at recruiting firm Halbrecht and Co. in Fairfax, Va., calls "CASE change agents." A change agent operates under the aegis of the chief information officer or senior IS director and may make up to $100,000 annually. This agent (there's likely to be just one in a CASE start-up scenario) must be a business-savvy, marketing-oriented professional who is also technically proficient, he adds.

"Change agents don't always have to have IS backgrounds, but they should understand the enterprise modeling concept and how business processes work," Wilkinson says. "If they are only technically knowledgeable, they won't understand how organizations do business — and they won't be able to change the way their own organizations do business."

According to Merlyn, companies are looking for "visionary marketeers" to get CASE rolling. Instead of recruiting only computer science graduates, they're also going after professionals with MBAs or sociology degrees who may have more of the people skills required for CASE advocacy and implementation.

A change agent must have excellent interpersonal skills to work with veteran software developers who think CASE tools will put their jobs in jeopardy. The agent must reassure developers that CASE tools are simply productivity enhancers and may even free the developer from humdrum maintenance tasks for more interesting work.

"Developers are eager to get involved with CASE once they realize it is just a tool and isn't going to take away their jobs," says Sharon Williams, director of IS staff development and training at Kaiser Foundation Health Plan in Walnut Creek, Calif.

The next step

Once a change agent has achieved high-level sponsorship of CASE throughout an organization, the next step is finding staff members to use the tools.

Today, most CASE professionals are selected and grown in-house. "Companies are training existing people in a base of tools, such as Knowledgeware," says Jack Mellon, group manager of MIS planning and architecture at Ryder Truck Rental, Inc. in Miami. "They start in-house because they have confidence in their own people."

In addition, only a few computer science schools, such as Washington University in St. Louis, offer a CASE-centered curriculum, says Capers Jones, chairman of Software Productivity Research in Burlington, Mass.

However, once CASE is no longer the new kid on the block, traditional software developers who want to carve out a career in CASE will need to hone their business skills first. But when that day comes, they will be in high demand. "Five years from now, CASE will be a necessity on resumes," Merlyn says.

So, whether you are an MBA with good communications skills or a developer piqued by leading-edge technology, there may be a place in CASE for you.

"If your career inclinations are in this direction, it's a no-lose situation," says Ed Ackley, a consultant at International Data Corp. in Framingham, Mass.

Wiseman is a free-lance writer based in Watertown, Mass.

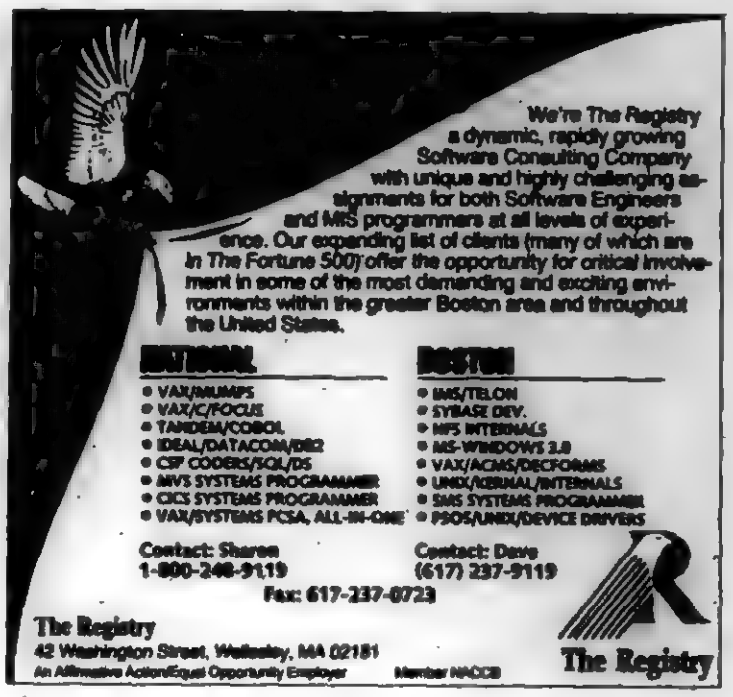
A peek at the future

Boeing Computer Services Division, unlike most U.S. companies, is not a CASE fledgling: It has been using CASE tools since 1984, says Wendy Wagner, project manager of CASE deployment at the Bellevue, Wash.-based firm. Now that the company is well past the start-up phase, she can give other firms a peek at the future.

Boeing's ideal CASE developer must understand the analysis design methods and techniques on which CASE is based. The company supplements this technical foundation with a strong in-house CASE training program. Boeing expands its in-house training programs every year, tailoring them to fit the tools and techniques the company is adopting.

Wagner notes that the need for on-site CASE advocates does not evaporate once senior management buys into CASE technology. Over time, however, the advocacy role shifts from the change agents to the developers on the team, so good communications skills are key. Boeing strategy relies on trained technical coordinators and others to spread CASE knowledge. The team thus provides a built-in support network for developers who feel uncomfortable working on CASE projects.

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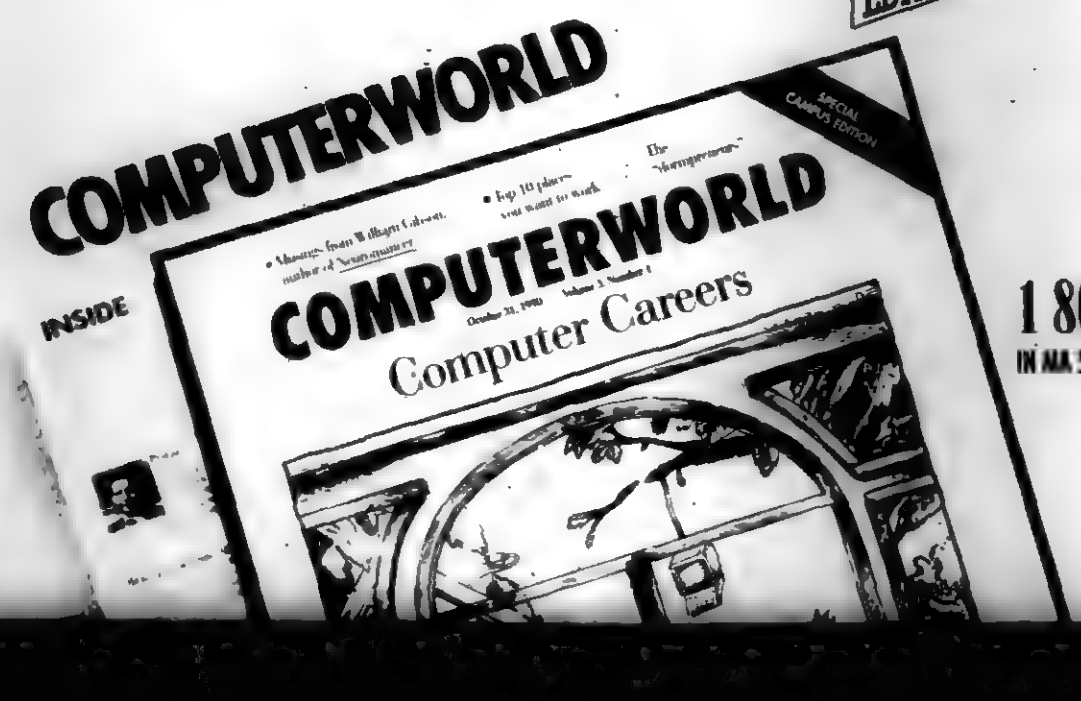
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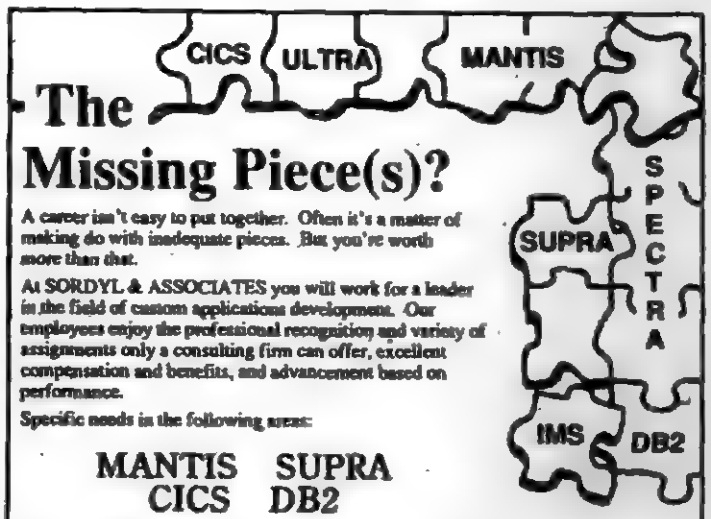
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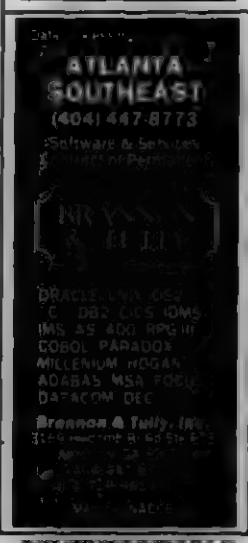
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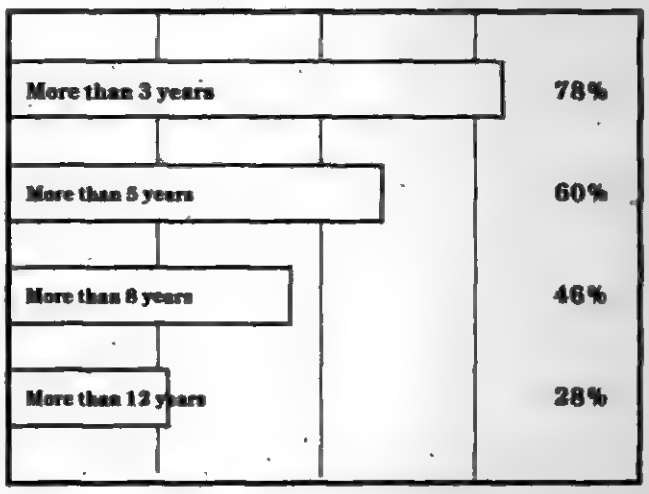
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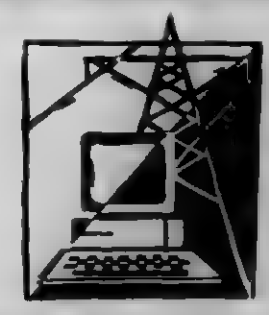
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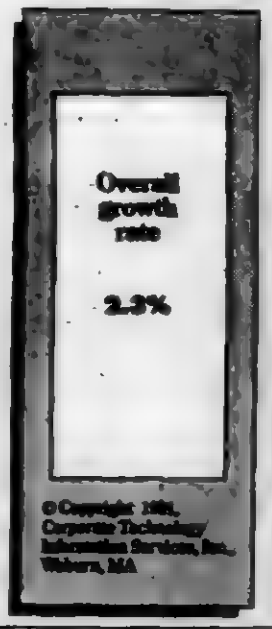
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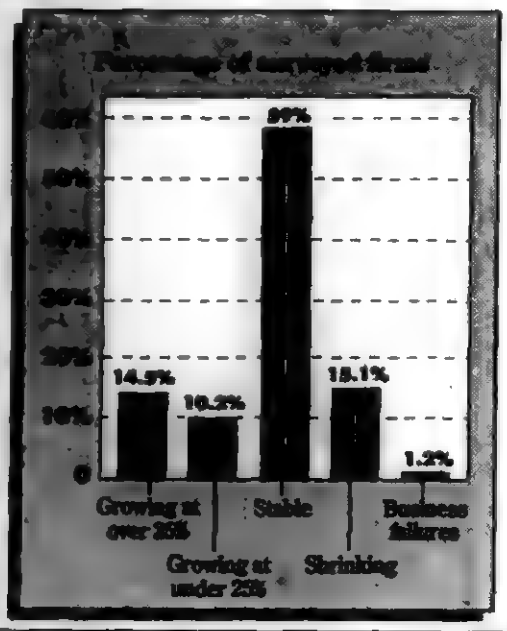
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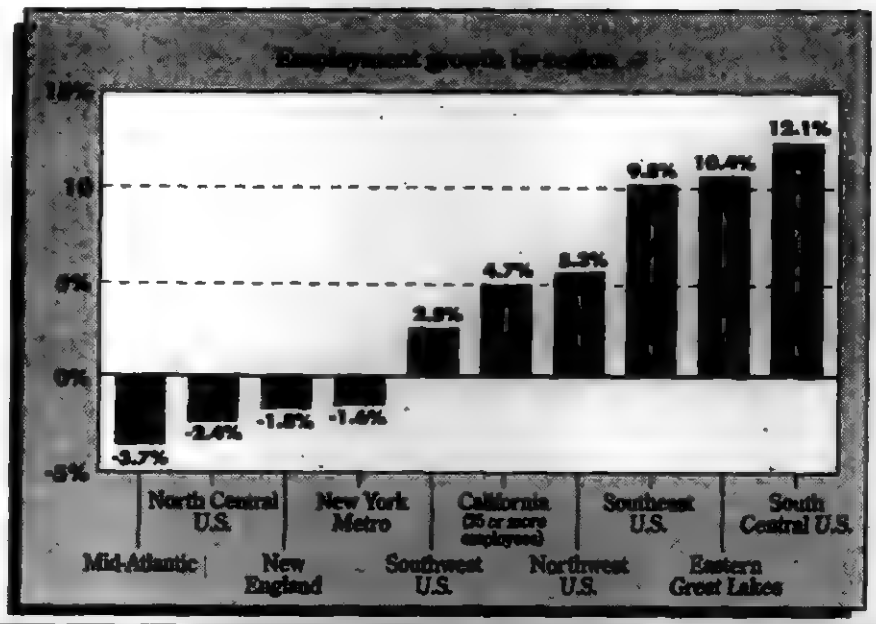
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Do-it-yourself repairs cut costs, IS execs say

BY SUZANNE WEIXEL
SPECIAL TO CW

Last year, Columbus, Ohio-based accounting firm Groner Boyel & Gillan discovered, to its dismay, that 30% of its information systems budget was spent on equipment repairs. After careful consideration, the firm decided to get rid of all unnecessary service contracts and handle most of the repairs itself.

"We made major changes. Except for proprietary equipment, we now do all repairs in-house," says Jim Schmeltzer, supervisor of data processing.

The result? A preliminary forecast for the first quarter of this year indicates that repair expenses at the firm are down by about 82%, Schmeltzer says.

Keeping a lid on it

As IS managers struggle to keep a lid on spending, many indicate that savings can be found by fixing their own equipment. While in-house repairs aren't ideal for every situation, managers say they are reducing service budgets, minimizing downtime and bolstering productivity.

"The cost of on-site service is just getting too high," says Alan Herman, vice president of electronic data processing at Jacobson Stores, Inc. in Jackson, Mich.

At Garber Travel Service, Inc. in Brookline, Mass., maximizing uptime is the most significant reason for stocking parts and performing in-house equipment repairs, says Rock Blanco, vice president of IS. Outside service companies often guarantee a four-hour turnaround, but that's not fast enough, he says. "Why should I wait when I can fix it myself?"



Two years ago, all of Garber Travel's repairs and replacements were handled by a third-party service company. The cost in terms of contract fees and downtime was enormous; Blanco says, so he looked into bringing repairs in-house. He also considered ease of repair when deciding which personal computer would become the corporate standard. He opted for IBM Personal System/2s because of their simplicity. "I can grab a hard disk off the shelf and plug it in in no time," Blanco says.

Some IS managers indicate that stocking up on parts to perform in-house repairs not only saves time but can also come to the rescue of the entire business.

"With a PC in the patient-accounting department that brings in $40,000 per day simply by being on-line, a faulty disk drive is no excuse for downtime," says Steve Cobleigh, manager of technical services at Winchester Hospital in Winchester, Mass.

Keeping a careful, detailed inventory is a key factor in performing in-house repairs. Blanco says that Garber Travel has designated a hardware specialist to stock parts that have high failure rates, such as Token Ring cards, hard disks, printer heads and fuses. Because of this extra attention, both employee productivity and the quality of service have increased, he says.

Cobleigh posts a spare parts list that includes everything from keyboards and monitors to PCs and modems so that the IS staff knows what is in use and where it is at all times.

Handling repairs in-house takes a lot of consideration, and it's not right for everyone all the time.

At Winchester Hospital, Cobleigh carefully weighs each repair situation in terms of cost before deciding whether to send out equipment for repairs or do it himself. To help him in his decision-making, he developed an equation: He compares the length of time it takes to return a system to working order with the cost of maintaining spare parts. "Do we keep a spare file server in the closet? No. Do we keep a spare network interface card? Yes," he says. But, he adds, returning to uptime is the prime concern. Cost is secondary.

In a company as large as Richardson Electronics Ltd., it is not always cost-effective to fix things in-house, says Eric Powell, vice president of information services at the LaFox, Ill.-based company. To cover all the different kinds of technologies, ranging from mainframes to wide-area networks to dumb terminals and PCs, Powell says, he would have to maintain a large staff of technicians with a broad base of knowledge. To determine which parts he should stock and which he should leave to an outside service provider, he considers the cost of a service contract and labor, how critical the equipment is, how fast a turnaround time is required and how many parts he would have to keep in inventory.

Sending out equipment for repairs also makes sense if the inoperable equipment is more sophisticated than an IS department can handle.

Garber Travel still contracts with third-party service companies for problems that are more complex than just replacing a part and malfunctions that occur at locations far from corporate headquarters.

> HANDLING REPAIRS in-house takes a lot of consideration, and it's not right for everyone all the time.

At the remote offices, Blanco says, he cannot guarantee the work if he is not there to supervise it, so he entrusts it to a third-party company. For problems that he judges too complex or too expensive to handle in-house, Blanco sometimes uses what is known as a depot maintenance agreement. For instance, if a printer fails, he can swap in a replacement and send the original out to be fixed. That way, time is not as much of an issue.

Weixel is a free-lance writer based in Framingham, Mass.

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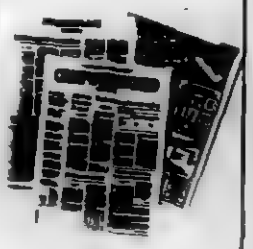
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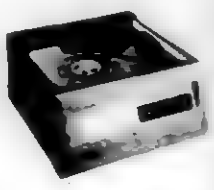
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For the complete RFI, call Craig Matusek at 202/328-5993. Deadline for responses is 3:00 p.m., April 29, 1991

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Old lessons learned in a new land

Head of the Class is a monthly column exploring innovative training approaches.

BY PETER FINGAR
SPECIAL TO CW

One August night in 1975, I stepped on Saudi Arabian soil for the first time to organize and implement an applications programming school for a small group of Saudi government employees. I knew at the time that this would not be an ordinary assignment, but I had no idea I would go on to live in the Middle East for 14 years or that I would carry away from this desert kingdom important lessons in training.

That pilot program was conducted 16 years ago. During those years, I worked in different training jobs at Arabian Data Systems in Jeddah, King Fahd University of Petroleum and Minerals and the Saudi Aramco, both in Dhahran.

I am currently director of computing at the University of Tampa in Florida, and I still use the methods I learned from my early experiences in Saudi Arabia.

That first assignment was to prepare a group of workers from various government departments in Riyadh to staff the many computer projects planned throughout the Saudi government.

This presented a challenge for two reasons: None of the trainees, with the exception of one, had ever worked on a computer before, and all of the students spoke English as their second language.

English is the de facto language of computing in the Middle East. Some trainees had just completed their intensive English language training the month before. Among themselves, they spoke Arabic dialects from different areas of Saudi Arabia; one trainee was from neighboring Yemen, where yet another dialect is spoken.



Rote learning

The secondary education received by most participants had a strong component of rote learning, and they easily committed to memory the definitions of technical terms. But because the focus of the training was on complex problem solving, technical vocabulary was not sufficient. Clearly, there were language and learning barriers to overcome in teaching complex programming and systems skills.

At the time, I felt that very basic teaching methods were in order to handle such a problem. However, over the years, and especially after my return to the U.S., I realized that the solutions I found were actually tried-and-true techniques and could be universally applied to all users despite diverse abilities and backgrounds.

First, I emphasized building conceptual models from the top down. Top-down mapping of computing subjects provides the hooks for hanging the overwhelming number of details. Having grasped the big picture, people can learn in a meaningful context, knowing the relationship of the technical details to an overall whole. Whether the content is a technology concept or a computing skill, the effectiveness of taking a whole-to-parts approach cannot be overemphasized.

For example, if an instructor is teaching a programming language, he will begin his top-down approach with a very small yet complete program. Then, he will assign a small, complete programming exercise to the trainees.

Contrast this with the bottom-up approach, where weeks of syntax and programming language rules are studied. In the parts-to-whole approach, motivation and understanding dwindle as the trainees are lost in the massive amount of details.

Second, I rediscovered a very basic way to overcome language barriers: I reverted to pictures, the original form of human language. I used pictures of both technical things and of the methods and processes of technology.

When words and pictures come together, a signal passes to the brain from two simultaneous input sources. This is why professional teachers are instructed in the correct use of pointers in classroom presentations. If the pointer is pointing out of sync with the words being spoken, learning drops off immediately. When words and pictures are used together, communication increases dramatically.

Since the mid-1970s, great progress has been made in the use of computers in Saudi Arabia. Today, some of the original trainees are systems managers in government and business. The marble and granite offices in the desert sands of Dhahran house some of the world's most advanced technology.

The Aramco network

Aramco deploys networked IBM 3090s, Cray Research, Inc. supercomputers, Intergraph Corp. and Genegraphics computer-aided design technology and global Systems Network Architecture and packet-switching networks that bounce off Arabsat satellite and through optical fibers. The oil giant offers more than 50 computer subjects to thousands of employees each year.

Next door to the oil company, King Fahd University of Petroleum and Minerals has implemented a full-fledged College of Computer Science and Engineering with a growing number of Saudi Ph.D.s on the faculty. Computing education and training remain strategic priorities in the kingdom.

I look forward to returning to Saudi Arabia for short-term teaching and consulting assignments in one of the most fascinating computing environments on the planet.

And I continue to use the lessons I learned in the desert sand to meet training challenges here at home.

Fingar is director of computing at the University of Tampa. He lived in Saudi Arabia for 10 years and is the author of Computing Illustrated, a book for end users.

COMPUTERWORLD

April Training Editorial Topics

22 What's new with computer-based training?
Product Spotlight: *CASE tools*
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29 How the nuclear industry handles technical training
Executive Report: *How CEOs and CFOs Evaluate IS*
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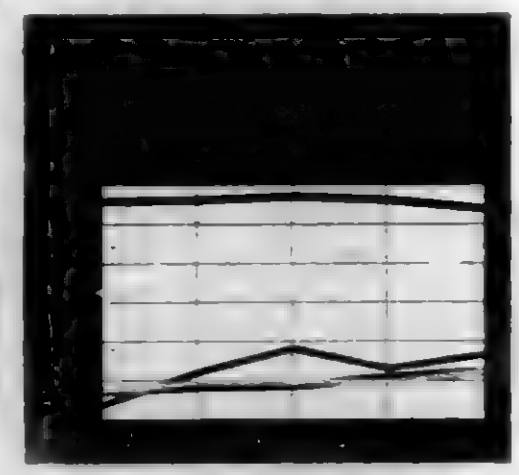
Micron Technology, Inc., maker of 1M-bit dynamic random-access memory chips, is currently trading near its 52-week high. Japanese DRAM makers have cut production, thereby inflating their prices, according to Larry Hickey, a First Analysis Corp. analyst. Micron, he said, is ready to pounce on the newly recharged market.

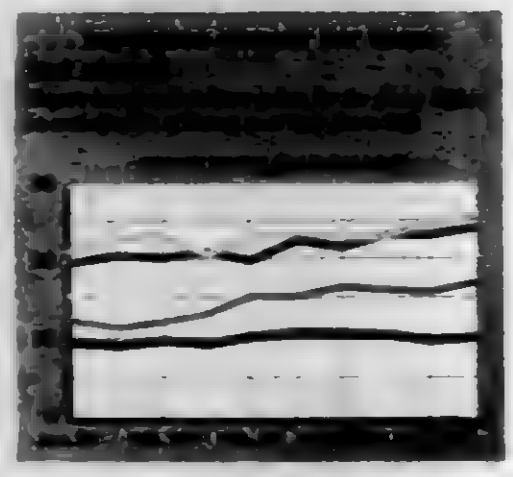
Not all stocks at new zeniths are good buys. **Computer Task Group, Inc.** will increase earnings by a modest 10% this year, said Cato Carpenter, an analyst at Alex. Brown & Sons, Inc. He called Computer Task Group a "hold." Although Carpenter said the recession will deflate the prices of most service stocks, he likes **American Management Systems, Inc.**, a Computer Task Group competitor. Profits at American Management will rise 20% in 1991, in part because of its dedication to research and development, he said.

With its Amiga computer, **Commodore International Ltd.** "is the only company that combines personal computer functionality with the ease of use of consumer electronics," said Steve Eskenasi, an Alex. Brown & Sons analyst who said he expects the stock to reach $24 to $28 in the near term. Fiscal year 1991 revenue will jump 20% over last year, he predicted.

Tektronix, Inc. is rated a "hold" now by Laura Conigliaro, an analyst at Prudential Securities, Inc., but she noted that significant revenue growth over the long term can make Tektronix attractive. The company has shown "exceptional expense control," she added.

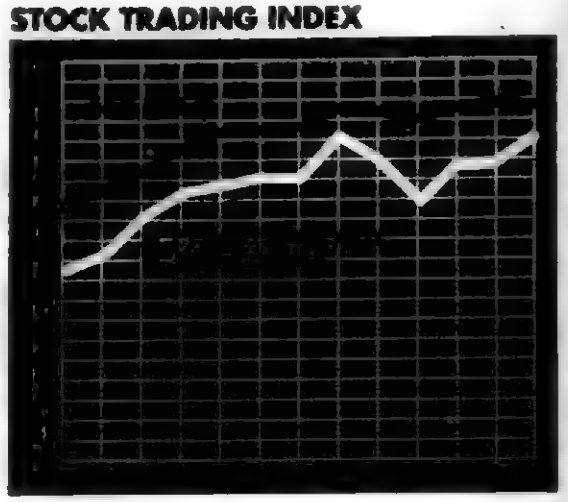
KIM S. NASH





American Management Systems, Inc.
Commodore International Ltd.
Computer Task Group, Inc.
Micron Technology, Inc.
Tektronix, Inc.

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Earnings from semiconductor firms made investors happy, bolstering stock prices in the sector. Motorola, Inc.'s first-quarter profits fell compared with last year, but by less than analysts had feared; Motorola stock leapt 3¾ points to close Thursday at 62⅞. Intel Corp. jumped 2¾ points to 52, and Advanced Micro Devices, Inc. advanced 1½ points to a new high of 12⅝. Both companies posted strong quarterly earnings last week.
- Among hardware firms, IBM lost 2⅛ points to 110¼. NCR Corp. slid down 2⅛ points to 95⅝. AST Research, Inc. and Advanced Logic Research, Inc. each added 1¼ points to close at 32 and 18¾, respectively.
- Silicon Graphics, Inc., one of 21 vendors newly allied to support reduced instruction set computing chips from Mips Computer Systems, Inc., gained 2¼ points to 39⅛; Mips slipped ⅛ of a point to 19¼. Meanwhile, Sun Microsystems, Inc., which is being challenged by the alliance, picked up 2⅛ points to close at 35.

Computerworld Stock Trading Summary

CLOSING PRICES FRIDAY, APRIL 12, 1991, 1991

TOP PERCENT GAINERS

Alloy Computer Prod.	75.00
Informix Corp.	30.43
Micropolis Corp.	28.79
Cognos Inc.	19.69
Micrografx	18.44

TOP PERCENT LOSERS

Infotron Systems Corp.	-14.29
Ariel Communication Corp.	-14.29
Barclac Inc.	-11.32
Cornshare Inc.	-10.58
Capital Associates	-9.18

TOP DOLLAR GAINERS

Intel Corp.	6.00
Motorola Inc.	5.50
Texas Instruments	4.38
Computer Sciences	4.25
Micropolis Corp.	3.75

TOP DOLLAR LOSERS

IBM	-4.75
Microsoft Corp.	-2.75
Cornshare Inc.	-2.25
Symantec Corp.	-2.25
Compression Labs Inc.	-1.88

Exch	52-Week	Range		April 12 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Off 0.21%
OTC	19.00	5.38	3 COM Corp.	9.00	-0.50	-5.26
NYS	69.75	52.50	American Info Techs Corp.	65.13	-1.25	-1.88
NYS	44.13	29.00	AT&T	35.25	1.25	3.68
OTC	5.13	0.88	Ariel Communication Corp.	2.25	-0.38	-14.29
NYS	66.25	38.50	Bell Atlantic Corp.	50.88	1.13	2.26
NYS	57.88	49.00	Bellsouth Corp.	52.38	0.88	1.70
NYS	41.25	13.13	Cabletron Systems	39.00	1.38	3.65
OTC	25.88	8.25	Compression Labs Inc.	21.75	-1.88	-7.94
NYS	41.25	23.38	Contel Corp.	41.00	0.00	0.00
OTC	5.13	1.88	Data Switch Corp.	4.13	-0.25	-5.71
NYS	28.75	8.88	Digital Comm. Assoc.	20.00	0.50	2.56
OTC	25.25	12.25	Dynatech Corp.	21.13	-0.13	-0.59
OTC	12.88	5.50	Fibronics Int'l Inc.	9.38	0.13	1.35
OTC	4.00	1.75	Gandalf Technologies Inc.	3.63	0.50	16.00
NYS	4.50	1.63	General Datacomm Inds.	3.00	0.38	14.29
NYS	34.13	23.50	GTE Corp.	32.25	0.25	0.78
OTC	0.25	0.75	Infotron Systems Corp.	1.50	-0.25	-14.29
NYS	60.88	40.25	ITT Corp.	57.25	-0.63	-1.08
OTC	44.13	17.88	MCI Communications Corp.	27.63	1.38	5.24
OTC	21.00	2.75	Microcom Inc.	5.75	-0.50	-8.00
NYS	10.25	4.00	Network Equipment Tech.	7.50	0.00	0.00
OTC	14.63	4.50	Network General	8.25	0.25	3.13
OTC	15.50	8.13	Network Systems Corp.	12.50	0.13	1.01
NYS	32.63	22.13	Northern Telecom Ltd.	32.63	0.88	2.76
OTC	58.50	17.25	Novell Inc.	55.88	-1.50	-2.61
NYS	89.50	62.00	Nynex Corp.	73.00	0.88	1.21
NYS	47.88	36.25	Pacific Telesis Group	41.75	0.25	0.60
ASE	15.38	4.75	Parcel Corp.	14.50	-0.13	-0.85
NYS	29.13	8.88	Scientific Atlanta Inc.	15.75	0.38	2.44
NYS	59.50	47.25	Southwestern Bell Corp.	53.00	-0.38	-0.70
NYS	46.38	20.63	United Telecom	23.25	-1.50	-6.06
NYS	40.75	32.38	US West Inc.	39.13	0.13	0.32
Computer Systems						Up 2.62%
OTC	8.75	0.88	Alfant Computer Sys.	1.50	-0.13	-7.69
ASE	18.88	10.00	Amdahl Corp.	18.88	1.00	6.35
OTC	72.75	24.25	Apple Computer Inc.	71.75	2.38	3.42
OTC	13.88	4.25	Archive Corp.	8.38	0.63	8.06
OTC	32.25	7.50	AST Research Inc.	32.25	2.75	9.32
NYS	7.88	3.88	Bolt, Beranek & Newman	7.00	0.00	0.00
NYS	21.63	4.50	Commodore Int'l	18.63	-1.25	-6.68
NYS	74.25	36.50	Compaq Computer Corp.	63.25	0.75	1.20
OTC	2.38	0.13	Computer Automation Inc.	1.00	0.00	0.00
NYS	21.38	6.75	Control Data Corp.	12.38	0.25	2.06
NYS	20.88	6.38	Convex Computer	16.75	1.38	8.94
NYS	51.25	20.00	Cray Research Inc.	37.63	2.13	6.00
NYS	15.38	3.50	Data General Corp.	15.38	1.00	6.96
NYS	3.25	0.75	Datapoint Corp.	2.00	0.00	0.00
OTC	30.38	7.63	Dell Computer Corp.	29.63	0.88	3.04
NYS	65.13	46.50	Digital Equipment Corp.	65.13	1.25	1.96
NYS	35.13	13.75	Harris Corp.	25.75	-0.75	-2.83
NYS	52.00	24.88	Hewlett Packard Co.	51.63	1.63	3.26
NYS	139.75	89.25	IBM	109.38	-4.75	-4.20
OTC	14.00	7.75	Information Int'l	8.00	-0.75	-8.57
OTC	29.50	10.50	Intergraph	29.00	3.00	11.32
NYS	3.13	0.50	MAI Systems Corp.	0.75	0.06	9.01
NYS	148.75	114.00	Massachusetts Electronics	128.75	0.00	0.00
OTC	26.00	9.00	Mentor Graphics Corp.	17.38	0.75	4.51
OTC	100.50	44.50	NCR Corp.	97.00	0.13	0.13
OTC	35.50	11.00	Pyramid Technology	27.25	0.75	2.83
OTC	34.00	9.75	Sequent Computer Sys.	18.50	0.50	3.13
NYS	47.25	18.00	Silicon Graphics	39.88	2.13	5.78
NYS	35.88	14.63	Stratus Computer Inc.	35.88	2.88	8.71
OTC	37.25	15.00	Sun Microsystems Inc.	35.13	3.38	10.63
NYS	28.88	6.88	Tandem Computers Inc.	14.50	0.38	2.65
NYS	39.50	23.50	Tandy Corp.	34.75	1.50	4.51
OTC	33.25	6.75	Teradata	19.00	0.00	0.00
NYS	7.88	1.38	Ultimate Corp.	4.88	0.00	0.00
NYS	15.88	1.75	Unisys Corp.	5.13	0.00	0.00
ASE	5.75	2.00	Viking Labs Inc. (s)	4.00	0.00	0.00
Software & DP Services						Up 2.69%
OTC	62.00	17.00	Adobe Systems Inc.	62.00	3.00	5.08
OTC	59.88	16.75	Aldus Corp.	58.75	0.00	0.00
OTC	28.50	12.00	American Mgmt. Systems	28.50	1.00	3.92
OTC	19.25	7.50	American Software Inc.	11.00	-0.50	-4.35
NYS	4.63	1.38	Anacomp Inc.	3.88	-0.25	-6.06
OTC	23.50	10.00	Analysts Int'l	15.25	-0.75	-4.69
OTC	13.25	4.88	Ashton Tate	10.50	1.50	11.11

Exch	52-Week	Range		April 12 Close	Wk Net Change	Wk Pct Change
OTC	10.25	4.00	ASK Computer Sys.	7.50	-0.25	-3.23
NYS	66.25	46.25	Auto Data Processing	66.25	3.25	5.08
OTC	60.25	32.00	Autodesk Inc.	51.88	2.13	4.27
OTC	31.50	19.50	BGS Systems Inc.	27.25	-1.25	-4.39
OTC	43.88	17.75	BMC Software Inc.	39.75	1.25	3.25
OTC	21.50	11.00	Boole & Babbage Inc.	14.25	-0.50	-3.39
OTC	62.25	14.00	Borland Int'l	61.50	1.25	2.07
NYS	9.88	0.88	Businessland Inc.	2.00	0.13	6.67
OTC	19.00	5.13	Cognos Inc.	18.00	3.13	19.88
NYS	16.88	4.38	Computer Associates	9.25	0.00	0.00
OTC	17.75	10.75	Computer Horizons	14.25	0.25	1.79
NYS	70.50	38.75	Computer Sciences	70.50	4.25	6.42
NYS	11.75	8.63	Computer Task Group	10.00	0.38	3.70
OTC	25.25	13.00	Cornshare Inc.	19.00	-2.25	-10.59
OTC	16.00	3.75	Corporate Software	11.00	1.25	12.82
NYS	47.00	27.88	General Motors E (EDS)	46.00	-1.13	-2.39
OTC	18.75	7.25	Goal Systems Int'l	14.50	0.25	1.75
OTC	6.75	1.88	Hogan Systems Inc.	5.13	-0.25	-4.65
OTC	19.75	7.75	Information Resources	18.88	0.00	0.00
OTC	17.50	2.63	Informix Corp.	7.50	1.75	30.43
OTC	7.88	1.38	Intellicorp Inc.	2.25	0.25	12.50
OTC	8.00	2.50	Interleaf Inc.	7.25	-0.50	-6.45
OTC	41.75	10.00	Knowledgeware Inc.	39.75	-0.50	-1.24
OTC	46.00	16.75	Legent Corp.	36.13	3.13	9.47
OTC	39.25	12.50	Lotus Development	28.06	0.00	0.00
OTC	32.00	13.63	Micrografx	21.50	3.50	19.44
OTC	118.75	50.75	Microsoft Corp.	107.25	-2.75	-2.50
NYS	10.50	4.00	On Line Software Int'l	9.00	-0.25	-2.70
OTC	24.00	4.88	Oracle Systems	11.50	0.38	3.53
NYS	16.13	7.50	Parasophic Systems	12.13	0.88	7.76
OTC	9.25	1.25	Phoenix Technologies	8.63	-0.25	-2.82
NYS	62.00	31.63	Policy Management Sys.	49.00	-1.75	-3.45
NYS	23.63	11.50	Reynolds & Reynolds	20.63	0.63	3.13
OTC	16.13	6.88	Sage Software Inc.	9.50	-0.88	-8.43
OTC	25.50	14.75	SEI Corp.	24.00	-0.50	-2.04
OTC	19.38	12.25	Shared Medical Systems	19.38	2.88	17.42
OTC	35.25	12.00	Software Publishing Corp.	21.00	0.25	1.20
NYS	14.50	5.50	Sterling Software	13.88	0.13	0.91
OTC	26.00	9.50	Sungard Data Sys.	15.75	0.50	3.28
OTC	65.88	17.75	Symantec Corp.	59.75	-2.25	-4.25
NYS	24.50	4.50	System Center Inc.	7.38	-0.13	-1.67
OTC	37.25	12.75	System Software Assoc.	17.75	0.50	2.90
OTC	27.38	4.75	Wang	15.63	2.25	16.82
Semiconductors						Up 4.83%
NYS	25.88	19.38	Advanced Micro Devices	22.75	-1.13	-4.71
NYS	11.88	5.88	Analog Devices Inc.	11.13	-0.13	-1.11
OTC	21.75	5.25	Chips & Technologies	10.50	0.00	0.00
OTC	54.25	28.00	Intel Corp.	54.25	6.00	12.44
NYS	13.00	5.13	LSI Logic Corp.	9.75	0.75	8.33
NYS	18.13	6.75	Micron Technology	18.00	1.00	5.88
OTC	20.25	7.25	MIPS Computer Systems	20.13	0.38	1.90
NYS	88.38	45.75	Motorola Inc.	62.25	6.50	9.62
NYS	8.63	3.00	National Semiconductor	8.00	0.63	8.47
NYS	46.88	22.50	Texas Instruments	45.88	4.38	10.54
OTC	12.25	3.00	VLSI Technology	10.88	1.13	11.54
ASE	14.88	4.00	Western Digital Corp.	4.88	-0.25	-4.88
Peripherals & Subsystems						Up 5.53%
OTC	1.38	0.09	Alloy Computer Prod.	0.88	0.38	75.00
OTC	2.50	0.88	Apertus Technologies	2.50	0.19	7.92
OTC	24.00	7.50	Barclac Inc.	11.75	-1.50	-11.32
ASE	11.50	4.13	Cognitronics Corp.	11.50	0.75	6.98
NYS	31.25	14.63	Conner Peripherals	26.25	2.38	9.95
ASE	22.00	7.50	Datatrom Corp.	10.75	0.38	2.38
OTC	11.88	4.25	EMC Corp.	11.88	0.25	2.15
NYS	47.25	33.75	Eastman Kodak Co.	41.50	-0.88	-2.09
OTC	10.88	4.38	Emulex Corp.	10.63	1.38	14.88
OTC	34.50	14.00	Evans & Sutherland	20.00	-1.00	-4.76
OTC	6.50	3.75	Iomega Corp.	5.88	-0.25	-4.21
OTC	28.25	6.75	IPL Systems Inc.	23.25	0.00	0.00
OTC	1.63	0.13	Maxstor Systems	1.63	-0.69	-8.36
OTC	17.00	2.63	Maxtor Corp.	8.50	0.25	4.76
OTC	17.75	4.38	Micropolis Corp.	17.25	3.75	28.79
NYS	93.75	73.63	3M Corp.	89.50	-0.13	-0.14
OTC	14.50	6.00	Prime Corp.	8.50	0.25	2.70
NYS	33.63	8.50	QMS Inc.	23.63	0.88	3.85
OTC	27.25	12.38	Quantum Corp.	25.88	1.75	7.25
NYS	8.25	4.38	Recognition Equipment	5.88	0.00	0.00
OTC	9.88	4.00	Reson Inc.	9.88	0.38	3.95
OTC	19.75	9.63	Seagate Technology	19.75	1.00	5.33
NYS	38.75	11.00	Storage Technology	37.63	0.63	1.69
OTC	4.00	1.25	Tandon Corp.	3.44	0.13	3.77
NYS	25.63	11.63	Tektronix Inc.	25.63	1.13	4.58
OTC	0.63	0.16	Televideo Systems	0.38	0.00	0.00
NYS	58.25	28.00	Xerox Corp.	58.00	1.00	1.75
Leasing Companies						Off 2.35%
OTC	16.25	6.88	Amerilcon Inc.	15.00	-0.25	-1.64
OTC	4.38	0.31	Capital Associates	0.63	-0.06	-8.16
NYS	28.38	14.63	Comdisco Inc.	27.38	1.38	5.29
OTC	16.25	9.25	LDI Corporation	10.75	0.00	0.00
OTC	5.75	2.25	Safecom Inc.	3.75	-0.25	-6.25

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IBM Credit

FROM PAGE 1

IBM mainframe users lease, rather than buy, their machines, according to Framingham, Mass.-based market research firm Technology Investment Strategies Corp. As of early January, some 70,000 IBM customers had approximately 700,000 separate IBM assets, leases or loans from ICC, fueling the firm to $1.4 billion in 1990 revenue.

That track record, coupled with the stature of the IBM name and the subsidiary's ability to obtain low-cost financing based on its parent's credit rating, allows ICC to offer unbeatable deals to its users, said Moody's Investors Services, Inc. analyst Byron Walker.

However, it also arms ICC with the ability to bludgeon the competition and intimidate customers, according to many within the Computer Dealers and Lessors Association (CDLA), the trade organization that represents an estimated 80% of the companies that form the third-party computer leasing industry.

Users, too, have disparate views of ICC's power. Some feel strong-armed by the firm; others sense only a helping hand. "I've heard about all these wonderful deals that ICC offers, but I sure haven't seen any," said the information systems director at a Midwest-based industrial company who asked for anonymity. His firm has been an ICC lessee since IBM first opened its subsidiary's doors, he said — however, he added, that status will soon terminate.

The IS director at a large East Coast services firm, who also asked for anonymity, agreed. "IBM feels that every time they walk in here, we should open our wallets," he said. "Last year, an ICC manager told us flat out that if we weren't going to buy more new equipment, we wouldn't be getting the same amount of attention and service. I've never done business with any company that's that hard to do business with."

That is far from a universal view. "We don't see ICC as the Big Bad Wolf," said an IS executive at a large industrial corporation on the East Coast. In his recounting, ICC emerged "hard-nosed but fair. They always close [the deal]; they always have the money. It's a pleasure to deal with them."

There is nothing bashful about ICC's goals. "In a perfect world, we would like to have a very competitive financing program wrapped around every product IBM sells," said IBM Vice President Harry L. Kavetas, president of ICC since 1986.

Toward that goal, which Kavetas speculated the firm could reach within the next three years, ICC is currently expanding on several fronts.

The firm is about to escalate its activity in the 27 to 30 foreign countries in which it is present, partly through the International Customer Financing System ICFS. The system, an on-line financing support and administration software package, has been in development for two years under the aegis of ICC's IS department and will begin a multistage rollout in June.

ICC is continuing its aggressive push into the end-user leasing market, offering a panoply of standard and specifically tailored deals directly to commercial customers. This area currently accounts for some 80% of the firm's assets and approximately 90% of its profits.

The complementary area of channel financing — arranging finance packages in connection with the sale of products to value-added resellers — is now a billion-dollar business for ICC, Kavetas said, "and growing fast." Largely administered by an outside contractor, the channel business — estimated at 24% growth over the next year — has been brought back inside ICC during the past six months. "We wanted to put more of our own spin on it," Kavetas said.

In addition, he said, a massive Total Quality Management program currently under way at the company is aimed at tightening ties — electronic and otherwise — among ICC's management, employees and customers. The effort, Kavetas said, is expected to yield a marked decrease in the time it takes ICC to find out what it can do for IBM customers and the efficiency with which it does it.

That is just what ICC's competitors fear. The independent vendors who own a shrinking slice of the estimated $25 billion computer leasing industry widely believe that ICC's agenda includes the wholesale conquest of the third-party market.

Nothing has focalised this suspicion more than the recent round of lawsuits ICC fired off against third-party players early this winter. The firm accused leading independent lessor Comdisco, Inc. of cannibalizing IBM computers in the course of upgrades and reconfigurations done as part of subleasing deals. A week later, IBM-compatible memory vendors EMC Corp. and Cambex Corp. were served with similar suits.

The shots that ICC is taking at third-party firms could backfire, several analysts noted, if users begin to subscribe to the CDLA view of ICC and to fear the downstream consequences of tying their fortunes to a company that is on its way to virtually owning the market.

ICC president defends firm's motives, vision

ICC President Harry L. Kavetas held forth on issues most critically facing his company and the industry it is increasingly coming to dominate in an interview with Computerworld *Senior Editor Nell Margolis:*



Kavetas *says ICC is not targeting third-party vendors*

- "Sure, we want to compete aggressively with the third-party lessors. But the real strategic competition we're facing is IBM's competition. It's Amdahl, Hitachi, Apple, DEC, Hewlett-Packard that I really want to focus on when we're figuring out how IBM and ICC want to work together in this incredible marketplace."
- "Quality implementation is absolutely critical in a service company — even more so than in a manufacturing company. Manufacturing companies have other ways of differentiating themselves — capital investments, patents ... Service companies either satisfy the customers or they don't, based directly on the quality of their service. For us, quality isn't a matter of value added — it's a question of survival."
- "Some of our competitors are fond of saying that ICC will do anything to close a deal ... I can state categorically that ICC never makes a deal on which IBM does not expect to make a profit."
- "CDLA likes to make a big point of ICC's being unwilling to sit down and discuss things with them ... Right now, they seem a lot more interested in telling me how unfair it is that we have advantages they don't."
- "I'm not interested in going to a meeting to listen to somebody tell me how much of my business I ought to be handing over to them."

A head-on attack

In lawsuits against third-party companies earlier this year, ICC maintained that it is moving only to bar practices that rob it of its property and imperil its gilt-edged credit ratings. Stripping of IBM machines by other parties made it unable to account for computer parts, the company said.

Within the third-party and industry observer communities, the suits shone in a different light. "I am outraged by this attempt to spread fear, uncertainty and doubt in the marketplace," Comdisco President Kenneth Pontikes said.

"ICC is trying to control and dominate the computer leasing business," said W. Paul Fitzgerald, EMC chief financial officer.

After three suits in quick succession, Computer Dealers and Lessors Association (CDLA) President Kenneth Bouldin said, "it is now apparent that IBM and ICC intend a head-on attack on the industry represented by CDLA."

ICC's right to protect both its rightfully owned assets and its status as a secured borrower won widespread defense among third-party lessors and industry observers. Nonetheless, the perception persists of ICC and IBM using a defensible legal stance as a veil for threats against both competitors and customers that deal with ICC competitors.

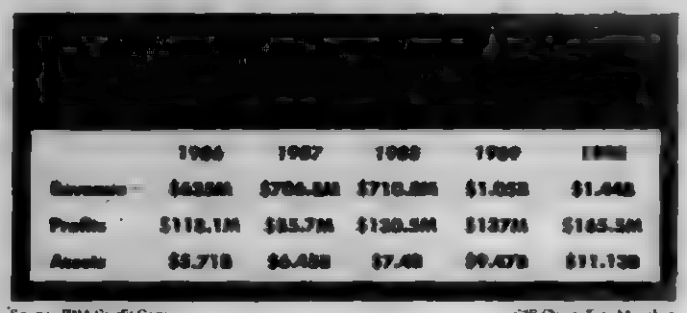
ICC's aggressive onslaught is likely to cast a chill on the third-party memory market, said Thomas Donovan, an analyst at Technology Investment Strategies Corp.

The quick settlement by Cambex Corp. — only weeks after being sued and on terms that financially amounted to total capitulation, albeit without admission of wrongdoing — showed that the chill is already setting in, Donovan said.

CDLA — whose members have voted IBM/ICC practices their No. 1 concern for three years running, according to Gartner Group, Inc. — plans to fight back. Prior to the filing of the suits, the association of leasing firms hired the New York-based law firm of Weil, Gotshal & Manges to scrutinize IBM/ICC behavior with an eye toward possible violations of the 1965 Consent Decree.

It has also been keeping the U.S. Department of Justice apprised of IBM/ICC ways and means that could be seen as curtailing free movement of IBM machines on the market.

[redacted]



	1986	1987	1988	1989	[illegible]
Revenue	$628M	$709.6M	$710.8M	$1.05B	$1.44B
Profits	$118.1M	$85.7M	$130.5M	$137M	$165.5M
Assets	$6.71B	$6.48B	$7.4B	$9.47B	$11.13B

Source: IBM Credit Corp. CW Chart: Tom Monahan

10 years of ICC

A giant is just like us — only bigger, much, much bigger.

— James Lapine and [redacted]
Into The Woods

- ICC was conceived on Jan. 23, 1981, when IBM finance director Al Shapero went before the IBM Corporate Management Committee to suggest that the company form a financing subsidiary to expand its debt capacity and boost its future financing capacity.
- ICC has financed some $42 billion worth of IBM-related transactions, earned $887 million after taxes and produced an average return on equity of just under 19%.
- How big is it? ICC's first instruction manual on how to prepare a term lease and fill out a lease supplement, published in 1982, was nine pages long. The 1991 edition is three inches thick. It is also available on-line.
- How times do change: The midrange gave ICC its start in leasing, an ICC manager said. In the firm's early days, he recalled, "the high-end guys were sort of, 'go away, we have our own leasing companies out there.' "
- Who was ICC's first leasing customer? St. Joe Lead, of St. Louis, Mo.
- Who was ICC's first lease renewal customer? St. Joe Lead.

NEWS SHORTS

Ergonomics committee emerges

Bob Bettendorf, president of The Institute for Office Ergonomics, Inc. in Stamford, Conn., formed a committee of users and vendors last week to study the link between cumulative trauma disorders and computer use. The committee's goal is to sponsor scientific research and provide companies with guidance on ergonomics and successful intervention strategies, said Bettendorf, formerly IBM's director of VDT ergonomics. Committee members include Aetna Life and Casualty Co., Bank of America, Cigna Corp., ITT Hartford Insurance Group, McClatchy Newspapers, Inc. and US West as well as major vendors.

Intergraph wins huge Navy deal

The U.S. Navy awarded a 12-year, $362 million contract to Intergraph Corp. last week to supply hardware, software and professional services for computer-aided design and manufacturing to support the design, construction and maintenance of Navy ships and shipboard systems. The Huntsville, Ala.-based firm will provide off-the-shelf gear, including 2,820 workstations, 450 servers and 11,000 mass storage devices as part of the Navy's $2 billion CAD-2 program. The Navy said it solicited 500 bids but received only two; the second was from the Computervision subsidiary of Prime Computer, Inc.

Sprint moves to ISDN on FTS-2000

U.S. Sprint Communications Co. announced it has begun Integrated Services Digital Network (ISDN) service for the federal government's Federal Telecommunications System-2000 telecommunications network. Multiagency government centers in Auburn, Wash., and Kansas City, Mo., are now linked for a six-month trial with FTS-2000 via ISDN, allowing the transmission of voice, data and video information over a single digital circuit. Sprint said the government's first ISDN application will be to provide agencies with more accurate and detailed usage, billing and cost data.

Defendant settles in Novell suit

The first of several piracy suits filed this year by Novell, Inc. was settled out of court last week. Reliable Data Systems, Inc. in Baltimore paid Novell an undisclosed sum and agreed to stop selling unauthorized versions of Netware. Reliable admitted "some mistakes" in incorporating aspects of the Netware network operating system in office automation software it designs for waste management firms, according to a statement from Reliable President Steve Baldwin.

Dust settles at The Sierra Group

A two-year ownership battle over The Sierra Group, Inc. ended last week with Alliance Development Corp. acquiring the Scottsdale, Ariz., market research firm. The Sierra Group has been at the center of an ownership struggle between cofounders Marty Gruhn and Merily Shinyeda. Gruhn left the firm 18 months ago but has returned in an overseer's role as executive vice president of Alliance. Shinyeda has left the firm.

Lotus Notes officially on Vines

The six-company beta test of Lotus Development Corp.'s bulletin board-like Notes application on Banyan Systems, Inc.'s Virtual Networking System (Vines) network resulted in a formal announcement last week: Notes will soon be available to all users of the new Vines Version 4.10, drawing OS/2 clients into the Vines environment.

OMG gets Objectwindows

Borland International, Inc. moved to position its development tools as de facto Microsoft Corp. Windows programming standards last week when it announced that Objectwindows — a graphical interface used in object-oriented programming — has been handed over to the Object Management Group. The international consortium of systems vendors, software developers and users will in turn make the Objectwindows specification publicly available to developers, group officials said.

IRS in need of technology help

GAO report claims computers could help track billions of tax dollars

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Wealthy individuals who fail to file tax returns by midnight tonight can sleep with little fear of being dunned by a computer system that is likely to zap less affluent nonfilers.

That was one conclusion of the U.S. General Accounting Office (GAO), which also found recently that the IRS could improve its computer matching to eliminate millions of expensive and troublesome false alarms — returns incorrectly flagged for underreported income.

The IRS estimated that nonfilers cost the U.S. Department of the Treasury $7 billion in 1987. Nonfilers are identified when income notices such as W-2 or 1099 forms fail to find a corresponding tax return in a computer match and subsequent notices mailed to the nonfiler fail to elicit a return. At that point, another computer system is used for modest-income nonfilers to calculate a substitute tax return and send notices showing estimated taxes, penalties and interest due.

However, high-income nonfilers are not assessed a penalty because the IRS feels their cases are likely to be so complex that a substitute return would understate taxes owed. Instead, agents in IRS collection offices try to resolve by mail or telephone those cases whose estimated tax yield relative to collection costs exceeds a certain threshold.

Cases below the threshold may remain inactive indefinitely. "We found nonfiler cases in the queue from tax year 1980 that may never be investigated because of their low estimated yield," a GAO report said.

doing another year's tax returns. It's too much trouble."

The GAO found that half of the 6.2 million suspected cases of underreporting pursued by the IRS in 1987 were "unproductive" — that is, taxpayers turned out not to owe more taxes. The GAO found that many of these unproductive cases could be eliminated through improved computer matching.

At a congressional hearing on the GAO findings last month, IRS commissioner Fred T. Goldberg Jr. said the IRS was implementing a number of the GAO's recommendations and would undertake others.

Goldberg said an automated underreporter project, to be tested at one service center this summer, will convert a "high-volume, paper-intensive manual process" into a paperless one in which all relevant information is available on line.

Tax facts

- More than 100 million U.S. tax returns are filed voluntarily by individuals each year. They are computer-matched against some 1 billion wage statements and other records of income.
- In 1987, 4.2 million people failed to file tax returns, which cost the U.S. Department of the Treasury $7 billion. The number of nonfilers jumped 25% between 1985 and 1987 and another 7% in 1988.
- Some 40,000 nonfilers in 1987 had incomes above $100,000.
- In 1987, 17.9 million filers were suspected of underreporting income, at a cost to the Treasury Department of $48 billion. The Internal Revenue Service investigated 6.2 million of these but found that in half the cases, taxpayers did not owe additional taxes.

Source: IRS and General Accounting Office — CW Chart: Doreen St. John

Based on samples of actual cases, the GAO estimated that referral of the high-income nonfilers to the automated returns program would yield $1,716 in tax revenue for every dollar of collection costs, whereas the present manual system yields $60 on average.

A GAO official who worked on the study said it was technologically feasible to do retroactive matching, but it would involve a considerable data processing effort. "And it's an issue of priorities," he said. "Two to four years later when these returns come in, they [IRS staff] are off

Encryption

FROM PAGE 1

government does, and it is unclear when that endorsement will come, said Sanford Sherizen, president of Natick, Mass.-based Data Security Systems, Inc.

The U.S. Department of Commerce's National Institute of Standards and Technology, charged by Congress to set a public key-encryption standard, failed to adopt a standard last September as it said it would and has not set a new date.



DEC participated in a meeting hosted by RSA in February to discuss the endorsement of RSA's system as a standard, said Steven Lipner, manager of the secure systems group at DEC.

Lipner said that he was uncertain when the group would endorse the RSA system as a standard but added, "I wouldn't be surprised if some proposed standard came out imminently." Bidzos said that announcement is likely to come within a matter of days.

Conventional data encryption is based on an algorithm that encodes messages by translating them into series of numbers. Only holders of the mathematical key can encode or decode a message. Public key-encryption uses two keys — one public, the other private. Data encrypted with the public key can only be decrypted by a private key. Using two keys also creates a kind of digital signature that can be used to prove the authenticity of message senders.

The RSA encryption system, invented by three MIT mathematicians, is widely considered to be the best available because the algorithm relating the two keys is so advanced that it is virtually indecipherable.

The endorsement of RSA's system could be a significant boost for the tiny company, which has 12 employees and annual sales of less than $5 million. There are no public key-encryption standards for the commercial world.

Encrypting data, while not difficult, is an extra step that some users are unwilling to take, according to K. Y. Chiu, director of customer services in the corporate MIS and telecommunications department at Motorola, Inc. in Schaumburg, Ill. "There is no question that a better system that is automatic is needed."

THE RSA ENCRYPTION system is widely considered to be the best available.

RSA has aggressively touted its system to vendors rather than attempting to market security products using its encryption system. "Encryption needs to be buried in the product to be safer, harder to tamper with and to be transparent to the user," Bidzos said.

NCR tone softening as AT&T hangs on

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — Executives on both sides of the front line of the AT&T battle for ownership of NCR Corp. expressed frustration last week at the ongoing delays for a resolution.

In an interview last week, NCR Chairman Charles Exley Jr. indicated AT&T has been unwilling to discuss sales figures or NCR's new products, such as the Document Management System, which is scheduled to be released tomorrow.

Despite the apparent lack of movement, Exley's tone has softened considerably. "Everybody wants to see this thing resolved, one way or another," he said.

Exley backed away from an earlier promise to slash AT&T products, such as its 3B2 line of minicomputers.



"EVERYBODY WANTS to see this thing resolved, one way or another."

CHARLES EXLEY JR.
NCR

"All those things in the real world would require pretty careful consideration," he said, adding that he thought a merger had a good chance of success if NCR's management team controlled the combined companies.

Exley reiterated his stand that $110 per share, or $7.4 billion, was the lowest price he would recommend to his board, while AT&T stands firm at $90 per share, with $100 its apparent upper limit.

Apathetic attitude

Exley also told *Computerworld* that he has been "surprised" by AT&T's position. Robert Kavner, AT&T's group executive for Data Systems/Federal Systems, acknowledged that "there seems to be a lack of intensity of meetings, which we're confused about.

"One of the only benefits I know of about this long delay is that we've been able to think through a lot of details about [merging the businesses]," Kavner said.

AT&T expected NCR to welcome negotiations after statements Exley made at NCR's annual meeting March 28, according to Kavner. Most analysts said they think the price issue will be resolved in as little as two weeks.

"I think [they're] very close [to a deal]," said Harvey Poppel, partner at Broadview Associates in Fort Lee, N.J., a mergers and acquisitions firm specializing in high-tech industries. "What you're hearing from Exley is sufficiently accommodating."

Dissenter in crowd

One analyst who disagreed is Peter Labe, chairman of Labe, Simpson & Co. in New York.

"AT&T is going to pursue this. If you start with that, I think it leads you down a trail to the question, 'What is the incentive to NCR to rush things?' The incentive is to wait until next year's annual meeting," he said.

Between now and then — barring a deal — is a June 10 federal court date in Dayton, Ohio, where AT&T's suit against NCR's poison pill defense is scheduled to be heard. The presiding judge will be U.S. District Judge Walter Rice, who struck down NCR's employee stock ownership plan last month.



Sam Pennisi

"ONE OF THE only benefits I know of about this long delay is that we've been able to think through a lot of details about [merging the businesses]."

ROBERT KAVNER
AT&T

Exley said he considers NCR's position in this case "a very strong one."

If he is right, NCR "would effectively be able to stall this for a year," said Maria Lewis, analyst at Cowen & Co. in Boston. If he is wrong, "it's over."

Final tallies from NCR's special and annual shareholders meetings were expected this week but are still being counted. Both sides said they think AT&T failed to oust NCR's entire board but succeeded in replacing the four directors up for re-election.

NCR will announce its first-quarter earnings today. Modest results are expected.

486SX

FROM PAGE 1

"But people are beginning to worry about underpowering their desktops. New applications like graphics, imaging and multimedia will need something more powerful than a 386," he said. The 486SX will meet this need.

Sources close to AST Research, Inc. and Everex Systems, Inc. confirmed that those two companies have machines ready to go, and others believed to be in a similar situation include IBM, expected to announce its machines the week of Intel's announcement; Compaq Computer Corp.; Dell Computer Corp.; and Advanced Logic Research, Inc.

"The 386DX will peak this year, and [the 486SX] will supplant it — it's a natural migration," predicted one analyst, who asked not to be named.

Analysts said most major vendors and many smaller ones will introduce 486SX-based boxes within two weeks of Intel's chip announcement. Pricing is expected to fall between $3,500 at the low end and $13,000 at the high end.

Sources familiar with the AST and Everex strategies said the companies expect to market their machines as desktop models on the AT bus. But at least one AST user scorned the desktop strategy.

"What am I going to do with a 486 on a single desktop?" said Enrique Crespo Jr., corporate manager of user computing services at The Torrington Co., a division of Ingersoll-Rand Co.

Other users, such as John Geyer, vice president and director of systems at Financial Guaranty Insurance Co. in New York, said they expect to fill a need for high-powered file servers.

"During 1991, people will want to upgrade to a 486, and given the current costs, it's difficult to do that," Geyer said.

William Tignanelli, vice president of the Federal Reserve Bank in Baltimore, said he has users asking for upgrades to a 486 now, and the 486SX "will make upgrades more feasible."

Not impressed

Other users are less impressed. "The 486SX realistically is a 386 with a cache," said Mike Drips, a senior strategist at a major communications company. "Personally, if I were going to the 486 level, I certainly wouldn't be getting a 486SX."

Analysts said they expect IBM to charge around $13,000 for a fully loaded SX box with 4M bytes of memory, a 320M-byte hard drive and its Extended Graphics Array video controller.

A source close to AST said the company would offer four desktop models based on the 486SX. Pricing has not been finalized, the source said.

All AST models will come with 4M bytes of memory, expandable to 16M bytes on the motherboard and 80M bytes total using external expansion.

Sources close to Everex said its two 486SX-based machines will run as fast as 13 million instructions per second under the High benchmark by Intelligent Devices. Everex will ship boxes standard with 4M bytes of memory, expandable to 64M bytes on the motherboard, and will leave video controller and hard drive decisions up to the buyer. Pricing has not been determined.

Intel riding high horse — for now

BY CAROL ROSSBRAND
CW STAFF

SANTA CLARA, Calif. — Microprocessor giant Intel Corp. posted record-breaking quarterly results for first-quarter 1991, exceeding analysts' expectations. However, shifting industry alliances could foreshadow future financial pressures.

Richard Whittington, an analyst at Kidder, Peabody & Co., said he expected that Intel was going to run into trouble from dark horse Advanced Micro Devices, Inc. (AMD) as well as the new consortium formed by the Mips Computer Systems, Inc./Microsoft Corp. reduced instruction set computing axis. "At both ends of the spectrum, I think Intel is going to have its profit margin competed down very dramatically," Whittington said.

"I THINK INTEL is going to have its profit margin competed down very dramatically."

RICHARD WHITTINGTON
KIDDER, PEABODY

He also said he expected Intel to maintain revenue for the next quarter or two, but it will "really take a tumble in the second half of the year," he added.

Revenue for the quarter totaled $1.13 billion, up 27% from the same period last year and up 8% from the fourth quarter of 1990.

According to Intel, its 80386DX, 80386SX and 1486 chips shipped in record volumes this quarter.

AMD also ran in the black, showing first-quarter sales of $274 million and returning to profitability from a fourth-quarter loss of about $43 million. The fourth-quarter loss included $6 million in severance pay resulting from personnel cutbacks.

The company pointed to belt-tightening measures and a strong new product mix as reasons for its renewed profitability.

Whittington said he expected AMD to continue its upward swing. "I think [AMD's clone] 386 chip is going to take a lot of unit market share and pricing away from Intel," he said.

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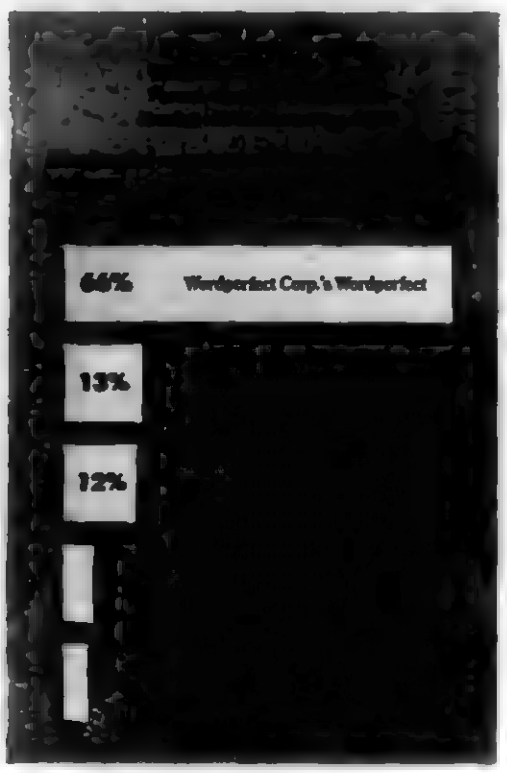
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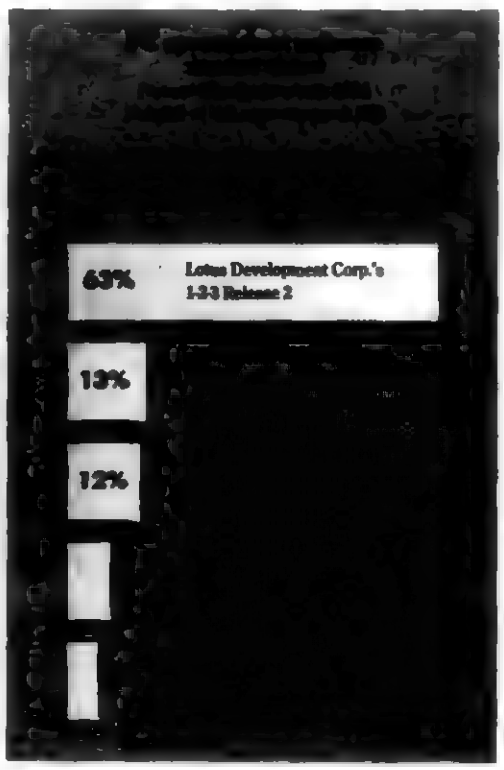
SOFTWARE

The old faithfuls, word processing and spreadsheets, are the primary applications purchased for PCs. As Windows-based versions become available, the rankings of current market leaders may change depending on acceptance and the ability to properly run Windows

(Percentage of packages purchased during a three-month period ending January 1991)







Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

How are IS departments managing the influx of **laptop computers?** There are many different approaches and many different issues, including purchasing, data security and insurance. Despite some headaches, most firms agree that laptops are not causing the upheaval that the PC revolution did in the 1980s. See Manager's Journal.



Gerlaux Weiland

Now that they have tried their new CASE packages, buyers of these tools have turned skeptical. The problem is that vendors cannot meet expectations as well as they raise them, especially when it comes to promises of integration, or "I-CASE." Find out the true meaning of this term and what you should ask before purchasing in Product Spotlight.

INSIDE LINES

Just how big is this market?

If you think the stakes in the RISC market aren't big, think again. In an effort to gain share of mind, both Sun and DG were scheduled to take to the airwaves Sunday in expensive campaigns to sell their wares. Sun's 30-second spot uses special effects to make viewers feel as if they are hurtling 100 miles per hour through the air in an action reminiscent of the air-scooter scene in *Return of the Jedi*. DG said last Friday that it was ready with a campaign that "stands apart for its clarity of message and avoidance of technical hocus-pocus." Yo, buddy, want some TCP/IP to go along with your burger and Bud?

Back on the bus

Just when you thought it was over, bus wars are back: Sources say Intel will introduce a new Extended Industry Standard Architecture chip set on April 22 as a tagalong to its 20-MHz I486SX announcement. According to the sources, the internal code name for the EISA II chip set is "Mongoose."

Ah, togetherness!

Just a few weeks after IBM and AT&T shook hands on a deal to integrate their respective network management platforms, IBM is expected to announce this week a similar alliance with HP. Of course, IBM and HP got together previously to submit a distributed management system to the Open Software Foundation. The real question is when IBM and DEC will bury the hatchet. So far, the archrivals have only agreed to touch each other's systems by proxy through third parties.

If only we'd copyrighted the 'O' word

Is there any room left for another user advocacy group? Novell CEO Ray Noorda thinks so and has called for an Open User Recommended Systems (OURS) consortium. Long on ideals but short on specifics, OURS would create a cadre of users from such large industries as banking and aerospace, which would evaluate various multivendor networking setups and keep suppliers apprised of their needs. "We need to drive the industry to customer priorities," Noorda said. We didn't, of course, spoil the party by bringing up the disk mirror and global naming priorities Netware customers have long been awaiting.

Now leaving home without it

There's no love lost between American Express and AT&T. After signing up for Tariff 12 and other network services some time ago, American Express was less than pleased when AT&T became a credit-card competitor last year with its Universal Card. "They are not a supplier any more," said Al Crawford, executive vice president of strategic business systems at Amex Travel Related Services in Phoenix.

Don't honor thy boss

Although Jim Sutter, Rockwell International's vice president of IS, was on the selection committee, it was American Airlines' Max Hopper who nominated Rockwell Chairman and CEO Donald Beall for this year's Gartner Group/Conference Board Excellence in Technology Award. Perhaps Sutter knew that last week's award ceremony in New York would force Beall to cut short his Mexican vacation, which it did.

OK! Last mention of RISC this week . . .

DEC will bring out a new low-end workstation based on RISC technology at the end of this month. The new box will be priced at less than $10,000 and run at 15 MIPS or more, according to sources close to the company, and it will fit into the RISC-based Decstation line above the Decstation 3100.

Microsoft's Bill Gates took pains not to overstate his company's involvement in last week's Advanced Computing Environment party: "Don't exaggerate what I'm doing here. I'm going to go home today and buy two ice cream cones, and they'll say 'Bill Gates thinks ice cream cones to be the new dominant platform.' This whole thing is pretty noncontroversial." If you know what flavor he's standardized on, tip off News Editor Pete Bartolik at (800) 343-6474, send just the fax to (508) 875-8931 or send your licks over Compuserve at 76537,2413.

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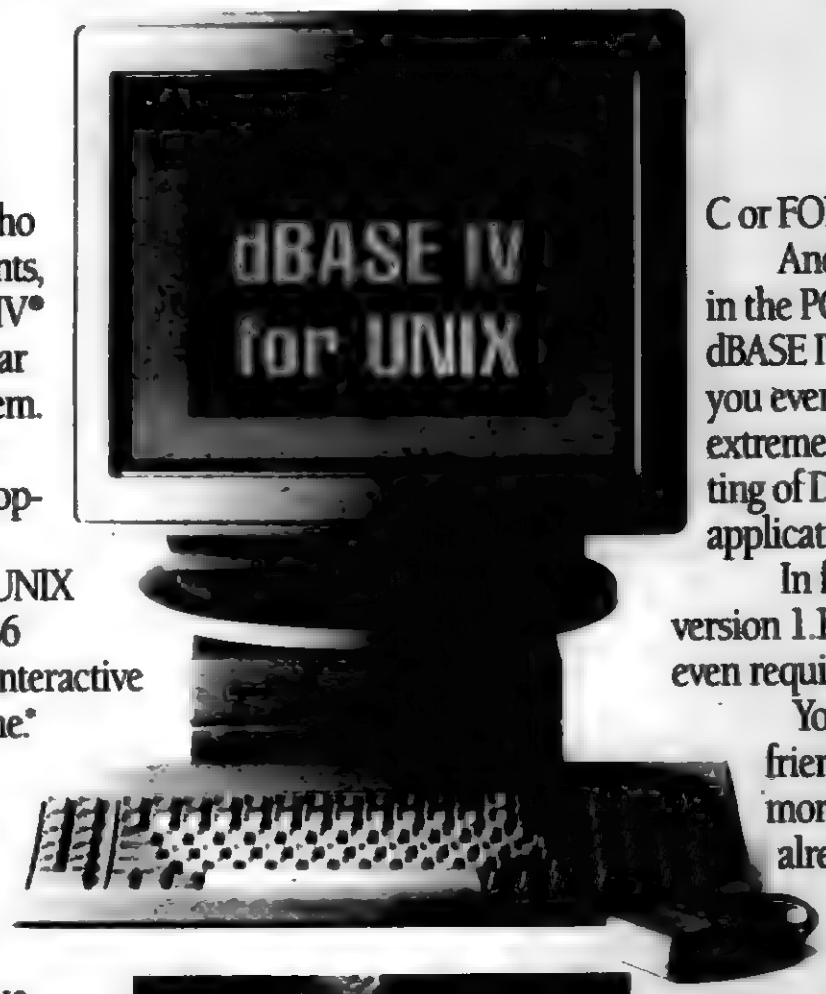
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COMPUTERWORLD

Compaq price cuts hit mark

BY RICHARD PASTORE
CW STAFF

HOUSTON — In cutting personal computer prices by up to 34% last week, Compaq Computer Corp. all but abandoned its long-standing premium pricing philosophy. Whether a price war will ensue remains to be seen, but many users are already captivated by this dramatic about-face.

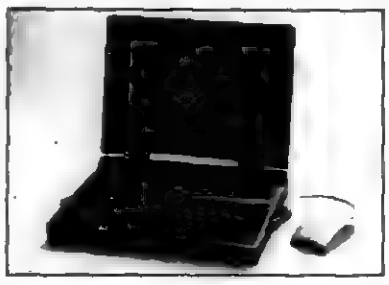
"I've never seen anything like this from a manufacturer before," said Stephen Rood, microcomputer technology manager at Coopers & Lybrand in New York.

Analysts said Compaq's premium pricing strategy is gone for the time being, a victim of increased competition, the commodity nature of the PC market and economic problems in the U.S. "With this pricing, Compaq is saying 'We're not special; we're a clone,'" said Joe McGlone, president of research investment firm McGlone & Co. in Westport, Conn.

Compaq's new pricing policy has one clear objective: to increase North American market share, said Ross Cooley, vice-president of Compaq North America. Compaq's future products will fall in line with the new pricing formula, he said.

Compaq's domestic market share has stagnated and declined slightly during recent months.

Continued on page 8



AT&T's Safari laptop *weighs in this week at 7 pounds, 2 ounces with an IBM VGA-compatible screen, a full-size keyboard and Microsoft Corp.'s Windows 3.0. Story, page 105*

Overhauled AS/400s to cross mainframe line

BY MARYFRAN JOHNSON
CW STAFF

A radically revamped line of IBM Application System/400s makes its debut today, topped off by a dual-processor machine equal in power to a low-end 3090 mainframe.

As a major reconstruction of the midrange systems first introduced in 1988, the AS/400 D models will replace every system in the current line and run an entirely new version of the OS/400 operating system. Performance boosts of 30% to 50% are expected, with prices so aggressive that in some cases, they may match or just slightly exceed the cost of current systems, according to users and analysts familiar with IBM's plans.

IBM is also expected to unveil the first piece of its Systemview network management capabilities for the AS/400 platform, with a product called SAA Systemview System Manager 400. It will allow users to distribute program fixes automatically to remote locations and will be of most interest to customers with large networks of AS/400s.

The addition of Systemview — introduced in September 1990 as part of IBM's Systems Application Architecture — will eventually give AS/400 users new abilities in monitoring and managing remote machines from the corporate data center.

"Systemview will be important to us because we have such a mixed environment — everything from two 3090 mainframes on SAA to distributed AS/400s to Novell networks," said Mike Hansen, director of

Continued on page 10

In with the new
The popularity of IBM's Application System/400 continues to increase as use of the older System/36 and System/38 declines

U.S. installed base

1/89	121,760	11,200
7/89	119,657	20,650
1/90	118,000	26,100
7/90	114,600	32,000
1/91	112,855	37,550

Source: Computer Intelligence

NCR bids to smooth imaging integration

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — NCR Corp. threw its hat into the imaging ring last week, emphasizing low cost, modular design and the ability of its Document Management System to be easily adapted to existing paper-based systems.

Although DMS has not yet been installed in customer sites, potential users were intrigued by the promise that it would work within traditional data processing environments, and analysts were impressed by its work-flow management software. This icon-based software allows users to track a specific document within the system and who has worked with it.

Another differentiating factor, analysts noted, is the proprietary character-recognition software that works with a variety of scanners. Later this year, NCR executives said, DMS will be able to interpret hand-printed numeric characters.

Based on NCR's System 3000 family of Unix processors, DMS allows users to convert paper to electronic form, store and process the images and distribute them throughout an organization. The system supports

Continued on page 104

Battered banks reappraising value of their IS investments

BY CLINTON WILDER
and JOHANNA AMBROSIO
CW STAFF

The information systems function of most large commercial banks in the 1980s was like a BMW: It was fashionable to spend a lot of money on it. In the recessionary 1990s, however, banking IS is a lot more like a sensible Honda.

From Boston to Miami to San Francisco, U.S. banks are struggling with the sins of their past in the loan business and in IS. After a 1990 fourth quarter that saw combined profits of the nation's top 54 banks tumble 90%, technology spending is being scrutinized as never before.

Banks are currently squeezing cost savings by consolidating data centers and deferring applications development.

"We're living in a new era now," said M. Arthur Gillis, president of banking IS consultancy Computer-Based Solutions, Inc. in New Orleans. "If you want to buy new technology, you damn well better bring your business case to the table."

If the sluggish economy was not enough to put more pressure on banking IS, banks are also facing unprecedented challenges from competitors outside the banking industry.

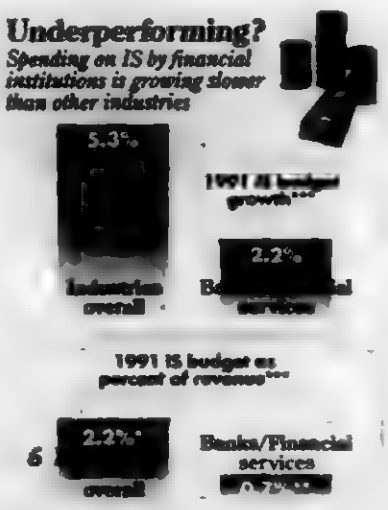
Visible competition

The AT&T Universal card and the Sears, Roebuck and Co. Discover card are the most visible examples of this new competition, which will increase as legislators further deregulate the financial services industry.

Even while watching IS expenses with a much keener eye,

Continued on page 103

Underperforming?
Spending on IS by financial institutions is growing slower than other industries



*Excluding banks/financial services
**IS budget as % of assets
***Projected

Source: Index Group, Inc.
CW Chart: Marie Haines

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INSIDE

CASE satisfaction
How would you rate your satisfaction with the product and vendor you use?

See Buyers' Scorecard page 72

Product	Score*
Texas Instruments, Inc.'s IEF	8.2
CGI Systems, Inc.'s Paclbase	7.5
Knowledgeware, Inc.'s IEW/ADW	7.2
Arthur Andersen & Co.'s Foundation	6.6

*Scores are based on 1-to-10 ratings where 10 is very satisfied.

CW Chart: Doreen St. John

OS/2 redux: Price cuts and promises anchor IBM's renewed bid to offset the move to Windows. Page 6.

Apple to read Windows 3.0 into lawsuit. Page 4.

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4 April showers may bring flowers but not for **IBM** this spring: Drooping profits may mean power plucked from its stem by strong contenders **Microsoft** and **DEC**.

6 Leader of the pack **HP** offers the RISC-based X terminal, destined to beat the slower crowd of CISC-based terminals in popularity.

12 Wait a minute, Mr. Postman: **Microsoft Mail** software is significantly costlier than the electronic mail package on which it is based.

14 More power to you: **Teradata**'s next generation database model generates two to three times the speed of the previous Model 3.

16 Music lovers can no longer mix and match favorite singles at record stores — innovator **Personica**' voice and supplies have dried up.

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105 Weighing the pros and cons of **AT&T**'s takeover of **NCR**, Comten networking product users tip the scales in favor of the proposed merger.

Quotable

"Apple has been hurt in the marketplace, so they're becoming more combative in the courtroom."

JIM POYNER
WILLIAM K. WOODRUFF

On Apple's plan to broaden its suit against Microsoft.
See story page 4.

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27 Everybody needs a little help from friends — even **DEC**, which has hooked up with two voice applications vendors.

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The 5th Wave



"LET ME GUESS - NO SURGE PROTECTORS...RIGHT?"

EXECUTIVE BRIEFING

■ **The slumping banking industry** is placing unprecedented demands on IS to do more with less. Even while cutting costs — sometimes through data center consolidations and outsourcing — banks are asking IS to play a key role in competing against non-traditional players such as AT&T and Sears. New systems must show a business benefit; banks' long romance with technology for its own sake is over. **Pages 1 and 103.**

■ **Compaq slashes personal computer prices** by up to 34%, apparently in response to slower sales in this year of cost-conscious IS. The cuts may not prompt a price war response by other PC makers, but they could signal the end of Compaq's role as the premium clone manufacturer. **Page 1.**

■ **Apple plans to target Microsoft's Windows 3.0** in an expansion of its 1988 lawsuit against Microsoft and HP. Apple says it considers the release to be a derivative product from the original Windows 2.03. Users expecting a drawn-out courtroom battle say they do not plan to shy away from Windows in the meantime. **Page 4.**

■ **Proliferation of laptop computers** is posing a dilemma for IS management. Many firms are placing laptop management in the hands of end users but making sure they don't lose control, as happened with PCs in the 1980s. **Page 55.**

■ **Microsoft and DEC post encouraging first-quarter results,** brightening the computer industry gloom and doom. Microsoft appears especially well positioned as 'the most powerful company in the industry,' in the words of one analyst. **Page 4.**

■ **Southwestern Bell taps** company veteran Ghyrane Davidson as its new head of IS. He replaces Kenneth Bender, who recently retired from the St. Louis-based regional holding company. **Page 55.**

■ **The burgeoning market for imaging** adds NCR to its lineup of vendors. At first glance, NCR's Document Management System earns high marks from users for functionality and price/performance. **Page 1.**

■ **AT&T is still balking** at the $110-per-share takeover price demanded by NCR, but recent jumps in AT&T's stock prices are fueling speculation that it may bid higher for NCR. Meanwhile, NCR shareholder vote tallies this week are expected to oust company Chairman Charles E. Exley Jr. from the board. **Page 105.**

■ **Signet Bank in Richmond, Va., plans to outsource** its IS operations to EDS. A deal is expected to be signed May 1. **Page 58.**

■ **Disaster recovery planning** and fault-tolerant systems have IS breathing easier at the Federal Reserve Bank in New York. The bank moved quickly to put its plan in place after its funds transfer system crashed twice in two days in 1987. **Page 31.**

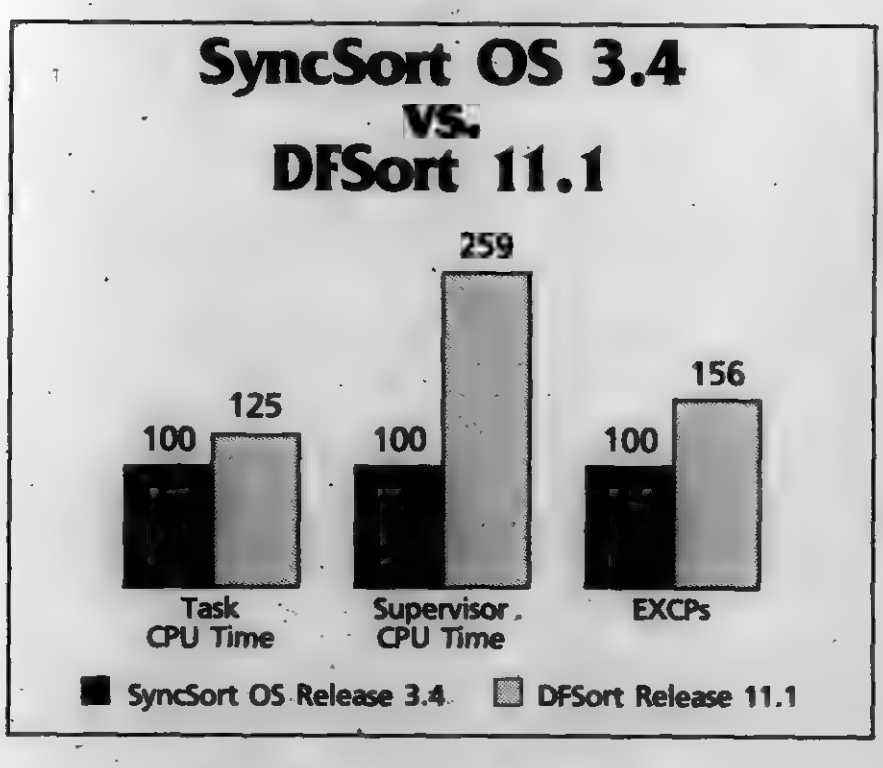
■ ***Computerworld Smithsonian Award*** **winner Personica** files for Chapter 11 protection. The developer of a system for making custom audiocassettes in music stores ran up against record companies concerned about royalty issues. **Page 16.**

■ **The ideal CASE environment** does not yet exist, but there are two approaches that come close: single-vendor tool suites and frameworks that integrate tools from other vendors. **Page 61.**

■ **Object-oriented technology** operates under different principles than those of traditional software development. Its object focus enables code reuse and ease of maintenance, helping companies get out from under a development legacy of tangled applications. **Page 79.**

■ **Checking employee references** is an integral part of the IS hiring process, but it comes with its own set of problems. It is a time-consuming task that can brush up against legal privacy issues. **Page 88.**

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Spring profits bringing upbeat outlook

BY NELL MARGOLIS
CW STAFF

Industry observers saw a grim spring ahead for the computer industry after IBM said last month it would not meet profit expectations. But stellar financial results posted by Microsoft Corp. and encouraging signs from Digital Equipment Corp. last week produced a distinctly more upbeat forecast.

Analysts reading between the lines of last week's earnings reports predicted power shifts and price wars — a bonanza for users — in the low-end market and a reemergence of strength at the high end.

Redmond, Wash.-based Microsoft's 65% profit leap over last year's third quarter surpassed Wall Street's most optimistic expectations. The company said it made $123.8 million in profits on revenue of $486.9 million, up 57% from one year earlier, for its fiscal third quarter ended March 31.

Regarding the Microsoft situation, analyst David Bayer at Montgomery Securities said, "Users are clamoring for graphical user interfaces on desktop platforms."

Marc Schulman, an analyst at UBS Securities, Inc., said he sees Microsoft as more than a mere bellwether. "If power is measured by the ability to set [other companies'] agendas, then Microsoft, despite its relatively modest size, is now the most powerful company in the computer industry," he said.

However, Charlotte Walker, an analyst at Labe, Simpson, Inc., said IBM's renewed OS/2 push (see story page 6) will aim a formidable competitor at Microsoft's popular Windows 3.0 and MS-DOS. "While this won't be a death knell for Windows, we certainly could see a dampening of enthusiasm," she said.

An OS/2 comeback campaign, according to Walker, could help software firms with products well-positioned on OS/2 — for instance, Lotus Development Corp., Borland International, Inc. and, somewhat ironically, Microsoft.

Lotus reported a first-quarter profit of $7 million, down 71% from $23 million one year earlier, with revenue climbing 5% to $174 million. The company cited the steep development and marketing costs of expanding its product range.

The battle is not only on the software side. Struggling to bolster its unexpectedly sagging sales and goaded by Compaq Computer Corp.'s price cuts (see story page 1), IBM is widely expected to announce personal computer hardware price cuts of its own, Bayer said.

DEC reported an 8% increase in revenue to $3.5 billion for the third quarter, with profits increasing 368% to $116.6 million. Both numbers reflect the consolidation of DEC's recently acquired 65% stake in German technology firm Mannesmann AG.

DEC's software and service revenue was strong enough to fuel an overall revenue increase, despite an 8% to 10% drop in hardware sales. DEC's nonhardware sales are growing at 16% annually, said Montgomery Securities analyst John B. Jones Jr. Moreover, "for the first time in recent history, expenses grew more slowly at DEC than revenues," he added.

The Midas touch

Microsoft Corp.'s growth continues at an intense pace

Quarter	Revenue (in millions)	Profits (in millions)
Q3 '90	$310.9	$75.2
Q4 '90	$337.0	$80.0
Q1 '91	$369.4	$87.6
Q2 '91	$460.5	$112.9
Q3 '91	$486.9	$123.8

CW Chart: Janell Genovese

Apple looks to include Windows 3.0 in lawsuit

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Apple Computer, Inc. is preparing to turn its legal guns on Microsoft Corp.'s Windows 3.0 by including the best-selling interface in a broadened version of its copyright infringement lawsuit against Microsoft and Hewlett-Packard Co., Microsoft officials said last week.

Although supplemental complaint papers have yet to be filed, William Neukom, Microsoft's vice president for law and corporate affairs, said Apple general counsel Edward Stead told him Apple will seek to widen the scope of the suit to include Windows 3.0. Apple sued Microsoft and HP in March 1988, claiming that the overlapping windows and icon manipulation screen features in Windows 2.03 and HP's New Wave, which is based on Windows, violated Apple copyrights.

While Neukom called the potential additions "curious," Apple spokesman Christopher Escher said the lawsuit "was brought against Windows 2.03 and all derivative works, and we've always believed that Windows 3.0 was a derivative work."

Last month, Apple won a round in the courtroom drama when U.S. District Court Judge Vaughn Walker rejected Microsoft's contention that the visual elements in dispute were part of a 1985 cross-licensing agreement with Apple. The ruling cleared the way for the case to go to trial, which is expected in the next few months.

Several analysts said the runaway success of Windows, which has sold more than 3 million copies since its release last May, has come at the expense of Macintosh sales. "Apple has been hurt in the marketplace, so they're becoming more combative in the courtroom," said Jim Poyner, an analyst at William K. Woodruff & Co., a research firm in Dallas.

Potential threat

If Apple prevails, it could squeeze large royalty payments out of Microsoft or even halt sales of the current version of Windows 3.0, spurring Microsoft engineers to rewrite major portions of the application.

Legal experts noted, however, that an addendum to the charges may not be permitted. "At this late stage in the game, such an amendment is far from a sure thing," said Ronald Abramson, an intellectual property lawyer at legal firm Hughes Hubbard & Reed in New York. He added that changes would likely be allowed only if they did not introduce major new legal or factual issues to the case.

The potential ramifications of the lawsuit have made it the most closely watched litigation in the personal computer industry, but users said the battle has not affected their acquisition plans. "These courtroom dramas take so long that until I see a ruling saying Microsoft is going to recall Windows, I'm not worried," said Robert McPhee, a senior engineer in the imaging system department at Du Pont Co.

Observers noted that the case could drag on for years. A final court ruling could be one year or more away, and a lengthy appeals process is likely to follow, Abramson said.

CORRECTIONS

A story headlined "IRS accuses Fujitsu units of tax fraud" [CW, April 1] contained several inaccuracies that resulted from translation problems and a misunderstanding between a reporter and a Fujitsu Ltd. spokesman. The story incorrectly stated that the Internal Revenue Service had accused two U.S. subsidiaries of Fujitsu of tax evasion and had imposed penalty charges against them. In fact, the IRS has not alleged any willful misconduct by the Fujitsu subsidiaries nor has it imposed penalties beyond back tax liability and interest charges.

The story was based on a newswire report distributed in both Japanese and English by the Nikkei News Service in Japan. The Nikkei reports apparently differed in the language they used to refer to the IRS filings, with the English-language version specifically citing allegations of tax evasion and imposition of penalty charges. An IDG News Service reporter confirmed the Nikkei story with a Fujitsu spokesman. However, the spokesman later said he confirmed only the Japanese version of the story, which did not mention any IRS allegations of misconduct.

.....

The Sematech technology consortium is still very much alive. Our April 15 editorial incorrectly stated otherwise. U.S. Memories was the consortium that went out of business last year.

.....

A headline in last week's News Shorts column [CW, April 15] incorrectly implied that Compaq Computer Corp. would not attend Comdex/Fall '91. As the item indicated, the company will dispense with its floor booth but will maintain its meeting room space for press conferences and vendor demonstrations.

.....

RDI Computer Corp. is located in San Diego, not in Dallas, as was previously reported. The firm produces Softmac 1.0, software that emulates Apple Computer, Inc.'s Macintosh operating system on workstations using Sun Microsystems, Inc.'s Scalable Processor Architecture.

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Stability key to OS/2 users

BY PATRICIA KEEFE
CW STAFF

NEW YORK — A funny thing happened on the way to the IBM OS/2 forums last week. While IBM stressed 32-bit-enabled functionality and dramatic pricing options, enthusiastic users cited the promise of a stable environment capable of supporting key business applications.

"The issue isn't price or 32-bit capability," said George Oliver, manager of information delivery technology at the Toronto-based Royal Bank of Canada. "It's a quality thing pitched against all the hassles with Windows."

"Windows isn't stable," agreed Bill Zack, a consultant at Leveraged Technology, Inc. in New York. If one Windows application goes down, the whole system crashes, he said. Data integrity built into OS/2 Version 2.0 will protect both the operating system and other applications from crashing neighbors. That capability was demonstrated last week.

"Windows is a stable product," protested Steve Ballmer, Microsoft Corp.'s senior vice president of system software. "Like any other product, over time, people will find bugs."

OS/2 has better memory protection than Windows does, but Microsoft will address this in some release after Windows 3.1



IBM's Reiswig: *IBM learned its lesson from having to fix two quality problems with OS/2 1.3*

ships, he said.

Ballmer also cautioned IBM. "I want OS/2 2.0 to be great, but it will need time to really get beta-tested and used," he said. "I hope IBM doesn't rush 2.0."

Microsoft need not worry, said Lee Reiswig, IBM assistant general manager of programming. He said IBM learned its lesson from the "terrible trauma" of having to correct previous OS/2 quality problems with the IBM-built OS/2 Version 1.3

Users and consultants who attended daylong briefings on IBM's desktop strategy were mostly enthusiastic about the star of the show — OS/2 2.0, slated to ship late this year.

IBM stressed that users will be able to run their desktop software investment, including Windows 3.0, unmodified under an attractively priced, 32-bit system.

But the bottom line for accounts such as the Royal Bank is that they can finally port mission-critical applications to "a true, architected" operating system, Oliver said. "OS/2 2.0 is everything OS/2 1.0 should have been from the start," said John Dunkle, a consultant at Workgroup Technologies, Inc. in Hampton, N.H.

The ability to run Extended Edition on non-IBM hardware opens the door to cost savings at OS/2 accounts previously hesitant to buy clones.

It could also hurt IBM hardware sales at the same time it works to bolster OS/2 acceptance, said John McCarthy, a consultant at Forrester Research, Inc. in Cambridge, Mass. "This really opens up Fortune 1,000 accounts to clone makers," he said. But IBM Vice President James Cannavino predicted, "From '90 through '91, we will, at minimum, hold market share."

Besides demonstrating 16-bit DOS and Windows applications running under OS/2 Version 2.0 at speeds faster than possible in their native environments, IBM announced aggressive price cuts.

Operation OS/2

Goaded into action by anxious users and skeptical developers, IBM went on the OS/2 offensive last week, unveiling a multipart strategy for recapturing the desktop mind-set.

The strategy to boost acceptance of the operating system includes the following:

- Cutting the cost of OS/2 Version 1.3 Standard Edition from $340 to $150 and OS/2 1.3 Extended Edition from $830 to $690. IBM DOS users can upgrade to OS/2 1.3 for $99 and to Extended Edition for $835.
- A free upgrade to OS/2 Version 2.0 for customers who buy either OS/2 1.3 Standard or Extended Editions between April 17 and Dec. 31.
- The promise of running Windows software under OS/2.
- Announced support for OS/2 2.0 and the unbundled Extended Edition components from hardware vendors Compaq Computer Corp., Olivetti Systems & Networks and Tandy Corp.
- Pledges to port applications to OS/2 2.0 from Hewlett-Packard Co., SAS Institute, Inc., Bachman Information Systems, Inc., Intelligent Environments, Inc., Knowledgeware, Inc., Corel Systems Corp., Describe, Inc., Ventura Software, Inc., Metaphor Computer Systems, Inc. and others.

PATRICIA KEEFE

HP first to put RISC factor in X terminals

BY J. A. SAVAGE
CW STAFF

Last week, Hewlett-Packard Co. became the first major vendor to offer reduced instruction set computing (RISC)-based X terminals, according to analysts.

The nascent X terminal market, which Eileen O'Brien, an analyst at International Data Corp., estimated at only 64,000 units worldwide last year, is primarily complex instruction set computing-based. Basing the terminals on an embedded RISC processor increases power and is likely to become the norm for the market, analysts said.

An X terminal offloads display processing from a central processor, which runs applications. HP's X terminals are supported through its Unix-based workstations or other workstations through Transmission Control Protocol/Internet Protocol or Telnet protocols.

HP's terminals, called the HP 700/RX family, use Intel Corp.'s 1960 embedded RISC processor.

"An HP processor would be overkill in this situation," an HP spokesman said. Analysts said that an X terminal coming from IBM will also use the I960. Earlier X terminals from HP used Motorola, Inc.'s 34010 chip.

The X terminals range from $2,995 for a Model 19MI monochrome station, which the company claims has a speed of 60,000 Xstones, to $5,995 for a Model 19CA with a color monitor and a performance rating of 75,000 Xstones. An Xstone is an indication of the speed at which X commands are executed.

X marks the spot

X terminals are carving out a noticeable share of the terminals market

Percent of U.S. Shipments

Year	Low-end terminals	High-end terminals	X terminals	Total shipment (in millions)
1989	58.0%	41.7%	0.3%	2.70
1990	57.8%	41.6%	0.6%	2.85
1991*	58.6%	39.1%	2.3%	2.97
1992*	59.7%	36.4%	3.9%	3.01
1993*	57.1%	32.9%	6.3%	3.02

*Projected

Source: Market Intelligence Research Corp. CW Chart: Janell Genovese

IBM taps HP's Openview for Unix strategy

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM has announced plans to use pieces of Hewlett-Packard Co.'s Openview technology to fill a yawning gap in its Unix network management strategy.

IBM has licensed portions of the Openview technology from HP and is planning to implement them on an AIX-RISC System/6000 network management platform, although no time frame was offered for a specific product. The platform will initially manage AIX and some HP-UX workstations, said Bill Warner, IBM's director of network management.

IBM will base its Openview system on its Systems Application Architecture data structure and user interface, according to Warner.

This will provide consistency and easier integration between the Unix system and other IBM management platforms, such as Netview and the OS/2 Extended LAN Network Manager, Warner added.

Unix connection

IBM's Openview product plans mesh with the needs of companies that combine a strong IBM host installation with a growing base of distributed Unix systems, said Don Czubeck, president of Gen2 Ventures, a research firm in Saratoga, Calif. "Some departments don't have any IBM hosts at all, and IBM doesn't want to be left out," he added. In addition, Unix-based systems are more suitable for the emerging generation of distributed, graphics-based network management applications, Czubeck said.

One likely customer of IBM's Openview system is Deere & Co. The company uses Netview to manage its Systems Network Architecture host network but has searched in vain for an effective platform to manage its Transmission Control Protocol/Internet Protocol worldwide network of Unix workstations, said Tom Hein, the firm's manager of technical support.

Providing integrated management has become crucial to Deere since it became dependent on Unix-based production applications that are distributed to factory sites, Hein said. "We have applications that run on both environments that have to work together," he added.

Still in question, however, is whether IBM will expand the Openview product's role beyond the departmental local-area network niche to the management of enterprisewide networks, Ernst & Young partner David Passmore said.

Warner left open the possibility that the Openview-based system could be used as an enterprise management system. Its scope would be limited only by the RS/6000's capacity, he added. However, IBM is far from determining the system's ultimate role, Warner said. It will act as an element manager that can feed Unix LAN management data and alerts to IBM's central Systemview and Netview platforms, he added.

The road to Openview

IBM became acquainted with Openview while working with HP on the two companies' joint submission of a Distributed Management Environment (DME) proposal to the Open Software Foundation (OSF), Warner said.

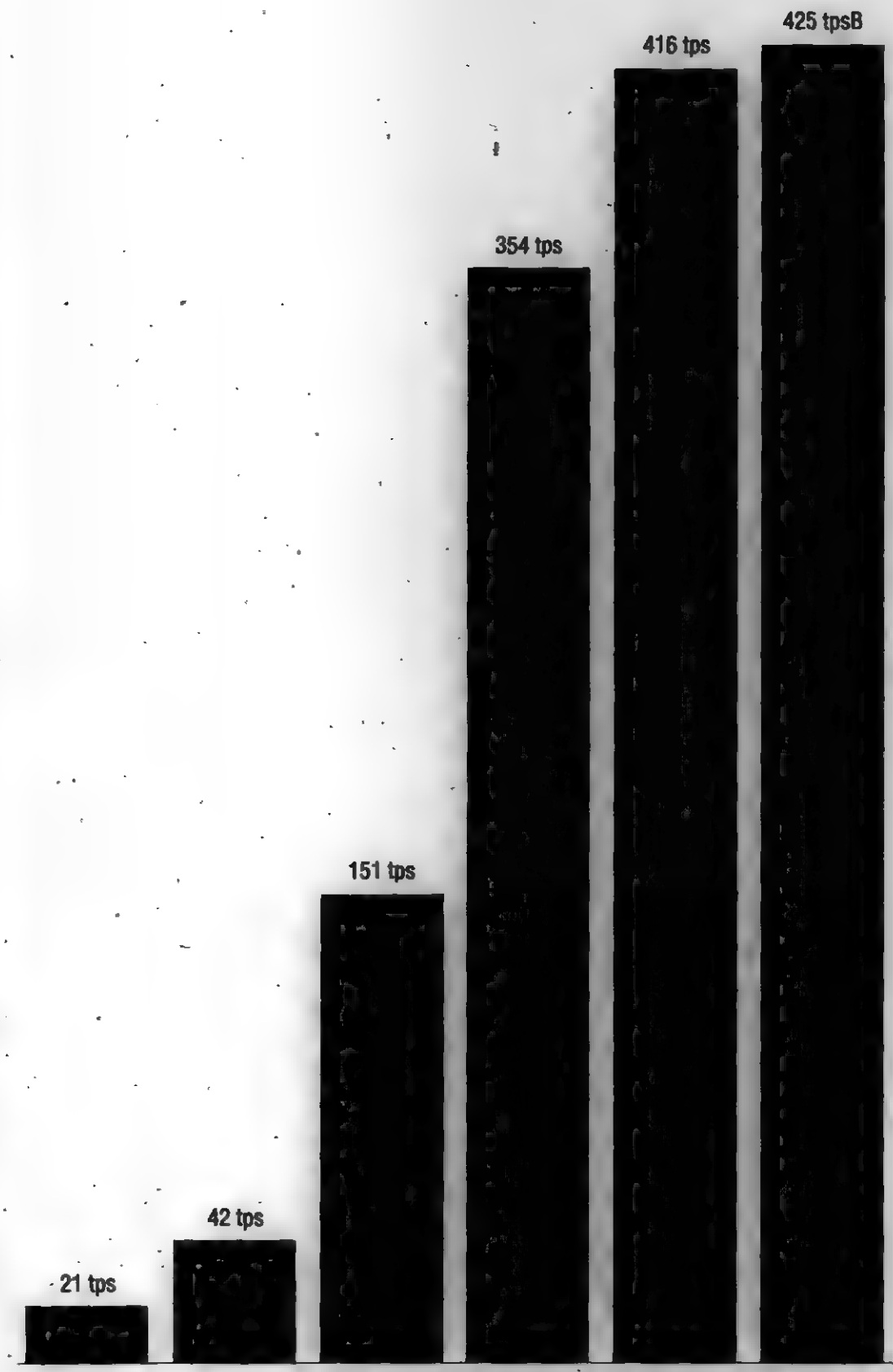
"It was a natural next step to look at Openview when we were looking at AIX network management," Warner added.

IBM will be pressured to grant its system full status as an enterprise management system if Openview becomes an official part of the OSF's DME architecture, Passmore said.

IBM will want to gain access to the broadening user and vendor base support that the system will garner as an official standard, he added.

Both IBM and HP have pledged to support DME, whether or not their technology is chosen by the OSF. However, IBM will find it harder to support the OSF platform if it is not based on Openview, Warner said.

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NEWS SHORTS

HP plans gallium arsenide chips

Hewlett-Packard Co.'s mainframe-class computer, slated to be out this time next year, is expected to incorporate gallium arsenide chip technology. The eight-processor reduced instruction set computing machine "will not necessarily be more powerful than IBM's mainframes, but it will be up there," said Richard Sevcik, general manager of HP's Commercial Systems Division. Being developed in conjunction with Hitachi Ltd., the computer will have four to five times the speed of current HP machines with a 1G byte/sec. I/O bus, according to Sevcik.

Multiuser CASE tool offered

McDonnell Douglas Information Systems International announced a multiuser version of its Prokit Workbench system for computer-aided software engineering (CASE) last week. The company, a division of McDonnell Douglas Corp., said Prokit Workbench Multiuser gives better project control and enables a software development team working on a network to use a common, integrated repository to improve performance and first-time software quality.

Panel probes FTS-2000

A congressional panel last week lambasted management of the federal government's huge communications contract, charging that the agency overseeing carriers AT&T and U.S. Sprint Communications Co. had wasted millions of taxpayer dollars by steering too much business to Sprint, the higher cost provider. John Conyers Jr. (D-Mich.), chairman of the House Government Operations Committee, also charged that the U.S. General Services Administration (GSA) caved in to Sprint's protest at the GSA's attempts to recover some $6 million to $11 million in alleged overcharges.

Micrografx signs up for OS/2

Joining the OS/2 development team is Richardson, Texas-based Micrografx, Inc., which inked a long-term joint development pact with IBM last week. Micrografx will assist IBM in boosting the speed and performance of the OS/2 Presentation Manager graphics engine. Using an "advanced" version of its Mirrors technology, it will also develop migration tools for porting Windows 3.0 applications and device drivers to OS/2 Version 2.0. In addition, Micrografx will develop a Presentation Manager device driver development kit and will provide device drivers for a new Adobe Systems, Inc. Postscript, matrix film recorder and other drivers for OS/2 Presentation Manager.

Computer dealers merge

The latest example of computer dealer consolidation has claimed Inacomp Computer Centers, Inc. and Valcom, Inc. The two firms announced a merger last week that should be finalized this summer. Both companies' directors and their stockholders will have roughly a 50-50 stake in the new firm, to be called Inacom Corp. The announcement closely follows the recent purchase agreement between Computerland Corp. and Nynex Business Centers and perpetuates a consolidation trend among major personal computer resellers.

Tandem plans PBX link

Tandem Computers, Inc. is expected today to announce a software product designed to directly connect its hosts to AT&T and Northern Telecom, Inc. private branch exchange (PBX) systems. Scheduled for release in the third quarter, Tandem Call Applications Manager was designed to support call-center applications such as customer service, order entry, reservations and telemarketing. For example, a customer's caller identification number can be used to access the customer's file on a Tandem host and send it to the terminal of the service representative that is picking up the call. The initial software release, slated for the third quarter, will support Northern Telecom's Meridian 1 and SL-1 as well as AT&T's Definity Generic 1 and Generic 2 and System 85 PBXs.

More news shorts on page 104

Do Compaq's price actions spell war?

ANALYSIS

BY RICHARD PASTORE and MICHAEL FITZGERALD
CW STAFF

Compaq's dramatic personal computer price cuts last week herald a pricing battle to come, many analysts and users said. Others reasoned that because of the niche strength of major clone vendors, the war may not be that bloody.

Clone makers have largely traded in on their ability to dramatically undercut the prices of first-tier players such as Compaq and IBM. Therefore, some observers predicted the cloners will be compelled to drop prices in response to Compaq's maneuvering and cuts IBM is expected to announce midyear.

If second-tier vendors do not continue offering large price differentials, users may see little advantage in buying their wares instead of Compaq's. "Any rational person would probably prefer a Compaq over anything else at that price just because the machinery runs so well," said Stephen Anderson, an information systems architect for the state of Washington. He spoke personally and not for the state.

"Dell Computer Corp. and PC Brand, Inc. will have to price accordingly, or they'll go out of business," predicted Compaq customer Andrei Chivvis, first vice president at Financial Guaranty Insurance Co. in New York.

It will be a tough pill to swallow, for some of the low-price PC vendors, however, which have less price flexibility. In January, for instance, Compaq enjoyed a 44% profit margin on its PCs. Everex Systems, Inc.'s margin was 26%, and Zeos International, Inc.'s was 19%, according to Ladenburg, Thalmann & Co.

The industry is also anticipating price drops because of this week's introduction of lower cost 1486 chips from Intel Corp. To position their product lines for these arrivals, vendors may be forced to cut prices on high-end Intel 80386-based boxes.

The most well established clone companies may not have to cut as deeply as less-established ones, some analysts said. Compaq's competitors have been carving their own market niches and establishing credibility, which could shield them from some of the pressures to cut.

"Dell, Advanced Logic Research and others have built credibility for their distribution strategies and their PC product families," said Tom Willmott, vice president at Aberdeen Group in Boston.

Most clone vendors shrugged off the price cuts. "This puts them more in line with IBM than with us," said Graham Beachum Jr., vice president and general manager at Tandon North America Corp.

"We're real happy with it. We thought it would be a lot more," said Kimball Brown, an Everex spokesman. "At the dealer level, it's only 5% or 10% less, so it's not a big deal."

Gravitational pull

Compaq Computer Corp.'s price cuts pull its product lineup into closer alignment with competitors

MODEL	PRICE
Dell Computer Corp. System 320LX*	$3,199
Compaq Deskpro 386S/20 Model 120	$3,299
AST Research, Inc. Premium Exec 386SX/20	$3,295
Compaq LTE 286S/20	$4,799
NEC Technologies, Inc. Powermate 286/12	$1,949
Compaq Deskpro 286N	$1,999
Advanced Logic Research, Inc. Powercache 33/4E	$14,499
Compaq Deskpro 486/33L	$12,999

CW Chart: Doreen St. John

Price cuts

FROM PAGE 1

Meanwhile, rivals NEC Technologies, Inc., Dell Computer Corp., Toshiba America Systems, Inc. and others have grown their domestic shares significantly, according to Storeboard/Computer Intelligence.

Early user reaction indicates Compaq may succeed in its goal. "If they provide [a] product to me at a very competitive price, they'll move me away from AST," said Mitchell Weiss, a partner at New York accounting firm Buchbinder Tunick & Co.

Weiss is a Compaq customer who recently strayed to AST Research, Inc. for some desktop purchases.

The heat is on

At the Baltimore Federal Reserve Bank, pressure has been mounting on information systems departments to buy cheaper clones. The new pricing will relieve that pressure, said Michael Ball, data processing coordinator at the bank.

The cuts could also boost order volumes from Compaq users.

"They'll pick up some business here; it will help us buy more equipment from them," Rood predicted.

Compaq dealers are already seeing positive customer reaction. Corporations with outstanding bids have quickly settled on Compaq after hearing of the cuts, said Ed Michelson, co-owner of a Computerland Corp. outlet in San Diego. "It made the clone competition go away."

Compaq's price shift comes none too soon, observers said. Because the disparity in pricing was "almost embarrassing," Compaq's status with major corporate clients was growing "tense," said Matt Fitzsimmons, owner of a Computerland dealership in White Plains, N.Y.

In addition to market factors, Cooley attributed the timing of the change to the economy, market slowdown, rising competition and the fact that Compaq's manufacturing infrastructure is now capable of handling higher volume production.

Observers cautioned that the discounts in list price will not likely transfer dollar for dollar to street prices.

Compaq has passed some of the profit margin squeeze off onto its dealers, which will receive lower vendor discounts. With margins tight already, "no dealer in his right mind will slash his street price the same percentage as Compaq slashed their retail price," Michelson said.

Many observers predicted a price war. "This foreshadows some very bloody days to come in the PC market," said Ben Rose, a senior analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Rose and others said they expect IBM to be the slowest to respond because it is insulated by its more diverse product line.

Is it a big deal?

Executives at AST and Northgate Computer Systems, Inc. downplayed the seriousness and potential impact of the price cuts. But others are taking it seriously.

"It's too early for us to take any action, but we've really got to look at [pricing] much more closely," Dell spokesman Brian Fawkes said.

Dell was slapped with a Compaq lawsuit in the U.S. last week that charged it with false advertising in its long-running price comparison campaign.

Wyse Technology said it hopes to avoid a price war but will respond if it feels pressure from other second-tier players. "It's going to be a hell of a year," said Ron Okamoto, director of product marketing.

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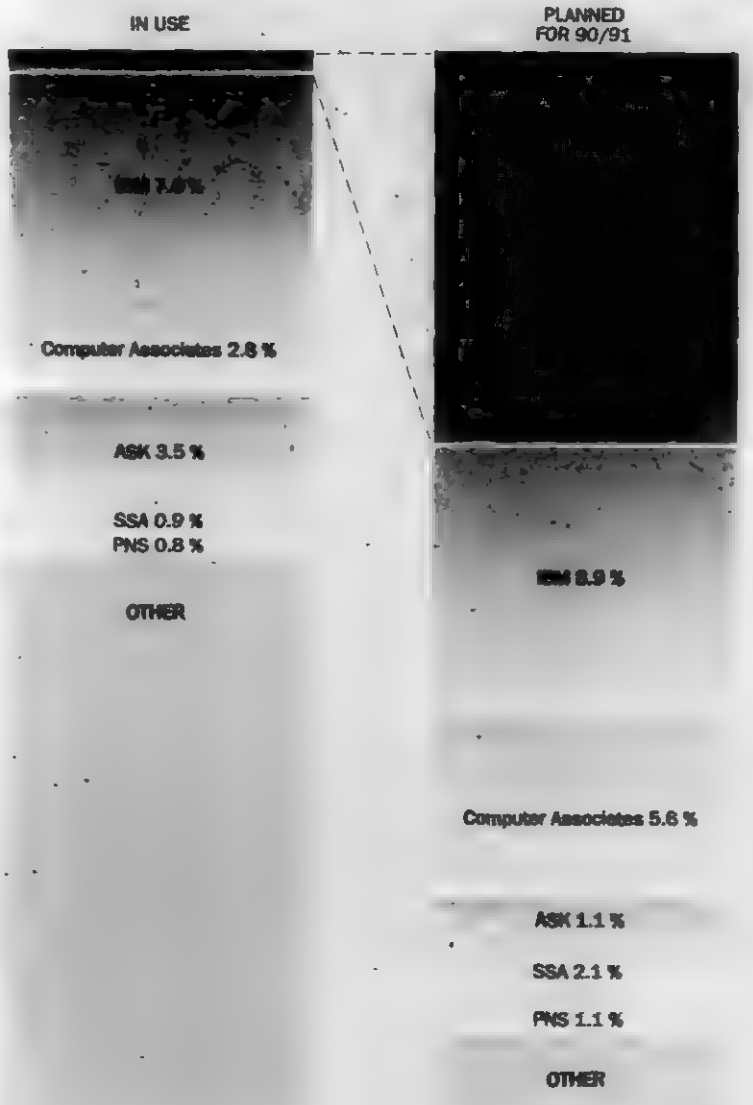
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AS/400

CONTINUED FROM PAGE 1

information systems at Chemical Waste Management, Inc. in Oakbrook, Ill. The company has 20 AS/400s at its headquarters, with another 20 located at other facilities and remotely managed.

Perhaps the greatest relief for capacity-strained users will be the arrival of the mainframe-power Model D80, reported to have 2½ times greater throughput than the present top-end Model B70.

The Model D80 equals an IBM 3090 Model 200 in capacity, communications ports, disk space, memory and internal I/O architecture, and it can handle a mainframe-style work load, said Teresa Elms, president of Elms Technical Communications in San Diego.

"IBM has completely refreshed the whole product line," Elms said. "They changed the processor technology, the internal packaging, everything."

Some things won't change

What will not change, however, is the ability of the D models to run all previous AS/400 applications and peripherals. While the D80 processor will not run any faster than the current B70 processor, analysts noted, the presence of two of them doubles the machine's work load capacity.

One company already in line for a Model D80 is Hills Pet Products, Inc. in Topeka, Kan.

"We need an upgrade pretty badly," said John Waetzig, manager of computer operations at Hills Pet Products. "We're looking at getting two D80s: one here and one in our distribution center in California."

Among several improvements to the OS/400 operating system, Waetzig said he is particularly interested in a "performance adviser" tool that analyzes machine performance and teaches users how to better tune their AS/400s.

"That is something really needed," Waetzig said. "On the B70s, tuning is a full-time job."

Batch processing has been another weakness of the AS/400, he added, but a dual-processor architecture should strengthen those capabilities.

Opening up AS/400

IBM is repositioning its premiere midrange Application System/400s as "full-range" systems and will start trumpeting a theme of "openness" for its proprietary line.

That does not mean there is a Unix operating system in the AS/400's future, however. Rather, it signals the arrival of more industry-standard open interfaces and development tools, improved C compilers and the ability to attach the AS/400 to multivendor networks.

Analysts who have been briefed on the new machines said IBM is anxious to move its profitable midrange line into a position where it can be hawked as an applications file [redacted].

"IBM does not want to position the AS/400 as a conventional local-area network server or data storage device for PCs. It's just not cost-effective," said Teresa Elms, president of Elms Technical Communications in San Diego. "They do want people to start thinking of it as an applications server for a network."

IBM will also be unveiling personal computer connectivity products, plus client/server and cooperative processing applications from third-party vendors. Synon, Inc. in Larkspur, Calif., for example, is expected to announce today an entry-level computer-aided software engineering tool for low-end AS/400s. The applications generator tool, which IBM will distribute, produces database design and native RPG applications with SQL generation.

The price and power of the D models are also expected to accelerate the migration of hordes of hesitant System/36 users into the AS/400 fold, said Carson Soule, president of Computer Applications Specialists, Inc. in Beltsville, Md. "System/36 users who were looking at having to spend $150,000 to move to an AS/400 will now be looking at $100,000 — and price is a key issue with these people," Soule said.

IBM will be rolling out a host of new or improved products for just about every nook and cranny of the AS/400, analysts said.

One example is the Programmable Input/Output Processor, which will allow users to attach foreign devices, such as electronic weight scales or radio frequency input programmers, to feed data directly into the AS/400 database.

"That would come in handy for us because we use radio frequency input for tracking waste materials through our facilities," said Mike Hansen, director of IS at Chemical Waste Management. "Right now, we host that through personal computer networks, but a direct interface for that kind of stuff to the AS/400 would be pretty neat."

MARYFRAN JOHNSON

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Microsoft beefs up E-mail package and price

BY JIM NASH
CW STAFF

REDMOND, Wash. — Network administrators surprised by Microsoft Corp.'s new electronic mail package might be suffering more from sticker shock than amazement with the product's speedy introduction.

One systems analyst estimated his company will have to spend three times the money for Microsoft's mail package compared with the Consumers Software, Inc. product on which it is based.

Microsoft announced last week the shipment of Microsoft Mail Version 2.1 for personal computer networks. A Microsoft spokeswoman said the software is the firm's first mail product for PCs and supports DOS and Microsoft's Windows. It currently markets Microsoft Mail for Apple Computer, Inc. Appletalk networks.

Microsoft Mail for PC Networks is a repackaged, debugged and repriced version of Consumer Software's Network Courier Version 2.1. Microsoft bought Consumers Software early last March to absorb the Network Courier line.

While few industry observers said they were surprised by the acquisition, some said they are uncomfortable with Microsoft's pricing strategy for Microsoft Mail. One systems analyst who participated in a beta test of the product said the price for a complete 100-user version of Microsoft Mail is about triple that of a comparable version of Network Courier from Consumers Software.

"We'll pay it," said the user, who requested anonymity, "but we'll be looking for much more support" from Microsoft. Microsoft Mail is being sold in two pieces. For $695, customers can buy a complete mail server and a single-user license. License packages for five, 20, 100 and 500 users are sold separately for $395 to $22,500. Free upgrades are available to licensed Network Courier users.

The user said Consumers Software packaged server components separately, but purchasing Network Courier for 100 users in the past meant an outlay of about $2,000. The same package from Microsoft will run $6,195 before taxes. In addition to better support, the source said he would like to see dynamic data exchange features that would allow text produced with Microsoft Word, for example, to be directly sent over Microsoft Mail. Right now, that is a two-step process.

Shane Kim, product manager for Microsoft Mail, said costs did not actually triple, given that many previous limitations on the software have been lifted. For instance, Kim said, Microsoft Mail supports many network operating systems, including those from Novell, Inc., IBM, Banyan Systems, Inc., 3Com Corp. and Microsoft. Previously, he said, customers had to buy Network Courier packages for each networking system.

Racal to unify by restructuring

BY JOANIE M. WEXLER
CW STAFF

SUNRISE, Fla. — Racal-Milgo last week confirmed a corporate reshuffling aimed at alleviating customer confusion and headaches in tapping its disjointed spectrum of networking products.

The expected reorganization of Milgo and siblings Racal Interlan, Racal-Milgo Sky Networks and Racal-Quanta, all owned by the $3 billion, UK-based Racal Electronics PLC, reportedly includes a 350-person layoff at Milgo during the next 30 days. The $300 million Milgo is known chiefly for its modems, multiplexers and associated network management systems.

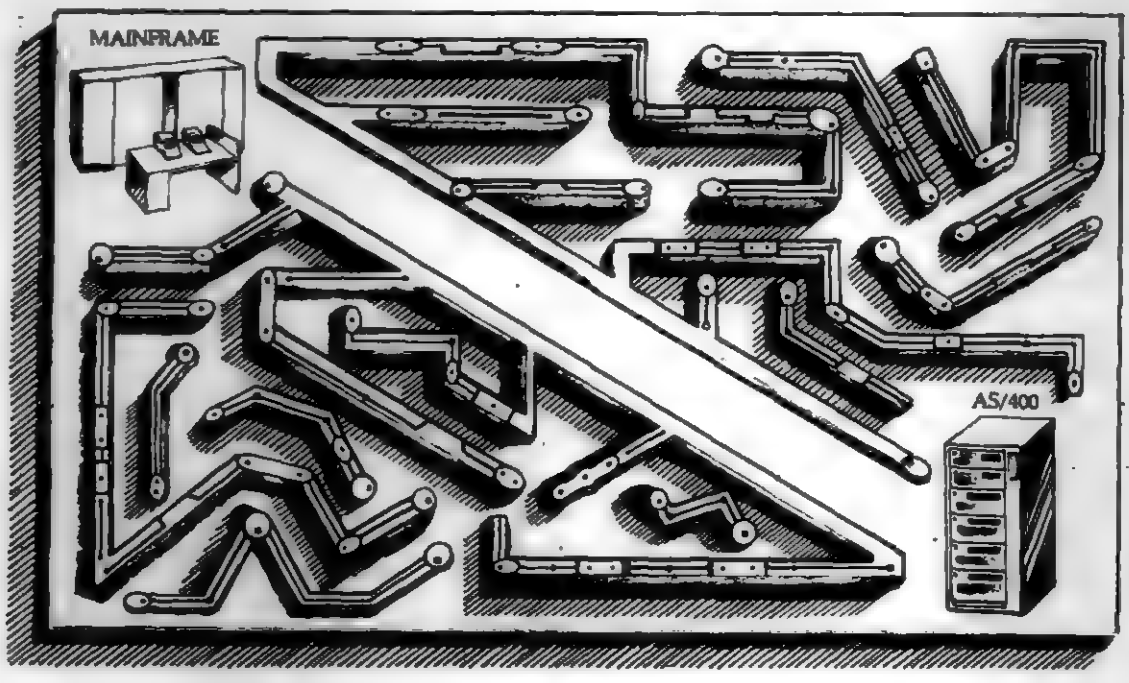
James K. Norman, president of Milgo and Racal Data Communications, U.S., said the 13% staff reduction is part of an effort to "pull together our acquisitions into a unified rather than fragmented" organization that addresses customers' growing needs for enterprisewide networking and one-stop shopping.

However, some industry observers said a Racal consolidation may not be as important to customers as new product development and a better understanding of the vendor's offerings.

Steven A. Taylor, president of Distributed Networking Associates in Greensboro, N.C., indicated that Milgo is hurting financially because the time-division multiplexer market is flat, and the company has yet to produce a new generation, frame-relay switch. "Frankly, I don't see a great deal of pressure from customers to one-stop shop. Users just want good equipment at good prices," he said.

Milgo customer Bill Conley, manager of information technology services at Loral Aerospace Corp. in Newport Beach, Calif., agreed: "I look to an AT&T, IBM or outside consultant for architecting my network. I then turn to Milgo and ask, 'What pieces can you supply?' "

Part of the reorganization already in effect is the replacement of Randy Phillips, president of Boxboro, Mass.-based local-area network company Interlan, by Robert A. Steinkrauss, formerly senior vice president of finance at Milgo.



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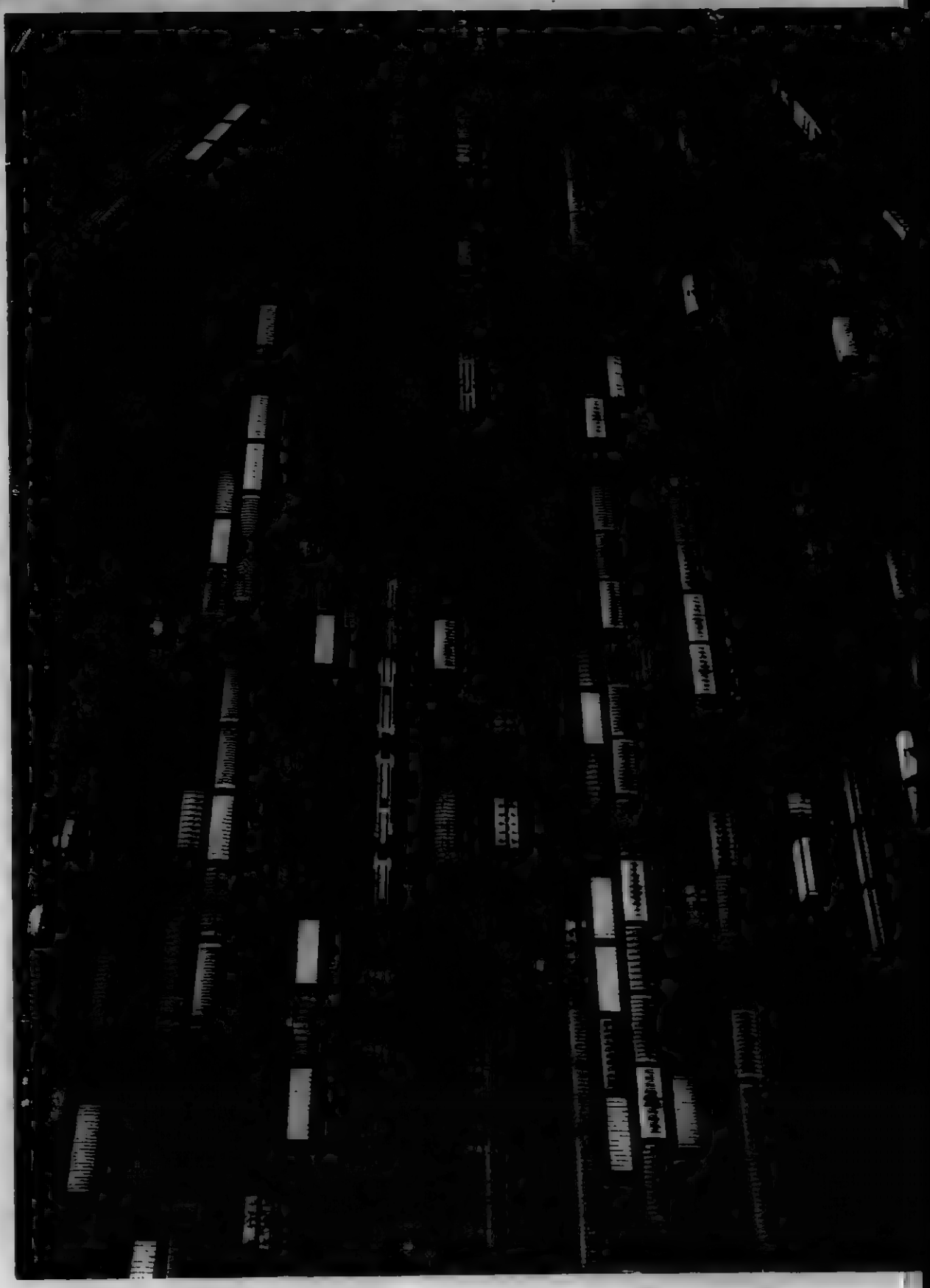
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Teradata to speed up CPU

BY JEAN S. BOZMAN
CW STAFF

EL SEGUNDO, Calif. — In New York today, Teradata Corp. is expected to announce a new generation of its DBC/1012 database computer — a Model 4 that will run two to three times faster than the 2-year-old Model 3.

Teradata Chief Executive Officer Kenneth Simonds, in a prepared statement, said the new database machine gives customers "a single-image database — one that handles the most complex queries while simultaneously performing batch and transaction processing." The machine, priced at $816,000 or more, is targeted at the largest Teradata sites.

Industry analysts said the firm has about 130 large sites, excluding sites gained in Teradata's 1990 acquisition of Los Gatos, Calif.-based Sharebase Corp., which makes smaller database machines.

The new Teradata computer replaces the Model 3's Intel Corp. 80386 microprocessors with more powerful Intel I486 chips. Each I486 is bundled with 256K bytes of cache memory and 8M bytes of main memory.

Teradata's Ynet communications architecture connects the multiple microprocessors, ranging from six to 300 per installed machine, into a cohesive parallel-processing computer. Theoretically, Teradata customers could connect up to 1,000 microprocessors, company sources said. Analysts reported that current customers have used configurations with up to 300 80386 processors.

Although Teradata claimed a threefold increase in processing speed over the Model 3, one industry analyst noted that customer applications are likely to run slightly slower than that.

"The benchmarks they've run on it show good performance improvements but just about what you would expect when you bump from a 386 processor to a 486 processor," said Roy Schulte, program director at Gartner Group, Inc.'s Software Management Strategies service in Stamford, Conn.

Other systems features, however, will boost overall performance, analysts said. Teradata improved I/O bandwidth and more than doubled the storage capacity of the system's disk drives from 1.2G bytes apiece to 2.5G bytes.

"They've increased engine speed threefold, but they've also made the I/O bus run five times faster," said Perry Harris, director of management strategies at The Yankee Group in Boston. Up to 16 of the new disk drives can be placed in a single Teradata cabinet, Harris said.

An upgrade package will allow some Model 3 buyers to swap out CPU boards, although the cost is cheaper if they have purchased the Model 3 since July 1990, Schulte said. A minimum configuration of the Teradata DBC/1012 Model 4 is priced at $816,000. Teradata sources said last week early users have already installed the Model 4 machine, including AT&T, Delta Air Lines and Koch Industries, Inc., a Wichita, Kan., oil refinery.

Schulte said more than one airline site plans to use the Teradata machine for capacity planning based on analysis of thousands of passenger records stored in the database "engine."

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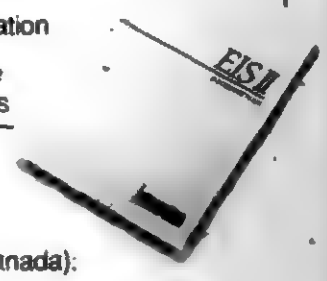
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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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DEC, Maspar join forces

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. and Maspar Computer Corp. in Sunnyvale, Calif., made it official last week that they will jointly market and develop software for Maspar's massively parallel systems.

As its first foray into the massively parallel market, DEC will resell Maspar systems worldwide and license some of its own patented software technologies to Maspar. DEC plans to tie the Maspar MP-1 systems, introduced in January 1990, into its VAX networks.

Supplying users with debugging and performance tools and producing compilers for the Fortran and C languages are also high on the work list, said Samuel Fuller, vice president of corporate research at DEC.

Customer interest

The company's decision to enter a niche market area — where annual revenue is still less than $200 million — was driven by customer interest, Fuller said.

"We have a set of major customers in the oil industry, government labs and research universities who want to integrate these massively parallel systems into their DEC systems," he added.

Massively parallel computers usually have 1,000 or more microprocessors and operate by spreading data across a large number of processors to work simultaneously, making them ideally suited for applications such as image processing, database searching, seismic data processing and other compute-intensive scientific work.

Although DEC has made a minority investment in Maspar, both companies are free to pursue other partnerships.

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IBM meeting to address South Africa again

Shareholder support has been growing for company to end all business ties with country

BY J. A. SAVAGE
CW STAFF

For the fourth year in a row, IBM stockholders will consider a proposal to stop all direct and indirect sales of computers to South Africa until apartheid ends.

The resolution, to be offered at the annual shareholders meeting in Kansas City, Mo., next week, has gained steady support from IBM employees and religious organizations, said James Leas, author of the resolution and a staff engineer at IBM's semiconductor plant in Manassas, Va. "I believe IBM's sales to South Africa strengthens white rule, adds to its military power and puts human lives at risk," he said.

IBM's response stated that apartheid is "morally repugnant," but that "responsible business activity and social programs carried out by American and other companies in South Africa have contributed to ending apartheid and creating a postapartheid economy and society."

In a proxy statement, holders of 87,750 IBM shares — endorsed by 554 employees from the U.S., Europe and Japan as well as 17 church groups — made their intent known to the company. Shareholder support has been steadily increasing, from 9.9% in 1988 to 17.2% last year.

Last week, the 12-nation European Community (EC) agreed to lift economic sanctions against South Africa, despite pleas from the African National Congress. The EC cited continuing government steps to dismantle apartheid. The Investor Responsibility Research Center, Inc. in Washington, D.C., however, pointed to continuing racist policies of the South African government, such as the black majority being prevented from voting.

IBM's sales to South Africa through a direct-marketing arm affect its ability to sell to local governments in the U.S., which Leas said presents the threat of more lost profits than the company stands to gain from South Africa. IBM estimated in 1986 that revenue from South Africa amounted to .05% of its income. "It has not been sized since then," an IBM spokesman said.

About 115 city, county and state governments have statutes prohibiting buying products from companies that do business in South Africa. However, some have construed that to mean that if a company sells through an arm's-length relationship, it does not violate local law.

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Audio innovator files Chapter 11

BY JOANIE M. WEXLER
CW STAFF

REDWOOD CITY, Calif. — Cold feet in the music industry have booted technological innovator and *Computerworld Smithsonian Award* winner Personics Corp. into Chapter 11 reorganization, according to company founder Charles Garvin.

Garvin said "industry acceptance" issues have forced Personics to withdraw its custom audiocassette recording systems from 250 retail stores throughout the country. Discomfort on the part of the record companies about the firm's innovative method of music delivery and its perceived potential for cannibalizing new album sales, he said, have caused the recording companies to cease supplying Personics with new music releases, drying up its business.

Personics won a *Computerworld Smithsonian Award* for technology innovation last year [CW, July 23, 1990] for developing a data compression-based system that allows customers to choose a custom repertoire of musical selections. Up to 90 minutes of music can be ported to an audiocassette from a compact disc-resident database in about 10 minutes.

Effects on sales

"The Personics system wasn't inhibiting my album sales at all; in fact, it was bringing in business," said George Mull, general district manager at Coconuts Music & Movies in Natick, Mass. Mull's Personics system had been in his store since it opened last June, and Mull described it as a low-maintenance system that he regretted losing.

Garvin said that Personics market tests in stores chosen by retailers showed no negative impact on album sales; rather, they showed an increase of about 39% in label and artist royalties, he said. Personics' arrangement with six major record companies entitled the companies and artists to "the richest royalties paid in the industry," he said.

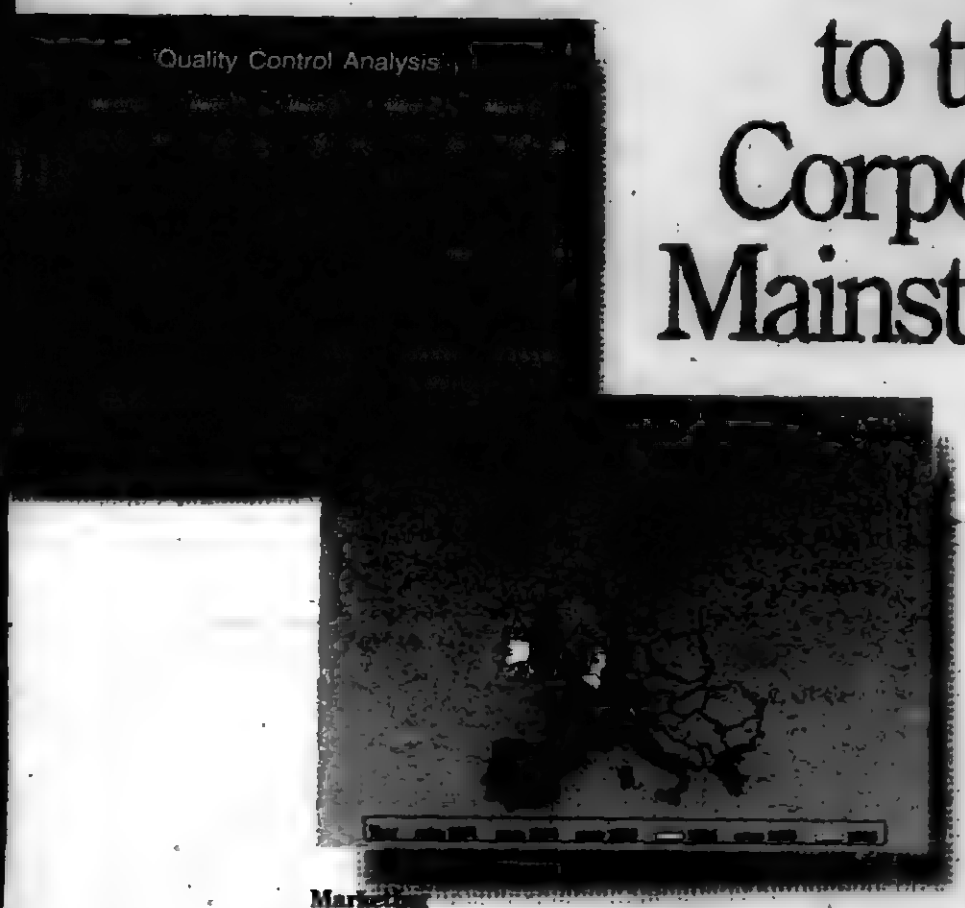
Garvin is currently ramping up a direct marketing campaign for selling customized tapes of the songs he has already licensed to an "oldies" audience. "Our experience is by no means unique," he said. "The entertainment companies were bitterly opposed to the home movie and cable television innovations in their day."

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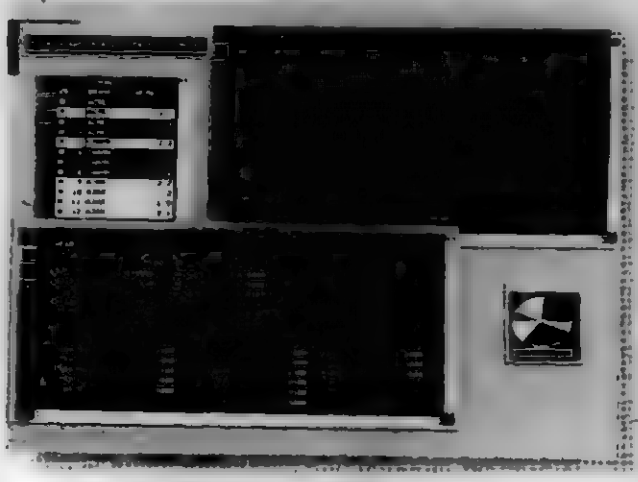
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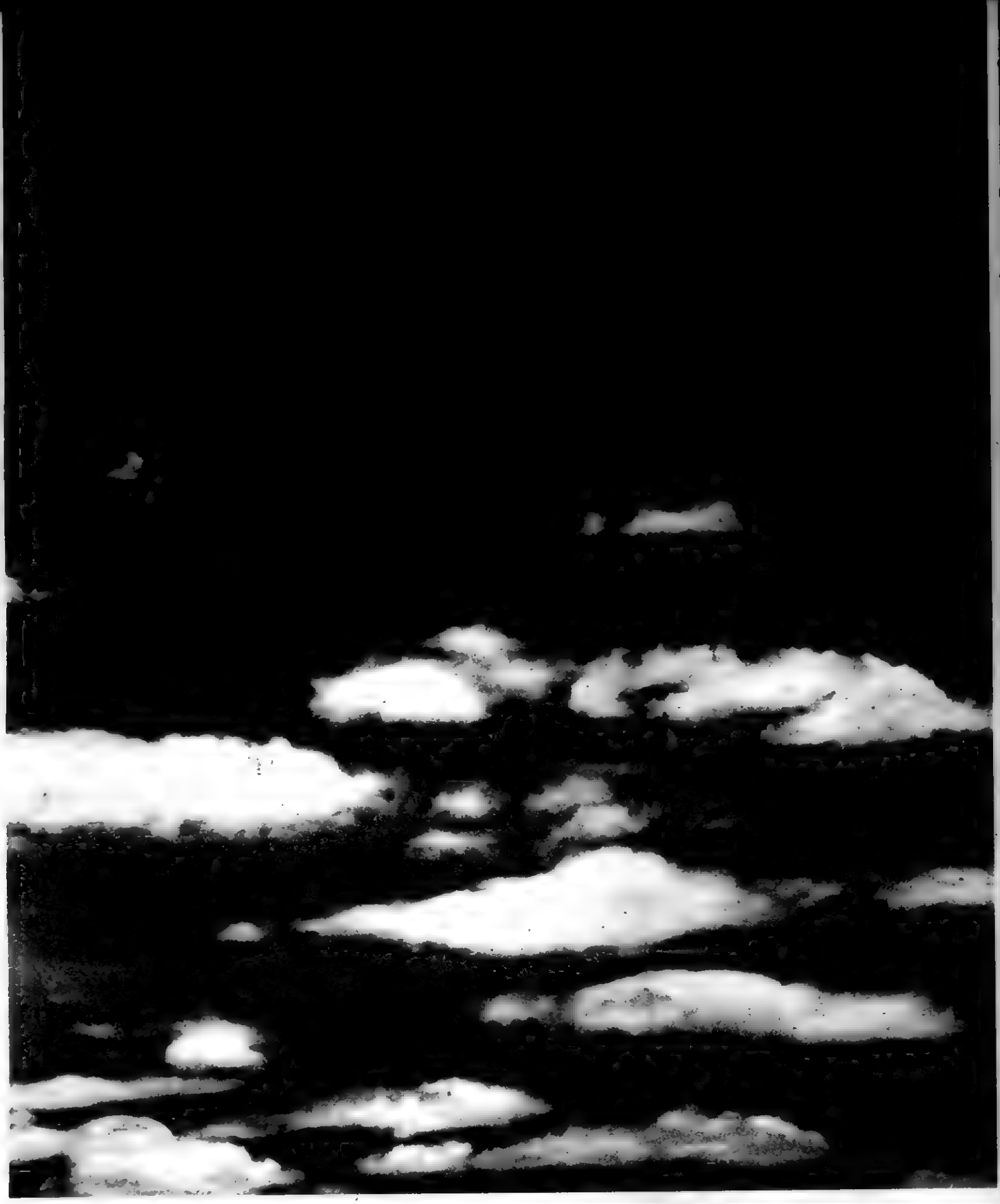
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3Com to deliver OSI software

Applications for DOS-based PCs, terminal servers announced recently

BY JIM NASH
CW STAFF

Aiming at a still relatively narrow market, 3Com Corp. said it will deliver Open Systems Interconnect (OSI) connectivity software for clients and servers.

3Com, fresh from redefining itself as a wide-area network company last year, announced two OSI applications for DOS-based personal computers and one for its terminal servers.

The Santa Clara, Calif.-based company said its dual-protocol Connection Service software for Transmission Control Protocol/Internet Protocol (TCP/IP) and OSI will ship to terminal server users in June.

Available immediately is 3Com's OSI Internetbios, an application that enables government agencies to use Microsoft Corp.'s LAN Manager Version 2.0 over IBM's Netbios and still adhere to Government OSI Profile (GOSIP) 1.0. 3Com said it will ship its OSI/End Systems with Demand Protocol Architecture next month. OSI/End Systems runs on any network operating system.

Connection Service will give terminals and PCs concurrent access to minicomputers and mainframes running TCP/IP and OSI; the service will cost $750 per server. Both OSI Internetbios and OSI/End Systems will enable PCs to support OSI's Virtual Terminal Protocol and File Transfer Access Management. OSI/End Systems is priced from $650 for a single-user license to $4,995 for 30 users. OSI Internetbios will cost $1,295 for each server.

SEVERAL ANALYSTS SAID 3Com moved strongly ahead with OSI development as many as three years ago but found only meager rewards then.

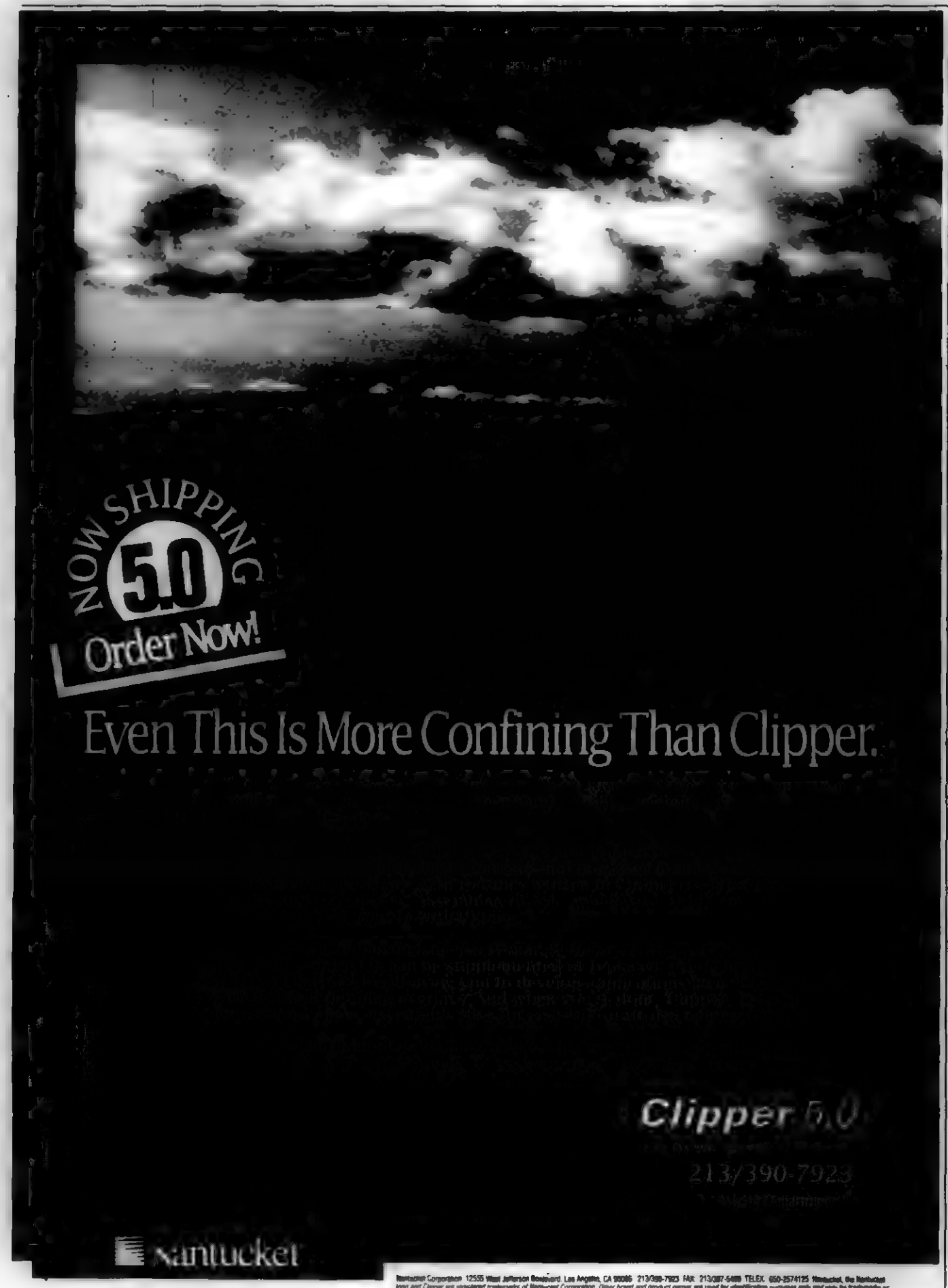
The products are "conceptually significant," said Peter Stevens, chief of the communications and computing technology division of the Bureau of Labor Statistics. Stevens said the bureau primarily runs under Xerox Network Systems (XNS) protocols, with TCP/IP gaining ground.

Like other government agencies, the bureau must eventually comply with GOSIP standards and now faces the "double conversion" from XNS to TCP/IP and then to OSI, he explained. These products, Stevens said, will help the agency convert one step at a time. He added, however, that these are preliminary products, and the bureau probably will wait for revisions before signing on with the software.

A spokesman for 3Com admitted that the firm's target market with the three applications is limited to private and semiprivate European companies, U.S. and foreign governments and U.S. defense contractors. Most industry observers said the OSI market remains pitifully small next to TCP/IP.

For some, 3Com's announcement marked either the company's desire to distance itself from last year's decision to retreat from local-area networking or an indication that it saw new opportunities. Several analysts said 3Com moved strongly ahead with OSI development as many as three years ago but found only meager rewards then.

"It must mean they finally smell some blood," said Dan Lynch, president of market research firm Interop, Inc. in Mountain View, Calif. "They did their homework and left it home," Lynch said. "Now they are bringing it back out."



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ADVANCED TECHNOLOGY

Complex rotorcraft flight simulators soar

Georgia Tech's training device lets pilots keep their feet on the ground while learning how to navigate the skies

BY SALLY CUSACK
CW STAFF

Flight simulators are widely used to train civilian and military pilots flying fixed-wing aircraft. Now, researchers at the Georgia Institute of Technology in Atlanta are working on a flight simulator for rotorcraft, which have more moving parts than airplanes and subsequently are more difficult to simulate.

The Georgia Tech simulator emulates the U.S. Army's UH-60 Blackhawk helicopter and will later emulate the Apache helicopter, which played a key role during Operation Desert Storm in Kuwait and Iraq. The system will be capable of simulating the flying of any rotorcraft for which mathematical models are available, researchers said.

"We want to enhance the pilot's perception of what it's really like to fly the craft," said Maj. William Lewis, one of the researchers and a test pilot in the U.S. Army.

Instead of relying solely on airborne practice, pilots complete portions of their training on the ground, using Disney World-like parabolic simulations that reproduce the feeling of movement and actual flight.

"It's similar to some of the attractions at Epcot Center, where you're strapped into a seat anchored to a floor, and the visual display creates the illusion of movement," Lewis said.

Just the beginning

The first phase of the project includes only forward-looking displays for now, but side-view displays will soon be added to the system to enable pilots to brush up on their hovering skills. Engineers will also be adding enemy attack simulations, which will allow pilots to stage mock battles.

At Georgia Tech, the research team is developing its flight simulator on a Silicon Graphics, Inc. VTX 380 Powervision series workstation, which features eight parallel processors. The simulator is also equipped with Flightlab 480 Simulation software from Advanced Rotorcraft Technologies, Inc.

Most existing flight simulators rely on serial processing, which produces a fractional delay between command and response times — up to one-third of a second.

Tests show that parallel computing architecture is ideal for simulating typical helicopter flight movements, such as hovering, reversing directions and maneuvering in tight spots.

According to Lewis, parallel processing increases the system's response time, which is extremely valuable when training pilots.



Joe Schwartz/Georgia Tech

Flight simulators *that are designed at the Georgia Institute of Technology simulate lifelike experiences for pilots during their training*

The simulator is also ideal for training military pilots in the simultaneous multiskilled tasks such as flying the craft, finding targets and shooting weapons, Lewis said.

"Reactions must be instantaneous for the pilot to know the system is responding," Lewis explained. "One of the main advantages to parallel architecture is a .057 [of a second] execution time."

To run the simulator in real-time mode, individual components of the machinery are broken down into specific segments, and then the segments are run together simultaneously. The technique allows for a smoother, more rapid flow of data, and the graphics software then adds the texture to allow pilots to discern motion in a three-dimensional format.

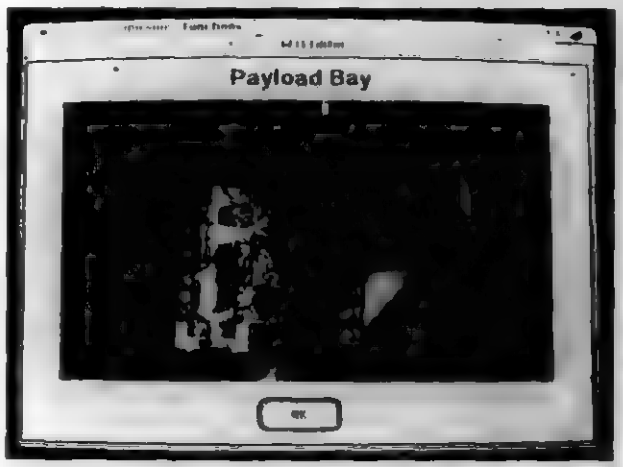
Expert system calculates space shuttle payload configuration

BY MICHAEL ALEXANDER
STAFF

Calculating how a payload should fit in the cargo bay of a space shuttle takes considerable experience. So formidable is the task that only two men can do it with any certainty. One of those men retired recently, and the second is nearing the day when he will do the same. That thought worried the ground systems integration technical staff at Rockwell International Corp.'s Space Systems Division enough that they developed an expert system to carry on when human experts are not available.

"The shuttle program now spans a generation," said James Engle, ground systems engineer. "One of our two experts for analyzing payload-to-ground systems compatibility has already retired, and the other is a senior member of the technical staff. It has become imperative that we capture the knowledge these men possess because otherwise, when they leave, their knowledge and skills leave with them."

The Rockwell staff members and Expertelligence, Inc., a Santa Barbara, Calif., expert system shell developer, have created an expert system called G-Fit to capture the knowledge accumulated by Rockwell's configuration experts over the past 15 years.



G-Fit *allows engineers to analyze a payload on-screen and make adjustments in the configuration for storage inside the space shuttle's cargo bay*

G-Fit, short for Ground System to Flight Payload Integration Tool, is an object-oriented expert system that allows engineers to interactively configure a payload on-screen and analyze it to see how well it fits in the cargo bay of a space shuttle.

The expert system, which runs on an Apple Computer, Inc. Macintosh II, includes a graphical user interface that engineers use to fit together pieces of a payload, like a jigsaw puzzle.

Payloads — satellites, telescopes and gear needed for scientific experiments — must be stowed on board while the orbiter is in its vertical launch position. The entire cargo must be designed to slide flawlessly into place as a single unit so that nothing obstructs the closing of the payload bay doors. The trunnions, or pins, supporting each of the payload's components must slip into their holding fixtures within minute tolerances of only one-hundredth of an inch.

Each payload configuration is unique, and it often takes weeks for experts at Rockwell's Space Systems Division to assemble payloads and try out each configuration on paper. "At any given time, there will be several different flights in work, and each flight requires at least four reviews," Engle said.

G-Fit has been used in configuration testing on several shuttle missions, although it is not the sole testing tool. "The overall task has required about 40 hours per week," Engle explained. "In automating the routine and repetitive manual activities, we have been able to recapture a large block of time that can be better used for creative problem solving."

On the inside

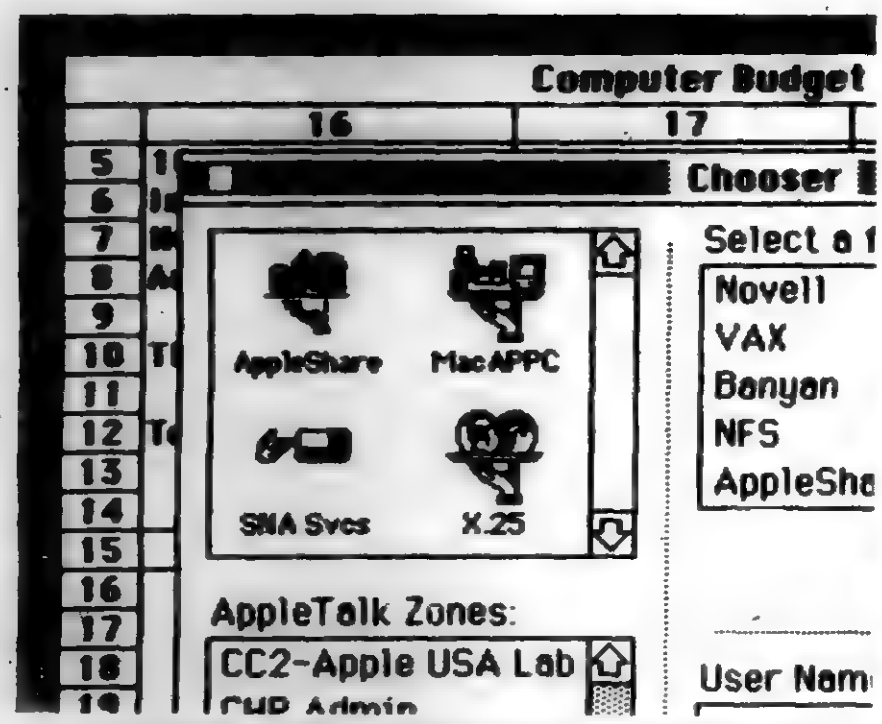
The knowledge base contains two key components: the physical dimensions of the payload bay and mission-critical devices mounted on the bay's sides as well as the rules governing the use of the available space and devices.

The G-Fit operator adjusts the overall configuration of the payload drawing from a palette of objects representing payloads of different sizes, cameras and other components. Payloads created on-screen can be tested and refined until the knowledge base signals that the cargo bay can accommodate the configuration.

Once testing is completed, the operator produces a printed report and drawing of each payload for contractors, who determine whether the planned unit can be conformed to the payload configuration. If not, they propose alternatives and submit them to a new round of testing.

Eventually, the payload is assembled and inserted into an upright, cylindrical payload canister that is an exact duplicate of the orbiter's cargo bay. The payload is then transported to the launch site and loaded into the orbiter.

We're open



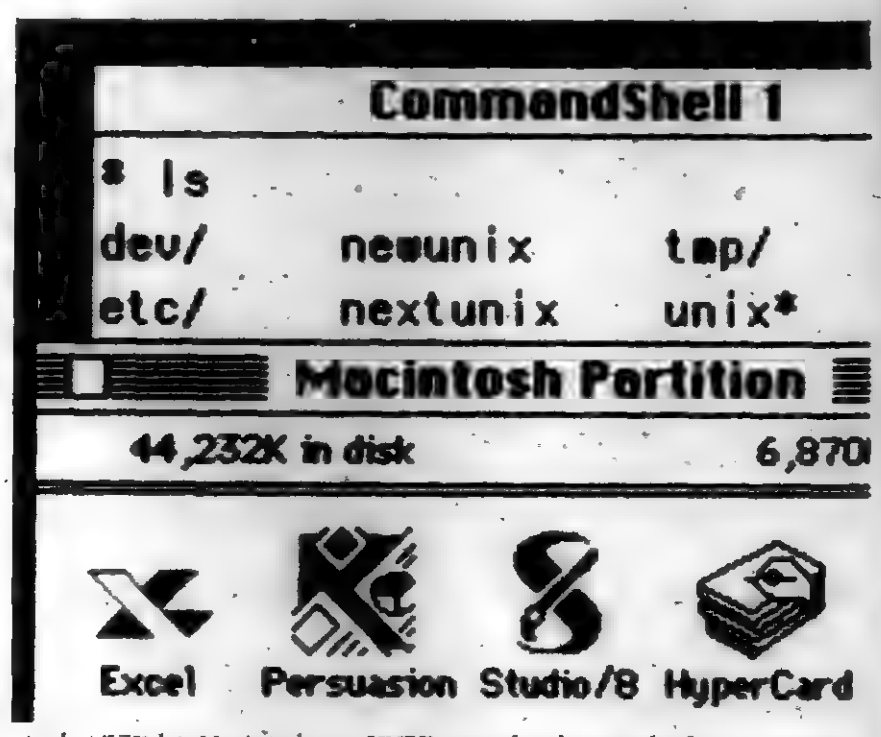
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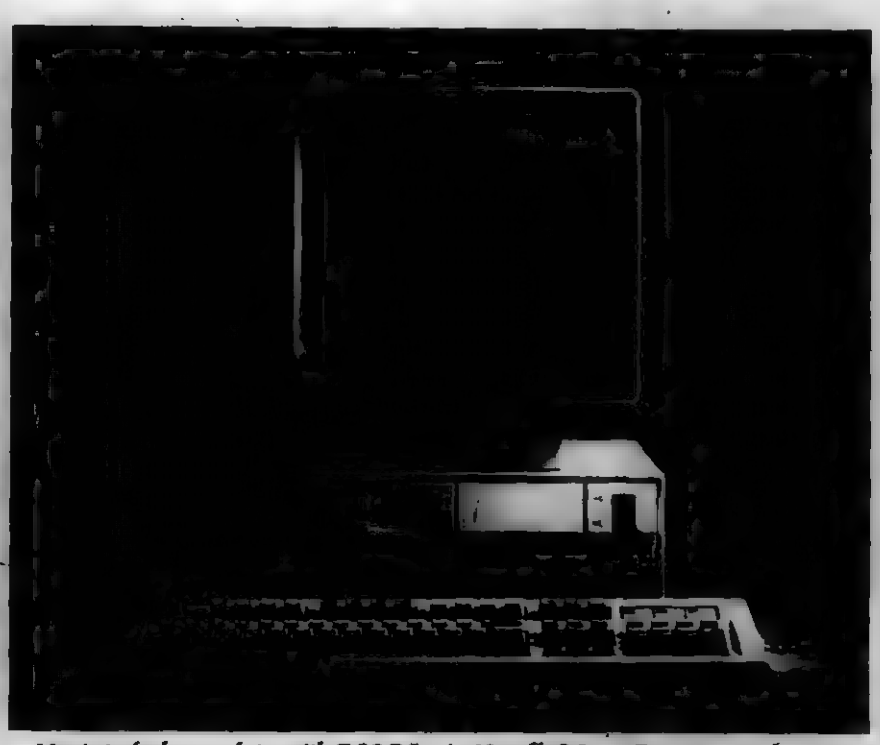
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EDITORIAL

Blind ambition

MICROSOFT MUST BE feeling like a pincushion right now. First there was the revelation that the Federal Trade Commission was investigating it for allegedly trying to corner the PC operating system market. Then that probe broadened to include a whole host of Microsoft activities in both software and hardware. Then Apple, perhaps smelling blood, told Microsoft last week it would broaden its copyright infringement suit to include the hot-selling Windows 3.0.

Microsoft has reacted to its recent adversity a little bit like a hurt puppy. It professes bewilderment that so many people could wish it ill. It has even asked industry opinion leaders to help it get at the root of its image problem.

It shouldn't have to dig too deep for an answer. The fact is, Microsoft *does* dominate the PC software market to a degree that makes many people very nervous. It has achieved that success through a combination of excellent technology, brilliant marketing, visionary insight — and blind ambition. Where it has gained the upper hand early (MS-DOS), it has preempted alternatives. Where it has met a worthy foe (the Apple Macintosh), it has turned competition into opportunity. It has stuck with technologies it believed in (Windows) long after most companies would have written them off. It has been quick to get out of markets (Access) where it realized its product wasn't up to snuff. It has danced with a bear (IBM) and led the waltz.

But Microsoft has also made enemies in its climb to the top. Ask 3Com, which had and then lost a preferential marketing deal for LAN Manager. Ask Lotus, which invested in OS/2 Presentation Manager largely on the strength of Microsoft's commitment. Ask IBM, for that matter. The Microsoft magic has been based in part on its willingness to put its own ambitions ahead of others'. That ambition is what draws such scrutiny to everything Microsoft does. It doesn't matter that the company claims its penpoint operating system has nothing to do with the technology that Go Corp. once demonstrated to it in private. Competitors will cry foul. It makes no difference that Microsoft claims to have a wall between its systems and applications groups. Success engenders suspicion. It might argue that things changed after it declared in November 1989 that Windows wouldn't challenge OS/2. That's little comfort to the developers who poured millions down the OS/2 drain.

Microsoft appears to want to dominate the market and still be loved. Unfortunately, its current methods don't permit this. If the firm indeed wants to project a gentler image, it should be more willing to share or even concede some markets instead of trying to bulldoze them. It should learn to live with commitments it has made, even when they aren't in its own best interests. Perhaps it should even cut short the monopoly debate by putting the MS-DOS standard into the public domain. These changes wouldn't boost Microsoft's short-term profits, but they would buy the company the goodwill it apparently craves.



LETTERS TO THE EDITOR

Readers rally for the repeal of Section 1706

I enjoyed Mr. Coates' analysis of technology in "Leaving the Computer Stone Age" [CW, April 1]. However, I'm afraid the U.S. will have a tough time leading the way out of this era.

It took *Computerworld* four years to come out against the bias of Section 1706 where the net results were that many independent contractors lost their livelihoods, and competition was stifled in the consulting market. I take it that *Computerworld*'s stand was timed to coincide with Mr. Coates' article.

We will not leave this Stone Age until the U.S. takes a more long-term "what is right" approach on tax law and funding and not the current "where do we make up the shortfall in revenue?" attitude in Washington.

Americans must convince their politicians to stop thinking of short-term special interest and start thinking long term on tax law and funding affecting education, environmental and health care issues. Maybe then the American manager will learn another programming language, and trade newspapers will offer classes in leadership.

Steve Larson
Cowie Computing Co.
Evanston, Ill.

You really hit the bull's-eye with your "Repeal 1706" editorial [CW, April 1]. Section 1706 has not benefited our customers, our industry or our country. You mention that 1706 was "tacked onto the Tax Reform Act without debate or proper hearings." Adapso members have not debated or held hearings on the issues either, and yet our dues are spent to support 1706.

We don't need laws that restrict the rights of small businesses. Entrepreneurs have built our software industry. Many of today's leading software companies began as small professional services companies. Restricting the right of a software professional to operate as a small business can only have a negative impact on our country's leading-edge position in software technology.

I hope that editorials like yours will lead to the death of unnecessary legislation like 1706. Now is the time for Adapso to unify its memberships around the real issues facing the information technology industry. Rather than stifling small businesses, invest in software innovation. This is the spawning ground for our strong, vital software and services industry.

William M. Braasch
President
Data Base Architects, Inc.
Alameda, Calif.

I have to compliment you on taking the correct side of the 1706 issue with your editorial [CW, April 1].

There are two points, however, that need to be clarified, which you did not illuminate. First, 1706 is not revenue neutral, it costs the government money. Independent contractors are the most efficient means of delivering computer services to businesses. This efficiency allows greater revenue and thus higher taxes paid than large service organizations with tax-deductible unnecessary overhead.

To use myself as an example, as an employee in 1985 I made $36,000 and paid $4,200 in taxes; in 1986, I made $60,000 and paid $17,000 in taxes. Last year I paid more in taxes than my combined taxes from 1978 (my first computer job out of college) to 1985 (my last year as an employee). Anybody claiming that the government makes more money with me as an employee is clearly misrepresenting the facts for their own hidden agenda.

Which brings up my second point. Adapso should be publicly berated for their support of 1706. They are acting against the best interests of the computer industry as a whole. The main supporters for 1706 are the large inefficient service firms whose direct competition is the independent contractor. Their inability to compete on equal terms has left them pursuing legislation and other economic harassment to maintain their market share.

Let the industry beware. The next step for these organizations, especially if 1706 gets repealed, is certification. Who do you think will predominate the certification boards? Those who donate large sums of money to politicians to pass bogus legislation in the middle of the night, that's who.

Steve Johnson
President
Software Development Factory
Hunt Valley, Md.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. *Please include a phone number for verification.*

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Microsoft, IBM diverge on OS/2 direction
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Knowing too much but too little

Can you be both over- and underqualified? The job market says 'yes'

MELVIN NISKA



It is a phenomenon of the economic times that some of us are overqualified and underqualified at the same time. I know this firsthand because on Dec. 11, I was "downsized" out the door at Unisys.

The euphemism "overqualified" means that your present or most recent salary is greater than what employers want to pay in today's "bargain basement" job market.

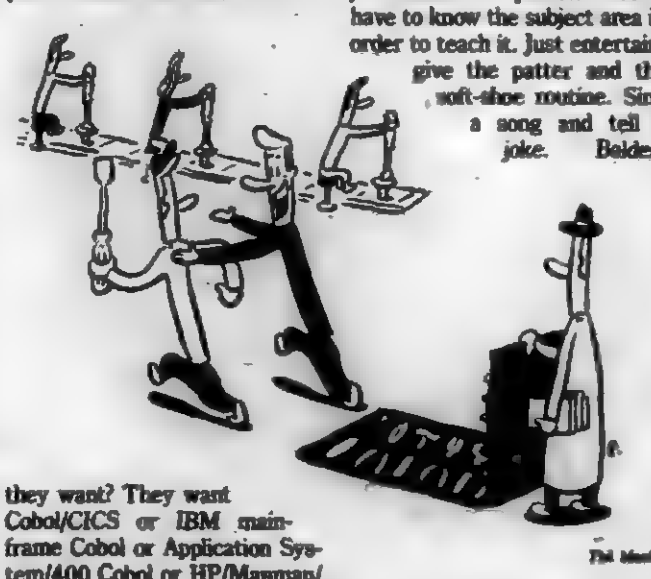
Never mind that today a person has accepted the fact that to become re-employed means adjusting to a reduced salary. Never mind that re-evaluation and financial regrouping has taken place, along with self-analysis, personality testing, career assessment and so on. The people with jobs to fill just don't believe it. They are afraid that if they hire me, I'll be gone as soon as times improve.

This focus on salary is also a handy way to screen resumes. Depending on whom you talk to, the number of resumes that come in when a job is advertised is either 300 or 1,000-plus. So it helps to put this in the ad: "Include salary history. Applications without salary history will not be considered." This allows them to screen out all of us who have 30 years of experience.

However, this kind of thinking is flawed for several reasons. First, the prognosis for business "opening up" anytime in the near future is bleak. Unisys has discarded only about half of its projected 1991 employee count. IBM has announced that another 14,000 jobs will be eliminated. And those willing to make predictions say instances like these are just the beginning. Hence, the employer's market we are looking at today should be even more skewed tomorrow. This makes the possibility of job-hopping almost nonexistent. But watch me carefully because I quit a job 22 years ago!

To be underqualified at the same time means that my resume does not contain the proper acronyms. Consequently, if I am not screened out by the "salary history" ruse, I will be eliminated by a junior personnel person using an acronym template.

An example is Cobol. Firms want someone who knows Cobol. I know Cobol, have taught Cobol and have even created instructional material for structured Cobol that has brought some joy into the lives of Cobol practitioners. But what Cobol do they want? They want Cobol/CICS or IBM mainframe Cobol or Application System/400 Cobol or HP/Mamman/Satcom. The rejection letter to my application for an AS/400 position came back at Mach 4.



Another example is relational databases. I have been working with SQL since it was first developed in the Unisys 1100 series: RDMS 1100, which has competed well with DB2 all over the world. Dr. Codd's definition is universal. But if you don't have DB2 SQL or Oracle SQL, then you don't have any SQL experience worth mentioning.

Then there's the other dodge — teaching vs. doing. "But you only taught SQL, you haven't really had to *know* it." That's the way people think in today's job market: A person doesn't have to know the subject area in order to teach it. Just entertain, give the patter and the soft-shoe routine. Sing a song and tell a joke. Balderdash! To last 15 years as an instructor requires a person who can do it, not just sing about it.

The same goes for management positions. I've been involved with supervision, negotiation, planning, estimating, inventory, even the establishment of priorities for scheduling my work and the work of others. I've settled office wars and smoothed ruffled feathers. But I have no "track record" as a manager, so I'm easy to screen.

What one can do, is willing to do and has done in the past are confused here. I've done a lot of things in the past that I'm not willing to do in the future. I've washed a lot of dishes, I've cleaned latrines. If there's one thing I'm grateful for, it's that I got out of the mess hall before the job market turned sour.

Trying to figure out what a person is capable of and wants to do is way too complicated for employers now.

Probably because I've spent almost my whole career helping people adjust to computerization, it comes as a shock to see that employers are now insisting on ready-trained employees.

I was a technical writer for seven years, but the ads for technical writers insist on the applicant already knowing the word processor of the employer's choice. Yes, it will take a few days to get accustomed to a new word processing package, but the skill of the wordsmith transcends any tool. Furthermore, no tool, by itself, is going to produce great literature. It takes an underqualified person to do that.

Niska mails his resumes from his home in Andover, Mass.

Financial data often yields false positives

BILL FROMM



Many people believe that financial statements disclose how well their company is competing in the marketplace.

That simply isn't true.

The *only* accurate measure of how successfully a company is competing in the marketplace is the trend line of its share of the market. And, sadly, most companies don't know what their market share is.

Most chief executive officers use operating statements to evaluate the health of their companies. But these statements simply describe past profits or losses. They won't give you any clue as to the future. If they did, banks wouldn't make bad loans. Operating statements ignore the strategic health of the company.

Traditional measures of success ignore how the competition is doing. The measurements don't take into account what's going on in the industry. They assume that your company exists in a vacuum.

No measurement except the market share trend line will tell you how you're doing in relation to your competitors.

Profits won't tell you. You can make money while you lose customers to the competition. Just cut back on the quality of the goods or services you provide while maintaining the price you charge. You'll lose your repeat business, but you'll make huge profits until you run out of new customers. A company can gain a lot of money simply by harvesting — but it could be in bad shape for the future.

Return on net assets won't tell you. That figure reveals only how the investors are making out. It doesn't consider the return that the competition is getting, and it won't give you any idea how the company is going to do in the future. You might as well consult an astrologer.

Another possible problem: Even if CEOs recognize the importance of their companies' market share, many are unsure of how to measure it.

That's where you, as an information systems manager, can make a difference. Instead of continuing to oversee the production of financial reports according to old and faulty formulas, propose an alternative. Taking the initiative in this way probably won't get you a bigger IS budget, but it is likely to earn you a lot of respect as someone who really knows how information should be used and isn't reluctant to propose an idea that won't require a big investment in new technology.

You don't have to spend a fortune in research to find out how you're doing in relation to the industry and your competitors. You don't need a fancy new computer system or expensive research sources. You don't even need (and this may sound sacrilegious) exact numbers. It is the trend line of your market share that is important, not whether you're measuring it down to the 10th decimal. You can figure an accurate trend line with less than exact figures as long as you measure your share of the market the same way every year.

The first step you can take toward figuring your company's market share and making financial reports more meaningful is to define your company's market — both geographically and by product category. After you have done that, consult census figures to find the average amount spent on your product category per household. Then multiply that amount by the number of households in your market area to find out how much money your potential customers are spending in your product category. This number is your denominator. Your numerator is your company's sales.

The resulting equation will tell you how well your company is doing. It will tell you how you're competing and, after a few years, it will tell you whether you are gaining or losing ground against your competitors. Most importantly, it will help your company decide how it should prepare for the future.

Fromm, president of Barkley & Evergreen Advertising in Kansas City, Mo., is conducting a nationwide seminar series sponsored by Sears Business Centers and Toshiba on how to build a high-performance company. This piece is adapted from his book, *The Ten Commandments of Business and How to Break Them*, published by G. P. Putnam's Sons.

What's in a name? A royalty

READER'S PLATFORM

JAMES SMITH

Computers now reach into virtually every corner of our lives — from birth through death. It's comforting to know that our life is recorded somewhere; at least the computer won't forget. Obviously, much of this information is extremely valuable in the causes of saving lives, paying taxes and so on. Nonetheless, somehow without "big brother" watching, much of the data is available for a price. Maybe it is time that we as individuals say, "I want data on myself or family kept confidential — it's not for sale."

Or here's another idea! All firms that want data have to contact the intended individuals, ask permission, and pay the source.

Most of us dislike the annoying telephone calls requesting us to buy this stock, time-share or even gold mine but getting paid could make them a little more tolerable (still not buyable but at least tolerable).

If individuals wish their data and their families' data to be used by others, let's have data banks established for just such a reason. We send data to whatever number of data bank firms, and this information is available to other companies for a fee. Then each time our data is used for solicitation, we get paid.

It's time to stop the "free pass." Let's you and I get paid for our individualized data.

Smith is an information systems professional who resides in Marlboro, Conn.

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COMMENTARY

J. A. Savage

Pick market decision time



Last time I was at a Pick Systems convention, it reminded me of an EST seminar: True believers wandered around the floor repeating, "Pick is good. Pick is swell. Pick will run my business well."

Unlike former EST guru Werner Erhard and some other cult leaders, Dick Pick has not been involved in FBI, IRS or other investigations. What he and his business applications software do have, however, is a flock of faithful followers.

The applications have been around for more than 20 years, mostly running on the Pick operating system. Yet, while almost every other computer business is heading toward applications based on open systems platforms, Pick is, well, still Pick. Not only are its followers still following, but it is gaining new vendor subscribers as some open systems vendors have decided to put Pick applications on top of the Unix operating system.

Just in the last month, Sequent Computer Systems and General Automation have announced excursions into the Pick/Unix market, with Pick applications layered on top of the Unix operating system. Traditional suppliers of Pick, such as McDonnell Douglas Systems Integration and Ultimate, are likely to be vulnerable to deep-pocketed marketing organizations like Sequent, which sells multiprocessing computers

Continued on page 33

DEC spreads word: Voice applications

BY MARYFRAN JOHNSON
STAFF

MAYNARD, Mass. — With more than a little help from its third-party friends, Digital Equipment Corp. last week hauled the highly specialized field of voice applications onto its own general-purpose VAX/VMS computing platform.

DEC unveiled two software company alliances with Voicesoft Corp. and Audiotechs, Inc., which are crucial to its plans to pitch a variety of voice applications to businesses with complex computer networks. The company also jazzed up its Decvoice system for voice processing with new features, including the ability to handle eight channels per module instead of one and to run on VAX 4000 client/server systems as well as Microvax 3000 systems.

"It will take time for DEC to come up to speed, but there is still an awful lot of open ground here," said Albert Lill, a telecommunications analyst at Gartner Group, Inc. in Stamford, Conn. "This is the perfect strategy for them."

DEC will sell and support the Voicesoft voice-mail and call processing applications, making them an integral part of its All-In-1 Phase II networked office computing applications by 1992.

"It is clear that voice is a form of information, and you can manage it on general-purpose computer platforms," said Martin F. Parker, president of Voicesoft. He stressed that users can use Voicesoft's applications without changing desktop devices.

Many attractions

The veterinary medical teaching hospital at the University of California at Davis recently installed a VAX 4000 Model 300 with the Decvoice system, running Voicesoft voice mail. Hospital administrator Paul Brentson said the system was attractive both for its ability to automatically create and manage electronic mailboxes and for its potential use in other applications.

"We expect to have room left on the VAX to run staff packages as well," Brentson said.

That expectation is a key point of DEC's conviction that information systems managers want an integrated voice and data environment that can be managed centrally from a host machine running both telecommunications and business applications. A VAX 4000 running Decvoice need not be dedicated to voice, although a 72-port Decvoice system would fully load a VAX 4000 Model 300, DEC officials acknowledged.

So far, the voice technologies market has been dominated by individual vendors with equipment specific to their products. Those vendors are now "madly scrambling for a common voice and call processing platform," Lill said. "What's happening here with DEC and Voicesoft is the ultimate common platform idea."

Yet, Lill said customers who need "hot performance for a special application" more complex than voice mail should plan on waiting until next year to buy from DEC. In 1992, DEC and Voicesoft plan to deliver sophisticated voice and mail networking capabilities as part of All-In-1 Phase II.

Conference call

DEC relied on third-party deals in putting together its Decvoice package

- A family of voice mail and messaging software products from Voicesoft Corp. in Rocklin, Calif.
- New software tools for developing audiotext voice applications — such as "talking Yellow Pages" or voice information services for newspapers — from Audiotechs, Inc. in Newton, Mass.
- Release 2.0 of Computer Associates International, Inc.'s voice applications development tool, CA-DB: Expert/Voice, which is currently in beta testing.

CW Chart: Darren St. John

Customer can't believe his ears

The news that DEC had rolled out a host of expanded capabilities in voice processing left a bitter taste in Warren Campbell's mouth last week.

As information systems director at the Better Business Bureau of Eastern Pennsylvania in Philadelphia, Campbell has been struggling for weeks to get Multiline Decvoice working properly on his new, $82,000 VAX 4000 server.

In the process, he has written twice to DEC President Kenneth H. Olsen, held numerous meetings with sales managers and done enough wheel spinning to grind a furrow in concrete.

"This has been a comedy of errors on their part," Campbell said. "We never knew we were going to be a field test. This was sold to us as a product shipping."

DEC's side of the story is that Campbell signed a letter acknowledging he was getting a prereleased product, but Campbell said he signed the letter as a last-ditch effort to get the system delivered. It was due in January but arrived in late March.

DEC also contends Campbell should have understood that field service personnel would not be fully trained yet nor able to provide complete documentation for Decvoice on the VAX 4000. The original Decvoice product, introduced in 1988, ran on Microvax II systems.

The bureau's plan was to set up an automated voice response system that would greet the caller, who would punch in the telephone number of the business in question. The system would access an in-house database for the information.

"We can't understand why this has been so much trouble," Campbell said.

Neither can DEC. "This is not the way we want to do business," said Carol Palmer, voice segment business manager at DEC. "We have tried to be very accommodating with this customer, and it is unfortunate this happened."

"I just want a machine that works without all the hassle," Campbell said. "Thank God we leased it."

MARYFRAN JOHNSON

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CW11/A

SOFT NOTES

Informix certified

Informix Software, Inc. recently claimed that its Informix Online is the first Unix-based relational database management system to win full certification from the **National Institute of Standards and Technology's** (NIST) FIPS-127.1 standard for SQL databases. The NIST standard is a superset of the American National Standards Institute's SQL standard.

IBM and **Knowledgeware, Inc.** have signed an agreement under which IBM will sell Knowledgeware's three host-based computer-aided software engineering products: Application Development Workbench/MVS, Information Engineering Workbench/Mainframe and ADW/Repository Enablement Facility.

Bell Atlantic Business Systems Services in Frazer, Pa., and **The Parsec Group** in Westminster, Colo., recently said they are offering layered product support for 20 applications, languages and utilities running on Digital Equipment Corp. VAX systems as an extension of Bell Atlantic's Dextra Support Program. The layered program includes a toll-free telephone line through which Bell Atlantic technicians can offer assistance or initiate more in-depth assistance.

Software vendor **Hogan Systems, Inc.** recently signed an agreement to market **Banca Corp.**'s Power 1 commercial credit and lending system for financial institutions. Hogan will sell the system to clients in the U.S. and will provide baseline support. Dallas-based Banca will continue to provide maintenance and manage development.

Parasoft Corp. in Pasadena, Calif., recently said it signed an agreement with **Ncube Corp.** in Belmont, Calif., under which Ncube will ship Parasoft's parallel processing tools Performance Monitor and Node Debugger with Ncube 2 supercomputers.

Planning is key at reserve bank

Preparing for disaster recovery is part of day-to-day life at New York Fed

BY JOHANNA AMBROSIO
CW STAFF

At the Federal Reserve Bank of New York, the week of Sept. 29, 1987, will forever be remembered as a nightmare come to life. That week, the computer that runs the Fedwire funds-transfer system crashed twice in two days.

Since then, thanks to a plan that the New York Fed has implemented to increase its fault-tolerant and disaster-recovery capabilities, no other experience has been quite so unnerving. The bank even kept running throughout a nearly week-long blackout in August 1990, although it had to move to its hot site nearly 40 miles away.

During a recent IBM financial services conference in Albuquerque, N.M., Israel Sendrovic, executive vice president at the New York Fed, outlined the bank's transition from a setup that crashed too often for comfort to one with its affairs much more firmly under control.

As one of a dozen reserve banks in the U.S., the New York Fed moves about $1 trillion each day over its portion of the nationwide Fedwire system. Fedwire is the country's primary mechanism through which commercial and other banks transfer funds and securities. The New York Fed moves about 30% of Fedwire's total funds volume and about 75% of the total securities volume, Sendrovic said. This requires 150,000 transactions each minute.

Fedwire runs on one of the New York Fed's three IBM System/370 series mainframes in the bank's New York data center. The second mainframe is used for all non-Fedwire bank business, and the third resides at the hot site in Pearl River, N.Y.



New York Fed's Sendrovic *aims for 100% uptime*

Given the importance of Fedwire to the country's financial well-being, it was no small matter when the system crashed twice that week in 1987. Not only did the New York bank go down, but all the banks with which it did business found themselves ignorant of their exact financial positions.

On Sept. 30, 1987, the night of the second IMS database crash, "hordes of IBMers were at the bank," Sendrovic recalled. "The database was corrupted, and we closed that night at 3:45 a.m."

Although the bank did recover from those crashes, Sendrovic said, that week prompted some of his colleagues at the bank to question his approach to providing 100% availability. Since about 1986, the bank had been trying to decide on the best method for ensuring no downtime. One faction argued that it would be best to start from scratch and redevelop Fedwire on fault-tolerant hardware.

However, Sendrovic did not like that idea. "We didn't need fault-tolerant hardware because hardware is the component that crashes least often," he said. "We needed a fault-tolerant system, and this includes everything — environmental software, people, procedures and utilities." Sendrovic's philosophy, and the one that ultimately prevailed, was to slowly build up fault-tolerant capabilities thoughout the bank's information processing network.

His approach has apparently worked. The New York Fed improved its funds-transfer uptime from 97.2% in 1987 to 99.98% in 1990, although the recent figure does not include 2½ hours downtime from the blackout.

To get to this point, the bank focused on educating both management and users, identifying the single points of failure and buying backups of certain items, such as network controllers. It also automated the operations side as much as possible.

Further, Sendrovic said, seven of the nine crashes in 1987 were caused at least partly because the bank was behind in its software releases — especially in the MVS operating system and IMS. Now, the bank makes sure it is using the most recent releases within six months of their availability. Maintenance changes and updates are made only once per month and tested both individually and as a group before being put on-line.

The bank has also implemented IBM's Extended Recovery Facility, which automatically switches applications in one mainframe to a connected mainframe in the event of a failure.

The New York Fed also reduced the amount of time it needed to recover at the hot site from six hours to one. The Fedwire database is re-created and sent four times each day to the hot-site facility.

All this paid off during the blackout last August, when one of the bank's generators failed. After getting the OK to go ahead with the hot site, Sendrovic said, his team had everything running in about 40 minutes.

"I was very grateful that things worked like we said they would," Sendrovic said. "But if the week in 1987 was a 10 on a scale from one to 10, the blackout was a minus two."

Unisys begins building on OLTP architecture

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Last October, when Unisys Corp. issued its systems architecture blueprint, it said a major pillar of the scheme — as well as the company's future — would be on-line transaction processing (OLTP).

Two weeks ago, Unisys uncrated the first pieces of furniture for this OLTP house, announcing new processors and software products, including an enhanced version of AT&T's Unix transaction monitor, to support its trademarked Unix/OLTP offering.

The three new systems — U 6000/65, U 6000/75 and U 6000/85 — use the Intel Corp. I486 microprocessor, run AT&T Unix System V Release 4 and are binary compatible with existing U 6000 machines introduced in 1988.

The high-end U 6000/85, like the existing U 6000/75, is built by Sequent Computer Systems, Inc., can have up to 30 processors and supports 1,000 users.

Unisys officials deflected the idea that powerful Unix servers, which can run the same fourth-generation languages (4GL) as Unisys mainframes, would become an inevitable migration path for mainframe customers. They emphasized that the client/server architecture outlined in October calls for three tiers, the top being the "information hub," typically a mainframe.

Analysts see things a bit differently, however.

"In the long run, Unisys is hoping for [migration]," said David Card, director of systems research at International Data Corp. in Framingham, Mass., who praised Unisys for doing a good job of adding features to its mainframes to keep them above the Unix line.

John Dunkle, president of Workgroup Technologies, Inc. in Hampton, N.H., said Unisys is traveling, albeit more slowly, along the path already traveled by NCR Corp. "They're faced with trying to standardize on a single architecture," he said.

At the same time, some Unisys users sided with their vendor. "Today, you don't run mainframe applications as you did 10 years ago," said Ernst & Young's national director of MIS, George J. Germann.

In Germann's shop, a network of about 1,500 Unisys personal computers work on Novell, Inc. networks; the corporate mainframe in Lyndhurst, N.J., nightly grabs the data from these networks for processing. "We see the corporate mainframe holding the 4GL, with the transaction processing distributed."

Making Unix hardy enough for OLTP, and eventually for distributed OLTP, was clearly a top priority for Unisys. Unisys' answer was an enhanced version of AT&T's Tuxedo Transaction Monitor and what it called the industry's first OLTP database to use the XA protocol. The protocol, from X/Open Consortium Ltd., specifies a standard interface between the transaction monitor and multiple distributed database management systems in an OLTP setting.

Unisys and Menlo Park, Calif.-based Informix Software, Inc. said the result of their joint effort would be an XA-compliant version of Informix-Online.

The three additions to the Unisys U 6000 line are all multiprocessor systems, the first for the line. They are priced between $36,000 and $214,000.

One of Unisys' largest U 6000 users, K Mart Corp., plans to upgrade its platforms to the multiprocessor option as soon as possible. Two years ago, the Troy, Mich., retailer signed up for what was then the top-of-the-line Unisys Unix box, the 1486-based U 6000/60.

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"We will upgrade to the 65s over the next year or so, and by the end of '91 will have 800 machines in," said David M. Carlson, senior vice president of corporate information systems.

Carlson said the upgrade means the systems will be able to grow by adding processors as they are needed.

Uniface serves up A la Carte query product

BY JEAN S. BOZMAN
CW STAFF

ALAMEDA, Calif. — Uniface Corp. is allowing end users to take home a side order of its database-server application development system with a client-oriented query product called A la Carte.

The front-end report writer, introduced recently, gives users the option of substituting a what-you-see-is-what-you-get environment of pop-up menus under Open Software Foundation's Motif interface for a character-based Uniface interface designed by corporate information systems programmers.

It supports the same relational database management system products as the standard Uniface applications-development programming package. The existing Uniface supports RDBMS packages including those from Oracle Corp., Sybase, Inc. and Ask Computer Systems, Inc.

Uniface, a 4-year-old Amsterdam-based firm, has 175 employees, 30 of them in the U.S.

Cost cutting

Copies of A la Carte may run against remote copies of Uniface software running on remote data servers. However, users must still have access to at least one system running Uniface's layered fourth-generation language software.

"As long as you go through a Uniface data dictionary on the remote machine, you don't have to have Uniface on the client machine," said Anu Shukla, Uniface's vice president of marketing. Thus, start-up costs for existing Uniface customers would be substantially less than for new A la Carte users, who would need to buy some Uniface products.

One Uniface customer said he planned to integrate the A la Carte package with an existing Uniface applications generator and a Sybase RDBMS. "This will allow me to design end-user applications that run against multiple RDBMSs," said Larry Laux, president of Milwaukee-based MCSS, Inc., which sells Hewlett-Packard Co.-based data servers to systems vendors to track customer support and maintenance services.

A la Carte menu

A la Carte runs under MS-DOS, OS/2, Digital Equipment Corp.'s VMS and Ultrix, Stratus Computer, Inc.'s VOS and various versions of Unix. Future releases may support other operating systems, Shukla said.

Prices for the reporting tool range from $800 for an MS-DOS desktop version to $40,000 for a DEC Vaxcluster version, she said.

Imaging goes to press for start-up

BY CAROL HILDEBRAND
CW STAFF

HUDSON, N.H. — Deciding that market opportunity beats out a slingshot, David joined hands with Goliath in the press industry.

The tiny firm, Presstek, Inc., has signed a 20-year licensing agreement with Heidelberger Druckmaschinen A.G., the largest manufacturer of printing presses worldwide, for Presstek's direct-to-plate imaging technology.

The proprietary technology takes the bit-mapped image of an electronically composed Adobe Systems, Inc. Postscript-produced page and images it directly onto special waterless plates on a printing press. This results in plates that are already aligned and in register, eliminating costly press preparation time. It also eliminates many of the intermediate steps necessary to produce color plates in conventional printing and electronically adjusts ink keys.

Presstek's imaging technology will be incorporated into Heidelberg's GTO line of presses, with the first, the GTO-DI, aimed at exploiting the short-run color printing market.

According to Frank Romano, editor of "Typeworld," a newsletter on electronic publishing, there is a void of cost-effective answers for people seeking between 500 and 5,000 copies of a brochure, for example. "Conventional printers want you to do 10,000 or more, and color copiers are limited in quality and speed," he said. He estimated that 65% of electronically formatted pages fall into this category.

Romano also said he expects a lot of switching from black and white as a result of the direct-to-plate imaging. "It allows them to get color at almost black-and-white rates," he said. "It's a whole hidden market out there."

However, some industry observers said Presstek needs to do some fine-tuning. Peter Dyson, editor of "The Seybold Report on Publishing Systems," questioned the amount of time it takes — 20 minutes — to image a plate on the press. With press time an expensive commodity, "you might be better off taking the hit on the setup time," he said, referring to the steps needed to prepare conventional printing plates. "What Presstek needs to do is cut down on the amount of time it takes to burn a plate," he said.

Are Your DBAs Being F



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NEW DEALS

DEC sells to Asian firm

Digital Equipment Corp. sold a VAX 9000 to South Korean securities firm **Dongnam Securities Co.**, its sixth mainframe sale to an Asian firm. Combined with a fault-tolerant VAXft system, Decserver terminals and other DEC products, the contract is worth $3 million. The VAX 9000 Model 210 will handle Dongnam's customer accounts, investment information, integrated branch management network and trading and portfolio management systems.

Hitachi Data Systems Corp. won an EX 90 mainframe contract from the **Port of Singapore Authority.** The authority will upgrade from a Hitachi EX 50. The mainframe, the largest commercial processor in Singapore, will accommodate the growing Portnet system, which is expected to link 876 users and 1,290 personal computers by year's end.

Amex Canada, a division of American Express International, licensed $2 million worth of integrated banking applications from **Hogan Systems, Inc.** The system will allow Amex Canada to begin offering banking services to its 2 million merchant customers this year. Hogan also announced software license agreements totaling $4.25 million with four international financial institutions.

Cray Research, Inc. sold a Y-MP2E research supercomputer to Netherlands service bureau **Informatica Centrum Voor Infrastructuur en Milieu.** The bureau will use the Cray for monitoring and forecasting the effects of transportation on the environment and analyzing and predicting changes in waterways and coastlines.

HP updates its MPE/XL

BY J. A. SAVAGE
CW STAFF

CUPERTINO, Calif. — Hewlett-Packard Co. will continue to enhance its proprietary operating systems with 25 additions to be announced at the end of next month. MPE/XL Release 3.0 adds functions for systems management, database management and client/server services, according to the company.

In systems management, HP will add seven enhancements, including management through Openview on either personal computers or an HP 3000 minicomputer monitor. "Anyone on a network can open up a console window," said Richard Sevcik, general manager at HP's Commercial Systems Division. Also included will be recovery software that will switch users to another HP 3000 system while recovering user data.

In database management, the new operating system will add five enhancements, including connections with its database, Allbase/SQL, and development tools such as those from Ingres Corp. and Information Builders, Inc.

Finally, MPE/XL 3.0 client/server enhancements include support of X Window System and will allow migration from PC-based servers by supporting Novell, Inc.'s Portable Netware.

Savage

CONTINUED FROM PAGE 27

based on Intel's 80386 and 1486 architecture. Still, it's not much of a future market on which vendors can hang their profits and not much of a future applications growth path for users, either.

Still, it's one thing to preach to the choir and another to convert disbelievers. Sequent believes it can increase its business 15% by adding Pick applications, and at least one analyst organization concurs. Gartner Group/Infocorp says the Pick market will more than double in the next few years, from $1.63 billion to $3.4 billion by 1994.

Stop me if I'm wrong, but I don't think that many college graduates are leaving with Pick experience. In addition, how many salespeople have the background to sell Pick? Sequent officials acknowledge that they have to take Unix people and train them.

While I don't doubt that Pick facilitates database management and some business applications, it seems to be scattering the focus of new users. Just when Unix applications appear to be the thing on which to concentrate, a few vendors are throwing Pick/Unix at users. Perhaps once Unix settles down into one or two or three basic strains (AT&T System V Version 4 and the Open Software Foundation's OSF/1), then it will be time to confuse users with Pick on top of it all. But until then, vendors should spend their time getting their Unix act together. Users have been waiting entirely too long for it.

Savage is a *Computerworld* West Coast senior correspondent.

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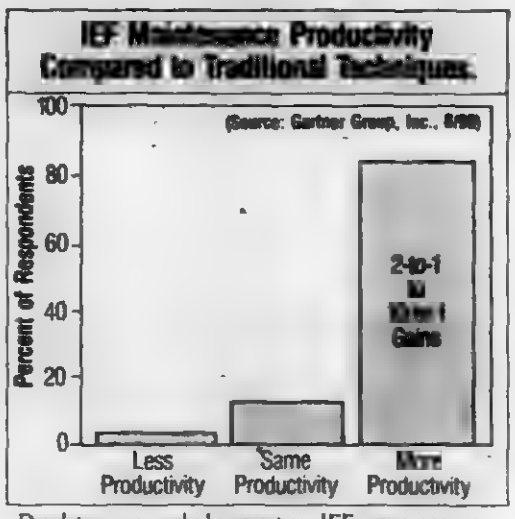
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

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In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

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66106

NEW PRODUCTS — SOFTWARE

Development tools

Software AG of North America, Inc. has announced a version of its application generation system that includes object-oriented design techniques.

Natural Construct Version 3.1 features object-oriented design capabilities that allow several tables or files to be used during the creation and maintenance of complex data structures. Program, statement and model creation elements are also included.

License fees range from $9,000 to $77,800, depending on type of platform and operating system.

Software AG
11190 Sunrise Valley Drive
Reston, Va. 22091
(703) 860-5050

Sun Microsystems, Inc. has announced a tool kit that allows users to design what-you-see-is-what-you-get applications that also use Unix System Laboratories, Inc.'s Open Look graphical user interface.

The News Toolkit was designed for creating applications on Unix systems within Sun's Open Windows application development environment.

A user license for the News Toolkit is bundled with all Sun Sparcstations. The product can also be purchased separately for $295, including media and documentation.

Sun Microsystems
2550 Garcia Ave.
Mountain View, Calif. 94043
(415) 960-1300

Applications packages

Stalwart System Concepts of Canada, Inc. has announced that its Stalwart Object Administrator software package now runs on IBM Application System/400s.

The product includes user-defined object types, multiple security levels for each user and up to 999 development cycle stages.

The software package is priced at $14,583.

Stalwart System Concepts
P.O. Box 899
Station J
Calgary, Alberta T2A 6A6
(403) 237-5528

UIS, Inc. has announced Version 2.1 of UIS-Manager (formerly called V-X Manager), its Digital Equipment Corp. VAX data center management system.

UIS-Manager automates user authorization, system reporting and backups. This results in reducing VMS training time and requirements, according to the company.

Version 2.1 offers enhanced VMS monitoring and an upgraded user-defined privilege coding scheme. It also includes DEC's License Management Facility.

Pricing ranges from $2,600 to $21,000, depending on system size.

UIS has also announced a new version of UIS-PACS (formerly V-X PACS), a resource accounting and chargeback software package. UIS-PACS Version 2.1 allows incorporation of non-VMS resource data and adds a holiday accounting option and a zero-based accounting feature for budget allocation based on resource use.

The product is priced from $3,400 to $30,000.

UIS
420 Bedford St.
Lexington, Mass. 02173
(617) 861-6262

HARDWARE

Data storage

Optimem, an Archive Corp. subsidiary company, and Kom, Inc. have announced that 3.9G bytes of write-once read-many (WORM) optical storage is now available for Digital Equipment Corp. and Sun Microsystems, Inc. computers.

Kom's Optifile II ($5,000) software package has been merged with Optimem's 4400 WORM optical disc drive. The 12-in. drive can be installed on DEC VMS-based Q-bus and Unibus machines or on Sun Sparcstation and Sparcserver systems running under SunOS.

Optifile II lets Optimem's 4400 drive be intermixed with other optical drives to provide additional storage capacity.

The bundled package is priced at $22,300.

Optimem
297 N. Bernardo Ave.
Mountain View, Calif. 94043
(415) 961-1800

Micro Technology, Inc. has announced two Storage Disk Interface-compatible removable storage systems that were designed for Digital Equipment Corp. VAX machines.

The MDI-120R ($42,000) and MDI-79R ($24,680) both feature data transfer rates of 2.8M byte/sec., and both can be configured as dual-drive systems.

The MDI-120R is also equipped with 1.2G bytes of formatted storage capacity, the company said.

The MDI-79R features an average seek time of 20.4 msec and can reportedly generate more than 50 I/Os per second.

Dual-drive versions are priced at $42,000 and $72,000, depending on model.

Micro Technology
5065 E. Hunter Ave.
Anaheim, Calif. 92807
(714) 970-0300

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COMMENTARY

Richard Pastore

Mixed signals from Compaq



What is Compaq doing in this Advanced Computing Environment (ACE) alliance? Is it favoring RISC over the Intel architecture? Is it gunning for high-powered users over the corporate desktop set? Have thousands of Systempro users bought into the wrong high-end solution? To hear Compaq tell it, the answer is yes and no. And maybe.

One thing is clear, however: Compaq is very serious about ACE and is putting its money and its mouth into the project. Chief Executive Officer Rod Canion stood up in front of hundreds of skeptical reporters and analysts at the announcement and promised it will be the "predominant system for advanced computing within this decade."

For current Compaq users, the signals are mixed. The vendor says it will remain "strongly committed" to the future Intel product line. But one has to wonder if the old-fashioned Intel 80386 and I486 will command much of Compaq's attention during the next 18 months.

Case in point: Compaq admits it is getting harder to differentiate the Intel-based desktop PC. The company's accustomed

Continued on page 40

Hollywood to make its VDT screen debut

BY CAROL HILDEBRAND
CW STAFF

Not content with its staid Blue image, IBM went to Tinseltown to find inspiration for its entry into the presentation graphics market.

With Hollywood, a Microsoft Corp. Windows-based package from IBM's Desktop Software Business Unit in Milford, Conn., the company takes aim at such packages as Microsoft's Powerpoint and Aldus Corp.'s Persuasion.

IBM has also acquired the rights to develop a version of OS/2 Presentation Manager from Hollywood's developer, Publishing Solutions, Inc. in Marlboro, Mass.

Variety of methods

Hollywood allows several methods of creating presentations. Users can choose either a predesigned, customizable template or an integrated outliner to put together a project. Text can be imported from word processors and spreadsheets.

Hollywood's Data Manager interface features a spreadsheet-like format that allows easy importation of the data and generation of charts and tables.

Sheldon Laube, national director of information and technology at beta-test user Price Waterhouse, said the outlining feature broadened the product's appeal. "It makes it relatively accessible for nongraphics professionals," he said. "You can do simple stuff easily, but it has a tremendous amount of further sophistication as you get in under the covers."

Hollywood supports Speedo scalable fonts from Bitstream, Inc. and features a tool that allows shadowing, curving, mirroring and color washing of the text. It offers a wide array of chart types and a chart gallery in which a user can store frequently used chart types. A toolbox offers "drawers" of basic tools for such tasks as entering text, drawing and painting.

Kelley Anderson, a beta-test user at Deloitte & Touche in Dallas, praised the ease of use for the unsophisticated user. Anderson, who is "not a power user," said, "It's intuitive to use. It comes up, you've got that toolbox, and it's easy to pick the type of activity you want, and you just go in and do it."

Anderson added that he also liked the ability to get into black and white quickly and output a presentation on a laser printer, which, he said, was a problem with other packages.

Laube said he found one drawback: The package does not install on a network very well. "You pretty much have to have a copy of it on every machine," he said. "It takes up a lot of disk space." Laube added, however, that IBM is presently working on the problem.

Hollywood retails for $495 and is slated for availability May 31. IBM announced toll-free live technical support for all IBM Desktop Software products. Online support is available to Compuserve members.

FEATURE: GRAPHICAL USER INTERFACES

Keep them sleek and simple

BY CHRISTINE COMAFORD
SPECIAL TO CW

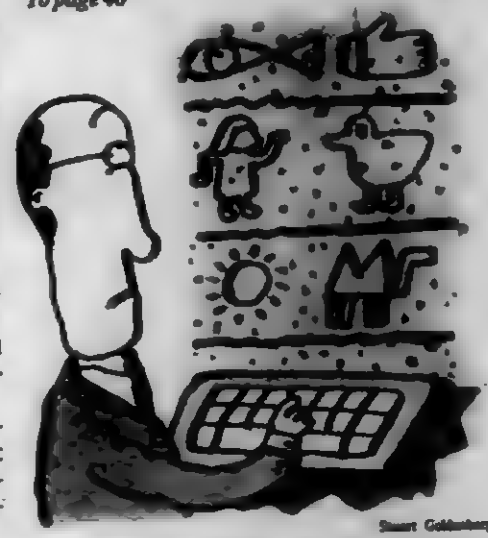
The fact that a user interface is graphical doesn't automatically mean it's intuitive or easy to use. Consider this: According to Microsoft Corp., becoming accustomed to a graphical user interface (GUI) should require eight hours of training. However, in a study by Corporate Software, Inc., 14 firms reported that 20 to 30 hours of training was a more accurate estimate. Apparently, GUIs are not nearly as intuitive as their creators would like to think.

A "good" graphical user interface is straightforward in its presentation and easy to navigate. It uses its screen real estate well, is succinct and powerful and doesn't include unnecessary components.

A "bad" GUI is awkward, unclear and certainly not intuitive. The user is never sure what to do and never sure how to find his way to a desired action. Some GUIs give the user confidence; others don't.

Computer-fluent developers are often guilty of designing interfaces that are difficult to understand, assuming that users think and interact

To page 40



Stuart Goldenberg



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Paradox breaks new ground

While most in the software industry scramble to maintain their status, Borland International, Inc. has used technical acumen and aggressive marketing to grow at a rate reminiscent of the industry's boom years. Last week, the company announced 1991 revenue of $226.8 million — 100% higher than a year earlier.

In recent years, Borland has claimed that its Quattro Pro spreadsheet has made great strides against entrenched rivals, while sales of language products such as Turbo Pascal, Turbo C and Turbo C++ also continued to soar.

Officials at the Scotts Valley, Calif.-based firm now have high hopes for the upcoming Paradox for Windows, which features a new database engine architecture that allows applications to share data by snapping into a common "object layer." In the current, character-based version of Paradox, such data exchange now requires traversing the Paradox database.

Microsoft Corp. and Ashton-Tate Corp. have both promised Windows-oriented databases, but the potentially lucrative Windows database market is still relatively untapped and serviced by such products as Superbase 4 from the smaller Precision Software, Inc.

Computerworld Senior Correspondent James Daly recently discussed with Borland Vice President and general manager Rob Dickerson the upcoming product and its importance.

What are the advantages of the new architecture?

Data independence. We want our users to choose the kind of data they want and be consistent with it. It's the ultimate open architecture. Plus, you're guaranteed that any data the engine maintains reserves the referential and domain integrity of the information.

Will you extend that design to the character-based Paradox?

Nothing technically prevents us, but right now we're maniacally chasing after getting these Windows products out the door. We're not saying you won't see it on DOS, but we're not working on it right now.

Do you think those who use character-based Paradox will feel left behind?

That's going to be a fundamental question during the DOS-to-Windows [transition]. As a vendor, we're always thinking about into which basket we should put our eggs. We've chosen to make Paradox for Windows the killer application, because we see a real opportunity for us there.

Borland has a tradition of announcing and shipping products on the same date. Why the sneak peek?

The biggest complaint we get is that we sometimes play our cards too close to the vest. We want our customers to know what our objectives are. We want to show people where we're going, so developers don't feel they've been abandoned.

Speaking of where you're going, what is the Borland commitment to OS/2?

We focused on Windows before OS/2 because it's more commercially significant near term. We know how to build OS/2 applications — Sidekick OS/2 is bundled with an operating system from IBM — but we're not doing anything stupid in terms of not being able to move Windows applications to OS/2.

With OS/2's future up in the air, does "not doing anything stupid" mean not doing anything at all for OS/2?

No. We're just not doing anything under Windows that makes the code nonportable to OS/2. But at this time, we are not building Paradox for OS/2.



Dickerson *is pursuing a place in the Windows market*

How about Unix?

We're not building Paradox for Unix right now. We support broad connectivity rather than a cross-platform strategy. Vendors that choose a single-platform focus strategy usually win, because they know how to take advantage of that platform. Compare Borland with Ashton-Tate, which is building a flavor of Dbase IV for virtually everything that runs on electricity. As a result, they've got so many code bases, it makes it very difficult to evolve the product. We're building a broad range of applications on a narrower range of platforms.

What are Borland's greatest challenges in the next two or three years?

Winning on Windows. Using the transition to Windows as an opportunity to grab big pieces of market share, and giving customers products the competition doesn't have. Paradox is a big part of that.

Object of the game

While Borland continues to gain accolades and market momentum with its dizzying release schedule, there remains an unsung hero of the firm: object-oriented programming.



Borland's Kahn *emphasizes object-oriented tools*

Chief Executive Officer Philippe Kahn is betting the company on the methodology, a visually oriented programming technique that slashes development time by supplanting rigid programming designs and commands with graphical icons.

Since Borland switched to an all object-oriented development program more than two years ago, the firm's release schedule has been the envy of the industry. It was object-oriented programming, after all, that allowed the release of the Quattro Pro Version 3.0 spreadsheet only five months after the product's previous edition.

Object-oriented technology also played a key role in the development of the upcoming Paradox for Windows. "If we didn't use object-oriented technology, the program would take more than 100 engineers to build, and that's unmanageable," Kahn said.

The increasing complexity of writing software will require firms to standardize on object-oriented programming, he added.

JAMES DALY

Intel plans AMD squeeze

BY MAURA J. HARRINGTON
CW STAFF

SANTA CLARA, Calif. — As it has done in the past, Intel Corp. will probably use its marketing muscle to try to neutralize arch-rival Advanced Micro Devices, Inc.'s efforts to market its new AM386 clone microprocessor. Intel is expected to introduce a low-end I486 chip in a 386 price range this week.

Code-named the P23, Intel's new microprocessor chip will not include a floating-point co-processor, according to analysts.

Though it will likely be marketed as a higher-end product than AMD's AM386 chip, the P23 would be similar to AMD's new AM386 because both chips would run 32-bit software applications at only slightly different clock speeds, analysts said.

Intel's effort to overshadow AMD's new chip is not in vain, according to semiconductor analyst Millard Phelps at Hambrecht & Quist, Inc., an investment firm in San Francisco.

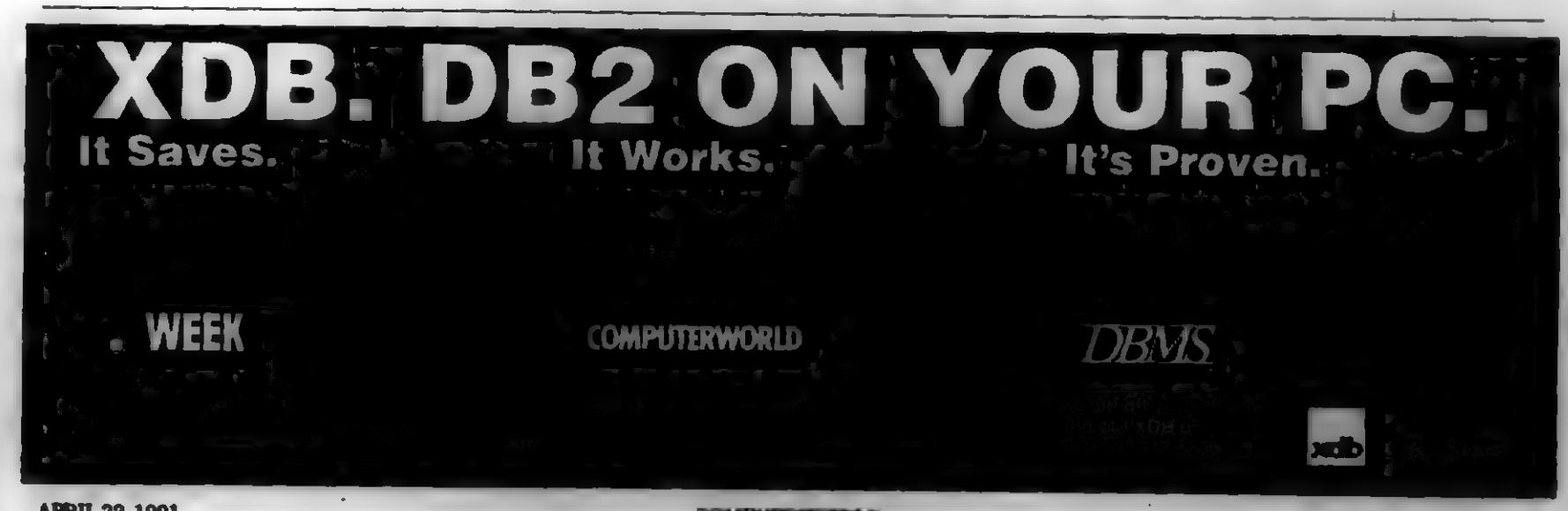
Some major differences in the components of a 486 chip might make the P23 more attractive than AMD's 40-MHz AM386 clone, if the price/performance ratio is right, Phelps said. Intel was able to place cache memory inside its new chip, for example.

AMD was the first to clone Intel's 80286 microprocessor (in 1988) but took a reduction in profit margins on sales of the 16-bit chip after Intel introduced the 32-bit 80386SX chip, which it priced competitively with AMD's AM286 chip to drive it out of the market.

Semiconductor analyst Michael Slater, publisher of trade journal "The Microprocessor Report," said he agrees that Intel may attempt to tarnish AMD's competitive efforts with its marketing clout and product introduction. However, he said it will not be easy this time for the chip vendor to succeed.

"This is a price/performance issue ... where Intel is essentially saying, 'Here's a way to get the same performance on a higher level machine for the same price as the lower level [386 chip],' " Slater said.

He added that Intel will probably sell its low-end I486SX-type product for just slightly more than the Intel 386 chip costs.



Sleek and simple

CONTINUED FROM PAGE 37

with computers the same way they do. They are often quite unaware of how much prior knowledge goes into their understanding of what appears on the screen and are unable to grasp the requirements of users who lack that background. This is frequently compounded by failure to solicit user feedback or get help from human factors specialists.

The current definition of IBM's Common User Access (CUA) is quite limited and rarely helpful when designing and predicting how users will interact with software. In response, a growing number of applications are using "nonstandard" interface components such as status and tool bars, utility "ribbons" and file caches. The more users embrace these new interface components, the more they become de facto standards.

Because of such emerging standards, it is critical for developers to keep up with new GUI applications. Observe them objectively — try, if you can, to mimic the mind-set of the naive end user. What functions can you use and understand before picking up the manual or asking questions? Try to apply the most successful structures to your software's tasks. This is not a question of copying the look and feel of a competitive product but of applying successful design principles to your own work.

• **Know your users.** Build on paradigms users encounter in their daily life and thus are familiar with. Test the icons you are thinking of using: Find out if most users understand that the little striped squarish shape represents an open book.

Don't assume that users are like you. Have someone sit in front of your application and try to figure out how to interact with it. Be humble enough to gauge honestly how the users react and solicit their input for making interface changes. Provide default options in all fields and make sure sufficient attention is given to context-sensitive Help.

Users rarely fall into one broad class. Assume they will fall into a number of categories and allow the interface to be extendable. GUI design for general-purpose corporate applications should be based on three categories of users:

1. Data entry/transaction processing. These applications should be geared toward high-turnover staff and must require minimal training. They will be keyboard-intensive, so you should provide menu accelerators and expect minimal, if any, use of mice.

2. Decision support. These should be geared to professionals with minimal time for training. They will be mouse-intensive, but don't overlook keyboard-intensive laptop use.

3. Systems administration. These should be geared toward technical staff who need more information for operating system, network and database management system administration. They will use both mice and keyboards.

GUI guide

The following are the eight essential steps to designing an easy-to-use GUI:

- Know your users.
- Make frequent tasks easy.
- Adapt to users' work patterns.
- Consider multiple skill levels.
- Provide navigation help.
- Be consistent.
- Don't rely on users reading the manual.
- Don't get too cute.

• **Make the things done most frequently the easiest.** Actions performed most often should require a minimal number of keystrokes, and menu selections should be at or near the top of the menu hierarchy. For example, changing character attributes in a word processor is common. Don't make users step through multiple menu levels for something so basic.

• **Adapt the interface to users' work patterns.** The interface should be customizable at some level. A good example of this is the ability to add menu items to Microsoft's Word for Windows by using macros. This idea is very powerful in light of the need to know your users. A corporation's end-user computing group could provide custom menus for each user category.

• **Consider multiple skill levels.** Both occasional and sophisticated users should be accommodated. Provide an option to display advanced features if desired by the user. A good example of this is Word for Windows Long Menus option. This feature enables power users to work at their own speed and does not confuse inexperienced users by displaying too many choices that they wouldn't need anyway.

• **Provide navigation assistance.** It is essential to design GUI applications with the inexperienced user in mind, to avoid providing too many options at the highest level and causing user paralysis. Grouping related menu items together also significantly reduces navigation confusion. Avoid modes in which a user's actions will be restricted and, worse yet, in which the user will have to figure out how to return to the default state of the application.

• **Be consistent.** CUA emphasizes consistency over clarity and ease of use. Follow the basics of CUA in order to be consistent with shrink-wrapped products, but when in doubt, opt for clarity and usability. In menus and on buttons, use words that are common in the industry (File, Edit, Help and so on) or are understood and accepted within your firm.

Don't overlook formally designing the interface and having users review it before starting to code. Audit your interface design against other in-house or shrink-wrapped applications. Is it consistent? It should look and feel like other CUA-compliant applications, or it will require additional user training and may not integrate well with other applications.

• **Don't require the user to refer to a manual.** Basic functionality of the application should be easily understood. Display as much of the application's functionality as possible without cluttering the screen. Tool bars and utility "ribbons" are helpful in graphically portraying product features, assuming the icons are properly designed.

• **Don't get too cute.** Use graphics to provide visual metaphors to give users a familiar operating environment. Avoid the temptation of cluttering limited screen real estate with unnecessary icons, for example. Strive for a "WYSIWYNTS" interface — what you see is what you need to see — nothing more, nothing less.

Tomorrow's users will be increasingly more sophisticated and demanding. To design successful GUIs, developers need to do just that — really design them. That's not always easy, and chances are good that you will have to make tradeoffs, given the fast-paced world of software development. But bear in mind that the benefits of doing it cleanly the first time will show up — fast.

Alex Ward, senior technical consultant at Kuvera Associates, Inc., contributed to this article.

Comford is a partner in Kuvera Associates, Inc. with offices in Redmond, Wash., and Sausalito, Calif.

Pastore

CONTINUED FROM PAGE 37

high profit margins depend on differentiation. The last thing it wants to do is peddle commodity boxes. So the PC maker is turning to the sexy, underexposed world of RISC and is apparently concentrating a great deal of development effort there.

Indeed, chief engineer Gary Stimac has been cloistered away for several months on this project. Other than the notebook LTE 386S/20, what exciting Intel product has come out of Compaq during that time?

The Houston PC maker certainly isn't planning to dump the corporate market in favor of partner Silicon Graphics' scientific and engineering user base. The bucks and the volume still lie in the corporate environment.

Apparently, Compaq thinks high-end corporate users are increasingly fixated on the possibilities of RISC architecture. They perceive RISC as a faster, more robust architecture and development platform, according to Lorie Strong, Compaq's vice president of marketing. Compaq is doing ACE partly based on that perception, she said.

In actuality, the Compaq brain trust says it expects Intel and the Mips Computer Systems' RISC chip to seesaw as the dominant power platform. The firm will offer dual architectures until one earns market dominance.

So, how is a user supposed to determine which architecture to buy from Compaq in 1992?

Compaq says it is not sure who would buy which architecture for what purpose. But presumably, users doing higher end, mission-critical work would opt for RISC — based on that perception of power superiority.

What then of Compaq's current high-end strategy: multiprocessor systems? Is the Systempro a dead end on the high end? Or was it intended only as a network server, despite Compaq's earlier claims that it could replace minicomputers?

Once more, Compaq says it is not sure of the fate of the Systempro. "If users are putting higher end applications on the network, we think they will be looking for more than two processors and greater storage," said Michael Clark, a Compaq engineering vice president.

The company is considering expanding the Systempro beyond the two-processor limit or building a Systempro-like box around future RISC processors. In any case, the Systempro as it now stands apparently will not be the answer after 1992.

One more thing Compaq says it is not sure of is distribution for the new RISC systems. Many Systempro customers are already unhappy about having to buy mission-critical systems from traditional PC dealers, and even more are unhappy with the service the dealers provide. Users are quite unlikely to accept a whole new advanced RISC platform from the friendly neighborhood Businessland [illegible].

APPARENTLY, COMPAQ THINKS high-end corporate users are increasingly fixated on the possibilities of RISC architecture.

Compaq's new bedfellow, DEC, sells its RISC workstations directly. New partner Silicon Graphics sells its workstations directly. The PC maker has some obvious examples to follow if it chooses to do so. Indeed, the agreement with Silicon Graphics does not preclude it from distributing Compaq's products, according to Clark.

The next two years will tell Compaq customers what they will be able to buy and where they will be able to buy it. But why they should buy may be the toughest question to answer.

Pastore is a Computerworld senior writer.

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Trax Softworks, Inc.

R:Base 3.1 feature-filled but lacks speed

Microrim, Inc.'s R:Base Version 3.1

Reviews	Ease of use	Data integrity	Multiuser support	Performance	Application development	Documentation	Service & support	Value	Status
InfoWorld 1/14/91	Very good	Good	Satisfactory	Poor	Very good	Very good	Satisfactory	Good	Great tool, but slow
PC Week 12/10/90	Satisfactory	Good	Good	Satisfactory	Satisfactory	NC	NC	NC	Best integrity
PC Computing 2/91	Smoother	NC	A strength	Poorer	NC	Good	NC	Good	A contender
Users									
Jim Sheehy, Superior National Insurance Co.	NC	■	■	■	■	▙	■	■	Nothing can touch it
Bill Cahill, Putnam Berkly Group	■	■	▙	▙	■	■	▙	■	Needs more speed
Charles Beran, CB Commercial	■	■	■	▙	■	▙	■	■	Phenomenal service
Analysts									
Dean Hiller, D. L. Hiller & Associates	▀	▀	▀	▙	▀	▙	▙	▀	Fair
Jerry Caron, Faulkner Microcomputer Reports	▙	▙	▙	▀	▙	▀	▙	▙	Good
Paul Litwin, *Database Advisor*	■	■	▙	▀	■	■	▙	■	Solid, mature

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment Key: ■ Very good ▙ Good ▀ Fair ▪ Poor

Technology Analysis — A roundup of expert opinions about new products. Summary written by staff writer Derek Slater.

Reviewers said Microrim's R:Base database management system is for sedan drivers: Its low-octane performance will frustrate speed lovers, but it is laden with luxurious features for querying, reporting and development.

Version 3.1 corrects a number of rough edges and performance problems that plagued R:Base 3.0, and Microrim offers free upgrades to registered users of that release.

Ease of use: R:Base is a user-friendly program, reviewers said. Queries and browser menus make data easily accessible. Users can operate either through menus or with a command line. A prompt-by-example function demonstrates the correct way to build commands. *PC/Computing* reported that Version 3.1 also handles printer problems more gracefully than its predecessor, warning the user instead of freezing the system. The installation procedure has been simplified and takes only 15 minutes, reviewers said.

Data integrity: Referential integrity in a multiple-table database is enforced by rules written specifically into that database rather than in the controlling code. As a result, reference rules can be very specifically customized. R:Base stands above its competitors in this area, according to *PC Week*.

Multiuser support: R:Base offers good multiuser features overall, reviewers found. However, there are a few notable limitations. All locking is at the table level; individual records cannot be locked. Users trying to view a locked table are sent to a wait queue, which aborts after a user-defined interval if the table does not become available.

Performance: Lack of speed is the foremost drawback for R:Base users. The program straggled in well behind other databases in benchmark tests conducted by personal computer laboratories. However, as analyst Jeremiah Caron commented, "Its performance is poor relative to the others, but you don't have to sit around tapping your fingers."

On the plus side, Version 3.1 is slimmed down, running in as little as 450K bytes of memory.

Application development: R:Base's powerful programming language and numerous tools provide an excellent development environment. SQL commands can be integrated into R:Base applications, and a compiler is included. The debugging tools and editor are less impressive but still useful, according to reviewers.

Documentation: For Release 3.1, the documentation is reworked, including updated indexes. The manuals are thorough and clear. One manual explains the similarities and differences between R:Base and Ashton-Tate Corp.'s Dbase. R:Base has on-line Help as well.

Service and support: Support policies were recently revised. Microrim now offers several support options. Phone support, while still free, is no longer toll-free for all users. Technical information is still available for no charge through a bulletin board service and a fax program.

Reviewers found the phone support technicians to be fairly easy to reach and very knowledgeable.

Value: Reviewers said R:Base, priced at $795, is a good value overall; it is best suited for users willing to sacrifice some speed for powerful features.

Microrim recently announced a new upgrade plan for R:Base called Upgrade Express. Users who enroll for a fee of $129 per year ($99 before April 30) will receive periodic enhancements throughout the year. The first Express extension includes a feature called the Dynamic Application Integrator, which gives users the ability to menu and run other applications (such as spreadsheets) from within R:Base.

A low-end version called Personal R:Base, without programmability and network support, is available for $99.

Vendor financial information

A 9-year-old company, Microrim, Inc. produces only the R:Base product line. Based in Bellevue, Wash., the company has 135 employees. It is run by CEO Jack Noonan, formerly at IBM, and by Founder and Chairman Wayne Erickson. The privately held company does not release financial data. Sales are reportedly in the $20 million to $25 million range.



"AFTER FIVE YEARS of development and use, we remain convinced that no other environment could give us the capabilities provided by R:Base."

James A. Sheehy
Vice President, MIS
Superior National Insurance Co.

Microrim responds

Comments from Mickey Friedman, director of product marketing:

Performance: We have concentrated our performance enhancement efforts where our users need them most: queries by example, for instance. Upgrades will continue to enhance performance.

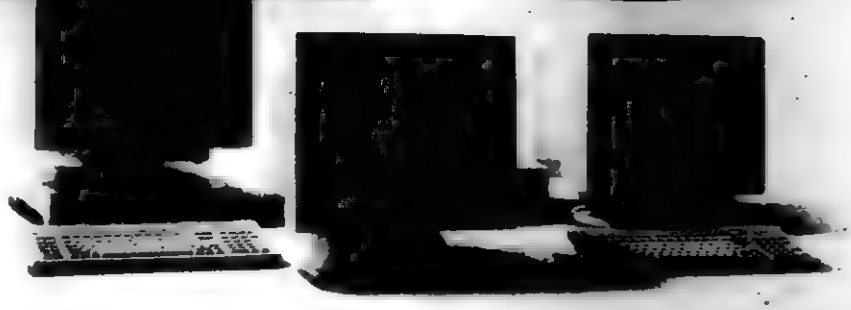
Service and support: Our purpose in changing support policies was to satisfy a broader range of needs. We offer three levels of service. The first level is free support to all R:Base users. Second is higher priority for $99; that includes a toll-free number, faster response time and our 'R:Base Exchange' publication. The third level is consulting on application development, which costs either $2 per minute or $20 per call; or there is a value pack of 10 calls for $149. This offers a level for any need or budget.

Value: Each release in Upgrade Express will be significant. There will be three upgrades per year, and we have general guidelines to follow for outlining quality updates, performance enhancements and so on.

NEXT WEEK

▶Datacase International, Inc.'s Datacase 4.2 offers no procedural programming language. Instead, the company emphasizes ease of use.

28½ V



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HEWLETT PACKARD

Satellite firm automates sales force

BY ALAN J. RYAN
CW STAFF

PLANO, Texas — Sales can get complicated in Timothy Flynn's business of selling satellite time, especially with a four-person sales team handling 24-hour operations, a tricky pricing strategy and customers who do not like to wait.

Flynn's company, Broadcast Satellite International, Inc. in Plano, buys thousands of hours of satellite time from various carriers and then resells that time in 15-minute increments to news and sports organizations, syndicated businesses and the like.

Flynn was working with various pricing structures because the channels were purchased from several carriers. Because he was dealing with every time zone in the world, he could get calls at any time of the night.

All that has been simplified with software from SBT Corp., which sells an accounting package that includes sales force automation modules.

Flynn purchased Database Executive Library two years ago because it was compatible with his Fox Software, Inc. Foxbase database. Since then, he has added an on-line sales order program and a contact manager module.

Salespeople can now access data directly from laptops to check on the status of a client; what the client has ordered in the past and contact names at client companies. They can even conduct credit checks.

Pricing benefits

More importantly, however, the company can now more accurately price the satellite time it sells, thus increasing profitability. On the old system, Flynn set one average price for all the channels on the satellite to avoid the complexity of pricing each one separately. His profits varied from channel to channel.

The SBT software allows him to plug in the varying prices for each channel. When the time is sold, the correct price automatically pops up on the screen.

The most important change sales-force automation software has brought about, however, is the ability to more easily maintain 24-hour operations.

"If someone calls in from Japan in the middle of the night and wants to buy satellite time immediately, [an on-call representative] can sell it from home," Flynn says.

The salesperson can also alert customers to the status of the request and immediately give the confirmation number assigned by the satellite carrier.

Broadcast Satellite plans to add fax cards to its Zenith Data Systems laptops so they can close transactions even more quickly. "We are just beginning to see the benefits of that program, and that will be tremendous for us," Flynn said.

HP unveils pocket computer

CORVALLIS, Ore. — Hewlett-Packard Co. will release a calculator-size computer this week, according to sources close to the company.

The 95LX will weigh 11 ounces and will come with 512K bytes of random-access memory, 1M byte of read-only memory (ROM) and a slot for flash-memory cards. The ROM will hold Lotus Development Corp.'s Lotus 1-2-3 Version 2.2 and MS-DOS. The 95LX will also include a built-in scheduler, memo-taker, address book and HP Advanced Financial Calculator. It is slated to retail for $699.

HP will also bundle the machine with an infrared, cableless port, which will allow data transfer between 95LXs.

Sources said HP will also offer 95LX users automatic paging via Motorola, Inc.'s Electronic Mail Broadcast to a Roaming Computer technology by the end of 1991. It will include terminal emulation abilities for electronic mail retrieval and file retrieval, but it will not have a built-in modem.

NEW DEALS

Canadian agency enters into PC contract

The Canadian government has purchased a personal computer network contract worth up to $45 million over three years. The Employment and Immigration Canada bureau is buying 8,000 Acer America Corp. PCs based on the Intel Corp. 80386 chip, as well as 8,000 Acer IBM Video Graphics Array monitors. Systems integrator Mohawk Data Sciences Corp. will supply and install the equipment.

Everex Systems, Inc. won a subcontractor role in the federal government's Department of Veterans' Affairs (VA) Nationwide Office Automation contract. Everex will supply up to 15,000 Intel Corp. 80386SX and 80386DX-based PCs over six years to contractor Lockeed Integration Solutions Co., which will install the systems in VA agencies.

General Electric Information Services (GEIS) awarded an $8 million contract earlier this month to Hewlett-Packard Co. for workstations, servers, software development tools, system software and peripherals. GEIS will use the equipment as part of its information services business.



NEW PRODUCTS

Software applications packages

Applix, Inc. has announced Version 1.1 of Asterix, an open suite of applications packages designed for Unix workstations and X terminals.

The product includes word processing, a graphical spreadsheet, audio for voice annotation, color pixel editing and live links to third-party applications. The software also provides fax support via macros and adds interprocess communications capabilities to its extension language facility. A color pixel editor enables users to edit scanned-in, imported and Asterix-generated images pixel by pixel using a 64-color palette.

The product now runs on Sun Microsystems, Inc.'s Sun3, Hewlett-Packard Co.'s HP 9000 Model 300 workstations and Mips Computer Systems, Inc.'s RISC System workstations.

The product costs $995, or $665 for a version without spreadsheet capability.

Applix
112 Turnpike Road
Westboro, Mass. 01581
(508) 870-0300

Computer Associates International, Inc. has begun shipping Accpacc Plus U.S. Payroll Version 6.0, an upgraded payroll processing software package.

The personal computer-based product adds the ability to distribute an employee's payroll expense to several departments in the same pay period. Other enhancements include an updated user interface, multiple time-card reuse capability and a workmen's compensation report.

The product is priced at $795.

The company said it offers several lower priced options for upgrading from previous versions.

CA
711 Stewart Ave.
Garden City, N.Y. 11530
(516) 227-3300

Software utilities

V Communications, Inc. has announced a Microsoft Corp. Windows 3.0-compatible version of its Intel Corp. 80386/1486 DOS memory manager.

Memory Commander ($100) can reportedly move terminate-and-stay-resident programs and device drivers into high memory while a system is being booted, thereby creating more main memory for DOS-based applications that contain copious amounts of data.

When necessary, DOS users can break their 640K-byte memory barrier by equipping their environment with up to 900K bytes of contiguous memory, the vendor said.

V Communications
4320 Stevens Creek Blvd.
San Jose, Calif. 95128
(408) 296-4224

Right On, a mouse utility designed by Fanfare Software, enables Microsoft Corp. Windows 3.0 users to create customized sets of button actions for each application they use.

The product allows a mouse's middle and right buttons to be programmed to perform special tasks for use during various applications.

The product costs $50.

For a limited time, the company is including its screen cursor utility package, Magic Cursor, with Right On for $79.95.

Magic Cursor requires less than 10K bytes of memory and can be purchased separately for $49.95.

Fanfare Software
9420 Reseda Blvd.
Northbridge, Calif. 91324
(818) 886-8787

Central Point Software, Inc. has announced an antivirus software package designed for DOS, Microsoft Corp.'s Windows and networked environments.

Central Point Antivirus ($129) detects, eliminates and prevents data corruption caused by more than 400 known and unknown viruses.

A file immunization feature makes executable files self-protecting, and a dialog box alerts Windows users of infections that occur while a Windows application is running.

The product includes Vsafe, which is a memory-resident utility that monitors systems for signs of a virus attempting to infect a file.

Central Point Software
15220 N.W. Greenbrier Pkwy.
Beaverton, Ore. 97006
(503) 690-8090

Database management systems

Micro Data Base Systems, Inc. has released M/4 for Windows, a Microsoft Corp. Windows 3.0-compatible database management system.

The product incorporates a data dictionary, an interface for the company's Object/1 graphical development environment, a Microsoft C application programming interface and developers tools.

Available add-ons to M/4 include ad hoc query generation and interactive tools for database access.

The package is listed at $995.

Micro Data Base Systems
Two Executive Drive
Lafayette, Ind. 47902
(317) 447-1122

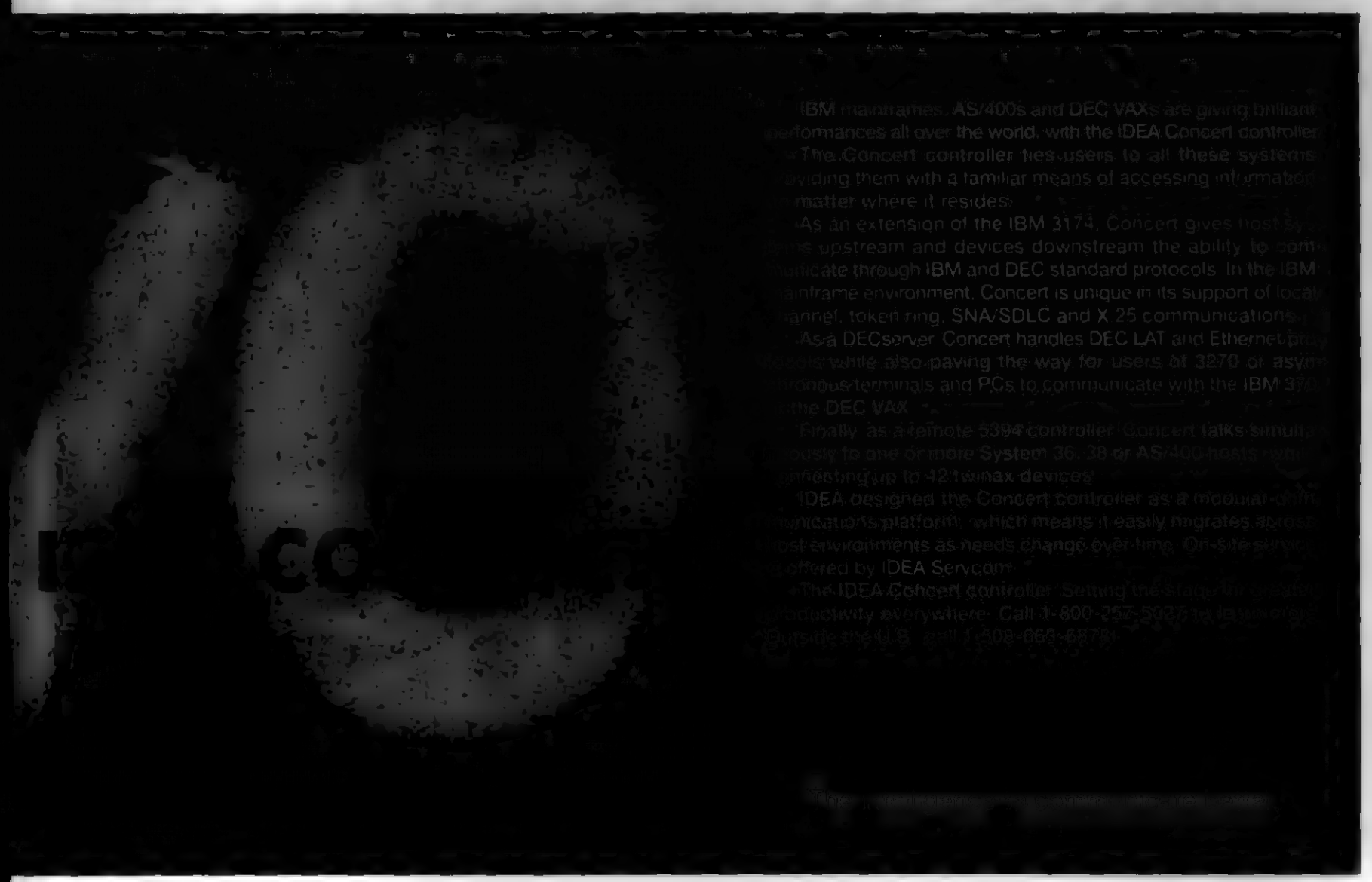
Revelation Technologies, Inc. has announced Version 2.1 of Advanced Revelation, a relational database management system and application development environment for IBM Personal Computer ATs, Personal System/2s and compatibles.

The product's query-by-example feature acts as an intuitive front end for interactive relational queries, and its distributed indexing capability obviates the need for all transactions to pass through a single file, according to the vendor.

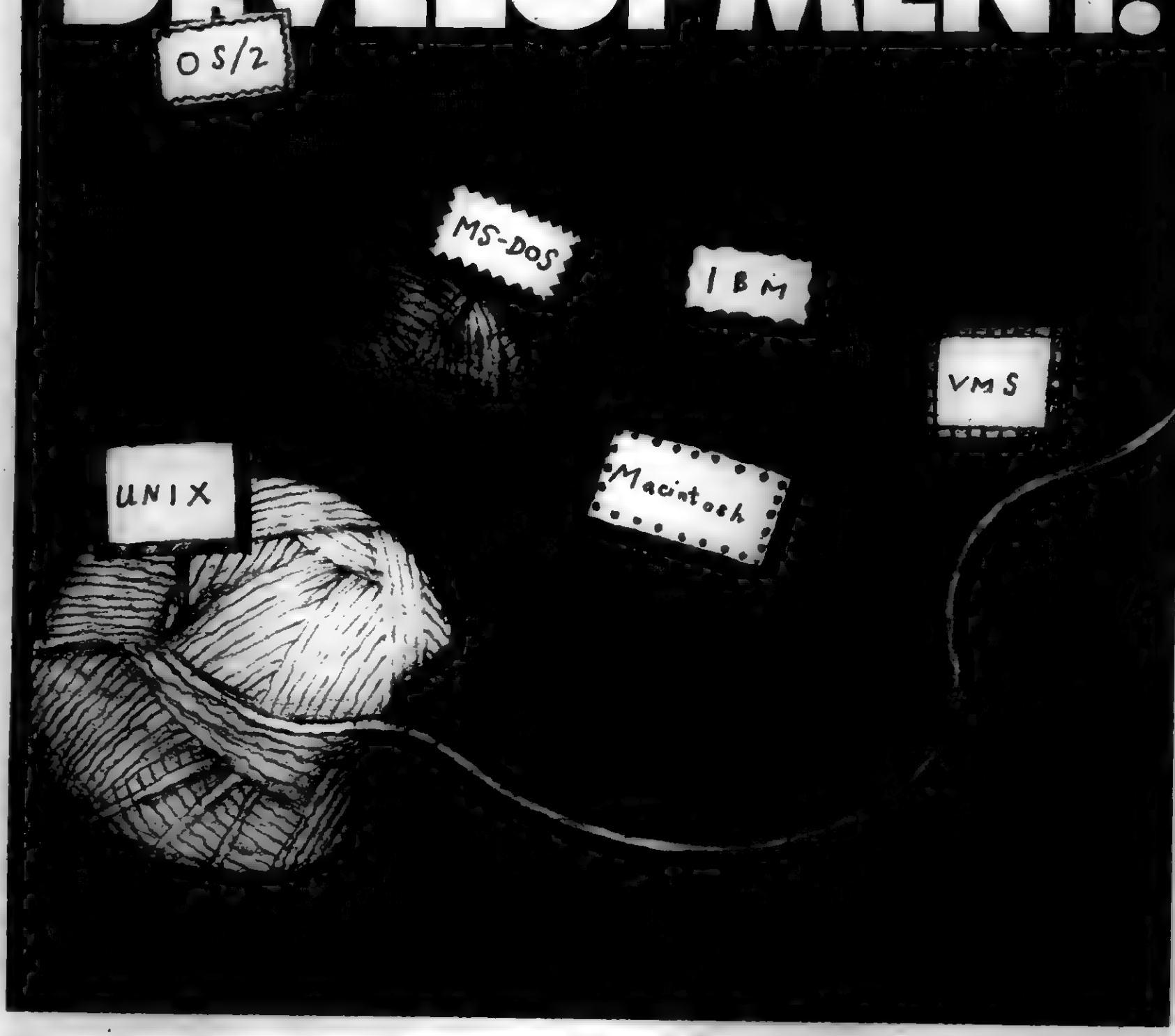
Advanced Revelation Version 2.1 lists for $1,195.

Users of Version 2.0 can upgrade their systems for $200; all other upgrades cost $400.

Revelation Technologies
Two Park Ave.
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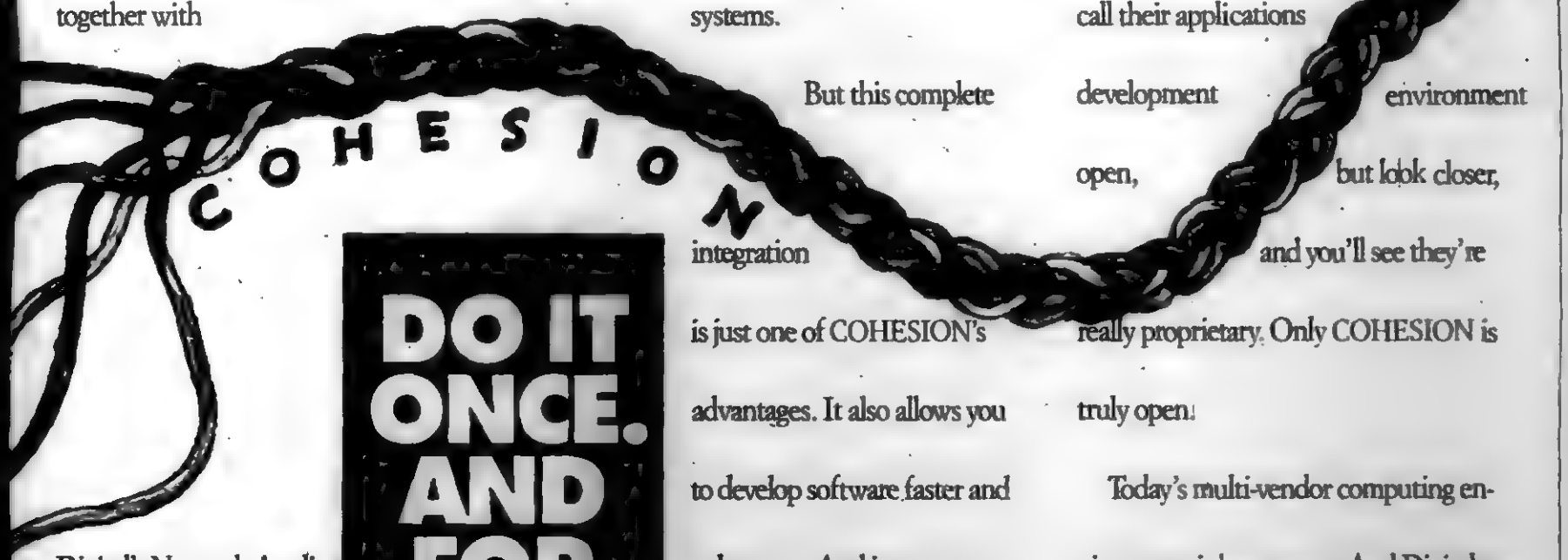
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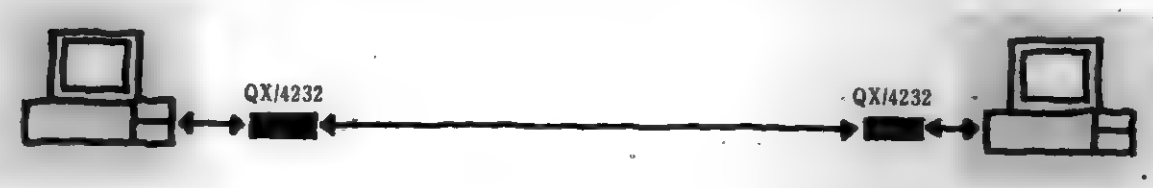
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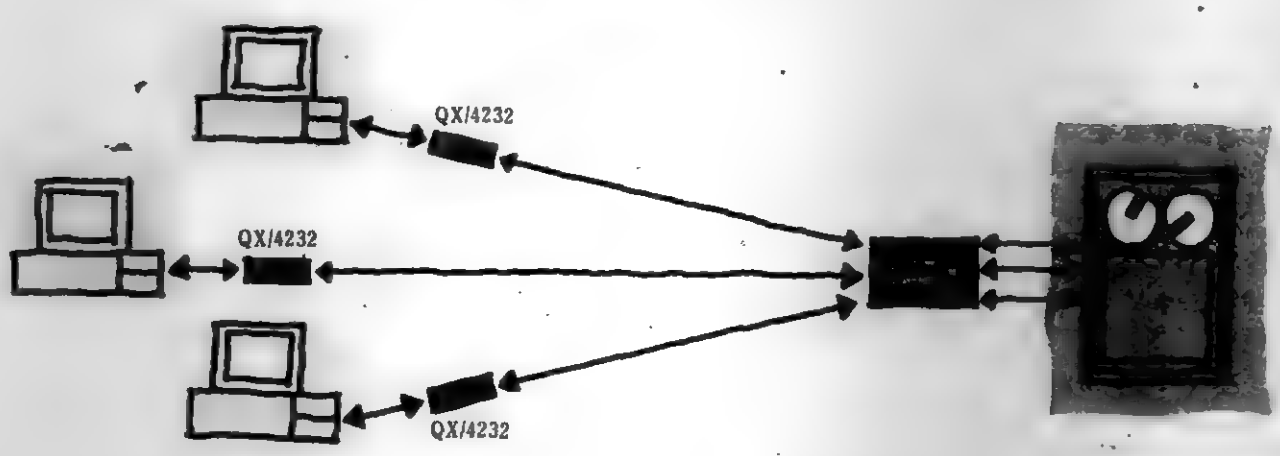
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BIT BLAST

Netool licensed

Multiplexer vendor **Timeplex, Inc.** and **Make Systems, Inc.** recently announced a worldwide agreement that will allow Timeplex to license a version of Make Systems' Netool decision support system. Netool allows users to preview the ramifications of new network configurations before making equipment and line installation decisions. Make Systems announced the Link version of Netool — along with a version for Newbridge Networks Corp.'s Mainstreet T1 multiplexers and 4602 network management systems — last September. Timeplex and Make Systems are reportedly jointly developing a system for importing network information from Timeplex's Time/view 2000 network management system to Netool.

Anthem Electronics, Inc. recently created a new manufacturing unit to handle existing and undisclosed new networking products. Anthem, based in San Jose, Calif., has an exclusive license to build and sell Novell, Inc. Ethernet adapter cards. The new unit, Eagle Technology, will take responsibility for that line. According to Anthem, which is rumored to be preparing to license Novell's Netware ELS work-group software, Eagle will offer unspecified new connectivity products.

Unisys Corp. recently announced a flurry of enhancements to its Network Applications Platform voice processing system, including fax services and voice messaging capabilities. The fax features include a fax mailbox, fax overflow, fax translation and broadcasting. Voice messaging capabilities include password security, message retrieval, review and storage, paging, group mailboxes and message forwarding.

Alliances get mixed reviews

Banding of telephone companies may aid multinational corporations

BY ELLIS BOOKER
and JOANIE M. WEXLER
CW STAFF

In this era of strategic vendor alliances, the world's telecommunications carriers are no exception. Many are banding together to provide one-stop global network shopping to multinational customers — with mixed reactions from the user community.



While users agreed that better coordination among the world's carriers is desirable, some said they have yet to be convinced that a carrier partnership will prove faster or more competent than their seasoned in-house networking staffs.

Bill Coopman, director of telecommunications at Deere & Co. in Moline, Ill., said that because his 11-country network is "not broken," he would be reluctant to hand over its design, planning and management to an independent entity.

Coopman, who is also vice president of the U.S. branch of the International Telecommunications Users Group (Intug), said the Intug jury is still out on the one-stop concept. Today, he explained, eliminating finger pointing in troubleshooting international circuits requires "you to simply sit down with the carriers and figure out whose problem it is."

How much better three or more carriers will do in resolving a customer problem is an open question, he said.

Meanwhile, a multinational carrier alliance is working well for General Electric Co., according to Stanley Welland, manager of corporate telecommunications at GE. British Telecommunications PLC, AT&T, France Telecom and Japan's long-distance provider, Kokusai Denshin Denwa Co., have been providing a 40-country end-to-end network for GE since the spring of 1989.

Welland said that for GE, the approach has paid off — particularly in not having to employ telecommunications staff around the world.

"The three carriers know Europe; their relationships with the PTTs are better than ours," he added. "They help us build rapport with the other carriers and define what facilities we need and coordinate a smooth installation of those services."

Day by day

Welland acknowledged, however, that the arrangement's success hinges on day-to-day involvement by GE. "I'm a great believer in outsourcing, but I'm also a great believer in participation," Welland said. GE runs a centralized network management base in Princeton, N.J., that interfaces with all the Postal Telephone and Telegraph (PTT) authorities. The firm is involved in the day-to-day troubleshooting of network problems.

"Communications today plays too vital a role to turn the whole thing over and cross your fingers," Welland said.

Potential partners

The most recent carrier alliance is a proposed partnering of British Telecommunications PLC, Japan's Nippon Telegraph & Telephone Corp. and Germany's Deutsche Bundespost. While details of the would-be alliance are sketchy, Wolfgang Huerter, a network analyst at the Deutsche Bundepost's Economic Research Institute in Bad Honnef, Germany, explained the impetus behind it.

"Different countries use different protocols and different standard transmission rates," he said. "Most U.S.-based companies don't have enough knowledge of all these nuances to optimize their networks, and it is very complicated and expensive to do all the research."

JOANIE M. WEXLER

Networking could spur DVI technology growth

BY JIM NASH
CW STAFF

Proponents of digital video interactive (DVI) have said the multimedia-derived technology is waiting for a spark to set off rapid growth. That spark, they said, will be networking.

DVI, a technology that links audio, still-image, video and data in an interactive database, is already having an impact on employee training and product marketing. The problem is, it is often impractical to set up an entire system — including personal computer and videocassette or laser disc player — on an employee's desk.

The answer, early implementors of DVI said, is to centralize the data and distribute it over local-area networks. At Bethlehem Steel Corp. in Bethlehem, Pa., plans are under way to network its 18-month-old DVI system. Bethlehem Steel uses the system as an automated help desk and for desktop training.

Leon Murphy, manager of Bethlehem Steel's multimedia applications team, said that with DVI, company managers are able to provide "just-in-time training," or training available almost as soon as the trainee needs it. But it still requires employees to have the proper equipment on their desks and to borrow compact disc/read-only memory (CD-ROM) discs to receive lessons.

Bethlehem Steel has designed a CD-ROM training program using DVI to educate employees as well as suppliers and customers on how to use the steel maker's IBM mainframe connectivity application. The software allows users to link their IBM mainframes to Bethlehem Steel's mainframe and vice versa. In the next 36 months, Murphy said, 1,000 people will use the DVI system to learn how to use the linking application.

However, the spotlight right now is on a prototype project that would put lessons about that software and any other training program onto Bethlehem Steel's growing PC network.

Bethlehem already is taking inventory of its estimated 20 local-area networks to see how DVI can be used on the existing Ethernet, Token Ring and fiber networks. "We're scavengers," Murphy said. "We'll try to retrofit DVI onto what we have."

He said that DVI's digital nature should help to ease bandwidth problems on most media.

"I don't think DVI will take off, really, until it is on networks," said Reinhard Ziegler, senior manager at Andersen Consulting's Change Management Services Division in Dublin.

One DVI software vendor, Protocomm Corp. in Trevose, Pa., has said it will ship a networking version of its Videocomm/NV product June 15. Videocomm/NV will support five workstations running on a Novell, Inc. Netware Version 3 file server. It is priced at $3,800.

Ziegler said that Intel Corp. 80386-based 25-MHz DOS servers can handle DVI without bogging down. Better performance will arrive with DVI for Unix boxes early next year, he said.

In a way, DVI may be almost as good for networking as networking is for DVI, Murphy said.

Ziegler said Andersen Consulting is integrating networked DVI systems for several clients and is designing such a setup for its own use. The internal system, he said, should be operational in six weeks, but he would not elaborate.

Departure time

Networking may be the force that makes digital video interactive (DVI) succeed



Networked DVI:

- Works on Intel Corp. 80386-based servers.
- No special cabling necessary.
- Microsoft Corp. Windows version expected this fall.

DVI applications:

- Training and retraining program at employees' desks.
- On-line help desk with images to reduce confusion.
- On-line marketing of products, real estate and services.

CW Chart: Tom Monahan

Westchester County opts for T3 links

BY JOANIE M. WEXLER
CW STAFF

WHITE PLAINS, N.Y. — In its endeavor to interconnect several isolated local-area networks, Westchester County has decided to skip the T1 scene altogether and jump ahead to T3 (45M bit/sec.) technology.

While the county offices are currently using T1 gear from Timeplex, Inc. for low-speed RS-232 data connections and some voice connections, T1's 1.5M bit/sec. speeds are too sluggish to handle wide-area exchanges of the county's growing Ethernet traffic, said Robert Gallagher, director of distributed systems.

Instead, Gallagher said, the county will initially invest $200,000 in four Timeplex TX3/Superhub systems, which will communicate over the wide area via private microwave radio links. A private microwave network was chosen; Gallagher said, because the price of leasing terrestrial T3 lines from New York Telephone Co. is currently sky high.

For Gallagher's application, leased T3 lines from the local carrier would cost the county $25,000 per month, he explained.

The only delay on the project, which is slated to be up and running by fall, is the county's selection of a microwave radio equipment vendor. Gallagher said he expects to invest another $200,000 in radio equipment, "so the total payback of having a private network will be about eight months," he said.

Timeplex's T3 gear will collect traffic from the county's 15 existing Timeplex Link/2+ multiplexers and concentrate it over the higher speed links.

Currently, Link/2+ multiplexers are used to haul traffic from about 2,000 stand-alone personal computers and dumb terminals to two mainframes in the data center here via T1 interface-equipped bridges.

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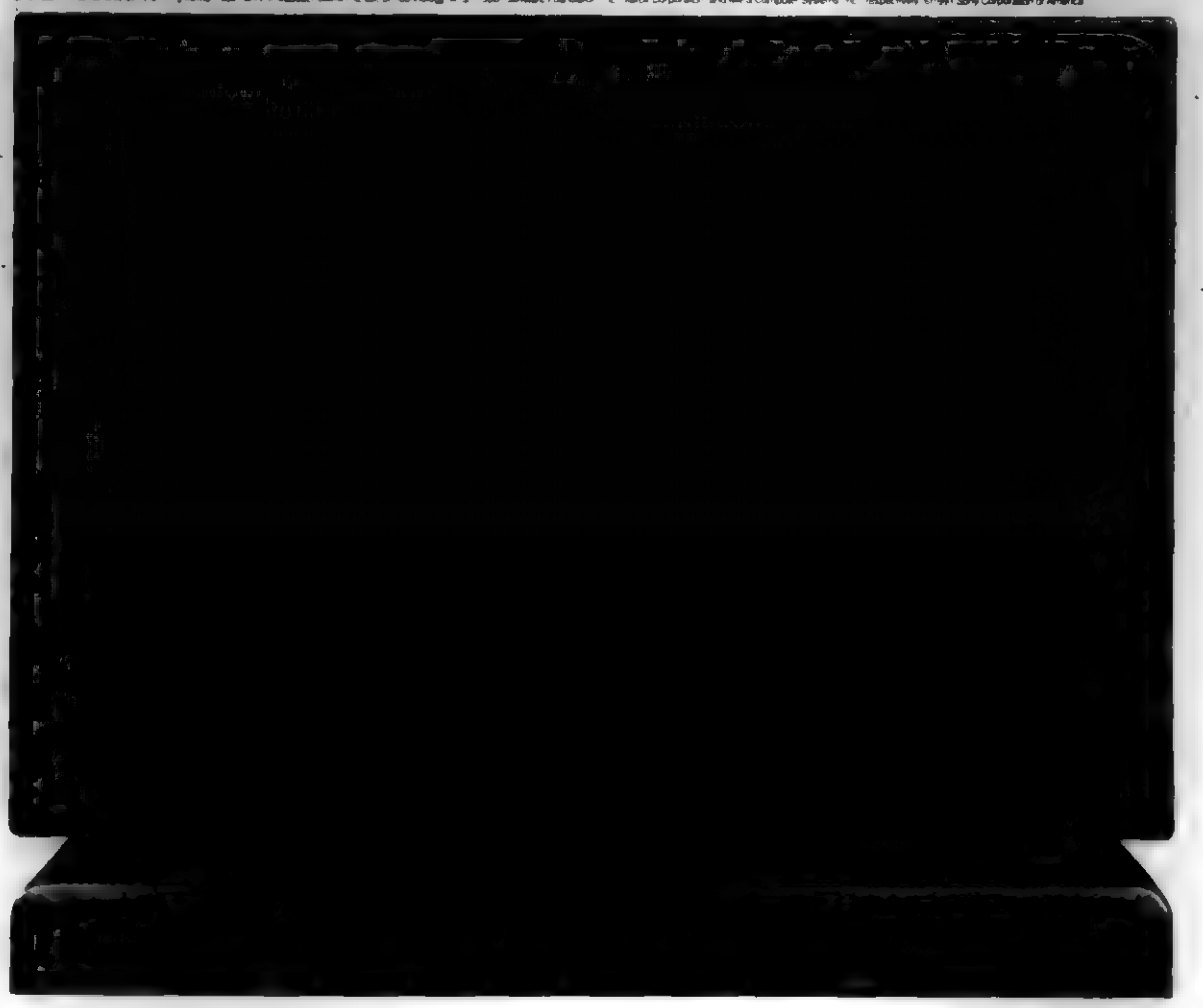
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3Com unveils bridge gear

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. recently announced additions to both its adapter card and bridge product lines. The networking company said it is shipping a Micro Channel Architecture 32-bit bus master Ethernet adapter and a new version of its brouter.

In an unrelated move, 3Com announced it will not sell off its Work Group Systems Division. The division, which is responsible for making network servers, workstations and related software, was one of the operations that in January 3Com said it would cast off.

Late last year, the firm decided to abandon its local-area network operations and move more directly into internetworking. 3Com sold its Maxess Systems Network Architecture Gateway Division shortly afterward.

A spokesman for the company said keeping the division will have no financial or structural ramifications for the organization. The spokesman also said buyers were willing to pay 3Com's undisclosed price but were unwilling to guarantee service or support standards that 3Com demanded.

Etherlink/MC 32 could give users noticeably better performance, said Rick Reed, network manager at Aion Corp. in Palo Alto, Calif. Because it is a bus mastering-based adapter, Etherlink/MC 32 takes some of the data transfer duties away from the central CPU, allowing the CPU to perform more quickly.

Reed added that the jump from 16 bit to 32 bit will boost performance. The adapter is selling for $899 and includes Novell, Inc. Netware Version 3.0 drivers and drivers for network driver interface specification-compliant DOS and OS/2 software.

Users, vendors make Mumps contagious

BY ELISABETH HORWITT
STAFF

COLLEGE PARK, Md. — A band of users and vendors wants to create a Mumps epidemic via an "open" networking interface that is said to give applications on multivendor systems access to Mumps databases.

Mumps, the Massachusetts General Hospital Utility Multi-Programming System, was developed 20 years ago as a high-level programming language with embedded database functions. While Mumps began as a medical system, it has caught on in the government as well as in a variety of commercial sectors, particularly overseas, according to Mumps Users' Group spokeswoman Peggy Hoffman.

There are now approximately 75,000 Mumps users worldwide. Mumps' chief attractions are its ability to support high-volume database interactions and the terseness and flexibility of its language.

"I like Mumps' ability to allow one to concisely program," said Carl Bower, a computer specialist at the Department of Veterans Affairs (VA). "I also like its ability to support intensive interactive processing — you can do a lot of concurrent database accesses with Mumps."

The VA's health services and resources administration uses Mumps almost exclusively for health administration and clinical applications, Bower said.

Virtual Island

Open Mumps Interconnect, which was developed by the Mumps Users' Group, was designed to make the system's unique database features available to a broader group of systems and users. Right now, each vendor's Mumps implementation is virtually an island, accessible only by terminals and workstations designed to access that particular system.

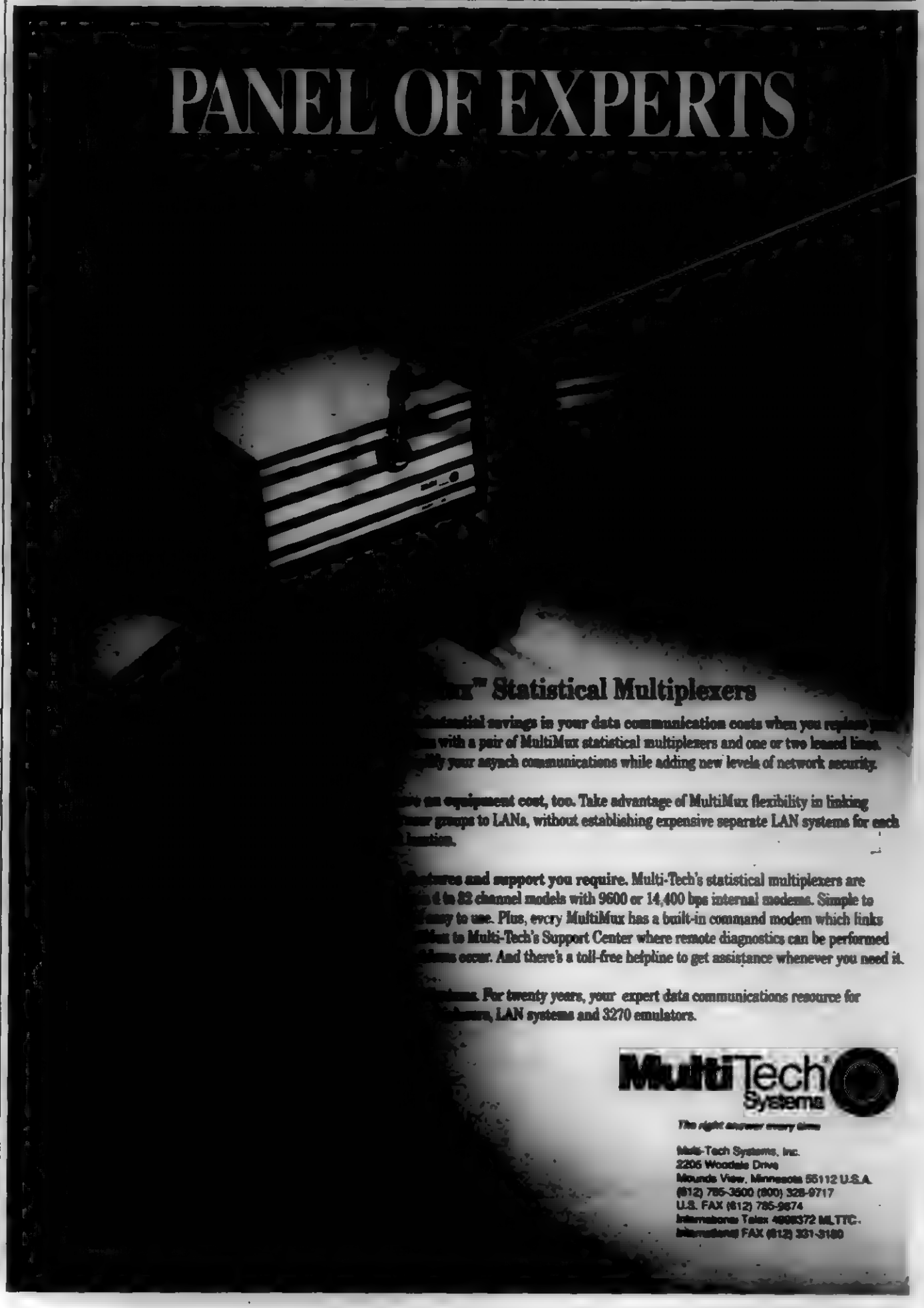
In contrast, applications written to Open Mumps Interconnect would be able to access any Mumps server, according to John Althouse, chairman of the Mumps development subcommittee on networking and communications. What is more, client applications such as Lotus Development Corp.'s 1-2-3, once written to Open Mumps Interconnect, can access Mumps databases without requiring the client workstation they are running on to support full Mumps protocols, Althouse said.

The VA is so eager to get Open Mumps Interconnect that it has put a stipulation into some recent computer systems contracts that vendors must support the protocol as soon as it becomes available, Bower said. There is "a crying need" within the VA for users to be able to access Mumps databases on a variety of remote systems, he added.

"I may be a dreamer, but I like the picture of one [distributed] system that makes clinical and administrative data available nationwide," he said.

Ten years ago, the only way to share data among different Mumps implementations was via magnetic tape, Bower said. More recently, various vendors have provided links between different Mumps systems, such as personal computers and Digital Equipment Corp. VAXs, on a proprietary, one-to-one basis. "This first pass of OMI probably won't meet everyone's needs, but as a first step up from nothing, it's a big one," he said.

The user group designed Open Mumps Interconnect to be easily portable to any underlying network protocol, so "there is no reason why you can't implement it on any virtual circuit," Althouse said. A demonstration scheduled for June will have a variety of multivendor Mumps implementations communicating via Open Mumps Interconnect on top of Transmission Control Protocol/Internet Protocol, running over Thinwire Ethernet.



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NEW PRODUCTS

Local-area networking software

Netmanage, Inc. has announced Chameleon, a Transmission Control Protocol/Internet Protocol applications package.

The Microsoft Corp. Windows 3.0-based software allows remote logons, transfers files and isolates problems on Token Ring and Ethernet networks. Chameleon communicates with host operating systems, including IBM's AIX, VM and MVS; Digital Equipment Corp.'s VMS and Ultrix; and The Santa Cruz Operation's Unix.

The product costs $400.

Netmanage
10020 N. DeAnza Blvd. 101
Cupertino, Calif. 95014
(408) 257-6404

Network management

Bicc Data Networks, Inc. has announced Version 3.0 of the Isoview Network Manager, an open systems-based management system for OS/2 platforms.

Isoview's capabilities include multilevel topology display, performance monitoring with graphical display and fault management. The new version uses a modular design, allowing users to customise the product to their system requirements. The Kernal provides management access control, a graphical user interface and general management functions. Support modules can be added to manage specific bridges.

The Kernal is priced at $5,000; Support Modules range from $500 to $1,000.

Bicc Data Networks
1800 West Park Drive
Westboro, Mass. 01581
(508) 898-2422

OS/2 networking

Sybase, Inc. has announced Sybase PC Net-Library, a set of networking modules integrating personal computer-based applications with Sybase's SQL Server.

The Net-Library runs under DOS, Microsoft Corp.'s Windows and OS/2 and integrates both third-party and custom C language applications with all SQL Server-supported platforms. Each interface module costs $145.

Sybase
6475 Christie Ave.
Emeryville, Calif. 94608
(415) 596-3500

Electronic mail

Novell, Inc. has announced Netware Message Handling Service (MHS) Version 1.5. The product was designed for large, complex networks.

It follows a standard MHS platform agreement between Novell and Action Technologies, Inc. and is interoperable with the worldwide MHS installed base.

The product lists at $495 but is available for $100 during a promotional period that ends in August. Users of previous MHS systems from Novell or Action Technologies can upgrade for $50.

Novell
122 East 1700 South
Provo, Utah 84606
(801) 429-7000

Modems

Ven-Tel, Inc. has begun shipping the pocket-size Fax Modem 24/96S.

The product features full duplex asynchronous communication at 2,400, 1,200 and 300 bit/sec. It supports Group III standard fax transmission at 9.6K bit/sec. The Fax Modem ($189) operates for six hours on a standard 9-volt battery and weighs 6 ounces.

Ven-Tel
2121 Zanker Road
San Jose, Calif. 95131
(408) 436-7400

Front ends, multiplexers

Timeplex, Inc. has announced voice transmission and other enhancements to the Link+ T1/E1 multiplexer line.

New features include 8K bit/sec. voice compression and asymmetrical data link capability for the Link/2+ system ($5,000 per voice module), increased capacity to 48 T1 lines for the Link/100+ hubbing system (starting at $40,000) and distributed workstation capability for the Time/View 2000 network management system ($4,000 per workstation).

All enhancements are scheduled to be available in the second quarter of 1991.

Timeplex
400 Chestnut Ridge Road
Woodcliff Lake, N.J. 07675
(201) 930-4631

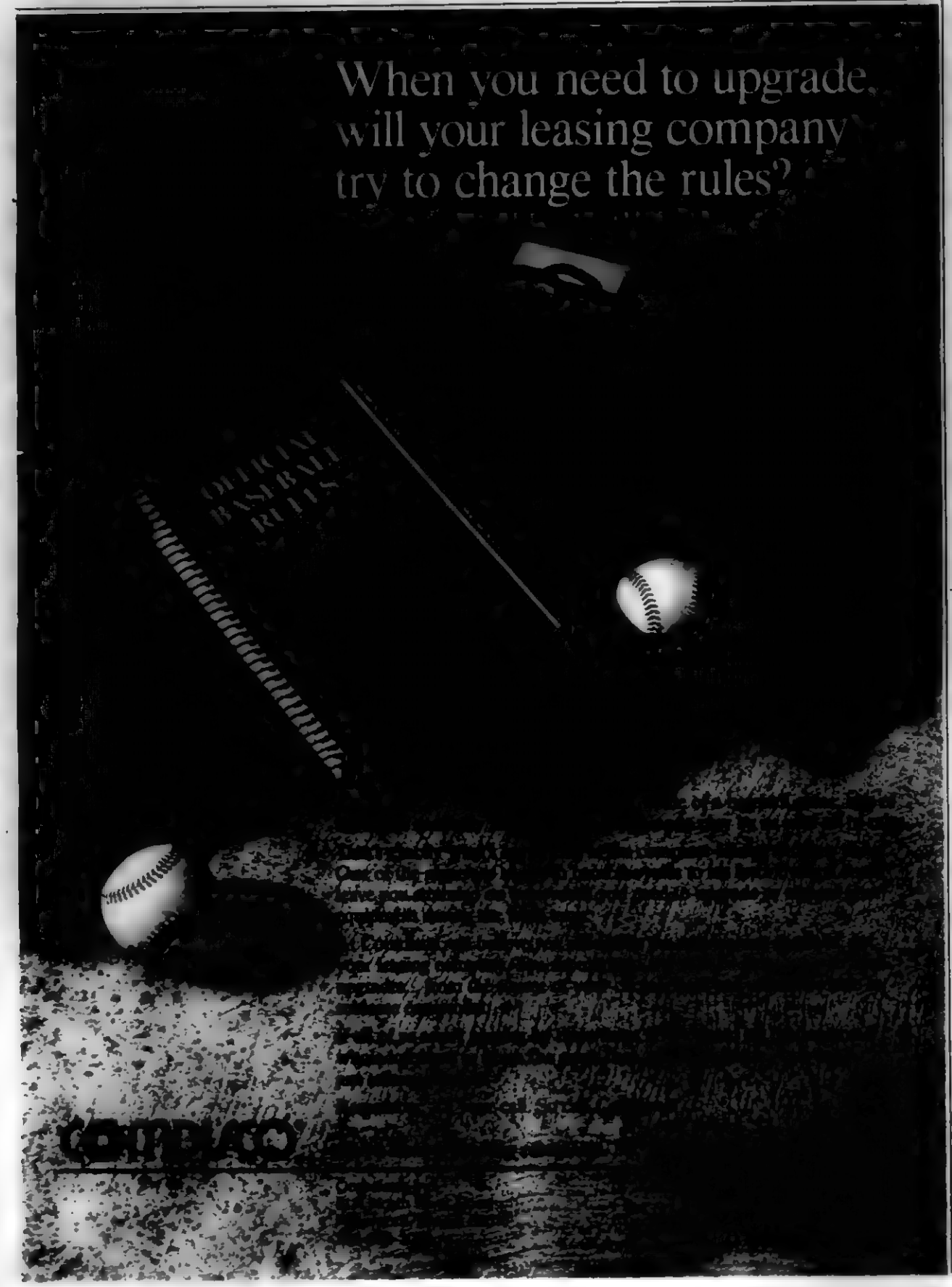
Micro-to-micro

Silverware, Inc. has announced an asynchronous communications software library for applications developed under Nantucket Corp.'s Clipper.

Silverclip SPCS is interrupt-driven and offers features including a 115K bit/sec. rate, ANSI terminal emulation, character filtering and flow control.

List price is $349; the current introductory rate is $299. Registered users of the company's Silvercomm library can purchase Silverclip SPCS for $99.

Silverware
Suite 740
3010 LBJ Freeway
Dallas, Texas 75234
(214) 247-0131



MANAGER'S JOURNAL

EXECUTIVE TRACK



Robert J. Stokes has been promoted to manager of technical support at the **Port of Charleston, S.C.**, Information Services Division.

Stokes was most recently a senior systems programmer. As manager, he directs a staff of five technicians and systems programmers and reports to John Christensen, manager of the Information Services Division.

Stokes is responsible for all systems programming and operating systems software as well as for the communications network required to support Orion, the port's automated manifest filing system. Orion links more than 400 waterfront businesses to the port and to the U.S. Customs Service for rapid cargo clearance.

Stokes joined the South Carolina State Ports Authority in 1984 as a programmer/ analyst.

.....

Edward J. Curvey has been named director of the **Internal Revenue Service** Quality Assurance Division in Washington, D.C.

He is responsible for a support program to ensure the quality and effectiveness of the IRS information systems program.

An IRS employee since 1978, Curvey had been director of the Contracts and Acquisitions Division since 1987. Before that, he was assistant director of the Facilities Management Division for four years.

Curvey holds a bachelor's degree from East Stroudsburg State College and a master's degree from George Washington University in Washington, D.C.

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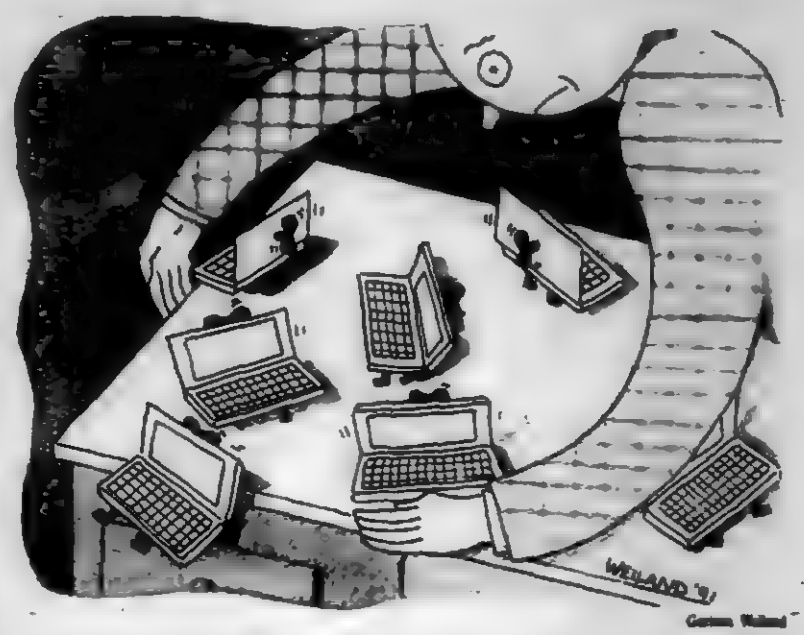
Dick B. Schrader, former director of MIS at the IBM World Trade Corp., has been named director of technical projects at **Bedford Associates, Inc.**, a consulting firm in Norwalk, Conn.

Bedford Associates, a subsidiary of British Airways PLC, helps clients integrate and implement high-volume transaction processing and associated data communications systems.

IS adjusts as portables fly the coop

Unable to corral laptop PCs on the desktop, managers still keep them under control

BY MICHAEL FITZGERALD
CW STAFF



It's 10 a.m. Do you know where your company's laptop computers are?

That question is an increasingly relevant one for information systems managers in the 1990s with the proliferation of laptop and notebook-size computers for a variety of business tasks. But fortunately, most corporate IS departments have their laptops under control — either by taking laptop management into their own hands or empowering end users to manage their own laptop technology. It is not a case of deja vu from the 1980s, when many IS groups turned their backs as personal computers invaded corporate America.

"I don't think we manage the laptops any different than we do the desktops," says Dick Nelson, vice president of agency systems at New York Life Insurance Co. "We've adopted a philosophy that anything that runs on the desktop must run on the laptops."

But another insurer, Blue Cross/Blue Shield of Massachusetts, handles things a bit differently. "I think you have to look at this as another platform; there are mainframes, desktops and then portables," says John Thibodeau, manager of end-user computing at Boston-based Blue Cross/Blue Shield.

Behind the general acceptance of portable computers is a more user-responsive IS management than was present in the 1980s. Many laptop implementations are driven by the users, and IS only offers support in many cases.

Nelson, for example, is a New York Life agency division executive, not an IS staff member. Hyundai Motor America and Coors Brewing Co. are two other companies whose IS departments do not handle laptop management.

Separating the user group from IS "has a very positive effect," Nelson says. "The fact that I'm an agency officer instead of an IS officer puts me closer to my customers, so there's a layer of bureaucracy that gets eliminated by that." He is quick to point out that "there are liabilities, too — if you're out of the mainstream, you may miss certain things, but we try and coordinate with what's happening in the IS department."

The main issues facing companies that purchase laptops stem from the mobility of the machines: tracking, field service and data security.

Companies have adopted different methods of handling these issues. At Blue Cross/Blue Shield, Thibodeau says, portables are routed in two ways. There is an office pool of laptops for workers who happen to need one for the night; the rest are permanently in the hands of the sales force.

At New York Life, there is a similar division — employees are given laptops by the IS department, and a separate group has been created to handle models for its 10,000 agents. This group recommends the kind of portables its agents should buy, but the agents are responsible for their own machines, including having to insure them in case of theft or loss.

Theft of laptops has been no small concern at Coors in Golden, Colo., which has given laptops to its

Continued on page 58

Southwestern Bell goes with experience

BY CLINTON WILDER
CW STAFF

Southwestern Bell Corp. believes there is something to be said for longevity in this era of chief information officer turnover and company-hopping.

After the retirement of 40-year company veteran Kenneth R. Bender, 64, as vice president of information systems earlier this month, the St. Louis-based regional Bell holding company named 36-year veteran Ghyrane A. Davidson to replace him.

Davidson, 59, had been vice president of controller operations for Southwestern Bell's Texas region in Dallas for the past 12 years. He reports to Executive Vice President Robert Glaser, as did Bender.



Bell veteran *Davidson has taken over CIO spot*

Davidson is a strong advocate of user empowerment through personal computers, especially in a time of decreased IS spending.

Trimming down

Southwestern Bell's IS operating budget dropped 4% this year to $192 million, marking the second straight year of lower spending. Early retirement incentives have trimmed the IS staff by about 2% since the beginning of the year to its present size of 2,700 employees.

"Doing more with less has been the bottom line here," Davidson said.

Davidson joined Southwestern Bell in Little Rock, Ark., after graduating from the University of Central Arkansas in Conway, Ark., in 1954.

His career began in the punch-card era and included overseeing the installation of Southwestern Bell's first IBM 1401 system in 1961.

He has been with the firm in financial and IS-related positions ever since, except for a two-year stint at AT&T in the late 1970s. While there, he helped develop AT&T's Customer Records and Information System.

At Southwestern Bell's controller operations in Dallas, Davidson spearheaded the development of a PC-based billing and customer service system. Southwestern Bell has an approximate 1-to-1 ratio of PCs and terminals to employees corporatewide.

Ranked No. 29 in the 1990 *Computerworld Premier 100*, Southwestern Bell was a participant in the recently completed MIT Management in the 1990s research program.

Making the leap is a lot less intimidating wh

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Portables

CONTINUED FROM PAGE 55

sales representatives, along with cars and portable telephones. Coors has had five of 200 laptops swiped, all but depleting its backup supply of six machines.

Although mainly a self-insured company, Coors has to purchase outside insurance for its laptops because of the high risk.

"I wish somebody else had to manage them," sighs Donna Whitley, project manager at Coors Brewing. "It's a major headache."

Adding to the red tape for Whitley, an end user, is the necessity of dealing with four different people in the Coors accounting department to track depreciation. When employees leave the company, they must return their laptops with all the original documentation and software — a provision sometimes requiring management enforcement.

Another headache can be getting service for laptop computers in the field, but managers contacted report good luck with their portables, so far. Most say that they keep a small store of laptops on hand, to be given to employees when they send in a machine for repairs or if their laptop is stolen.

Data security an issue

The possibility of theft brings up the potential problem of stolen data. While most managers downplay this possibility, saying laptops get stolen for the hardware, not the software, several acknowledge that data security is an issue that hasn't been addressed.

"I suspect we are not as security-conscious as we should be, although most of the data on a single computer is not too sensitive," Whitley says.

Coors relies on changing user passwords when laptops get stolen and tells its sales force to do weekly backups. Relying on security at the mainframe level to keep peering eyes out is a staple at many companies.

Some managers report that they have to play policeman to prevent use of nonstandard software or software piracy.

"That's a management headache," says Carrie M. Ulvestad, national manager of dealer communications at Hyundai Motor America in Fountain Valley, Calif. "You have to make sure they don't load games on the machine or other nonstandard software."

Barry Larson, director of systems and data processing at the Wisconsin Department of Transportation, agrees. "You have to be somewhat concerned about some of the software licensing issues," he says. "You have far less management control because they're not in the office."

Training new users, however, is rated less of a problem than one may expect. While this is in part because many portable users are already sophisticated PC users, many companies are giving laptops and notebook computers to noncomputer users. But managers report that training them as if they were new PC users is effective, and the transition to laptops is not as difficult as they expect.

In a Wisconsin highway construction project, "virtually none of those people were computer literate, and we felt that would be the major hurdle," Larson says. "Surprisingly, they really took to it."

Ultimately, the decision of whether laptops should be managed by IS or end users depends on the organization. In many cases, it makes more sense for the users to be in charge, as long as things are kept under control.

If notebook computer and laptop use continues to expand, there could be a lot more happily surprised IS types, as long as they develop a strategy for their use in advance.

"A lot of companies are going through this," says Robert Peterson, director of sales and marketing IS at Coors. "IS organizations simply can't keep their arms around all the technology that's floating around in their organization. It's just a fact of life.

"The explosion of technology in our company in the last five years has been dramatic, and IS couldn't keep up with it."

Signet plans to outsource IS

RICHMOND, Va. — Signet Banking Corp. will soon become the latest convert to the outsourcing movement. The company expects to sign a contract by May 1 that will put its data center, operations for telecommunications, systems and programming support in the hands of Electronic Data Systems Corp.

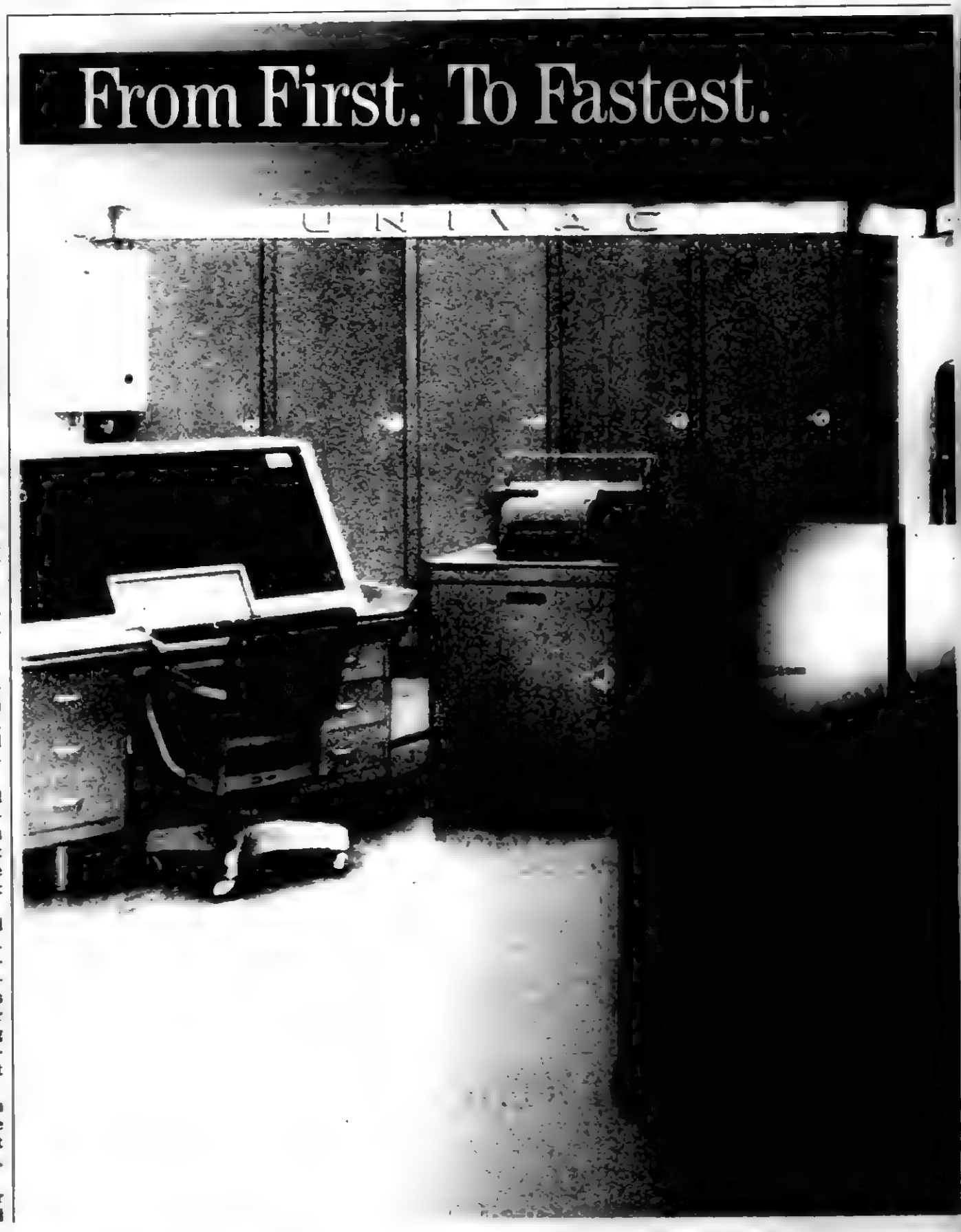
"We expect the contract will reduce information service operating expenses by $137 million over 10 years," said Floyd Griggs Jr., the firm's executive vice president of information systems.

Griggs said that outsourcing will also enable the financial holding company to move faster on a number of strategic information technology initiatives that it plans to implement during the next four years.

The initiatives were the main motivation for the IS department to recommend an outsourcing evaluation to management in the first place, Griggs said. The initiatives include migration from a multivendor mainframe operation to an all-IBM environment and implementation of automation procedures to move Signet toward lights-out data center operations.

"EDS has resources the bank lacks to some extent" for implementing these plans, Griggs said.

ELISABETH HORWITT



CALENDAR

Client Server '91, a conference on the benefits of business process redesign along with client/server technology will be held May 28-31 at the Westin Hotel O'Hare in Chicago. Speakers at Client Server '91 include Novell, Inc. Chief Executive Officer Ray Noorda, Meta Group, Inc. President Dale Kutnick and Nolan, Norton & Co. President Richard Nolan.

For more information or to register, contact Bonnie Sen, Washington University, St. Louis, Mo. (314) 889-5380.

MAY 12-18

Nomad International Users Conference. Las Vegas, May 12-16 — Contact: Chris Palomas, Must Software International, Norwalk, Conn. (203) 845-5000.

The Hammer Sales, Marketing and Service Conference. Boston, May 13-15 — Contact: Hammer & Co., Cambridge, Mass. (617) 354-5555.

Office Systems and Networks Dialogue. Washington, D.C., May 13-15 — Contact: TTI, Santa Monica, Calif. (213) 394-8305.

Telecom Developers '91. Dallas, May 13-15 — Contact: Telecom Library, New York, N.Y. (212) 999-0345.

Micro Focus Users Conference. Orlando, Fla., May 13-16 — Contact: Micro Focus Users Conference, Palo Alto, Calif. (415) 856-9617.

Entity Modeling: Techniques and Application. Washington, D.C., May 13-17 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Legent Corporation's Users Conference. New Orleans, May 13-17 — Contact: Legent, Pittsburgh, Pa. (412) 323-2600.

Video Expo. Los Angeles, May 13-17 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Data Administration Management Association Annual Symposium. Gaithersburg, Md., May 14-15 — Contact: Andrea Tyndall Norris, DAMA, Washington, D.C. (202) 453-1790.

Distribution/Computer Expo. Chicago, May 14-15 — Contact: C. S. Report, Exton, Pa. (215) 827-7436.

ID Expo. Chicago, May 14-16 — Contact: Expocon Management Associates, Trumbull, Conn. (203) 374-1411.

Multimedia Expo. New York, May 14-16 — Contact: American Expositions, New York, N.Y. (212) 226-4141.

Software Research Quality Week. San Francisco, May 14-17 — Contact: Software Research, San Francisco, Calif. (415) 957-1441.

National Energy Software Center. Argonne, Ill., May 15-16 — Contact: NESC, Argonne, Ill. (708) 972-7250.

Business Continuity Planning Conference. Atlantic City, May 15-17 — Contact: Sungard Planning Solutions, Wayne, Pa. (215) 341-8790.

Canadian Open Systems Conference. Vancouver, B.C., May 15-17 — Contact: Corporation for Open Systems, McLean, Va. (703) 883-2700.

Data Communications Conference. Tyngsboro, Mass., May 15-17 — Contact: Andrea Fontaine, Wang Institute of Boston University, Tyngsboro, Mass. (508) 649-9731.

Exchange '91. Indianapolis, May 15-17 — Contact: Sterling Software, Dublin, Ohio. (614) 793-7000.

Macworld Expo/Europe. Amsterdam, May 15-17 — Contact: Macworld Expo/Europe, Amsterdam, The Netherlands. (011-31) 20-549-7040.

Networks for the '90s. Boston, May 15-17 — Contact: Wang Institute of Boston University, Tyngsboro, Mass. (508) 649-9731.

North American Open Systems Conference. Vancouver, B.C., May 15-17 — Contact: Corporation for Open Systems International, McLean, Va. (800) 758-2674.

International Partnerships in Computers and Communications: Imperative for the '90s. San Francisco, May 15-18 — Contact: International Computers and Communications, Washington, D.C. (703) 467-2804.

Vantage Expo '91. Waltham, Mass., May 16 — Contact: Betsy Minich, Imaging Technology, Woburn, Mass. (716) 938-8444.

Videoconferencing: Tips and Techniques. Dallas, May 16 — Contact: Informart, Dallas, Texas (214) 746-3500.

MAY 19-25

Adjusting to Reality: New Profit Strategies of 1991 and Beyond. Palm Springs, Calif., May 19-22 — Contact: Information Industry Association, Washington, D.C. (202) 639-8262.

International Industrial Engineering Conference. Detroit, May 19-22 — Contact: IIE Registrar, Norcross, Ga. (404) 449-0460.

Share 76-S. Nashville, May 19-22 — Contact: Share, Chicago, Ill. (312) 822-0932.

Cause Summer Institute. Boulder, Colo., May 19-23 — Contact: Cause, Boulder, Colo. (303) 449-4430.

Ingres World 1991. San Jose, Calif., May 19-23 — Contact: Ingres, Alameda, Calif. (415) 769-1400.

International DB2 Users Group Conference. San Francisco, May 19-23 — Contact: IDUG headquarters, Chicago, Ill. (312) 644-6610.

Association of Data Communications Users Conference. Atlantic City, May 20-22 — Contact: Angie Hogan, ADCU, New York, N.Y. (612) 861-6803.

Comdex '91. Atlanta, May 20-23 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

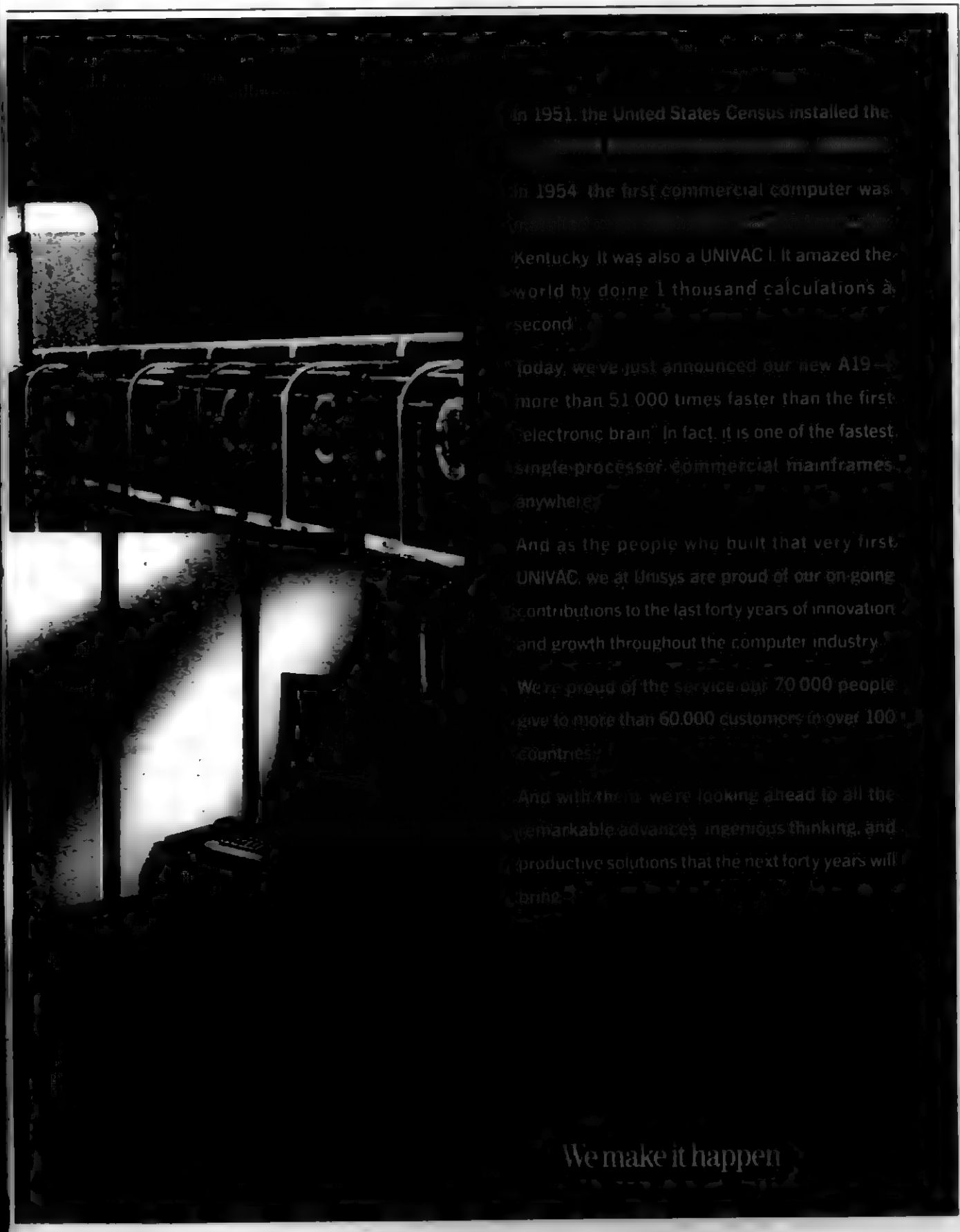
Midwest Electronics Expo. Minneapolis, May 20-23 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

Windows World '91. Atlanta, May 20-23 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Leadership in a Global Marketplace. Atlanta, May 21-22 — Contact: Sharon Scott, Informs Institute, Atlanta, Ga. (404) 220-2602.

Systems 3X/400 Expo. Rosemont, Ill., May 21-22 — Contact: National Productions, Salem, Mass. (508) 745-6010.

Unix and Open Systems. Santa Barbara, Calif., May 21-23 — Contact: Deborah Hay, Seybold, Boston, Mass. (617) 742-5200.



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Look beyond the 'I-CASE' label

A closer look at 'integrated' tools reveals that assembly is often required, with no guarantee that the pieces will fit as you'd like

BY DAVID SHARON

Now that they've torn off the wrappings and had a chance to play with their new computer-aided software engineering (CASE) tools, many buyers have lost enthusiasm for their new software-erector sets.

Purchasers of analysis and design CASE tools spurred that market's growth rate to 67% from 1988 to 1989, but tales of frustration helped to quell growth, which fell to 20% just one year later.

There are many reasons why users have become skeptical: a lack of portability among hardware and software platforms, nonstandard graphical user interfaces (GUI) and closed, unmodifiable architectures.

Chief among their frustrations is a lack of integration between the vendor's own front-end and back-end tools and among tools from various vendors. Adding salt to the wound is the proliferation of the term "I-CASE," which refers to a variety of techniques vendors use to market tools as "integrated."

Simply put, integration is the ability to bring together tools from all parts of the life cycle to operate as one. Information systems groups discovered that nonintegrated, "point" products lead to inefficiency and a lack of automated control.

The output of an analysis and design tool, for instance, loses some of its semantic meaning when it is loosely connected to another vendor's code generator.

In addition, many users would like to integrate their current development and maintenance tools with CASE software methodologies, structured methods and object-oriented tools.

Vendors use the term I-CASE to mean three things: tool suites sold by a single vendor, integrated project support environments (IPSE) that are integration frameworks and tool-to-tool interfaces between products from multiple vendors.

We might do well to imagine that the "I" in I-CASE stands for "ideal" and not "integration." In that case, very few vendors would qualify. This ideal CASE environment could be compared to a software factory (see diagram page 62), where the factory itself is the environment and the CASE tools are the machines. The machines are interconnected by conveyor belts, which provide the integration. All raw material, work in process and finished goods are stored in the warehouse or the CASE repository.

In this ideal environment, five operating requirements are met: Tools can be integrated and interconnected, there is an open architecture and common user interface, and the system is portable to any hardware or software environment (see story page 66).



Steve Lyons

Striving for ideal CASE

The products that come closest to the ideal I-CASE environment are the systems sold by single vendors (see chart listing page 76). Andersen Consulting, Texas Instruments, Inc., Knowledgeware, Inc. and CGI Systems, Inc. all offer product suites in which the tools are tightly coupled and are governed by a rigorous methodology and produce complete systems.

These environments provide a central repository for storing project data as well as the tool-coordination mechanisms and methods for controlling and monitoring all project tasks.

Even among these tools, however, satisfaction with the level of integration varies (see Buyers' Scorecard page 72).

A much more substantial problem is that these systems essentially lock the user into using a single architecture. If a user wanted to use most of the tools provided by the single vendor with another vendor's reverse engineering tool, he'd have to resort to using the import/export facilities — a somewhat primitive method — provided by the single vendor.

Unlocked architecture

Realizing that most organizations are unwilling to lock into a single architecture — whether they want to buy their development tools from more than one

Continued on page 62

Sharon is president of CASE Associates, Inc. in Oregon City, Ore., a consulting firm specializing in CASE market and product research. He also publishes CASE product directories and buyers' guides.

INSIDE

What's New? Reuse, cross-development are two recent trends. Page 68.

Buyers' Scorecard Users rate TI's IEF the top single-vendor CASE tool. Page 72.

Product Guide Analysis/design/code generation tools from single vendors. Page 76.

Full deck

Most vendors offer only a subset of a full life cycle environment. A complete life cycle software development environment includes the following:

DEVELOPMENT
- *Front-end CASE:*

Planning, requirements, analysis, design, simulation and prototyping.
- *Back-end CASE:*

Code generation, editing, compiling, testing, debugging and integration.

TEAM ENGINEERING
- *Project database:*

Communications, monitoring, security and control.
- *Management:*

Methodology, configuration, project and acquisition.
- *Support:*

Maintenance, re-engineering, verification, database administration and control and documentation.

Continued from page 61

source, or they have internally developed tools they wish to integrate into a CASE environment — some vendors are beginning to offer frameworks or IPSEs. Two examples of IPSEs are Hewlett-Packard Co.'s Softbench and Atherton Technology, Inc.'s Software Backplane.

IPSEs do not perform actual software development functions but provide an environment that can integrate tools from other vendors. Within this environment is a common user interface, a central project repository and tools for configuration, process, project and requirements management to support team engineering. IPSEs offer operating systems portability and tool coordination facilities.

These frameworks are fashioned around the reference model from the upcoming Portable Common Tool Environment standard (PCTE). PCTE, which is one of three primary guidelines for building integrated environments, includes the essential ingredients for integration as well as the framework for an IPSE.

IPSEs use repository-based integration to link tools together and transfer information among them under a common user interface. (The single-vendor products mentioned above also use repository-based integration.) Like an automated warehouse, the repository stores the output of every life cycle phase and the relationships between the outputs.

IBM's AD/Cycle and Digital Equipment Corp.'s Cohesion are also IPSEs, but they have front-end and back-end tools already integrated. As with Softbench and Software Backplane, multivendor tools can be integrated into AD/Cycle and Cohesion.

Some IPSEs do pose problems for users, however. Current implementations offered by hardware manufacturers — with the exception of HP's, which runs on Sun Microsystems, Inc. systems — are portable only to proprietary platforms. They can also exhibit poor semantic information transfer among tools, and there can be extensive effort involved to add a new tool to the environment.

Blue-collar answer

The most primitive method for integrating CASE tools is to use tool-to-tool interfaces from vendor alliances. These interfaces are usually provided through import/export facilities or file-transfer mechanisms. Some vendors refer to this as multivendor I-CASE.

Tool-to-tool interfaces may be the most primitive, but they are also the oldest, simplest and most commonly used mechanism for CASE tool interconnection, especially between analysis/design tools and code generators or among analysis/design tools from different vendors.

The primary function of these interfaces is to read and write information from one tool's data dictionary to another's, eliminating the need to re-enter data and thereby reducing data entry errors. Either the interfaces are provided by the vendor, or the customer must write his own using a vendor-supplied I/O utility.

Many strategic alliances have evolved from this approach, including those among Deloitte & Touche, Index Technology Corp. and Pansophic Systems, Inc.; Interactive Development Environments, Inc., Saber Software and Frame Technology Corp.; Index Technology and Sage Software; and Cadre Technologies, Inc., Pansophic and Interleaf, Inc.

Tool-to-tool interfaces are viable because they enable users to pick and choose the tools they need. However, the deficiencies involved make this method better described as "interconnection," not integration. The utilities provided by the vendors for tool interconnection are typically ASCII file extracts or imported templates that deal with the data names and attributes but not the underlying

Continued on page 63

Checklist

Before you buy an "integrated" tool, ask the vendor if it meets the following criteria:

- ✔ Do the tools operate together as if they were one multifunction tool?
- ✔ Can I do all the work I need to do?
- ✔ Can I use my own tools or my favorite tools from another vendor without losing functionality?
- ✔ Is data shared between tools, eliminating the need to re-enter data and allowing the outputs of each tool to be verified for consistency and completeness?
- ✔ Is all the data kept in a common database or repository?
- ✔ Is use of the tools governed by a definable process or methodology?
- ✔ Do the tools use a common user interface?
- ✔ Are the results meaningful, usable and complete? That is, are all requirements from the analysis phase used in the design phase, and is 100% of the code generated from the design specifications?

DAVID SHARON

Short term can be worth it

BY SUSAN R. NYKAMP
CW STAFF

Integration isn't always a top priority in CASE tool purchases. Sometimes it makes sense to start small with an easy-to-use tool that addresses only one part of the development life cycle.

Just ask Howard Kushner at MCI Telecommunications Corp. and Dale Hardy at The Hanover Insurance Co. Each made a $7,000 investment in front-end CASE tools they may very well abandon after their firms settle on integrated, full life cycle tools.

Kushner, project manager at MCI, is using Easycase Plus from Evergreen CASE Tools, Inc. in Redmond, Wash.

"If we only get a year of use out of Easycase, it will easily pay for itself," Kushner says. "It doesn't offer everything the big guys do, but it's pretty much everything we need right now."

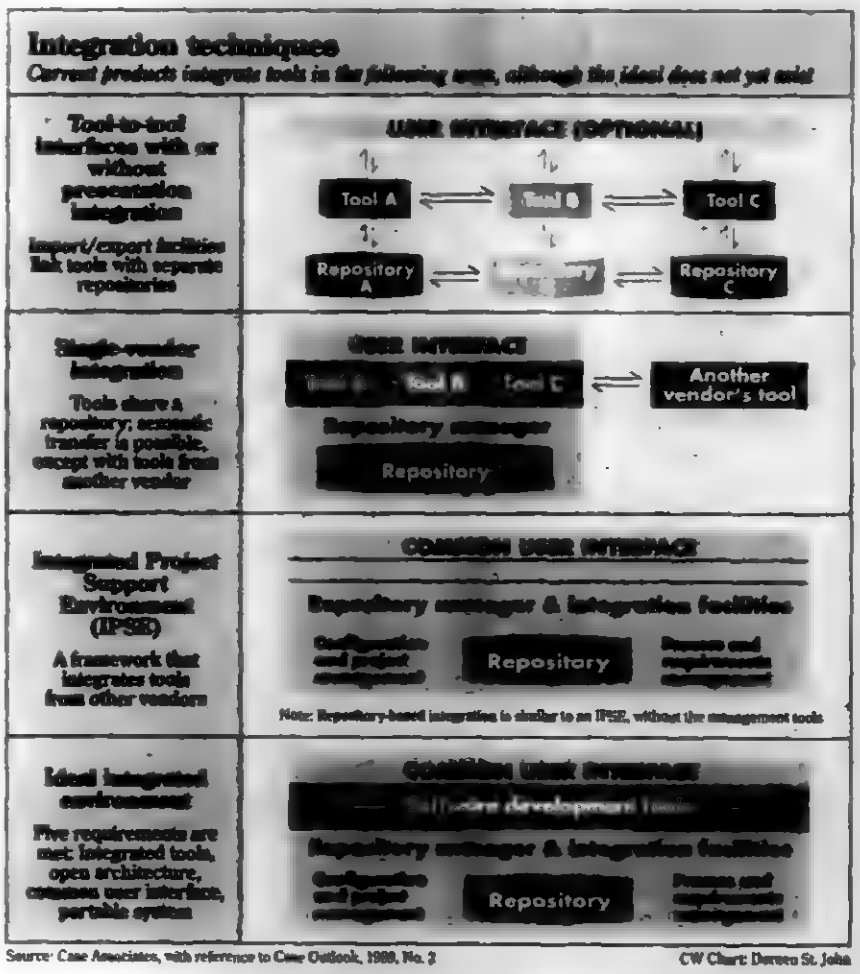
An MCI corporate committee is in the midst of evaluating full life cycle tools as a standard platform. In the meantime, Kushner wanted multiple users to do process modeling but didn't want to make a big training investment. Priced at about $300 for each copy, Easycase fit the bill.

"It's not the top-of-the-line CASE tool . . . but that's all right," he says, adding that his group will wait to do things such as enterprise modeling when the corporate standard for a full life cycle CASE tool is established.

Hardy, a systems consultant at Hanover Insurance, had similar requirements. He is using Visible Analyst Workbench from Visible Systems Corp. Hanover is also evaluating full-function tools, but Hardy needed a tool that would allow multiple users on a local-area network to do data modeling.

Hardy rejected Erwin from Logic Works, Inc. and Pose from Computer Systems Advisors, Inc. as cumbersome to use and says Easycase "isn't in the same league" as Visible Analyst.

Hardy says he is impressed with Visible Analyst's user interface and process modeling capabilities but finds the reporting capabilities limited.



Source: Case Associates, with reference to Case Outlook, 1988, No. 2

CW Chart: Doreen St. John

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Continued from page 62

semantics of the information transfer.

There is no common environment because each tool has its own repository that users must maintain separately. The burden of integration is on the tool user, who must reconcile the multiple user interfaces, tool repositories and each tool's processing requirements and outputs.

Some vendors transfer information directly from one tool to the other, bypassing the data dictionary. This is the optimal tool-to-tool interconnection technique.

One example of this is Pansophic's Exchange, which is used to modify the designs created by Index's Excelerator, which in turn drives the Telon code generator. Sage and Interactive Development also use this approach.

Presentation integration

Tools can appear to be more integrated than they actually are when coordinated by a common user interface, called "presentation integration." With a GUI such as the Open Software Foundation's Motif or X Window System, two disparate tools can have a common look and feel.

This approach ignores semantic transfer and repository issues. What is lacking is data storage and retrieval, tool coordination and process management.

The primary barriers to the ideal CASE environment are not technical but rather psychological and financial. Vendors that think they can "do it all" are reticent to integrate with others, while best-in-class vendors tend to leave the problem of integration to someone else.

Vendors with tools supporting limited life cycle phases must choose among strategic partners or become yet another participant in someone else's framework. Single I-CASE vendors must either decide who to integrate into their proprietary environment or rearchitect their products to create an environment open to all vendor tools.

The ideal software factory should emerge by 1995. In the meantime, smart shoppers will ask all the right questions to find a vendor whose integration vision matches their requirements. •

Software factory components

The ideal integrated CASE environment is no different than a manufacturing operation for software — a software factory of sorts. The operating requirements are similar to those for building and running the ideal manufacturing operation:

- The ability to integrate tools using a common user interface (control panel) for invoking the tools and a repository for storing the data created by the tools. Project data should be stored and managed in one central information warehouse.
- A mechanism for interconnecting tools to transfer the semantics of data created by one tool and used by another (the assembly line). The tools must use the same interpretation of the data transferred.
- A methodology, or mechanism, for defining the software engineering process rules and requirements that govern the use of the tools making up the environment (process control). Without a methodology, the factory is out of control.
- An extensible, open architecture that allows users to change each tool's behavior and rules to conform to their cultures and requirements (machine retooling).
- An environment that is portable over a wide range of operating systems and platforms to preserve the investment and extend the life of the environment.

DAVID SHARON

Vendors' claims; users' realities

Typical claims by vendors include the following:

PROMISE: Full life cycle support.
REALITY: No vendor offers a full life cycle product as most users understand the term. Most offer only a subset of the life cycle, so be sure to ask which specific phases are supported.

PROMISE: Complete support for one life cycle phase or another.
REALITY: Some products provide only limited support; for example, 100% code generation is not always possible.

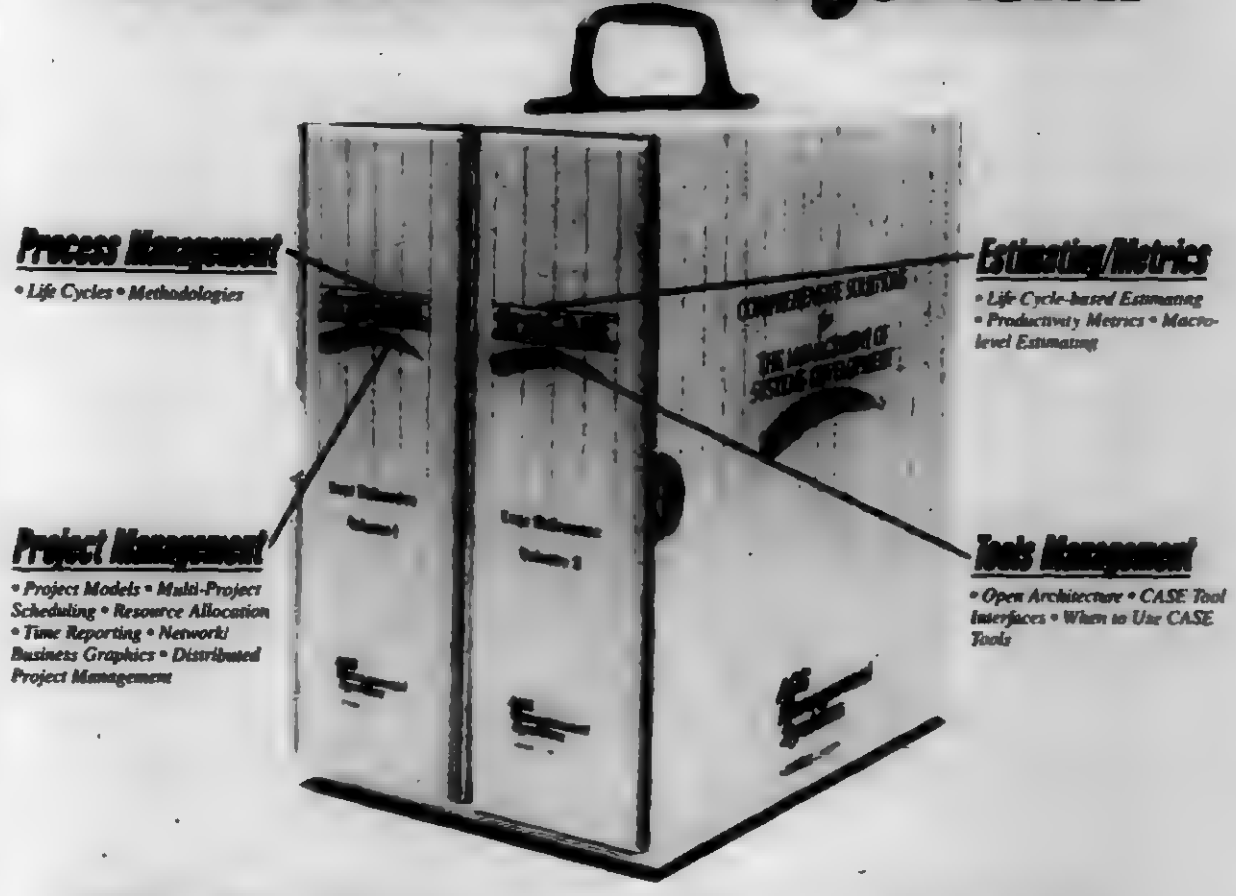
PROMISE: Integrated tools.
REALITY: Users expect all tools in the environment to work together in a consistent, uniform manner. The truth, however, is that not all tools are integrated the same way.

PROMISE: Open architecture.
REALITY: Users expect to incorporate their own and other vendors' tools into the environment. However, the vendor may provide only an import/export facility for data sharing, not full integration.

PROMISE: Integrated environment.
REALITY: Users expect a common user interface and the ability to incorporate multivendor tools with a common look and feel. A common user interface does not guarantee that the tools are well-integrated or that they provide complete support.

DAVID SHARON

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'Have I got a repository for you!'

BY STEVEN BARSH
and WILLIAM GILTINAN

You read all the articles on AD/Cycle and Cohesion. You hear about dictionaries, encyclopedias and repository-enabled tools. You're trying to get the repository that makes the most sense for you, but all you're getting is confused.

So, how do you choose a repository? Basically, a repository has three components:

- A database for storing information about software projects.
- An interface through which computer-aided software engineering (CASE) tools can access the database.
- A definition of what information the tools can store in the repository.

The goal of a repository is to provide one central location for many tools to store and exchange information about software development projects.

Virtually every CASE tool vendor has its own proprietary repository. Other vendors are creating universal repositories for all CASE tools, including IBM with Repository Manager, Digital Equipment Corp. with CDD/Repository, Computer Associates International, Inc. with CA '90s Repository and Oracle Corp. with CASE*Dictionary.

When choosing among these products, first consider the database — its performance, how well it runs in a distributed environment and how well it interacts with your current hardware and software.

Next, consider the tool interface. If the repository vendor provides an unwieldy interface, few tool vendors will be willing to integrate their products.

For its new CDD/Repository, DEC chose to take an object-oriented approach to create a simple, flexible tool interface.

IBM, on the other hand, formed alliances with some of the major CASE vendors and says these tools will interface with its repository.

Third, consider the richness of the data definition (metamodel) that defines what information tools can be stored in the repository. If the metamodel does not encompass all of the information used by a particular CASE tool, the CASE tool vendor either cannot store that information in the repository or must unilaterally extend the repository to include that information.

For instance, if you use a tool with a new diagramming technique, another vendor's development tool may be unable to read the information captured in those diagrams. Why? Because the diagramming tool had to extend the metamodel so it could store information captured in the new type of diagram. Tool B knows nothing about Tool A's modeling technique because it is not defined in the base metamodel.

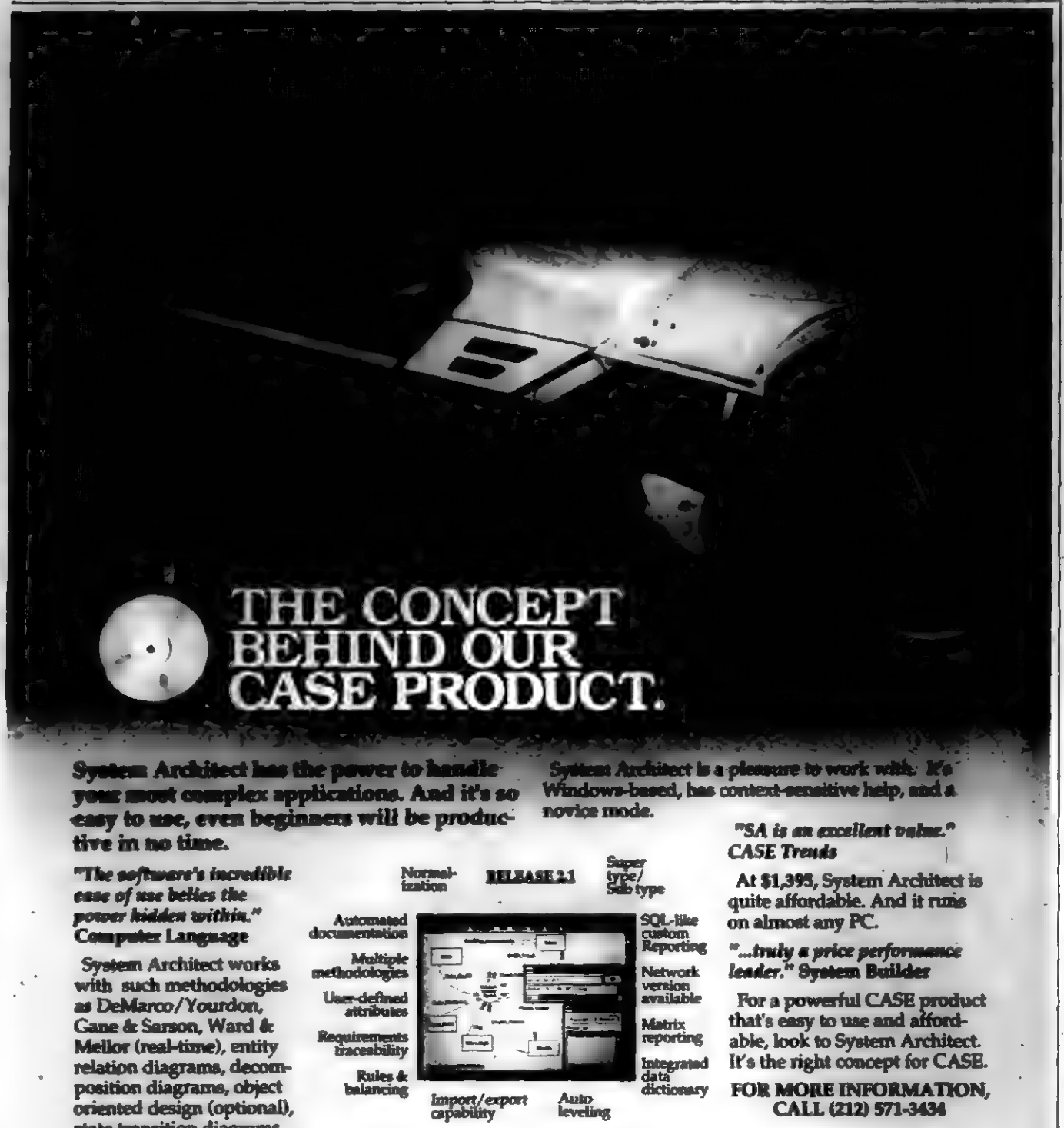
IBM's strategy is to create a metamodel so comprehensive it will not need to be extended. Its metamodel is so far incomplete. DEC and Oracle both have complete metamodels, but they're expecting CASE tool vendors to extend the base metamodels and provide tools to help the vendors perform the extension. ●

Repository vendors

- Amdahl Corp. (Sunnyvale, Calif.)
- Computer Associates International, Inc. (Garden City, N.Y.)
- Computer Corp. of America (Cambridge, Mass.)
- Digital Equipment Corp. (Maynard, Mass.)
- DSDMS Corp. (Waxahachie, Texas)
- IBM (Armonk, N.Y.)
- Infospan Corp. (Edina, Minn.)
- Oracle Corp. (Redwood Shores, Calif.)
- Unisys Corp. (Detroit)

Source: SECA, Inc. CW Chart: Doreen St. John

Barsh is president and Giltinan is a senior consultant at SECA, Inc., a Conshohocken, Pa.-based firm that provides software engineering and CASE tool implementation and consulting services.



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New trends abound in CASE

BY GENE FORTE

In the face of fierce competition and industry consolidation, computer-aided software engineering (CASE) vendors are scurrying to add more functionality to their product lines. There are many trends for users to keep an eye on, including the following:

▶**Cross-development tools.** Local-area network-based cross-development tools allow developers to define, generate and test applications on a workstation or personal computer, waiting until deployment to specify the target platform.

Because applications need to be specified just once for multiple platforms, management can not only defer equipment decisions but also move applications or upgrade to new platforms with fewer restrictions. Cross-development also provides a CASE environment naturally suited to client/server applications.

CGI Systems, Inc.'s Paclan for OS/2 LANs and Paclan/X for Unix LANs exemplify this trend. An application designed on one workstation or a group connected by a LAN to a Paclan repository server can be targeted at IBM OS/2, MVS and OS/400 platforms or Unix, Tandem Computers, Inc. and Digital Equipment Corp. VMS platforms. Andersen Consulting's Foundation for Cooperative Processing and the upcoming version of Texas Instruments, Inc.'s IEF are two other cross-development products. However, both still require an encyclopedia, or repository, based on a target platform.

Intersolv, Inc. — the newly merged Sage Software and Index Technology Corp. — has moved its APS workbench to the PC network, as has Software AG of North America, Inc. with its recently announced Entire architecture.

▶**Hypertext guidance for CASE development methods.** Faithfully following a rigorous development method can be difficult for new CASE users. Some vendors now offer methodology guidance tools that use hypertext to support method-browsing at various levels of detail.

These tools use built-in application examples to help developers through rough spots. For example, The Delphi Group's Software Engineering Environment provides a guidance facility for a variety of preconfigured common methods, although it also accommodates proprietary processes.

James Martin Associates' IE Expert gives a comprehensive explanation of the information engineering method with stages, tasks, deliverables and typical examples. The developer can explore information engineering in any sequence to the depth desired and can hot-key to tools such as TI's IEF and Knowledgeware, Inc.'s Information Engineering Workbench.

▶**Practical approaches to reuse.** CASE vendors are starting to provide facilities that allow developers to reuse code. For large-scale reuse, Andersen Consulting's Designware products come with turnkey applications implemented using the company's Foundation environment. Developers can create a customized version of a generic application by modifying data definitions and screens and regenerating the application without touching source code.

TI is pursuing a similar strategy with its IEF templates. These include a complete general ledger package and an upcoming investment management system for insurance and mutual funds companies derived from Control Data Corp.'s IMIS.

Computrol, Inc. is taking a different approach to making its Master Financial System reusable. Instead of a top-down code-generation environment, Computrol has made the product modular and has added parameters for each functional subsystem. Developers can select and customize the desired functionality simply by altering tables and screens.

Traditional reuse focuses on small modules of functionality — called objects — with well-defined interfaces that can be assembled into larger applications. Because graphical user interfaces (GUI) are an ideal application for the object paradigm, GUI tools such as Apple Computer, Inc.'s Macapp and the X Window System library are among the leading facilitators of small-scale reuse.

However, newer products extend the simple GUI building blocks to more powerful objects that are essentially mini-applications. Examples of those tools include Asymetrix Corp.'s Toolbook for Windows 3.0, Expertelligence, Inc.'s Spokeaction and Integrated Systems Division's Systembuild.

▶**CASE for the chief executive officer.** The newest niche of CASE tools allows business processes to be directly modeled and automatically converted to functioning computer systems.

Vendors catering to this niche claim that CEOs as well as applications developers will find the tools useful. One example is Metavision from Applied Axiomatics, Inc. Key to the company's approach is its Cybernetic Business Model, which generates systems directly from a visual model of business operations.

Daisys from S/Cubed, Inc. allows businesspeople and developers to use familiar objects to describe the requirements of a computer system. ●

Forte is president of Portland, Ore.-based CASE Consulting Group and executive editor of "CASE Outlook," an international journal on software design automation.

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INTERSOLV

PRESS RELEASE

AND INDEX FINALIZE MERGER, FORMING INTERSOLV

ksville, Md., March 19, 1991 – Sage Software, Inc. and Index Technology
Corporation today announced completion of their previously announced merger,
forming a new entity to be called INTERSOLV, Inc.

Kevin J. Burns, former chief executive officer of Sage, will serve as
chairman and CEO of INTERSOLV.

Burns said the merger creates the industry's largest supplier of computer
aided software engineering (CASE) tools, with more than 200 employees at
over 10,000 sites worldwide.

"The formation of INTERSOLV
CASE products that span
products deliver
as their needs change.
serve our customers'

E Company That's s Since March 19, 1991.

The merger of Sage Software and Index Technology does far more than just bring together two strong CASE companies. It allows two companies with complementary strengths to focus on a common vision. A vision of where the market must go to fulfill the promise of CASE.

At INTERSOLV, our combined 17 years of CASE experience has taught us that you can't build applications in a hyperintegrated and closed environment. We have a unique solution: the benefits of I-CASE, but with a modular implementation approach that reduces upfront costs and risks.

Our solution takes into account the realities of the 1990's development environment — development cycles, methodologies developers really work, [illegible] may have [illegible] [illegible] [illegible]

BUYERS' SCORECARD

Due to a lack of photographic contrast, this page did not reproduce well.

TI's IEF scores high for integration, benefits delivery

COMPUTERWORLD BUYERS' SCORECARD

Integrated computer-aided software engineering (I-CASE) tools

Total scores reflect average user ratings for all measures, weighted by user-assigned importance. Response base: IEF: 33; Pacbase: 40; Foundation: 30; IEW/ADW: 40

Product	Highest ratings	Lowest ratings
Texas Instruments' IEF SCORE 57	Integration of life cycle stages Ability to increase quality Code generation capabilities	Ability to work with other vendor's tools Support for local-area networks Training time required
CGI Systems' Pacbase SCORE 55	Data repository capabilities Code generation capabilities Ability to increase quality	Ability to work with other vendor's tools Training time required Planning, analysis and design features
Arthur Andersen's Foundation SCORE 50	Integration of life cycle stages Ability to increase quality Support for local-area networks	Ability to work with other vendor's tools Code generation capabilities Training time required
Knowledgeware's IEW/ADW SCORE 49	Ability to increase quality Planning, analysis and design features Integration of life cycle stages	Support for local-area networks Effectiveness of testing Ability to work with other vendor's tools

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Like street corner jugglers, vendors of integrated computer-aided software engineering (I-CASE) tools are being asked to balance an increasingly complex set of items to satisfy the wishes of their audience. Not only do they need to excel in planning, analysis and design features, but they must also offer strong repository and code-generation functions.

Small wonder that the market for single-vendor I-CASE tools can be narrowed down to four players with significant market share: Texas Instruments, Inc.'s IEF, CGI Systems, Inc.'s Pacbase, Arthur Andersen & Co.'s Foundation and Knowledgeware, Inc.'s IEW/ADW.

When *Computerworld* polled users of these four products, IEF received the highest ratings overall from its users for I-CASE features, followed closely by Pacbase. Foundation and IEW/ADW finished in close competition further back.

Each group of users rated only its own product. A 1-to-10 (poor to optimal) rating system was used for each feature and function. (See methodology next page for explanation of how total scores are derived.)

Overall, users ranked integration and repository features as more important than individual front-end or back-end categories.

IEF placed first in 12 of 19 Buyers' Scorecard categories, in addition to garnering the highest individual rating — 9 out of 10 — for product set integration.

IEF topped three out of four benefit-oriented categories, including increasing applications quality (8.9), programmer productivity (8) and value for the dollar (7.6). Pacbase users rated their product highest in the remaining benefit category: ability to increase speed of applications development.

IEF scores were particularly low in two areas: ability to work with other vendors' tools (3.9), a category in which none of the products received higher than a 4.8, and support for local-area networking (4.4). Pacbase achieved the highest ratings for data repository capabilities (8.7), which ranked as the second most important consideration for users overall. Second to IEF in most categories, Pacbase garnered top marks in quality of technical support (7.6) and compatibility with the current environment (7.2).

Four last-place finishes reduced Pacbase's overall score. These lower rankings were: working with other vendors' CASE tools (3.8), training time required (4.9), ease of use (5.8) and planning, analysis and design features (6).

Foundation received the top mark for LAN support (7.1). Its highest user ratings came in the categories of integration (7.4) and increasing applications quality (7.3). Overall, Foundation placed last in 10 of 19 categories.

IEW/ADW, the front-end tools market leader, achieved a 7.5 rating for planning analysis and design features, a second-place finish behind IEF's 7.9. Another 7.5 rating placed the product second for integration behind IEF.

IEW/ADW also placed first in its ability to work with CASE tools from other vendors, with a 4.8 rating from its users. However, four last-place ratings, including ability to increase development speed (6.2), programmer productivity (6.1), efficient programming capabilities (5.5) and support for LANs (3.1) — the lowest individual rating — caused IEW/ADW to rank behind Foundation in the overall score. ●

KEY RATINGS

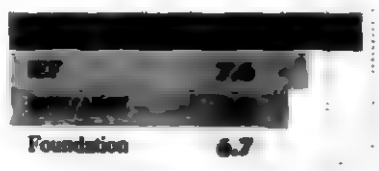
Quality, productivity, integration and value are among the most important categories for I-CASE buyers, and TI's IEF users give their product the highest rating in those areas. Speed and data repository capabilities are also vital, and CGI Systems' Pacbase achieves the top scores on those counts.

User importance rating

8.9 Ability to increase application quality



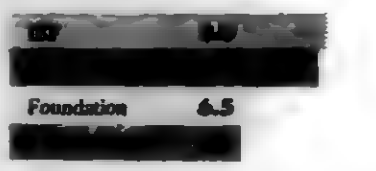
8.4 Data repository capabilities



8.4 Ability to increase the speed of applications development



8.3 Ability to increase programmer productivity



8.2 Integration of life cycle stages within product set



8.1 Value of the dollar



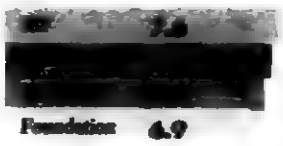
Due to lack of photographic contrast between text and background, this page did not reproduce well.

A CLOSER LOOK

IEF also receives the strongest marks in eight of 11 remaining categories. Arthur Andersen's Foundation achieves highest ratings in LAN support and compatibility with the current environment. Knowledgeware's IEW/ADW, the upper CASE market leader, receives the highest rating in ability to work with other vendor's CASE tools.

User importance rating*

7.9 Responsiveness of vendor service



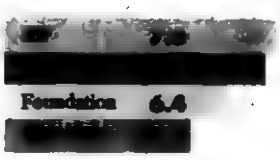
7.8 Overall ease of use



7.8 Code generation capabilities



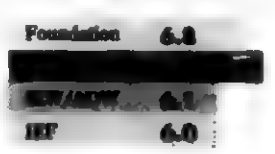
7.5 Efficient programming capabilities



7.4 Effectiveness of testing



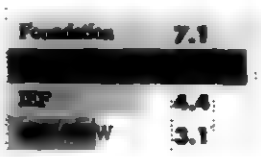
7.3 Compatibility with current computing environment



7.2 Training time required to use product



6.6 Support for local-area networking



5.2 Ability to work with CASE tools from other vendors



8.1 Planning, analysis and design features



8.1 Quality of technical support



Verbatim

What do you like best/least about this product? (Reasons are based on most frequently stated answers)

Likes
Life cycle integration/Methodology
Effective code generation

Dislikes
Not easy to use with other workstations/LANs
Reporting capability

Likes
Data repository
Life cycle integration/Methodology

Dislikes
Steep learning curve
Not user friendly

Likes
Life cycle integration/Methodology
Methodology fits well into our system

Dislikes
Not easy to use with other workstations/LANs
It's slow

Likes
Life cycle integration/Methodology
Methodology fits well into our system

Dislikes
Not easy to use with other workstations/LANs
Too complex, cumbersome

Loyalties

How likely would you be to purchase this product again if you were making the decision today?
(Reasons based on most frequently stated responses)

Response base: 33

32 — Likely
The reason: Effective integration

1 — Unlikely
The reason: Not good on a network

Number of respondents

Response base: 40

37 — Likely
The reason: Good central repository

3 — Unlikely
The reason: Other tools meet needs better

Number of respondents

Response base: 40

35 — Likely
The reason: Capable product, reliable

5 — Unlikely
The reason: Not good on a network

Number of respondents

Foundation

Response base: 30

22 — Likely
The reason: Serves purpose well

8 — Unlikely
The reason: Not good on a network

Number of respondents

Vital statistics

Total number of respondents: 143

How long have applications developed with these tools been in production?

Five to six years	7%
Three to four years	8%
One to two years	30%
Less than one	54%
Don't know	1%

What is your position?

Director	16%
Manager	56%
Staff member	18%
Other	10%

For how many years have you used I-CASE tools?

Five or more	22%
Three to four	39%
One to two	36%
Less than one	2%

METHODOLOGY

To qualify for *Computerworld*'s Buyers' Scorecard on integrated computer-aided software engineering (CASE) tools, a product had to be integrated across the life cycle. In addition, the vendor had to be a market share leader in planning, analysis and design tools and/or code generation tools.

Among the products surveyed, the market share included: planning, analysis and design — Knowledgeware, Inc., 36%; Texas Instruments, Inc., 9%; Arthur Andersen & Co., 4%; code generation — CGI Systems, Inc., 13%; Knowledgeware, 8%. Figures are based on Computer Intelligence's survey of IBM/plug-compatible mainframe or manufacturer sites.

The response base for qualifying products was as follows: TI's IEF: 33; Knowledgeware's IEW/ADW: 40; CGI Systems' Paclbase: 40; Arthur Andersen's Foundation: 30.

The survey was conducted and tabulated by First Market Research Corp. in Austin, Texas, an independent telephone research firm. Randomly chosen users were surveyed. Total weighted scores were computed by multiplying the mean importance scores users assigned to each criterion by the mean scores each user group gave its own product.

CASE use

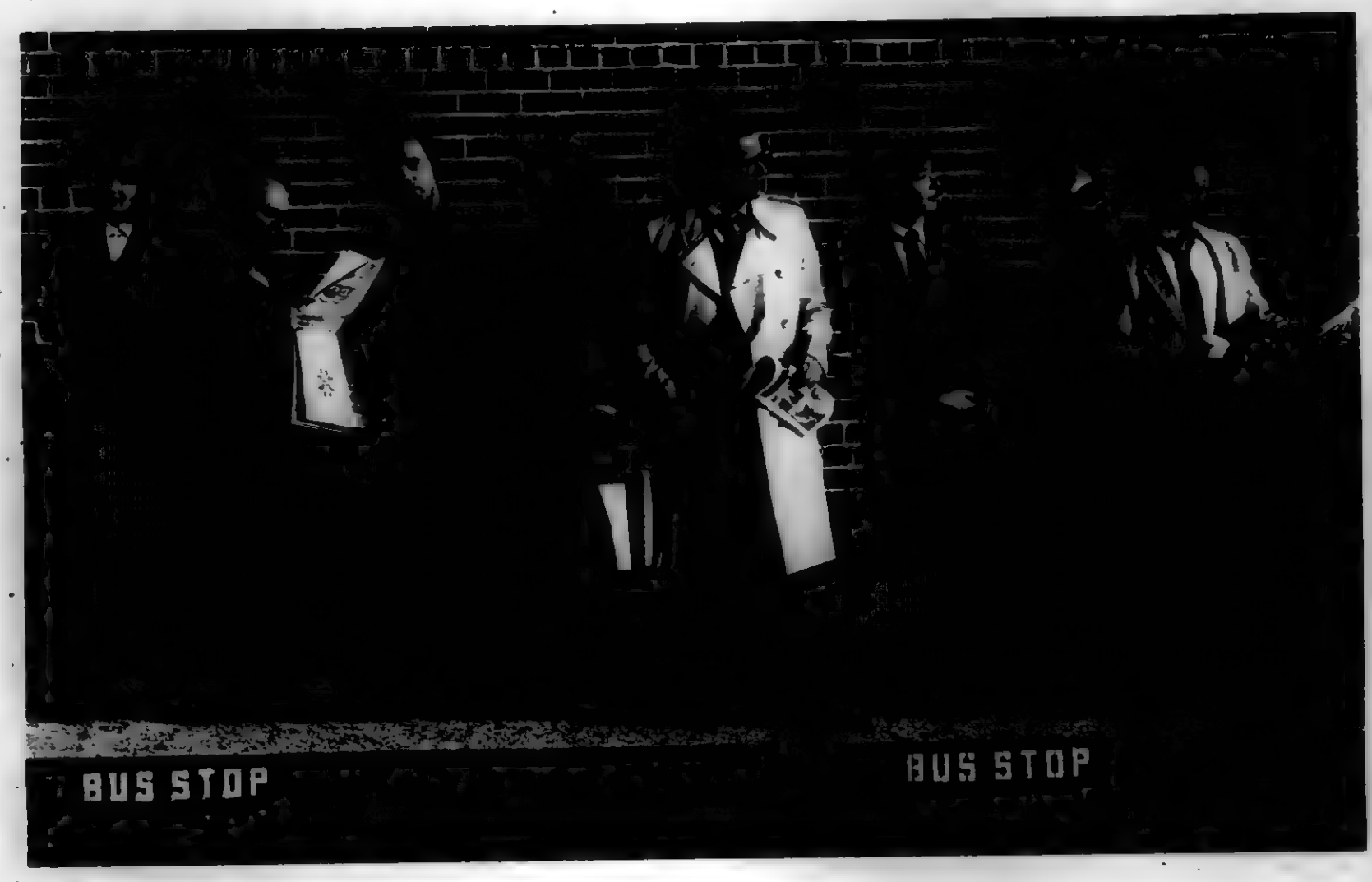
Thirty-six percent of the 143 respondents reported that the major benefit received from use of their particular I-CASE tools was increased quality of applications; 27% said maintenance and enhancements capability, and 24% said consistency of design.

Forty-four percent of respondents said they chose the methodology before the tools; 38% chose the tools first, and 14% chose both at the same time. Fifty-five percent said less than half of their applications development staffs were trained to use the tools.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and companies for their assistance: Computer Intelligence, La Jolla, Calif.; Vaughn Merlyn and Greg Boone, CASE Research Corp., Boston; and Digital Consulting, Inc., Andover, Mass.

Sometimes sharing will slow you down.

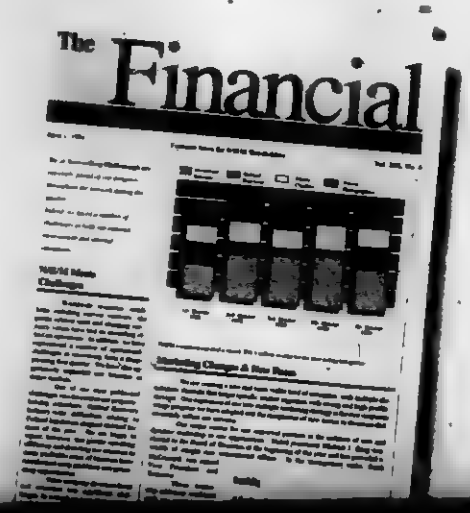


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Analysis/design/code-generation tools[1]

VENDOR	PRODUCT	SHIP DATE OF ORIGINAL/ MOST RECENT VERSION	OPERATING SYSTEMS SUPPORTED	HARDWARE REQUIRED	RAM REQUIRED (BYTES)	FUNCTIONS PERFORMED[2]	SOURCE CODE LANGUAGES GENERATED	CASE METHODOLOGIES SUPPORTED	DBMS SUPPORTED	BUILDS IN NETWORK CONTROL	USER INTERFACE	NETWORKS SUPPORTED	PRICE
American Management Systems, Inc. (703) 641-8000	Life Cycle Productivity System	June 1986/Dec. 1990	DOS, OS/2, MVS, VMS	IBM PCs and compatibles, System/370, DEC VAX	640K for DOS, 4M for OS/2	Rapid prototyping, testing	Cobol	DeMarco, LPS Methodology, Yourdon	Adabas, DB2, IMS	Yes	Command line, OS/2 Presentation Manager	Netware	$12,000 for PC; $100,000 - $275,000 for mainframe
Andersen Consulting (312) 507-5161 (800) 458-6851	Foundation	March 1986/Oct. 1990 - Jan. 1991 for various components	DOS, CICS, GCOS 7 and 8, IMS/DC, MVS/XA, OS/2, VMS	IBM PCs and compatibles, System/370 and 390 series; DEC 3300 through 9000 series; Bull DP 7 and 8	640K - 8M	Rapid prototyping, testing	C, Cobol	Chen, DeMarco, Korean Government Methodology, Information Engineering, Merise, Method/1, Yourdon	DB2, RDB, Sybase, Ingres, Oracle	Yes	Microsoft Windows, OS/2 Presentation Manager	LAN Manager, Netware, PC LAN Server, 3+, Starlan	$7,000 + per module
Applied Architecture, Inc. (212) 643-1310	Metavision	1988/Nov. 1989	DOS, OS/2	IBM PCs and compatibles	3M	Enterprise and business modeling, rapid prototyping	C, Cobol	Gane & Sarson, IDEF, HIAM, SADT, Yourdon-DeMarco	DB2, Oracle, SQL, VSAM, IMS, Dbase	Yes	Proprietary windows, pull-down menus	CICS, TSO, MOS-VS, VMS	$27,500 - $40,000
Bachman Information Systems, Inc. (617) 273-9003 (800) 222-4626	Database Administrator for DB2, Analyst, Designer for CSP	Feb. 1989/April 1991	OS/2	IBM PS/2 Model 70 or higher	12M	Re-engineering	SQL	Bachman DM, entity-relationship models, SA/SD	DB2	No	OS/2 Presentation Manager	3+, LAN Manager, Netware	$3,500 - $15,000
CGI Systems, Inc. (914) 735-8580 (800) 722-3666	Packmac, Packm, Packm/2	1983/April 1991	MVS, VSE, GCOS 7 and 8, OS1100 for Packmac; OS/2 for Packm; HP-UX for Packm/X	Bull, Unisys 1100 A series and mainframes running MVS or VSE for Packmac; IBM PCs and compatibles for Packm; HP 9000 for Packm/X	8M for Packm	Rapid prototyping	Cobol	Information Engineering, Merise, Yourdon	DB2, Oracle, RDMS, SQL/DS, SQL/400, Teradata, RDB, Datacom/DB	Yes	Microsoft Windows, pull-down menus	Netware, LAN Manager, 3+, LAN Manager X	$60,000+
Cadre Technologies, Inc. (401) 351-5950	Teamwork	June 1985/Jan. 1991	Unix, VMS, Ultrix, AIX, HP-UX, OS/2	HP/Apollo, DEC VAX and Vaxstation, Sun Sparcstation, IBM RS/6000	16M	Testing	Ada, C	Boeing-Hatley, Buhr Ada, Yourdon-Constantine, Yourdon-DeMarco, Ward-Mellor, Schlaer-Mellor	Proprietary	NP	DEC Windows, Sunview, pull-down menus	NFS, TCP/IP, Decnet, Netware	$6,500+
Cadware, Inc. (203) 397-2998 (800) 223-6873	System Developer I	May 1988/Dec. 1990	DOS	IBM PCs and compatibles	1M - 1.5M	None	Cobol	Constantine, DeMarco, Gane & Sarson, Shlaer/Mellor, entity-relationship models, state transition, project hierarchy	Dbase III and higher	No	Command line, pull-down menus	Netware	$490 for single-user version
Cadware, Inc. (203) 397-2998 (800) 223-6873 Ext. 81	Powercase, Powerbase	June 1988/Dec. 1990	VMS	DEC Vaxstation	16M	Documentation, rapid prototyping, testing	Power-house 4GL, SQL	Entity-relationship models, data flow diagrams	RDB, Powerhouse Starbase, any ANSI-standard SQL database	No	Decwindows	Decnet	$15,000 for single copy
Computer Association International, Inc. (516) 227-3300	CA-DB: Generator/PC, DB: Architect	April 1986/Nov. 1990 for DB: Generator; Jan. 1988/Sept. 1990 for DB: Architect	DOS	IBM PCs and compatibles	640K	Rapid prototyping, testing, database design	C, C++, Pascal, Fortran	Chen, entity-relationship models, data models	IDMS	Yes	Command line, pull-down menus	None	$4,000 for DB: Generator; $8,000 - $12,000 for DB: Architect
Computer Systems Advisers, Inc. (301) 381-6000 (800) 537-4382	Paus	July 1988/NP	DOS	IBM PCs and compatibles	640K	Database schema generation	Cobol	Gane & Sarson, Yourdon	DB2, SQL/DS, Oracle, Focus, OS/400 Relational database, Adabas	No	Pull-down menus	Any NetBios-compatible	$995 - $6,995
Icaan Software Engineering, Inc. (213) 458-0983	Powertools	1985/4Q 1990	Macintosh OS, DOS, Sun OS	Macintosh, IBM PCs and compatibles, Sun Sparcstation	1M	Rapid prototyping, testing	Ada, C, C++, Cobol, Fortran, Pascal	Buhr/Booch, Chen, DeMarco, Martin, Shlaer/Mellor, Yourdon	CDIF	Yes	Microsoft Windows, proprietary windows, pull-down menus, X Window	Appleshare, Tops	$995 or $1,995 per module; $6,995 for entire set
Interactive Development Environments, Inc. (415) 543-8900 (800) 888-4332	Software Through Pictures	March 1988/Mar. 1989	AIX, DG/UX, Domain OS, HP-UX, Iris, Mips RISC OS, Sony News, Sun OS, Ultrix, VMS	DG Aviion; Decstation 2000, 3000, 5000, Vaxstation 3000; HP/Apollo 9000 series 300, 400, 700, 800, DN2500 through 4500; IBM RS/6000; Mips Magnum 3000; Sony News; Sun 3, 4, Sparcstation	8M	Rapid prototyping, testing, database schema generation	Ada, C, C++, Cobol, Pascal	Gane, Constantine-Yourdon, DeMarco-Yourdon, Gane & Sarson, Hatley-Pirbhai, Jackson, Wasserman-Pircher	DB2, Informix, Ingres, Interbase, Oracle, Sybase, Trell, any ANSI-standard SQL database	Yes	X Window, Motif, Open Look	Any supported by Unix	$5,000 - $21,000
Interactive, Inc.[3] (301) 230-3300 (800) 582-1601	APS, PVCS, Excelerator, Design Recovery	1984/March 1991	DOS, OS/2, AIX, MVS, DOS/VSE, OS/400	IBM PS/2 and compatibles, RS/6000, 3090 series	500K	Configuration management, maintenance, rapid prototyping, re-engineering	Cobol	Information Engineering, Yourdon, data-driven, object-oriented	IMS, IDMS, VSAM, ANSI-standard SQL database	Yes	Command line, Microsoft Windows, proprietary windows, pull-down menus, OS/2 Presentation Manager	Netware, LAN Manager, OS/2 LAN Server, Vines, Netbios	$495 for single-user PVCS; $8,250 for APS, $8,600 for Excelerator; $8,600 for Design Recovery
KnowledgeWare, Inc. (404) 231-8575 (800) 338-4139	Application Development Workbench	March 1988/ Dec. 1988	OS/2 Version 1.2 and higher	IBM PS/2 Model 70 or 80	4M	Rapid prototyping, strategic systems planning	Cobol	Methodology-independent	DB2, IMS, IDMS, VSAM	No	OS/2 Presentation Manager	OS/2 LAN Server	$10,125 per workstation; $20,000 for starter set
MCI International (312) 338-8000	Supercycle	Nov. 1988/ March 1991	VSE, VM, MVS, DOS, OS/2	IBM PCs, mainframes and compatibles	8M	Rapid prototyping, testing	CA-Ideal	Information Engineering, SDM-70, Yourdon-DeMarco, proprietary	DB2, CA-Datacom	No	Command line, Microsoft Windows, pull-down menus	Any supported by VTAM, LU6.2	$50,000 - $250,000
McDonnell Douglas Systems International (314) 232-2626 (800) 325-7760	Prism Workbench, PRO-IV	1987/1991	DOS, Unix, MVS, VMS	IBM PCs and compatibles, AS/400, 3080, 3090, 4300 series, HP 9000, DEC VAX, AT&T 382, Altos 1000/2000, Prime EXL	640K	Rapid prototyping	Proprietary routine library	Chen, Gane & Sarson, IDEF, Structo	DLI, DB2	No	Proprietary windows	Netware, Vines, OS/2 LAN Server	$35,000 for 8-user Workbench; $2,000 - $150,000 for PRO-IV

[1]All CASE environments listed perform analysis, design and source-code generation for building business applications. Each vendor sells all the required components for its environment; no third-party products are required, and integration techniques vary. [2]All products perform analysis, design and code generation. Additional functions are listed in the chart. [3]Formerly Index Technology Corp. and Sage Software. [4]Panaophic's Telon/Teamwork is a version of Cadre Technologies' Teamwork, with functions added specifically for use with Panaophic's Telon products. Telon/Teamwork is available only through Panaophic.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	SHIP DATE OF ORIGINAL/ MOST RECENT VERSION	OPERATING SYSTEMS SUPPORTED	HARDWARE REQUIRED	RAM REQUIRED (BYTES)	FUNCTIONS PERFORMED[2]	SOURCE CODE LANGUAGES GENERATED	CASE METHODOLOGIES SUPPORTED	DBMS SUPPORTED	BUILDS IN NETWORK CONTROL	USER INTERFACE	NETWORKS SUPPORTED	PRICE
Manager Software Products, Inc. (617) 863-5800	Method Manager	July 1990/ March 1991	DOS, MVS	IBM PS/2, 9370, 4300, 3080, 3090, ES/9000 series	2M minimum	Rapid prototyping	Cobol, CSP-ESF	Information Engineering	DB2, SQL/DS	Yes	Microsoft Windows	None	$120,000 +
Michaels, Ross & Cole Ltd. (708) 916-0662	MRC-Productivity series	June 1988/Sept. 1990	OS/400	IBM AS/400	NA	Rapid prototyping	RPG/400	Software Engineering, Rapid Application Development	OS/400 relational database	Yes	Command line, proprietary windows, pull-down menus	Any supported by Ethernet, Token Ring	$5 000 $39 500
	MRC-Query series	Feb. 1983/Oct. 1990	CPF	IBM System/38	NA	Rapid prototyping	RPG-III	Software Engineering, Rapid Application Development	CPF database	Yes	Command line, proprietary windows, pull down menus	See above	$4 000 $15 000
Oracle Corp. (415) 506-3267	Oracle CASE	1986/1990	VMS, Unix, OS/2, DOS, MVS, VM, AIX	Any hardware that supports operating systems listed	8M	Database and index design, reverse engineering	Oracle SQL and Forms	CASE Method, Gane Sarson, Information Engineering, Systems Engineering	Oracle SQL, DB2	Yes	Dectwindows, OS/2 PM, pull-down menus, X Window	Oracle SQL Net	$5 000 $100 000+
Panophic Systems, Inc. (708) 505-6000 (800) 323-7333	Telon/ Teamwork*, Telon, Telon Plus	1982/April 1991 for various components	OS/2, DOS, MVS, DOS/VSE, OS/400	IBM PS/2 Model 70, AS/400, mainframes	8M	Rapid prototyping	Cobol, PL/1	Buhr, Chen, Constantine-Yourdon, DeMarco-Yourdon	DB2, IDMS, IMS, VSAM	Yes	Proprietary windows, pull down menus, command line	[illegible] Network PC LAN, LAN Server	$2 250 $1 500 for Telon Plus, $9 000 for single user Telon, Teamwork, $150 000 $350 000 for Telon
Scandura Intelligent Systems (215) 664-1207	Prodoc RE/NU Sys Workbench	1990/1991	DOS, Unix	IBM PCs and compatibles, RS/6000, Sun Sparcstation	2M minimum; 4M - 8M recommended	Rapid prototyping, testing, specific language support, reverse engineering	Ada, C, Cobol, Fortran, Pascal	Methodology-independent	Exports to any	Yes	Command line, pull-down menus, X Window, dialog boxes	Any supported by DOS or Unix	$12,600
S/Cubed, Inc. (203) 323-0760	The Developer's Assistant for Information Systems	Nov. 1988/ March 1991	DOS	Intel 80386- and I486-based IBM PCs and compatibles	4M	Business requirements definition, rapid prototyping, testing	C, Cobol	Methodology-independent	Proprietary SQL based	Yes	Microsoft Windows	Any supported by Windows 3.0	$6 000 $36 000
Sage Technologies, Inc. (212) 643-6000	High Productivity Systems	Q4 1987/March 1991	DOS, OS/2, MVS	IBM PS/2, 3090 series	6M on PS/2	Migration, version and change control, rapid prototyping, testing	C, Cobol	Information Engineering	DB2, DBM	Yes	Microsoft Windows, OS/2 Presentation Manager	IBM Communications Manager	$10,000/month license fee
Softlab, Inc. (415) 957-9175	Maestro II	1975/1990	DOS, Unix	IBM PCs and compatibles, RS/6000, HP 9000	640K on PC, 24M on server	Maintenance, rapid prototyping, re-engineering, testing	Cobol	Mense, SA/SA, SSADM, Setec	Proprietary Object Management System	Yes	Proprietary windows, pull down menus	Any supported by TCP/IP	$15 000 per workstation
Software AG of North America, Inc. (703) 391-6720	Predict CASE and Predict CASE Workstation	March 1990/ April 1991	MVS, DOS/VSE, VMS for Predict CASE; DOS for Workstation	IBM 4300, 3090, 3090 series and compatibles, Wang for Predict CASE; IBM PC AT and compatibles for Workstation	1.5M for workstation	Rapid prototyping, testing	Natural	Information Engineering	Adabas, DB2, IMS, VSAM, SQL/DS	No	Command line with proprietary windows	None	$6,800 $252,000
	Natural Architect and Natural Construct	1988 for Construct, 1989 for Architect; Feb. 1991 for both	Macintosh OS for Architect, MVS, DOS/VSE, VM, VMS for Construct	Macintosh SE, II for Architect, IBM 4300, 3090, 3090, 9300 series and compatibles; DEC VAX; Wang	1M for Architect	Rapid prototyping, testing	Natural	Chen, Gane & Sarson, Martin, DeMarco-Yourdon	Adabas, DB2, VSAM, SQL/DS	No	Macintosh on Architect, proprietary windows on Construct	None	$8,800 for single copy of Architect, $1,000 $77,000 for Construct, $4,200 $36,000 for required gateway
SPS Software Products & Services, Inc. (212) 686-3790	EPOS	1979/Dec. 1989	VMS, Unix, DOS	DEC VAX, Sun-3, HP 9000, IBM PCs and compatibles	640K	None	Ada, C, Fortran, Pascal	Methodology-independent but does support object-oriented schemes	Proprietary	Yes	X Window	None	$9 [illegible] $25 000
Syscon, Inc. (416) 481-8000	Syscon/IE	July 1987/ March 1991	OS/400	IBM AS/400, all models except V10	4M	Rapid prototyping, testing, data modeling, action diagramming	Cobol, RPG/400	Information Engineering	OS/400 relational database	No	Command line, proprietary windows, pull-down menus	Any supported by LU6.2, Token Ring	$48,000 $80,000
Syncorp International (512) 338-5900	Macrostep Version 1.5	Jan. 1990/Jan. 1991	DOS 3.1, 3.3, 4.0 required to generate applications	IBM PCs and compatibles	640K	Rapid prototyping, testing	C	Rapid Application Development	Btrieve, Dbase	Yes	Proprietary windows	See above	$7 500
System Software Associates (312) 641-2900	As/Set ADK, As/Set Integrator	Jan. 1990/ March 1991	OS/400, OS/2	IBM AS/400, PS/2	8M	None	RPG/400	Information Engineering	OS/400 relational database	No	Command line, proprietary windows, pull-down menus	Any supported by OS/2, OS/400	$17 000 - $80,000
Texas Instruments, Inc. (800) 527-3500; Outside North America, call local TI office	Information Engineering Facility	1987/1990	DOS 3.1 and higher, OS/2 Extended Edition 1.2 and higher	IBM PCs and compatibles	640K	Rapid prototyping, testing	C, Cobol	Information Engineering	DB2, OS/2 DBM, RDB, Oracle	No	Proprietary windows	None	$9 400 $23 800
Unisys Corp. (215) 986-4011	The Linc Environment	Dec. 1985/Dec. 1990	Unix System V, Unisys A series MCP/AS, V series MCP, OS1100, OS/2, DOS	Unisys U, A, V, 1100/2200 series, PW2	5M	Rapid prototyping	Cobol	Linc, data-flow diagrams, entity-relationship models	Oracle 6.0, A and V Series DMS II, 1100/2200 RDMS	Yes	Command line, Microsoft Windows, OS/2 Presentation Manager, pull-down menus	Any supported by Unix	$5,500 $100,000 for Unix version, $30 000 - $322,000 for A or V series, $104,000 - $358 000 for 1100/2200 series
Westmount Technology b.v. (818) 597-9119	ISEE, TSEE, RTEE	Oct. 1988/Oct. 1990	Unix, VMS, Ultrix, Sun OS, HP-UX, Dynix, OSX, Clix	Sun-3, Sun-4, DEC VAX, 3100, HP 9000 Series 800 and 700, Intergraph Clipper, IBM RS/6000, DG Aviion	16M - 24M	Reverse engineering	C, AGL	Chen, Constantine, DeMarco, Jackson, Ward-Mellor, Yourdon	Ingres, Informix, Unify, Sybase, Oracle	Yes	X Window, Motif	Any supported by NFS, TCP/IP	$5 000 per module

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Object lesson

Understanding the principles behind object-oriented technology is the first step toward reaping its benefits of code reuse and ease of maintenance

BY DANIEL TASKER

Optimists see object orientation as the next silver bullet. Pessimists see it as the next arrow in the chest of pioneers. Somewhere between these two extremes lies reality.

Information systems professionals have a lot to gain from finding that middle ground: improved requirements and analysis methods, code reusability and ease of applications maintenance. These features can offer considerable relief from development backlogs and maintenance burdens.

However, achieving such object-oriented benefits is not easy; this approach to designing and building applications requires changing mind-sets. Nor do benefits accrue overnight. While off-the-shelf tools that support generic objects such as windows and lists do exist, there is still a need for in-house analysis and development for the specific objects a business needs. Object-oriented work will require close to traditional development time frames at first.



Katherine Mahaney

Object principles

To understand the positives and negatives of object-oriented analysis, design and programming, it is necessary to understand that it operates under different principles than the software development environments that have come before. It also has its own terms (see glossary page 84).

Traditional development has focused primarily on function or what the system does. In a function-based view, program logic is composed of instructions that emulate what people do. In this function-oriented world, data is usually structured in any way necessary to make the system execute its code in the shortest time possible.

It's true that IS shops get their tailored code to execute faster, but the legacy of developing systems from a purely functional perspective is a tangle of production applications and databases. This mess has become difficult, if not impossible, to manage. It is time to shift focus.

Objects represent a new way of looking at programs. Rather than seeing a system purely on the basis of what it does, object orientation looks at the elements (objects) involved. Each object within the system is analyzed to establish what it knows (data) as well as what it should do (function). Objects interact with other objects only by sending messages, similar to subroutine calls. These messages request information from or action by other objects.

Two types of objects in a banking system, for example, might be "customer" and "account." Each "customer" object knows its name, address and so on. "Customer" objects perform actions such as "make deposit" and "make withdrawal." "Account" objects know their "balance" and "interest rate" and perform tasks such as "calculate interest" and "produce a bank statement." A "customer" object wanting to know an account balance sends the message "tell balance" to the appropriate "account" object, which acts on the message.

This object-oriented approach makes possible the reuse of code. Typically, when reuse is mentioned in relation to object orientation, it refers to the practice of arranging objects into class (or type) hierarchies, through which they inherit knowledge and action properties. Therefore, for example, logic for "hiring" different subtypes of "employees" (such as "secretary," "engineer" and "salesman") does not have to be either called or copied. Logic is established once for the "employee" object and is inherited (reused) by the other subtypes.

Inherited data

Inheritance works for data components of objects in the same way as for action or functional components. "Secretary," "engineer" and "salesman" inherit "name" and "hire date" from the "employee" object. The object-oriented system automatically makes them available to all of the subtype objects.

Reusing business objects across applications is where IS can realize the greatest productivity improvements; reuse obviates the need to build code from scratch every time.

Reuse through inheritance is different from more traditional forms of subroutine libraries in which members of such libraries typically perform special functions, such as date conversion or statistical calculations. There are two difficulties with this traditional setup. First, code intended to be called as a stand-alone routine requires special effort to properly structure it. Second, organizing significant numbers of members (more than 50) in subroutine libraries is not easy. Functions are difficult to classify on their own.

It is typically faster to recode simple functions than to spend time searching for one that exists within a list of tens or sometimes hundreds of callable routines.

Action properties within objects, on the other hand, are always designed to be

Continued on page 80

Tasker is a Sydney, Australia-based independent consultant and author of the book Fourth Generation Data.

- **A shift from function view to data view**
- **Firms implement what they can**
- **A glossary of object-oriented terms**

Continued from page 79

callable. Access to an object's knowledge or actions can be obtained via messages, with inheritance hierarchies providing a natural classification structure. Thus, besides providing automatic reuse through inheritance, these structures aid in locating functions for reuse via messages.

Reuse instances

Reusing only the definitions of objects (their knowledge and action properties) is not sufficient. Advantages of object orientation can be lost if object instances are not reused as well.

For example, a university might develop a course enrollment application that includes the "person" hierarchy and populate it with subtype instances of "students" and "faculty," along with their relationships to other objects such as "course." A second project team at the school developing a payroll application can copy the "person" hierarchy. The team can take advantage of reusing the definition of "person" and "faculty," adding a new "staff" subtype.

However, if the payroll application is run on a different computer, it will not be able to directly reuse the object instances found in the course enrollment application. It will require either redundant entry of faculty information and duplicate updates over time or additional extract and update transaction mechanisms between it and the enrollment systems.

This is the same kind of situation that results in redundant data in application-specific databases and end-user query tables that support traditional function-based applications. IS can reduce initial development time by reusing (copying) existing object definitions, but in the long run, these new applications will experience the same kinds of problems found in today's production systems.

Not a recognized problem

Instance reuse has not yet been widely recognized as a problematic issue in the object-oriented community, perhaps because groups experimenting with object orientation have done so only on a pilot application basis in which no programs overlap. Clearing up these traditional types of problems, however, is important in taking full advantage of object orientation's maintenance strengths.

Program complexity and interdependency are two of the major issues affecting program maintenance. Complexity relates to the additional time needed to locate the appropriate code for a required change. Spaghetti code, clever logic and heavily modified programs all contribute to slowing this search. Structured techniques are intended to address the complexity problem, but the majority of production applications have not been developed using these techniques.

Program and/or systems interdependency (the passing of transactions or even whole databases between systems) means maintenance staff members must spend additional time identifying the potential ripple effects of a program change. With many of today's larger (and older) applications, it has become impractical, if not impossible, to do thorough impact analysis. Standard practice in many shops is to take care of the most obvious cases and then let the program run. A team is usually kept close by to fix whatever fails.

This is not a pretty situation but a reality nonetheless.

What object orientation has to offer in this area is encapsulation based on data-

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Implementing bits and pieces

Object-oriented technology is not just a lot of hype. Even without industrial-strength languages and database management systems, companies are applying object-oriented principles to analysis, design and even implementation.

Westpac Banking Corp. in Sydney, Australia, captures user requirements in the form of business objects for its redevelopment of core banking applications. Implementation of those objects is being accomplished using IMS and Cobol. The firm has committed more than $100 million (Australian) to this multiyear development project.

By performing extensive object-oriented analysis on its banking products, the organization expects to be able to mix and match product features implemented as reusable objects. Reusing objects will enable Westpac Banking's IS department to develop applications in days and weeks instead of weeks and months.

New Zealand Insurance, also based in Sydney, is using traditional languages and database technology to implement support tools for delivering applications based on object-oriented principles. Early tests indicate these tools will be able to offer tailored insurance applications in a greatly reduced time frame.

However, companies currently having success in the object-oriented field have had to invest significant time, money and effort. Companies implementing applications using object-oriented languages and DBMSs have had to accept the risks that come with an emerging technology: few standards or off-the-shelf products and vendors with short track records.

centered objects. Encapsulation is basically a fancy term for surrounding all knowledge properties with action properties. Objects are isolated from one another. An object needing to find out what some other object knows or to change that knowledge is not permitted to access (read or update) the data directly. It must send a message asking for the information.

Objects, therefore, have "telling" actions as well as "update" actions for each of their knowledge properties. Although this may sound a bit tedious, it allows for maintenance changes to objects without impacting other objects.

In the case of updates to knowledge properties, other objects may send information relevant to the update, but only the object containing the knowledge has the logic to implement the update. This guarantees that maintenance will be required only in a single, well-classified location.

Instance reuse, in which one application copies object definitions for its own use, creates a situation that can violate encapsulation, however. Even if a single database were shared by

OBJECT-ORIENTED technology is about where relational database management systems were eight to 10 years ago.

both applications, there is now more than one source of logic that delivers or updates the same fact. Maintenance to only one of these copies would mean the fact could be operated on by different logic.

To prevent this, the exact same changes must be applied to all copies of object definitions. Locating and changing two or more copies obviously increases maintenance time and effort. IS will require some form of documentation procedure to keep track of exactly which systems have taken copies of which object definitions.

What can be done today?

Although object orientation has been around for many years, it is only recently that it has received major attention from vendors and methodologists. The technology (programming languages and object-oriented database management systems) is about where relational DBMSs were eight to 10 years ago. Some promising products are available, but none are considered "industrial strength" or "strategic" enough for major business applications. Furthermore, object-oriented language standards are in their earliest stages.

IS organizations' understanding of object-oriented concepts is not much more advanced.

Even so, some organizations are taking advantage of what object orientation can offer today (see story previous page). Some companies are applying it to stand-alone applications. Others that understand the benefits of enterprisewide data sharing are using it to share/reuse functions through object-oriented style hierarchies and encapsulation.

IS shops can benefit today from object-oriented principles without risking existing production technologies. The first step is to increase the understanding of the concepts.

The study of object orientation should be approached not only from the function perspective but also from the data perspective. Because they take a data-centered perspective on systems in which they identify entities (persons, places and things), data analysts and data modelers make an easier transition to the idea of "objects." Their experience can help companies organize the enterprise's data along object-oriented rather than function-specific lines.

Requirements for new systems expressed from the perspective of objects can be useful, even when implementing applications in traditional nonobject-oriented languages and database technologies.

Beginning to structure such applications using object-oriented principles can only help in delivering reuse and maintenance benefits to companies. ■

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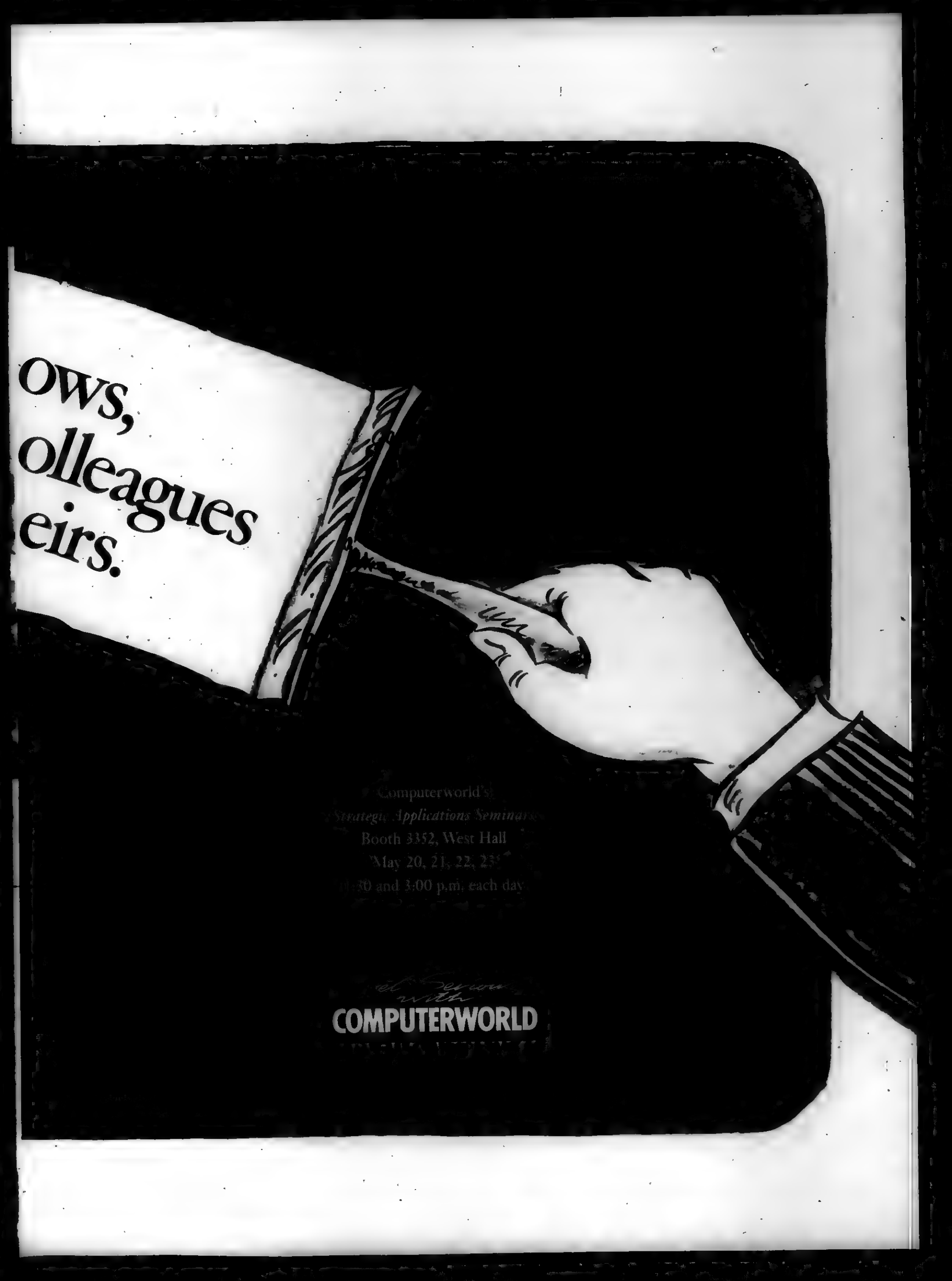
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Term paper: An object-oriented glossary

Object/instance: An individual item of interest in the system. For example, in a banking system, each customer (Jones, Smith and so on) is an object, or instance of an object type (or class), of customer. Each account, statement, etc., is an object or an instance of its type.

Object class/class/object type: A generalization of the objects (or instances) of interest in a system. The generalization is based on all of the instances having common properties. "Customer" is the object class for the objects Jones and Smith, each of which has a name and address and performs similar actions.

Object property/feature/attribute/method: A component of an object (type) that either represents something that the object knows (such as a knowledge or data property) or something that the object does (such as an action the object is capable of carrying out). Thus, for the object class "customer," "name" and "address" are the knowledge properties, and "make deposit" and "make withdrawal" are the action properties.



Message: A request issued by an object for another object to respond to. This response can take the form of supplying a piece of information, such as returning a customer's name to the message sender, or initiating some action, such as accepting a withdrawal amount included in a "withdraw" message and updating a balance.

All interaction among objects is via messages. The name of the message must match the name of the receiving object's action property or an action the object inherits from somewhere higher in its class hierarchy.

Class hierarchy/type hierarchy: A relationship structure in which one object is identified as a special case of another. For example, a "customer" is a special case of "person," and a "savings account" is a special case of "bank account." Objects inherit properties (knowledge and actions) from all general objects above them in the hierarchy. The immediate "parent" of an object in a hierarchy is called the supertype of the object. The immediate "child" of an object is called a subtype.

Many object-oriented systems allow for an object to have more than one parent, enabling it to "inherit" upward through more than one structure.

Inheritance: A feature of object orientation that automatically makes available to a given object any properties of objects above it in a type hierarchy. Thus, a "student" object is considered to have "name" and "address" properties, which are actually defined as part of its supertype, "person."

Encapsulation: A limitation imposed on objects whereby knowledge properties are directly accessible only by action properties of the same object. Any other object wishing access can only do so indirectly by sending a message. This message is serviced by the appropriate action property, which provides the required information. For example, an account balance can be provided to message senders through a "tell balance" account action.

Polymorphism: Means "taking many forms." Different action properties of different object types are allowed to have exactly the same name. Thus, two or more subtypes of an "account" object (for example, term deposit, Christmas club and so on) can each have an action property "calculate interest," with the logic within each being appropriate to that type of account.

Polymorphism provides for different objects to respond differently to the same message, depending on the object type that receives it.

Dynamic binding: A special program execution feature that waits until the last minute to determine exactly which action property in which object to send a message to (also referred to as branching). With static binding, the branch destination is fixed when the program is compiled.

Because of polymorphism in object orientation, a message with a given name may actually want to access different actions (program logic), depending on the particular object type being processed at the time. In this case, dynamic binding is required so the appropriate action is invoked when each type is determined.

Persistence: A state in which an object's knowledge is required to remain intact when the object-oriented system is not active. Traditional records in databases are persistent; instances of window objects are not. When the system is shut down, the window ceases to exist. A new instance is established when the application is activated again.

So, although a window for accepting customer address details is not persistent, the details as part of the customer instance are.



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NATIONAL BRIEFS

JDC gets some R&R

▶ **Reynolds and Reynolds Co.**, the Dayton, Ohio-based purveyor of computer systems to automobile dealers, inked an agreement last week to buy the assets of neighboring **NCR Corp.**'s **JDC Data** subsidiary. Based in Vejle, Denmark, JDC Data supplies computer systems to the Scandinavian — and, more recently, the German — automobile markets as well as to gas stations, lumberyards and accounting firms. It also supplied $52.3 million in revenue to NCR in 1990. Terms of the deal were not disclosed.

Bull N?

▶ French computer firm **Groupe Bull** last week bought out former partner **Honeywell, Inc.**'s remaining 12.8% interest in **Bull HN Information Systems, Inc.** The long-planned move completes Honeywell's exit from the computer industry and gives Groupe Bull an 85% stake in the Billerica, Mass.-based Bull HN. Japan's **NEC Corp.** — the N in Bull HN — remains a 15% owner of the firm. Honeywell said last week it would remain on board as a key Bull customer.

Sterling deal

▶ The slimming of **Control Data Corp.** continued last week as the Minneapolis-based computer vendor poised to sell its Redinet Services division to Dallas-based **Sterling Software, Inc.** Redinet, an electronic data interchange (EDI) network services and software supplier, will join the EDI Group, which Sterling said is the fastest growing part of its business. Both firms said they expect the deal to close by the end of June.

Ready, steady, go public

▶ Smart-hub manufacturer **Chipcom Corp.** recently made prophets out of those analysts who have numbered the company among those most likely to launch an initial public offering this year. The Southboro, Mass.-based firm went public on March 22 at $10 to $12 per share. Proceeds from the sale of the initially offered 1,550,000 shares of common stock will be used for general corporate purposes including product development, Chipcom said.

Banyan: Make-or-break time

Enterprise networking pioneer's technological leadership on the line

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — To say that Banyan Systems, Inc. should be watching its marketing p's and q's these days would be putting it mildly.

Banyan, historically lauded for its technology leap in enterprisewide networking but chided for its lack of marketing acumen, might soon hit a brick wall if it does not quickly come through with some fancy marketing and development footwork, analysts and users said recently.

Some questioned whether the 550-person, privately held company is moving fast enough to allow it to thrive much longer without being purchased by a major industry player.

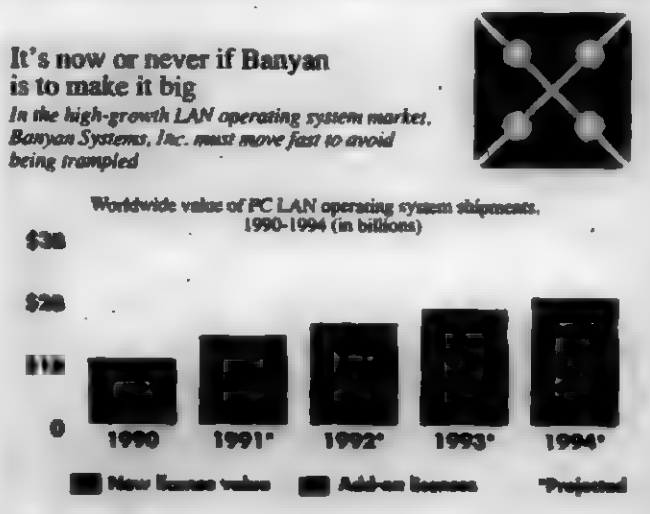
"The biggest question mark is how long Banyan can survive with just a sliver of market share," said Janet L. Hyland, director of network strategy service at Cambridge, Mass.-based Forrester Research, Inc. A recent Forrester study of Fortune 1,000 firms revealed "a strong jitteriness" about Banyan's viability as a company because of its size, despite widespread enthusiasm for its Virtual Networking System (Vines) network operating system, Hyland said.

Banyan has long had a head start in enterprise networking with its AT&T Unix System V-based Vines. The network boasts a global naming service, known as Streettalk, that lets geographically dispersed Vines local-area networks plug into one another. This enables users to communicate directly with remote computers over wide areas without having to know and specify their precise locations.

To date, Streettalk remains unchallenged in the industry, but competitors are said to be scurrying to roll out similar naming services within 18 months. They are also enhancing networking software and forming partnerships to challenge Vines in the enterprise market (see story page 86).

It's now or never if Banyan is to make it big

In the high-growth LAN operating system market, Banyan Systems, Inc. must move fast to avoid being trampled



Banyan's mission, analysts said, should be to listen to the market and act fast on what it hears. For example, customers at the recent Association of Banyan Users meeting in Montreal said large-account-oriented Banyan must start selling into smaller accounts to build "mind share" [CW, April 15].

Users are also demanding Vines interoperability with other vendors' LANs and support of many more computing platforms as "clients" — computers that request data and services from Vines' Unix-based servers.

"Banyan has barely gotten off its own proprietary hardware," said Frank Michnoff, program director of desktop computing strategies at The Meta Group, Inc. in Westport, Conn.

Making progress

With the release of Vines Version 4.10 at the Montreal conference, the network is making progress. Vines 4.10 added OS/2 client support along with further integration of Microsoft Corp. Windows environments to existing MS-DOS clients. Support for Apple Computer, Inc. Macintosh clients is next on Banyan's list, according to the firm.

In contrast, Novell's Netware LAN has long supported DOS, Windows, OS/2, Unix and Macintosh clients — which makes

Continued on page 86

Q1: Upbeat results indicate promise instead of disaster

BY NELL MARGOLIS
CW STAFF

IBM's first-quarter fall from earnings grace [CW, April 15] earlier this month wreaked havoc on Wall Street and set industry observers dourly speculating as to how bedraggled other recession-wracked companies' quarterly reports might appear. However, a slew of upbeat first-quarter results posted by computer companies last week indicated that despite a grim preview of coming attractions, the year's opening quarter may turn out to be a good show.

"We've seen upside surprises already, and I've got a sneaking suspicion we're in for more," said Joseph Payne, an analyst at Alex. Brown & Sons, Inc. For instance, he noted, "People forget that in a recession, peripherals do better than computers."

Louisville, Colo.-based storage and retrieval systems purveyor Storage Technology Corp. saw revenue increase 9% to $282 million for the quarter, while net income swelled 73% to $15 million.

San Jose, Calif.-based Conner Peripherals, Inc.'s net income for the quarter ended March 31 soared 127% to $35 million on revenue up 62% to $382 million.

In addition, several analysts pointed out, the same recession-induced fears that make customers clutch their wallets also sharpen their appreciation of assets that endure or that protect other assets. Healthy first-quarter figures are expected from Stratus Computer, Inc., Payne said, owing to the fact that "their fault tolerance is real, and their customers know it."

During hard times, emphasis also shifts to service, analysts said. At Roseland, N.J.-based Automatic Data Processing, Inc., for example, employer services — which contribute some 60% of the firm's bottom line — enjoyed double-digit year-to-year growth in the first quarter, fueling the firm to a 14% increase in earnings per share and its 119th consecutive quarter of 10% or better earnings-per-share growth.

Meanwhile, many of the quarter's happier tales serve as a reminder that rolling out new and needed products — on time and at the right price — is a winning gambit in good and bad times alike, said David Wu, an analyst at S.G. Warburg & Co. "Another is sound management with a talent for cost control," he added.

First-quarter earnings 1991

Recession equals arduous times for computer makers while peripherals manufacturers tally profits

Company	Revenue Jan. through March 1991	Percent change from 1990	Profit Jan. through March 1991	Percent change from 1990
Apple Computer, Inc.	[illegible]	19%	$131M	(58)
AST Research, Inc.	$180M	31%	$17M	74%
Automatic Data Processing, Inc.	[illegible]	4%	$70M	7%
Borland International, Inc.	$70.6M	103%	$8.4M	102%
Cray Computer Corp.	$.89M	—	[illegible]	—
Cypress Semiconductor Corp.	$69.1M	31%	[illegible]	[illegible]
[illegible]	$113M	1,450	$5.2M	(34%)
Intergraph Corp.	$287M	25%	[illegible]	33%
NCR Corp.	$1.4B	8%	$46M	(128)
Pyramid Technology Corp.	$59M	44%	[illegible]	35%
Sequoia Systems, Inc.	$16.2M	21%	$2M	[illegible]
Tandon Corp.	$113M	7%	$8M	12%
[illegible]	[illegible]	7%	$(544K)	—
United Telecommunications, Inc.	$2.2B	7%	$84M	[illegible]

[illegible]

CW Chart: Doreen St. John

Banyan

CONTINUED FROM PAGE 85

Netware appealing to a broader group.

"Users are looking to hook all their heterogeneous clients together at the server and get on with their applications development," Michnoff explained.

Bill Sheehan, director of information services at the Commonwealth of Massachusetts Metropolitan District Commission, verified Michnoff's assessment. "The main thing I want to do is integrate my Macintoshes into my Vines network," he said. "I'd also like connectivity to other platforms."

Last July, Banyan hired Compaq Computer Corp. veteran James D'Arezzo as marketing vice president. Since that time, the firm has increased its marketing budget by 50%, inducted a six-member marketing team and retreated from the network server business to focus attention on its major strength: LAN software with inherent wide-area communications capabilities.

In addition, the company is expanding its distribution channel. For example, the ink is barely dry on an agreement to extend Memorex Telex Corp.'s resale, service and support of Vines from the southern U.S. to the entire nation.

On the interoperability front, Banyan's February announcement of a partnership with AT&T coincided with the availability of products that allow Vines networks to communicate with AT&T's LANs. The fact that the announcement reflected actual product availability recouped some credibility for Banyan, analysts said.

The industry is still stinging from the firm's May 1990 promise to deliver interoperability between Vines and Microsoft's LAN Manager. That project — labeled "nothing but pure smoke" by Infonetics Research Institute, Inc. President Michael Howard — is reportedly still under way, though its only fruits have been some OS/2 applications programming interfaces added to Vines 4.10.

D'Arezzo conceded that "it's time we did a better job of delivering on our promises. We need to put up or shut up."

Despite its historic marketing Achilles' heel, the firm increased worldwide sales from $46 million in 1988 to $98 million in 1990. According to International Data Corp., Banyan reported that fourth-quarter 1990 revenue of $28 million was up 35% from the same quarter in '89.

Hyland asserted that the quarterly growth "looks good, but not great. Banyan is slowing down in terms of resource dollars" it can invest to keep its technological upper hand. She said the firm has refrained from going public because of continuous senior management turnover and a revenue growth slowdown resulting from its retreat from the hardware business.

Shifting winds

Novell strides toward adding wide-area networking capabilities to its traditionally work group-oriented Netware LAN could help the firm encroach on Banyan's global networking turf.

For example, Novell added T1 support to its server last year. Based on client feedback, Kevin O'Neill, network research and consulting vice president at Newton, Mass.-based Business Research Group, said the move kept Novell from losing many customers to enterprise-oriented Banyan.

In February, Novell "blew the industry away" when it introduced Netware v3.11, according to Forrester Research's Janet L. Hyland. The revamped network operating system includes support for several key communications protocols in addition to its proprietary IPX/SPX. It also brings Apple Macintosh network clients into the existing MS-DOS, Windows, OS/2 and Unix Netware client fold.

At the time of the v3.11 announcement, Novell also partnered with IBM in a worldwide reseller agreement that, by combined installation numbers alone, allows the two firms to rub elbows with a large chunk of would-be Vines users.

All these moves enhance Netware's attractiveness to firms with multivendor computing environments — the profile of firms moving toward enterprisewide networks.

JOANIE M. WEXLER



Software lawsuit prompts questions on patents

ANALYSIS

BY JAMES DALY
CW STAFF

Is the software patent the doormat of the computer industry? Paul Heckel thinks so. For the second time in as many years, the industry veteran and Hyperacks, Inc. president is gearing up to defend a software patent he says has been repeatedly walked on since he obtained it in 1984. In the process, he could write an important new chapter in the battle for intellectual property rights.

Heckel claims to have invented the on-screen image of a stack of file cards and used it in a product called Zoomracks. Several years later, Apple Computer, Inc. employed a similar motif in its much-heralded Hypercard. Heckel sued and won, forcing Apple to cut him a substantial check and draw up a technological cross-licensing swap.

Now Heckel is challenging both IBM and Asymetrix Corp. Asymetrix produces an application builder called Toolbook that IBM bundles with some Personal System/2 models.

"So far, nobody has gotten hit real hard over misuse of software patents," said Heckel, a former consultant to Xerox Corp.'s legendary Palo Alto, Calif., Research Center. "Maybe when they do, patents will start getting treated with the respect they deserve."

Although Heckel has yet to formally file charges, and IBM and Asymetrix spokesmen refuted his claims, the standoff has reignited long-simmering debates about the need for software patents. Depending upon which side is speaking, software patents are either an essential protective armor for innovative programmers or a suffocating pillow over the face of the software industry.

Patent vs. copyright

Unlike copyright laws, software patents protect an application's fundamental technology. A programmer who uses an entirely different code yet produces a functionally similar application could be in deep legal trouble.

A patent grants exclusive rights for making, using and selling the invention for 17 years. Once a patent exists, anyone who wants to further develop the software must obtain a license from the patent holder.

Critics such as the League For Programming Freedom based in Cambridge, Mass., said software patents are not only irksome but dangerous. They bundle the risk of a lawsuit into every design decision in the development of a program, League President Jack Larsen said.

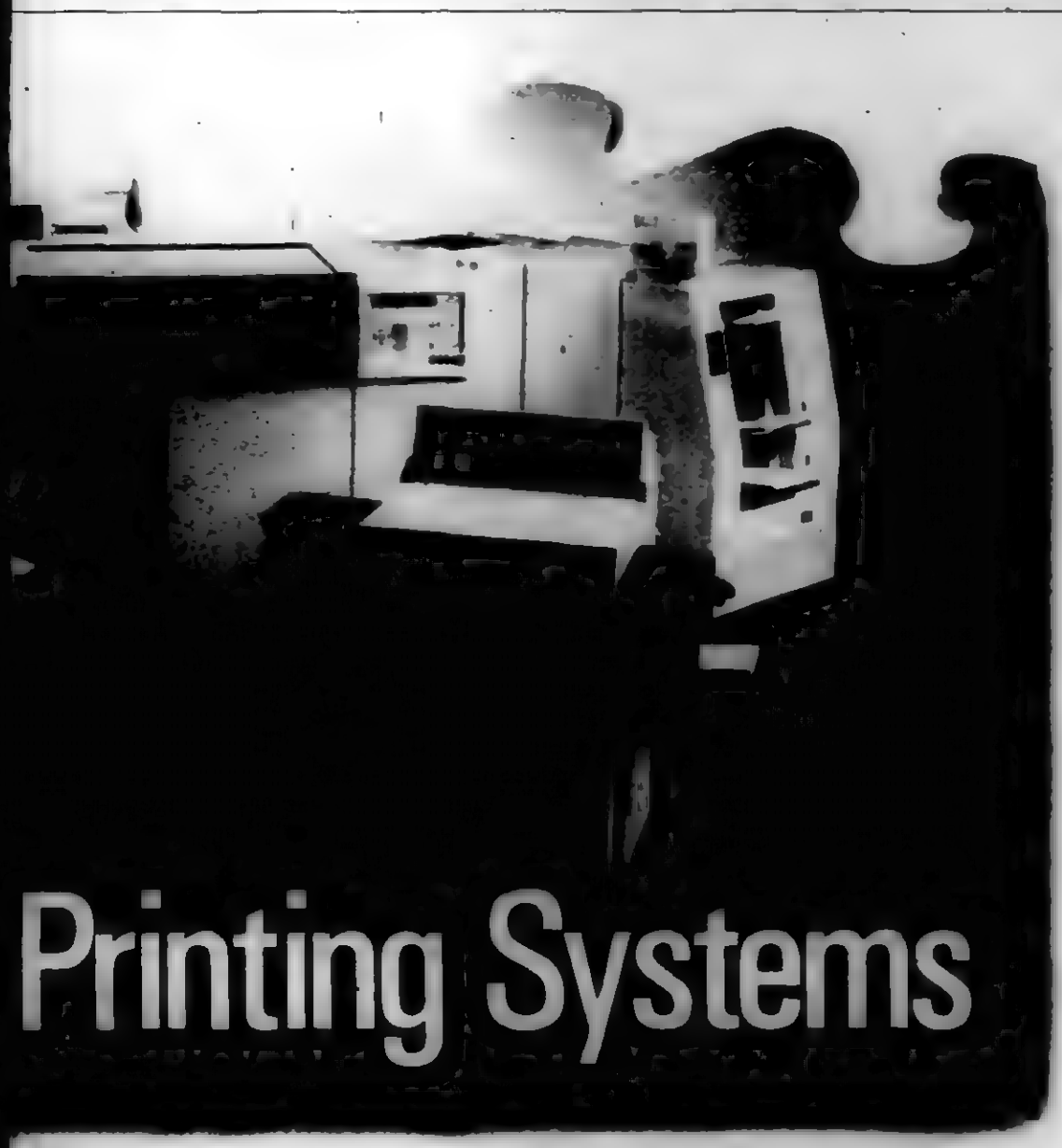
League members said it is difficult and expensive to figure out whether each specific programming technique is patented. To avoid a lawsuit, developers would need to make each new product look completely different. Heckel questioned such arguments. "So little software has been patented and the scope of most patents [is so] relatively narrow that the chance of a programmer trampling over someone's patent is very slim," he said.

Recent years have seen a shift to stronger patent laws, said Richard Bernacchi, an attorney with the law firm of Irell & Manella. A major reason is the 1982 creation of the Court of Appeals for the Federal Circuit, which has upheld 70% of the patents that have been challenged before it, he explained. "The district and appellate courts were not able to understand technology, so there was a tendency to invalidate patents because they feared a monopoly," Bernacchi said.

Many observers placed the problem at the door of the Patent Office. "The Patent Office is not adequately armed with qualified technical examiners and a large enough database to determine who already owns a patent and who should be granted one," said Ken Wasch, president of the Software Publishers Association in Washington, D.C.

A typical patent search will also frequently overlook pending patent applications. Since it typically takes several years for a software patent to be granted, this presents a serious problem. A developer could design and release a large program after a patent has been applied for but only learn later that distribution of the program is prohibited.

Instead, Wasch argued, copyrights should be the vehicle for protecting intellectual property. While patents protect ideas, copyrights protect the expression of those ideas.



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Reference checks: The truth be known

BY EMILY LEINFUSS
SPECIAL TO CW

Two former criminals apply for applications programming positions at Black & Decker Corp. in Towson, Md. The first, convicted of breaking and entering, was candid about it in the job interview. The other, also a onetime burglar, failed to mention his past. However, the firm's standard reference-checking procedures found him out. The honest man got the job.

This illustrates not only that honesty is the best policy but also that reference checking is a basic, integral part of the hiring process, information systems executives say.

"It is a hygienic factor. You must do it for every applicant to make sure there is nothing hidden," says Sid Diamond, Black & Decker's vice president of worldwide IS.

Checking references, however, comes with its own set of problems: It's a time-consuming task, and it can brush up against legal privacy issues.

Drawing the line between what a company needs to know about a prospective employee and what can be interpreted as an invasion of privacy can be difficult. That is why many companies will only give out "neutral" references, and some will not even discuss their personnel policies at all. A neutral reference check verifies dates of employment, positions and pay rates.

Employers are leery of lawsuits involving defamation of character and slander. Sometimes, a reference can have an ax to grind. "We are scared to death of that happening, so we just have the flat-out [neutral reference checking]," says Peter Palmer, K Mart Corp.'s vice president of labor relations and assistant general counsel.

Palmer admits that employers have an obligation not to hire somebody who could threaten public safety. "If an employee was harmed by a mass murderer we had hired, and we hadn't done any kind of check, someone could allege negligent hiring," he says.



Most IS managers get around the time-draining task of validating references by delegating it to human resources departments, outside investigators or executive search firms.

For example, Ernst & Young asks applicants to sign a release form that allows the company to send the application and resume to the investigative firm Research Associates, Inc. in Cleveland. Research Associates then runs a thorough analysis of the person, says Scott Evans, manager of IS recruiting at Ernst & Young. The firm verifies all employment, references, education, litigation and credit backgrounds. It also interviews references and informal sources within the applicant's former places of employment.

Most often, these reference checks turn up inconsistencies in education and credit histories, says Dean Kuntz, an investigator at Research Associates. One applicant for a $100,000-per-year IS position claimed to have a doctorate but had actually falsified the diploma. Many people who have filed for bankruptcy fail to mention it on their job applications, yet most companies want to know about a person's financial history, Kuntz says.

Recruiting firms also run detailed reference investigations for their clients. Preliminary checks are usually informal contacts with professionals in the industry who have worked with the applicant, says Alan Grossman, a senior partner at recruitment firm A. Davis Grant & Co. in Iselin, N.J. Formal investigations are 15- to 20-minute telephone conversations with stated and informal references. The firm asks questions that reveal why the applicant left the job, how creative he was and how he interacted with the user community.

An employer ultimately wants to know if applicants can perform the skills of the job and get along with their peers. "Mavericks don't usually do well in this business," Evans says.

For the most part, IS employers say, applicants tell the truth. But it is a one-sided truth. "I would say that sometimes applicants just don't tell the whole truth. There are gray areas they overlook, and we have to find them out," Diamond says.

Leinfuss is a free-lance writer based in Sarasota, Fla.

Drawing the line

Every state has its own pre-employment question policy, which is determined by the department of fair employment or equal opportunity commission. The following are guidelines combined from several states to assist hiring managers in learning areas to watch out for:

- **Education.** You *can* ask about academic, vocational and professional experience.
- **Experience.** You *can* inquire about previous work experience.
- **Character.** You *can* ask for names of previous employers, co-workers and personal references to probe the character of the applicant.
- **Birthplace, citizenship.** You *cannot* ask applicant where he was born, whether he is naturalized or what date he acquired citizenship. You *can* ask applicant if he can submit verification of his legal right to work in the U.S.
- **Sex, marital status.** You *cannot* inquire about an applicant's sex or marital status.
- **Age.** You *can* ask if a person is under 21 or over 65.
- **Religion.** You *cannot* ask applicant his religious denomination or religious days observed.
- **Race and color.** You *cannot* ask an applicant's race or color.
- **Military experience.** You *cannot* ask the person whether he ever served in a foreign military. You *can* ask about relative skills acquired during applicant's U.S. military service.
- **Organizations.** You *cannot* inquire about organizations in which the applicant is a member. You *can* ask applicant to list job-related organizations to which he belongs, omitting those that indicate race, religious creed, color, sex and age.
- **Criminal record.** You *cannot* ask about arrests or convictions that occurred more than 10 years prior to the date of application unless the conviction involved a sexual or narcotics offense or imprisonment.

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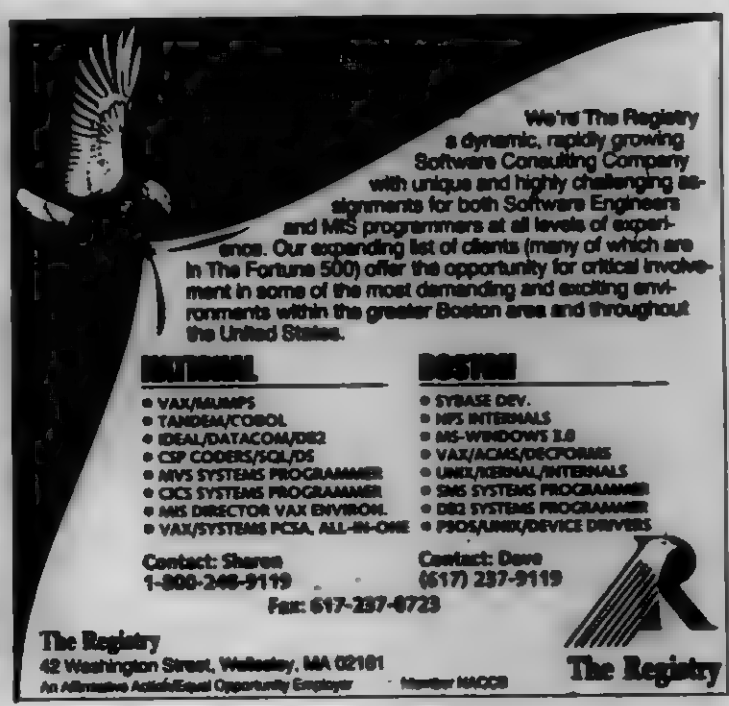
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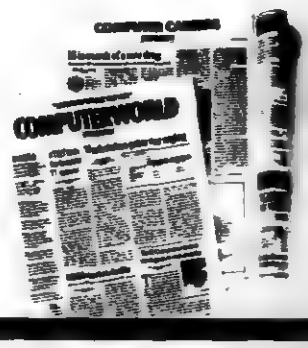
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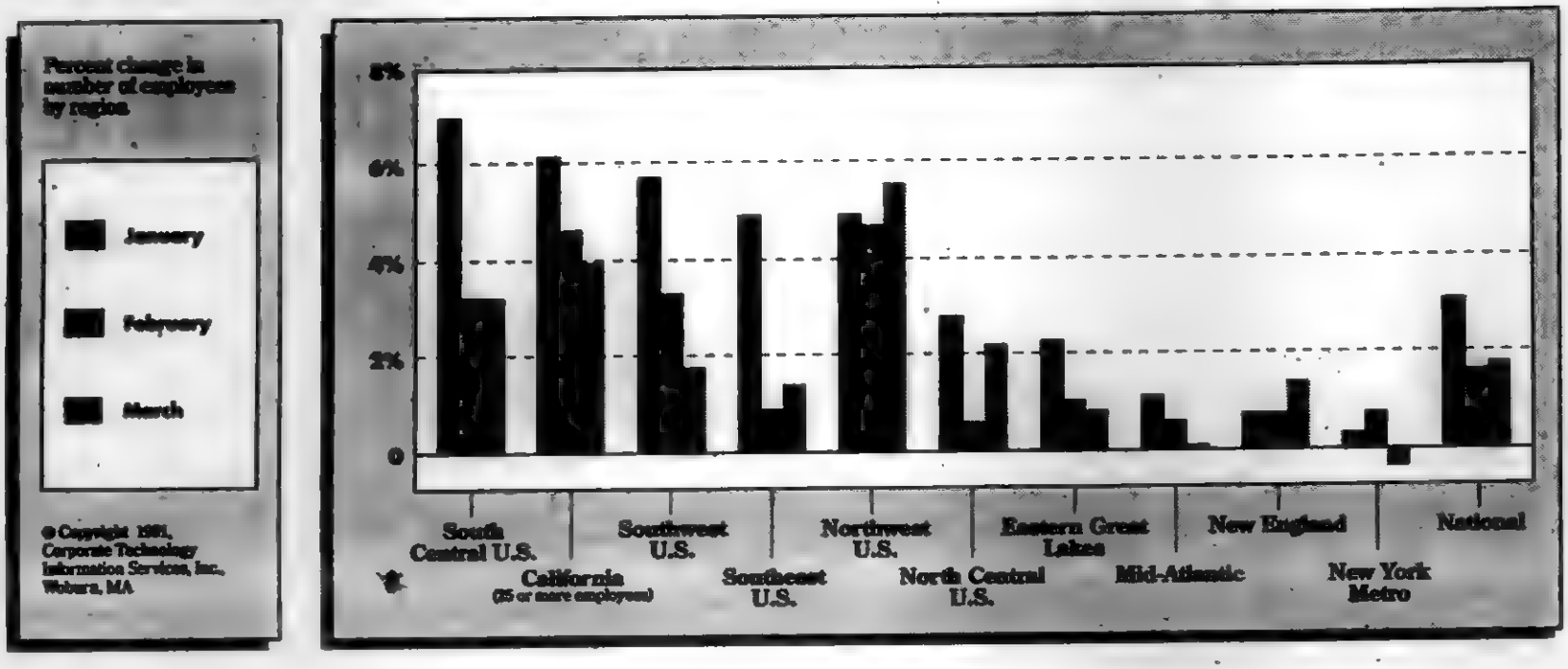
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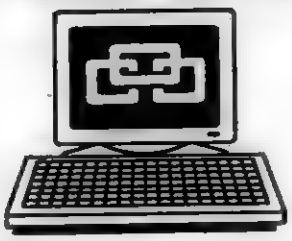
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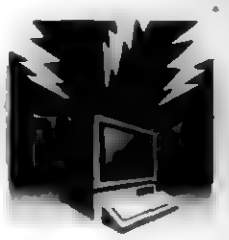
BEST READ



Cheap surge protectors not always best answer

BY ALAN RADDING
SPECIAL TO CW

If you spent $8 to $29 for a metal oxide varistor (MOV) surge protector and you think your personal computers and networks are protected, think again. Some information systems workers and users are now saying that these low-end offerings are just not good enough.



Surge protectors are designed to intercept sudden jumps of power in computers and to dissipate them harmlessly. Problems with power surges show up as inexplicably lost or damaged data, sudden crashes and seriously damaged hardware. PCs and workstations are particularly vulnerable to power surge damage because they draw relatively little power.

There are two major problems with common, inexpensive surge protectors. First, they are built using MOVs, which capture the sudden surge of power but wear out quickly and soon become useless. "We used to use MOV protectors, but they'd only last until the first lightning storm," says Chris Jackson, manager of Samuel Jackson Manufacturing Co. in Lubbock, Texas.

Second, the low-cost devices divert the surge to the ground wire, which can interrupt data flow and corrupt data in a network environment. Even with a stand-alone PC, diverting the surge to the ground can cause garble in documents from an attached modem or printer.

In a 1988 technical paper, Francois D. Martzloff at the National Bureau of Standards first identified the dangers inherent in MOV-based surge protectors, particularly when surges are diverted to the ground. "An unexpected side effect of these surges . . . was apparent damage suffered by the data line input components," he noted.

Power engineers also recognize the limitations of MOV-based surge protectors. "The problem with MOVs is that they fail open, and you don't know they failed," says Kenneth Brill, president of Computersite Engineering in Danvers, Mass. When the MOV fails, it lets the surge pass through unchecked and unknown to the user until it causes damage.

Now there are alternatives to MOV-based devices. Zero Surge, Inc. in Princeton, N.J., and Sutton Designs, Inc. in Ithaca, N.Y., offer devices that cost from $150 to $190. The alternatives don't rely on MOVs exclusively; instead, they provide additional filters and circuitry associated with MOV-based products. Isolation transformers can also do the job, but they are large, heavy and very expensive.

However, just because these products are available doesn't mean much. IS workers and users say they are having a tough time appealing to their managers to spend three to five times more on the new offerings than they would on a MOV-based surge protector.

"It's hard to convince somebody to spend $150 when they can spend as little as $8 for something they think does the same thing," says Bill Shuff, a materials engineer at General Electric Co. in Schenectady, N.Y.

Few organizations have a formal surge protection policy for end-user PCs and workstations. "We don't require one except where it is mission-critical. It depends on the user's preference," says Stephen Rood, manager of microcomputer technology at New York-based Coopers & Lybrand.

In the hope of sparking more IS response, individual users and IS workers have started a grassroots campaign around the issue of surge protection, carried on through user groups and electronic bulletin boards. The campaign has yet to make much headway in large corporations.

> "IT'S HARD TO CONVINCE somebody to spend $150 when they can spend . . . $8 for something they think does the same thing."
>
> BILL SHUFF
> GENERAL ELECTRIC

For instance, Shuff learned about the Zero Surge device through an Apple Computer, Inc. user group. He tried the product on computer equipment that had suffered from mysterious damage, and the problem was fixed. However, his company won't formally adopt Zero Surge on all of its systems.

Corporate users usually turn to the more costly surge protectors only as a last resort. "We were having a series of Netbios errors on one local-area network. It's difficult to prove, but we suspected the problem was surges," says Marty Stanton, IS officer at the Geoserve Division of Manufacturers Hanover Corp. He finally installed the Zero Surge device and the problems stopped. Now it is the only protector his department uses.

"Nobody complained about the cost. We spend $3,000 to $5,000 for a workstation, so another $150 for a surge protector seems reasonable," Stanton says.

Weber Marking Systems, Inc. in Arlington Heights, Ill., incorporated the Sutton Designs surge protector into its label printing systems because the device represented a compromise between the low-cost devices and more costly systems.

Compared with five low-cost MOV devices Weber Marking Systems reviewed, the Sutton product "did the job without getting into really large money," says Gerald Permann, Weber's senior IS buyer. "Many of the cheap ones did nothing," he adds.

Radding is a free-lance writer in Newton, Mass.

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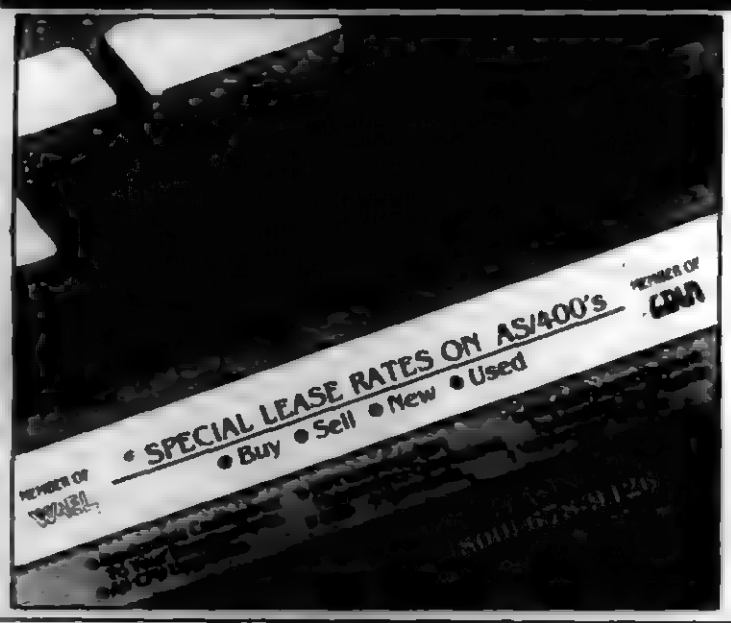
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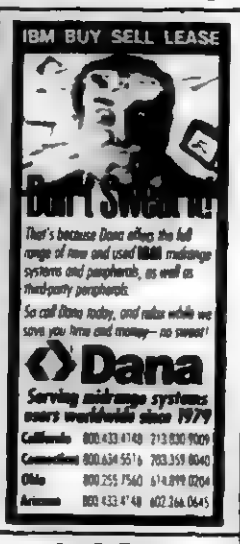
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The BoCoEx index on used computers
Closing prices report for the week ending April 12, 1991

	Closing price	Recent high	Recent low
IBM PC Model 178	$250	$450	$200
XT Model 089	$500	$550	$450
AT Model 099	$650	$775	$500
AT Model 239	$725	$925	$700
AT Model 339	$875	$1,000	$800
PS/2 Model 30-286	$1,100	$1,300	$1,000
PS/2 Model 60	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,200	$3,500	$3,000
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,350	$1,000
SLT 286	$2,250	$2,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$2,200	$2,300	$1,900
Deskpro 286	$800	$1,000	$700
Deskpro 386/20	$2,150	$3,000	$2,000
Apple Macintosh Plus	$750	$975	$700
SE	$1,125	$1,250	$1,100
II	$2,600	$2,800	$2,400
IICX	$3,300	$3,600	$3,200
IIFX	$5,900	$6,500	$5,900

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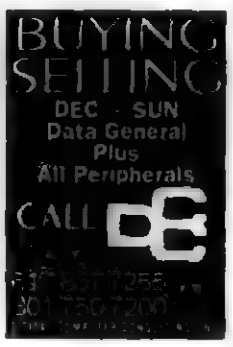
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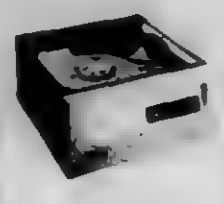
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Future looks a little brighter for CBT

BY MARK FRITZ
SPECIAL TO CW

Computer-based training (CBT), the self-instructional underdog that has never been able to outrun the traditional instructor-led pack, is starting to catch up — just a little bit.

Ironically, although CBT has been rejected because of its traditionally high start-up costs, the current economic downturn is providing a catalyst for its use by corporate information systems trainers. "CBT use is active, if not growing," says William Bramer, managing partner of change management research and development at Andersen Consulting.



Part of the reason is that when staff is cut, those left assume additional duties, which requires more training with fewer trainers, says Marc Silver, manager of self-instruction development at Unisys Corp.

CBT is also making a bigger dent in the training industry because more companies are recognizing that it helps trainers become more productive. For example, trainers can manage the training function by tracking student answers and scores, modules completed and so on. Often referred to as computer-managed instruction, this capability has long been a common advantage of mainframe-based CBT.

Now that personal computer networks have become more prevalent — often using a mainframe as a central file server — more trainers are discovering the advantages of mainframe management.

Also stirring the CBT pot is users' demand for faster training: Bramer says classroom training is too slow and unresponsive to change. "You could plan a workshop for three weeks from now, but by the time it rolls around, your information is dated," he says. The best way to keep up with changing information is to deliver instruction by machine, he adds.

In addition, CBT is a natural for embedded or concurrent training, says Eric Parks, president of Ask International, a custom-design training firm in Long Beach, Calif. "It's easy for people to see that the best way to teach software is with software," he says.

However, CBT has some negative images and problems that continue to stand in its way.

In the past, CBT was misunderstood, Parks says. It was seen as a "solve-all," which, he says, led to the misapplication of this powerful technology. Misapplication, in turn, resulted in black-sheep CBT programs that have given the whole field a bad name.

Using CBT with beginners has been one of the most flagrant misapplications. For example, an attempt to use CBT to teach Lotus Development Corp.'s 1-2-3 spreadsheet to beginners was a disaster, says Tori Coward, president of Tangent Computer Resources. When her company sent CBT disks to the students, many sent them back, saying 1-2-3 was too hard to learn.

"We later found out that these people hadn't even tried to use [1-2-3]; they hadn't gotten past the CBT lesson," she says.

The confusion surrounding development tools for CBT has also stunted the technology's growth. Trainers often find that an authoring system is either too complex to learn or too simple to do the job properly. Add to that the confusing assortment of products and the general lack of standards, and you start to understand why many training organizations have stuck to stand-up training techniques.

In addition, authoring tools are costly. Not only is the initial cost of most software high, but many vendors also tack on run-time licensing fees for any applications produced with these tools. Parks says the fees have inhibited the spread of CBT.

Further preventing CBT's early rise to stardom was the failure of interactive videodisc — a subset of CBT. Interactive videodisc still faces an uphill battle for acceptance, even though it was introduced 10 years ago.

Initially, interactive videodisc was to be the savior of CBT, combining the interactivity of CBT with the visual power of video to create a sort of super-CBT. Unfortunately, it was also overhyped and misapplied.

NOW THAT PERSONAL COMPUTER networks have become more prevalent — often using a mainframe as a central file server — more trainers are discovering the advantages of mainframe management functions.

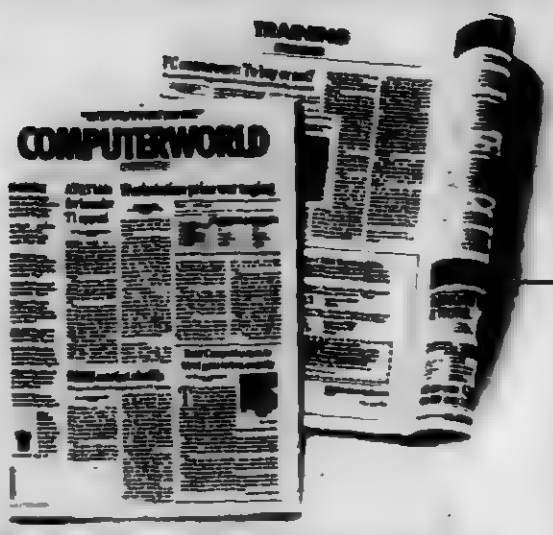
Trainers and users are not counting CBT out; instead, they're predicting a bright future for the beleaguered technology.

"Training is seen as a perk by most people. It gives them a chance to get away from their desks, go off-site, see their colleagues, get free coffee and doughnuts. They don't get those things with CBT," Parks says.

Fritz is a free-lance writer based in Dedham, Mass.

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INDUSTRY ALMANAC

ACE AND THE INVESTOR

Judging by stock movement among its members, the Advanced Computing Environment (ACE) consortium unveiled two weeks ago has piqued investor interest. From industry analysts, though, ACE has drawn but a skeptical nod.

During the week following the April 9 announcement, Digital Equipment Corp. and Microsoft Corp. — ACE's two largest members — each surged two points, closing Tuesday at 65 and 112¼, respectively. Several other members also advanced, including Silicon Graphics, Inc., which picked up 1½ points to 38¾.

However, now may not be the time to buy stock in ACE members if the decision is based purely on anticipated ACE accomplishments, brokerage analysts said. Mark Stahlman and Steve Eskenazi, analysts at Alex. Brown & Sons, Inc., said they do not expect ACE to dent the desktop computing market until late 1992 or 1993. Even then, the installed base and shipment rates of workstations from Sun Microsystems, Inc., Hewlett-Packard Co. and IBM "may present too large a barrier" for ACE to penetrate, they added.

For short-term investing, Stahlman and Eskenazi recommended Silicon Graphics, despite its third-quarter profit drop of 64% posted Thursday. They predicted the firm's expected introduction of an under-$10,000 workstation this fall to stir sales.

Sentiment varies for ACE leader Compaq Computer Corp. Alex. Brown rates it a gung-ho "buy," while UBS Securities, Inc. suggested holding Compaq stock, at least for now, because of uncertain near-term demand for personal computers. UBS analyst Marc Schulman said he is confident in Compaq's future, in part because of its involvement with ACE. He called Compaq "attractive on an intermediate-to-long-term basis."

Even though ACE members have agreed to build processors from Mips Computer Systems, Inc. into their hardware, Mips is now rated a "source of funds" by Stahlman and Eskenazi, who noted the company's current high stock valuation. Mips' long-term prospects look better, they said, because the consortium gives Mips "a shot at considerable business that otherwise would have defaulted to other contenders."

Meanwhile, Schulman said, DEC now hovers on the rim of what could be a profitable new market for it: desktop computers. Yet, he remained neutral on DEC shares in the short term because DEC has been hurt this year by battered demand for its VAX 9000.

Schulman added that new workstations from HP may bite into DEC's business. "It's 1992, not 1991, for DEC's renaissance," he said.

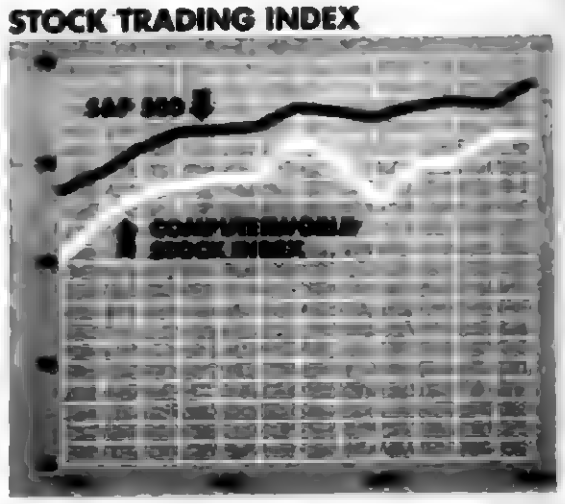
HP, which is not a member of the consortium, is rated a "buy," by Schulman. While ACE may become a problem for HP two years from now — when Schulman predicted the group will likely come into its own in the workstation market — "this year, HP's new machines will be more important than its exclusion from ACE," he said.

Sun, decidedly not an ACE partner, looks like a good buy to several Wall Street watchers. Richard Shaffer, editor of "Computer Letter," an industry newsletter, said Sun has a large lead in the workstation arena, a start so big that it may preclude ACE from being more than a "last-place entrant in the traditional workstation market."

Instead, the coalition should concentrate on high-performance distributed systems, according to Shaffer.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Disappointed with Apple Computer, Inc.'s second-quarter profits, investors knocked Apple shares back 10 points last week to close Thursday at 61. Other microcomputer makers also stumbled. Compaq Computer Corp. lost 3¾ points to 61¾, and Dell Computer Corp. slid 4½ points to 25¼.
- After posting better-than-anticipated earnings, Digital Equipment Corp. advanced 5⅛ points to 70⅝. IBM continued to lose after making official its weak first-quarter financials, dropping ⅝ of a point for the week to 109¾.
- Among software makers, Lotus Development Corp.'s reported 71% profit dip for the quarter did not stop its stock from jumping 1¾ points to 29½. Microsoft Corp. closed Thursday at 110, down one point.
- Seagate Technology, Inc. reported lower-than-expected profits; its stock then fell far and fast, tumbling 5⅛ points to 13¾. Storage Technology Corp. added 2¾ points to 40¼ as it reported steady earnings gains.

Computerworld Stock Trading Summary

CLOSING PRICES FRIDAY, APRIL 19, 1991

TOP PERCENT GAINERS

Tandon Corp.	30.89
Recognition Equipment	21.28
LSI Logic Corp	20.51
System Software Assoc.	18.31
Western Digital Corp.	17.95

TOP PERCENT LOSERS

Seagate Technology	-29.75
Boole & Babbage Inc.	-22.81
Dell Computer Corp.	-18.57
Apple Computer Inc.	-16.80
AST Research Inc.	-14.73

TOP DOLLAR GAINER

Digital Equipment Corp.	6.50
Autodesk Inc.	4.13
Storage Technology	3.75
System Software Assoc.	3.25
United Telecom	2.75

TOP DOLLAR LOSERS

Apple Computer Inc.	-12.13
Aldus Corp	-6.63
Seagate Technology	-5.88
Dell Computer Corp.	-5.50
Symantec Corp.	-5.25

Exch	52-Week High	52-Week Low		April 19 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 0.19%**			
OTC	18.00	5.38	3 COM Corp.	9.00	0.00	0.00
NYS	68.75	52.50	American Info Techs Corp.	65.00	-0.13	-0.19
NYS	44.13	29.00	AT&T	37.25	2.00	5.67
OTC	6.75	0.88	Ariel Communication Corp.	2.13	-0.13	-5.56
NYS	66.25	39.50	Bell Atlantic Corp.	48.63	-2.25	-4.42
NYS	57.63	49.00	Bellsouth Corp	51.63	-0.75	-1.43
NYS	41.63	13.13	Cabletron Systems	41.63	2.63	6.73
OTC	25.88	8.25	Compression Labs Inc.	19.88	-1.88	-8.62
NYS	41.25	23.38	Contel Corp	41.00	0.00	0.00
OTC	5.13	1.88	Data Switch Corp.	3.88	-0.25	-6.06
NYS	26.75	8.88	Digital Comm. Assoc.	20.63	0.63	3.13
OTC	25.25	12.25	Dynatech Corp.	21.00	-0.13	-0.59
OTC	12.88	5.50	Fibronics Int'l Inc.	9.25	-0.13	-1.33
OTC	4.00	1.75	Gandalf Technologies Inc.	3.38	-0.25	-6.90
NYS	4.50	1.63	General Datacomm Inds.	3.50	0.50	16.67
NYS	34.13	22.50	GTE Corp.	31.75	-0.50	-1.55
OTC	6.25	0.75	Intecom Systems Corp.	1.00	0.00	0.00
NYS	80.00	40.25	ITT Corp	59.88	1.63	2.84
OTC	44.13	17.88	MCI Communications Corp.	28.63	1.00	3.62
OTC	21.00	2.75	Microcom Inc.	5.50	-0.25	-4.35
NYS	16.38	4.00	Network Equipment Tech.	7.50	0.00	0.00
OTC	14.63	4.00	Network General	9.88	0.63	7.58
OTC	16.50	8.13	Network Systems Corp.	11.13	-1.38	-11.00
NYS	33.13	22.13	Northern Telecom Ltd.	32.88	0.25	0.77
OTC	68.50	17.25	Novell Inc.	53.00	-2.88	-5.15
NYS	69.50	57.00	Nynex Corp.	72.50	-0.50	-0.68
NYS	47.88	36.25	Pacific Telesis Group	41.25	-0.50	-1.20
ASE	15.38	4.75	Pairel Corp.	14.50	0.00	0.00
NYS	23.13	8.88	Scientific Atlanta Inc.	16.75	1.00	6.35
NYS	58.88	47.25	Southwestern Bell Corp.	54.00	1.00	1.89
NYS	46.38	20.63	United Telecom	26.00	2.75	11.83
NYS	40.75	32.38	US West Inc.	36.25	-0.88	-2.34
Computer Systems			**Off 0.65%**			
OTC	6.75	0.88	Alliant Computer Sys.	1.38	-0.13	-8.30
ASE	18.88	10.00	Amdahl Corp.	16.50	-0.38	-2.22
OTC	73.25	34.25	Apple Computer Inc.	59.63	-12.13	-16.90
OTC	13.88	4.25	Archive Corp.	8.63	0.25	2.99
OTC	32.75	7.50	AST Research Inc.	27.50	-4.75	-14.73
NYS	7.38	3.88	Bolt, Beranek & Newman	6.88	-0.13	-1.79
NYS	21.63	4.50	Commodore Int'l	18.50	-1.13	-5.75
NYS	74.25	36.50	Compaq Computer Corp.	60.63	-2.63	-4.15
OTC	2.13	0.13	Computer Automation Inc.	1.13	0.13	12.50
NYS	21.13	6.75	Control Data Corp.	13.00	0.63	5.05
NYS	20.88	8.38	Convex Computer	19.13	2.38	14.18
NYS	51.25	20.00	Cray Research Inc.	38.50	0.88	2.33
NYS	15.50	3.50	Data General Corp.	15.50	0.13	0.81
NYS	3.25	0.75	Datapoint Corp.	1.75	-0.25	-12.50
OTC	30.63	8.25	Dell Computer Corp.	24.13	-5.50	-18.57
NYS	95.13	46.50	Digital Equipment Corp.	71.63	6.50	9.98
NYS	38.13	13.75	Harris Corp.	28.50	0.75	2.91
NYS	53.00	24.88	Hewlett Packard Co.	53.00	1.38	2.68
NYS	130.75	86.25	IBM	109.50	1.13	1.04
OTC	14.00	7.75	Information Int'l	8.13	0.13	1.56
OTC	28.75	10.50	Intergraph	28.75	-0.75	-2.54
NYS	3.00	0.50	MAI Systems Corp.	0.75	0.00	0.00
NYS	149.75	114.00	Matsushita Electronics	126.25	-2.50	-1.94
OTC	26.00	9.00	Mentor Graphics Corp.	17.00	-0.38	-2.16
NYS	100.50	44.50	NCR Corp.	68.75	-0.25	-0.25
OTC	35.50	11.00	Pyramid Technology	26.75	-0.50	-1.83
OTC	24.00	9.75	Sequent Computer Sys.	18.50	2.00	12.12
NYS	47.25	18.00	Silicon Graphics	38.38	0.50	1.32
NYS	36.50	14.63	Stratus Computer Inc.	36.50	0.63	1.74
OTC	37.25	15.00	Sun Microsystems Inc.	24.13	-1.00	-2.85
NYS	29.88	8.88	Tandem Computers Inc.	15.63	1.13	7.76
NYS	39.50	23.50	Tandy Corp.	35.38	0.63	1.80
OTC	32.00	8.75	Teradata	20.13	1.13	5.92
NYS	7.88	1.38	Ultimate Corp.	4.75	-0.13	-2.56
NYS	15.88	1.75	Unisys Corp.	4.88	-0.25	-4.88
ASE	5.75	2.00	Wang Labs Inc. (b)	3.75	-0.38	-9.25
Software & DP Services			**Off 0.09%**			
OTC	60.25	17.00	Adobe Systems Inc.	57.00	-6.00	-9.05
OTC	59.88	18.75	Aldus Corp	50.13	-6.63	-11.67
OTC	28.75	12.00	American Mgmt. Systems	26.00	-0.50	-1.89
OTC	18.25	7.50	American Software Inc.	11.25	0.25	2.27
NYS	4.63	1.38	Anacomp Inc.	3.63	-0.25	-6.45
OTC	23.50	10.00	Analysts Int'l	18.75	0.50	3.39
OTC	13.25	4.88	Ashton Tate	8.75	-0.38	-2.80
OTC	10.25	4.00	ASK Computer Sys.	8.63	1.13	15.00
NYS	70.00	46.25	Auto Data Processing	70.00	1.75	2.56
OTC	60.25	32.00	Autodesk Inc.	54.00	4.13	7.86
OTC	31.50	13.50	BGS Systems Inc.	28.50	1.25	4.59
OTC	43.88	17.75	BMC Software Inc.	40.75	1.00	2.52
OTC	21.50	11.00	Boole & Babbage Inc.	11.00	-3.25	-22.81
OTC	62.25	14.00	Borland Int'l	58.50	-3.00	-4.88
NYS	9.75	0.88	Businessland Inc.	1.88	-0.13	-6.25
OTC	19.63	5.13	Cognos Inc.	10.50	0.50	2.63
NYS	16.88	4.38	Computer Associates	8.88	-0.38	-4.05
OTC	17.75	10.75	Computer Horizons	13.25	-1.00	-7.02
NYS	71.50	38.75	Computer Sciences	70.63	0.13	0.18
NYS	11.75	6.63	Computer Task Group	10.38	-0.13	-1.19
OTC	25.25	13.00	Comshare Inc.	18.88	-0.13	-0.66
OTC	16.00	3.75	Corporate Software	12.38	1.38	12.50
NYS	47.88	27.88	General Motors E (EDS)	48.25	0.25	0.54
OTC	18.75	7.25	Geac Systems Int'l	15.75	1.25	8.62
OTC	5.75	1.88	Hogan Systems Inc.	4.63	-0.50	-9.76
OTC	19.75	7.75	Information Resources	18.50	-0.38	-1.99
OTC	17.50	2.88	Informix Corp.	7.00	-0.50	-6.67
OTC	7.88	1.38	Intelicorp Inc.	2.13	-0.13	-5.56
OTC	8.00	2.50	Interleaf Inc.	7.50	0.25	3.45
OTC	41.75	10.00	Knowledgeware Inc.	40.00	0.25	0.63
OTC	45.00	16.75	Legent Corp.	39.00	-0.13	-0.35
OTC	39.25	12.50	Lotus Development	29.88	0.88	3.13
OTC	32.00	13.63	Micrografx	19.75	-1.75	-8.14
OTC	116.75	60.75	Microsoft Corp.	107.25	0.00	0.00
NYS	10.50	4.00	On Line Software Int'l	9.63	0.63	6.94
OTC	24.00	4.88	Oracle Systems	10.38	-0.63	-5.68
NYS	14.63	7.00	Pansophic Systems	12.13	0.00	0.00
OTC	9.25	1.25	Phoenix Technologies	8.63	0.00	0.00
NYS	52.00	31.63	Policy Management Sys.	47.63	-1.38	-2.81
NYS	23.63	11.50	Reynolds & Reynolds	21.38	0.75	3.64
OTC	16.13	6.88	Sage Software Inc.	10.50	1.00	10.53
OTC	25.50	14.75	SEI Corp.	24.00	0.00	0.00
OTC	21.00	12.25	Shared Medical Systems	21.00	1.63	8.39
OTC	35.25	12.00	Software Publishing Corp.	19.75	-1.25	-5.95
NYS	14.50	5.50	Sterling Software	14.13	0.25	1.80
OTC	26.00	9.50	Sungard Data Sys.	18.75	1.00	5.35
OTC	65.88	17.75	Symantec Corp.	45.50	-5.25	-10.34
NYS	24.50	4.88	System Center Inc.	7.75	0.38	5.08
OTC	37.25	12.75	System Software Assoc.	21.88	3.25	18.31
OTC	27.38	4.75	Wang	15.50	-0.13	-0.80
Semiconductors			**Up 2.43%**			
NYS	13.88	3.63	Advanced Micro Devices	13.88	0.25	1.83
NYS	11.88	8.50	Analog Devices Inc.	11.75	0.63	5.62
OTC	21.75	5.25	Chips & Technologies	10.25	-0.25	-2.38
OTC	54.38	28.00	Intel Corp.	52.88	-1.38	-2.53
NYS	13.00	5.13	LSI Logic Corp.	11.75	2.00	20.51
NYS	18.25	8.75	Micron Technology	17.75	-0.25	-1.39
OTC	23.25	7.25	MIPS Computer Systems	18.50	-1.63	-8.07
NYS	68.38	45.75	Motorola Inc.	60.00	1.75	2.77
NYS	8.63	3.00	National Semiconductor	7.88	-0.13	-1.56
NYS	48.00	22.50	Texas Instruments	42.63	-3.25	-7.08
OTC	12.25	3.00	VLSI Technology	11.38	0.38	3.45
ASE	14.88	4.00	Western Digital Corp.	5.75	0.88	17.98
Peripherals & Subsystems			**Up 0.63%**			
OTC	2.63	0.88	Aperture Technologies	2.50	-0.06	-2.43
OTC	24.00	7.50	Benchtec Inc.	13.00	1.25	10.64
OTC	17.50	4.25	Cambex Corp.	15.00	-0.25	-1.64
ASE	11.75	4.13	Cognitronics Corp.	10.25	-1.25	-10.87
NYS	31.25	14.63	Conner Peripherals	27.25	1.00	3.81
ASE	22.00	7.00	Datarem Corp.	10.63	-0.63	-1.16
NYS	12.25	4.25	EMC Corp.	11.63	-0.25	-2.11
NYS	47.25	33.75	Eastman Kodak Co.	43.38	1.88	4.52
OTC	11.25	4.75	Emulex Corp.	9.50	-1.13	-10.59
OTC	34.50	14.00	Evans & Sutherland	21.00	1.00	5.00
OTC	8.50	3.75	Exabyte Corp.	5.63	-0.06	-1.11
OTC	28.25	8.75	IPL Systems Inc.	23.50	0.25	1.08
OTC	1.63	0.13	Maxstor Systems	1.00	-0.03	-3.01
OTC	17.00	2.63	Maxtor Corp.	5.13	-0.38	-6.82
OTC	18.00	4.38	Micropolis Corp.	15.50	-2.25	-12.68
NYS	93.75	73.63	3M Corp.	87.75	-0.75	-0.85
OTC	14.50	8.00	Printronix Inc.	9.25	-0.25	-2.63
NYS	34.25	8.50	QMS Inc.	34.25	0.63	2.66
OTC	27.25	12.38	Quantum Corp.	25.75	-0.13	-0.48
NYS	7.13	4.38	Recognition Equipment	7.13	1.25	21.28
OTC	10.88	4.00	Reserch Inc.	10.88	1.00	10.13
OTC	19.88	5.88	Seagate Technology	13.88	-5.88	-29.75
NYS	41.38	11.00	Storage Technology	41.38	3.75	9.97
OTC	4.50	1.25	Tandon Corp.	4.50	1.06	30.89
NYS	25.88	11.63	Tektronix Inc.	25.88	0.25	0.98
OTC	0.63	0.16	Televideo Systems	0.38	0.00	0.00
NYS	39.63	29.00	Xerox Corp.	38.88	1.63	2.80
Leasing Companies			**Up 0.64%**			
OTC	19.25	5.88	Amplicon Inc.	15.00	0.00	0.00
NYS	28.38	14.63	Comdisco Inc.	27.25	-0.13	-0.46
OTC	16.25	9.25	LDI Corporation	14.25	0.50	3.64
OTC	5.75	2.25	Salestarm Inc.	3.75	0.00	0.00

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Banks

FROM PAGE 1

banks are guarding their territories by planning innovations such as credit/debit cards. Offerings such as these demand that IS be inextricably linked to business strategy.

"It puts a large burden on the technology to bring together deposit and credit information," said Robert Spicer, chief information officer at Chevy Chase Federal Savings in Chevy Chase, Md. "The platforms for deposit and credit have been independently developed, but now they'll have to be networked."

New competition "just exacerbates the problems in an industry that already has too much capacity," said Brian Phillips, executive vice president of technical services at Norwest Corp. in Minneapolis. "Isn't it interesting how many people want to get into this business, despite all the current financial problems? It's viewed as a very lucrative long-term business."

Norwest hopes to fight back with IS-improved customer service. It is currently piloting a personal computer-based system that will allow branch employees to compare multiple bank products simultaneously on the desktop. "We're moving from branch automation to sales assistance," Phillips said.

Another look

More than ever, bank executives said they want to see an IS dollar returned in market share, new customers or new fee-based services.

"We have had to re-evaluate the cost/value relationship of IS," said Michael Packer, vice president of technology strategic planning at Bankers Trust Corp. in New York. "We're still spending heavily in areas where we feel we can make money."

Many banks are now moving to correct the excesses of the 1980s, when deregulation and the global economic boom sparked a giddy expansion mentality that resulted in a hodgepodge of incompatible systems at many banks. Bank of Boston, for example, had no fewer than 11 hardware platforms and 55 databases, which it is now trying to streamline in a five-year IS architecture plan [CW, Dec. 10, 1990].

Like Bank of Boston, The Chase Manhattan Bank NA in New York suffered a huge loss ($334 million) last year. Chase's actions are typical of the way in which many large banks have reacted to the current adversity; it is not slashing IS but, rather, spending selectively.

"Like all other areas of the bank, we need to save money and get things done sooner," said Elaine Bond, executive vice president of corporate systems. "Sometimes this means adding systems; sometimes it means taking them away." Chase has cut back its European operations, for example, while spending more on new applications in its credit-card business.

As the loan side of the banking business has soured, banks are looking to squeeze profits out of other areas — and they are looking to IS to help identify those areas. Systems that can do so are being spared the budget ax.

Substantial savings

PNC Financial Corp. in Pittsburgh, the nation's 14th largest bank, said it has such an application: Internal Management Profitability Reporting (IMPR). Co-developed with Hogan Systems, Inc. at a $5.5 million cost to PNC Financial, IMPR allows executives to analyze profitability by products, even very small ones. PNC Financial recently sold its Louisville, Ky.-based lockbox operations after IMPR helped show financial analysts that it was costing as much as it was bringing in.

PNC Financial lost $168 million in the fourth quarter and is scaling back or deferring projects in other areas, but it is hiring 30 people to use and update IMPR. "It was never in jeopardy," said William J. Johns, comptroller at the firm.

While spending continues in strategic areas, finding fat to cut is far from easy. Many systems, even if outmoded and expensive to maintain, have become so essential to the business that they are sacred. Banks can hold firm on capital expenditures (see chart at left), but many are finding that data center consolidations and outsourcing are the only ways to save significant amounts of money.

"Most of the people are maintaining code, operating the data center or monitoring telecommunications," said Diogo Teixeira, a partner at Ernst & Young's Information Technology Center in Boston. "It's very hard to find sizable cutbacks in IS."

Feeling the pinch

One area feeling the pinch is the hired guns of programming and consulting. Republic National Bank in New York has cut its use of outside consultants by an estimated 80% to 85% in the past two years but has not laid off any full-time employees.

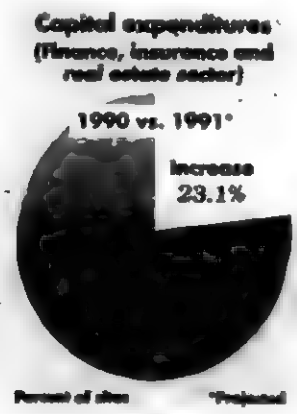
"If you're adequately staffed and don't have twice as many people as you need, there's not a lot you can do," said Ray Tamayo, senior vice president. "Very little is discretionary."

With some exceptions, the leading banks realize that IS has long since passed the point of being a back-office, overhead function ripe for major cuts in tough times. Spending on technology for technology's sake is a luxury most banks can ill afford, but funding for strategic areas remains available — and necessary.

"I get frustrated with the notion that systems is in a class by itself," Bond said. "We're talking about the guts of the bank here. I wouldn't look for any dramatic changes."

Hold that line

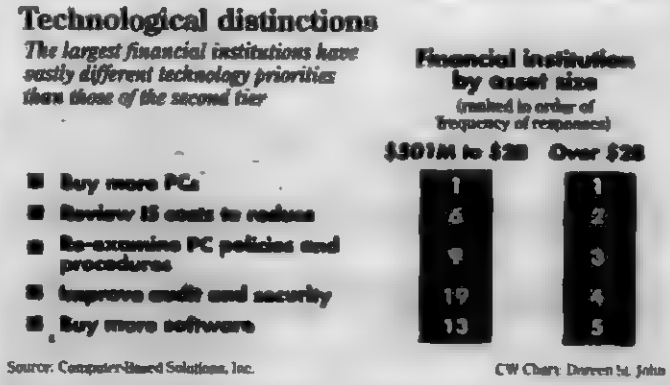
More than 75% of firms in the finance/insurance/real estate sector are keeping 1991 capital expenditures at or below 1990 levels



Source: The Dun & Bradstreet Corp.
CW Chart: Doreen St. John

Technological distinctions

The largest financial institutions have vastly different technology priorities than those of the second tier



Source: Computer-Based Solutions, Inc.
CW Chart: Doreen St. John

> "ISN'T IT INTERESTING how many people want to get into this business, despite all the current financial problems? It's viewed as a very lucrative long-term business."
>
> BRIAN PHILLIPS
> NORWEST

Money $avers

Two actions that can save big IS dollars in the recession-plagued banking industry are consolidating data centers and outsourcing.

Manufacturers Hanover Trust Co. in New York, for example, is in the process of whittling a set of eight data centers down to two. The bank has invested in two IBM Enterprise System/9000s in hopes of eventually saving $20 million to $30 million per year on operations.

Bankamerica Corp. recently closed its Hong Kong data center and combined overseas operations in London. It is currently considering further consolidations among five U.S. centers.

Other notable consolidators include First Interstate Bancorp in Los Angeles, which is combining five data centers into two, and Fleet/Norstar Financial Group, Inc. in Providence, R.I.

The outsourcing option has proven particularly appealing to banks experiencing financial difficulty. Not every bank that chooses to outsource IS is operating in the red, but many are. Of the nation's top 100 banks, seven that lost money in 1990 have farmed out IS operations:

- Southeast Banking Corp. in Miami lost $199 million; has outsourced to IBM.
- First City Bancorp. of Texas in Houston lost $158 million; has outsourced to Electronic Data Systems Corp. (EDS).
- First American Bankshares, Inc. in Washington, D.C., lost $142.3 million; has outsourced to Perot Systems, Inc.
- Riggs National Corp. in Washington, D.C., lost $57 million; has outsourced to IBM.
- Hibernia Corp. in New Orleans lost $11 million; has outsourced to IBM.
- First Fidelity Bancorp. in Newark, N.J., lost $6 million; has outsourced to EDS.
- Bank South NA in Atlanta lost $4 million; has outsourced to IBM.

No more turmoil?

Turmoil is nothing new to Bankamerica Corp.'s IS organization.

The nation's second largest bank is now led by its fourth IS chief since the mid-1980s, with the alumni club including high-profile Max Hopper at AMR Corp. and Michael Simmons at Bank of Boston. Bankamerica, based in Concord, Calif., still prefers that its executives not respond to questions about its past CIO turnover.

Compared with many of its brethren on the East Coast and elsewhere, however, Bankamerica may now have one of the most stable IS organizations. It has resolved a longtime centralized vs. decentralized debate by bifurcating IS into two "towers" supporting the retail and wholesale sides of the bank. Meanwhile, the bank has been profitable for two [redacted].

Still, now is no time to become complacent. "There is less certainty about revenue than at any other time in the past," said Martin Stein, who left Paine Webber, Inc. to become executive vice president and head of Bankamerica Systems Engineering (Base) last year. "Cutting costs is one of the bank's six major objectives for 1991, and Base is clearly a big contributor to cost," Stein said.

The $110 billion bank is hunting for savings in many different corners. In addition to consolidating data centers (see story bottom left), Bankamerica expects to save an estimated $750,000 per year by "insourcing" management of its California Data Network, formerly done by AT&T. "Given our size, we can find economies of scale inside the bank," said Senior Vice President Peter Hill.

As far as high-risk tenure at the top is concerned, [redacted] remains confident. "What might have been a death wish three years ago is now a very viable situation," Stein said. "At Paine Webber, I had eight predecessors in five years, so I might argue my risk is diminished."

CLINTON WILDER

NEWS SHORTS

NEC to resell Stratus gear

NEC Corp. entered the on-line transaction processing arena last week by announcing it will resell Stratus Computer, Inc.'s new reduced instruction set computing-based system under its own label as NEC Super Tolerant FT20. Stratus' XA/R Model 20, released last month and scheduled for shipment at year's end, is the industry's first fault-tolerant machine with a dual operating system, running either AT&T's Unix System V Release 4 or VOS, Stratus' proprietary operating system.

Slim pickings for IBM laptop buyers

IBM's new laptop computer is in tight supply. IBM claims the product, the Personal System/2 L40 SX, has been the firm's best-received personal computer ever. IBM said it has already received orders for 80% of what it expected to sell all year. But some dealers are unhappy. "I haven't seen one yet. It's ridiculous," said Matt Fitzsimmons, a Computerland Corp. dealership owner in White Plains, N.Y. A Valcom, Inc. dealership in Wichita, Kan., received only one IBM laptop out of an order for 10. "It's no more frustrating than it was waiting for the Compaq [Computer Corp.] LTE. I'm getting used to it," Valcom representative Tom Hudspeth said.

Index/Sage merger brings charge

Intersolv, Inc., the Rockville, Md.-based software development tool firm, announced a onetime charge against earnings for the fourth quarter, ending April 30. The roughly $20 million charge resulted from activities relating to the creation of Intersolv, which resulted from a merger of Sage Software, Inc. and Index Technology Corp. The amount included charges relating to a work force reduction of about 150 employees.

Spectrum net manager ships

Cabletron Systems, Inc.'s artificial intelligence-based Spectrum enterprise network management system formally started shipping last week. Spectrum gives users a central graphical representation of a multivendor network from several perspectives that can be as deep and broad as the user chooses. The vendor said it hopes to sell 100 Spectrum licenses in the next 12 months and added that it has the resources to install three Spectrum sites per week. Cabletron said it added 35 support staff members for Spectrum within the last six months. The firm also announced a 72% increase over last year in worldwide sales for its fiscal year ended Feb. 28. Sales totaled $180.5 million, while profits grew 61% to $35.9 million.

Pyramid adds high-end system

Nearly doubling the power of its Unix mainframe systems — to a claimed high end of 300 million instructions per second (MIPS), up from 168 MIPS — Pyramid Technology Corp. introduced its Mieserver S series last week. The S series begins at $93,000 and could top out at about $3.5 million, according to a spokesman.

DEC flies Delta

Digital Equipment Corp. last week announced a $4.6 million contract with Delta Air Lines to provide systems and services for automating the production and publication of aircraft maintenance information. Delta's Technical Operations Publishing System — the first on-line maintenance information system in the airline industry — will be based on VAX/VMS systems.

Knowledgeware fills out OS/2 line

Knowledgeware, Inc. has added two products to its line of OS/2-based computer-aided software engineering tools, seeking to pump up applications development for the struggling software platform. A rapid-application package reportedly gathers end-user business requirements during the analysis phase of development, reflects them in an operational prototype and automatically generates code. A documentation tool that integrates with the software development package keeps applications documentation up to date, the company said.

Wang to enhance imaging connections

BY ELLIS BOOKER
CW STAFF

LOWELL, Mass. — Seeking to increase the appeal of its imaging software to users of other computer platforms, Wang Laboratories, Inc. last week expanded its connectivity options for the IBM mainframe and Apple Computer, Inc. Macintosh worlds.

Analysts welcomed Wang's move away from proprietary imaging based solely on its own VS minicomputer architecture.

"[Wang] is exceedingly pragmatic from a market viewpoint," said Mike Howard, program director of office information systems at Gartner Group, Inc. in Stamford, Conn. The company, he said, has "looked itself in the mirror" and realized it has to be a solutions provider using the hardware and software of others when necessary.

The mainframe software, Open/Image IMS/DC, allows applications running on IBM and compatible hosts to control Wang image processing, either on a Wang image server or a local-area network server.

The LAN product, Open/Image 3270 Windows, works on IBM's Systems Network Architecture networks and allows mainframe applications to access Wang imaging services on a personal computer network. The network image servers can run on standard PC LAN operating systems from Banyan Systems, Inc., Novell, Inc. and 3Com Corp.

Open/Image 3270 Windows works with both the newly introduced IMS/DC product and Open/Image CICS. Wang previously introduced the latter, which integrates Wang imaging services with IBM CICS applications.



Open/Image IMS/DC and Open/Image 3270 Windows are both scheduled to be available in June. The IMS/DC product will be priced at $25,000, and the PC LAN offering, configured with 20 users, an image server, an optical jukebox and LAN and imaging software, will cost $320,580 ($16,029 per client), according to Wang. Wang also vowed to bring forth support for other mainframe operating systems — specifically, MVS/ESA and DOS/VSE — but did not give a timetable.

For Macintosh users, Wang announced Macvs Image workstation software, which enables either stand-alone or networked Macintoshes to connect with Wang VS image servers. Users can also mix Macintoshes and IBM Personal Computer AT-compatible systems over a network with the new software, which is scheduled to be available in May, Wang said.

Wang is offering two pieces of workstation software for the Macintosh. One, priced at $350 per client, allows Macintosh clients to access VS data applications. Another, at $1,500 per client, gives Macintoshes access to integrated data and image applications on the VS. Users will also need $750-per-server Macvs 802.3 LAN software to link Macintoshes and VS hosts. The LAN software provides native Appletalk capabilities to VS servers, and Macintoshes can be connected directly via an Ethernet option board or over a Localtalk network, which is connected to the LAN and server over a router.

Not unexpectedly, Wang said the next release of its PC software, due in June, would support Microsoft Corp.'s Windows 3.0.

Moving up to Windows 3.0 is of interest to Nick Gismondi, manager of uniform systems at U.S. Steel Corp. in Pittsburgh. But Gismondi says he believes the Windows 3.0 version will execute faster than his current Wang WIIS Windows system, which has a response time of about two seconds.

NCR bids

FROM PAGE 1

other magnetic and optical media.

NCR is clearly hoping to garner a piece of an exploding market. North American revenue from imaging systems grew from $172 million in 1988 to $911 million in 1990, according to BIS Strategic Decisions, a research firm in Norwell, Mass. That figure could climb to $12.6 billion by 1995, BIS said.

Potential customers examining the NCR offering last week were particularly interested in how well DMS would fit into their existing systems.

Ray Tamayo, senior vice president at Republic National Bank in New York, said he was at the NCR announcement because "we're looking at putting in an imaging pilot in the third quarter. We've not narrowed it down to a vendor yet." He said his "main question" was how well DMS integrates into his company's computing environment, which includes Digital Equipment Corp. and IBM computers.

Barbara Rigsby, manager of office automation at Westinghouse Corp.'s commercial division in Baltimore, said her company is also looking to install an imaging system. Although Westinghouse has not yet selected a vendor, Rigsby said one allure of the NCR system is that it is based on "open standards."

DMS includes scanners, high-resolution displays, servers, workstations, optical storage devices and laser printers. Prices range from approximately $800,000 for a 20-workstation system to $3.5 million for a 120-workstation system. In addition, NCR will sell the software components separately so users can image-enable their existing workstations and servers.

NCR's System 3000 Unix computers act as servers in the imaging network, with MS-DOS personal computers as the front end. Clients and servers are connected via Ethernet or Token Ring local-area networks.

Looking to Windows

Other features include terminal emulation to IBM mainframes and DEC computers as well as a data-compression scheme that allows imaging information to take up less bandwidth than would otherwise be required. NCR is also providing applications development tools based on Microsoft Corp.'s Windows.

The system is scheduled for general availability in October. Manufacturers Hanover Trust Co. in New York has ordered DMS and will install it later this year, NCR executives said.

In the meantime, analysts said they are impressed with DMS. "NCR has gone a long way toward solving some of the nitty-gritty problems of imaging," said Thomas Nolle, president of CIMI Corp., a technology assessment consulting firm in Voorhees, N.J.

"They've paid particular attention to how you substitute electronic distribution for manual routing of documents. It's the greatest strength of the system," he added.

Nolle also said that, unlike imaging systems from Unisys Corp. and other players, NCR's system is based on a single architecture. "It's enough of a challenge to bring imaging into an organization without having to worry about integrating the imaging systems as well."

Bruce Silver, director of image management systems at BIS, said, "I'm favorably impressed that they've done a number of things right." In particular, he said, NCR's implementation of character recognition sets the system apart from others on the market.

Comten users not worried

Say AT&T buyout might even strengthen NCR's communications unit

BY GARY H. ANTHES
CW STAFF

BALTIMORE — Users of NCR Corp.'s Comten networking products seem resigned to soon becoming customers of AT&T, most saying the controversial buyout would either strengthen Comten or have no effect on it.

But a few users attending the Comten Users' Exchange here last week worried that AT&T might spin off or sell the communications products unit, leaving product maintenance and enhancement in question.

"Most users see it as a done deal," said Ronald Block, president of the user group and a vice president at New York-based Donovan Data Systems, Inc. "And they view it positively. AT&T is a huge organization and a big user of Comten equipment. They know the children."

One Comten user at the U.S. Department of Health and Human Services said NCR's absorption by AT&T would make no difference to the agency, but a colleague disagreed. "The financial backing and the networking expertise of AT&T will help Comten. Both companies will benefit," he said.

John Ostrowski, a programmer at the Internal Revenue Service's Martinsburg, W. Va., computer center, said he was "not too worried." He said the IRS is moving toward open systems as part of its massive computer systems modernization, and that will offer alternatives to the proprietary Comten Systems Network Architecture (SNA) equipment now in use by the agency.

Fear of sale

An official at the National Aeronautics and Space Administration, which has much Comten gear, was troubled by the possibility that AT&T might sell NCR's Comten unit or just let it atrophy. "I don't see how Comten fits into AT&T's Unix strategy," he said.

Neither AT&T nor NCR would comment directly on Comten's future under an AT&T umbrella. "Until we've been able to sit down with NCR management and work out a transition plan, it's pure speculation," an AT&T spokesman said.

However, he pointed to a Dec. 2 letter in which AT&T Chairman Robert E. Allen told NCR Chairman and Chief Executive Officer Charles E. Exley Jr. that Allen intended to put AT&T's computer business and NCR's businesses under NCR management. Allen also pledged to "maintain uninterrupted relationships with NCR employees, customers and suppliers," and he said, "it is not our intention that any NCR facilities will be closed."

Last year, NCR's Comten unit sold $113 million in communications processors and other software and hardware for SNA, Transmission Control Protocol/Internet Protocol and Open Systems Interconnect networks. Comten was bought by NCR in 1979 but was operated at arm's length until recently. In January, the sales and customer service groups of NCR and Comten were combined.

Frank Deubeck, president of Washington, D.C.-based Communications Network Architects, Inc., said one faction at AT&T favors holding on to Comten while another wants to get rid of it after the buyout is completed. But he said now that Comten and NCR have become more closely integrated, selling Comten would not be easy. He predicted AT&T would retain the Comten product line and that Comten users will be affected "not one iota" by the merger.

Allen: We need NCR but won't pay $110 a share

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — Calling himself "a very patient person," Robert E. Allen, chairman of AT&T, said last week that netting NCR Corp. was essential to AT&T's future growth. However, he told reporters that AT&T would not pay the $110-per-share, or $7.4 billion, asking price set by Charles E. Exley Jr., NCR's chairman and chief executive officer.

Allen's patience may be paying off. Exley prepared to remove the word "chairman" from his business card, after preliminary results of the shareholders' vote from NCR's annual meeting showed that he and three other NCR board members, including NCR President Gilbert Williamson, had been voted off the board. A special vote to oust the entire board fell far short, with only 52% of the needed 80% voting for it. The results are expected to be certified sometime this week.

The flat statement that AT&T will not up its bid for NCR — AT&T has offered as much as $100 per share for a friendly merger — did little to cool NCR's rocketing stock price. Analysts said arbitrageurs are betting that a rise in AT&T stock, now trading at more than $38 per share, will allow the company to renew a virtual three-for-one stock swap deal it had offered months before when AT&T stock traded near 30.

The record high hit by the Dow Jones Industrial Average last week "increases the odds we will see more money for NCR," said Charles Neuhauser, an analyst at Legg Mason Wood Walker, Inc. in Baltimore. "AT&T stock is up to the extent it should make it more palatable for them to offer a higher dollar value."

Allen made his remarks at AT&T's annual meeting, where the company announced a 6.6% increase in first-quarter profits — $712 million on $9.19 billion in sales, up from $668 million on $8.9 billion in sales one year ago.

Earlier in the week, NCR announced better than expected results for the first quarter. NCR had record revenue of $1.37 billion, although profits slipped to $46 million. NCR claimed that profits would have risen 4% if it were not for costs related to fighting AT&T's takeover attempt.

AT&T laptop turns heads, but it's a jungle out there

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — Today's laptop computer announcement from Safari Systems, the joint venture between AT&T Computer Systems Division and Marubeni America Corp., will turn heads, if not open corporate wallets.

The Safari laptop, based on Intel Corp.'s 80386SX chip, is distinctively styled. AT&T and Henry Dreyfuss Associates, a design firm based here, developed a black matte case with a gray ridged "bumper" around the outside seam and a similarly styled handle. Attendees at last week's Laptop-Palmtop Expo '91 here crowded around a Safari and generally seemed impressed with its design and features. However, they were a little put off by its $5,399 price tag.

"What differentiates it is its software and its connectivity features," said Tim Bajarin, executive vice president at Creative Strategies International, Inc. in Santa Clara, Calif.

The most distinctive features are communications-oriented. AT&T has included a 2,400 bit/sec. internal fax/modem and a beta-test version of AT&T Mail Access Plus 2.2, a front-end to AT&T's Easy Link; the company said registered buyers will receive the finished version at a later date. Wireless messaging is possible with an option called the Wireless Mailbox, and in the third quarter, a 9.6K bit/sec. internal fax/modem will be available. Another option will include a local-area network adapter from Xircom, Inc.

At 9½ by 12 by 1½ inches, the machine fits in a briefcase, and its full-size, 82-key keyboard has a better feel than many of its counterparts, although it is somewhat spongy. The 10-in., IBM Video Graphics Array-compatible super-twisted display features electroluminescent backlighting.

Safari weighs 7 pounds, 2 ounces, or 7 pounds, 5 ounces with the handle. It has two built-in RJ11 phone jacks and two cables — one to hook to a phone and one to hook to a wall jack.

It also features a system window, visible with the laptop closed or open, that uses icons to display the power source, indicate if batteries are low or whether automatic power management is in use and more.

When used with all its power management features, Safari's double nickel-cadmium batteries provide between four and six hours of battery life. Safari can be used with a single battery, and a third battery can be added, extending life to as long as nine hours. However, AT&T warns that Borland International, Inc.'s Paradox Version 3.5 database, Quarterdeck Office Systems, Inc.'s Desqview 386 Version 2.3 with QEMM Version 5.1 and Microsoft Corp.'s DOS 4.01 EMM 386.sys applications behave improperly if full power management is on.

What remains to be seen is whether distinctive styling and better-than-average SX notebook features can overcome a relatively high price tag, AT&T's weak reputation in the personal computer field and the ferocious competition in the SX notebook PC market. But at least one analyst predicts Safari will survive.

Matsushita Electric Industries Co. will manufacture the Safari products, which began shipping last week, at its plant in Franklin Park, Ill. Resellers include Microage, Inc., Sears Business Centers, Computer Bay, Claretech Business Centers, Inc. and Arrow Electronics, Inc.

On Safari

AT&T's laptop has a bundle of features – and a premium price

▶ **Processor: Intel Corp. 20-MHz 80386SX**
Size: 9.5 by 12 by 1.5 in.
Weight: 7 pounds, 2 ounces without handle
Display: 10-in., Video Graphics Array-compatible backlit, super-twisted screen
Memory/Storage: 2M bytes of RAM, expandable to 6M bytes; 40M-byte hard disk, upgradable to 80M bytes
Communications: internal 2,400 bit/sec. fax/modem
Bundled software: Microsoft Corp.'s Windows 3.0, AT&T MS-DOS 4.01 Revision 1.1, Microsoft's Productivity Package, Safari Systems Tourguide and Safari Utilities (modem diagnostics, temporary reconfiguration of system and password keyboard)
Price: $5,399

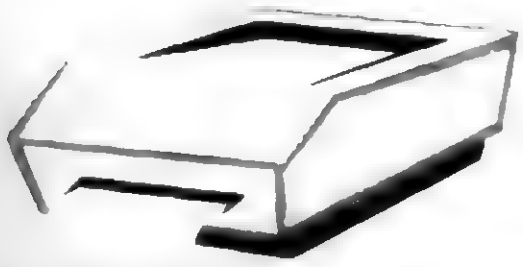
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TRENDS



Image Management Systems



The imaging market continues to gain momentum as many early adopters move from pilot systems to full production systems

System placements by industry

The early adopter, financial services continues to lead in both revenue and system placements

(North American sites)	1990	1991*	1992*	1993*
Services	280	376	908	1,666
Financial	352	450	1,029	1,790
Manufacturing	306	395	912	1,602
Government	338	437	1,004	1,760
Health	81	104	241	423

Revenue by system size

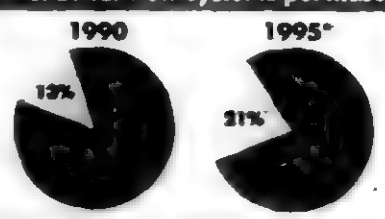
(In millions)	1990	1991*	1992*	1993*
Sub-work group	$57	$72	$165	$290
Work group	$229	$287	$602	$1,013
Departmental	$375	$469	$972	$1,618
Multidepartmental	$198	$315	$589	$1,079
Enterprise	$52	$77	$121	$188

Revenue figures include hardware, software and service revenue for new system placements; sales of add-on equipment; and support and maintenance costs

Sub-work group and work group systems dominate the market in units, but systems serving a single department with 15 to 50 workstations lead in revenue

Percent of total revenues for new systems purchased

Over the next five years, software is expected to represent an increasing percentage of the total revenues for new systems purchased



*Projected

Source: IMS Strategic Decisions, Norwell, Mass.

CW Chart: Donald Maurer

NEXT WEEK

Quality software: What you get after spending millions of dollars fixing bugs. A joke? Not to those firms for whom this definition is all too real. But firms can develop quality software with an improvement plan that targets key IS areas — measurement, development, the maintenance organization and more. See In Depth. ▶



Jesse Hagen

Exclusive *Computerworld*/Andersen Consulting survey examines executive attitudes toward information technology. Two years ago, many CEOs and other corporate officers were swooning over the idea of using IS for competitive advantage. Today, hard experience and cold reality have moderated executive hopes about IS. See Executive Report.

INSIDE LINES

Jim Manzi's Excel-ent adventure

Lotus' 1-2-3 for Microsoft's Windows went into beta testing last week with an initial rollout to about 20 of Lotus' top customers. By summer, Lotus chief Jim Manzi expects to have shipped from 1,000 to 2,000 beta-test copies. Manzi refused to talk specifics but did say customers love the backwards compatibility built into 1-2-3/W. He also hinted at a tighter "fit and finish" with other Lotus Windows-based products.

Did Dick Tracy beta-test this?

The Hewlett-Packard/Lotus palmtop will be introduced this week, along with new pager technology from Motorola that will reportedly allow HP palmtop users to receive text messages and incorporate them into applications virtually anywhere they happen to be.

Turnaround channel

A triumphant Gary Held, chief executive officer of Northgate Computer Systems, is expected to announce today that Northgate had a profit of $2.24 million on $46.94 million in sales in the first quarter of 1991. Held calls the last three months a turnaround case study made for Harvard Business School. Skeptics eyeing the brewing storm clouds of PC price pressures might point out that Harvard prefers businesses to do well for an entire year.

Vines outgrowth

Banyan Systems Vines users who are disappointed that the network does not yet support Apple Macintosh clients can take heart. One Vines customer at the recent user conference in Montreal said he had volunteered to be a Macintosh client beta-test site in six months, but Banyan had replied it would be ready for beta testing much sooner than that.

Looking for your Achilles' heel

Among the latest confidence scams traveling around the Internet is a Trojan horse in the form of a game and mail message that asks the recipient to beta-test the game and provide the developer with feedback. The game includes a program designed to sneakily capture logons and passwords. In another scam, a message supposedly from the systems administrator asks users to temporarily change their passwords to a common password as part of a security check. In the interim, a hacker enters their accounts and sets up trapdoors that allow him to freely return later.

A chicken-and-egg classic

A dedicated band of users and vendors, including DEC, IBM and the U.S. Department of Defense Internet folks, are doggedly trying to come up with an application programming interface (API) for TCP/IP. The protocol was originally designed "as an interoperability tool, not a program development tool," so it lacks the equivalent of Open Systems Interconnect Layer 5 or a standardized application interface, industry analyst Frank Dzubeck says. With TCP/IP's recent apotheosis into a de *facto* networking standard, however, vendors want that API so they can fill the demand for TCP/IP-based applications.

See you in the fall, maybe

Appearances — live and taped — by top-level IBM executives John Akers and Jack Kuehler last week are proof that concern over OS/2 has reached the highest echelons in the company. One unconfirmed story had Akers taking the name badges from IBM desktop software executives, telling them they will get them back once OS/2 Version 2.0 ships.

Into the chips

Among a gaggle of vendors ready to trot out systems based on Intel's I486SX — expected to be announced today — are AST and Advanced Logic Research.

One humorous line passed on to us last week had Sun's Scott McNealy responding to a query on how he measures his worth with the response "Milligates," an apparent reference to a recent report that Mr. Bill is worth $4 billion. Your best lines should be directed to News Editor Pete Bartolik at (800) 343-6474, faxed to (508) 875-8931 or lodged on Compuserve 76537,2413.

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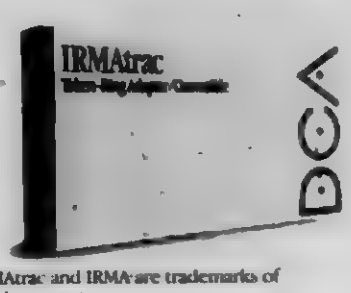
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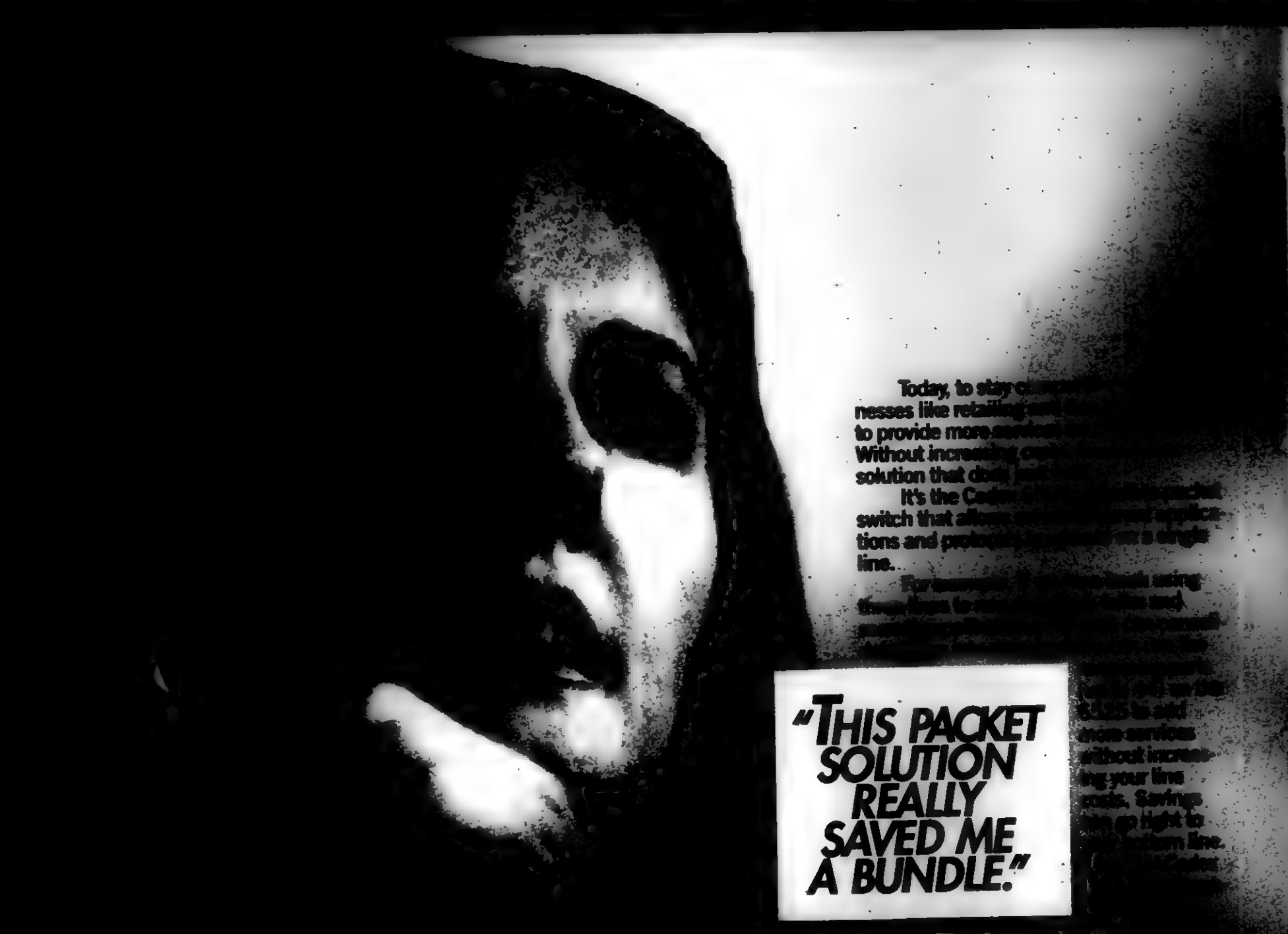
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COMPUTERWORLD

What does the CEO think?

Notwithstanding concerted efforts to tie information systems more closely to business goals, a majority of corporate executives say they still do not feel they are getting their money's worth from their IS investment.

According to a *Computerworld*/Andersen Consulting survey of 200 senior corporate managers in Fortune 1,000 companies, chief executive officers are cooling to the notion that information technology, can, on its own, improve profitability or ensure competitive advantage.

Despite these changes, satisfaction with IS performance has gone up since our last CEO survey two years ago. Full report begins on page 81.

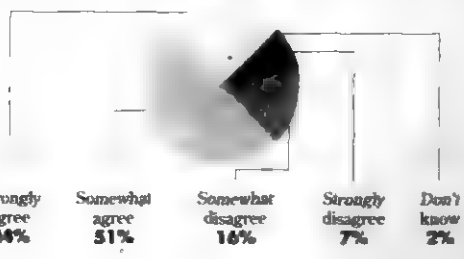
CEO-CFO Survey

Great expectations

... tempered by a growing sense of "realism"

"I believe that information systems hold the key to *competitive advantage for my organization in the 1990s.*"

Respondent base of 200



Oracle latches on to Netware

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — In a bid to make data fly farther and faster on local-area networks, Oracle Corp. said last week that it is shipping a version of its relational DBMS designed to work under Novell, Inc.'s Netware Version 3.1 operating system.

Oracle Server for Netware 386 — a Netware Loadable Module, or application, version of Oracle 6.0 — could pose another setback for OS/2 database server products, which are not yet widely installed, according to analysts.

While the database server products are dependent on OS/2, which has gained little market share, Netware 3.1 operates with personal computers using MS-DOS.

"The LAN database server market is absolutely not taking off," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass. "What's holding it back is the limited penetration of OS/2 in the LAN market, a lack of high-quality tools to develop applications and the high level of support and consulting services needed to install such systems."

Oracle claimed four-fold greater performance for the Netware 3.1 system than the SQL/Server for OS/2 from Microsoft Corp. and Sybase, Inc. — and nearly the same improvement as its own Oracle Server for OS/2.

But analysts said most of the improvement is because of the substitution of an Intel Corp. 1486 engine for an older

Continued on page 119

Icy reception

Database server products from leading vendors have made relatively small inroads to date

1990 installed base (worldwide)

Oracle Corp.'s Oracle Server	13,500
Gupta Technologies, Inc.'s SQL Base Server	4,500
Sybase, Inc.'s SQL Server	5,000

Source: International Data Corp.

IBM leads charge to lower-cost 486s

BY RICHARD PASTORE
CW STAFF

Targeting users reluctant to pony up for pricey 1486-based personal computers, IBM and several clone vendors last week rolled out Intel Corp. 1486SX-based PCs, priced 25% below their cheapest 1486DX machines. The strategy may pay off, but the new chip is not expected to bury the Intel 80386-based PC or drastically depress prices anytime soon.

Just one day after Intel unveiled the 1486SX, IBM incorporated the 20-MHz chip into its Personal System/2 Models 90 and 95. At least seven other vendors joined in, announcing boxes or the intent to develop boxes based on the chip.

The 1486SX, which lacks the math coprocessor of the 1486DX, runs current 16-bit applications 10% to 40% faster than 33-MHz 80386 processors, Intel said. The chip maker predicted 1486SX chip shipments will equal those of 1486DXs by year's end.

In the IBM product line, a PS/2 Model 90 offers a 44% better price/performance than a comparable 25-MHz 80386-based PS/2 Model 80. Technology Investment Strategies Corp. in Framingham, Mass., rated the price/performance of the new Model 90 at $606 per million instructions per second, whereas the Model 80 was rated at $1,087 per MIPS.

These differentials have not been lost on users hungry for more power. "We've been staying away from the 486 because of the price. The [PS/2] 90s and 95s have just been too high," said Thomas Casey, a senior application project specialist at the Boston office of New York Life

Continued on page 6

Dbase copyright reinstated

BY JAMES DALY
CW STAFF

LOS ANGELES — Ashton-Tate Corp. cheated the hangman last week when a federal judge reversed his potentially devastating December ruling that had stripped the company of the copyright to its flagship Dbase product line.

Some observers noted that the unorthodox legal reversal is indicative of how unacquainted many judges are with high-technology law. "The judge goofed," said Paul Goodman, a software law attorney at the New York-based law firm of Elias, Goodman & Shanks. "He made a very radical initial decision and consequently was subjected to an accelerated learning process."

Experts warned, however, that Ashton-Tate is not yet off the gallows. The revocation by U.S. District Judge Terrence Hatter Jr. clears the way for the resumption of the legal action that prompted the initial

Continued on page 120

A $46 tape becomes a $10K print job

Government slow to open data files to freedom of information requests

BY MITCH BETTS
CW STAFF

For Brownstone Publishers, Inc. in New York, the database kept by the city buildings department was a gold mine of statistics it could market to the local real estate industry. Brownstone Publishers planned to use the state's Freedom of Information Act to get the data for just $46, the cost of copying the database onto computer tape.



However, city bureaucrats had other ideas. The department said it would only release the database in paper form, meaning a six-week, $10,000 printing job that would consume more than 1 million sheets of paper and force Brownstone Publishers to recomputerize the data at an estimated cost of several hundred thousand dollars.

The resulting court battle over whether the data should be released in paper or electronic form is a prime example of the growing tensions between government agencies and the various parties who are trying to obtain computerized government records under freedom of information laws.

The conflicts must often be settled through litigation to determine how the FOI laws, enacted when most government

Continued on page 121

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INSIDE

Quarterly report: Compaq's growth slows, profits may dip; Wang woes continue, but DG turnaround goes against the grain. Page 4.

IBM pitches AS/400 as the Advanced System with SAA breakthrough and host of high-tech options. Page 6.

EDS signs up Continental Airlines in biggest outsourcing pact to date, Page 8.

Murder clues on floppy disk are key evidence in federal trial. Page 12.

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6 In what analysts are calling its most significant rollout in 1991, **IBM** announces AS/400 D models with all the trimmings — including very competitive prices.

8 **EDS** announces it has won the biggest outsourcing deal to date: a $2.1 billion, 10-year contract with **Continental Airlines.**

10 **OSF, DEC and HP** are hit with a lawsuit from **Addamax** after the Federal Trade Commission's recent investigations of possible OSF antitrust violations.

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119 The White House shows signs of warming up to the idea of giving high-tech industries a boost: Government-sponsored technology programs could be on the way.

120 "It's a done deal," an analyst says of the proposed **AT&T/NCR** merger. Observers say the two companies, which have been locked in intense negotiations, will likely announce a merger soon.

Quotable

"It may be that Compaq is running out of rabbits to pull out of its hat."

MARK STAHLMAN
ALEX. BROWN & SONS

On Compaq's disappointing first-quarter earnings.
See story page 4.

SYSTEMS & SOFTWARE

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53 **Cabletron Systems'** artificial intelligence-based Spectrum network management software works for its beta-test users — so well, in fact, that many of them are lining up to buy it.

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EXECUTIVE REPORT

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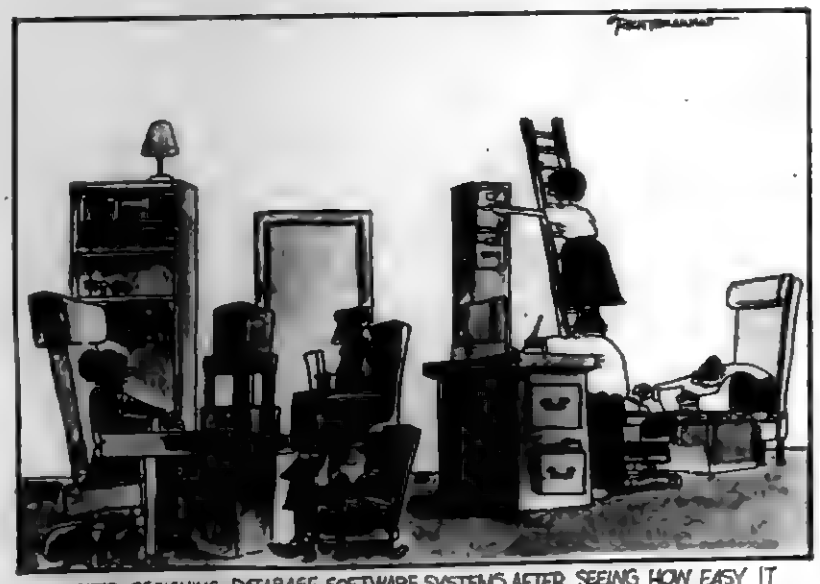
IN DEPTH

93 "Quality software" does not have to be a contradiction in terms. By Raymond Falkner.

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The 5th Wave



"I STARTED DESIGNING DATABASE SOFTWARE SYSTEMS AFTER SEEING HOW EASY IT WAS TO DESIGN OFFICE FURNITURE."

EXECUTIVE BRIEFING

■ **CEOs no longer believe in information technology as a magic bullet** for competitive success. According to an exclusive *Computerworld*/Andersen Consulting survey of 200 top business executives, the view from the top has matured into a new, better-focused reality. Top executives at many organizations are concentrating on targeted and carefully cost-justified projects, while emphasizing re-engineering of business processes around information systems. **Page 81.** One such CEO is Sea-Land's Alex J. Mandl, who wants to see real payback from systems and emphasizes the need for proper employee IS training. **Page 67.**

■ **Oracle makes a bold bid** for LAN platforms. Its relational database management system will now run under Novell's Netware, posing a challenge to OS/2-based database server products currently running under Microsoft's LAN Manager. Novell is also reportedly pursuing an industrywide database server strategy with other RDBMS companies. **Page 1.**

■ **EDS consummates the largest outsourcing deal ever,** a $2.1 billion pact to provide IS services for 10 years to Continental Airlines and System One. However, the contract is half the size of the one originally announced 14 months ago. **Page 8.**

■ **Wang and Compaq each report bad financial news.** Wang's red ink continued to flow in the first quarter on a 16% plunge in revenue, while Compaq shocks Wall Street by predicting that second-quarter sales will fall below last year's levels. **Page 4.**

■ **Citibank will become the first user** of global point-to-point ISDN, with five lines in operation beginning next month. Until now, global networks had to give up ISDN capability at some point along the way. Citibank's network will connect New York to three sites in Europe and one in Singapore. **Page 16.**

■ **The Bush administration outlines critical technologies for the U.S.,** edging closer to government-sponsored programs to support them. Among them are software, high-performance computing, high-definition imaging and computer simulation. **Page 119.**

■ **The PC price war continues** as IBM and others unveil cheaper models based on the new Intel I486SX chip. The Personal System/2 Models 90 and 95 promise significant price/performance advantages over 80386-based models. **Page 1.**

■ **Ten competing California HMOs** agree to cooperate on setting EDI and other data standards for the industry. **Page 67.**

■ **A small software vendor sues OSF,** claiming the vendor consortium violates antitrust laws. The plaintiff, Champaign, Ill.-based Addamax, recently lost a bid for OSF business. **Page 10.**

■ **Software maintenance spending** can be cut in half by implementing a software quality improvement plan. The plan must target IS measurement, the development process and software skills and technologies. **Page 93.**

■ **Middle-aged IS workers are feeling the squeeze** from college graduates willing to start at low salaries and retirees re-entering the work force. **Page 103.**

■ **PC dealers are jumping through hoops,** offering deals galore to get the attention of largely uninterested IS buyers. **Page 112.**

■ **On-site this week:** The Indiana Pacers' hopes in the NBA playoffs rest partially on Poqet computers and a LAN with 25 NEC PCs. Pacer coaches use the computers to plot game strategy based on opponents' tendencies in certain situations with particular players. **Page 45.**

"Have You Seen What They Did With CA-IDMS?"

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COMPUTER ASSOCIATES

Wang loss worse than feared

BY NELL MARGOLIS
CW STAFF

LOWELL, Mass. — Still in the throes of a precarious product-line transition and hard-hit by adverse financial trends at home and abroad, Wang Laboratories, Inc. last week posted a staggering fiscal third-quarter loss and a steep revenue slide.

For the quarter ended March 31, Wang reported a $48.9 million loss on revenue of $499.7 million, down 16% from last year's comparable period. "I didn't think I was about to see a good quarter from Wang, but I didn't expect anything this bad," said Roger Sullivan, an analyst at Norwell, Mass.-based BIS Strategic Decisions.

According to Chief Executive Officer Richard Miller, the worldwide recession, war in the Middle East and "continued weakness in the computer business and other industries" combined to derail Wang's turnaround. The potency of his remarks may have been sapped somewhat by the same-day release of stronger-than-expected quarterly figures by neighboring minicomputer vendor Data General Corp. (see story below).

Perhaps even more worrisome, Sullivan said, was Miller's note that revenue decreases from Wang's traditional minicomputer lines are continuing to outpace revenue gains from new products and services. "Traditional business is drying up at an absolutely alarming rate," Sullivan said. "Economists are saying that the recession could wear on through August. If that turns out to be true, the pressure on Wang to really succeed with the up-and-coming product rollout promised for [the current] quarter is intense."

Fiscal squeeze

An eroding revenue base continues to cloud Wang Laboratories, Inc.'s future



Source: Wang CW Chart: Tom Monahan

The company's recently announced Office 2000 game plan [CW, April 15], which aims Unix-based image processing applications at the office automation market, has been praised by analysts as strategically sound and potentially promising. However, said Chris Christiansen, an analyst at Westport, Conn.-based Meta Group, Inc., "Let's be serious — there are no products here. At least, no major ones deliverable today." The earliest Office 2000 products are slated for rollout in May.

And while time may be running out for Wang, Sullivan said, competition is intensifying — not only from traditional sources such as Sun Microsystems, Inc. but from IBM emerging as an imaging contender.

Even Wang's statement last week that its cash reserves were at the highest point in 18 months raised some eyebrows. "It looks like they're either making the company more attractive to a friendly buyer or else positioning to acquire someone else," Christiansen said.

Nevertheless, he and other analysts noted that Miller has proven adept at leveling Wang's once-staggering debt load, instilling a commitment to quality "that's been a deficit at Wang over the past several years," and focusing the firm on a strategy that could have it giving customers what they want. "There must be a few rabbits he can pull out of the hat" to keep the money from running out before the products phase in, Sullivan said.

DG profits on upswing

BY NELL MARGOLIS
CW STAFF

A charter member of perhaps the computer industry's most beleaguered sector — old-guard minicomputer companies in transition to open systems — last week posted an upside surprise that analysts said showed signs of true staying power.

Westboro, Mass.-based Data General Corp. reported net income of $19.2 million on revenue up 2% at $320.4 million for its fiscal second quarter ended March 31. The second consecutive profitable quarter after two years in the red contrasted sharply with the $8.6 million net loss a year earlier.

Chief Executive Officer Ronald Skates credited the strong quarter to mounting sales of the Aviion workstation family.

Brown Brothers Harriman & Co. analyst William Milton Jr. said DG's biggest stunner was that revenue from its MV minicomputer line held steady for the third quarter in a row.

"IBM's hardware revenue is down 17% this quarter, Compaq is hurting, and Data General is selling minicomputers in the middle of a recession," Milton said. "Who would have ever believed it?"

In contrast, Unisys Corp. issued another dismal financial report last week, losing $98.2 million on revenue of $2.06 billion. A year ago, Unisys lost $3.2 million on revenue of $2.31 billion.

Chairman and CEO James A. Unruh blamed the weak worldwide economy and a general slowdown in the computer industry. He conceded that the firm might have to renegotiate its $1.25 billion revolving credit agreement with its lenders. That agreement stipulates Unisys must maintain a net worth of $3.5 billion.

If Unisys technically defaults on its loans, said Duff & Phelps, Inc. analyst David Schofield Jr., it is uncertain what action the bank consortium would take — "But loss of the revolver would force Unisys into bankruptcy, in our opinion," he said.

Meanwhile, tight cost control and healthy sales rocketed Sun Microsystems, Inc. sales up 34% to $848.3 million with profits growing 60% to $58.7 million for its fiscal third quarter.

Sun's quarter outdistanced expectations, said John Girton, an analyst at Van Kasper & Co., in San Francisco. "Sun's big story this quarter is that they held operating costs under really tight control," he said. But, he warned, "this can't continue; they're going to have to spend more on R&D."

Sun's rival, Mips Computer Systems, Inc., showed a 36% revenue increase to $43.9 million. However, a steep year-to-year increase in the cost of producing such sales sapped Mips' profits, which fell 82% from last year's first-quarter net of $3.5 million to $.62 million.

Compaq slow growth blamed on competition, recession

BY RICHARD PASTORE
CW STAFF

Compaq Computer Corp.'s Wall Street bubble burst last week. The personal computer maker's first-quarter earnings were not up to par, partly because of recent price cuts and the soaring dollar abroad. Compaq added to the dismay by predicting a decline in second-quarter revenue vs. the previous year's quarter.

"It may be that Compaq is running out of rabbits to pull out of its hat," said Mark Stahlman, an analyst at Alex. Brown & Sons, Inc. in New York. Compaq had been able to maintain high margins and solid growth last year despite the slumping PC market, he noted.

Compaq reported revenue up 11% to $871 million for the quarter ended March 31. In the previous four quarters, Compaq averaged better than a 26% sales growth rate. The company's profit rose to $92 million, a 24% increase over net income logged in the corresponding quarter last year.

Compaq said its quarter was affected by the recession, the Persian Gulf war and dollar appreciation overseas. But the Houston-based PC maker also hurt itself with its recent price-cutting strategy.

The biggest toll probably came from rapid appreciation of the dollar relative to European currencies. Compaq garners 59% of its revenue overseas. International sales rose only 16% in the first quarter, compared with numbers in the 70% range last year.

A dip overseas?

The dollar factor is expected to intensify and may cause total overseas revenue in the next quarter to dip compared with last year, Compaq officials warned. That in turn may cause overall revenue to decline in the second quarter ending June 30.

The warning soured investors on Compaq as the stock value fell 15% to 52½ points late last week.

Though it announced the sweeping price cuts only two weeks ago [CW, April 22], Compaq took an earnings hit when it applied the reduced prices to products already in the distribution channel, said Eric Zimits, an analyst at Rauscher Pierce Refsnes, Inc. in Dallas.

As evidence of the price cuts' impact, Compaq's North American box shipments grew at a relatively healthy pace of 20%, but revenue grew only 5%.

CORRECTIONS

An article in the March 25 Product Spotlight titled "Estimating maintenance costs" incorrectly stated that Software Quality Management System from Software Quality Tools Corp. has not yet been released. An MS-DOS version is due for release in the near future. A Unix version of the program has been available since last September.

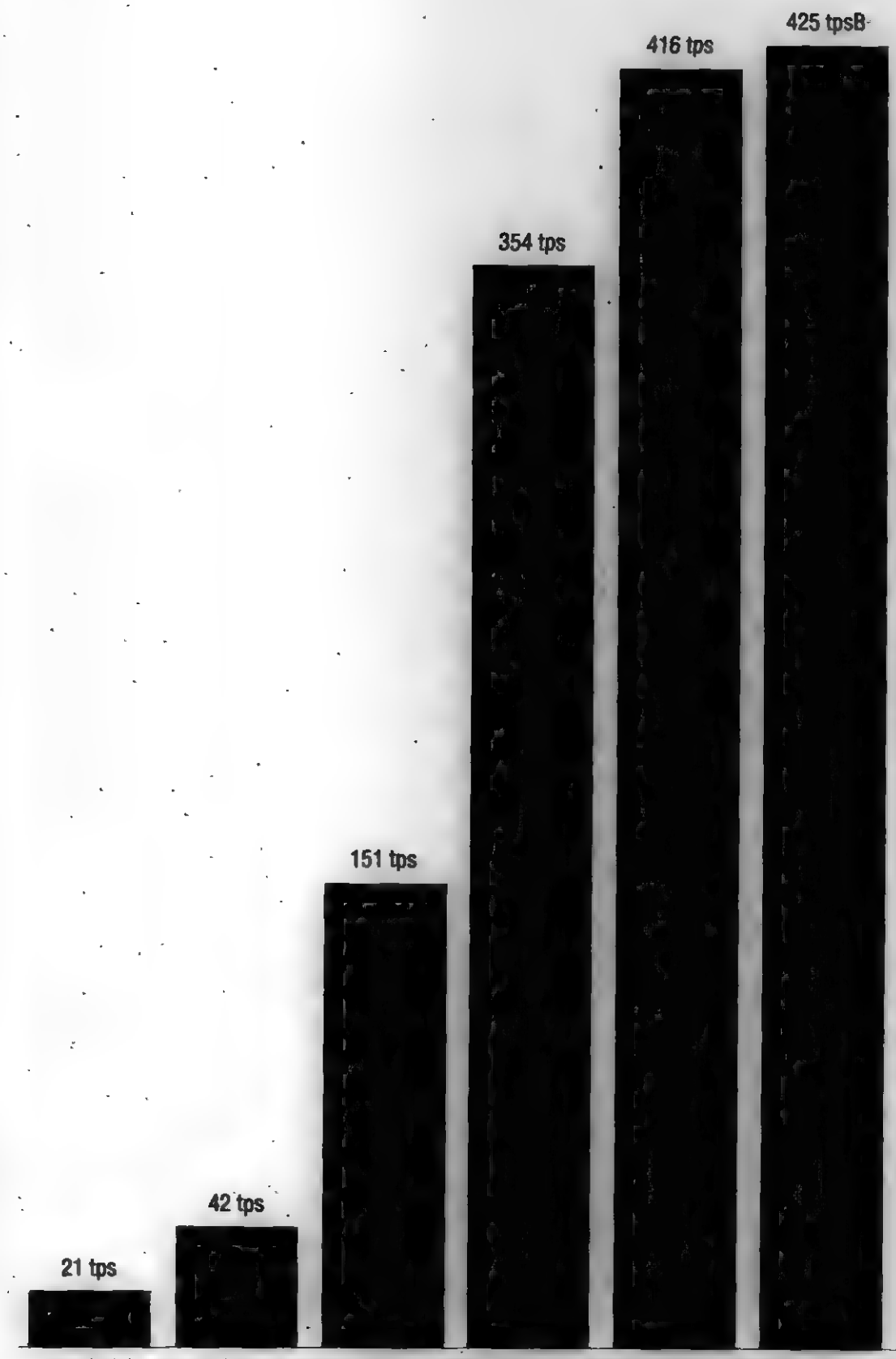
In the same article, Amherst, N.H.-based Softstar Systems was incorrectly identified as Softstar International, Inc.

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AS/400 line racks up performance gains

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — IBM festooned its new Application System/400 D models with an arsenal of new technologies, advanced applications and sharply competitive prices last week in an announcement that industry analysts and customers say is IBM's most significant rollout for 1991.

With performance and power increases of 30% to 60% — and price cuts from 10% to 40% over current models — the 11 AS/400 D models swept aside the current B models and replaced the OS/400 operating system with a new version.

MODEL	PRICE	*RELATIVE PERFORMANCE
9402		
D04	$16,250	1.5
D06	$23,850	1.9
9404		
D10	$21,950	1.9
D20	$41,500	2.4
D25	$79,500	3.4
9406		
D35	$47,400	2.6
D45	$97,700	3.7
D50	$135,000	4.8
D60	$272,000	8.3
D70	$405,000	11.2
D80	$720,000	19.8

Source: IBM CW Chart: Doreen St. John

One of the more significant but less emphasized parts of the announcement is the AS/400's new prominence as a Systems Application Architecture (SAA) platform. From its stepchild status as the last platform to get SAA capabilities, the AS/400 is now set to leapfrog IBM's mainframe and workstation lines with superior distributed database capabilities in mid-1992 (see related story this page).

Bill Sines, an analyst at Technology Investment Strategies Corp. in Framingham, Mass., said the "clear price/performance advantages" of the new AS/400s finally make the machine a formidable competitor against other proprietary midrange systems from Digital Equipment Corp. and Hewlett-Packard Co.

"Up until now, our larger sites just didn't take the AS/400 seriously," said John Palm, vice president of systems at Gannett Co. in Arlington, Va., publisher of *USA Today* and 81 other daily newspapers.

Yet, Palm said the high-end capabilities of the AS/400 D models, particularly new remote diagnostic features, will be critical to Gannett, which manages computer support operations centrally from Washington, D.C.

Analysts said IBM hopes to cut a swath through encroaching personal computer local-area network servers by positioning the AS/400 as the ideal "high-function" applications server on a multivendor network. The new systems are beefed up with server support features for cooperative processing and improvements in PC connectivity and access.

Customers may end up feeling a bit rushed, however, as IBM aggressively pushes their migration to the new platform with trade-in deals and upgrade packages that start expiring toward the end of next year. IBM will also be charging 10% to 15% more each time new versions of the operating system are released, analysts said.

Considering options

Caught smack in the middle of a 46-machine rollout of AS/400s, Richard Deckard, vice president of data processing at Atlanta-based Manheim Auto Auction Division, part of Cox Enterprises, Inc., was glumly considering his options last week. He discovered the 20 machines he had already installed will cost $678,000 to upgrade, add disk storage and replace third-party memory that will not run under the new operating system.

Another customer in the midst of rolling out an AS/400 network is Bryan Meyers, director of information services at KOA Kampgrounds of America in Billings, Mont. By 1993, KOA plans to have 60 to 70 small AS/400s dispersed to its campgrounds nationwide.

"So far, we've gone from ordering B10s to C10s to C04s, as every new model came out," Meyers said.

Several System/36 users said this announcement may act as a catalyst for moving them off IBM's earlier and widely popular systems. "The price will get us in," said Jerry Taylor, MIS supervisor at Chicago-based Children's Home and Aid of Illinois.

The dual-processor AS/400 D80, which can support up to 600 concurrent users, was a relief for Tiffany & Co.'s data center in Parsippany, N.J., which expects to take delivery this week. "Our only concerns on the AS/400 were wondering if IBM could stay a step ahead of us. It was like fighting fires every year to get through the Christmas season," said Eric Corbman, director of development center at Tiffany.

Computerworld correspondent Ellis Booker contributed to this report.

Bells and whistles

The AS/400 D models are packed with advanced technologies in everything from a laser-driven fiber-optic I/O bus to IBM's latest 45-nsec CMOS technology. A host of new software products, such as knowledge-based systems for business use and third-party alliances, rounded out the offering.

The following are some highlights of last week's announcements:

- The new operating system, OS/400 Version 2, includes new migration aids for System/36 users, extensions for Advanced Peer-to-Peer Networking and more than 200 open application programming interfaces.
- Greater flexibility on the AS/400 is provided for personal computer users and developers through improved networking performance, availability of remote SQL services and client coexistence with Novell, Inc.'s Netware 3.1. IBM added compatibility with Microsoft Corp.'s Windows 3.0 and doubled the throughput of its new Token Ring adapter.
- Gupta Technologies, Inc. in Menlo Park, Calif., announced AS/400 support for its SQLwindows software, and Wall Data, Inc. in Redmond, Wash., is delivering a Windows-based emulator called Rumba/400 that will enable PC users running Windows to interact with applications stored on the AS/400.
- Introduction of the IBM 3995 Compact Optical Library Dataserver, a 5¼-in., write-once, read-many optical drive for small to midsize imaging customers. The $52,000 jukebox can store 20 unformatted gigabytes, or the equivalent of 300,000 pieces of paper.
- Systems Application Architecture (SAA) support was extended to include data sharing among different SQL databases and to improve SQL functions. The AS/400 is the first IBM platform to announce general availability in March 1992 of products supporting Distributed Relational Data Architecture, which allows data and application sharing among heterogeneous systems on a network.

MARYFRAN JOHNSON

IBM

FROM PAGE 1

Insurance Co.

Casey said he would like to replace his Model 80 servers with 1486-based PCs by the end of the year, and the new 1486SX boxes sound appealing.

"The software we use does not support a math coprocessor," Casey added, noting that he would not miss that component in the 1486SX.

"I would definitely buy the 486SX; there's a need for something less expensive," said Darrell Hess, computer consultant at New York accounting firm Buchbinder Tunick & Co.

Analysts said the new boxes will not have a major impact on market pricing this year. Prices for 80386 and 80386SX boxes will decrease over time but not to bargain-basement levels.

The reasons? Ramp-up requirements will keep 1486SX shipments relatively low, and most software still has not outstripped the capabilities of the 80386. Indeed, there is no irresistible 32-bit software title to propel users to invest in higher performance systems, said William Ablondi, an analyst at BIS Strategic Decisions in Norwell, Mass.

Interest in 32-bit application development may climb once the 1486SX racks up volume sales. But the arrival of 32-bit operating systems from IBM and Microsoft Corp. will be the real spark for this market.

Pricing pressures

Prices of 80386DX and SX systems are more dependent on the sweeping reductions made recently by Compaq Computer Corp. and IBM last week. Admitting it is responding to competitive pressures, IBM announced 3% to 38% reductions on several models, including the newly discontinued Model 50Z, 65SX and some versions of the Model 70 386.

IBM's new machines offer the same features as the previous Model 90 and 95 versions, including the Micro Channel Architecture bus and 4M bytes of standard memory. Both models are CPU-upgradable to 25-MHz or 33-MHz 1486DX systems. The 90 is shipping immediately, and the 95 is set to ship in July.

Buyer's market

PC vendors were quick to offer new systems based on Intel Corp.'s 1486SX chip

Vendor	Product	Base configuration	Base price	Ship date
Acer America Corp.	Acer-power 1486SX	2M bytes random-access memory, Video Graphics Array	$2,745	now
Advanced Logic Research, Inc.	Bootmaster 1486ASX	4M bytes RAM, Extended Industry Standard Architecture bus, 80M-byte hard disk*	$3,495	May
AST Research, Inc.	Premium II 1486SX/20	4M bytes RAM, 80M-byte hard disk*	$3,695	May
Everex Systems, Inc.	Tempo 1486SX/20	1M byte RAM	$2,399	now

*ALR and AST also offer diskless configurations at lower list prices

CW Chart: Doreen St. John

Turn up the heat

Coupled with Compaq's earlier repricing, IBM's pricing move has turned up the heat on second-tier clones — especially at the low end. Advanced Logic Research, Inc. gave in late last week, cutting some 80386SX system prices 13% to 17%.

AST Research, Inc. also announced last week that it planned to trim the price of one 386SX system.

AST is still evaluating the need for further movement. "We will look at Compaq's success this week to determine our best course of action," said Larry Fortmuller, director of systems marketing.

Ablondi predicted 15% to 20% annual reductions in 80386 system pricing in 1992.

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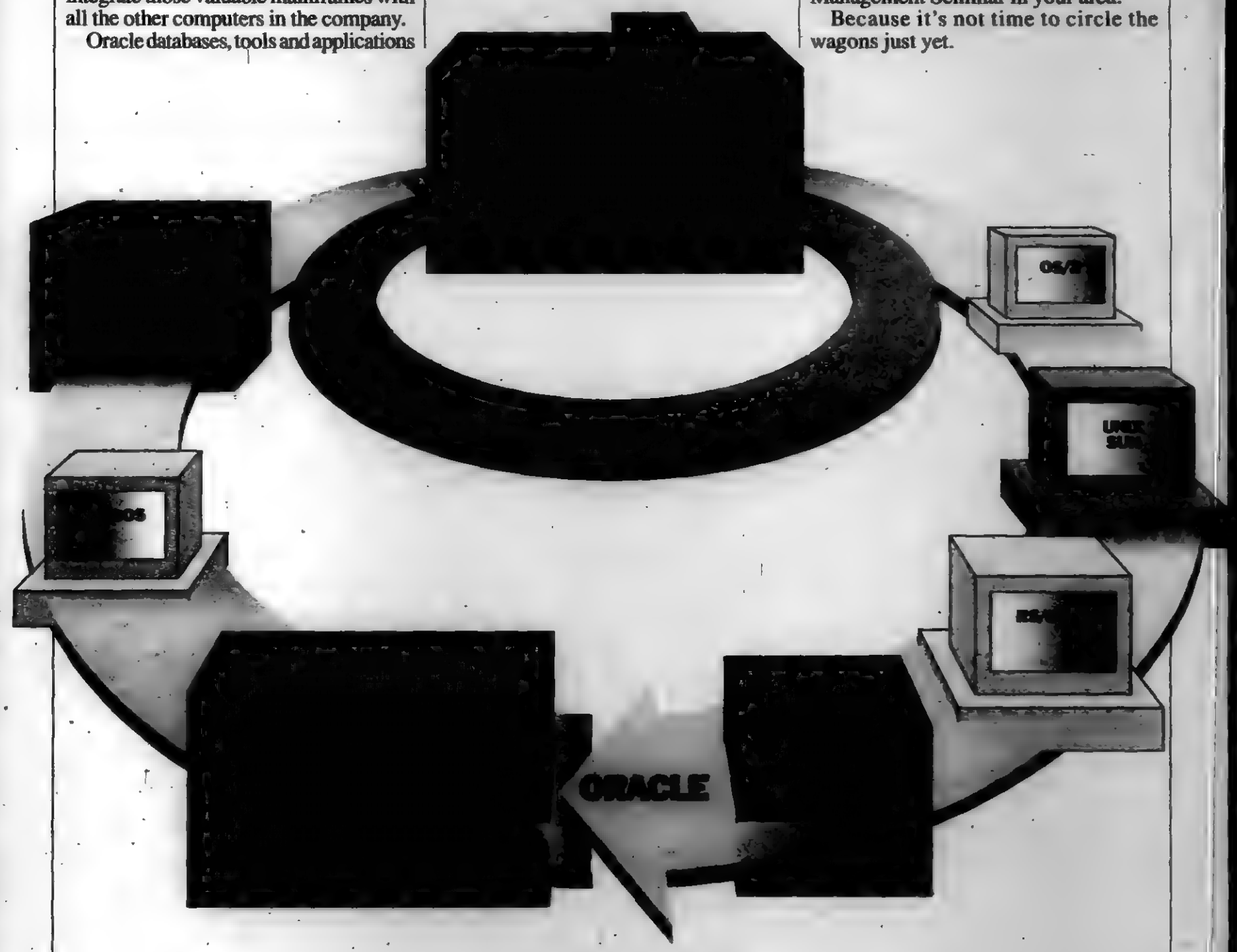
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*1990, Datamation/Cowen & Co. user survey.

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NEWS SHORTS

House panel gets Inslaw papers

After months of resistance, the U.S. Department of Justice agreed last week to turn over 200 documents sought by the House Judiciary Committee in its investigation into charges by software developer Inslaw, Inc. that the Justice Department stole and is still illegally using Inslaw's case-tracking software. Committee Chairman Jack Brooks (D-Texas) said he had negotiated access to the documents over several weeks with Attorney General Dick Thornburgh. "The committee can now move forward with its investigation to seek a resolution of the many outstanding issues before it," Brooks said.

Lyons new chairman at Ashton-Tate

Ashton-Tate Corp. has announced that Chief Executive Officer William Lyons has been named chairman of the board. Dave Proctor, executive vice president of product development, was simultaneously named president and chief operating officer and will continue to manage all product development. Lyons, a 19-year veteran at IBM, has been CEO of the Torrance, Calif., database maker since December and was elected president and COO in April 1990.

Connor heads Lotus group

There has been yet another changing of the guard at Lotus Development Corp., this time involving the Consulting Services Group. David Connor, formerly a partner at Deloitte & Touche, has been named a vice president and will head up the group. Connor replaces former Lotus Vice President Frank Moss, who recently left to become CEO at Tivoli Systems, an Austin, Texas-based start-up. The group recently expanded by adding a Lotus Notes-specific section.

NET suffers loss

Network Equipment Technologies Corp. (NET) reported a net loss of $46.1 million in fiscal year 1991. Revenue did a free-fall from $180.8 million last year to $135 million this year. NET was rocked last year by alleged false sales bookings with resulting management shake-ups and shareholder lawsuits.

NCR to service Northgate machines

Northgate Computer Systems, Inc. last week announced it had signed an agreement with NCR Corp.'s service division to provide field service for all Northgate sites in the U.S. NCR replaces Bell Atlantic Corp. as Northgate's service provider. Northgate Chairman Arthur Lazere praised Bell Atlantic but said NCR was able to provide same-day coverage service throughout the U.S., which he hopes will help win corporate accounts for Northgate. Also last week, Northgate announced record first-quarter profits of $2.24 million on sales of $46.94 million, compared with first-quarter 1990 profits of $2.1 million in profits on $47.21 million in sales.

OSF/1 shown on RS/6000

IBM demonstrated the Open Software Foundation's OSF/1 operating system on the RISC System/6000 workstation last week at the AIX Forum in La Hulpe, Belgium. Based on the Unix operating system kernel, OSF/1 runs on a wide range of computer platforms and incorporates technologies submitted by member companies of the OSF. IBM previously demonstrated OSF/1 on the IBM Personal System/2 computer and the System/390 mainframe.

Businessland, shareholders settle

Beleaguered computer dealer Businessland, Inc. agreed to settle five shareholder class action suits last week by offering $2 million in cash and stock valued at $4 million. Without admitting any wrongdoing, CEO David Norman said, "Settlement at this time will avoid lengthy and expensive litigation and eliminate further distraction of our management team." Businessland has not made a profit in more than one year. The settlement awaits approval by the court.

More news shorts on page 120

EDS captures airline contract

Outsourcing deal is largest ever; marks firm's entry to airline services

BY CLINTON WILDER
CW STAFF

DALLAS — Electronic Data Systems Corp. had to settle for half a loaf, but that was enough to be the largest outsourcing deal to date and EDS' long-awaited entry into the airline services business.

Last week, EDS announced a $2.1 billion, 10-year contract to provide all information technology services to Continental Airlines and its reservation system, System One. However, the deal falls far short of the original $4 billion pact announced more than one year ago [CW, Feb. 26, 1990], which called for EDS to service now-defunct Eastern Airlines and also own a 50% equity stake in System One.

The latter provision was scrapped after Continental's parent, Continental Airlines Holdings, Inc., filed for bankruptcy protection under Chapter 11, fuel prices soared, and IBM Credit Corp. (ICC) filed a lawsuit against the deal [CW, Nov. 5, 1990). But analysts said EDS may be better off sticking to the outsourcing services.

"This looks like it has most of the advantages of the earlier deal and few of the disadvantages," said Martin Ressinger at Duff & Phelps Investment Research Co. in Chicago.

One analyst speculated that EDS may still have an interest in other reservation systems such as Amadeus, a European system in which Houston-based Continental holds a stake.

"This gives EDS the best of all possible worlds — access to the System One software and people," said Stephen McClellan, vice president of securities research at Merrill Lynch & Co. in New York.

EDS will hire 1,860 System One information systems professionals to run data centers in Miami, Houston and Los Angeles.

Another factor that prevented EDS from acquiring System One was a lawsuit filed by ICC objecting to the transfer of ICC leases from System One to EDS. The suit was dropped when the acquisition was canceled. An ICC spokesman said the firm was involved in the current deal only as a Continental creditor on file in the bankruptcy proceedings.

EDS will acquire one small piece of System One, the Airline Services Division, for a reported $35 million. The division provides scheduling and ticketing services (but not reservations) to 170 small regional airlines and has annual revenue of about $30 million. This acquisition was part of the original deal.

Hackers find open season on Internet

BY MICHAEL ALEXANDER
CW STAFF

Computer hackers from all over the world are routinely cruising the Internet network and attempting to penetrate a wide range of computer systems operated by the U.S. military, defense contractors and academic computer centers.

The number of attacks has increased dramatically within the past year, although it appears that the hackers have caused little damage, according to security experts and systems administrators whose computers are linked to the nationwide network.

"We see attacks from England, Australia, Spain, Norway ... There is an incredible number of countries involved," said Eugene Schultz, a computer scientist who heads the Department of Energy's Computer Incidence Advisory Capability at Lawrence Livermore National Laboratory. "There are hacking clubs in every country in Europe."

The Dutch connection

The New York Times reported last week that a group of Dutch hackers was openly defying U.S. military, space and intelligence authorities by breaking into Internet sites.

Security experts said last week that several of the attacks have appeared to originate from the Netherlands, but it is nearly impossible to say with certainty.

Some hackers route telephone calls through the Netherlands in order to cover their tracks or because there are no Dutch laws prohibiting illegal computer access. "A lot of the calls are traced back to the Netherlands because it is a free stomping ground," explained Ron Tencati, National Aeronautics and Space Administration Science Internet security manager at Goddard Space Flight Center in Greenbelt, Md.



During the past year, overseas hackers have entered a wide range of sites including Anniston Army Depot in Alabama, Aberdeen Ballistic Research Laboratory in Maryland and the Johnson Space Center in Texas, according to security experts.

"Computer Fraud & Security Bulletin," a newsletter published in London, reported recently that Dutch hackers were systematically rifling military computer systems using the Unix Grep command to search for specific character strings. The strings included "Patriot," "missiles" and "weapons," the newsletter reported. In February, a Dutch television station interviewed an unidentified hacker who claimed to have collected sensitive information related to Operation Desert Storm.

The U.S. Air Force Office of Special Investigation, the Federal Bureau of Investigation and other federal agencies are said to be investigating the claims. However, there is no evidence that Dutch or any other hackers are mounting a coordinated effort to penetrate U.S. military systems, security experts said.

However, hackers, perhaps Dutch, have managed to penetrate about a dozen machines at the University of Chicago since last summer, said Scott Teissler, vice provost for information technology. In one instance, they deposited word processing files of "government origin" on a machine belonging to a vacationing professor, Teissler said. The pirated files had no apparent value, he added.

"They did no damage, and although they were using accounts illegally, they were using them to explore and probe to get onto other machines," Teissler said.

The lack of computer security has been a longtime problem at Internet sites. Even unskilled hackers can successfully penetrate systems by exploiting default and commonly used passwords as well as the sort of loopholes that were exposed by a worm program released on Internet by hacker Robert Morris more than two years ago.

There are some 300,000 sites on Internet, and the network is growing 20% per month, according to a spokesman for the U.S. Department of Defense's Computer Emergency Response Team based at Carnegie Mellon University in Pittsburgh.

"The new people that are connected are not as versed about system security," the spokesman said.

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Spurned firm brings antitrust suit against OSF

BY JOANIE M. WEXLER
CW STAFF

BOSTON — A small software firm officially challenged the fine line between multivendor cooperation and antitrust infringement last week when it filed suit against the Open Software Foundation (OSF) and two of its members, Digital Equipment Corp. and Hewlett-Packard Co.

Addamax Corp. turned the Federal Trade Commission's recent investigations of possible OSF antitrust violations into formal litigation when it filed suit in federal court here last Tuesday. Seeking damages of up to $100 million, Addamax alleged that in creating the OSF/1 operating system, OSF and its two deepest pocketed members pooled their market power into an illegal cartel and conspired to fix software prices and set price ceilings.

"Antitrust applies when the goal of the charged party is specifically to restrain someone else's business," explained Edson Rafferty, a senior partner at Rafferty, Polich & Shaw, an antitrust and litigation firm in Cambridge, Mass. Rafferty is not involved in the case.

"Addamax will have to prove that this isn't just a reasonable attempt by a group of companies to get decent prices from competitors for different forms of software," he said.

Earlier rejection

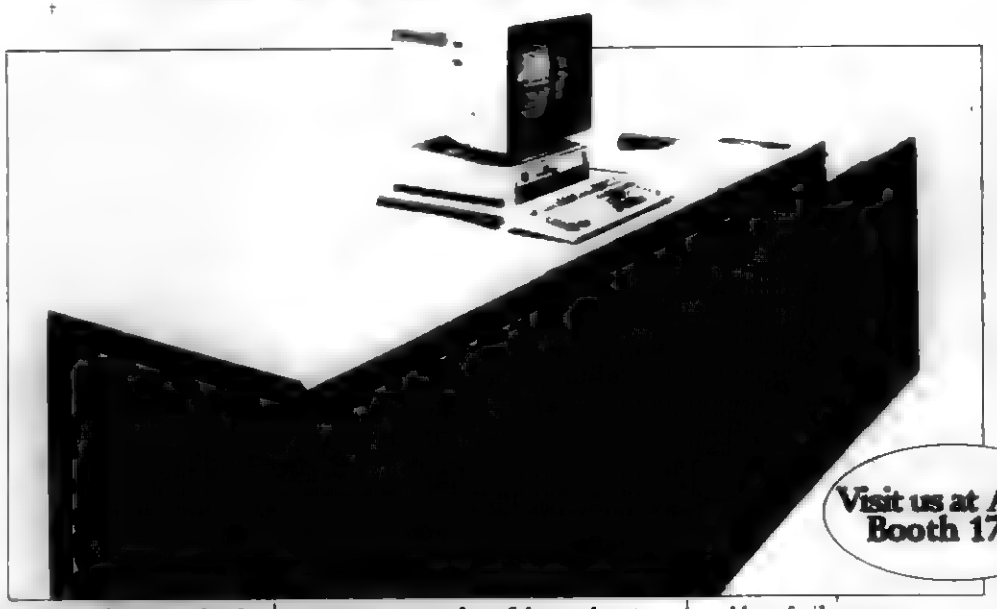
Addamax is a 22-employee software development firm in Champaign, Ill. The company lost an OSF bid in December 1989 to Atlanta-based Secureware, Inc. for a security component to be bundled into OSF/1, which is being promoted as a Unix-based operating system.

However, Addamax was in a "lose-lose situation" whether or not its technology was selected, Addamax President Peter A. Alsberg said. "You can get chosen by OSF and make a little money [on license fees] or not get chosen and make no money. Your business dries up either way," he said. OSF's combined-vendor muscle edges small software vendors out of business, constituting antitrust violations, Addamax claimed.

The Cambridge-based OSF is a consortium of computer vendors and users that selects and blends technologies from various manufacturers into what it deems an "open" software environment, then resells it to computer manufacturers. Alsberg said the OSF was only going to pay "six figures" to license Addamax's B1st System security technology if it were chosen as a component for OSF/1 — not even one-tenth of the product's development cost.

Alsberg said the "lose-lose" scenario applies to the independent software community in general. However, Secureware Chief Executive Officer Michael McChesney said sales of his SMP+, which beat out B1st, have tripled since the OSF selection.

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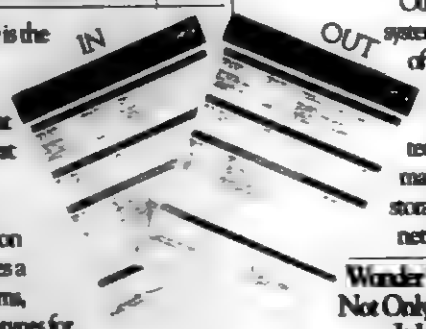


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Kodak imaging added to Notes

BY PATRICIA KEEFE
CW STAFF

Lotus Development Corp. and Eastman Kodak Co. announced plans last week to add Kodak's document image processing technology to the Lotus Notes workgroup environment.

Under the agreement, Kodak will integrate its imaging technology, including image capture, storage and management, into Notes. This will enable users to import images, such as paper documents, fax transmissions and microfilm, directly into Notes applications. It will also extend Notes' integrated access to paper information sources.

"Image-enabled" Notes will be composed of Lotus Notes and Kodak-owned "Imageware." It will be packaged, distributed and supported solely by Lotus in early 1992. A prototype system is scheduled to be shown at this week's 1991 Association for Information and Imaging Management conference. Pricing details were not available.

Potential benefits

The nonexclusive partnership is expected to provide a significant improvement in price/performance in imaging systems and to open the imaging market to a broader range of users. Imaging systems typically run on separate, more expensive high-end systems. Kodak sees Notes as a way to bring imaging into the mainstream computing environment and, more specifically, to desktop users.

Craig Goldman, a vice president at Chase Manhattan Bank NA, said he needs "industrial-strength" imaging to round out his Notes-based technical platform.

"Up until now, imaging has been weak," he said, referring to the process of scanning in individual documents and storing them on network servers. Goldman said he expects an image-enabled Notes to open up access to back-office and peripheral information, allowing him to integrate that data into Notes. Currently, he has to use an "extremely awkward" stand-alone product, he said.

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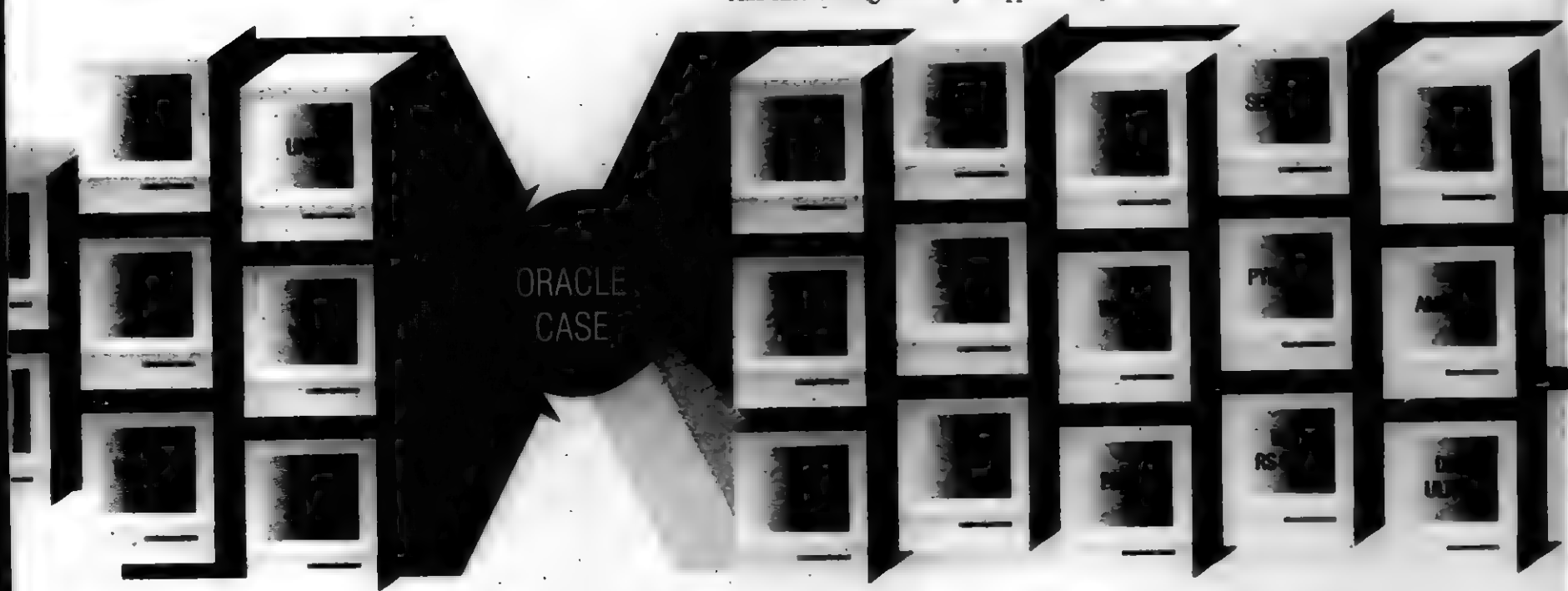
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Murder, he wrote?

BY CHRISTINE CASATELLI
SPECIAL TO CW

ALEXANDRIA, Va. — A standard government-issue floppy disk may hold the key to the death of a U.S. Marine Corps officer whose husband is on trial for her murder this week in federal court.

Robert Russell is charged with the killing of U.S. Marine Capt. Shirley Gibbs Russell, who was reported missing from the Quantico Marine base in Virginia on March 4, 1989. Although no body has ever been found, government prosecutors have established a case of premeditated murder based on a 26-step plot found on the defendant's floppy disk at work labeled "Murder."

The case, which marks the first time federal murder charges have been lodged against a defendant without a body being recovered, began Tuesday and will continue throughout this week.

Robert Russell, a 34-year-old former Marine captain, was relieved of duty in 1988 for falsifying documents during his assignment at the Marine base in Gulfport, Miss. While clearing out his office, co-workers went through his computer files looking for "mission-essential" information, a government witness testified.

Finding a file named "MURDER," they called it up, thinking it was a computer game. What they stumbled onto was a file that they believed outlined the perfect crime. "Alibi/excuse from work," the file read, "Make it look as if she left." The list of things to do also included "How do I kill her????" "Make sure car appears to have had problems," "Check in library on ways of murder — electrocution??" and "Blame it on her own kind." Robert Russell is white, and Shirley Russell was black.

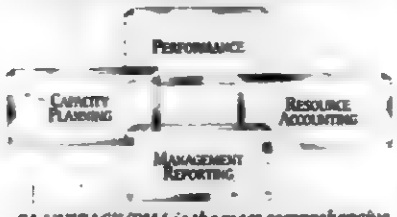
At the time, Marine investigators who were alerted to the incriminating file brushed it off because Shirley Russell was alive and well and stationed in Parris Island, S.C. It was not until she disappeared the following year that interest in the 5¼-in. floppy disk was renewed.

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HP, Safari laptops out

BY MICHAEL FITZGERALD
CW STAFF

As expected, one tiny — and one sexy — portable computer hit the streets last week. Hewlett-Packard Co. and Lotus Development Corp. announced their joint development, the HP 95LX, and Safari Systems, the joint venture of AT&T Computer Systems Division and Marubeni America Corp., introduced its laptop.

The 95LX, an 11-ounce, 6.3-in. by 3.4-in. by 1-in., $695 palmtop IBM Personal Computer XT-compatible, runs for up to two months on two AA batteries and comes with 512K of random-access memory, 1M byte of read-only memory (ROM), a flash memory drive, a 16-line LCD and a Qwerty keyboard.

Lotus' 1-2-3 Release 2.2 spreadsheet is bundled with the device, along with Microsoft Corp.'s DOS 3.22, both built into ROM. Other functions include an HP advanced financial calculator, a telephone directory, an appointment calendar and a memo pad.

The 95LX also features an infrared link for data transfer with other 95LXs as well as built-in file transfer communications features and a serial port for RS232C devices such as printers and modems.

In addition, HP confirmed it is working with Motorola, Inc. to allow the 95LX to use Motorola's upcoming Electronic Mail Broadcast to a Roaming Computer technology.

Safari's 7.3-pound NSX/20, perhaps the sleekest laptop available in terms of design, was also announced. The Safari began shipping two weeks ago [CW, April 22].

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Citibank breaks ISDN ground with global lines

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — Citibank said last week that it is likely to become the world's first user of pure, worldwide Integrated Services Digital Network (ISDN) technology when its global ISDN lines kick in next month.

In a move that is the closest thing yet to the technology in its intended form, Citibank installed the initial five U.S. ISDN lines last week and will have another seven running to its overseas offices in May with the goal of "improving real-time, interhuman communication" and reducing expenses, said David Isherwood, vice president of Citibank's Global Systems Division.

Citibank has become the first ISDN customer of bypass carrier TC Systems, Inc. TC Systems, the switched services subsidiary of Teleport Communications Group, said last week that it is now making basic-rate (144K bit/sec.) ISDN generally available and will provide the local ISDN portion for linking New York sites to Europe and the Far East.

Citibank's basic-rate traffic will spill from TC Systems' network into AT&T's primary-rate (1.5M bit/sec.) long-haul ISDN network, then switch back to basic-rate lines hooking into Citibank offices in London, Brussels, Singapore and Dusseldorf, Germany. Isherwood said all the foreign locations participating have basic-rate ISDN service available.

Until now, ISDN lines have not generally been available for every leg of an international trip, forcing users to give up some ISDN features at some point along the way.

Isherwood explained that Citibank is initially using the dial-up, integrated voice and data features of ISDN for "shared desk" applications. He said that using a single line to provide PC-to-PC file transfers while simultaneously discussing and editing on-screen text and graphics will help control costs by reducing the number of international business trips.

TC Systems' unregulated pricing is competitive with New York Telephone Co.'s tariffed service, Isherwood said, which was not available when he decided he needed ISDN. He said he would ultimately like to use the ISDN services of both carriers for redundancy.

The only investment Citibank has made, Isherwood said, has been in NCR Corp. personal computer ISDN adapter boards. He said the boards compare in price to high-speed modems and that he does not expect his monthly telephone bill to change much.

"The bottom line is that as a global systems division, we consider ISDN to be of profound interest to us," he said. "We're finally getting ISDN as it's supposed to be — like a telephone service. That's been the wish for many decades."

Bull mainframe announcements open doors for large-systems users

BY SALLY CUSACK
CW STAFF

BILLERICA, Mass. — Groupe Bull announced four new models of its high-end mainframe family, giving existing GCOS users more upgrade options and giving other Bull large-systems clients a lower price entry point to 9000 technology.

The high-end systems, based on NEC Corp. chip technology, come at a time when NEC is negotiating to acquire a portion of Bull, according to an official at the ailing French company. NEC currently owns 15% of Bull's U.S. subsidiary, Bull HN Information Systems, Inc.

The entry-level DPS 9000/61 is a single-CPU-based machine. The company also introduced the DPS 9000/62 dual-CPU platform.

Both systems offer 128M bytes of main memory and one I/O processor with 64 physical channels and an I/O capacity of 96M byte/sec.

At the higher end, Bull unveiled two machines. The 9000/62T has 256M bytes of memory, expandable to 1,024M bytes, and two system control units, and the 9000/92 has 128M bytes of main memory expandable to 512M bytes.

Prices for the new mainframe systems range from $3.9 million for the entry-level 9000/61 to $9.37 million for the high-end 9000/92.

One customer has already taken delivery on the large system. Braxton Vick, senior vice president of corporate services at Carolina Freight Corp. in Cherryville, N.C., recently installed a DPS 9000/62T, giving the company 13% more processing power than the DPS 90/93 and 90/91 systems it replaced.

According to Vick, the dual-CPU system will allow Carolina Freight to run both batch and real-time systems applications on a single machine. Previously, the transactions were executed on separate systems, he said.

The 9000/62T provides two I/O processors, each capable of supporting 64 physical channels and offering a combined I/O capacity of 96M byte/sec., while the 9000/92 can be expanded to two I/O processors with a total of 128 physical channels and 192M byte/sec. of I/O capacity.

A viable competitor

"Groupe Bull, as a distributor of NEC products, bears watching. NEC could come back as a force in the mainframe market," said Frank Gens, vice president at Technology Investment Strategies Corp., a market research firm.

According to Patrick Marx, director of international press relations at Bull, the French company is looking to streamline its European organizations and create greater harmony between Bull HN and the Paris-based parent company.

While a spokeswoman for NEC declined comment, Marx said that the apparent resolution would most likely take form in some type of share swap on a prorated basis.

HP introduces hybrid laser/fax

BY J. A. SAVAGE
CW STAFF

SAN DIEGO — A peripheral that acts as a laser printer and a fax machine is being introduced today by Hewlett-Packard Co. Through the Laserjet Fax, documents can be sent either from a personal computer or from hard copy and printed on a Laserjet printer.

"We're expecting to see more of these integrated peripherals hitting the market soon," said Marc Boer, an analyst at BIS Strategic Decisions, a consulting group in Norwell, Mass. He said the Laserjet Fax is the first of its kind. "But all the major vendors are looking into it," he added.

Aids the Laserjet

The Laserjet Fax works as a facilitator of plain paper faxes, which are then printed on an HP Laserjet printer. It is cabled between the PC and the printer. It is not a stand-alone peripheral because it does not have a printer engine, but it sends faxes to the printer, according to an HP spokesman.

Boer said using this "bridge" peripheral strategy instead of introducing a stand-alone machine is a good method for entering this embryonic market.

"There are 2.5 million HP Laserjets out there that can use this thing," Boer said.

Laserjet Fax prices begin at $1,895.

Fax potential

Hewlett-Packard Co.'s fax product was designed to tap into the large installed base of Laserjet printers

Number of U.S. shipments

1988	
Laserjet Series II	406,000
1989	
Laserjet Series II	600,000
Laserjet Series IIP	160,000
1990	
Laserjet Series II and III	350,000
Laserjet Series IIP	735,000
Laserjet Series IID and IIID	55,000

Source: International Data Corp. CW Chart: Marie Haints

Graphics show turns to Windows

BY ELLIS BOOKER
CW STAFF

CHICAGO — The 12th annual National Computer Graphics Association (NCGA) show last week appropriately carried the theme: "We're doing Windows."

But graphics software developers at the three-day show admitted the Microsoft Corp. Windows 3.0 phenomenon had less to do with the environment's technical capabilities than with its position at the top of the software sales charts.

"They've promoted the hell out of it . . . so we have to have it," observed one vendor, who asked for anonymity.

Windows 3.0 was seen in strength among the 180 vendors at NCGA '91, competing for space with the Apple Computer, Inc. Macintosh and a smattering of Unix end-user interfaces.

Statistics underscore the move to Windows 3.0. A survey by Sudbury, Mass.-based Computer Graphics Research Institute found graphical user interfaces for the arts evenly split between Windows and the Macintosh interface, but "51% said they planned to move from DOS to Windows for presentation graphics," said Research Director Dan Baker. One year ago, only 13% planned a Windows migration, he said.

Unix processors made a strong showing, too. Hewlett-Packard Co. came to NCGA with its recently introduced HP/Apollo 9000 Series 700 family, and IBM showed high-end graphics on its reduced instruction set computing (RISC) workstation, the RISC System/6000.

In addition, several companies announced board-level products to support the RS/6000.

But it may be an inopportune time to enter the high-resolution graphics board business. A recent report issued by Jon Peddie Associates Institute in Oakland, Calif., reported that 1990 sales of the boards were flat, with an expected 20% to 30% growth rate wiped out by a horrendous fourth quarter.

In other NCGA developments, Computer Associates International, Inc. announced ports of the Unix version of CA-Dissplа to IBM's AIX, Cray Computer, Inc.'s Unicos and Silicon Graphics, Inc.'s IRIX Unix implementations.

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TECH TALK

Customers call for help

■ NCR Corp. recently launched a nationwide radio data information service that relays customer service calls to field engineers within 45 seconds. A customer service request to a telephone hot line is keyed into a computer by an operator and then transmitted by radio waves to a field engineer's mobile handheld computer. The company said that 5,000 engineers will use the system to respond to service calls. NCR Corp. signed a $15 million pact with Ardis, a nationwide radio data information service provider.

Pumping up the heart

■ Researchers at the Illinois Institute of Technology in Chicago are developing a computer-controlled pump capable of sensing disturbances in the heart's rhythm and releasing small amounts of drugs into the bloodstream when needed. The disturbances, called arrhythmias, cause most of the 400,000 sudden cardiac deaths in the U.S. each year. Drugs for treatment are available but can be dangerous when taken orally for long periods. The pump system releases a drug into the bloodstream and then shuts off, thereby reducing the toxic effect of long-term, chronic oral drug use.

Computer combustion

■ Using a combination of supercomputing, animation and video recording, chemical engineers at the State University of New York at Buffalo have found a way to examine combustion reactions in production of ceramic materials. The researchers have developed the most complete picture thus far of combustion synthesis of inorganic materials, the rapid chemical reactions that produce ceramics from metal powders for use in automotive, manufacturing and aerospace applications. Combustion reactions are videotaped and studied on scientific workstations using specially designed modeling software.

Creepy, crawly heroes of the AI age

Researchers envision miniature robots cleaning house and clearing clogged arteries

BY JAMES DALY
CW STAFF

Attila is not particularly big or attractive and tends to whine when it walks around the room. But the time may come when Attila — a nimble six-legged robot — and miniaturized versions of the frisky automaton may be heroes of the electronic age, hopping around Mars, swimming through blood vessels or even tidying up your house.

"Can you imagine a little creature living in your home who wanders around picking up dust?" asks Colin Angle, a graduate student at MIT's Mobile Robotics Laboratory in Cambridge, Mass., where Attila was built. "Or you can let it outside and it could live in the tall grass, chopping it and keeping it short."



Insect robots such as Attila *currently serve as an exciting platform for robotics research, but practical applications are on the horizon*

Leading AI light

The shoebox-sized Attila is a leading light in what has developed into an exciting new chapter in artificial intelligence research. While AI scientists typically use complex programs to replicate the independent reasoning process humans perform with ease, Angle used microprocessor-equipped legs with Attila to enact a simpler reactive behavior: a lowered leg knows it should go up, a raised leg knows it should go down. If the legs are not moving in a sequence that allows walking, the first microprocessor figures it should discourage its leg from lifting when other legs are raised. "Walking isn't all that difficult," Colin says, "because the robot has direct feedback when it lifts a leg vs. when it falls down."

This reflex-based design equips the robots with a basic intelligence level on par with that of a grasshopper or termite, hence their nickname: insect robots. "Insects accomplish incredible things using simple reactive and repetitive behaviors," said Anita Flynn, a graduate student and researcher at the lab. "Instead of trying to build subparts of a complex animal, we're building complete parts of very simple animals."

Behind this surface appearance of simplicity exists one of the most sophisticated microrobotic systems ever constructed. Attila packs 25 motors and 11 on-board circuit boards into a five-pound package. One hundred and fifty sensors can determine the lay of the terrain, surface texture, hardness and even color. Self-contained batteries allow up to 40 minutes of ambling time.

Scientists such as Flynn have proposed taking the research to another level by dramatically shrinking the size of the robots and replacing their conventional motors and batteries with tiny micromachines. "We can pack a lot of intelligence onto a tiny chip but often have to power the robots with diesel engines and air conditioners," she said.

Flynn's idea is to integrate the entire robot, from sensors to motors, onto one chip. The machines, dubbed "gnats," would be as tiny as one cubic millimeter and possess near limitless potential: They could explore distant planets, march up plant stalks and kill pests or clear clogged arteries after being injected into the bloodstream.

Although Attila and friends currently serve as a fascinating platform for robotics research, practical applications are on the horizon. Bruce Bullock, chief executive officer of Westlake Village, Calif.-based IS Robotics, Inc., said robots such as Attila could perform jobs that are too risky for humans.

"We could let camera-equipped robots go in a building where a bomb has been set or go down into a mine shaft or an area where there has been a chemical spill," he said.

Bullock also said he hopes to spur the acceptance of robots by lowering the cost of owning one. A machine as technically complex as Attila might cost $50,000. However, IS Robotics has produced a model called R1 that could sell for less than $1,000.

Reliability needs fuel fault-tolerance phenomenon

To err is human; to forgive is fault tolerant — Lawrence Bernstein, vice president of operations systems at AT&T Network Systems

BY MICHAEL ALEXANDER
[illegible]

Is fault-tolerant computing the "designer label of the '90s?" According to Lawrence Bernstein, vice president of operations systems at AT&T Network Systems in Middletown, N.J., "It will have the same magic as computers and software did in the '60s, digital switching in the '70s and fiber fever in the '80s."

Computer users are becoming so dependent on computer technology that they are going to want their systems to be as reliable as their telephone, he said. Paradoxically, the failures of AT&T's own networks in recent years captured public attention so much because they were so unique. The notion that systems must be entirely failproof will be expected of all other systems, Bernstein said. "People don't think about the reliability of bridges in New York until they start falling down."



AT&T Network Systems' Bernstein

That refusal to accept downtime as a normal consequence of computer technology will force virtually every major computer vendor to offer fault-tolerant capability, at least as an option, Bernstein said. It will also lead to a shake-up in the ranks of fault-tolerant hardware and software [illegible].

In addition to no unscheduled downtime, fault-tolerant systems offer users freedom from obsessive machine management, enhanced opportunity to manipulate processes and ease of expansion. Thus far, the four largest areas where fault-tolerant technology is used are the military, aerospace, telecommunications and transaction processing. That will change beginning in 1993 when the industry takes to fault-tolerant computing in a big way, Bernstein predicted.

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Rockville, Md., March 19, 1991 -- Sage Software, Inc. and Index Technology Corporation today announced completion of their previously announced merger, forming a new entity to be called INTERSOLV, Inc.

Kevin J. Burns, former chief executive officer of Sage, will serve as chairman and CEO of INTERSOLV.

Burns said the merger creates the industry's largest supplier of computer-aided software engineering (CASE) tools, with more than 100,000 customers at over 10,000 sites worldwide.

"The formation of INTERSOLV enables [illegible] to offer a more unified line of CASE products that span mainframe, workstation and [illegible]. These products deliver to users the very best of [illegible] as their needs dictate," said Burns. "[illegible] serve our customers by providing [illegible] information system solutions." [illegible] among the [illegible] leading key users of the [illegible] platforms, application [illegible] configuration management through [illegible] reengineering through Design [illegible] under an open, LAN-based desktop [illegible]

[illegible] will continue and expand its [illegible] Ovum, Business Partner, in [illegible] to establish [illegible] at 3200 Tower Oaks Boulevard, Rockville, [illegible]

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EDITORIAL

IS realism

OVERBLOWN EXPECTATIONS. Mistaken calls. Slow turnaround. Chief information officer turnover.

Gee-whiz attitudes and the blind pursuit of competitive advantage maturing into clear-eyed realism.

Cause and effect.

If there is one thing that is perfectly clear from our Executive Report today, based on interviews with 200 senior corporate managers, it is that the go-go years of information systems spending based on anything other than carefully documented justification are over.

Consider that, as in our first chief executive officer survey two years ago, a majority of those polled still don't think they're getting their money's worth for their investment in IS. In the U.S., that's a $200 billion annual investment, making IS the biggest beneficiary of capital outlays.

This statistic comes from a group that believes overwhelmingly that the benefits of IS are quantifiable. Yet they can provide few if any metrics to support this belief. "We don't even try," one chief financial officer said candidly.

So based on gut feeling and other subjective inputs to calibrate the value of the IS investment, the corporate elite are moderating their formerly inflated expectations of just what IS can do for the company. And they are parting with a lot of CIOs along the way.

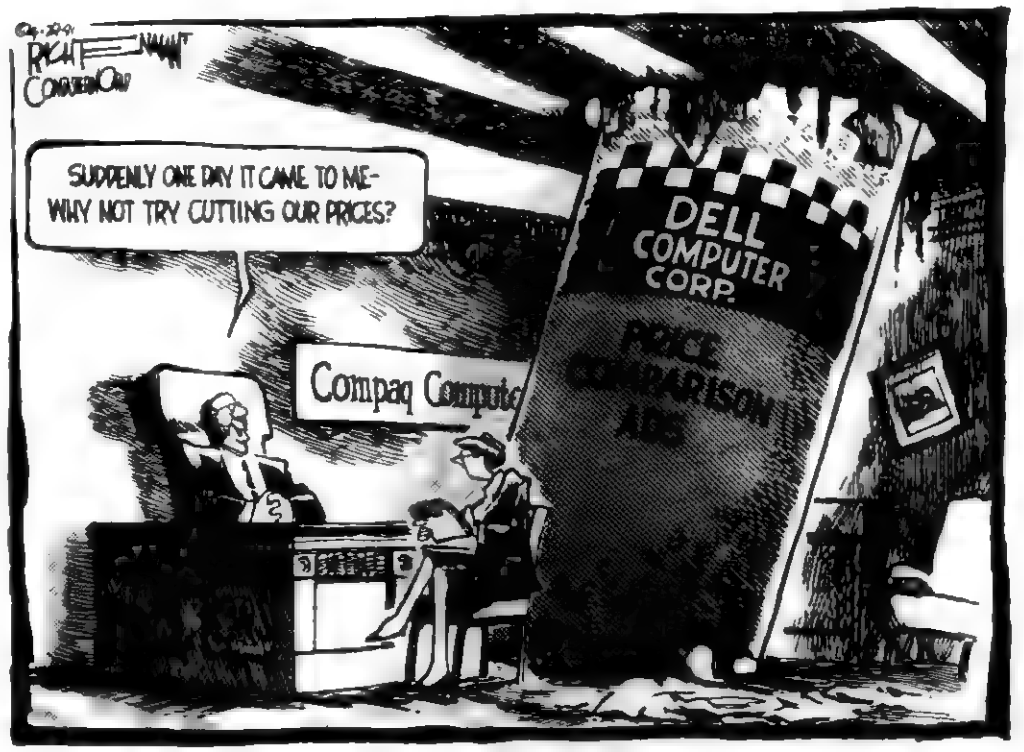
This is not to suggest that IS is not seen as playing a very significant role in the corporate success story. It very much is, as the survey shows.

However, the more sobering reality creeping into the corporate psyche, according to the survey, is that IS certainly won't buy corporate America the Holy Grail of competitive advantage (as just might have been represented by consultants, vendors and IS management).

Rather, they are embracing the management buzzword of the early 1990s, "re-engineering," in a most meaningful way. Simply put, just layering technology onto existing core business processes is a diminishing returns game. Those very processes have to be changed to accept and properly utilize the coming generations of super-high-performance microprocessor-based technology. That's the cold light of dawn striking corporate management.

For the IS executive, this emerging reality should be welcome in that it represents perhaps a more honest set of expectations of the IS function. On the other hand, this reality will also place a heavier burden of responsibility on the CIO to be a much more effective corporate team player while ensuring that the company gets every millimeter of advantage from the dizzying array of technology choices.

This requires that the CIO have, in the words of *Computerworld* Senior Editor Joseph Maglitta, "the technical brilliance of Charles Babbage, the business savvy of Bill Gates, the vision of Thomas Jefferson and the leadership abilities of Gen. H. Norman Schwarzkopf."



LETTERS TO THE EDITOR

All in agreement

I was extremely gratified to read your editorial of April 1, endorsing the repeal of Section 1706 of the Tax Reform Act of 1986. As a member of that select group of independent consultants who have, as you so precisely put it, been tarred and feathered by Section 1706, I agree completely with your stand. I, as well as my friends and colleagues of the Independent Computer Consultants Association, will continue to work to overturn this atrocious regulation. We are delighted, therefore, to have your support in this ongoing fight.

John T. Williams
Williams Software Services, Inc.

OS/2 gets bad rap

I was disappointed when I read "DOS seen through other windows" [CW, March 4], but I wasn't surprised. OS/2 has been misunderstood since the day it was released.

"Windows is configured to run pre-existing applications, while OS/2 Presentation Manager is not" is a really poor, confusing statement. The only sense in which the statement is true is if you mean that a DOS character application will display its characters in a window under Windows and not Presentation Manager. That is a far cry from what you said, which basically sounds like "Old applications will run under Windows but not OS/2."

OS/2 is a complete operating system designed from the ground up to reliably run multiple programs, be portable to different computers, use multiple processors and use large amounts of memory. Windows is not an operating system but instead depends on DOS, which does a terrible job at those things if it can do them at all.

The bottom-line conclusion is that it will take (more) years of unreliability; half-completed, half-baked half-measures; rewriting programs and buying upgrades; complexity in buying and installing computers; slow-running programs; and other types of pain to reach the same point we could reach in six months if programs were rewritten *once* to run under OS/2.

Russell Van Zandt
Systems programmer
The Old Second National Bank of Aurora
Aurora, Ill.

Mixed signals

Regarding the letter from Charles Wang [CW, March 4], I am increasingly amazed at Computer Associates' ability to twist the facts of its support for its products. In his letter, Wang stated that there would be no upgrade fee for CA's products running under VSE/ESA as long as ESA is not exploited. The problem is that people are not going to pay for ESA unless they are going to exploit the software. It appears that Mr. Wang has tried to convince the managers of VSE installation that there is no upgrade cost but while migrating, it would become apparent that upgrade costs would be incurred for CA's products. Unfortunately, that would come too late in the migration for it to be practical to change to hold down the future costs of upgrading.

I have spoken with several other software companies, and none of them are going to charge to make their products run on ESA. It makes you wonder if CA is more concerned about itself than the people who it is supposed to be serving.

Robert Fink
Systems programmer
Lakewood, Colo.

Misdirected blame

As an executive for Realia, Inc., it's evident where Marc S. Sokol's motivation originated for his recent commentary on "Mainframe programmers and the V-8 mentality" [CW, April 15]. While I concur with his observation that migration of application development from the mainframe to the PC has been inexcusably slow, his auto analogy places blame on the wrong drivers. Mainframe programmers typically have no more choice about the development platform than they do about the programming language (Cobol or Cobol).

Management is ultimately responsible for configuring the computing environment; the fact that they're reluctant to invest in the resources and training for a new platform shouldn't cast a negative reflection on the lowly programmer.

Denise Modrick
Modrick Consulting
Collegeville, Pa.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

A diploma can't ensure ethics

If industry wants straight arrows, it must be willing to help form them

BY KAREN FORCHT



Computer security and computer-based crime have been the focus of substantial debate during the past decade. Yet, it remains clear that unethical behavior is common. This is a concern that educators and businessmen must address together.

Many professional groups are developing guidelines in this sea of uncertainty by proposing formal codes of ethics. Such guidelines are a crucial starting point, but they are not enough. Businesses, particularly those in the computer industry, must get more involved in the process of educating future computer professionals about the standards of conduct they will be expected to uphold after graduation.

Two surveys recently conducted by James Madison University make very clear that greater collaboration between the business and educational sectors is necessary if companies truly want employees with high ethical standards. Both surveys were designed to study ethical awareness and practices. One concentrated on business executives in the computer industry; the other on college students.

In the business practitioner survey, a questionnaire was mailed to the chief executive officers of 100 major hardware, software, peripherals and computer service companies. For the most part, the CEOs responding said they adhere to a high standard of personal ethical conduct and computer use. Furthermore, they expect their employees to follow ethical standards. This ethical attitude is reinforced by ethics codes, ethical awareness programs and sanctions or reprimands of offending employees.

When asked whether it was possible to teach ethical behavior in a classroom as opposed to on the job, however, more than 75% said they felt ethics could be acquired in a classroom setting. Based on the results of the student survey, this may be a dangerous assumption.

The student survey mainly targeted business students — sophomores through MBA students. Most of them had previous computer experience in the workplace, ranging from data entry and word processing to operations and specialized internships. When asked if they had engaged in any form of illegal computer use, whether software piracy or some form of hacking, almost half admitted to using the computer for unethical purposes.

Students majoring in accounting and computer information systems are most aware of formal ethical statements and honor codes. Alarmingly, though, while computer IS majors and MBA candidates are aware of the ethical concerns, they also represent the largest segment of student hackers among the survey sample.



Bob Dalton

This finding should cause great concern because these future consultants, bankers and government officials will be working with extremely sensitive information and yet their ethical standards are lacking at this early stage in their careers.

A comment from one of the student respondents shed a great deal of light on the ethics dilemma that is facing education and industry: "I think today, more than ever, students are learning that it is more practical and safe to use the business ethics that they are taught while still in school. However, many times when the students get in a real-world situation, they may feel that they have to do certain things just to stay competitive."

Survey responses indicated that computer industry executives do not condone such compromises and want to hire employees with high ethical standards. What these executives need to realize, however, is that they cannot depend on colleges and universities to do the whole job of ethical education.

For one thing, not all professors espouse the same values, and it is therefore easy for students to receive mixed messages about what is ethical computing behavior. Some professors view hacking as an intellectual pursuit, rather than a serious transgression. Those of us who disagree with that assessment can and do say so, but that does not mean the students believe us when we say that such behavior is not tolerated in business.

If that message is going to get across, it has to come from practitioners; from those who make the hires and set the codes for the workplace. We need you to testify to the value that you place on ethics through direct action.

Support your local university — the one you hire from — by opening your company for field trips or by venturing onto campus to share your values with the students. They need real-life evidence that ethical compromise is not the way to get ahead. From our lips, talk about ethics sounds like ivory tower philosophy. If they hear it from you — loud and clear — chances are they'll start taking computer ethics more seriously.

Forcht is an associate professor of computer information systems at James Madison University in Harrisonburg, Va. She was the 1990 National Computer Educator of the Year.

Want to score big? Learn to carry the ball

BY GEORGE T. SHAHEEN



It's a fact of life. Chief executive officers around the country are tightening their grip on information systems spending and directing more scrutiny at bottom-line justification.

Companies are tightening the clamps for a variety of reasons, from increased competition to the weak economy. But the core problem is that many CEOs aren't satisfied with the bang they are getting for their IS buck.

There's a reason for this: Technology is too often applied in isolation from other parts of the company. It's like digging for gold in one spot. If we don't discover gold, we just keep digging — redoubling our efforts to go deeper, faster. But, if the gold is 20 feet to one side, then we can dig forever without finding it.

The answer is to use technology as the catalyst for business process change, rather than as an end unto itself. And chief information officers should be sounding the trumpet for this approach — acting as "change agents" and leaders pushing for new ideas and directions. We all know that every idea needs a champion if it's ever to get off the ground. CIOs have to serve as the champions for this vision of technology's potential.

Making a real difference

The ultimate test of practical leadership is change that meets people's needs. The bottom-line result of being a change agent is that the organization is substantially improved. A real difference can be seen, felt and measured. The point is not just that a new system is installed but that the new system is in use and making things better for everyone. It's not just that there was a reorganization but that the new structure made a difference. It's not just a creative solution but the implementation of that solution.

Every good leader has, or should develop, the ability to envision the future — the ability to close his eyes and create a mental picture of what he hopes to accomplish. For the CIO, this may include asking himself what role he sees IS playing in his company next year, in five years or beyond. How would it operate? What will its priorities be? What will have changed?

Football coach John Madden tells of a conversation he had with famed coach Vince Lombardi about the differences between a good coach and a bad coach. Lombardi said: "The best coaches know what the end result looks like, whether it's an offensive play, a defensive play or a defensive coverage. If you don't know what the end result is supposed to look like, you can't get there."

What holds true for good coaches also holds true for good leaders when envisioning their future.

For many of you, your vision of the future will be one in which the vast resources of information technology are fully exploited by your firm. A vision where users get the right information when they need it; where the competitiveness of your firm is greatly enhanced by the information you provide; where your IS goals are aligned with overall corporate goals; and where software is developed and improved to break the status quo to reshape business processes.

Achieving the vision

As I see it, there are four key areas of preparation for achieving that vision.

First, the CIO must become the strategic planner for IS, aligning it with corporate goals. If this sounds like common sense, that's because it is. Most good ideas are. Hopefully, many of you are already well on your way in this direction.

Second, the CIO needs to instill confidence among senior management in your ability to manage change brought about by IS. This is where you put your skills as a change agent and leader to the test. You need to let your organization know that you are a key professional member of the team and that you can get the job done right.

Third, a good CIO will be able to demonstrate continued ability to handle current challenges. That means keeping your house in order — delivering new information systems on time, on budget and on target in terms of meeting business needs. You need to prove that IS has the skills to handle what's on its plate now, before getting the nod to tackle more complex challeges.

Finally, the CIO should show how the company's information technology investment is being optimized. Don't shy away from letting others know the benefits and successes the IS function has helped to create — how systems are improving productivity, how time and money are being saved and how better information is getting into the right hands more quickly.

It is imperative that the CIO demonstrate value for the dollars spent. Otherwise, IS will be viewed as a mysterious technological black hole where money vanishes, never to be seen again.

The CIO will continue to hold one of the most challenging and critical positions in the organization. However, major shifts are occurring on all fronts — in technology, human resources and business strategy. To address these concerns effectively, the CIO must be recognised as a leader companywide, taking a view that embraces the whole enterprise.

Shaheen is a worldwide managing partner at Andersen Consulting.

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PROGRESS

The Usual Limits Don't Apply.

COMMENTARY

Teresa Elms

Side road to success



By the light of conventional wisdom, IBM's Application System/400 minicomputer should be a machine in trouble. Squeezed between ever-more-compact mainframes and ever-more-powerful personal computers and workstations, the AS/400 also competes with popular Unix-based minicomputers in a fierce war for commercial computing turf. Worse, the AS/400 is spurned as a migration platform by a significant portion of IBM's System/36 customer base — the single largest target market for AS/400 sales.

Yet Elms Information Services Group estimates 111,000 AS/400s were installed by December 1990, and we project a worldwide installed base of 154,000 systems by the end of this year.

So what's really going on with the AS/400?

First, as AS/400 users have been arguing for years, IBM's midrange computers are not just for midrange computing anymore. Last week's announcement of the powerful AS/400 D models makes the point with a high-end, dyadic processor AS/400 Model D80 that extends well into the 3090

Continued on page 36

HP explores IBM mainframe market

BY J. A. SAVAGE
CW STAFF

Sensing an easy target in the moribund IBM 4381 mainframe market, Hewlett-Packard Co. has assembled a special sales force to sway IBM midrange users to jump ship. While the company will not give unit figures, officials said it is meeting with some success, not only in the 4381 market but in some 3090 sites.

"A lot of our success is throwing out old applications because they're so old they'd have to be rewritten anyway," said Richard Sevcik, general manager of HP's Commercial Systems Division.

For Norman Moore, vice president of management information systems at Macleod-Stedman, Inc. in Winnipeg, Manitoba, the chance to replace old software was motivation for replacing an IBM 4381 and a Bull HN Information Systems, Inc. DPS 7000 with HP equipment. Some of the software running in the data center at the hardware and variety store chain was as much as 17 years old.

Macleod-Stedman went to HP when the firm consolidated its headquarters this January. "No doubt there are substantial savings, primarily in software maintenance," Moore said. He estimated software maintenance costs about $400,000 per year on the mainframes but only about $40,000 per year on the two HP computers, an HP 3000 Series 960 and a 922LX.

George Russell, director of IS at Gates McDonald, a subsidiary of Nationwide Insurance Co.,

> "NO DOUBT THERE are substantial savings, primarily in software maintenance."
>
> NORMAN MOORE
> MACLEOD-STEDMAN

said he went from IBM 3090s to HP computers not just for the cost but for better response times and a competitive edge. The flexibility of the client/server environment allows the firm to customize its services.

The Columbus, Ohio-based claims processor used to share its parent's mainframes, according to Russell. "We didn't see much responsiveness, and we needed more flexibility because each company we process claims for has its own demands."

The change was not undertaken lightly, Russell said. "It scared me for a time. We had to do a total rewrite of the applications." But his two HP 3000s — a Series 935 and a 960 — are making up for the costs in timeshare savings, he said. More importantly, Russell said, it has brought power to the individual worker in a client/server mode.

Sevcik said the recession is helping HP get into what has been IBM territory. "We're seeing more cost-sensitive customers than there used to be." He estimated that HP minicomputers can offer about half the cost of ownership of 4381s.

Pyramid gains speed, lacks software

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Pyramid Technology Corp.'s new Unix and reduced instruction set computing (RISC)-based computers have mainframe speed but not the robust set of system software to which mainframe users are accustomed.

In its new models, the MiServer S series, based on Mips Computer Systems, Inc. RISC architecture, Pyramid has nearly doubled its computer speed. Its earlier T series topped out at 168 million instructions per second (MIPS). Its S series now runs a maximum of 300 MIPS.

However, company officials acknowledged that the kind of comprehensive mainframe management software available on IBM mainframes is lacking. "We have a project to provide that kind of support," said Mark Helfen, director of product marketing at Pyramid. "For instance, we will provide software to manage resources to assure that users get their correct share of system resources and allow the data center to charge back for its services." Pyramid said it expects to have that software within one year.

System software for the new computers currently addresses storage management and mirrored disks for high availability.

"I don't think Unix is capable of supporting [a complex data center environment], like one machine that runs 100 applications," said John Jones, an analyst at Montgomery Securities in San Francisco.

Large memory capacity

Like an IBM mainframe, however, it has large memory, CPU and I/O buses. The first two are 80M byte/sec., and the latter is 40M byte/sec.

The S series can be configured with up to 12 Mips RISC processors. It is the first computer to use Pyramid's implementation of AT&T's Unix System V Release 4. Pyramid's earlier T series uses the University of California at Berkeley's Unix Release 3 as an operating system.

Pyramid will concurrently sell its proprietary RISC architecture, according to Chief Executive Officer Richard Lussier.

Current Pyramid users can get board upgrades, but they cannot mix and match Mips and Pyramid processors within the computer, according to Ed Scott, executive vice president at Pyramid. Pricing for the S series begins at $93,000 and could top out at about $3.5 million, according to a spokesman.

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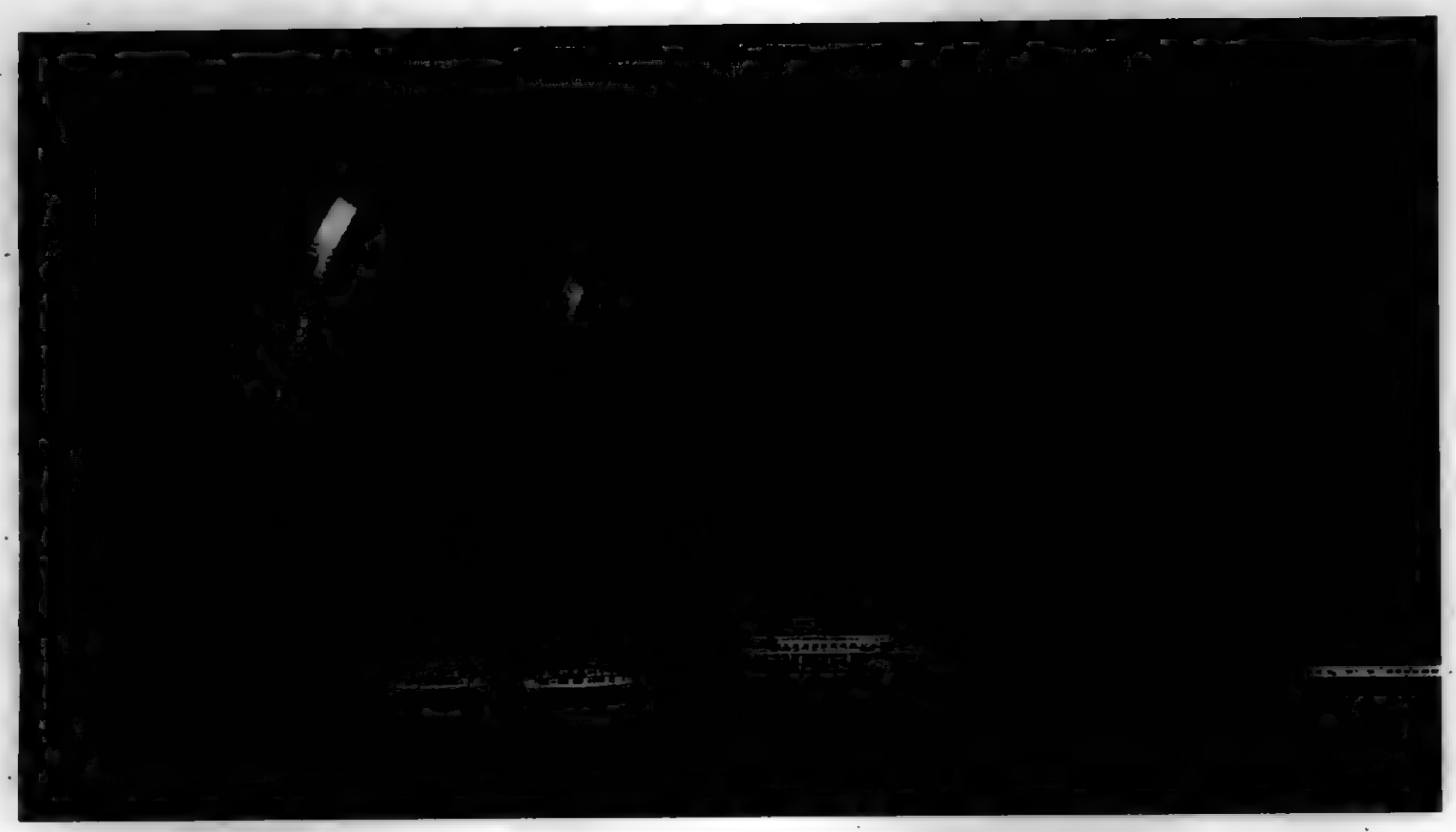
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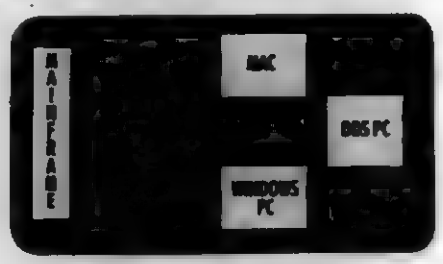
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Giving voice to 'intelligent newspapers'

DEC, Audiotechs use Decvoice to tie circulation, advertising databases into audio/video service

BY MARYFRAN JOHNSON
CW STAFF

Any lighthearted list of popular oxymorons is bound to include "military intelligence" and "postal service." Now computer technology has one to offer as well: "intelligent newspapers."

Coined and created in 1990 by the American Newspaper Publishers Association (ANPA), the intelligent newspaper has been more concept than reality. That may change, however, when Digital Equipment Corp. and Audiotechs, Inc. exhibit their new voice processing wares at an ANPA conference in early June.

DEC and Audiotechs, a start-up software company based in Newton, Mass., will be showing publishers how they can build this "intelligent newspaper" today on DEC's newly enhanced Decvoice voice processing platform, using Audiotechs' Audiokit tools.

News you can use

The idea behind the intelligent newspaper is to tie circulation and advertising databases into audio and video services. Media executives see it as a potentially rewarding way to extend the newspaper's usefulness to its readers by making information readily available by phone.

The more financially compelling reason, however, is the ability to offer added value to advertisers, said Stephen Reynolds, director of interactive media research at Link Resources Corp. in New York.

"There is a real evolution going on in the way the media, advertising and retail community relate to consumers — and how they reach those consumers," Reynolds said. "One of the trends we see is a true demand for personal information management, the desire on the consumer's part to have better tools to wade through information on a daily basis."

Voice services can give callers a range of options, such as replaying a classified ad or applying for a job by dictating their qualifications into a voice mailbox rather than sending them to a post office box.

People calling in for voice services generally remain anonymous, but newspaper executives are now pondering the marketing potential of tying those folks to a personal identification number — much like a bank card.

"You would identify who you are and a little bit about yourself. Then, as you use the service, your habits are tracked," said David Stotler, circulation marketing manager at the Houston Chronicle.

That tracking will, in turn, enrich the newspaper's customer database with the kind of specific information database marketers are hungry to get.

The potential for using voice services in conjunction with computers and their relational databases "opens up the possibility that voice systems can help feed and develop databases that the newspapers can use," said Paul Cohen, chairman of the advertising systems committee for the International Newspaper Advertising and Marketing Executives in Reston, Va. "The kinds of databases you can develop are only limited by your imagination."

While there are a score of audiotext and voice-mail products on the market now, they are specialised, stand-alone systems that cannot be easily linked to a general purpose computing platform without expensive customization. That is the vacuum DEC hopes to fill with Decvoice on its VAX 4000 and Microvaxes.

"DEC has a good track record, and their Decvoice platform has been noticed by newspaper publishers," Stotler said.

Reynolds noted that Decvoice is "the type of technology that is needed for voice processing services to evolve."

Audiotechs' Audiokit products, which will be available in June and run only on Decvoice, include modular tools and utilities for building and integrating the kind of voice transactions and audiotext applications necessary to put an intelligent newspaper on-line.

"The significant difference with Decvoice is its ability to tie the voice service to database marketing," said Howard Johnson, president of Audiotechs.

The market for voice services is still in its infancy, however. Services that are free to callers — such as stock quotes or baseball scores — generate about $173 million annually, according to Link Resources.

The larger market is in caller-paid voice services, which account for $690 million in annual revenue for 900 numbers and another $300 million for local 976 numbers.

Mainframe arena yields a few thriving pockets

BY CAROL HILDEBRAND
CW STAFF

The once-thriving mainframe market is becoming more barren as outsourcing, downsizing and consolidation make inroads on the territory of IBM and the plug-compatibles. But those mourning the decline of entire market may be missing pockets of fertile ground.

According to a survey by La Jolla, Calif.-based research firm Computer Intelligence, certain niches in the mainframe market are bucking the general decline. The survey, which broke markets out by Standard Industry Classification (SIC) groups, showed increases and declines in site growth.

Areas such as government, medical/education and data processing services showed more than 25% growth. The report attributed the rise in government sector spending to increased military spending during the '80s, while the medical sector growth was pinned to the overall growth of the field.

The outside processing field, while having an adverse effect on the overall industry site distribution, showed growth in its vertical market as demand has increased for off-site data processing and disaster recovery services.

"People have a tendency to say, 'Oh well, the base is shrinking,' and they take it verbatim across all SIC groups, and that's not true," said Jerry Berry, author of the report. "Some areas are declining, but others are actually increasing."

Big declines in banking and manufacturing are not surprising, according to the report, which attributed the former to the crisis in the banking and savings and loan industries and the latter to industry consolidation through mergers, acquisitions and closings.

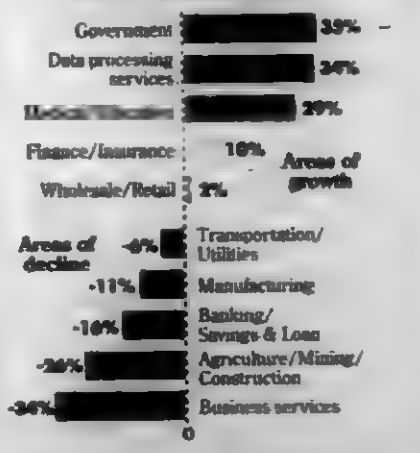
Berry said that another interesting detail was that the decline in mainframe sites does not mean a decline in processing power. While the firm charted an 8% decline in the number of CPUs and a 3% decline in the number of sites with IBM and plug-compatible mainframes, it also noted "a tremendous increase" in terms of processing power and storage capacity.

"The market has flattened off if you're just counting boxes or locations, but if you're looking at the power or the amount of storage, that's going up exponentially."

Berry said he believes this trend will intensify as mainframes are increasingly used for cooperative processing and distributed databases.

Full spectrum

Broad differences have sprouted up in the mainframe buying patterns of various industries, covering a range from 34% drops to 35% gains



Source: Computer Intelligence CW Chart: Doreen St. John

Cotter revamps IS to cut costs, improve distribution

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — Cotter & Co., a $2.3 billion cooperative formed by the owners of True Value Hardware and V&S Variety Stores, is doing a lot of its own retooling these days in an effort to cut costs and get a better handle on distribution.

Cotter has increased its information systems budget by 50% in the past 15 months as part of a three-part program centered around new point-of-sale systems. The cooperative has also upgraded its 15 distribution centers from IBM System/38s to Application System/400s and is pushing heavily into electronic data interchange via satellites.

The short-term costs are high, but, "in the long run, our productivity is going to increase," said John Semkus, vice president of operations at Cotter. "We're going to be able to process information and run our business quicker, more accurately and with fewer people."

Semkus said Cotter began putting its plan for the future in place last year when it began to move its distribution centers off of the System/38s and onto the AS/400s. The company also met with Siemens Nixdorf Information Systems, Inc. and later signed a contract for point-of-sale systems that could be worth as much as $50 million.

Because Cotter is a cooperative organization, member companies can choose whether or not to automate and what platform they wish to use. Between 15% and 20% of the approximately 8,200 stores in the chain are automated in some fashion today. Cotter hopes to have 2,000 of its members using Siemens Nixdorf equipment by 1995. Since October, some 250 stores have chosen to use Siemens Nixdorf equipment.

Cotter is recommending that its members install an Intel Corp. 1486-based tower-style system running Unix, along with Intel 80386SX-based point-of-sale systems with a scanner gun, cash drawer and receipt printer. The boxes will ship with TruTrac, a software application developed by Cotter.

Steve Kirkwood, Cotter's director of MIS, said he expects to build applications to improve the entire order-entry process, create mechanisms for invoicing and making payments, sales and promotional management as well as reduce inventory.

Cotter has been looking into improving its point-of-sale methods for years, Semkus said, but could not find a vendor that could offer the combination of service, training and hardware price it wanted until it talked to Siemens Nixdorf.

Cotter uses satellite technology today to transfer data from its IBM 3090 200S in Chicago to its distribution centers. Eventually, that data will grow to include electronic data interchange between the home office and computerized member stores, Semkus said.

"It'll provide an electronic linkup with the source for data information [the corporate mainframe], so we can better recognize what's selling, and we can respond to that," Semkus said.

Semkus said the firm also has started a planned two-year project to develop real-time, bar code-driven control of its merchandise flow, using radio frequency equipment.

East Coast AIX users beginning to form groups

BY JOHANNA AMBROSIO
CW STAFF

Support groups for users of IBM's AIX operating system are springing up on the East Coast. When the Washington, D.C.-area AIX user group meets for the first time on May 30, it will join the ranks of two similar organizations that have already formed or are about to.

All three groups, including one in the New York/New Jersey area that will host its second meeting on May 21 and one forming in Boston in the fall, are sponsored by Princeton Information Ltd., a New York-based consulting firm.

IBM is providing meeting space for the groups but is lending no other financial support, according to Lester Marcus, Princeton Information's New York/New Jersey user group coordinator. "They did post notices about the group on their Natboard electronic bulletin board, and we got calls from IBMers all over the country," Marcus said.

However, Marcus added, the focus is on reaching users and not IBM employees. "We've got 10 or 11 IBMers, and that's it — we're not accepting any more because this is a users' group."

At the first meetings, held on Feb. 5 in New York and on Feb. 6 in West Orange, N.J., about 90 people showed up from organizations including Aetna Life & Casualty Co., the city of White Plains and Ciba-Geigy Corp., Marcus said.

Up to 100 people are expected for the May meetings, Marcus added, which will include a roundtable discussion about how users begin to implement AIX. The panel will consist of three users and two IBM employees, he said.

Dues for the nonprofit user group are $45 per year, and that fee includes four meetings annually. "Nobody's making money on this," Marcus said. "If there's money left over, maybe we'll lower the dues for next year."

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Standards body releases 4GL guide

BY GARY H. ANTHES
CW STAFF

GAITHERSBURG, Md. — The National Institute of Standards and Technology (NIST) has issued a guide for users who have narrowed their choice of a fourth-generation language (4GL) to a few contenders and need a reliable way to identify which one is best suited to their needs.

The 60-page booklet is the fourth report in the agency's series on 4GLs.

The methodology described in the report, "Functional Benchmarks for Fourth Generation Languages," is based on experience in using 10 commercial 4GL products at NIST's Computer Systems Laboratory. It is intended to evaluate functionality, not performance.

The report breaks the evaluation job into 200 tasks, with 4GLs assessed in terms of their ability to perform the tasks and their ease at performing them. For example, to test a 4GL's ability to create complex menus, the guide tells the evaluator to try 10 things, such as defining a menu with more entries than can be displayed on the screen at one time.

The methodology multiplies the resulting availability and ease-of-use scores by a user-specified weight that indicates the criticality of the function for the user's application. The result allows competing 4GLs to be ranked in order of overall suitability for that application.

THE REPORT BREAKS the evaluation job into 200 tasks, with 4GLs assessed in terms of their ability to perform the tasks and their ease at performing them.

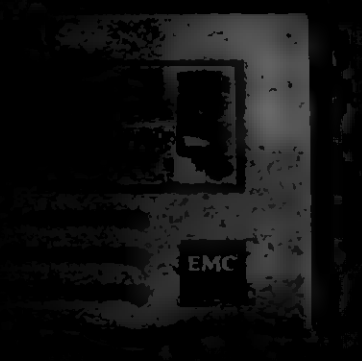
The procedure is actually step nine — "analyze top few in detail" — in a 10-step process described in an earlier NIST publication, "Guide to the Selection and Use of Fourth Generation Languages." The overall process recommends analyzing application requirements and then matching those requirements with product features gleaned from product literature, references, trade shows and the like.

Having narrowed a list of available 4GLs, users should buy personal computer-based versions of the top contenders for use in the NIST methodology, said Martha Gray, co-author of the report. Most can be had for less than $1,000, and that is a small investment to ensure making the optimum choice, she said.

"We were able to complete all the tasks in a few days for some of the products and in a few weeks for others," Gray said.

The book is available for $3.25 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The stock number is 003-003-03071-6.

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Elms

FROM PAGE 27

mainframe class.

By offering mainframe capacity and throughput with midrange economy and ease of use, the AS/400 becomes a complementary alternative to the mainframe rather than a machine without a mission.

AS/400 computing has become sufficiently attractive that even some established System/390 shops have converted their entire "glass house" operation to AS/400s. As much as 5% of AS/400 sales come from mainframe downsizing, according to industry analyst estimates.

However, it is not IBM's intent to cannibalize sales of its lucrative System/390 product line. Enterprise System/9000 users on the leading edge of that technology have such a substantial investment in hardware, software and staff that it rarely makes sense to discard it.

Rather, the growth of AS/400 capacity and performance reflects the growth of IBM's midrange franchise: the small-business sector. Successful small businesses grow much more rapidly than mature businesses, and their demands gradually start to resemble the demands of a large business.

A company may open branch offices or set up warehouses in several locations, each with its own computer resources interconnected via wide-area networks.

IBM has been hard-pressed to increase the capabilities of its midrange machines fast enough to keep up with user requirements — but it must keep up. Our research demonstrates again and again that IBM's midrange customer base would rather buy a DEC VAX than any species of ES/9000.

One key aspect of the AS/400's success has been its high "win" rate against competitive platforms as well as its expansion of midrange market share.

AS/400 revenue grew 12% in 1990, while the overall midrange computer market grew by only 4%. Application Business Systems, the IBM unit that makes the AS/400, contributed $14 billion to IBM's coffers last year — more than all the lines of business combined at the world's No. 2 computer maker, DEC.

Among its strengths are a highly integrated operating system that incorporates relational database management, the availability of 9,000 business application software packages and hardware and software reliability good enough to earn IBM's Rochester, Minn., manufacturing facility the Malcolm Baldrige National Quality Award.

IBM has also used the AS/400 to position itself for the first time as a technology leader in commercial midrange computing. A dedicated unit at IBM's Rochester lab — where AS/400s are designed and built — has spent the past three years enabling advanced technologies such as neural networks, expert systems and image processing for ready use in business applications.

Granted, you don't want to do rocket science on an AS/400. Nevertheless, IBM seems to believe that advanced technologies such as expert systems are sufficiently mature to add to the commercial programmer's bag of tricks.

Still, as IBM continues to grow, the AS/400 to take advantage of high-end opportunities, the system becomes vulnerable to erosion on the low end.

That "no-charge" database, for example, comes with OS/400 whether or not you want it.

The AS/400's entry price is consequently higher than the entry price for a basic Unix system. Furthermore, the AS/400 runs under a proprietary operating system, OS/400, that only partially participates in the movement to open systems through the adoption of international standards, documented application programming interfaces and IBM's blueprint for cross-system compatibility, Systems Application Architecture.

Despite thousands of screens of built-in Help text, the AS/400 is sufficiently complex to require at least one technical expert somewhere on the corporate staff. Small, turnkey System/36 accounts often refuse to hire that first technical expert. They migrate to multiuser PCs or local-area networks instead.

IBM's challenge for the remainder of the decade will be to grow its high-end AS/400 accounts without losing that low-end System/36 installed base. Toward that end, self-managing, self-diagnosing AS/400s with aggressive entry-level prices are already in the works. Stay tuned.

Elms is president of Elms Technical Communications, a market research and technical writing firm in San Diego.

Data service introduced

BY CHRISTOPHER LINDQUIST
CW STAFF

ORLANDO, Fla. — Dynasearch, an information retrieval firm, has introduced the Ultimate Knowledge Service.

Subscribers to the new service, intended for corporate chief executives and business owners, will be given fast, 24-hour-per-day, 365-day-per-year access to a large array of information sources customized to their needs and available in a confidential manner, according to company founder and Research Director Abner Weintraub.

Information for the service is taken from magazines and other publications, databases, surveys, market research and nearly any other source required by a subscriber. Subscribers can request information by telephone or fax.

Subscriptions cost $5,500 per year plus overnight delivery charges, telephone bills and fees for other such items. The number of subscriptions has been limited to 50 until Jan. 1, 1992.

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NEW PRODUCTS—HARDWARE

Data storage

Tense Lectronix, Inc. unveiled a disk array subsystem, the Legacy MASS Hot Fix Device.

Based on a small computer systems interface backplane, the device allows a user-specified configuration of up to eight half-height or four full-height storage devices, including hard and optical drives and tape backup units.

The Hot Fix Device with one 1.2G-byte hard disk costs $7,999. With four 380M-byte disks, it is priced at $13,799.

Tense Lectronix
200 Butterfield Drive
Unit B
Ashland, Mass. 01721
(508) 881-6442

Winchester Systems, Inc. has introduced a high-performance disk subsystem for the Digital Equipment Corp. VAX 4000.

The product uses a random-access memory cache. Flashdisk can reportedly perform up to 250 disk operations per second. Systems are available with up to 16M bytes of cache memory and 6G bytes of disk storage space.

Bundled software adds disk defragmentation, hot-file identification and file management.

Pricing starts at $7,495 for a 4M-byte cache system with 780M bytes of storage.

Winchester Systems
400 W. Cummings Park
Woburn, Mass. 01801
(617) 933-6174



Winchester Systems' Flashdisk can reportedly perform 250 disk operations per second

I/O devices

Avatar Corp. has added two internal cards to its Printer Emulation series of personal computer printer-to-mainframe connectivity products.

Passport-Plus and EP-Connect enable mainframe users to send data to a Hewlett-Packard Co. Laserjet printer or an Epson America, Inc. device.

Passport-Plus fits into the option slot of HP Laserjet II and III series printers and allows those printers to emulate IBM 3287, 3268 and 4224 system printers.

EP-Connect was designed for Epson's printers and features IBM 3287 emulation.

Each product costs $795.

Avatar
65 South St.
Hopkinton, Mass. 01748
(508) 435-3000

Power supplies

Sola Electric Co., a unit of General Signal Corp., has announced a series of uninterruptible power supplies designed to protect systems from brownouts and blackouts.

The CPS II series includes models that feature power ranging from 10 to 100 kVA for use in 50- and 60-Hz applications.

A front control panel displays data pertaining to critical operations. Pricing starts at $24,650 for a 15-kVA model.

Sola Electric
1717 Busse Road
Elk Grove Village, Ill. 60007
(708) 439-2800

Silicon Graphics announces real-time Unix features

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Moving from the general to the specific, Silicon Graphics, Inc. today will introduce its first visual simulation system. The firm primarily makes general-purpose graphics workstations based on Unix.

Skywriter was designed for use in training simulation, such as piloting, where real-time response is crucial. Silicon Graphics has added a set of functions called React, for real-time access technology, to the Unix kernel to allow it to operate in real time, according to Joshua Mogal, product manager for the company's Advanced Systems Division.

React, along with specialized graphics hardware in the computer, will be brought into more general-purpose machines, promised Paul Koontz, director of graphics systems at Silicon Graphics. "As molecular modeling and creative graphics get more sensitive to performance in the next year or so, you'll see it in lower end systems."

Skywriter starts at $209,900, including two Mips-based parallel processors, two graphics pipelines, two monitors and basic memory.

Computer Power, Inc. has introduced its Trimax II smart series of uninterruptible power supplies. The products were designed to provide continuous power protection for mainframes and minicomputers.

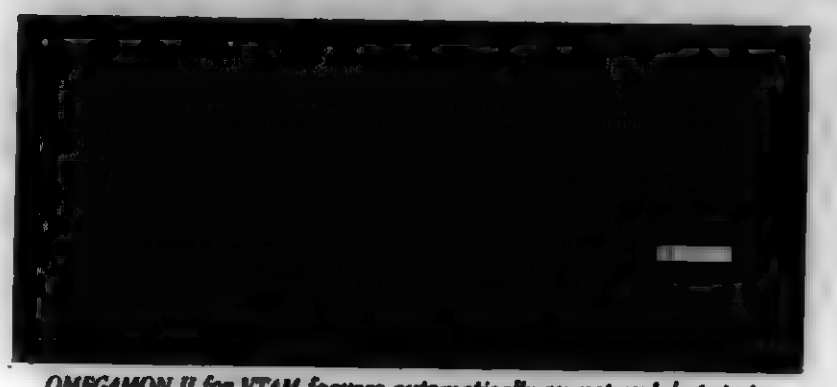
The products accommodate loads ranging from 10 to 300 kVA and feature the CPI-232, a microprocessor-controlled diagnostic interface that enables managers to monitor the status of the power system and respond to problems immediately.

Pricing ranges from $31,598 for a 10-kVA unit with 35 minutes of runtime to $76,869 for a 300-kVA unit with user-specified runtime.

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SOFTWARE

Development tools

Cyberacience Corp. has released Cyberquery/Cyberscreen (CQCS), its fourth-generation language (4GL)/report writer tool kit, for Sun Microsystems, Inc.'s Scalable Processor Architecture platform.

CQCS incorporates integrated mail-merge, transaction processing and a graphics presentation module along with the 4GL and report writer. The product is environment-independent, allowing development of identical applications within Unix, VMS, AOS/VS and MS-DOS operating systems.

Prices for the full development kit range from $4,000 to $19,750.

Cyberacience
Suite 800
10065 E. Harvard Ave.
Denver, Colo. 80231
(303) 745-3900

On-Line Software International, Inc. has announced Release 2.0 of Ad/Vance Datamodeler, a mainframe computer-aided software engineering tool.

The product will be compatible with IBM's AD/Cycle strategy, according to On-Line. It is used for analysis, design and generation of DB2 databases. Included are domain and data type facilities and mainframe dictionary functionality.

Pricing is dependent on processor size. A license for an IBM Group Processor 50 costs $37,500.

On-Line Software International
2 Executive Drive
Fort Lee, N.J. 07024
(201) 592-0009

Applications packages

SDM International, Inc. has announced Release 4.0 of its OCM24/Transaction Control System, an electronic funds transfer software package designed for financial institutions.

The product runs on IBM MVS- or VSE-based systems under CICS and features an electronic reporting system that allows operators to store, retrieve and view on-line financial reports.

Pricing begins at $100,000.

SDM International
134 Spring Ave.
Fuquay-Varina, N.C. 27526
(919) 552-1100

Dynax Resources, Inc. has announced O/F Release 3.0, an IBM Application System/400 distribution/financial package.

The product comprises three modules. Added General Ledger functions include the ability to copy budgets from Lotus Development Corp.'s 1-2-3 personal computer spreadsheet files and to report in multiple formats. Accounts Payable and Accounts Receivable functions are also enhanced to handle foreign currency and streamline check processing, Dynax said.

Pricing is as follows for rack-mounted AS/400 systems: The General Ledger portion costs $15,000; the Accounts Payable, $12,500; and the Accounts Receivable, $12,000. For non-rack-mounted systems, each segment costs $3,000.

Dynax Resources
2 Jericho Plaza
Jericho, N.Y. 11753
(516) 932-9080

Utilities

Velocity Software, Inc. has announced a real-time monitor designed to analyze system performance and monitor data created by VM/XA and VM/ESA users.

Version 1.0 Release 3.0 of Xamon captures system performance data on disk or tape and extracts monitor data for use by Xamap, a VM/XA and VMS/ESA monitor analysis program.

The product is priced at $5,000. Xamap users can purchase it for $3,000.

Velocity Software
1242 Wasatch Drive
Mountain View, Calif. 94040
(415) 964-8867

Novadyne Computer Systems, Inc. has released the System On-Line Maintenance Executive (SOME), a diagnostic and disk utility that reduces downtime for the firm's Reality computer systems.

SOME, installed on-site but invoked via modem by Novadyne service engineers, interrupts operations for no more than 500 milliseconds while reassigning defective media.

The product is available free of charge to all Novadyne contract customers using Reality-based Series 18 systems (under Releases 6.0 and 7.0) and Series 6000 systems (under Release 2.3).

Novadyne Computer Systems
1775 East St. Andrews Place
Santa Ana, Calif. 92705
(714) 566-4810

Services

Level One Technical Support, Inc. has introduced a source-code recovery service.

The service reconstructs lost source code for compiled program objects written in Cobol, RPG II and RPG III under any release of OS/400 Version 1.

The cost is 30 cents per Machine Interface instruction if the template is present in the program object. If the template is missing, the cost is 45 cents per instruction.

Level One Technical Support
14435 Keese Drive
Whittier, Calif. 90604
(818) 884-3589

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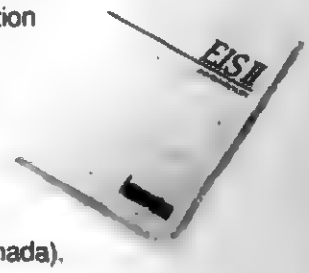
It's estimated that more than half of today's Executive Information Systems fail*. So if you're thinking about installing a traditional EIS, think twice.

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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."

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COMMENTARY

Patricia Keefe

Do or die for OS/2



Now or never caught up with IBM two weeks ago, after the company caved in to user pressure and finally broke a prolonged public silence on OS/2.

Having complied, IBM's bid to place OS/2 on the desktop has entered the do-or-die phase. If OS/2 Version 2.0 doesn't fly, then IBM might as well spike any lingering hopes about becoming a major influence in desktop software.

On the surface, the IBM briefing didn't have a whole lot of new things to say. I mean, who didn't know that IBM was "committed" to OS/2? Anyone who cared to find out already knew a great deal about OS/2 2.0's feature set and that delivery is at least six months off. IBM has been pretty public about both points. And the idea that OS/2 might be a bit too pricey and bereft of useful tools is another bit of old news.

No, you have to look a little closer at the OS/2 hoopla. IBM is doing more here than just spending megamillions on the one hand and cutting price tags on the other. First, there is the level of involvement and concern evident within the highest echelons.

Continued on page 46

Windows 3.0A tackles UAE bug

BY JAMES DALY
CW STAFF

Three words strike fear into the hearts of hard-core users of Microsoft Corp.'s Windows 3.0: Unrecoverable Application Error (UAE). When that ambiguous warning flashes on-screen, it typically signals a crashing application, unwanted delays and probably a short burst of language unfit for a family newspaper.

To make matters more maddening, the UAE message appears on a wide variety of applications and its cause is difficult to pinpoint. The result is an uneasy foreboding as users wonder if they will walk down the same troubled path twice.

Relief from UAE nightmares, however, has arrived. For the past few months, Microsoft's Product Support Services group has quietly offered Windows 3.0A, a maintenance update offered on an "as-needed" basis that contains code rewrites, setup program improvements and an instructional booklet designed to offset frustrating UAE problems.

Additionally, Microsoft spokeswoman Cathy Licht said the changes inherent in Windows 3.0A have been built into Windows since November.

Although UAEs can occur anytime, users said the problems are most frequent when Windows 3.0 is pushed to its limits:

- While working with networking applications. Users may experience data loss and/or packet corruption problems in Windows network connectivity applications.
- During enhanced-mode dynamic data exchange (DDE), which allows sharing and updating of information between applications while using a personal computer equipped with at least an Intel Corp. 80386 microprocessor and 2M bytes of memory.
- Under low memory conditions. Operating Windows 3.0 under very low memory conditions can cause a UAE when program code is being swapped into and out of random-access memory from the hard disk.
- While printing. Most printing operations require a lot of memory to load drivers and prepare data output, causing Windows 3.0 to run low on memory. UAEs often result.

Another UAE case

Users noted that programs running in Windows 3.0 standard mode may also experience UAEs when protected-mode code calls into real-mode drivers, including 3270 emulators as well as fax board and scanner drivers. Version 3.0A fixes these problems.

Microsoft officials said users experiencing frequent UAEs should contact product support for advice about updating to Version 3.0A.

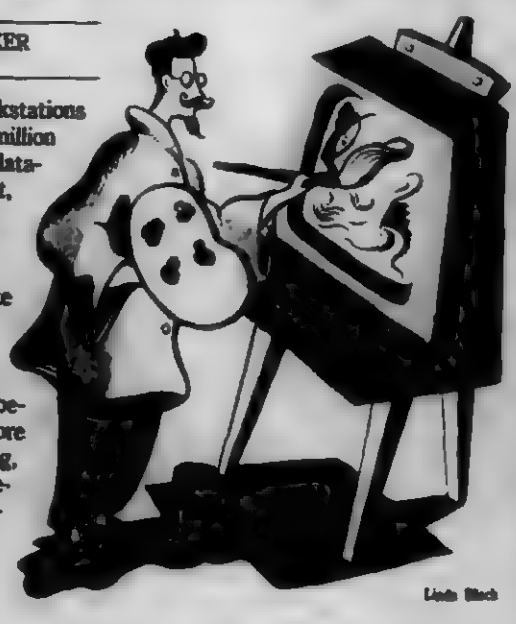
Windows 3.0A users said the fix smoothes out a lot of problems but does not completely eradicate them. "I've seen a lot of printing and DDE problems fixed, but there are still aberrations," said Joel Diamond, technical director at the Windows Users Group in Media, Pa. "I'm sure they're probably looking at a Version 3.0B by now," he said.

Graphic interfaces need artful programmers

BY ELLIS BOOKER
CW STAFF

CHICAGO — Workstations able to display 16.7 million colors; multimedia databases containing text, graphics, sound and full-motion video; and graphical user interfaces (GUI) that make the "system prompt" a thing of the past.

These technologies, which many believe are the future core of end-user computing, are putting new demands on software developers. Those developers must now create systems and interfaces as aesthetically pleasing as they are functional.



Linda Black

"[GUIs] have to visually pack a lot of information," said Ann M. Palermo, director of office systems research at International Data Corp. in Framingham, Mass. "If you look at an icon and have to ask, 'What's that?' it isn't working."

Applications developers are doing a better job with color and composition, Palermo said, because they are relying more on the advice of outside design consultants. "When people first started using color screens, there were some ghastly combinations," she recalled.

To improve his graphical sensibilities, Edward J. Gottsman took a basic drawing class. A manager at Andersen Consulting's Cstar research organization in Chicago, Gottsman recently completed the three-month class at the School of the Art Institute of Chicago.

"It sounded like a good idea in principle, but I couldn't quite bear myself explaining it my boss," said Gottsman, who paid his own tuition for

Continued on page 47



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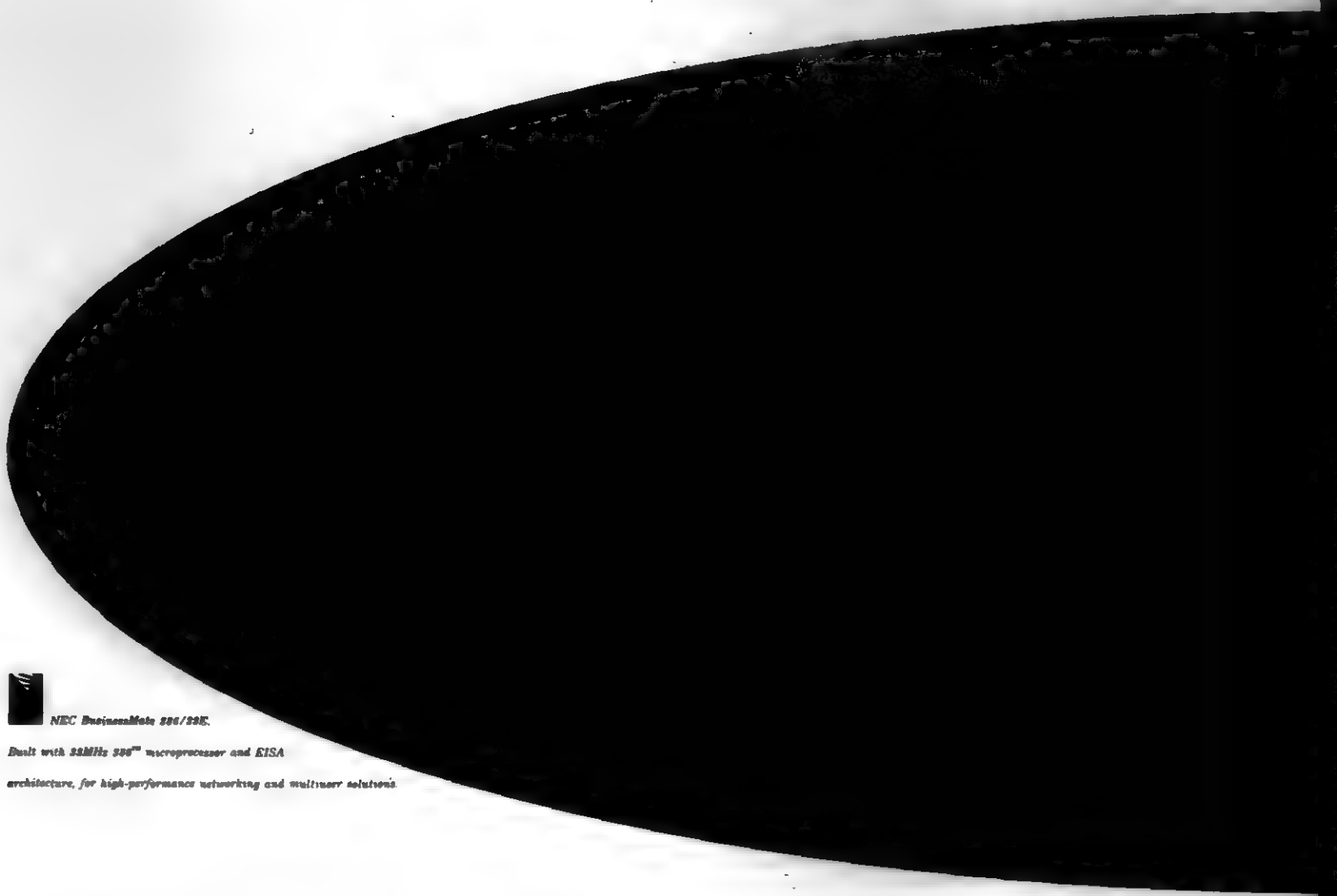
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Indiana team sets pace for game preparation

ON SITE

BY MICHAEL FITZGERALD

INDIANAPOLIS — The Indiana Pacers think they have figured out a way to stop Michael Jordan and the Chicago Bulls, thanks to their computer network.

"Michael Jordan hasn't won a game in here since we've gone to computers," said Mike Mullen, computer analyst for the Pacers. The streak ended at six, though, shortly after Mullen made that statement, when the Bulls beat Indiana here at Market Square Arena. Still, using computerized play selection and analysis has improved the Pacers' overall performance, Mullen said.

The Pacers use their computer system to analyze what the Bulls or any other National Basketball Association (NBA) team will do in certain situations with particular players on the floor. While Mullen calls the Pacers' 6-1 record against the Bulls an "interesting side note," the Pacers think technology is more than an item of interest.

The team committed to a completely computerized operation three years ago, and today it has a 25-node network of NEC Corp. machines with an Advanced Logic Research, Inc. file server.

Its plan now is to bring technology to the bench by outfitting the team's coaches with Poqet Computer Corp. Poqets. The Pacers have two Poqets: one used by the team president, Donnie Walsh, to help him plan deals when he is on the road; the other is used by George Irvine, assistant coach and director of basketball operations.

The Pacers picked the Poqet primarily because of its proportions. The team considered notebook-size machines but found them too large for coaches to take on the road, when added to a full briefcase, suitcase and garment bags.

Notebooks "just are not suitable for the NBA," Mullen said. The Pacers waited, he said, for someone to invent a pocket-size computer. The Poqet seemed tailor-made, and the team plans to add two more before next season.

The Pacers have expanded their use of the Poqet. Last year, they drafted players based on information in a home-built database written in Alpha Software Corp.'s Alpha III, which is compatible with Ashton-Tate Corp.'s Dbase. This year, coaches input information into Bellevue, Wash.-based Buttonware, Inc.'s PC File, a file manager with relational reporting abilities. Mullen then loads the files into Dbase IV. This year, their draft pick will be made based on the same program running on the network.

The Pacers' official responsible for drafting in New York will have the Poqet on hand, as well as reference to the whole database on the local-area network. The game-planning system uses the same basic approach.

Past results

The Pacers hope the computer generates the same kind of discovery they made at last year's draft.

With its first pick buried deep in the second round of the draft (typically, only first-round picks make a team), the Pacers last year selected Kenny Williams, who had attended a junior college and had not played basketball in a year. The pick drew groans in Indiana and laughs around the rest of the league, but Williams made the team and scored well in this season's slam-dunk contest at the NBA All-Star game.



The NBA's Indiana Pacers *are using Poqet Computer Corp. machines for game preparation*

Mullen's current goal is to continue developing play analysis programs that the coaches can use during game time next season. The team may also decide to have Mullen sit on the bench during games.

"The biggest stumbling block is the end user, but once they get used to it and aren't scared of it anymore, they'll be using it," Mullen predicted.

Despite the relational databases and pregame computer analysis, the basketball coaching staff still has to make the decisions, especially since the computer occasionally generates suspect statistics. "I keep popping up that Mike Mullen is the best shooter in the league, but they won't believe me," Mullen quipped.

Attracting the fans

The Indiana Pacers play in one of the NBA's smallest markets, so the marketing department has turned to the team's LAN to draw more fans.

Mark Andrew Zwartynski, director of ticket sales and game operations for the Pacers, said the team has been using the network extensively to develop sophisticated approaches to linking its various databases of research drawn from season ticket sales, focus groups and other sources. The team's intention is to target its customers more closely.

Zwartynski said it is too early to tell what kind of impact these new methods will have on attendance, which dropped this season. He did say, however, that last year "we broke all attendance records for the 25-year history of the franchise. This current marketing staff has had the most sellouts in any given year, most sellouts in any number of consecutive years and highest average attendance in our history."

IMRS, Lotus update tool

BY MAURA J. HARRINGTON

IMRS, Inc., based in Stamford, Conn., and Lotus Development Corp., based in Cambridge, Mass., recently introduced Executive Forum, a groupware software application specifically made for local-area network users running Lotus Notes under IMRS' Ontrack Executive Information System (EIS).

Executive Forum allows groupware users within IMRS' EIS system to hold an electronic mail conference using Lotus Notes. It also enables an executive to, for example, direct one note or memo to multiple users and attach it to any application residing under EIS, according to the vendors.

"This product is made for executives looking for the 'why' behind the answers in EIS reports — what we call the soft facts," said Gordon Raplin, IMRS' vice president of product development.

Added compatibility

Another feature that is provided in Executive Forum is the ability to reply to or add to any application that resides under EIS or Lotus Notes, according to Raplin.

IMRS developed its own graphical interface for the product, based on Microsoft Corp.'s Windows Version 3.0.

Executive Forum is expected to ship in volume this June. Pricing for a 10-user license is set at $25,000, the company said.

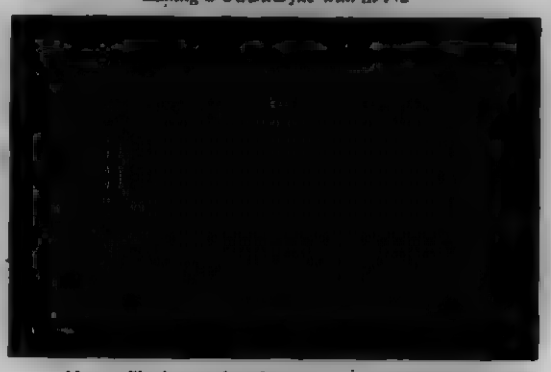
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Micrografx copilots OS/2 2.0

BY PATRICIA KEEFE
CW STAFF

RICHARDSON, Texas — If OS/2 ever catches the user wave, Micrografx, Inc. plans to be along for the ride.

The graphics software developer is one of the most visible Windows proponents, and, when not working with Microsoft Corp., has occasionally proved to be one of its sharper critics. Two weeks ago, the savvy Texans leapt aboard OS/2 with both feet, clinching an extensive and influential joint development pact with IBM.

Micrografx has not only pledged to port its successful line of applications to OS/2 2.0 but will also lend its expertise to fixing and extending OS/2.

For starters, Micrografx will rewrite Presentation Manager's graphical engine to be 32 bit, portable and faster, said Lee Reiswig, IBM's assistant general manager of programming and personal systems.

"Presentation Manager's engine today is a mix of 16-bit assembler and C code. Micrografx will convert all that to C and make it 32 bit," Reiswig explained. Micrografx will also improve the algorithm, boosting performance 30% to 40% faster than the 16-bit engine.

IBM also plans to use an advanced version of Micrografx's Advanced Mirrors migration software, renamed the High Performance Windows Porting Layer (HPWPL), to assist developers in porting Windows software to OS/2.

Micrografx, Inc./IBM agreement

- Rewrite OS/2 Presentation Manager graphics engine.
- High performance Windows porting layer.
- OS/2 Device Driver Toolkit.
- Device drivers.
- Data-driven graphics application bundled with OS/2.

"I don't know why they need a porting layer if OS/2 [2.0] will run Windows applications," said Steve Ballmer, Microsoft's executive vice president of system software. "If IBM figures out how to run Windows applications natively under OS.2, you won't need to port," he said.

Micrografx Chairman Paul Grayson said that while Microsoft's Windows Libraries for OS/2 lack 32-bit support, Advanced Mirrors, or HPWPL, has it. This means Windows applications will be able to run faster under OS/2, he said.

IBM also gets a Presentation Manager device driver kit, complete development of a Windows device driver porting layer and three drivers said to enhance OS/2 support for color output devices.

Keefe

CONTINUED FROM PAGE 41

Chairman John Akers and President Jack Kuehler were concerned enough to drag themselves away from other things to address OS/2 concerns. Akers presided over a dinner with IBM's top 250 accounts. Kuehler attended the forums in celluloid spirit, if not in the flesh. Consider that they did not show up for last fall's Enterprise System/9000 introduction, which IBM termed "the most significant announcement in 25 years."

Kuehler's videotaped presentation pressed the point that IBM's determination to succeed with OS/2 doesn't need help from anyone else — i.e., Microsoft.

This was not the only volley directed at Microsoft. In a demonstration that provided concrete examples, Lee Reiswig, IBM's assistant general manager of programming and personal systems, positioned OS/2 as a "better DOS than DOS," a "better Windows than Windows," and even a "better OS/2."

He also stressed product quality, which IBM says it began to correct with the release of OS/2 1.3. In an interview, Reiswig said IBM "had" to bring out Version 1.3, which he appears to view as the first quality release of OS/2, and said that doing so delayed the release of OS/2 2.0 by a year. He claimed that Microsoft's position was to skip 1.3 and go right to 2.0.

OS/2's long-term survival and viability will be measured by IBM's success in a number of areas including the following:

- Whether Version 2.0 ships in 1991. This is no time to encounter the supply constraints plaguing a good portion of IBM's desktop computer deliveries.
- Whether Version 2.0 works properly out of the chute. This late in the game, it is unlikely that 2.0 could recover from a bug whiplash similar to that which hit the initial ship of Windows 3.0.
- Whether Version 2.0's promise of an integrated environmental shell that will run DOS, Windows and OS/2 programs succeeds in winning over both the client in general and the bulk of a skeptical Fortune 1,000 in particular. IBM will have to convince users that 2.0 can and should compete with Windows for the desktop.
- Whether IBM can pump up the volume of OS/2-specific applications. In the briefing, IBM talked about having 2,500 applications to run under OS/2 Version 2.0 but conceded that only about 300 are Presentation Manager-specific.

Keefe is *Computerworld*'s senior editor, PCs and workstations.

dFacts Are In.

DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
EASE OF USE			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications without programming	Yes	Yes	No
Modern pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
PRODUCTIVITY			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
POWER & FLEXIBILITY			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	6	3
INDUSTRY STANDARDS			
#1 Selling, #1 Rated multiuser database; over 3 million users (*)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, ZenOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 35% of PC database systems sold (3 times nearest competitor) according to the most recent reports by the market research firms Ander & Survey's (Oct. 1990) (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX and Sun's Workstation and other UNIX Platforms are announced

Based on what our customers tell us, we made a list of some of the most important features to look for in data management software.

Then we compared the new dBASE IV® version 1.1 with two other database products.

As you can see, dBASE IV offers exclusive advantages in many categories.

For instance, only dBASE IV lets you access all its functions from a single screen. Called the Control Center, this screen lets you manage existing data, and create new tables, queries, reports, forms and labels totally without programming.

When all the facts are on the table, it's easy to see which database software is best.

Of course we aren't the only ones who have come to this particular conclusion.

Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

Trademark/owner dBASE IV, Ashton-Tate, Ashton-Tate logo/Ashton-Tate Corp. Other company or product names mentioned may be

Sharp, Panasonic show portables

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — Sharp Electronics Corp. and Panasonic Communications and Systems Co. headed a list of companies that introduced new portable computers at the recent Laptop & Palmtop Expo '91.

Panasonic brought out the CF-370H6 Business Partner, a notebook computer based on Intel Corp.'s 20-MHz 80386SX chip. The 6.8-pound CF-370H6 features a 60M-byte hard drive, a 7½-in. IBM Video Graphics Array-compatible display, 1M byte of random-access memory, expandable to 5M bytes, and a suspend/resume function.

It will be available toward the end of next month and will retail for $4,799. Panasonic also made it possible to put a 60M-byte hard drive in its CF-270H6 Intel 80286-based notebook.

Sharp introduced new versions of its Wizard electronic organizers. The Wizard Signature series has a top memory of 128K bytes, double the 64K bytes available previously.

The machines also currently have Qwerty-style Chiclet keyboards and offer a larger, sharper display as well as software improvements, including on-line Help.

Graphic

CONTINUED FROM PAGE 41

the course, which met once per week for four hours.

An economist and computer scientist by training, Gottsman said he realized he had no understanding of color or composition. This was a problem for someone working in Cstar's six-person Human Systems Integration Lab, which is trying to figure out the best "packaging" for multimedia databases.

The result? "There were daily humiliations . . . but I've made a good beginning," Gottsman said. "I no longer find it foreign or irrelevant to the work I do." Specifically, he said, the class gave him an appreciation for the communication and miscommunication that can occur with a [redacted].

Gottsman's work at the moment is a prototype multimedia teaching tool for Anderaen Consulting systems integration analysts.

Dubbed Vader for video assisted delivery of experience and reasoning, it includes text about different subjects relevant to systems integration, and also features several video personalities, whom the user can "wake up" to narrate stories, and anecdotes that teach different business concepts.

"[Designing] a 3270-type interface, there's only so much damage you can do," Gottsman said. What is more, the customer base is changing and is coming to expect more attractive and graphically entertaining screens.

On his desk, Gottsman has an Apple Computer, Inc. Macintosh IICX with a two-page Radius, Inc. color monitor.

However, sending people to art school is "too cookbook," said Richard Crandall, president and chief executive officer of Comshare, Inc., an executive information system (EIS) software developer in Ann Arbor, Mich. He acknowledged he has not even found a good way to interview for art aptitude, let alone instill it in his pro[redacted].

"You just have to take people who you suspect can do [GUIs] well and mix them in with a group that does this well . . . It's a very slow process," Crandall said. Over time, he added, the company has developed a style guide for its development staff describing what works and what does not work in GUIs.

COMSHARE'S APPROACH TO creating its highly graphical user interfaces begins by identifying the populations that will implement them.

The human element

Comshare's approach to creating its highly graphical user interfaces begins by identifying the populations that will implement them. The human interface requirements are different for computer-illiterate executives than they are for more computer-savvy managers, according to Crandall.

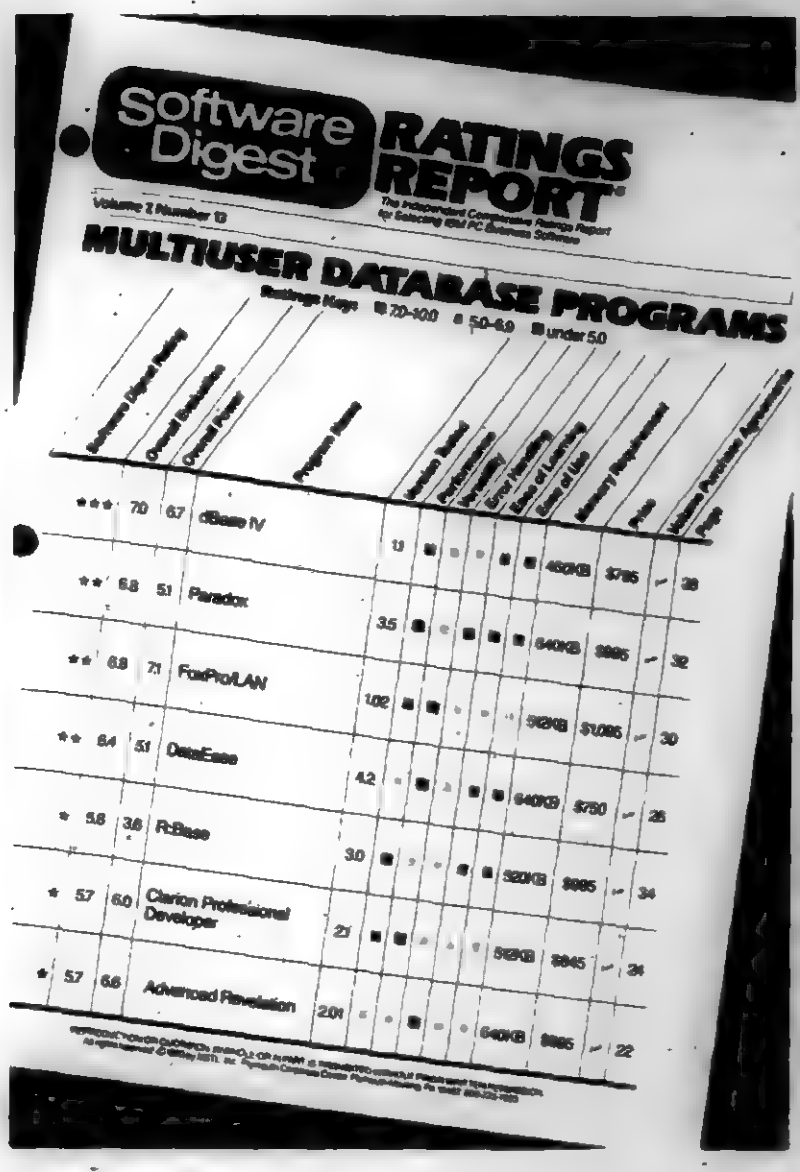
The effect of the art class can be seen in at least one of Gottsman's recent icons, a yellow Post-it-type note. When the user decides to "tear up" the note, a jagged black line is sent through the icon.

According to Gottsman, the aesthetic demands of user interfaces are expected to increase dramatically by 1996, "when simulation technology is available on the desktop."

However, Gottsman acknowledged he is unsure what the future multimedia, highly graphical user interface will look like. By way of analogy, he pointed to mistakes made during the dawn of television. "Some saw TV as radio with pictures," he explained.

One unsuccessful show, he said, simply gave its audience a picture of the traffic on the street in front of its building while playing its usual musical selections.

dTruth Comes Out.



Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

"Among the top ranking programs, dBASE IV (version 1.1) is the most well-rounded, with solid performance, versatility, and usability." Commenting on speed, *Software Digest* points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use and Ease of Learning, dBASE IV scored in the Excellent Range as many times as any other multiuser database product tested.

For a free evaluation kit, including competitive details and a free demo disk, call toll-free: 1-800-437-4329 ext. 1416. Better yet, call 1-800-2ASHTON to upgrade to the new dBASE IV now.



The truth is, no other database can do so much to improve productivity.

Ashton-Tate

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Optical discs move into reach

ANALYSIS

BY MAURA J. HARRINGTON
CW STAFF

End users are finally beginning to embrace optical disc technology, but it will be a while before they will be able to take full advantage of everything this technology has to offer at an affordable price.

Analysts concurred that while optical disc hardware prices have dropped significantly in the past year, compact disc/read-only memory (CD-ROM) and write-once read-many (WORM) drives are still too expensive for end users to easily justify the investment, partly because standards are still lacking for cross-platform optical disc technology.

"It will be 1995 before there is a mass acceptance of optical disc technology," said Bob Abraham, vice president of Freeman Associates, a market research firm based in Santa Barbara, Calif.

Nevertheless, optical disc technology is moving closer toward the average computer user's desktop.

CD-ROM usage is expected to balloon next year, according to a recent Datapro Research Group survey of federal government and military users. Of 900 respondents polled recently, only 26% said they are now using CD-ROM products. But that number will increase to 82% during the next year, the poll found.

The retail price of CD-ROM drives has dropped significantly in one year, from about $1,000 in 1990 to as low as $400 this year, with even more price drops expected in 1992, analysts said.

Prices for 5¼-in. WORM drives have come down from the $5,000 price range in 1988 to an expected end-user price range of $2,500 to $3,000 for a WORM drive introduced last month by JVC Ltd.

CD-ROM clincher

The decrease in hardware prices and the significant increase in mainstream software applications being delivered on CD-ROM were two of the factors that clinched Whirlpool Co.'s decision to move all of its product manuals from microfiche to CD-ROM, the Benton Harbor, Mich.-based company said.

By putting those documents on CD-ROM, using Microsoft Corp.'s Windows 3.0 as the front-end interface, Whirlpool increased the speed of its customer help service, knocking down the average time spent per call from approximately six minutes to about 4½ minutes, according to Bruce Dacre, Whirlpool's director of project management for the Consumer Affairs Group.

Officials at the U.S. Department of Commerce's Patent and Trademark Office said the agency improved its service relations by making all of its patent and trade records available to the public on CD-ROM.

Both Whirlpool and the Patent and Trade Office developed their own CD-ROM titles using WORM mastering systems that cost in the tens of thousands of dollars, a price far too expensive for many IS shops.

Price is not the only problem facing IS managers looking to publish their own CD-ROM titles or install CD-ROM drives in their IS shops. There is still no way to interchange CD-ROMs across multiple platforms.

For example, a CD-ROM disc running on a Unix machine cannot be read by a DOS-based machine. A standard, multiplatform file format system must be incorporated. While there is no solution to date, there are several vendor consortia working on standards that address various layers of the incompatibility problem.

So far, most of the current efforts to develop a standard file format system for optical discs revolve around the International Organization for Standardization's (ISO) standard.

The ISO 9660 standard specifies the media and basic drive characteristics for CD-ROM. The specifications were first developed by Sony Corp. and Philips Telecommunications N.V. Because the ISO 9660 standard is a physical standard, efforts are now focused on defining a set volume capacity and file format structure for all types of optical discs — including CD-ROM, CD-Write Once and magnetic optical discs.

One effort is being undertaken by the Rock Ridge Group, an ad hoc committee led by Young Minds, Inc., a CD-ROM publishing company based in Redlands, Calif. The group proposed two protocols to the ISO as enhancements to the present CD-ROM standard. The protocols were designed to allow Unix workstations to read DOS-based CD-ROM discs.

Another advisory committee, called the Frankfurt Group, is working on a volume and file structure standard for recordable CD-ROM discs, also known as CD Write-Once discs.

While these standards proposals demonstrate the advancement in optical disc technology, the time factor cannot be ignored. Even if these proposals were to become de facto standards, as the organizations hope, they could not be incorporated into the ISO 9660 standard until it is up for review by the ISO in 1993.

Gaining bit by bit

CD-ROM technology is winning acceptance, although slowly

- Analysts say they still believe that it will be 1995 before compact disc technology is widely accepted by corporate users, with the lack of standards being one barrier
- Base prices for CD-ROM drives have dropped precipitously in one year, from $1,000 to $400
- Lower prices and the availability of more applications have already led to increases in corporate use of CD-ROM

CW Chart: Doreen St. John



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CW0491

Sun users hot on CD-ROM trail

Despite the fact that Sun Microsystems, Inc.'s workstation and networking users are being forced into investing in CD-ROM technology by the end of this year, the enthusiasm for CD-ROM technology among Sun users appears to be mounting.

While Hewlett-Packard Co., Digital Equipment Corp. and Sun have all begun offering their systems software on CD-ROM, reasoning that it is more convenient for the end user as well as being cheaper than tape, it is Sun that has led the pack in its efforts to integrate CD-ROM into the workstation industry.

"By offering our system software solely on CD-ROM, we are able to save money, and that savings can be passed on to the end user," said Jamie Rapperport, Sun's distribution program manager. Rapperport admitted that in the past, users have been reluctant to adopt CD-ROM technology into their systems. However, he asserted that the company's decision to offer its systems software only on CD-ROM was in response to user demands. Although none of the users interviewed for this article said they asked Sun to transfer its systems software from tape to CD-ROM, many agreed that the new medium has its benefits.

Sun user Bob Shutties, local-area network administrator at the Los Alamos National Laboratory in Los Alamos, N.M., said he has installed CD-ROM drives in the laboratory's network servers, and he likes the benefits the technology has brought him so far.

"Having our system software installed on CD-ROM over the network works out very nicely. It cuts the installation time by about two thirds compared to that of tape," Shutties said.

"I think CD-ROM is great; we have drives installed here and we use it. The only thing is, the technology is still a little too expensive for everyone to have their own drive right now," said Sun user Michael Cutter, a member of the technical staff at AT&T Bell Laboratories in Whippany, N.J.

MAURA J. HARRINGTON

Due to a lack of photographic contrast, this page did not reproduce well.

Dataease 4.24: Power with lots of structure

Dataease International, Inc.'s Dataease Version 4.24

Reviewer	Ease of use	Data integrity	Multiuser support	Performance	Applications development	Documentation	Service & support	Value	Notes
Infoworld 1/14/91	Very good	Good	Good	Satisfactory	Satisfactory	Good	Excellent	Good	Powerful. Limited programming
LAN Times 6/90	Very easy to use	Ensures accuracy	Several good features	NC	Powerful and flexible	Complete	NC	NC	Easy but powerful
PC World 5/91	Good	NC	Excellent	Fair	Fair	NC	NC	Good	Friendly. Lacks debugger
Users									
Bill Sheldon, Mobil Oil Corp.	■■	■■	■■	■■	■■	NC	■	■■	Just what we want in a DBMS
Martin Fox, Manufacturers Hanover Trust Co.	■■	■■	■	■■	■■	■	■	■■	Best product for the price
Drew Hannah, Connecticut Mutual Life Insurance Co.	■	■	▮	■	■	▮	■■	■■	Power and ease but not flexible
Analysts									
Karen Offermann, Datapro Research	■■	■	■	■	▮	■	■■	■	Intuitive and powerful
Jerry Caron, Faulkner Microcomputer Reports	■	■■	■■	■■	■	■	■	■■	Outstanding package
Ty Fielding, Spantech Software, Inc.	■■	■■	■■	■■	■■	■■	■■	■■	Best positioned

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment Key: ■■ Very good ■ Good ▮ Fair ● Poor

Technology Analysis — A roundup of expert opinions about new products. Summary written by free-lance writer Susanne Weixel.

Dataease International, Inc.'s Dataease Version 4.24 would not be a likely choice for experienced programmers building complex applications, but the power and simplicity of its nonprocedural approach to relational database management earned high praise from reviewers.

Ease of use: Menu-driven and intuitive, Dataease provides powerful processing capabilities without a need for programming. But getting around the limitations of the package's structured approach requires creativity and know-how, reviewers said. For example, to delete more than one record at a time, users must write a separate query. Applications development and data entry can be accomplished through lists or menus. The forms facility lets users create forms with one-to-many relationships, and forms can double as report definitions. Dataease features forms-based query-by-example entries to generate multitable queries. Users can further customize queries with the Dataease query language (DQL). But all query results must be formatted as report output, according to *Infoworld*.

Data integrity: Dataease's built-in automatic file and record locking help ensure data security. In addition, users can customize security features for each database. The package includes seven predefined security levels and hard-coded lists of fields for each user. Locks can be shared or exclusive, and when a user tries to access a locked resource, a message identifying who placed the lock is displayed. Data validation is specified as part of the field definition. Referential integrity is enforced via the form mode.

Multiuser support: Dataease offers a solid multiuser environment, although some basic functions must once again be arrived at by working around the product's limitations, reviewers said. For instance, there is no direct support of network print spoolers, *Infoworld* said.

Performance: Certain functions slow Dataease's processing. For instance, transaction processing is fast, but query response time can be sluggish. Also, performance falls off in a multiuser environment. Dataease requires 640K bytes of random-access memory and uses extended memory.

Applications development: Despite its nonprocedural approach, Dataease includes some variables and control structures that allow procedural processing, but refining and polishing applications within the constraints imposed by DQL may require programming experience.

Infoworld reported that users cannot use macros or variables for file identifiers within a DQL procedure and that outside files cannot be accessed without importing.

Documentation: The manuals provided with Dataease are well-written and useful. There is a thorough table of contents and a comprehensive index. On-line Help is available but is somewhat meager. According to *LAN Times*, the Help keys are nonstandard and therefore somewhat awkward to use.

Service and support: Unlimited free (but not toll-free) support is available, as well as extended plans support for companies. Technicians who responded to telephone inquiries took the initiative in trying to solve problems and answer questions, reviewers said.

Value: If users are looking for a database management system product that everyone can use, Dataease is it, reviewers reported. It is powerful and provides quick and easy productivity benefits without programming. The trade-off for these features is a lack of flexibility, but even that can be overcome by a creative developer. Dataease costs $750 for a single user; each additional three-user local-area network pack costs $750; a five-user LAN pack costs $995.

Vendor financial information

According to Dataease International, Inc., Dataease's installed base is approximately 440,000 copies. The base is currently growing at a rate of between 20% and 25% per year. Sales growth for the product is in the same range. The company's overall profitability is higher than 25%. A private company, Dataease does not release specific financial data.



"ALTHOUGH DATAEASE is more structured than other DBMSs, it is faster to get an application up and running. If you are creative, you can accomplish anything."

Martin Fox
Technical Officer
Manufacturers Hanover Trust Co.

Dataease responds

Comments from Fred Holahan, vice president of product development:

Performance: Different database engines tend to perform better at different sets of activities. We try to optimize our performance according to the needs expressed by our user community. There will always be some more satisfied than others.

Applications development: DQL is as robust a programming environment as you will find. It is meant to be used in conjunction with our system utilities, and the combination results in an extremely powerful programming environment. In the future, we plan to make it possible to access outside third-generation languages to make use of their capabilities. In the meantime, DQL's syntax checking capability minimizes the need for a debugger. DQL's editor is perfectly fine, but some people want to use their own. There are third-party add-on utilities available to let users use other editors.

Documentation: We have not received complaints about our on-line Help.

NEXT WEEK

▶ Hewlett-Packard Co.'s Laserjet IIP and IBM's Laserprinter E receive high marks from reviewers for their price/performance features.

NEW PRODUCTS

Peripherals

Nissei Sangyo America Ltd. has announced a 20-in. color monitor designed for computer-aided design and manufacturing applications.

The CM2087M ($3,595) includes a dual-function microprocessor that supports multiscanning resolutions of 1,280 by 1,024 pixels. The monitor also features a 120-Hz vertical scan rate.

Nissei Sangyo America
800 South St.
Waltham, Mass. 02154
(617) 893-5700

Extended Systems, Inc. has introduced a printer-sharing device that includes four input ports that support serial and parallel connections as well as a serial and parallel port.

The ESI-2249A Multispool ($695) features Extendedlink technology, which enables users to transfer data at a rate of 23K byte/sec. via a parallel connection up to 500 feet away.

Extendedlink parallel port adapters cost $60 each; serial port adapters are priced at $20 each.

Extended Systems
6123 N. Meeker Ave.
Boise, Idaho 83704
(208) 322-7575

NEC Technologies, Inc. has announced a color thermal printer equipped with an Adobe Systems, Inc. Postscript page description language controller.

The PS Model 40 ($6,995) features 4M bytes of random-access memory and 17 Adobe typefaces. The product can produce letter- and A4-size pages.

An upgrade kit for the Model 40 includes one daughterboard with 4M bytes of RAM and one with 18 additional Adobe fonts. The upgrade kit costs $2,000.

NEC
1414 Massachusetts Ave.
Boxboro, Mass. 01719
(508) 264-8000

Development tools

Building Block Software, Inc. has announced a new edition of its CAD/CAM Developers Kit.

Edition 2D is a library of C language functions for two-dimensional geometric computations and displays and Data Exchange Format file transfers. Operations performed include rotation, scaling, mirroring and trimming of basic geometric shapes. The product supports compilers from a number of companies and is compatible with Autodesk, Inc.'s Autocad Development System and Microsoft Corp.'s Windows 3.0.

The personal edition, licensed for in-house use only, costs $499. Royalty-free distribution rights cost an additional $500.

Building Block Software
77 Pearson Road
Somerville, Mass. 02144
(617) 628-5217

Watcom Products, Inc. has announced the C/P16 Compacting and Optimizing Compiler for reducing code size.

The compiler generates compacted P/16 code for infrequently used regions of an application; at execution time, a P/16 interpreter is invoked. Frequently used application sections are compiled into optimized native Intel Corp. 80286, 80386 or I486 code. According to the company, this method reduces program size by up to 40% without a significant cost in execution speed.

The C/P16 costs $5,000. There are no royalty fees for compiled applications.

Watcom Products
415 Phillip St.
Waterloo, Ontario N2L3X2
(519) 886-3700

Software Quality Tools Corp. has upgraded the testing module of its Software Quality Management System (SQMS).

SQMS/Testing Version 1.2 allows developers to predict software reliability and fault detection costs through problem tracking and code change capture systems. SQMS comprises five modules, including design testing and development cost estimating programs, plus a user environment. The product is SQL-compliant and is available on Sun Microsystems, Inc.'s Scalable Processor Architecture platform.

The SQMS package costs $15,000 for the stand-alone version or $25,000 for a server license.

Software Quality Tools
Suite 200
2000 West Park Drive
Westboro, Mass. 01581
(508) 366-5045

Software utilities

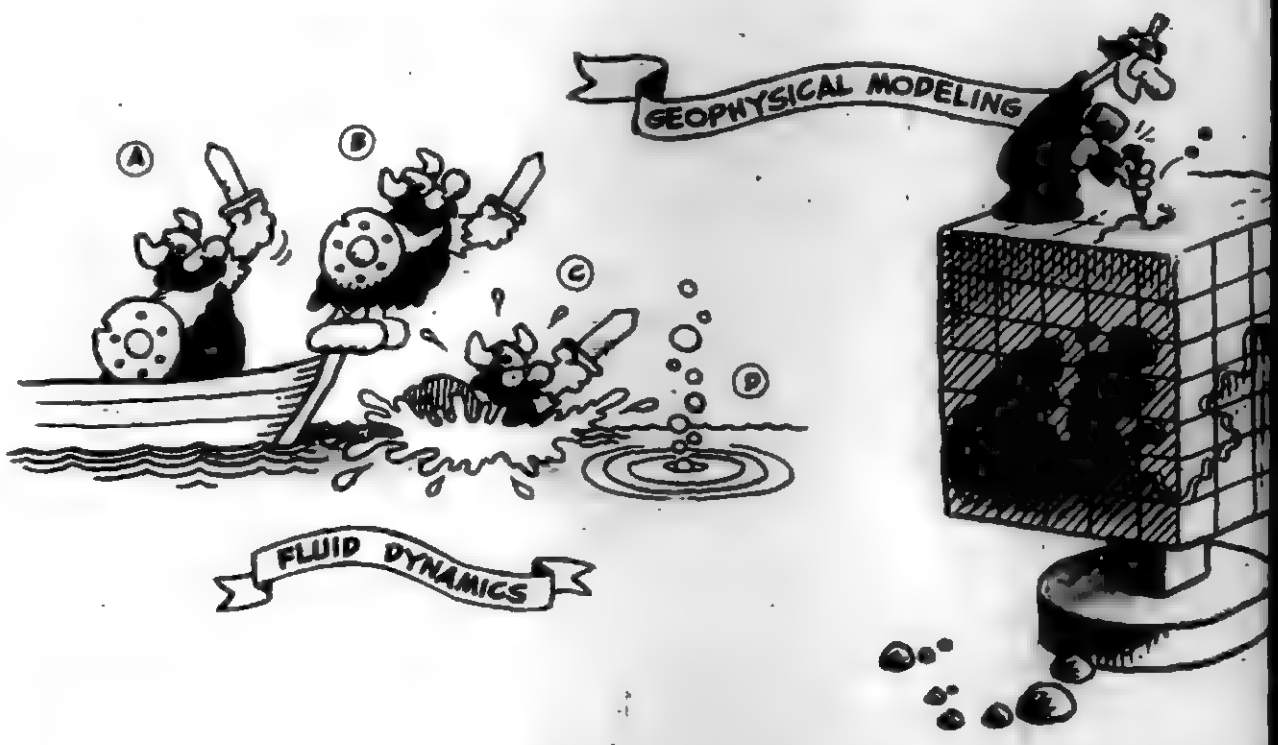
Roscsoft Co. has begun shipping Prokey Plus Release 5.1, a keyboard macro processing package that includes an event scheduler to enable an IBM Personal Computer XT, AT or compatible to perform various tasks without user intervention.

Features include user-specified variable looping and flexible date and time formats.

The product costs $129.

Roscsoft
P.O. Box 70337
Bellevue, Wash. 98007
(206) 562-0225

The IBM RISC System/ The power you've been seeking



It's a never-ending quest for power seekers. You're always looking for ways to run your favorite applications faster. Well, search no more. The RISC System/6000™ family of POWERstations and POWERservers gives you power that soars as high as 23 MFLOPS.

	MFLOPS	MIPS	SPECmark™
POWERstation 320	8.5	29.5	24.6
DECstation 5000-200	3.7	24.2	18.5

When it comes to porting, your ship has come in. Of course, all the speed in the world wouldn't mean much without the applications you need. So the RISC System/6000 family already has more than 2,500 of the most popular technical and commercial applications up, running and running fast. And if you think you know a good thing when you see it, so do software vendors. That's why you'll also be seeing more and more applications coming on board the RISC System/6000 platform all the time. And if you like to build your own solutions, there's a full arsenal of enablers and relational data bases from leading vendors, as well as CASE tools and a host of popular programming languages.

A smorgasbord of solutions. Applications already announced include the IBM engineering design packages CADAM,™ CAEDS,™ CBDS,™

MFLOPS are the results of the double-precision, all FORTRAN Linpack test 100x100 array suite. The Dhrystone Version 1.1 test results are used to compare RISC System/6000 integer MIPS value versus VAX Dhrystones/second to 1 MIPS (Vax 11/780). SPECmark is a geometric mean of ten benchmark tests. All performance data are based on published benchmark information.

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Macintosh products

Mobius Technologies, Inc. has announced the Mobius 030 Display System, an integrated video system and accelerator board for upgrading Apple Computer, Inc.'s Macintosh SE.

The system is based on a 25-MHz Motorola, Inc. 68ECE030 processor. It also includes an on-board video controller and a one- or two-page monitor. The accelerator and video are integrated to use the Macintosh SE's single slot. Mobius reported that the system increases SE performance by up to six times.

The system costs $995 with the 78 dot/in. resolution one-page monitor; $1,195 with the 75 dot/in. two-page display. The company has also announced the same upgrade package for the Macintosh Classic. The 030 daughterboard clips directly onto the Classic's motherboard via a special connector. Pricing is the same as for the SE.

Mobius Technologies
5835 Doyle St.
Emeryville, Calif. 94608
(415) 645-0556

Hyperpress, a division of Medialab Technologies, Inc., has begun shipping Hyperbundle 2.0, an Apple Computer, Inc. Hypercard 2.0 development tool kit.

Hyperbundle includes a copy of Hypercard 2.0 plus tools for organizing development projects, creating advanced palettes, generating and storing scripts and editing icons.

The package costs $134.50.

Hyperpress
1166F Triton Drive
Foster City, Calif. 94404
(415) 345-4620

Systems

Aydin Controls, a division of Aydin Corp., has introduced a reduced instruction set computing-based workstation targeted for high-performance monitoring and control graphics applications.

The Model 7100, built around a Motorola, Inc. 88000 processor, includes a real-time kernel running AT&T Unix 5.3.2. It offers 1,280- by 1,024-pixel color display and Transmission Control Protocol/Internet Protocol support for Ethernet-based local-area networks.

The system starts at $35,100, including a tape drive and 90M-byte hard disk.

Aydin Controls
414 Commerce Drive
Fort Washington, Pa. 19034
(215) 542-7800

Leading Technology, Inc. has introduced a 6½-pound Intel Corp. 80386SX-based notebook computer for $2,999.

The 9800NB includes a standard 2M bytes of random-access memory (expandable to 8M bytes), a 3½-in. floppy drive and a 20M-byte hard drive. It has an IBM Video Graphics Array LCD display with 16 gray scales. Also included is one year of 48-hour response time service.

Leading Technology
10430 S.W. Fifth St.
Beaverton, Ore. 97005
(503) 646-3424

Board-level devices

Truevision, Inc. has begun shipments of a videographics display card for personal computers.

VideoVGA generates both a noninterlaced IBM Video Graphics Array (VGA) signal and an interlaced National Television Standards Committee video signal, allowing users to record animation files or overlay color VGA graphics onto a live video source. It includes drivers for all standard software, the firm said.

The product, with 512K bytes of memory, is priced at $995. A 1M-byte version costs $1,195.

Truevision
7340 Shadeland Station
Indianapolis, Ind. 46256
(317) 841-0332

Orchid Technology, Inc. has begun shipping Prodesigner II/MC, a Micro Channel Architecture-compatible graphics card supporting up to 1,024- by 768-pixel display in 256 colors on interlaced and noninterlaced monitors.

The card is IBM Video Graphics Array-compatible and includes a comprehensive array of software drivers, according to the company. A custom font designer, a speed program and several other software utilities come with the product.

Prodesigner II/MC ships with 1M byte of memory and costs $599.

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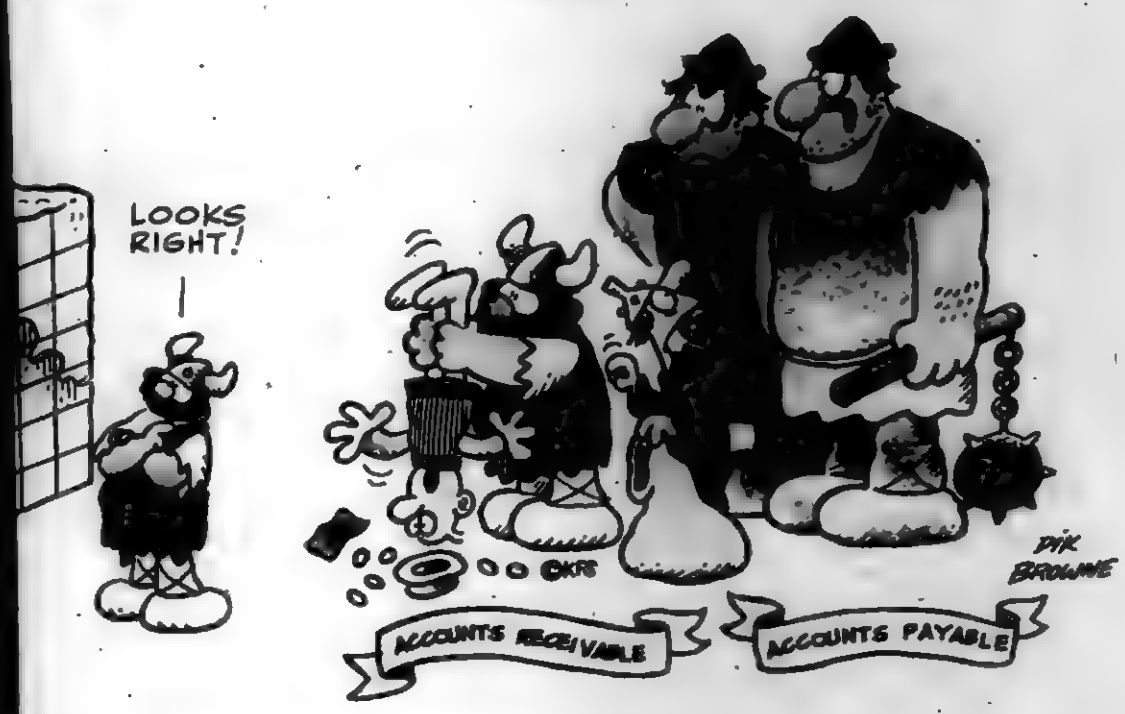
Kingston Technology Corp. has introduced high-capacity memory upgrades for IBM RISC System/6000 workstations.

The upgrades include eight 2M- or 4M-byte memory modules. The price for the 16M-byte board is $3,995; the 32M-byte board costs $8,995.

The company said it has also begun shipping memory upgrades for a number of leading notebook personal computers, including credit-card-size upgrades for Intel Corp. 80386SX-based portables from Compaq Computer Corp. and Toshiba America, Inc. Pricing for a 1M-byte upgrade begins at $160, depending on the type of computer.

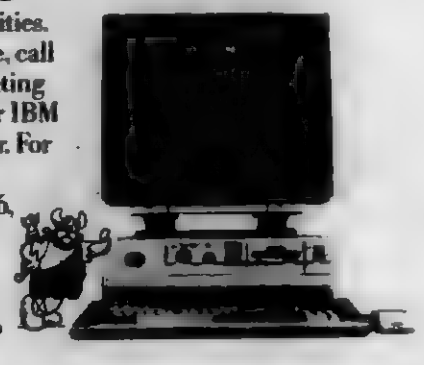
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COMMENTARY

Jeffrey N. Fritz

Don't count ISDN out



Let's face facts. ISDN technology has not exactly been a roaring success. We once heard predictions that by 1990 fully 1% of U.S. telephone lines would be ISDN-capable. Today's actual number is far less. Concern is now being expressed about ISDN's viability. Service providers, vendors and users are nervously saying, "ISDN is not moving. Something is wrong. Who is to blame for this lack of progress?"

The answer is that no one is to blame, nor is anything particularly wrong, other than a slower than expected deployment. What we are seeing is a period that Theodore Irmer, director of the Consultative Committee for International Telephony and Telegraphy (CCITT) and "father of ISDN," labels the "realistic reassessment" of ISDN deployment. The early predictions of ISDN deployment were overly optimistic, Irmer says. As he puts it, "It simply takes time for the user community to accept new technologies, particularly in data communications."

A look at ISDN converts seems to confirm Irmer's viewpoint. Steadily and without fanfare, more and more companies are signing up for ISDN services. AT&T is reported to be gaining an average of one new customer per day. This is a marked increase over its previous six customers per month. However, there is little argu-

Continued on page 64

Users laud Spectrum network manager

BY JOANIE M. WEXLER
CW STAFF

Seven months after Cabletron Systems, Inc.'s leap into the enterprise network management software fray with its artificial intelligence-based Spectrum announcement, nary a technical criticism has fallen from the tongues of beta-test users of the product, which became generally available earlier this month.

In fact, many beta users are now in purchase negotiations for the $50,000-and-up, Unix-based software, designed to centrally manage very large internetworks that comprise a hodgepodge of various vendors' equipment.

"Spectrum is the only product that does the trick for us because we have about a dozen diverse network management systems that we're trying to pull together onto one screen," explained Mike Turico, manager of applied research at Motorola, Inc. in Schaumburg, Ill. Turico said he has been beta-testing Spectrum for nearly one year on the 100,000-node Motorola network and has committed to purchasing at least one copy.

"My job is to make all those management systems one, and Spectrum is really the only way I can do it," Turico explained.

Development options

To date, Cabletron has developed software modules for managing about 40 diverse types of network equipment. Customers can work in tandem with Cabletron to develop modules for currently unsupported devices, develop it themselves or turn to a third party.

Beta-test user John K. Scoggin Jr., supervisor of network operations at Delmarva Power & Light Co. in Wilmington, Del., said Spectrum already "supports every major vendor" in his network, including equipment from Wellfleet Communications, Inc., Proteon, Inc., Cabletron and "soon, Banyan Systems, Inc. network servers."

Cabletron repositioned itself as a network management company when it formally introduced Spectrum at last fall's Interop '90 show in San Jose, Calif. Some considered the move a stretch for the Rochester, N.H.-based company, whose roots are in cabling, wiring hubs and network interface cards.

However, the concept of a centralized network manager that gives users a graphical view of a heterogeneous network from a variety of perspectives was appealing to at least 30-plus

Continued on page 58

Budget blitz

With the enterprise network management market still ripe, Spectrum's success could hinge on Cabletron Systems, Inc. quickly grabbing market share.

Integrated network management budget plans over the next two years



Percent of respondents

Base: 300 Fortune 1000 firms

Source: Business Research Group
CW Chart: Doreen St. John

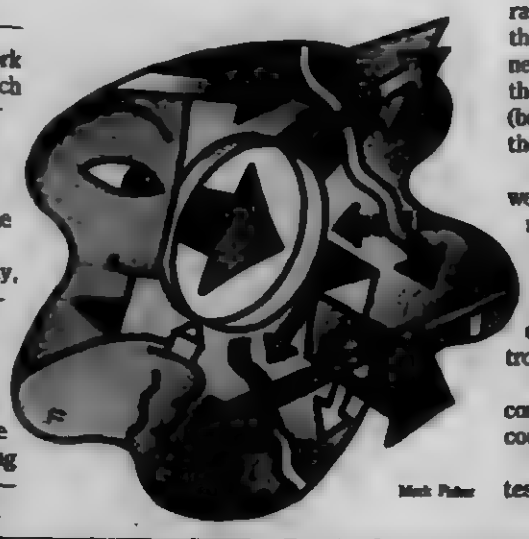
FEATURE: NETWORK ACCOUNTING

Choices aren't always black and white

BY LUCIE JUNEAU
SPECIAL TO CW

Weighing a variety of network accounting methods, Rich Belcastro, staff director for network development at McDonald's Corp., faces one overriding question: How simple or complex should the method he chooses be?

For many network managers today, that question looms large. Precise tracking and billing of network use is frequently still considered too costly and cumbersome. However, growing cost consciousness throughout information systems departments is leading some network managers to break down billing — or at least implement usage tracking — in hopes of improving network efficiency.



Mark Fisher

Network accounting practices can range from very simple (such as allowing the IS department to pick up the entire network tab or charging all expenses to the biggest network user) to very complex (billing departments or individual users on the basis of their precise use).

The latter option is hardly a snap. "If it were easy to do, we'd do it," says John Coman, manager of network information services at Atlantic Richfield Co.

"The goal is to keep it simple so the chargeback process in itself doesn't become a severe burden and cost," Belcastro says.

Despite the potential pitfalls, some companies are moving to build network accounting systems based on actual use.

"Our network billing system is in a testing process," says Kelsey Hill, Marri-

Continued on page 54



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Choices

CONTINUED FROM PAGE 53

ott Corp.'s vice president of systems and telecommunications at the firm's Information Systems and Technology Division. "We're still charging on a fixed-charge basis but trying to go to a usage basis."

When the new accounting system is implemented, Marriott will charge corporate groups for their business- or location-specific network expenses, in addition to levying charges based on use of such common network resources as the company's T1 backbone and switching equipment, Hill says.

Marriott's new billing system was developed in-house, according to Hill. "We've taken usage information available from the intelligence in the network [from BBN Communications Corp.] and built a customized cost accounting system that lets us use information for billing and for fine-tuning the network for trending and capacity planning," he says.

The company is considering charging back for use of the common network resources based on a charge per kilocharacter, or every 1,000 characters, Hill says. "This is consistent with what you would see in commercial, value-added [public] networks," he adds.

To get a handle on the network's cost-effectiveness, Hill says he would like to be able to determine the cost of transmitting a unit of information on Marriott's private network relative to the cost of transmitting the same unit over other private networks or commercial value-added networks from carriers such as U.S. Sprint Communications Co.

Like Marriott, many companies that are implementing chargeback procedures are putting together their own billing systems or turning to third-party software writers for customized systems. One reason is that there are virtually no off-the-shelf, generic billing systems available, analysts say.

"You can't build a billing product that would know how to work with the various vendor systems that are out there," and no single product could address a wide variety of customer billing needs, says Hub Vandervoort, president of Horizon Strategies, Inc., a consulting firm in Brookline, Mass. The billing systems on the market are almost exclusively vendor-specific and usually sold with the networks as value-added features, he says.

Most companies that have large wide-area networks use private lines leased from major carriers including AT&T, MCI Communications Corp. and Sprint, analysts say. The carriers are primarily in the business of providing raw bandwidth, but most also offer services for switching through their networks and methods of billing. Smaller telecommunications vendors, including Williams Telecommunications Group, Alcatel Network Systems and Rochester Telephone, also provide such services.

Sprint has seen a marked increase in the number of customers looking for chargeback solutions, says Jon Peacock, director of marketing for the Sprint International Network Systems Group. "They want to start backcharging individuals, divisions or departments. Right now, I would guess that about 30%, maybe 40% of customers we sell [private] networks to have some form of end-billing package," he says.

Prices for carriers' accounting/billing packages depend on the size of the network and the clients' billing and reporting needs, analysts say. "There really is no rule of thumb. The major carriers offer a lot of different pricing packages for using their services," says Steve Lake, principal consultant at Horizon Strategies.

After leasing a data or combined data/voice line from a telecommunications vendor, some organizations use equipment from multiplexer vendors to provide the tracking information they need to bill back charges, Lake says.

Most of the multiplexer vendors — including such companies as Newbridge Networks, Inc., Network Equipment Technologies, Inc., Racal-Milgo, Inc. and Stratacom, Inc. — offer monitoring capabilities through software in the node or through separate software running on a personal computer, workstation or some type of terminal interface, extracting data from the network so that it can then be manipulated for billing purposes, Lake says.

Many companies that charge back to multiple departments for use of the network don't track all of their network traffic continually. Avon Products, Inc. levies charges based on estimated network use, which is determined by monitoring the network periodically.

"We do charge back but don't do it on a strictly tracked basis," says Raymond Perry, vice president and chief information officer at Avon. Charges are based on an individual organization's share of total network use, which is estimated yearly, he says.



Joyce Rand

Avon's Perry: *'We're able to look at call abuse and to provide users with overall information about their level of use.'*

Feedback on call use

Avon's IS department periodically monitors use on the network, which runs on a T1 backbone, for capacity planning purposes and to derive its forecast estimates, Perry says. "We're able to look at call abuse and to provide users with overall information about their level of use," he says.

Still, the company doesn't feel that accounting for all the traffic on the network would be worthwhile, he says. "Because we're tracking and controlling costs and because we report back to our users their overall consumption, we don't think a breakdown on a call-by-call basis is worthwhile. It takes time and effort to create that," Perry says.

Many firms share Avon's skepticism about the value of tracking all network traffic, analysts say. "You reach a point of diminishing returns," says Edwin E. Mier, president of Mier Communications, a consulting firm in Princeton, N.J.

"Most people, after they take a look at the amount of work involved, fall back on pro rata [billing]," says Frank Dzubeck, president of Communications Network Architects, Inc., a consulting group in Washington, D.C.

One-stop shopping

Some organizations with extensive WANs are able to avoid complex network accounting solutions by charging back all of their network expenses to one corporate department.

One such company, New York Life Insurance Co., charges 100% of its network costs to its policyholders' services department, which accounts for about 98% of the traffic on the network.

New York Life uses services provided by its vendor carriers, AT&T and MCI, to monitor traffic on the network, says Tom Pettibone, senior vice president for information services. "When it looks like a line is getting overloaded, we put in another line," he says.

US Air, which has sophisticated network tracking capabilities, reports usage information to its departments to encourage them to conserve network resources but doesn't charge them. By monitoring network traffic, the company gains useful information for planning network expansion, says Paul Singer, manager of communications planning. Knowing precisely how the network is used makes it easier to order new circuits, he says.

US Air uses AT&T's Virtual Telecommunications Network Service (VTNS), an enhanced billing system, to track network use, Singer says. VTNS "can group [network] traffic pretty much any way you'd like it," he says. "We track bills by major departments, such as reservations. We can also track by network service: There's a bill for the data communications network and a separate bill for the voice network."

Juneau is a free-lance writer and editor based in Salem, Mass.

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Whenever you make a change in your LAN, the problems you foresee will not be the ones that occur.

—*Murphy's Law, v.1.3*

IBM program to link VM hosts with non-IBM systems

BY ELISABETH HORWITT
CW STAFF

IBM quietly announced last month a program for creating high-speed links between VM hosts and a wide variety of non-IBM systems.

The IBM VM Programmable Workstation Communications Services allows workstations running OS/2 Extended Edition, AIX-Personal System/2, MS-DOS and Microsoft Corp. Windows 3.0 workstations to access services on System/370, System/390 and 9370 VM servers. IBM told consultants that the program would support Apple Computer, Inc. Macintoshes, RISC System/6000-AIX workstations and Sun Microsystems, Inc. workstations in the future, according to Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

The program targets the needs of users who are doing engineering applications and program development on VM systems and want to distribute some of the tasks down to Unix workstations on Ethernet or Token Ring local-area networks, Dzubeck said. The program was designed to take up comparatively small amounts of main memory so as to ensure quicker response time, according to Norman Hager, IBM planner for VM.

A central feature of the program is IBM's Common Programming Interface for Communications (CPIC). The advantage is that applications written to the interface on one type of system can be ported to CPIC implementations on other systems. Thus, an application written to Programmable Workstation Communications Services will be portable across all workstations supported by the program.

However, the program does not have CPIC's other advertised advantage: the assurance of interoperability between applications on multivendor CPIC systems, over IBM's peer-to-peer LU6.2 protocol. Applications written to the workstation portion of the program can talk to VM systems only via a unique link developed just for the program, Hager said. The program does, however, allow LAN workstations to access resources and other workstations on an LU6.2 network via the VM server, he added.

IBM has implemented a Transmission Control Protocol/Internet Protocol (TCP/IP) connection between AIX workstations and OS/2 Extended Edition systems, Hager said. The OS/2 servers act as communications gateways between the LAN and the System/370 and System/390 hosts, he added. The 9370s have internal communications processors and do not need the OS/2 gateway.

IBM has provided TCP/IP support because the protocol is a networking standard for Unix systems, Dzubeck said.

Again, however, the program does not allow workstations to use TCP/IP as a general link to other systems but only as a link to OS/2 gateways, Hager said. Nor has IBM provided a true TCP/IP implementation for CPIC, which would allow applications to be ported from LU6.2 to TCP/IP, Hager said.

IBM is in the process of developing such a CPIC interface for the Open Systems Interconnect protocols. A group of vendors and users is now working on a standardized application programming interface for TCP/IP, he added.

BIT BLAST

Beam me up, Cal State

California State University is reportedly leveraging U.S. Sprint Communications Co.'s international Meeting Channel videoconferencing network to beam educational resources around the world. Initially, the new California State Video Network is expected to link campuses in Sacramento, Calif., and Bakersfield, Calif., and a Sprint Meeting Channel room on the Sacramento campus will connect the university with nearly 1,000 public and private facilities in the U.S. and overseas.

Now that Banyan Systems, Inc. has added OS/2 clients to its Virtual Networking System (Vines) local-area network, the firm has reportedly teamed up with Transmission Control Protocol/Internet Protocol (TCP/IP) vendor FTP Software, Inc. to jointly market FTP's TCP/IP software for OS/2 personal computers. TCP/IP is a set of de facto standard protocols allowing disparate computers to communicate. Banyan reportedly intends to resell FTP's $575 PC/TCP for OS/2 to users migrating to the recently announced 4.10 version of Vines. However, Banyan has yet to announce when it will make FTP's software available.

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The time it takes to pinpoint a LAN problem is directly proportional to its gravity.

—*Murphy's Law, v.1.7*

Spectrum

CONTINUED FROM PAGE 53

companies that are currently testing the product.

Scoggin explained that he took a chance on testing Spectrum because of his solid experience with Cabletron's hardware technology, service and support. Scoggin, on his fourth Spectrum beta-test version, is "now ready for prime time," he said, having filed a letter of intent to purchase.

To stave off industry uneasiness about a once-cabling company selling and supporting such an expensive and important product against the likes of Digital Equipment Corp., IBM and others, Cabletron said it has added 35 Spectrum support people during the past six months and currently has the capability to install three Spectrum sites per week. In addition, Cabletron Chairman Craig Benson has pledged that he "won't sell more product than he can support."

Mike Prudhomme, a senior engineer at systems integration house SSDS, Inc. in Littleton, Colo., commented, "Perceptionwise, Cabletron is at a disadvantage because a lot of people don't want to spend that kind of money unless it's with IBM or DEC. However, those vendors only have six- and seven-member programming teams for their enterprise managers; Cabletron, on the other hand, has a 40-person team."

Prudhomme has been using Spectrum since last August and "probably will purchase it," he said. In addition, he has recommended the product to large networking customers such as the federal Veterans Administration and Lockheed Corp.

Turico and Scoggin said that one current gray area involves where the responsibility will lie for keeping Spectrum modules updated with equipmer software upgrades. Another shortcoming is that the product currently supports no wide-area networking equipment.

Turico is now designing his own Spectrum module for his Codex Corp. 6290 fast-packet multiplexer. Scoggin does not want to invest in the development effort, so he said he will stick with separate management systems for now.

Spectrum select

Users and analysts agreed that Spectrum is not for the "casual" user with a relatively simple network. They paint a profile of the product's target audience:

- Operators of large corporate internetworks (generally 1,000-plus nodes) that are multivendor in nature.
- Those with a fairly sophisticated networking staff for developing modules for unsupported devices and for tailoring existing modules, if desired, to the company's preferred set of default recoveries.
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Network Systems.

Teleport net adopts Sonet

BY JOANIE M. WEXLER
CW STAFF

CHICAGO — Timing and economics have allowed Teleport Communications-Chicago to offer alternative network services based on the emerging high-speed Synchronous Optical Network (Sonet) fiber-based technology.

Because the New York-based Teleport Communications Group's Chicago network is new and Sonet standards are gelling, the carrier decided that the 15-mile Chicago-area fiber network might as well start at Sonet's 2.5G bit/sec. speeds. Teleport-Chicago also completed interconnect negotiations with Illinois Bell Telephone Co. this month, giving users a broader choice of network configurations. Sonet interfaces in the circuit-terminating equipment in Illinois Bell's central offices and customer premises equipment allow users to integrate incompatible transmission devices, according to Chuck Buckman, vice president and general manager of Teleport-Chicago.

Sonet standards eliminate the signal conversion that is necessary among different vendors' equipment, and the technology passes data at fiber's high speeds.

Most users turn to bypass carriers such as Teleport for disaster recovery. Prominent users are those with mission-critical financial and securities applications, and so far, Teleport-Chicago has signed up Telerate Systems, a division of Dow Jones & Co., and Montgomery Securities as Sonet customers.

Buckman said Teleport-Chicago is using the "full complement" of AT&T Sonet equipment. Because AT&T is likely to be a standard-setter for Sonet, he said, "we won't likely have to retrofit our office when the standards are finalized."

Teleport-Chicago is one of seven Teleport Communications Group carriers in the U.S. To date, Teleport has successfully negotiated interconnect agreements with Illinois Bell, New York Telephone Co. and New England Telephone Co.

Your most crucial new project will always need Token Ring if you already have Ethernet installed.

—Murphy's Law, v.1.8

Virtual servers lighten net load

Software lets key data stay on workstations, off host

BY JIM NASH
CW STAFF

Software that turns all Apple Computer, Inc. workstations and servers on a network into a giant virtual file server is helping some information systems managers speed up bogged-down systems.

Trading large or often used files and volumes on an Apple network can slow the network's performance during peak times. One solution, a virtual server, lets employees keep key data on their workstations and still make it available for other users who need file access less often.

Datachub, an application from International Business Software, Inc. in Sunnyvale, Calif., automatically collects information about files and volumes stored throughout an Apple network. It presents workstations with the name and status of files under a single icon as if the files were stored on a single file server.

Like dedicated devices, virtual servers offer a single place to look for files. They allow key data to be shared from all networked devices, much like peer-to-peer networks do.

Managers who have used Datachub said the application decreases network traffic because employees are able to keep certain files on their own machines. In addition, they said, they are seeing productivity increases because employees unfamiliar with the data's location are able to find files and volumes quickly by simply looking for the file names.

"Our network is really intense," said Rajan Dev, systems director at The Understanding Business in San Francisco. "We had 35 users on an Appletalk network with some people sending image files to the two servers. It was pretty crazy," Dev recalled. A division of Harper Collins Publishers, Inc., The Understanding Business designs and publishes travel guides.

"The network would crawl to a halt," he said, when image files were sent to or taken from the company's Apple Macintosh IIs with 600M-byte hard drives. Dev said those image files now can be kept on an individual's workstation and still be accessed by other employees.

A spokesman for International Business said Datachub, which takes up 415K bytes of memory, pools files for networks as large as 76 workstations whether or not a server exists on the network. Larger user groups split into zones that can access one another's workstations. Datachub runs over Appleshare and Localtalk, borrowing their security features.

Users assign access privileges to their folders with a single administrator maintaining access to all documents. Datachub updates itself by reading "keep alive" messages transmitted on the network.

"We found [Datachub] was most successful in small work groups," said Eric Epstein, senior data communications analyst at U.S. Sprint Communications Co. Ltd. Partnership in Herndon, Va. Epstein said Datachub was used heavily by Sprint's contract proposal department, where large contracts containing pages of boilerplate legalese are passed to various employees for their specific technology amendments.

Datachub costs $395 for a three-user license, $795 for 10 users and $3,250 for 50 users.

Tandem adds to OSI functions

BY JEAN S. BOZMAN
CW STAFF

CUPERTINO, Calif. — Once isolated in a proprietary systems fortress, Tandem Computers, Inc. is fortifying its bridges to the open systems world by adding to its collection of Open Systems Interconnect (OSI)-compatible networking software.

Tandem announced, but did not deploy, two new OSI-compliant products earlier this month: OSI/FTAM for its proprietary Nonstop systems and FTAM-UX for its Integrity S2 Unix machines. OSI/FTAM is due for shipment to customers in the third quarter of 1991; FTAM-UX will have limited availability in the fourth quarter of 1991, according to the company.

Tandem said the products are as much a statement of commitment to open systems as advances in the firm's file-transfer offerings. They support remote-file access and the ability to create, delete and modify files between dissimilar computers in an OSI network.

"We have a lot of large users who are handling large volumes of data and managing networks of heterogeneous systems," said Corinne DeBra, Tandem's communications products marketing manager. "In such large networks, it's important that you have flexibility."

The FTAM products may have been offered, in part, as placeholders for more comprehensive file-transfer systems planned by standards committees, such as the international CCITT X.500 protocol. "Tandem doesn't want to commit to X.500 before it's fully defined by the standards committees," explained Chris Christiansen, an analyst at Meta Group, Inc. in Westport, Conn.

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1985 Sprint introduces the world's first VPN℠ 1986 First transcontinental fiber optic call transmitted by Sprint. 1987 Eight million [illegible]

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[illegible] fiber optic cable completed. 1990 Sprint announces first commercial video services to the Soviet Union. Sprint introduces first nationwide ISDN capabilities.

Fritz

CONTINUED FROM PAGE 53

ment that vendor and carrier miscalculations have led to the perception that ISDN is in trouble.

Vendors complain that the CCITT and the American National Standards Institute have been too slow in getting the standards out. Some vendors even go so far as to call ISDN an unstandardized, immature service. That argument usually comes from vendors who missed the ISDN boat in the first place and need to somehow justify their lack of foresight. Such vendors usually have no plans for ISDN development and frankly, their arguments are beginning to show their age.

The CCITT defined an extensive set of ISDN standards that were released in 1984 in the Red Book and redefined four years later in the Blue Book. According to Irmer, "The Blue Book ISDN standards are available, and they are stable."

There is, however, a lack of applications unique to ISDN. This is a classic case of who has the ball. Users, vendors and carriers have all looked to one another for

> "IT SIMPLY TAKES time for the user community to accept new technologies."
>
> THEODORE IRMER
> CCITT

ISDN applications development. Irmer acknowledges that the CCITT should have spent more time addressing ISDN applications development. "We should have tried to develop applications to meet the needs of the customers and spent less time dealing with the services that run under those applications."

Inadequate marketing is also a problem. Some carriers got caught up in the excitement of preannouncing ISDN services but failed to announce ISDN tariffs or assemblies. The preannouncements served to dull interest and slow user response to the new service. IS directors are interested in bottom-line costs, not unpriced pre-announcements.

Among vendors and carriers, there is a lack of understanding about ISDN's capabilities and limitations. If those who market ISDN customer premises equipment and services cannot understand and accurately communicate ISDN features, users can hardly be expected to line up for the service. Thus, the age-old ISDN question remains: "That's nice, but what do you do with the stuff?"

Vendors, carriers and users must learn from past experience and move on, Irmer suggests, instead of fixing blame. "There is more value in determining what factors will promote customer migration to ISDN," he says.

Clearly, setting attractive tariffs is one of ISDN's most important success factors. Carriers and regulators must cooperate to make ISDN services affordable. Interestingly, the CCITT standards have something to say about ISDN tariffs. They recommend that ISDN lines be coordinated with analog line costs. For example, an ISDN Basic Rate Interface (BRI) offers about twice the call capability of an analog line. So, it seems reasonable to tariff a BRI at approximately twice the cost of an analog line.

The CCITT also favors "nondiscriminatory" tariffs. Such tariffs do not differentiate between voice and data use of the B channel. Also, carriers should be careful about charging for "extras" such as Calling Line Identification, packet charges and connect time on local data calls. Such charges produce user caution in deploying ISDN services. Eventually, such conservatism will be warranted. However, in these early days of ISDN deployment, carriers must be willing to do whatever is necessary to get the service out to the user community at low cost.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

NEW PRODUCTS

Micro-to-host

Century Software has announced Tinyterm, a $295 asynchronous terminal emulation software package.

The product connects DOS-based personal computers to Unix, The Santa Cruz Operation Xenix and Digital Equipment Corp. Ultrix and VMS platforms and includes six exact terminal emulations. The memory-resident program allows users to concurrently run one application on the host and one on the PC.

A network version, costing $395 for a five-user license, supports more than 20 common network systems, the firm said.

Century Software
Suite C134
5284 South 320 West
Salt Lake City, Utah 84107
(801) 268-3088

Network Software Associates, Inc. has added an Integrated Services Digital Network (ISDN) driver for its Adaptsna 3270 terminal emulation software.

Produced in conjunction with Teleos Communications, Inc., the product allows ISDN communications between IBM Personal Computer AT- and XT-bus-based machines and IBM 3174 controllers. The driver uses the ISDN Data Link Control protocol.



Adaptsna 3270 costs $245.
Network Software Associates
39 Argonaut
Laguna Hills, Calif. 92656
(714) 768-4013

California Software Products, Inc. has introduced Select, a software package that integrates midrange data into personal computer applications.

The product works with third-party PC word processor, spreadsheet and database file formats. It accesses data from IBM Application System/400s and other midrange computers with PC support. A 5250 emulator or Token Ring card is required.

Pricing starts at $1,000, ranging upward according to system model.

California Software Products
525 N. Cabrillo Park Drive
Santa Ana, Calif. 92701
(714) 973-0440

The Bluelynx 5250 Local twinaxial adapter board from Micro-Integration Corp. supports 5250 connectivity for DOS, OS/2 and Microsoft Corp. Windows 3.0.

The 5250 Local connects personal computer users to IBM Application System/400 or System/32, 34, 36 and 38 hosts over twinaxial or twisted pair wiring.

The board costs $895. A $295 software upgrade allows users to port to a different system.
Micro-Integration
215 Paca St.
Cumberland, Md. 21502
(301) 777-3307

Gateways, bridges, routers

Rad Network Devices, Inc. has announced Shortest Path First (SPF) routing on a Token Ring bridge/router, the RTB 16.

The product, which is field switchable between 4M and 16M bit/sec., optimizes source routing through wide-area networks via the SPF algorithm. It also offers a traffic prioritization network management feature and full Integrated Services Digital Network support.

Pricing starts at $5,995, depending on the number of network links.

Rad Network Devices
Suite 600
7711 Center Ave.
Huntington Beach, Calif. 92647
(714) 891-1964

Interlink Computer Sciences, Inc. has announced Sns/Printq, a software module for the company's Sns/SNA Gateway.

Sns/Printq enables Digital Equipment Corp. VAX users to access IBM Systems Network Architecture (SNA)-linked printers through local VMS print queues. Users can specify a delayed print time, making off-hours printing possible.

A license for up to three VAXs costs $22,950; a full-site license costs $49,950.
Interlink Computer Sciences
47370 Fremont Blvd.
Fremont, Calif. 94538
(415) 657-9800

Gateway Communications, Inc. has introduced a four-port Ethernet hub/adapter and accompanying expansion card.

The G/Ethertwist AT Hub Adapter combines an Ethernet adapter and a four-port 10Base-T hub on a single card. It allows users to build an unshielded twisted-pair network of up to five nodes using one expansion slot on the host computer.

Two G/Ethertwist AT Hub Expander cards, with four additional ports each, can be attached to each Hub Adapter.

The Hub Adapter is priced at $800. Each Hub Expander card costs $400.
Gateway Communications
2941 Alton Ave.
Irvine, Calif. 92714
(714) 553-1555

Electronic mail

Alisa Systems, Inc. has announced availability of Alisamail 2.0.

The Digital Equipment Corp. VAX-based electronic mail package integrates VMS mail systems and Microsoft Corp.'s Microsoft Mail. Version 2.0 features better defined installation procedures and management services and eliminates unnecessary VAX overhead and network traffic, according to the company. Alisamail also runs on top of standard Apple Computer, Inc. Macintosh-to-VAX communications software.

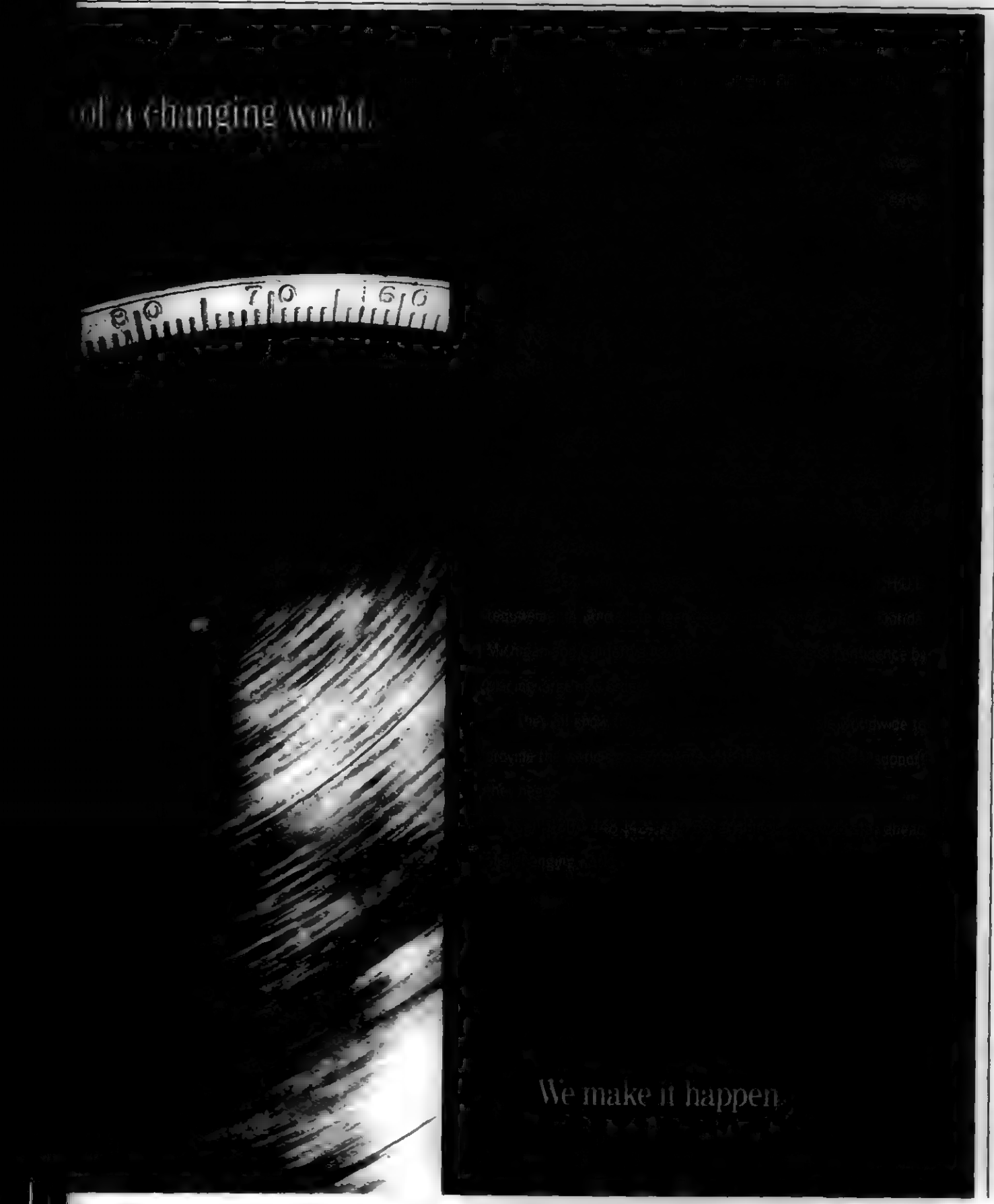
The price is $3,000 per 10-user license or $17,500 for an unlimited number of users.
Alisa Systems
Suite 175
221 East Walnut St.
Pasadena, Calif. 91101
(818) 792-9474

Diagnostic equipment

Spider Systems, Inc. has unveiled a system for remote monitoring and analysis of multisegment Token Ring local-area networks.

The Spiderprobe B130-R, a self-contained tool, monitors network segments and reports to a central Spideranalyzer 325. The probe's abilities include statistical error reports, hardware tests, packet capture and seven-layer protocol decoding.

The Spiderprobe costs $3,450, including protocol decodes up to the transport layer. Optional higher level decoding ability costs $1,500.
Spider Systems
12 New England Executive Park
Burlington, Mass. 01803
(617) 270-9818



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MANAGER'S JOURNAL

EXECUTIVE TRACK



James E. Hopper has been named vice president of information systems and chief information officer at A. B. Dick Co., a Chicago-based manufacturer of document publishing systems. He reports James Bast, the firm's president.

Hopper spent 11 years in senior positions at Tenneco, Inc., most recently as director of systems and computer services at Packaging Corporation of America, a Tenneco subsidiary. Before joining Tenneco in 1980, he worked at companies including Ernst & Ernst (now Ernst & Young) and IBM.

Hopper holds a bachelor's degree from Lamar University in Beaumont, Texas, and an MBA from Northwestern University in Chicago.

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Michael J. Williams was named vice president of data resource management at the **Federal National Mortgage Association** (Fannie Mae) in Washington, D.C.

Williams joins Fannie Mae from the information technology consulting group at KPMG Peat Marwick, where he was a senior manager in the strategic systems practice specializing in executive information and decision support systems. He has also worked at Du Pont Co.

He holds a bachelor's degree and an MBA in finance, both from Drexel University in Philadelphia.

.....

Denis M. Brown has been named director of the U.S. Department of Defense Communications Agency's Center for Information Management in Washington, D.C.

Brown was most recently director of planning at Martin Marietta Corp.'s Computer-aided Productivity Office, where he was responsible for the firm's IS planning.

Brown retired from the U.S. Air Force as a brigadier general. From 1983 to 1988, he was deputy assistant chief of staff for command, control, communications and computers. He holds a master's degree in computer systems from Colorado State University.

IS keeps Sea-Land on the move

CEO Alex J. Mandl has both his hopes and fears for information technology

Alex J. Mandl, a man who took a $3 billion global shipping company and restructured it from stem to stern, is worried about how much he has to rely on information technology.

"You have to be absolutely sure that it all works," says Mandl, chairman and chief executive officer of Sea-Land Service, Inc. "It does concern you because when you have an outage, everything in 80 shipping terminals around the world stops. It's a little scary."

Mandl took the helm of Edison, N.J.-based Sea-Land in 1988 under a mandate from John W. Snow, president of parent company CSX Corp., to improve the company's return on investment by earning as much as it costs Sea-Land to raise capital. Mandl initiated sweeping changes to push decision-making power away from corporate headquarters to the company's four regional divisions.

Mandl spoke recently with *Computerworld* Senior Editor Michael L. Sullivan-Trainor about the following aspects of information systems at Sea-Land:

• On the importance of information resources:

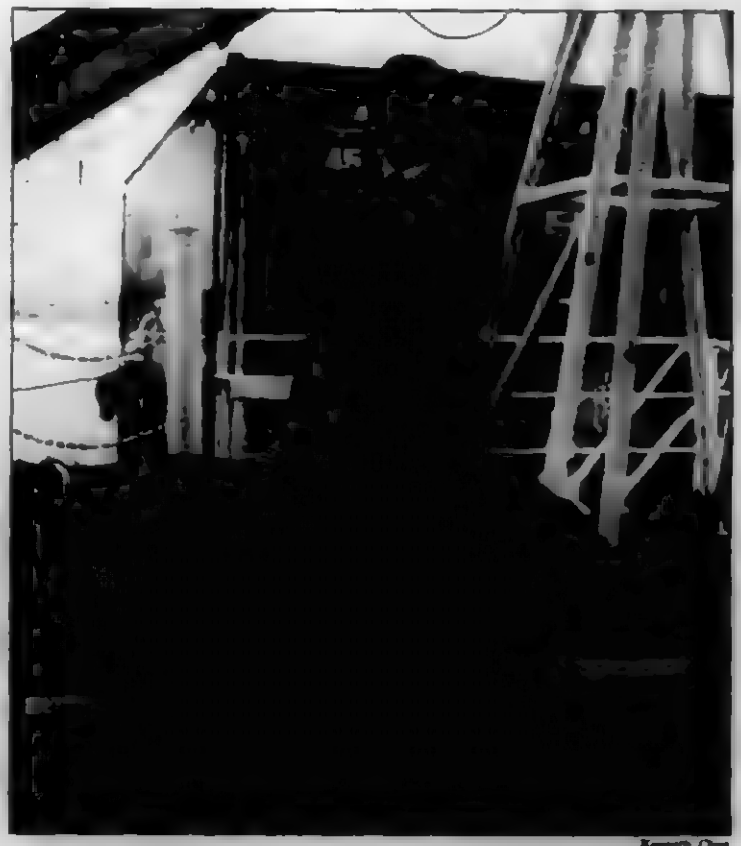
"What we're all about is the ability to combine a variety of transportation modes — trucks, ships and rail services — into one cohesive, seamless, door-to-door service from anywhere to anywhere in the world. Tying together all those components, when you have thousands of containers and a shipping terminal system that covers the globe, requires an enormous network of information and communications resources.

"If you make a decision about one part of this complex system, it will impact the rest of the system and you have to figure out how all that happens. That's not something you do with a piece of paper and a pencil.

"For example, when the situation in

Continued on page 76

THE CEO VIEW



Kenneth Chee

The CEO: *Alex J. Mandl, 47; BA Willamette University; MBA, University of California at Berkeley*

The career: *Chairman and CEO of Sea-Land Service, Inc., 1988-present; senior vice president (various finance, planning and corporate development positions) at parent CSX Corp., 1980-1988; finance positions at Boise Cascade Corp., 1969-1980*

Accomplishments: *Brought information resources into the day-to-day decision-making process; redefined technology applications to allow new overseas partnerships; doubled size of the company in sales from $1.5 billion to $3 billion; reorganized sluggish organization to make it more nimble*

Technology goals: *To further integrate information technology into the business by rotating managers among functions; to find places where information systems can provide market differentiation*

HMO competitors team up to set standards

BY JEAN S. BOZMAN

Information systems managers from 10 of the largest health maintenance organizations (HMO) in California are joining forces to forge new data standards for their adolescent industry. Their mission is to create a new form of electronic data interchange to simplify multiple reporting formats used by the state's largest HMOs to track patient care.



"This is an incredibly competitive industry, with 10 major players in the California market," said Thom Hubbell, director of operations development and technical assessment at Blue Cross of California's California Care division. "The reason we're doing this is mutual survival."

The group has no formal structure or name; it just goes by "HMO/Information Services Group." Yet, it dares to go beyond national attempts at the same thing, believing that a small regional group is more effective for active cooperation. Among its members are IS directors from Pacificare Health Systems, Inc., Kaiser Permanente, Maxicare Health Plans, Inc. and Health Net, whose groups collectively serve hundreds of thousands of HMO members.

"Sometimes we trade war stories," said Charlotte Jenkins of the Beverly Oncology cancer care organization in Montebello, Calif. She is an HMO operations consultant serving on the committee. "We talk about what has worked in the past and what hasn't worked. Many of us feel that vendor solutions for HMOs have proven to be too narrow."

Among near-term aims are the creation of a unified set of data-entry formats that can be used by group medical practices and medical care contractors to report on HMO patient care. A proposed set will be presented to the American National Standards Institute standards committee this summer.

COMMENTARY

N. Dean Meyer

Dispersing IS isn't an answer



Decentralization? Sure, users want control over information systems. It's an integral part of their businesses, and everyone wants to control his own business.

In the past few years, the fad has been to break up corporate staff functions and assign staff members to user divisions. This puts users in the driver's seat and seems to make business, more than technology, drive IS expenditures.

But shipping corporate head count out to the divisions is not the only way to give users control. And willy-nilly decentralization has some serious disadvantages.

For one, scattering high-tech staff members leads to less specialization. For example, a company might be able to afford just one neural networks expert, not one for every division. Decentralized IS staff members are forced to be jacks of all trades — all platforms, applications, end-user computing tools and disciplines. Because no one can be an expert at more than one thing at a time, decentralized technologies are forced to be mediocre at everything or to narrow their scope and become "solutions in search of a problem."

Another problem is integration. Many of the high-payoff opportunities now lie in cross-functional systems that transcend organizational boundaries. Decentralized staffs are less likely to see these. Even if they band together to pursue such opportunities, their independent, parochial designs make it difficult to build an integrated architecture.

Still another problem is management. Structuring, coaching and inspiring IS professionals is a profession in itself, and user executives are ill-equipped to lead these specialists.

In addition, decentralization destroys career paths for IS professionals. Although there is plenty of room for generalists to participate in the IS function, we still need specialists to produce world-class excellence in technology design. Such gurus will not be attracted to what will be dead-end jobs for them in user organizations.

And finally, decentralization is expensive. Software licensing costs skyrocket, volume discounts disappear, and redundancies proliferate.

So what's the alternative? It's simple: Don't decentralize head count; decentralize power.

Decentralization is a backlash response to an unresponsive and perhaps controlling corporate staff function. Why would corporate staff behave so poorly? It may not be the fault of the IS professionals but rather inherent in the design of the internal economy.

Think of the corporation as a marketplace and the IS staff as a business within a business. If this internal vendor were customer-focused and competent, it would compete effectively for the user's business. Decentralization, on the other hand, is a loss of market share. It indicates a vendor that is failing.

Most companies are run as a centrally planned economy — like those that failed in the Eastern bloc. With budget flowing top down (from the "Central Soviet"), the corporate IS staff doesn't have to compete for business. It is an unregulated monopoly, and it behaves like a bureaucracy.

An internal market economy, by contrast, gives users the budget, and corporate IS staff must earn their revenues through chargebacks — as a vendor in competition with outside providers and the users themselves. In this free market, users hold all the strings. Do you feel your grocery store controls you, or is it the other way around?

To earn market share, the IS staff must be responsive to its clients' needs and produce world-class products and services at competitive prices. Corporate objectives (such as architecture planning) can still be subsidized, but customer focus is built into the culture.

Internal vendors are free to structure and manage as they wish, without outside interference or arbitrary caps on head count. The marketplace automatically controls the level of expenditures and keeps staff members honest.

Chargebacks alone may cause more trouble than good. But a carefully planned migration to a market economy can, over time, build informed clients and entrepreneurial staff.

With root causes understood, problems can be corrected systematically. If problems are caused by the misbehavior of a monopoly, the solution should be sought not in structural change such as decentralization but rather in the design of an effective internal economy.

Customers may wish to hire their own purchasing agents, and internal vendors certainly should designate account representatives. But users are best advised to "stick to their knitting" and demand a healthy corporate IS function rather than dismantle it and try to run it themselves.

Meyer is founder and president of *NDMA, Inc.*, an information systems management consulting firm in Ridgefield, Conn.



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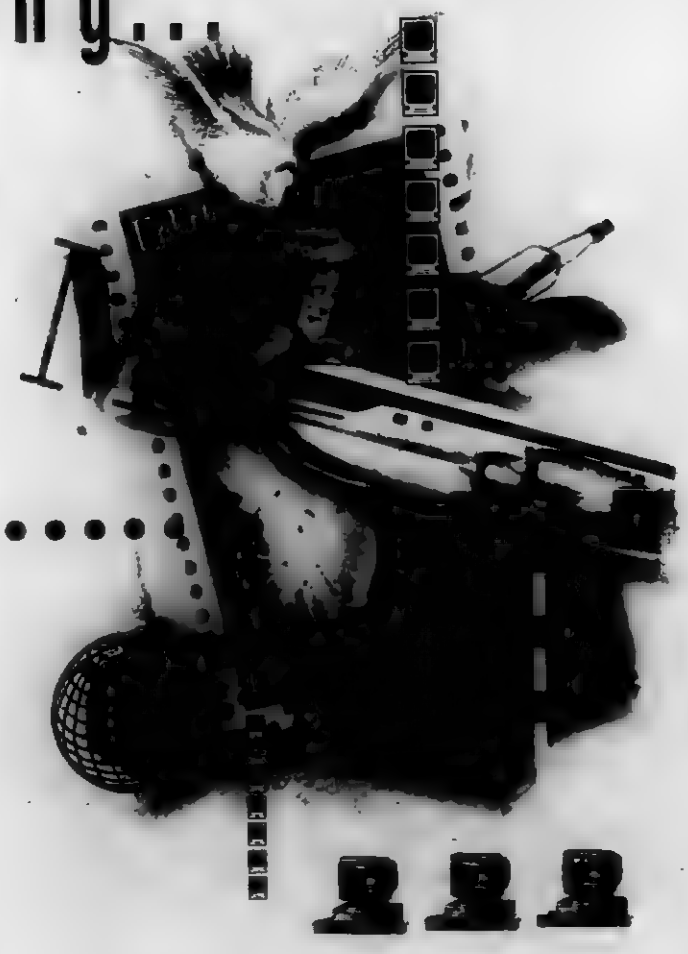
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NEWS AND VIEWS APRIL 1991

Messaging...

It's More than Just Mail



Six Points to Keep in Mind When Building a Corporate-Wide Electronic Messaging System

Electronic messaging is about communicating with as many people as you want — quickly and easily, using the desktop system of your choice. Pockets of users, on small networks that aren't on speaking terms, are just what you want to avoid. Messaging has to be the most open kind of computing possible, tying your corporation together and linking it to the outside business world.

Digital has built the largest private online messaging system in business today. We've found the following six points critical to the building of our corporate-wide electronic messaging system, as well as to the systems we've built for other Fortune 500 companies.

Standards Are Important in Building Your Messaging System

Open systems are as important in messaging as in other aspects of computing. Open means standards, and standards free you from the restrictions inherent in proprietary messaging networks. Open systems messaging allows you to link proprietary networks, so messaging isn't confined to pockets of users who can't communicate with the corporation as a whole.

With open-systems messaging, you can preserve your investment in existing equipment yet build applications that work throughout your expanded business environment. You can grow an open messaging system by adding gateways and users; you can begin with a messaging system for two users, then expand it to support thousands more. An open messaging system lets you move your resources physically — move terminals, gateways, and MTAs (message transfer agents), all without costly, time-consuming adaptation.

To remain competitive, organizations of the future will have to become flatter, with fewer levels of management. Open systems messaging lets you build distributed, peer-to-peer networks to match this changing business structure.

Whatever the messaging medium, quick, easy, and open communications is the goal.

Many corporations are planning for the '90s with open systems messaging. Digital has used open systems messaging for years — and is helping other corporations implement it as well.

X.400 Is the State-of-the-Art Messaging Backbone

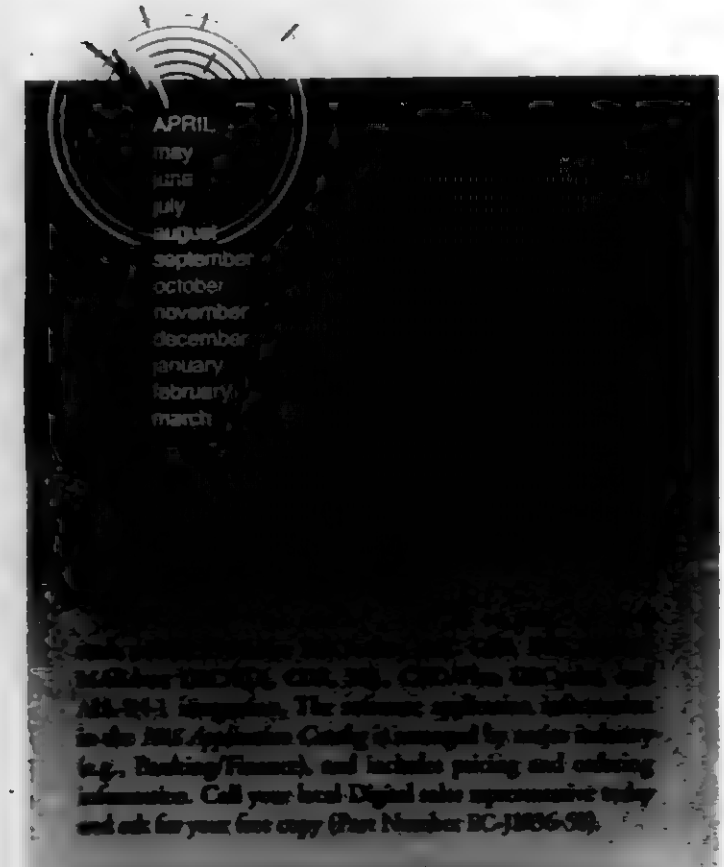
X.400 provides a standard interface for messaging, breaking down barriers so that mail systems from multiple vendors can be connected seamlessly. All major mail vendors are developing systems that interface with X.400. The single, proprietary system appears headed for extinction.

X.400 is a robust backbone, offering interoperability with a predefined set of services. It is standardizing messaging as thoroughly as plugs and appliances are standardized to fit one another to utilize electricity. Messaging products will, in effect, "plug into" the X.400 backbone.

Backbones other than X.400 can be risky. They don't offer a known set of services; they're not robust. They may weaken, especially in the management and directory services areas. With use, the chain linking your multivendor systems grows progressively weaker as the proprietary gateways and systems struggle to work together.

Many messaging vendors have commited to the X.400 international standard, but Digital has it today. Based on X.400, our MAILbus application software set can link systems and applications from over 40 vendors and public carriers into a corporate-wide electronic messaging system. MAILbus is in fact an integral part of Network Application Support (NAS), our comprehensive implementation of open systems.

continued ➤



Powerful Incentives to Upgrade to a VAX 6000 System

Purchase a new VAX 6000 system or a VAX 6000 CPU upgrade via an Easy System Upgrade, Conventional System Trade-In, or an In-Cabinet Board Upgrade, and you'll get from Digital AT NO ADDITIONAL CHARGE:

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- A System Performance Analysis Service by a trained Digital software professional to ensure that your new VAX 6000 system is tuned to meet your business needs.
- The right to use the VAX Performance Advisor (VPA) through December 31, 1991. VPA is a system performance analysis tool that allows you to monitor and manage your system today, while simultaneously planning for tomorrow's resource requirements.

To take advantage of this special offer, call our Technical Consulting Center today, at 800-343-4040, ext. 545. Orders must be received by June 14, 1991, with a ship-request date no later than June 28, 1991.

A Messaging System Is a Transport System

A messaging system allows you to use electronic mail to send messages to another corporation, person-to-person, terminal-to-terminal. It allows you to use EDI to move purchase orders, shipping orders, invoices, and payments between corporations.

Digital's MAILbus lets you build a true transport system. It lets you use electronic mail, EDI, FAX, and TELEX — on the same backbone. You don't need to build transport systems for each individual application. You install MAILbus once — for all of these applications. The flexibility inherent in standards and in MAILbus allows all these applications to run over the same network transport.

Your Messaging Directory Opens Up Information to Users

Your messaging directory should open up information to users, not shut them out.

The directory must support both the network and its authorized users, keeping track of employee names, addresses, job titles, and phone numbers. It should allow authorized users or applications to access devices or information from local and business-wide networks. Access should not stop at the front lobby door. You also need external access to directories outside your business, coupled with security features that protect your resources from intrusion by unauthorized users.

An "open yet secure" directory has many benefits. It eliminates the danger of a single point of failure. It improves performance, and it allows management of the directory to become distributed. The directory becomes scalable, serving a local or a worldwide network. Our MAILbus directory works in just this way.

A Robust Messaging Network Can Be Managed with Flexibility

A messaging network ought to be flexible enough to accommodate various levels of management. You should be able to choose whether network management is geographically distributed, centrally based, or a combination of the two.

You should be able to easily manage your messaging network. In fact, network management should work for you, monitoring the network and reporting when corrective action is needed.

Such network management features are built into MAILbus. MAILbus also lets you incorporate new technologies, systems, and applications from Digital or other standards-based vendors, without changing the way you use the messaging system.

A Messaging Network Is User Friendly

A good messaging system offers menus, help screens, management reporting tools, and configuration tools. Digital's messaging systems have these features, making them easy to set up, use, and manage.

Be sure to consult your users as you plan and implement a messaging network. Let them choose the desktop devices needed to satisfy job requirements — Macintosh systems, DOS machines, character-cell terminals, for instance. Then train your users thoroughly, so that they can then take full advantage of network resources and services.

Get the Message

Digital has the experience and breadth of products to be your vendor for corporate-wide electronic messaging. Our messaging consultants can help you plan, install, and configure your messaging system. For more information about MAILbus and Digital's other messaging products, call 800-DIGITAL (800-344-4825), or your local Digital sales office.



Third-Party Software Support





Digital has been in the business of supporting multivendor equipment since 1983. Via Vendor Equipment Services (VES) we support more than 8,000 different hardware products manufactured by 850 different vendors. VAS carries our service commitment into the multivendor software arena.

Multivendor computing is a reality. But consistent, comprehensive support for your multivendor environment is not always easy to come by. Digital is changing that.

With the recent introduction of Vendor Application Services (VAS), Digital now supports more than 70 selected third-party software products that run on Digital or Digital-supported hardware, including Simpact, SCO UNIX, LOTUS 1-2-3 for VMS, and the Wollongong Group WIN/TCP. As a result, you can now enjoy the same superior level of service you've come to know from Digital, regardless of your multivendor equipment configuration.

We're committed to providing you with a single source of support. Our software professionals receive extensive training directly from the software vendor — an arrangement that combines Digital experience with a specific knowledge of your software applications.

One call to Digital sets VAS in motion. We serve as the single point of contact, managing the critical link among multivendor configurations. This approach ensures a centralized service response and reduces confusion and time spent over service arrangements.

Depending on your products and your service needs, a number of VAS support options are available from Digital.

Telephone Support: Trained Specialists at the Other End of the Line

When your users encounter a software problem, they can dial a toll-free number and speak directly to one of our software specialists.

These specialists maintain an information database and links with third-party software vendors to guarantee timely, total support for all your system needs. This arrangement completely eliminates the confusion over multiple vendors and means that Digital is not just your first point of contact, but the ONLY source of support you'll ever need.

Trained on both Digital and non-Digital software, our specialists' expertise encompasses the entire system. They have the ability and the tools to define and resolve your application problems, so you can get back to working productively again.

Perhaps most importantly, we are always just a phone call away — worldwide, 24 hours a day, seven days a week for most products.

Financial Support That Maintains High System Availability

When you need more than routine telephone support, our skilled professionals are at your disposal. For most third-party software products, our specialists can reproduce and then diagnose your particular problem. They can download an appropriate solution in a short period of time and, whenever necessary, go directly to your site.

Software Media and Documentation Updates That Keep Your System Current

No matter how skilled your staff or how minimal your software maintenance requirements, current software and documentation updates can help you keep your system running at peak efficiency. Provided automatically on a regular basis, these updates incorporate technical changes, product improvements, and documentation refinements — all features geared to improving your system's efficiency, performance, and productivity.

Service Excellence: An Ongoing Commitment

At Digital, service has always meant giving you total support coupled with quality and value. We're committed to the continued expansion and improvement of our service programs — to give you more peace of mind in the "real world" of multivendor computing.

The strength of our commitment is evidenced by continuing high marks in independent customer surveys evaluating satisfaction with service delivery, as well as by industry consultant reports.

For more information on VAS, and other comprehensive service programs, contact your local Digital Services office.

servicenter

Here's some good news:

At our Digital SERVICenters, we now repair most popular personal computers, terminals, and printers, including those from IBM, Apple, COMPAQ, WYSE, Zenith, Tandy, Epson, and others. (This of course in addition to all models of Digital office products.)

Take advantage of this expanded carry-in service. You'll find our SERVICenters offer fast turnaround and quality service. Prices are competitive too.

Call 800-225-5385 today for more details on our SERVICenter carry-in service for Digital AND non-Digital products, including a complete list of all products on our current repair menu.

SERVICenter Labor Fees on Standard Repair-List Products

Printers, Terminals, PCs, Word Processors, Communications and Networking Devices, Monochrome Monitors	$55.00 per product fix plus parts
Laser Printers, Color Monitors	$100.00 per product fix plus parts
Office CPUs (MicroVAX and workstation systems, IBM and SUN workstations, for example)	$130.00 per product fix plus parts

Service contracts at equally competitive prices are also available.

STORAGE Bytes

Here's the latest word on some of Digital's storage products and solutions.

DSSI Power Migrated to VAX 6000 Systems

When it comes to high performance and data availability, the Digital Storage Systems Interconnect (DSSI) has proven itself to be an industry leader. So you'll be glad to hear that this technology now supports VAX 6000 systems.

The addition of DSSI to VAX 6000 data center systems allows you to configure dual-host VAX 6000 systems to achieve high availability, plus 40 percent improvement in storage price/performance.

New SF200 Storage Arrays, TF857 Tape Subsystems, and More

As part of this expanded DSSI solution, new SF200 storage arrays and TF857 tape subsystems provide high-performance disk storage and balanced, unattended backup for the VAX 6000 systems. The SF200 also supports dual-host capability for entry-level VAX 6000 VAXcluster systems.

Features such as high I/O rates, low access times, and lower price per megabyte, as well as conformance to our Digital Storage Architecture make these DSSI-related products a welcome addition to the VAX 6000 family.

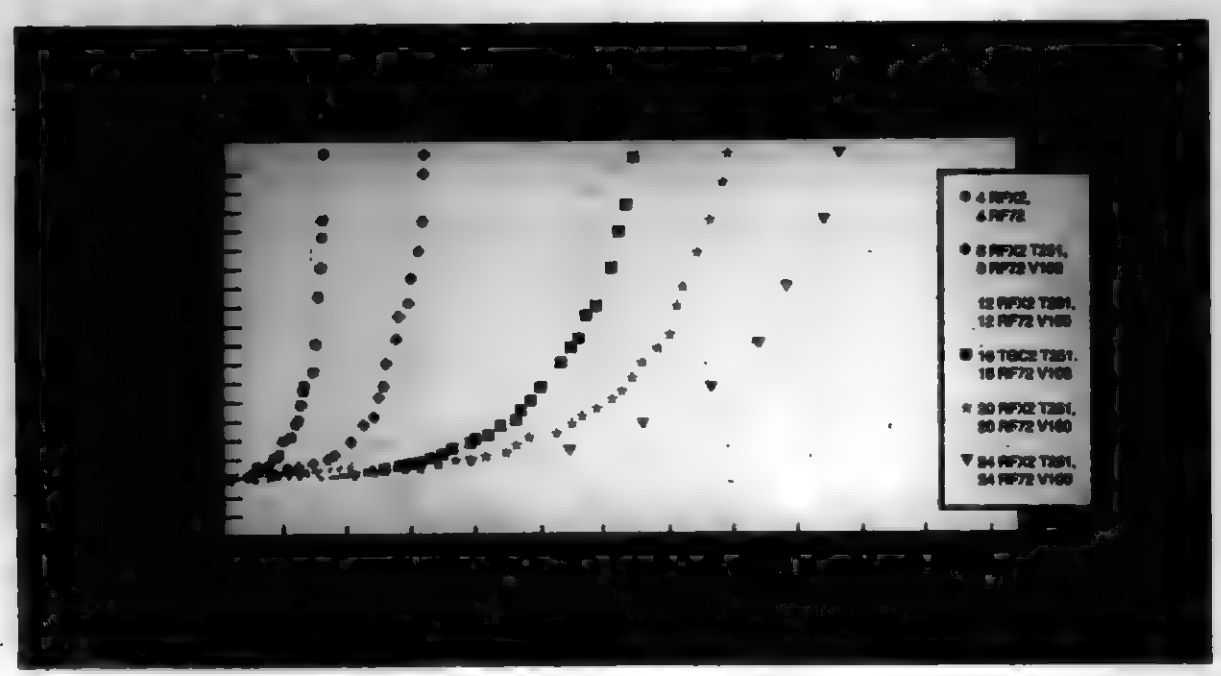
The new SF200 storage array subsystem houses up to 24 gigabytes of storage capacity plus up to 36.4 gigabytes of tape backup — all within a single cabinet. Housing both disk storage and tape backup, the SF200 storage array subsystem offers 75 percent savings in valuable floor space over previous configuration options. Prices for the SF200 storage array subsystem range from $33,000 to $317,000.

The new SF72 storage array building block configures within the SF200 storage array subsystem. Each SF72 provides two to four gigabytes of disk capacity; up to six SF72s can be configured within the SF200. The SF72 storage array is priced from $28,000 to $52,000.

Related storage products include the KFMSA — a single XMI interconnect module supporting up to 12 disk-integrated storage elements and up to two tape-integrated storage elements in single host mode. Up to four KFMSA modules are supported on a single host system to provide 48 gigabytes of formatted capacity. The KFMSA is priced at $14,000 each. A new RF72 disk provides high-end features at competitive prices. Priced at $13,000, this one gigabyte, 5.25-inch integrated storage element is the foundation for the new DSSI storage array.

The new TF857 magazine tape subsystem offers a total of 18.2 gigabytes of highly reliable and flexible unattended backup capability — all in a streaming tape device, available with a seven-cartridge auto-loading magazine. When included in the new SF200 storage array subsystem, two TF857 subsystems can provide up to 36.4 gigabytes of single-shift unattended backup. This makes the TF857 ideal for users of VAX 6000 systems, where the need for high capacity is significant. A complete TF857 magazine tape subsystem is priced at $29,000.

DSSI offers linear performance increases with each additional Integrated Storage Element. ▼



Unattended Backup Strategy Stronger Than Ever

The recent announcement of another new tape subsystem (in addition to the TF857) and the extended availability of an existing tape drive, reinforce our commitment to meet the need for unattended backup for all systems.

TA91 Cartridge Tape Subsystem

Well suited for the requirements of large VAX 9000 and VAXcluster installations, the new TA91 cartridge tape subsystem delivers the highest possible aggregate throughput of any tape subsystem available on Digital systems. It provides 2.4 to 9.6 gigabytes of unattended backup capacity — just like the earlier TA90E subsystem, but with a 27 percent smaller footprint. Improved Data Recording Capability (IDRC), an important feature of TA90 family subsystems, increases cartridge capacity between two and four times, thus increasing basic unattended backup capacity to between five and 48 gigabytes (depending on the application). The price of a dual-drive TA91 master subsystem is $134,000.

VMS Support for TZK10 Tape Drive

Now the TZK10 quarter-inch cartridge (QIC) tape drive is available on selected small systems using VMS Version 5.4-2. This includes VAXstation 3100 systems and MicroVAX/VAXserver 3100 systems. The TZK10 tape drive, intended for backup and data interchange, is an industry-standard half-height QIC streaming device, with a capacity of up to 525 Mbytes. It is priced at $1,800.

Notes on chart:
To the best of our knowledge, the test results show how a particular system having the configuration(s) shown above performed in a test environment, but other units or other environments might give different results. The results are not intended as any form of a warranty or specification for the above configurations(s), and we assume no liability for the accuracy or completeness of the results.

For more information on these and other storage products, contact your local Digital sales representative, or call 800-DIGITAL (800-344-4825).

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Speakers urge IS managers: Take the offensive

BY JOSEPH MAGLITTA
CW STAFF

TUCSON, Ariz. — It is easy being a crackerjack information systems manager these days. All you have to do is become a business whiz, mastermind technology initiatives and help propel your organization into the 21st century.

A snap, right?

Obviously, the problem with such grandiose visions of IS is that it is no easy feat to get there from here.

And where is *there* anyway?

The challenge of helping IS meet tomorrow head-on was tackled at the Society for Information Management (SIM) institutional member conference earlier this month.

The program, "Bridges to the Future: Theory and Practice," enlisted noted speakers in several fields to offer new ways of thinking about IS involvement and improvement. Following is a summary of their thoughts:

• **F. Warren McFarlan, Harvard Business School:** The days of business people saying "it's not my job" to handle information technology are over forever, according to McFarlan. Like never before, the 1990s will require ongoing cooperation among IS, general business management and midlevel user management.

"No two of these three groups can succeed by themselves," McFarlan said.

Smart business leaders see big opportunities to shorten response and delivery times, improve product quality and establish new alliances — all based on information technology.

The key to gaining these payoffs, he continued, is to focus on re-engineering and, especially, implementation. "Re-engineering is not a panacea. It can work only if you make things happen," he said.

He warned that companies who re-engineer but ignore business transformation face certain failure. In such cases, he said, "The system is a technological success, but the patient dies."

Companies must avoid three other fatal errors, he advised: expecting payoffs too fast, getting in too early on the technology curve and pursuing IS projects with inadequate payoffs. Companies should ask, "Is it a big enough step to warrant the pain?" he said.

Commenting on how the use of IS should be conceptualized in organizations, McFarlan said: "There's a lot of garbage being written in the academic journals today about whether IS is a defensive weapon or an offensive weapon. The bottom line is that you will be as fast as your competition, or the business history department at the *Harvard Business Review* will be interested in poking around the cadaver of your corporate records."

• **John Elkins, The Naisbitt Group:** "Anyone involved in five-year strategic planning is wasting their time," declared Elkins, president and chief executive officer of The Naisbitt Group, an Evergreen, Colo., consultancy.

Today, the rapid pace of economic, social, technical and political change has reduced the realistic planning horizon to about 18 months, Elkins said, and that includes IS. "We have to use organizations in the most flexible way to create systems to monitor that change," he said.

While markets will become more global, Elkins predicted, research and development will become more regionalized. IS supporting both activities will undergo careful scrutiny as cost pressures mount.

"Many companies are unable to get off the spending bandwagon for fear they are not doing the right thing. But in the last two or three years, there has been a serious re-examination of what the millions we have invested in technology are really returning."

Elkins also said the focus of IS use will increasingly shift to generating revenue while continuing to look for new ways of reducing costs.

SIM

• **Ralph H. Kilmann, Katz School of Business, University of Pittsburgh:** The complex problems facing companies today require a new kind of problem-solving approach and organizational structure. The solution, Kilmann said, is a "networked organization," described as "an interpersonal and electronic network of people, information and influence."

Such organizations are slowly taking shape, but they must become the norm if the U.S. is to remain a global competitor, Kilmann warned. "U.S. companies must remove barriers and . . . mobilize quick, informal problem teams," he said.

These teams would include experts from several disciplines, including IS. Technologically, communications would be handled via networked personal computers and fax machines.

However, Kilmann also cautioned that such major organizational change is "tougher to do when you come out of the 'Program of the Year' mentality: quality, innovation, excellence, etc. People ask 'Why is it different now?' "

His advice to veteran IS managers? "Don't dwell in the past. Have your own vision, and take a leadership role."

INFOMART OnSite EVENTS

MICROSYSTEMS INTEGRATION MAY 5-7

Join us for the MicroSystems Integration & Workshop Connectivity Conference sponsored by G2 Research. This conference will dispel micro myths and direct users and vendors to understand the potential of microsystems integration solutions.

RETAIL SYSTEMS '91 JUN 4-6

Find out how to be more competitive through strategic applications of retail technology. Sponsored by Retail Systems Alert, this show includes management seminars, technical case studies and exhibits.

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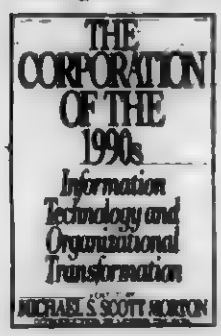
BOOK REVIEWS

Recipes for changing the organization: Some tough, some tasty

The Corporation of the 1990s
Michael S. Scott Morton, editor
Oxford University Press, $24.95

The Corporation of the 1990s offers a recipe for organizational change that is generally difficult to chew but occasionally [illegible].

The 331-page book is the result of MIT's Sloan School of Management's "Management in the 1990s" program.



What the book attempts to address, according to MIT's Lester Thurow's excellent introduction, is "how new technologies can change — and are changing — the way people work, the way society's major organizations are structured and the way corporations will collaborate and compete in the years to come."

The book is a collection of nine essays, three each under the headings of The IT Revolution, Strategic Options and The Organization and Management Response, and is largely written by members of the Sloan School's faculty. Their overall message is clear: Companies must change radically to survive beyond the year 2000. Unfortunately, predicting the future is not easy, particularly when so many of the ingredients are unknown.

What the professors can predict is generally obscured by the academic's tendency to equate the level of insight with the relative inscrutability of the point. Few of the essays ever approach the readability of Thurow's introduction.

Still, there are ways to glean the ample knowledge that is buried in these pages. For starters, change the way you read a book: Focus on the table of contents and the index. Read the uniformly well-written conclusion of each appropriate essay first, to determine how effectively it sums up its point. Use the index to see where topical references occur — such as "integration of business processes" or "labor-management relations."

There is also the recurring theme that technology does not replace human beings, stated most effectively in Paul Osterman's essay on the impact of information technology on jobs and skills: "High technology, standing alone in the absence of a corresponding set of human resource investments, does not seem capable of achieving comparable results" to an organization with less technological capability but better management skills.

Clearly, this is not the handbook to achieving a healthy corporation for the 1990s and beyond that it might have been. But do not ignore this book, if only because it illustrates how, in Thurow's words, "Thinking of these new technologies as something that should be used to produce information has led them to be used wrongly."

MICHAEL FITZGERALD

Tell Me a Story: A New Look at Real and Artificial Memory
By Roger C. Schank
Scribners, $19.95

In his latest book, Roger C. Schank, the director of the Institute for the Learning Sciences at Northwestern University and former director of the Artificial Intelligence Laboratory at Yale University, challenges the traditional AI assumption "that making computers intelligent means endowing them with logical reasoning abilities and detailed expertise in various domains."

Instead, Schank argues that a human model of intelligence would be based on storytelling ability. Stories, he says in the 253-page book, are the medium by which people communicate and store information; the more intelligent the person, the more subtle and varied his indexes for filing and retrieving stories.

It is an intriguing argument that is readable, persuasively written and demonstrates enormous insight into human nature.

NINA BARRETT

Knowledge Link: How Firms Compete through Strategic Alliances
By Joseph L. Badaracco Jr.
Harvard Business School Press, $24.95

Information systems managers fed up with attempting to understand the constant strategic shifts affecting their corporations can glimpse the business side of the "knowledge globalization" in *Knowledge Link*.

The 154-page book does not try to solve any how-to problems IS managers face when expanding their systems to meet a corporate global strategy. But the author successfully illustrates the important competitive role information and company-owned knowledge plays in today's business world. The book demonstrates how the globalization of knowledge through strategic alliances and company acquisitions is directly impacting the shift in the managerial structure within corporations worldwide.

MAURA J. HARRINGTON

Fitzgerald and Harrington are *Computerworld* correspondents. Barrett is a free-lance writer based in Evanston, Ill.

INTRODUCING THE RETRIEVAL THAT CAN HUNT



When a customer requests information, how long does it take you to find that data and supply it? An hour? A day? Now, thanks to Anatrieve software from Anacomp, those days are over. Regardless of the information you store on film—bank statements, account statements, invoices, insurance policies or health care forms—Anatrieve can retrieve it almost instantly.

Or, put another way, this dog will hunt. Anything.



Ask Anatrieve where something is, and it immediately points it out.

With Anatrieve, you'll never wonder "Do we have that data, and if so, where is it stored?" Anatrieve points to the answer immediately. Because of its unique computer indexing, you can access information any number of ways: customer name, account number or other identifying information.

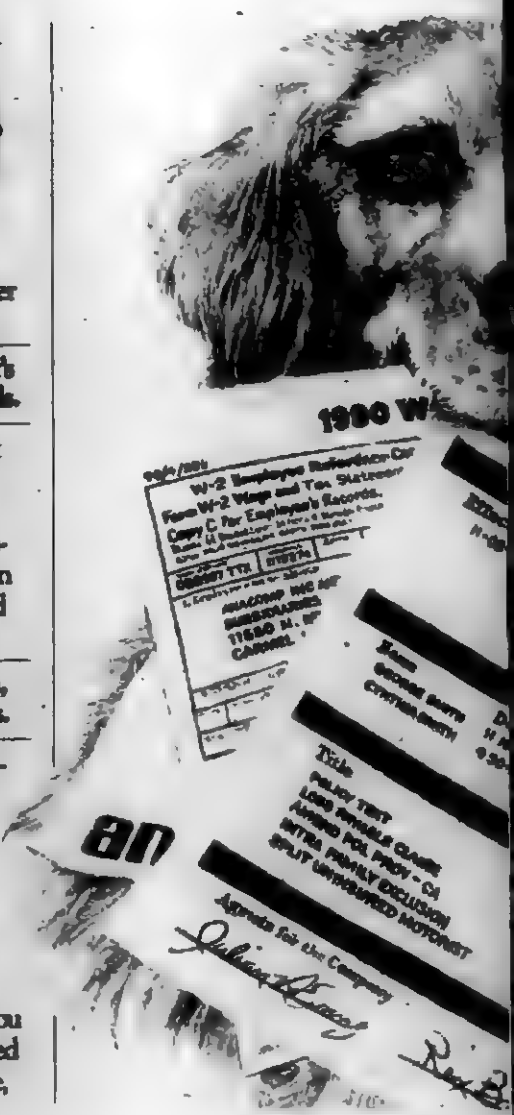
Tell Anatrieve to go fetch, and it's off and back, often within seconds.

Not only does Anatrieve point you in the right direction, it can retrieve information very quickly. When linked with intelligent, automated image retrieval devices, it can provide displays within seconds and can even provide for hard copies.

No matter what field you are in, Anatrieve brings back the goods.

No matter what the business—banking, insurance, healthcare, hospitality, government, retail—Anatrieve performs. If your company frequently receives requests for information, you can achieve major cost and time efficiencies with Anatrieve.

And only Anatrieve will tell you how to distribute customer requested information and, when appropriate,



Recession means IS stagnation

NEW YORK — Want more proof that we are in a recession? Despite all the volatility of the information systems profession, IS staff turnover is at a 10-year low.

This is according to Edward Perlin Associates, Inc., a computer professional compensation and management consulting firm. "I never thought I'd hear my client companies complain that computer staff turnover was too low," President Edward Perlin said.

In addition to the problems of lower morale and the lack of fresh talent entering IS departments, the low turnover may have a hidden disadvantage. When the economy recovers, Perlin warned, turnover may skyrocket. That is because the recession has also brought lower raises and salary freezes — resulting in dissatisfied employees.

"When the situation improves, employees who are now annoyed by low or no raises will not need much encouragement to switch jobs to gain better pay and greater opportunity," Perlin said.

Many IS departments benefit greatly from the ideas that outsiders can bring.

"This information interchange shows companies better ways to get things done, and the flow of this useful know-how seems to have dried up as staff turnover has dropped," he said.

MANAGEMENT BRIEFS

Index Group links up with Hammer to establish re-engineering center

Index Group, Inc. and consultant **Michael Hammer** have announced the creation of the Center for Re-engineering Leadership, an organization that will seek to develop and disseminate knowledge to help transform companies.

Based in Cambridge, Mass., home of Index Group, the center is scheduled to begin operations May 1. Index Vice President Steven A. Stanton will direct daily operations.

Initially, the center will bring together top business executives from 40 large companies to explore key issues in implementing re-engineering methods. Index and Hammer have collaborated since 1984 in running Prism, an information systems management joint research program sponsored by approximately 150 companies.

The Society for Information Management (SIM) has formed a group of select high-level IS executives to participate in joint research on IS management issues. The SIM Advanced Practices Council will consist of 30 members; a membership fee of $25,000 will be charged.

Harvard Business School Prof. F. Warren McFarlan will serve as research director, and Thomas Morin, vice president of Medtronic, Inc. and a former SIM president, will be chairman. The research will be "100% practitioner-driven," according to SIM Executive Director Henry Givray.

The council will eventually share its research results with the SIM membership. The council, which still has openings for new members, will meet again July 8.

Abbott, Langer & Associates has published the eighth edition of *Compensation in the MIS/DP Field*, a survey of salaries at all levels of IS in 622 organizations. The survey found that the highest paid position is a director of MIS/DP with 20 or more years experience administering an IS budget of $10 million or more. Among the organizations surveyed, the highest paid director makes almost $150,000 annually in salary and bonuses.

The report is available for $550 from Abbott, Langer & Associates, 548 First St., Crete, Ill. 60417 (708) 672-4200.

The **Automotive Industry Action Group (AIAG)** has published an industrywide guideline for electronic data interchange (EDI) standards. The EDI Industry Implementation Guideline was formulated by auto companies including the Big Three and large automotive parts suppliers such as TRW, Inc. and Allied-Signal Corp.

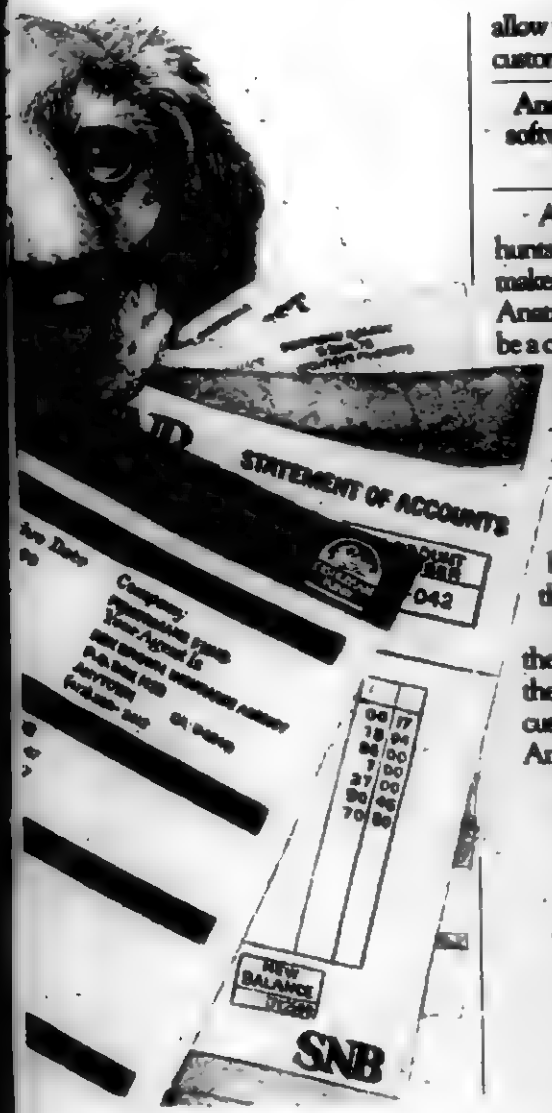
The guideline covers 14 business transaction sets related to invoicing, purchase orders, price quotes, shipping, receiving and other common business transactions in the industry.

One copy of the guideline will be sent to each AIAG member company free of charge. Nonmembers can purchase copies for $250 from AIAG, Suite 200, 26200 Lahser Road, Southfield, Mich. 48034 (313) 358-3570.

Uniforum has announced a call for papers for the 1992 Uniforum Conference scheduled for Jan. 20-24, 1992 in San Francisco. The conference will focus on the theme, "Unix: The Open Advantage." The deadline for submitting abstracts and application forms is June 1.

Participation forms are available from Uniforum, Suite 201, 2901 Tasman Drive, Santa Clara, Calif. 94054 (408) 986-8840.

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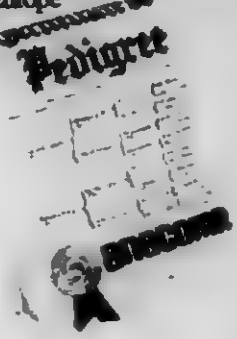
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Mandl

FROM PAGE 67

the Persian Gulf broke out, we had to reconfigure our whole system to some extent to accommodate this new requirement. You can't deal with such issues unless you have information resources that allow you to assess and understand what all the steps mean."

• On integrating information technology with the rest of the company:

"We have restructured our organization in a number of ways to ensure total cohesiveness between the people who run the business and the information technology people to make sure there is a frequent flow of leads and information and issues.

"We have done it in such a way that information technology really becomes the business and that people who operate and market the business think of themselves as individuals who are very much in the forefront of how to employ the technology to create the kind of service we want."

• On the current and future role of IS professionals:

"Before the restructuring, the information group was a good group but not part of the day-to-day business. They were not brought in and integrated into the basic fabric of the decision process. We have changed that by placing information technology people in all parts of the organization.

"These professionals provide the communication, the knowledge and the ongoing opportunity to ensure that information technology is part of the management process.

"The next step is to have information technology people run operational areas, marketing areas and shipping terminals and have business people run information technology areas. We've done some of that, and I want to see more.

"Whenever that happens, you have an enormous catalytic impact in terms of how these two functions are brought together and totally meshed."

• Where information technology hasn't met expectations:

"It doesn't meet my expectations when we don't do an adequate job of training the people to use it right. The systems usually work pretty damn well. But often, we don't provide adequate training to fully exploit the capabilities the systems have.

"Whenever I've seen something that didn't look right or things that weren't going right, more often than not the shortfall or mistake is failure to provide the right kind of training . . . to do everything with that system that it is designed to do."



INFORMATION technology "doesn't meet my expectations when we don't do an adequate job of training the people to use it right."

Alex J. Mandl
Chairman and CEO
Sea-Land Service, Inc.

• On deciding how much to spend on information technology:

"We spend between 3% and 3.5% of sales on the information technology budget. If you include all other direct and indirect user spending, the total is more like 4% to 4.5% of sales.

"That's a lot of money, and we look at how much we spend an awful lot. For a large portion of the expense, it's not a question of whether you do it or not. The major expenditure is for ongoing maintenance of existing systems. So you haven't got any choice. You have to make the assumption that you're doing it as efficiently as you can."

• On justifying new systems:

"The next question is how much more money are you willing to commit for further systems development and what kind of a return will you get. We look at those hard every time. Unless we are convinced that a new expenditure of, say, $10 million will do specific things and provide specific benefits in revenue, benefits or market share and differentiation, we won't spend it.

"We try to be as disciplined as we can to ensure that those incremental expenditures are financially fully justified.

"Those first two are the easy part. The tough part is to all of a sudden make a judgment to replace an existing system. If we replace that with a new architecture and new features, it would give us a more robust system and more reliability. But how do you justify it financially? You can make some assumptions and so forth, but that gets tough. Then you get to the point where you have to be damn sure you have the right people making the right judgments."

• On Sea-Land's business and technology goals:

"One of our principal goals is to improve the basic quality of service in terms of reliability and low error frequency — making the basic transportation and distribution service ride to the highest quality possible.

"We want to find ways to utilize our equipment more efficiently. We have containers constantly moving around the world in various ways. The challenge is to utilize those containers to get the most use out of them. We also need to provide the container for the customer as quickly as he needs.

"To minimize the movement of empty containers, we are putting a system in place that is strictly information-driven. Rather than manage containers on a terminal or regional basis, we will optimize their efficient use on a global basis. The basic elements are in place, but full deployment won't be until early 1992."

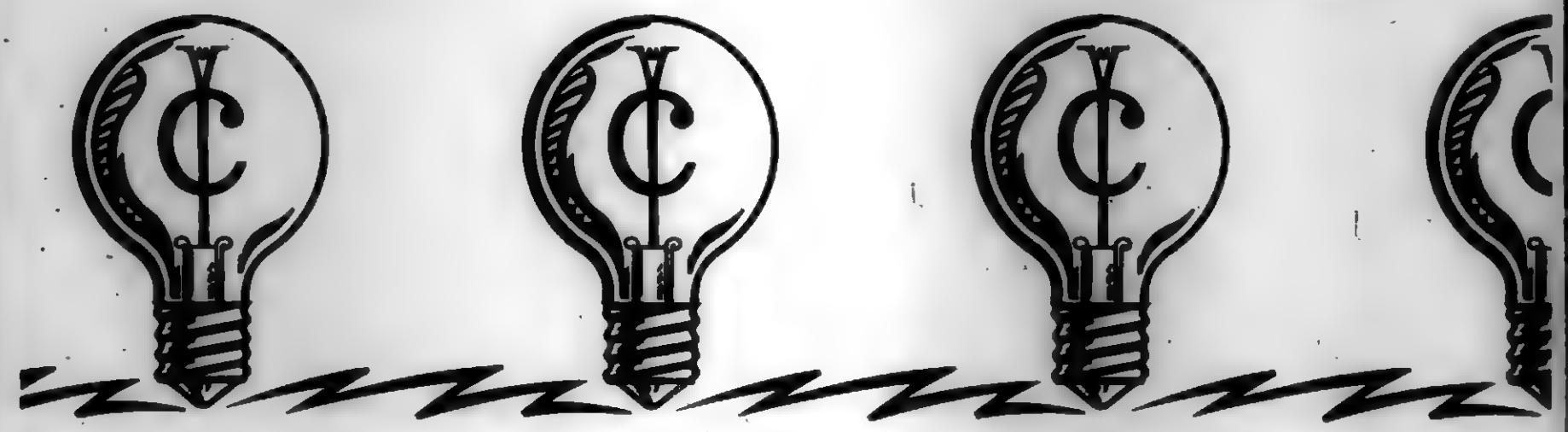
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CALENDAR

Gilbert M. Grosvenor, president and chairman of the National Geographic Society, will be the keynote speaker at the Managing Apple Computers in Information Systems (MACIS) conference June 2-5 at the J. W. Marriott Hotel in Washington, D.C.

Also speaking at MACIS on Apple Computer, Inc. Macintosh integration will be Albert Yepez, acting manager of the IS tools and technology integration group at Apple.

For information or to register, contact MACIS in Chicago, Ill., at (312) 644-6610.

MAY 19-25

Adjusting to Reality: New Profit Strategies of 1991 and Beyond. Palm Springs, Calif., May 19-22 — Contact: Information Industry Association, Washington, D.C. (202) 639-8262.

International Industrial Engineering Conference. Detroit, May 19-22 — Contact: IIE Registrar, Norcross, Ga. (404) 449-0460.

Cusco Summer Institute. Boulder, Colo., May 19-23 — Contact: Cusco, Boulder, Colo. (303) 449-4430.

Ingres World 1991. San Jose, Calif., May 19-23 — Contact: Ingres, Alameda, Calif. (415) 769-1400.

International DB2 Users Group Conference. San Francisco, May 19-23 — Contact: IDUG headquarters, Chicago, Ill. (312) 644-6610.

Association of Data Communications Users Conference. Atlantic City, May 20-22 — Contact: Augie Biegen, ADCU, New York, N.Y. (612) 881-6803.

Camdex '91. Atlanta, May 20-23 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Windows World '91. Atlanta, May 20-23 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Leadership in a Global Marketplace. Atlanta, May 21-22 — Contact: Sharon Scott, Informs Institute, Atlanta, Ga. (404) 220-2892.

Systems 3X/400 Expo. Rosemont, Ill., May 21-22 — Contact: National Productions, Salem, Mass. (508) 745-6010.

Unix and Open Systems. Santa Barbara, Calif., May 21-23 — Contact: Deborah Hay, Seybold, Boston, Mass. (617) 742-5200.

Application Development in the '90s Seminar. St. Louis, May 22 — Contact: Inference Corp., Los Angeles, Calif. (213) 322-0200.

Managing Information Technology in Turbulent Times. Wellesley, Mass., May 22 — Contact: CIMS, Babson College, Wellesley, Mass. (617) 239-4531.

Computer Interoperability and Quality: Networking Challenges for Manufacturing. Arlington, Va., May 22-23 — Contact: Ruth J. Bagnasi, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

IBM User Group Meeting. Phoenix, May 23-24 — Contact: South West Events, Scottsdale, Ariz. (602) 991-5131.

Cogo '91. Montreal, May 23-25 — Contact: Stuart Roove, Roove, Gerb and Associates, Toronto, Ontario (416) 482-8888.

World Computer Law Conference. Chicago, May 23-25 — Contact: Michael D. Scott, Center for Computer/Law, Manhattan Beach, [illegible]

MAY 26-JUNE 1

Database World Conference and Exposition. Washington, D.C., May 28-30 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Client Server '91. St. Louis, May 28-31 — Contact: Bonnie Sen, Washington University, St. Louis, Mo. (314) 899-5380.

SCAI/ASIT '91. Washington, D.C., May 28-31 — Contact: Gil Merrit, The Information Exchange, Woodbridge, Va. (703) 490-3300.

DB2 Productivity Tool Seminar. New York, May 29 — Contact: DB2 and SQL Users, New York, N.Y. (212) 866-7563.

JUNE 2-8

Interactive Systems Corporation Developers' Conference. Universal City, Calif., June 2-5 — Contact: Interactive Systems Corp., Santa Monica, Calif. (213) 453-8649.

3Wizard Spring Conference. Santa Clara, Calif., June 2-5 — Contact: 3Com, Santa Clara, Calif. (415) 732-5000.

International Communications Association Conference and Exposition. Anaheim, Calif., June 2-7 — Contact: ICA, Dallas, Texas (214) 233-3888.

National Prime Users Group Conference. San Antonio, June 2-7 — Contact: NPUG, Laurel, Md. (303) 490-2056.

Computer Graphics for Design. New York, June 3-5 — Contact: The Center for Computer Graphics for Design, Briarcliff Manor, N.Y. (914) 741-2850.

Mexbuild '91. Los Angeles, June 3-5 — Contact: Robert Berkowitz, Practice Management Associates, Newton, Mass. (617) 965-0055.

The IBM Imperative. Arlington, Va., June 3-5 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Xplor International European Conference. Veldhoven, Netherlands, June 3-5 — Contact: Xplor International, Palos Verdes Estates, Calif. (213) 669-7567.

Xhibition '91. San Jose, Calif., June 3-6 — Contact: Integrated Computer Solutions, Inc., Cambridge, Mass. (617) 547-0510.

Mumps Users' Group Meeting. New Orleans, June 3-7 — Contact: Mumps Users' Group, College Park, Md. (301) 779-6555.

Object World Conference. San Francisco, June 3-7 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Digital World Conference. Beverly Hills, Calif., June 4-6 — Contact: Seybold Seminars, Malibu, Calif. (213) 457-5850.

Downsizing Corporate Computing. Chicago, June 4-6 — Contact: Bob Daniel and Todd Langton, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Inventory Management Expo and Conference. Rosemont, Ill., June 4-6 — Contact: Kotch and Polisk, Inc., New York, N.Y. (212) 557-6050.

Managing Office Ergonomics: Toward a National Consensus. Tysons Corner, Va., June 5-6 — Contact: The Center for Office Technology Conference, Washington, D.C. (202) 466-7810.

Interactive Multimedia: An Approach to Education. Dallas, June 7 — Contact: Informart, Dallas, Texas (214) 746-3500.

Lotusworld '91. Boston, June 7-8 — Contact: Susan Hines, Dasack & O'Keefe Associates, Sudbury, Mass. (508) 443-3330.

JUNE 9-15

Software Publishers Association European Conference. Cannes, France, June 9-12 —Contact: Software Publishers Association, Washington, D.C. (202) 452-1600.

American Bankers Association's Corporate Trust Workshop. Reston, Va., June 9-13 — Contact: Lou Cox, ABA, Washington, D.C. (202) 663-5000.

The Security Impact of Networks, Telecommunications and Office Automation. Denver, June 10-12 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2626.

Usenix Summer 1991 Technical Conference and Exhibition. Nashville, June 10-14 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

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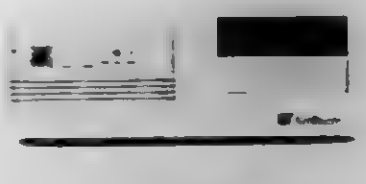
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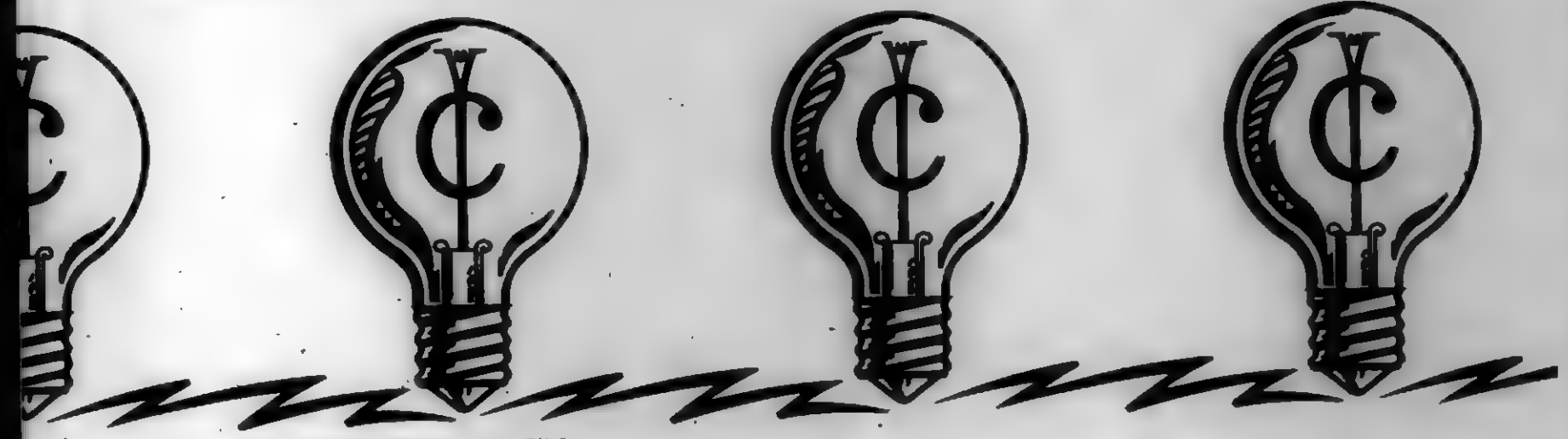
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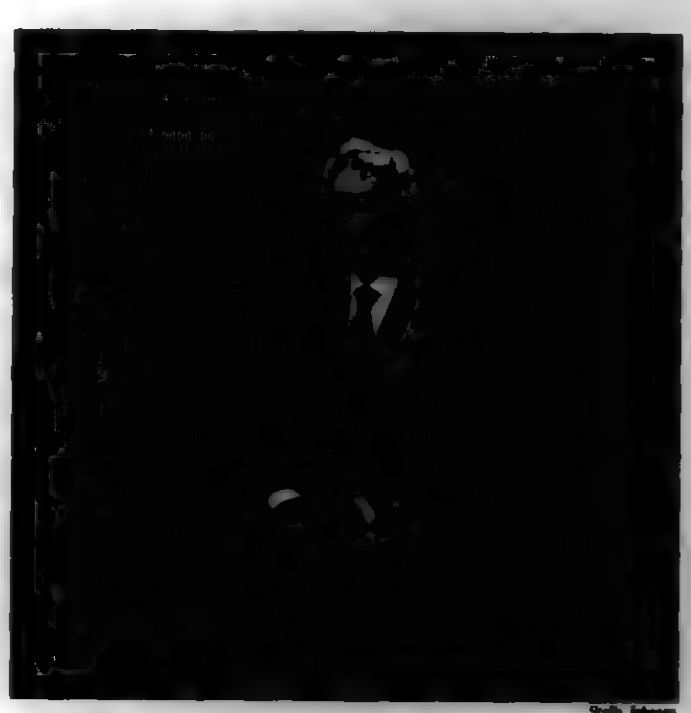
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It's reality time

The romance between corporate America and computers shows signs of maturing and settling down to everyday life



Stella Johnson

Thermo Electron's Hatsopoulos: *"Is it worth the money?"*

BY JOSEPH MAGLITTA

As the heady technology days of the late 1980s fade into the sober 1990s, the honeymoon glow surrounding corporate executives and information technology has sharpened into the harsh glare of everyday life.

Gee-whiz attitudes and the blind pursuit of competitive advantage have matured into clear-eyed realism. The new focus is targeted, functional and cost-justified. Chalk it up to experience.

"The expectations that we may have had four or five years ago were well beyond the scope of what a good system could do — let alone what the average system could do," acknowledges Steve Berlin, chief financial officer at Citgo Petroleum Corp. in Tulsa, Okla. Today, Berlin says, experience has better taught companies about what information systems can and cannot do. "We don't have the expectation now that a new computer system is the be-all and end-all that's going to solve all the world's problems. We have gotten much more realistic."

Realistic. The word crops up frequently when Fortune 1,000 executives are discussing computers. In fact, more realistic expectations of information technology highlight a new *Computerworld*/Andersen Consulting survey of 200 top U.S. executives.

Corporate heads say information technology remains a critical — and growing — part of their businesses. But compared with the most recent *Computerworld* executive survey two years ago, there is a much stronger feeling now that IS is less of a competitive magic bullet than a necessary (and often costly) ante for business survival.

"All of our manufacturing operations, all of our financial applications are really locked into computer applications," says Robert J. Myers, president and chief operating officer at Grumman Corp. in Bethpage, N.Y. "If we lost the use of our computers, it wouldn't be long before we'd really be in deep trouble."

James Klopman, a vice president who heads merchandising operations at Russell Athletic, a division of Russell Corp. in Alexander City, Ala., adds: "In the apparel business, there's less and less product differentiation. We have to think in terms of service, and that has to do with information flow."

It's too early to tell if the results represent a major shift in mind-sets or just a short-term detour. At the very least, the survey responses reveal the beginning of an important corporate reassessment of how information technology is used.

THERE IS A MUCH STRONGER FEELING now that IS is less of a competitive magic bullet than a necessary (and often costly) ante for business survival.

Blind faith no more

It was only a short while ago that chief executive officers — excited by articles in the *Harvard Business Review* and other magazines that touted successes at American Airlines, Inc., Baxter Healthcare Corp. and a precious few others — naively raced ahead in the belief that heavy investments in computers would automatically translate into big market gains.

Unfortunately, in most cases, big IS spending did not equal greater market share, and many executives came away disappointed, notes N. Dean Meyer, principal at N. Dean Meyer and Associates, Inc., a Ridgefield, Conn., consultancy specializing in information technology use.

"Everybody was looking for the grand slam — the single large system that had a dramatic impact on the competitive advantage and the success of the firm," Meyer says. "The problem is that grand slams in real life are hard to find."

Even in smaller projects, says Barbara Herman, vice president at Cambridge, Mass.-based Index Group, Inc., business results often failed to meet expectations. "Companies may have been able to

Continued on page 82



How top executives evaluate IS

Key points

▶The belief that information technology can be used for competitive advantage is less prevalent than it was two years ago.

▶The role of information technology is increasing in most Fortune 1,000 organizations.

▶Many executives say they have a more realistic attitude about what IS can and can't accomplish.

▶Most executives, especially CEOs, say IS is changing business processes such as manufacturing and distribution.

▶Despite lower expectations, more executives say they are getting their money's worth from IS investments. Measurement programs are popular, but they differ widely (see story page 83).

▶Personal computer use by executives is increasing (see story page 92).

▶The chances of IS managers reaching the CEO suite are considered very low (see story page 88).

▶Alex J. Mandl, chairman and CEO at Sea-Land Service, Inc., says top business executives must continue to press for smart technology use (see story page 67).

Continued from page 81

implement 'the laptop pilot' but still don't have better sales productivity or higher sales," she says. "There's a certain amount of disillusionment."

As a result, many cost-pressured executives are now taking another, harder look at how and where technology is deployed.

George Hatsopoulos, CEO and president of Thermo Electron Corp., a leading manufacturer of environmental controls in Waltham, Mass., says: "When MIS expends too much, I call all the managers in and say 'Do you really want all that information? Is it worth the money?' "

Scrutiny of IS projects has also increased at The Southern Co. in Atlanta, according to Larry Westbrook, vice president of finance. "I think we're doing a lot tougher job assessing the costs and benefits. Not just, 'It is nice to fix it,' but 'What do we get?' "

Far from giving up

Even though competitive expectations have diminished somewhat, U.S. corporations are far from willing to give up on IS. Nearly 94% of survey respondents agreed that IS should have a "significant impact" on the bottom line of their organization. Similarly, 87% agreed that "information technology is an integral part of our business strategies."

While both figures are down slightly from the 1989 survey, they nonetheless show the vital role information technology is expected to play in the overall company mission.

However, the focus for many has now shifted to improving internal quality and efficiency, which they hope will indirectly benefit overall corporate performance. Hatsopoulos declares: "If you manage your company well, you become competitive" — a view shared by many respondents.

In many organizations, the rush to automate has been replaced by a more careful, systematic examination that emphasizes the use of information technology to rethink individual business processes.

Indeed, "re-engineering" is fast becoming the next corporate computing fad. Some 86% of the executives polled this year agreed that "information technology is reshaping many of our business processes."

> IN MANY ORGANIZATIONS, the rush to automate has been replaced by a more careful, systematic examination that emphasizes the use of information technology to rethink individual business processes.

For example, retail bank National City Corp. in Cleveland — like many businesses — is seriously looking at ways to redo its processing by using imaging technology, says Harold Todd, executive vice president and COO.

Titan PRT Systems, Inc. in Park Ridge, N.J., which manufactures transportation systems, now uses computers to help its mechanical engineers do quick designs of superstructures. This simple process redesign has greatly improved speed and cut costs, according to Bob Liebmann, finance vice president.

Many reasons for shift

Another sign of the cooling romance between corporate executives and IS is a drop in the percentage of executives who say they are "personally paying more attention to information technologies than they did a few years ago." In 1989, 84% of respondents agreed with that statement; in 1991, the figure fell to 79%.

According to consultants and academics, the reasons for the changing attitudes toward technology are twofold: First, computers could never meet the impossibly high goals envisioned by many starry-eyed CEOs. Second, bad real-life experiences — including stalled, ineffective or long-delayed technology — gave many corporate officers a merciless education about what IS could and could not do.

"You expect EDI and . . . bar coding to come to the forefront, and it's slower getting here than we want it to be," explains Richard Ill, president of The Triumph Group, Inc., an Alco Standard Corp. subsidiary in Valley Forge, Pa. Expectations are also lowered, he adds, "because of the difficulty and cost of some of the [computer] projects."

Another big factor, executives and consultants say, is the heavy computerization of most industries today. While early technology pioneers got a jump on their competitors, such advantages quickly evaporate when everyone else gets the same technology. Today, industry analysts agree that a company is lucky to get a six-month advantage from IS. "I can't think of any system we don't have that our competitors do," says Edward Schenk, president of Gwaltney of Smithfield, Inc., a Smithfield, Va.-based subsidiary of Smithfield Foods, Inc.

N. Venkatraman, a professor at MIT's Sloan School of Management and an industry consultant, blames vendors and consultants for the "overblown expectations" and "mistaken call" of information technology in the late 1980s. "CEOs got mistaken expectations that you invest in information technology and the next quarter you get results. Forget it," Venkatraman said.

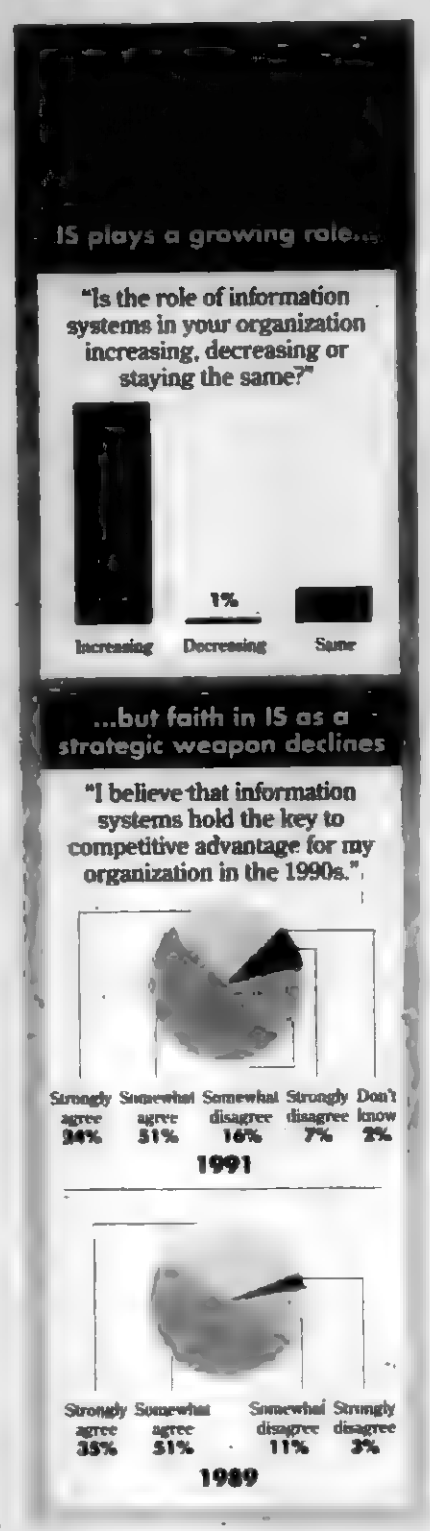
Spending holds steady

Despite lower hopes, executives feel strongly enough about the power of information technology to either hold level or modestly increase IS spending despite recessionary pressures.

While 82% of the respondents said current economic conditions are affecting their business, only 26% have reduced their spending on hardware, software or communications. Staff reductions and delayed capital investments were the favored cost-cutting measures. Many respondents refuse to trim, however.

"[Management guru] Tom Peters . . . says there are three things you definitely don't do in a recession," Klopman says. "You don't cut back on training, you don't cut back on advertising, and you don't cut back on information services. You increase your expenditures there."

To help ensure that they are getting the biggest "bang per buck" from IS, many corporations are employing a wide variety of measurement systems, ranging



IS: Different things to different industries

While executives from different industries agree on many major points about the use of information technology, big differences do exist.

In general, companies involved with energy exploration, natural resources and chemicals had the lowest expectations — and least satisfaction — when dealing with IS. Service companies and finance/insurance firms voiced the highest levels of satisfaction and hope. Following is a brief summary of broadly grouped industry responses in key areas:

Using IS for competitive advantage: Finance/insurance companies were the strongest believers (3.24 of 4 points); exploration/energy/natural resources/chemical were the weakest (2.78). Mean for category: 2.95.

Getting money's worth from IS: Exploration/energy/natural resources/chemical firms were the most satisfied; service industries were the least satisfied.

IS meeting expectations: Exploration/energy/natural resources/chemical firms (29.2%) were most likely to say IS was "fully meeting" expectations; manufacturing companies were least likely (16.7%). Average for category: 20.1%.

Bottom-line impact of IS: Service companies strongly expected the biggest contribution to the bottom line (68%); exploration/energy/natural resources/chemical firms expected the least (29.2%). Average for category: 54%.

Reshaping business processes with IS: Manufacturing firms expected the most change (3.33); exploration/energy/natural resources/chemical companies expected the least (2.96). Mean for category: 3.25.

Reductions in IS spending: Exploration/energy/natural resources/chemical firms reported making the most changes or reductions, followed by service and finance/insurance. Delaying or deferring capital investments was the most common cost-cutting measure.

Measuring IS benefits: Service companies believed it most possible (84%); exploration/energy/natural resources/chemical companies believed it least possible (50%). Average for category: 72.5%.

Outsourcing: Finance/insurance (39.5%) firms were most likely to outsource all or part of their IS operations; service companies were the least likely (29.2%). Average for category: 34.6%.

Rating IS management: Manufacturing firms were most likely to rate their IS management as "very adequate" (43.3%); exploration/energy/natural resources/chemical firms were least likely (29.2%). Average for category: 40%.

Background in IS: Executives in finance/insurance were most likely to have an IS background (15.8%); exploration/energy/natural resources/chemical executives were least likely (8.3%). Average for category: 13%.

Emerging technologies: Manufacturing was most interested in electronic data interchange (EDI) (30%); finance/insurance in imaging/bar coding (56.5%); service in EDI (60%); and exploration/energy/natural resources equally in networking, voice technology/artificial intelligence, distributed data processing and software development (25% each).

Of the 200 executives surveyed, finance made up 12.5%; transportation, 2.5%; exploration/resources/chemical, 12%; engineering, 1%; manufacturing, 48.5%; utilities, 4%; sales (retail/wholesale), 7%; service, 4.5%; insurance, 6.5%; other, 1.5%.

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from formal examinations of IS-generated profit and customer complaints to informal, subjective assessments (see story below). Still, acknowledges one CEO: "It's mostly a gut-feel kind of a thing."

Despite its current stigma as a last resort or admission of failure, outsourcing is becoming a more popular cost-cutting tactic. More than one-third of executives said they are currently outsourcing all or part of their IS operations. Another 8% are considering doing so.

That so many companies would even consider handing over a function as critical as information processing — unthinkable a few years ago — is a sure sign of the depth of the current rethinking of information technology.

Room for improvement

Are companies getting their money's worth from information technology? That, of course, is the $64,000 question.

Surprisingly, corporate heads expressed slightly greater satisfaction with the performance of their corporate IS departments in 1991 than they did two years ago. For example, the number of respondents who said they are getting their money's worth from IS spending actually increased since the last survey, from 35% to 46%.

Analysts attribute this apparent paradox to a growing understanding of IS on the part of corporate executives. "In many cases, executives have had much more frequent interaction with IS," and thus, they have a more realistic view, Herman says.

The majority said their companies do a fair job linking business strategy and IS, though there is room for improvement. Of the sample, 37% said the two are "very closely linked," 53% said they are "somewhat linked," 8.5% said they are "not very linked," and 1.5% claimed they are "not linked at all."

Such ratings, however, are relative. Nearly 50% of all organizations said they don't feel technology investments are yielding adequate returns. Antiquated systems, poor implementation and an increase in volume of paper and information, to name a few, have all dampened executives' enthusiasm about information technology.

Obviously, Meyer says, that represents a major problem and challenge for many large U.S. businesses. The solution, he says, "is not a few grand slams but an avalanche of strategic systems" based on new methodologies and better needs assessment.

High hopes

Even though many executives now appear to be taking a more tempered attitude toward information technology, hope about the future remains high.

There is fairly strong agreement (70%) among non-IS executives that computers will continue to shape how their corporations do business. Most executives, especially CFOs, continue to worry about corporate data security. But electronic data interchange (EDI), bar coding and imaging, voice technology and networking continue to draw high interest.

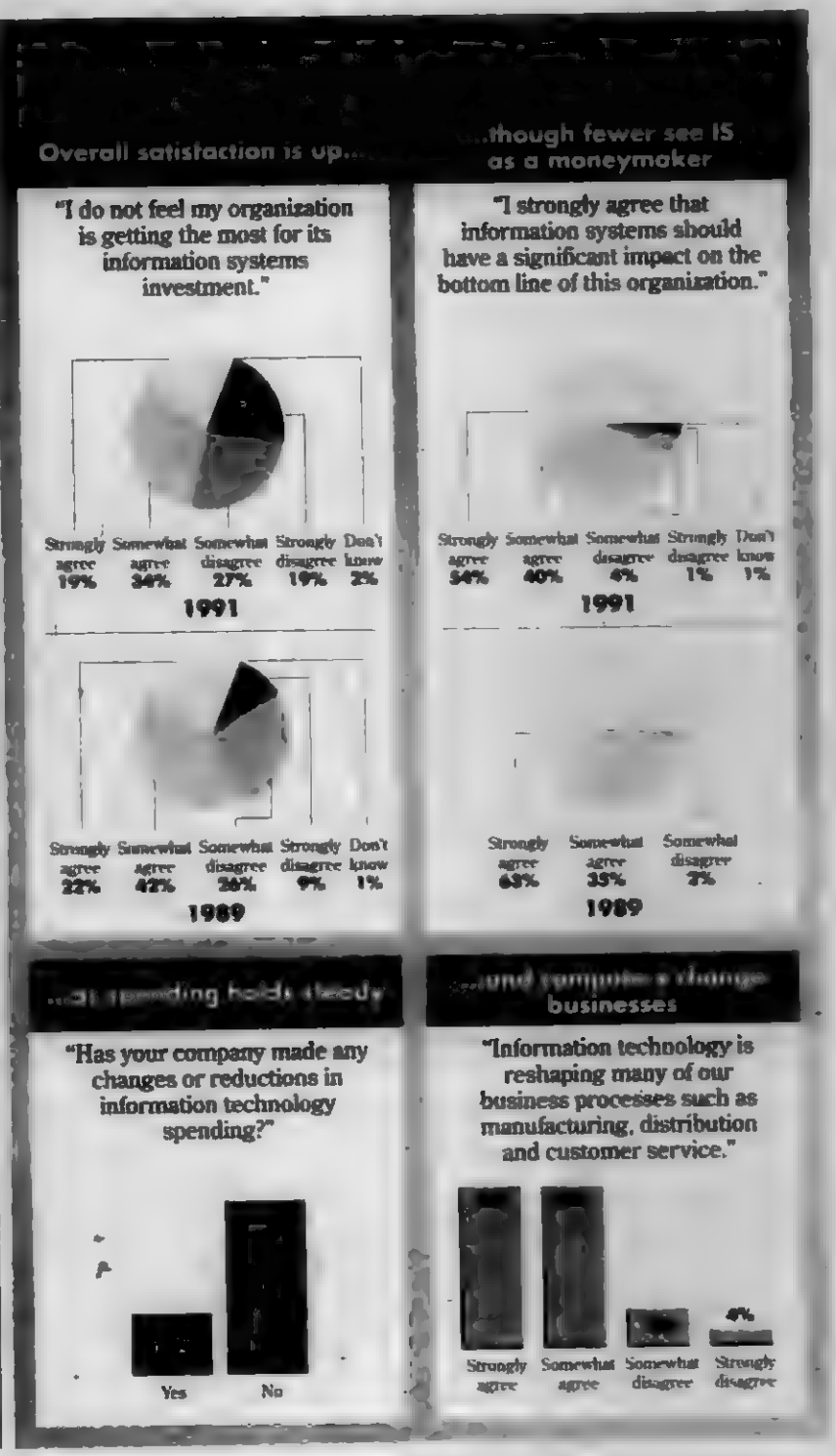
Yet it is important to note that many are far from willing to proclaim the death of information technology as a competitive weapon. Among them is Harvard Business School Professor F. Warren McFarlan, who blames the dip in the belief of IS as a competitive tool at least in part on the current recession. McFarlan, arguably the world's leading authority on the business use of IS, predicts attitudes will change when CEOs find themselves under less severe short-term financial pressures.

Others are more cautious. "Trying to find that elusive competitive advantage through information technology is going to be far more elusive than we ever anticipated," concludes William Welsh, president and CEO at Valmont Industries, Inc. in Valley, Neb.

So while information technology may no longer have the raw sex appeal for everybody that it did in the late 1980s, there's little doubt that corporate executives are very willing to settle down and work on a nice, long-term relationship. ■

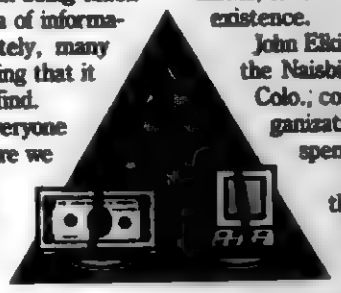
Susan Nykamp and Kim S. Nash contributed to this report.

Maglitta is a *Computerworld* senior editor, executive report/integration strategies.



IS dilemma: How to measure your return on investment

"If you can't measure it, you can't improve it." So goes a quality axiom popular in many large corporations today. In few places is the metric dictum being taken as seriously as in the area of information systems. Unfortunately, many corporations are discovering that it is easier to search than to find.



"The question that everyone is asking themselves is: Are we getting the value for [our IS] investment? Nobody can really tell us," says William Welsh, president and chief executive officer at Valmont Industries, Inc., a manufacturer in Valley, Neb.

The answer to the IS metric question is, of course, vitally import to business executives and IS managers alike. For business managers, solid information about technology's return on investment can provide much-needed ammunition to justify massive, profit-gobbling IS expenditures to shareholders. For IS departments, it is a way to justify their very existence.

John Elkins, president and CEO at the Naisbitt Group, an Evergreen, Colo., consultancy, says many organizations are stuck on an IS spending treadmill.

"It's sort of like a drug they can't get off of," Elkins says. Measurement can help companies decide to increase or decrease IS outlays, he says.

While overall satisfaction with IS is up from two years ago, many corporations are nervously casting about for measurable proof to back up their feelings.

Some 72.5% of executives polled said they believe "the values and benefits of information systems and technology are measurable and quantifiable." They also quickly admit, however, that determining exactly how and what to measure is no easy task.

"We don't even try," says Steve Berlin, chief financial officer at Citgo Petroleum Corp. in Tulsa, Okla. "If you see people walking around talking about 'we have this kind of back order, and this customer has historically taken this, and now we see a change in his pattern,' we know that the systems are working."

Actually, the measurement question breaks down into two important areas: measuring IS performance and measuring its impact on the bottom line.

Companies take wildly different approaches in their attempts to measure the two areas. Companies tend to fall into two schools: measurers and "gut-feelers."

Among measurers, several measures are popular: sales and profit margins, operating cost savings, staff reductions, inventory levels, overall unit productivity and specifics such as defects per unit and time per unit on projects.

However, most concede that such industrially oriented measurements do not readily account for "soft" benefits, such as improved customer satisfaction, that are among the most important benefits of information technology.

Wide-reaching outlook

Thus, a careful look at the bigger picture is also important.

"Cost is only half the story," says Harold Todd, executive vice president and chief operating officer at National City Corp. in Cleveland. "The other half is, how well are we meeting the business needs of our corporation, and how well are we supporting the rest of the corporation and doing what they want to do?"

As efforts to establish meaningful metrics continue, some executives wonder if they will ever discover the magic formula.

"I'm not sure we're ever going to get to a point where we can unequivocally say that what we're spending on information technology is the right amount," Welsh says, "or if what we're spending on information technology is generating value for our shareholders over and above what we would have gotten had we not had it. I don't think we'll ever get there."

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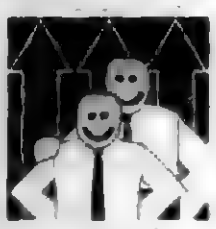
How can you make your boss happy?

Take a lesson from Superman: Learn how to be everything to everybody — and do it fast

How does Edward Schenk, president of a Smithfield Foods, Inc. subsidiary, describe his ideal chief information officer?

"Leaps tall buildings with a single bound," laughs Schenk, who heads Gwaltney of Smithfield, Inc. in Smithfield, Va.

He's only half joking.



Increasingly, general business managers say they are looking for a CIO who has the technical brilliance of Charles Babbage, the business savvy of Bill Gates, the vision of Thomas Jefferson and the leadership abilities of Gen. H. Norman Schwarzkopf.

The ideal CIO must be both "a technocrat and a businesscrat at the same time," says Jerre Stead, chief executive officer at Square D Co., an electronics manufacturer in Palatine, Ill. Not only that, the ideal CIO can't be a prima donna who pursues whatever project captures his fancy. Instead, says Schenk, "the CIO's goals have to be consistent with corporate goals and objectives."

At the same time, CIOs also need the guts to sponsor unpopular technology initiatives when appropriate, according to Harold Todd, executive vice president and chief operating officer at National City Corp. in Cleveland.

"CIOs must have the energy that allows them to take their vision of how technology can be applied to a particular situation and get it properly shaped," Todd says.

And if that's not enough, Fortune 1,000 executives add, it goes without saying that these key systems and services must be delivered quickly, on time and within budget.

If all that sounds pretty daunting, it is. But executives say that's the price information systems people must pay if they want to be considered hotshot players in the business and not spend the rest of their days exiled to a chilly machine room somewhere.

Here are the skills and attributes top business executives say are most critical for IS managers:

- Broad perspective/understanding of the business: 32%.
- Technical ability/skills/knowledge of current technologies: 30%.
- Understanding of how IS can improve the business process/vision: 18.7%.
- Interpersonal/people managing skills: 15.5%.
- Communication skills/being a good listener: 14.5%.

Interestingly, honesty was mentioned often by CEOs as an especially desirable attribute, as was good project management skills.

Improving performance

How can IS managers perform even better? Executives made the following suggestions:

"Better focus." "Be more responsive to change." "Enhancement rather than improvement." "More information online and fewer reports." "Do a better job on efficiencies and productivity." "Understand the benefits of IS better."

"Adaptability — to figure out what needs to be done and do it, not come up with excuses about why it can't be done." "People skills." "Streamlining information of a common format." "More reporting, less cost." "Getting end users involved more." "Better integrate IS with total quality management system."

"Better return on investment." "More expertise in the micro area." "More cohesiveness as a department." "Identify and focus on priorities." "Persistence." "Communications — to be able to articulate and define problems and strategies."

JOSEPH MAGLITTA

Things they hate



Formula for IS career suicide: Take a little more time developing applications. Rely on your gut feeling about what's best. Let tomorrow take care of itself. Go the extra mile in spending if it's needed, and always swing for home runs.

Here's a quick rundown of what business executives hate most about IS. They say IS:

- Doesn't anticipate future needs.
- Isn't customer service-oriented enough.
- Takes too long to develop software.
- Isn't flexible enough in adapting mainframe to division's needs.
- Has slow turnaround.
- Is too bureaucratic.
- Needs more expertise in the microcomputer area.
- Lacks departmental cohesion.
- Has poor linkage to strategic planning.
- Has high operation costs.

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Swallow hard before pitching that IS proposal to the CFO

You've got a hot technology proposal. You're likely to get the most resistance from (a) the CEO, (b) the COO or (c) the CFO?

The answer, in most cases, will be C.

In general, CEOs tended to have the most liberal attitudes toward information systems, and CFOs had the least. The differences between executive attitudes on many issues was pretty small, however.



Predictably, CFOs were toughest on money matters, and COOs were toughest on issues of implementation and operation.

"CFOs are closer to [IS] and more realistic," says Larry Westbrook, vice president of finance at The Southern Co. in Atlanta. "We also tend to measure things in dollars and cents, so perhaps we're more cautious."

Bill Huff, CFO at Affiliated Publications, Inc. in Boston, agrees: "I think that a lot of things that IS does cannot really be cost-justified from a CFO's point of view." But, he notes, "because it's the 'latest thing' in the world of technology, it has to be done."

CFOs were far less likely to believe that their company's IS operations were closely linked to business strategy (27%), compared with COOs (52%) and CEOs (42%).

Similarly, CFOs less often held the belief that IS should contribute to the corporate bottom line (44% vs. 66% of COOs and 62% of CEOs).

Compared with other executives, CFOs were least confident that spending on information technology was worth the money. Some 21% strongly agreed that their organizations were not getting their money's worth from IS investments. Only 14% of CEOs and 18% of COOs shared that view.

In addition, financial chiefs were also most concerned about corporate data security. Some 51% "strongly agreed" with the statement: "The security of corporate data is a major concern to me personally." This compares with 48% of COOs and 44% of CEOs.

Finally, CFOs also ranked lower in the belief that IS was reshaping business processes (33% vs. 56% of COOs and 50% of CEOs.)

In contrast, COOs were the strongest believers that IS could be used for competitive advantage (32% "strongly" agreed, compared with 21% of CFOs and 24% of CEOs).

Ranking IS managers

IS management received the highest approval ranking from COOs: 52% called IS performance "very adequate," compared with 44% of CEOs and only 32% of CFOs.

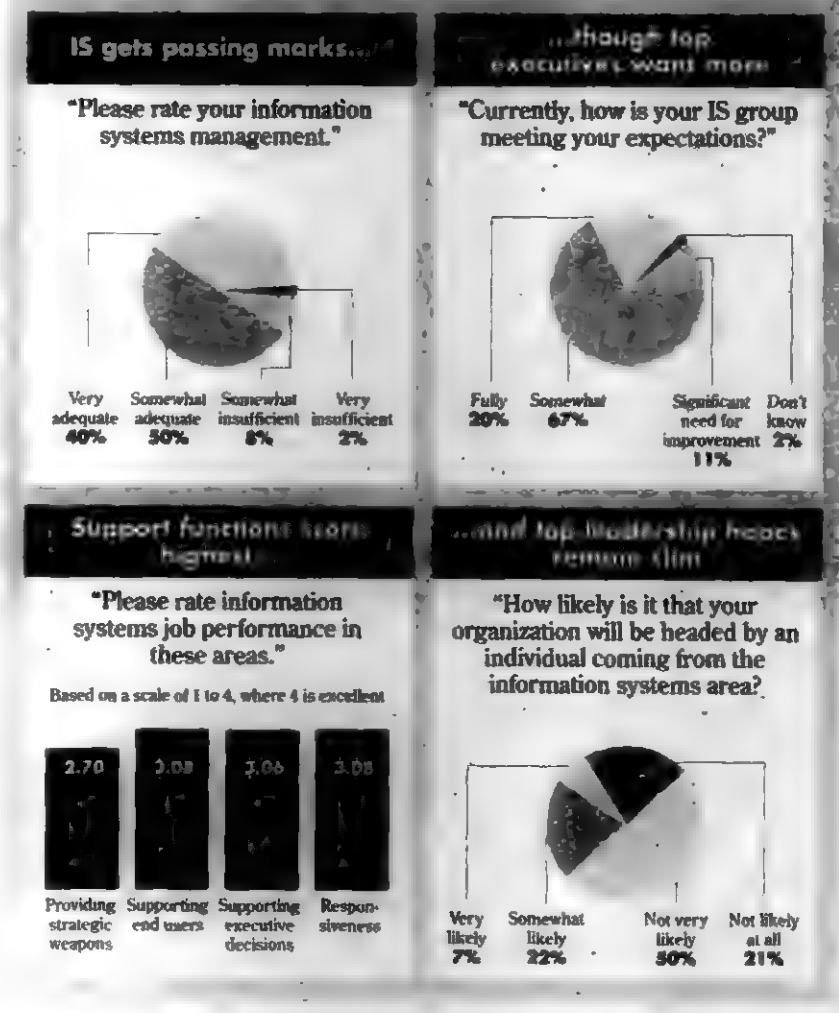
By a wide margin (32%), COOs said IS did a "very good" job supporting executive decisions, vs. 19% of CEOs and 26% of CFOs.

As a group, CEOs were most likely to see IS as "an integral part of our business strategies" (50% vs. 46% of COOs and 37% of CFOs).

CEOs were also least likely to believe that current economic conditions would greatly affect their company's business (22% vs. 40% of COOs and 31% of CFOs).

JOSEPH MAGLITTA

IS departments: OK as supporting actors



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The people have spoken – loud and clear. On February 25th, *Computerworld* published the results of a survey which named ADABAS from SOFTWARE AG the number one relational database management system – in a field that includes Oracle, Datacom, DB2, and others.

The victory for ADABAS was decisive. In eight out of 15 categories, ADABAS was the top-rated RDBMS, with second-place finishes in five of the other seven areas. And, to quote the *Computerworld* article, "ADABAS users rated their product highest in systems availability and recovery from crashes – by far the most important category for all users surveyed." ADABAS was also top-rated in providing effective programming tools and integration of CASE tools.

In the areas where ADABAS didn't place first or second – support of standard SQL, and useful SQL extensions – major improvements are in the works. ENTIRE SQL Server will be released in 1991, providing full ANSI compliant SQL in the ADABAS nucleus.

Perhaps the most telling survey statistic was the fact that 97.5 percent of ADABAS users said that they'd buy the product again if they were making the decision today. Now *that's* loyalty.

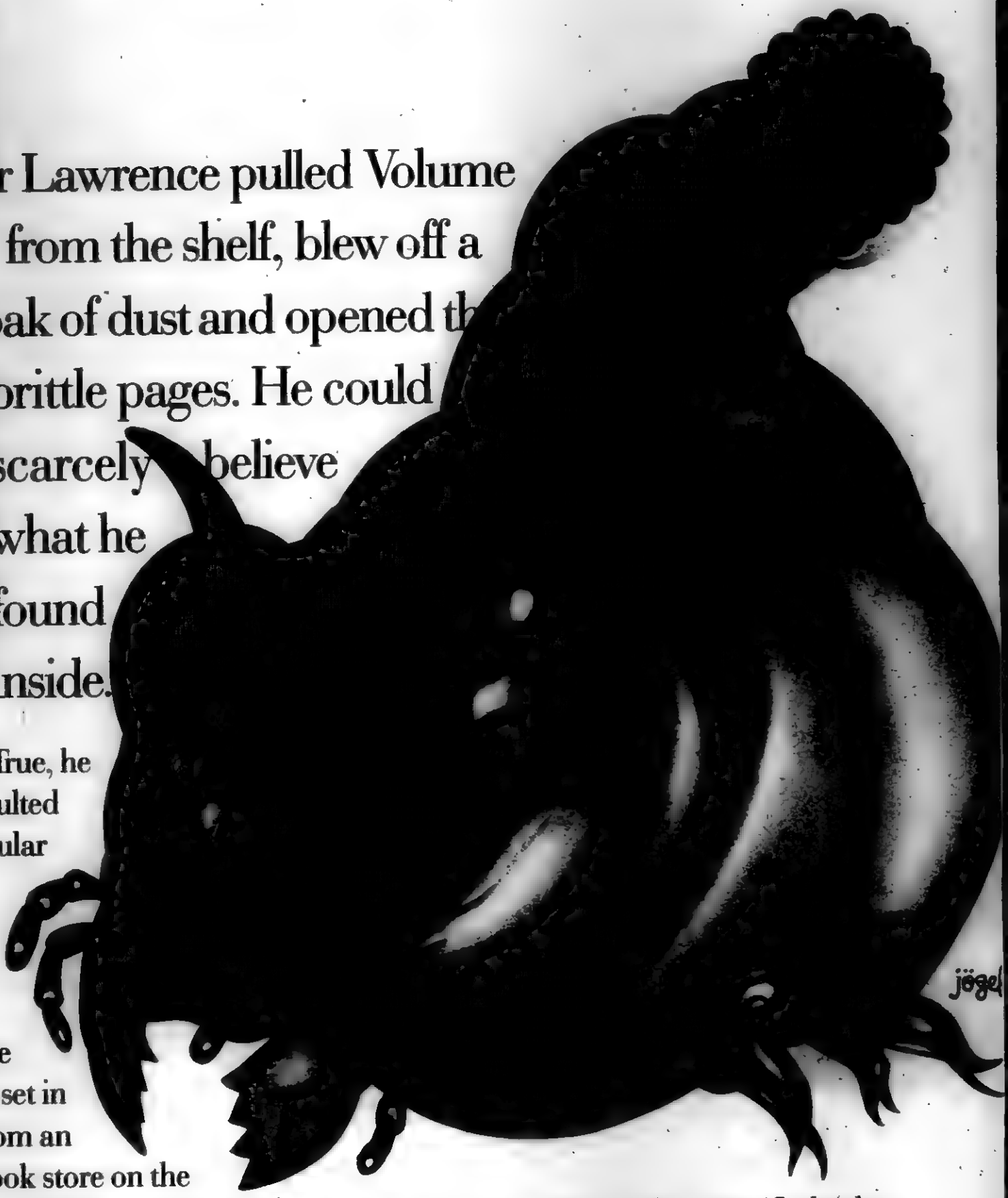
Of course, there were many other topics covered by the survey – more than we can discuss here. So in case you missed it, we'll send you a color reprint of the article absolutely free. Just write to SOFTWARE AG of North America, Inc., ADABAS Reprint, 11190 Sunrise Valley Drive, Reston, VA 22091.

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Sir Lawrence pulled Volume IV from the shelf, blew off a cloak of dust and opened the brittle pages. He could scarcely believe what he found inside.



True, he hadn't consulted these particular journals in years and, admittedly, he had acquired the ten-volume set in his youth from an odd little book store on the Thames, but still! Holes!? A bookworm had eaten clean through the pages. Indeed, to Sir Lawrence's considerable chagrin, he found the ravenous little bugger had chewed, in a straight line, from the front cover of Volume I to the back cover of Volume X.

All of which brings us to our seemingly simple question: If each book is exactly two inches thick, how far did the bookworm travel?

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In tussling with this type of cerebral aerobics most people make a simple but serious error: They *assume* something. Of course, this happens without realizing it. But still, it happens.

As you'll see in a moment, the way to avoid making a false assumption is to work things out methodically. Carefully thinking through each step.

For instance, consider this question. A company makes one of the broadest lines of computer terminals in the world. They have for years. In fact, they've delivered over three million of them.

If you needed terminals you'd probably think of them. But what if you needed PCs? Would you assume that, since this company is so dominant in terminals, they must not do a real number in PCs?

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Now that it's clear we make an impressive line of PCs, you might be tempted to assume we stop there and don't get into the even more sophisticated products like super fast multiprocessing systems for the UNIX environment. With speed in the 100 MIPS range.

But you wouldn't assume that after all this. Would you?

To learn more about our Decision Series PCs call us. We'll send you complete specs plus a poster of additional Cerebral Aerobics. To help keep your original equipment personal computer in top form. 1-800-GET WYSE.

WYSE

You're doing it again. Just because this little type is down here and printed upside down you assumed you'd find the answer this easily. No way. San Jose. Flip back up to the ad and your patience will be rewarded.

Eyeing the CEO suite? Sorry, but . . .

Go ahead, admit it: In your most private moments, you daydream about ascending past CIO heights and becoming . . . dare you say it? . . . CEO.

Forget it. While the chances of IS people making the leap into the executive suite have never been good, executives say they're even worse today.

According to survey respondents, the odds of most career IS people becoming the company's top dog are about as good as IBM rolling out a new generation of proprietary mainframes — in other words, near zilch.

A measly 6.5% of survey respondents said they believed it was "very possible" that the top post in their organization could be assumed by an IS person. That figure was even lower than responses in 1989 (8.9%).

Herb Halbrecht, principal at Halbrecht Associates, an international IS placement agency in Stamford, Conn., agrees with the executives surveyed.

A past president of the Society for Information Management, Halbrecht says many IS people are considered technicians by top management. As a result, there's no chance the vast majority of IS people will ever rise out of their departments, he says.

Despite such assessments, however, there are rays of hope.

Robert J. Myers, chief operating officer and president of Grumman Corp., notes that his most recent job was president of



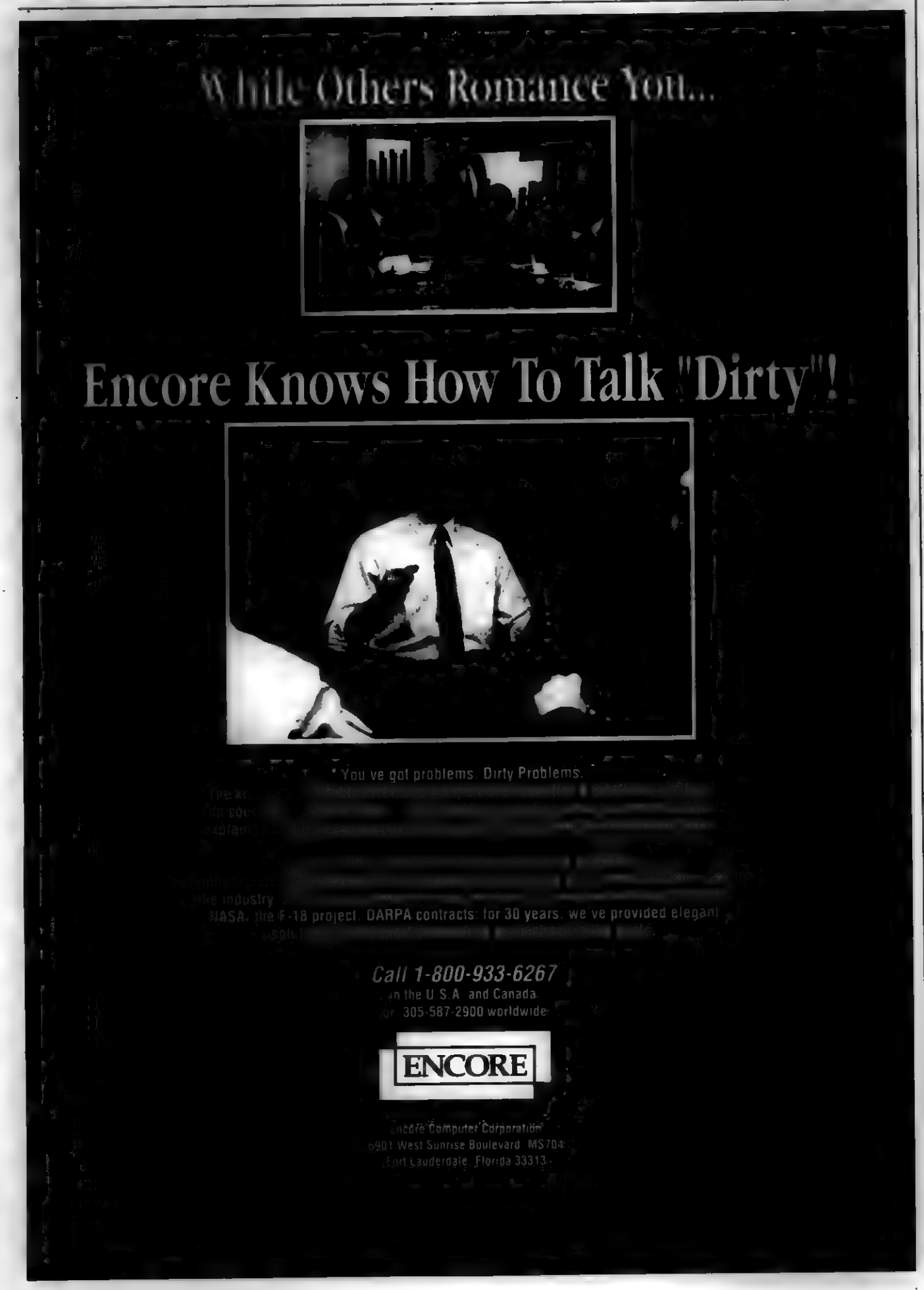
the corporation's data processing subsidiary. Myers, a financial planner by background, says many IS people lack the crucially needed profit and loss experience.

"But it's possible that somebody coming up in the IS end of the business can develop the same skills as somebody coming up in other elements of the business and have a shot at the job," he says.

"It can happen," agrees Barbara Herman, vice president at Index Group, Inc. in Cambridge, Mass. She points out that Hallmark Cards, Inc.'s CEO and president is a former head of IS.

"If you look at current CEOs, not many come from IS," she concedes. "But if you look at what *could* be, a lot of CIOs are basically businessmen."

JOSEPH MAGLITTA



People and processes

Two hundred top executives from large U.S. corporations participated in the Computerworld/*Andersen Consulting survey. Included were 50 CEOs, 50 COOs and 100 CFOs. Names were selected from* The Directory of Corporate Affiliations, The Corporate 1,000 Yellow Book *and* Hoovers Handbook '91.

Polling took place by telephone and fax between Feb. 8 and March 15, 1991, by First Market Research Corp. in Austin, Texas, and was tabulated and coordinated by the IDG Research Services Group in Natick, Mass.

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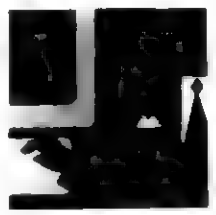
That tap-tap-tap sound is your boss

Could keyboard phobia be vanishing? Maybe. More nontechnical top executives say they are using computer terminals or personal computers in the normal course of their workweeks.

In the previous *Computerworld* executive survey conducted in 1989, only 44% of the respondents said they regularly used a PC or terminal. This year, the number shot up to 56%.

While executives can't offer any definite explanation for the increase, many say they suspect that heavy use by chief financial officers and younger top bosses is pushing the numbers up.

"I'm younger than many of the executives," notes James Klopman, 38, vice president of merchandising operations at Russell Athletic in Alexander City, Ala. "And I think the younger guys are much more likely not to think it's a big deal."



Predictably, CFOs reported the heaviest use: 59% use PCs or terminals, followed closely by chief operating officers (58%) and chief executive officers (48%). By industry, usage was heaviest in finance/insurance and lightest in service.

Those executives who favor PCs tend to be longtime users. George Hatsopoulos, CEO and president of Thermo Electron Corp., an environmental controls firm in Waltham, Mass., is a good example. A former engineering professor at MIT, Hatsopoulos uses a terminal daily.

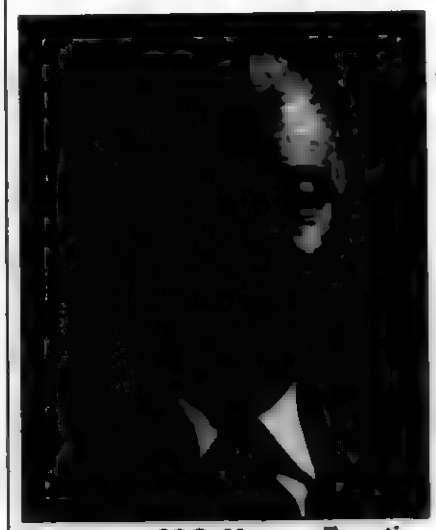
Resistance to PC use seems to have dropped down a layer in some organizations. As a result, many pro-PC managers such as Klopman are aggressively encouraging use by senior staff members. Klopman says, "They tell me, 'Oh, I don't have time.' I tell them . . . If I've got the time, you've got the time.' "

Hatsopoulos adds: "I wish more of our executives reporting to me used [a PC] hands-on, but there's a lot of reluctance; there's a lot of fear."

The biggest roadblocks are executives who are unfamiliar with — and possibly afraid of — technology. Other factors are executives who feel they are too busy to learn PC applications or don't know how to type. In many cases, the use of a keyboard is seen as a secretarial task, and executives prefer to rely on others for their information.

"I have [a PC] at home, which I use on occasion," explains Richard III, president of The Triumph Group, Inc. in Valley Forge, Pa. "But when I'm at work, it's frankly a lot easier to ask someone else to generate the information."

While the upsurge in executive PC use is encouraging, a certain amount of caution is still in order, warns Mary E. Boone,



Grumman COO Myers: ***Executives must be willing to learn and work hard***

author of *Leadership and The Computer*, which was just published by Prima Publishing and St. Martin's Press.

In her research, Boone says, she discovered that many top executives have PCs on their desks but don't regularly use them. Those who do use PCs use them mostly for simple tasks such as checking stock quotes rather than for leadership tasks, she says.

"While there may be an increase in the number of executives who have computers, I would be surprised if they really understood the connection between the use of the computer and their own leadership objectives," Boone says.

Robert J. Myers, president and COO at Grumman Corp., says executives must be willing to do the learning and hard work needed to make investments in executive support and decision support systems, as well as PCs, pay off.

"If you want to have an information system that's really going to pay off for you, frankly, it's going to require a lot of hard work on the part of the guy that wants to get something out of it," he says.

Executives who have adopted PCs for themselves and their staffs say greater productivity and independence is worth the work of learning the technology and applications.

"It's impressive to see a product manager of women's clothing sit down and write an application for sampling and sample control without any involvement from our MIS department," Klopman says.

JOSEPH MAGLITTA

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1A14WC

Quality-driven software

Bug-riddled, poorly developed software is costing you money — lots of it. Here's how to make quality your team's No. 1 priority

BY RAYMOND FALKNER

Poor software quality is currently costing U.S. companies millions of dollars. This money is being spent on enormous amounts of rework to eliminate bugs and remedy requirement omissions in both existing and newly created systems.

Companies can stop this money drain, however, by establishing a quality culture. By first assessing the magnitude of the software quality problem and then targeting areas for improvement, firms can work to fight this waste.

Organizational-level measures are needed to get a big-picture perspective of how much a company is spending to provide quality software to users. One such method is called Software Cost of Quality (SCOQ).

The concept is simple: SCOQ is the total cost associated with controlling and providing software quality to users. Using a spreadsheet to measure costs in the following broad categories will provide a framework from which to begin the software quality effort:

- **Prevention costs** — the total of costs associated with preventing software defects, education and training, policies and procedures and product redesign before delivery. Each company will have its own unique set of subcategories. For example, a firm's education and training costs might include software-specific information systems management education, language training and so on.
- **Appraisal costs** — the sum of costs associated with measuring, inspecting, testing and auditing for software defects.
- **Failure costs** — the total of costs associated with correcting software system defects (for example, maintenance repairs), computer downtime and additional customer support.

Because some spending will always be required to produce and maintain quality software, the SCOQ will never be zero. Companies should target the SCOQ to be about 5% to 10% of the information technology budget.

Falkner is founder and president of Quality Management Solutions, an Acton, Mass., consulting firm specializing in the quality of information technology software and services.



Jamie Hogan

Research on Japanese and U.S. companies has found that while the Japanese have an SCOQ of about 7% to 10% of the information technology budget, U.S. companies' numbers are 25% to 30%, with many insurance firms as high as 40%. That means tens of millions of dollars are being drained from some companies' bottom lines by poor software quality.

Besides indicating how much it is costing the company to provide quality software, the SCOQ lets IS executives know if resources are concentrated on fixing software problems or preventing them. Unfortunately, studies have shown that most of the money is being spent primarily on correction rather than prevention. In fact, U.S. insurance companies' software quality costs typically break down this way: 7% to 8% are appraisal costs, 2% to 3% are prevention costs, and a whopping 30% are failure costs.

The numbers reflect the severity of the software quality problem, and as most IS managers have discovered, no single structured design or development methodology prevents quality problems from occurring. Not even a change in employee compensation programs has been proven to be sufficient to overcome poor quality. This is because producing quality software is an IS management problem.

Research conducted by W. Edwards Deming and other quality gurus found that only 15% of all manufacturing defects can be traced to individuals. In most cases, individuals are forced to execute poor processes that have product delivery, not quality, as their goal.

It is imperative that management shift the focus from getting things done fast to getting things done right. IS chiefs need to imbue their team with this quality ethic.

For IS managers, that means a three- to five-year software quality improvement plan that targets key management areas: measurements and reports, the software development process, IS organizational setup and software skills and technologies. The plan is a guide to follow during the shift to a quality culture and should result in a 50% reduction in a company's SCOQ.

According to Quality Management Solutions, a software quality consulting firm in Acton, Mass., the most frequent causes of poor software quality are the following:

- **Incorrectly** organized project teams.
- **Improper** use of computer-aided software engineering methods and technologies.
- **Inadequately** trained staff.
- **No** tie between compensation and quality results.
- **Ineffective** management measurement and reporting systems.
- **Outdated** development processes.
- **Inappropriate** levels of user involvement.

Measurement and reports

Software quality — defined as satisfying your customers in various software areas such as performance, reliability, serviceability, conformance and so on — can be measured. Systems-level quality measurements within the information technology organization are essential for real gains to be substantiated and monitored. Software quality measurement begins with a baseline that tells a company where it stands today so it can figure out where it wants to be tomorrow.

A key indicator of quality is customer satisfaction in terms of data accuracy, number of defects, error-free performance and the like. Customer satisfaction can be gauged via a customer satisfaction survey (see chart page 96).

Software defects are typically tracked by systems and reported in terms of

Continued on page 96

Sometimes sharing will slow you down.

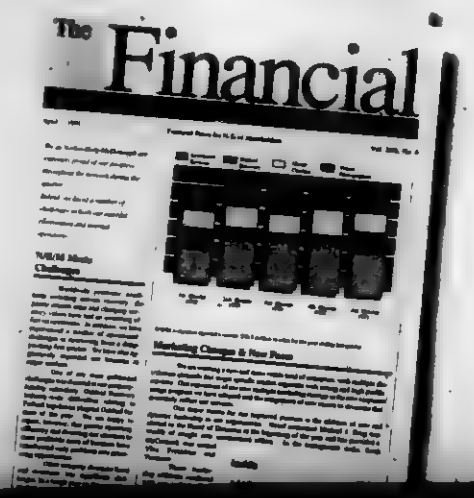


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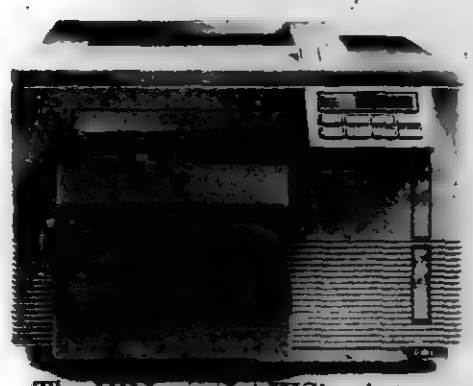
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Continued from page 93

systems reliability. Measures include pinpointing defects found within 90 days of delivery and mean time between failure. Productivity can be measured in terms of output, such as source lines of code or function points per effort month.

The results of these measures can be entered into a company database used for statistical analysis and quarterly reporting on trends. These figures can then be compared with internal objectives and the software quality improvement plan.

It is important that IS managers introduce a reporting process that clearly delineates the net causes and effects of software quality and productivity. Each report should be geared to its audience, with business managers knowing how overall software quality has changed and IS staff knowing how a specific system's quality has changed.

Metrics are not cure-alls, however, and they can actually work against quality if not focused properly. One company, for example, wanted to manage its maintenance budget better. It did so by keeping close tabs on programmers' lines of code and the ratio of maintenance and enhancement costs to production costs.

The result was code riddled with blank and extraneous lines (after all, programmers wanted to meet their quotas) and a maintenance nightmare. The two metrics intended to improve productivity and quality actually had the opposite effect because they took into account improvements only at the organizational level and not at the systems level.

If the company had instead measured output using function points and tracked maintenance productivity through the ratio of maintenance requests per full-time (or equivalent) worker, it would have achieved its desired results.

Development process

A change in the software development process can further the creation of a quality culture. The existing software development process used by 95% of all Fortune 1,000 companies consists of a structured process that dates back to the early 1970s. These processes are phase-driven and move sequentially from the requirements phase through design, construction, testing and implementation. Their advantage is project control; their disadvantage is a lack of customer satisfaction with software quality.

In the 1990s, the greatest change in software development (and quality) will occur as companies move from a software "product" orientation to a software "service" orientation.

Product-oriented software development works on the principle of unwavering requirements and the movement of software from one phase of development to another, obtaining all the appropriate sign-offs but with little user input.

Customers are involved only in requirements (within strict limits), and quality is judged by the correction of all previously identified defects as well as the ability of the development team to deliver the product as quickly as possible.

Service orientation has the customer as the driving force. Software development consists of multiple parallel activities, with requirements evolving from general to detailed. Customers are involved throughout the process and serve as the final determinants of whether the job is complete. Service-oriented software development has quality as its driving force.

Organizational setup

Improving software quality will rely heavily on the people who construct software systems and not on machines. Computer-aided software engineering tools and automated aids help people in the process, but the correct organization and use of people determines the quality of the resulting product or service.

Companies have used a variety of organizational setups to determine and track software quality, but most have not worked. Quality assurance organizations, for instance, have had trouble in the past because they were deemed "inspectors" whose mission it was to uncover problems created by others.

Software maintenance staff members are often considered second-rate programmers or analysts charged with pacifying users and fixing problems created by developers. Developers are viewed as creative generalists who design, build, redesign and rebuild to keep meeting floating requirements. This has led to poor quality, but enriching the work people do and not perpetuating stereotypes can turn this around.

A study conducted at a major communications company revealed that systems maintainers were surprisingly happier and more appreciated than any other information technology group in the company. Programmers, analysts and IS managers struggled to get themselves out of development and data centers and into maintenance. Why? Maintenance staffers didn't just work with code; they had close customer contact and were able to establish and manage schedules and satisfy their customers. They wanted to produce quality work and were allowed to do so. Interestingly, this company also spent less on maintenance and enhancements than the industry average, in spite of the poor quality of its development work.

Software skills and technologies

A quality culture relies on people who have the right quality orientation and the necessary skills and tools to create quality software. The trend toward new technologies has been slow to take hold in companies because of the retraining needed and resistance to change. However, new technologies must continue to be introduced to change the way systems are developed. New technologies allow active managers opportunity to enrich the IS "quality of work" environment and produce higher quality results.

The starting point has to lie in the retraining of managers, instilling in them a software quality ethic. Recognizing, communicating, rewarding and encouraging a quality ethic must be at the heart of every information technology organization. Most IS people want to produce quality work; managers must give them the means (skills and technology) and feedback (coaching) to do so.

Quality improvement requires a rethinking and revamping of human and technical processes. With millions of dollars — as well as the company's image as a quality provider of products or services — at stake, IS managers must personally lead the charge. After all, isn't that what quality leadership is all about? ●

Destination: Quality

Starting on the road to a quality culture? Here are some stops along the way:

- Measure your Software Cost of Quality (SCOQ) to gauge what you've spent to produce and maintain quality software and whether you've spent it on prevention or correction. Remeasure every six to 12 months.
- Establish a baseline from which to work and improve.
- Institute a three- to five-year quality improvement plan that implements a systems-level measurement program, improves reports to management and IS staff, reorganizes project and departmental resources, introduces technologies to bolster IS skills and revamps development processes.
- Set a goal — typically a 50% reduction in the SCOQ.

Is your software satisfying users?

A key indicator of quality is customer satisfaction. The following is a prototype of a customer satisfaction survey.

USER SATISFACTION SURVEY

From the business user's perspective, please rate the following criteria in terms of satisfaction and importance. Use the following scale to answer each question:

SATISFACTION	IMPORTANCE
5 - Completely satisfied	5 - Extremely important
4 - Very satisfied	4 - Very important
3 - Neither satisfied nor dissatisfied	3 - Somewhat important
2 - Mildly dissatisfied	2 - Of minor importance
1 - Strongly dissatisfied	1 - Not important

	SATISFACTION (answer 1-5)	IMPORTANCE (answer 1-5)
1. PERFORMANCE		
• Data accuracy		
• Accessibility to current data		
• Accessibility to historic data		
• Timeliness of system response		
• Completeness of system		
2. FEATURES		
• Flexibility for future modification		
• Ability to query data by request		
• Information summary capabilities		
• Security capabilities		
3. RELIABILITY		
• Consistency of response time		
• Extent to which system performs without error		
• Minimal defects at delivery		

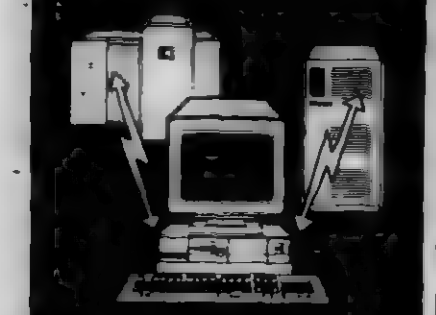
System name _____ User name _____

Today's date _____ User title _____

Source: Quality Management Solutions

CW Chart: Daniel Guiders

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NATIONAL BRIEFS

Spring thaw

▶ When last seen, mainframe report management market competitors **Software Engineering of America, Inc. (SEA)** and **Mobius Management Systems, Inc.** were on icy terms: SEA hauled Mobius into court in January on charges of making false remarks about SEA products; Mobius called the suit "bizarre" and filed a countersuit [CW, Feb. 4]. Earlier this month, the firms jointly issued the following statement: "The SEA suit against Mobius has been settled out of court to the satisfaction of both parties and the Mobius countersuit against SEA has been retracted."

And the beat goes on

▶ Analysts' predictions that 1991 would be a boom year for computer industry entries into the public market got another vote of support earlier this month as **Proteon, Inc.** registered with the Securities and Exchange Commission for an initial public offering of 3,100,000 shares of common stock. The Westboro, Mass.-based Token Ring networking and internetworking company offers a range of products aimed at integrating IBM and non-IBM systems into a single network.

Ashbrook leaves AST

▶ James Ashbrook, a five-year veteran of **AST Research, Inc.**, earlier this month resigned as senior vice president of marketing at the Irvine, Calif.-based personal computer vendor. Ashbrook cited personal reasons for the departure. He will continue as a consultant to AST, the company said.

The ride stuff

▶ When a computer vendor says it is tackling traffic problems, networking products come to mind. But the bridges **Apple Computer, Inc.** is talking about are the Golden Gate and Bay, and what it hopes to rout is air pollution. To give Apple employees a range of "environmentally responsible commute alternatives," facilities director Glenn Barber said, the Cupertino, Calif.-based firm recently rolled out a program offering options that include free shuttle buses to Apple sites, a fleet of company bicycles, access to an electronic ride-sharing database, telecommuting alternatives and a ride home in case of an emergency.

Keeping an eye on the East

U.S. firms are discovering the benefits of tracking Japanese competition

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — It was not too hard to convince executives at Motorola, Inc. that they needed an intelligence unit to monitor Japanese technology. Mark Stott, manager of strategic business research and a former Central Intelligence Agency analyst, told the story this way:

"We used to be in the television business. We used to be in the stereo business. And we face competition from Japan in the semiconductor business. Management decided we had to compete with Japan or else keep finding new businesses to be in."

At a recent conference sponsored by the U.S. Department of Commerce, Stott displayed some of the results of Motorola's intelligence effort, including a chart of the pretax profit margins of Japanese semiconductor companies. "For us," he said, beaming, "this is really useful information."

Motorola is one of a small number of U.S. companies that systematically monitor technology developments in Japan, overcoming language and business barriers. Most U.S. firms, however, are more worried about the "competitor next door" than about foreign rivals. As a result, they fail to have the kind of foreign technology tracking capability that is standard practice for Japanese businesses, several speakers said.

Monitoring Japanese technology requires a major investment in obtaining technical literature, learning the language and developing long-term relationships with Japanese companies and researchers, according to veteran Japan-trackers.

Business intelligence can be gleaned by participating in Japanese standards bodies, talking to trade associations, reviewing patents, creating joint ventures and attending trade shows in Japan. Thomas Kelly, a vice president at Eastman Kodak Japan Ltd., said the Japan Electronics Show held each October gives U.S. researchers a rare chance to see the most advanced components and talk with developers.

Avoid overload

There is so much Japanese technical literature available that collecting it all could quickly lead to information overload. To avoid wasting money, experts said, it is crucial to focus the intelligence effort on those nuggets of information needed by company decision-makers.

At the Microelectronics and Computer Technology Corp. (MCC), an advanced technology consortium in Austin, Texas, the technology monitoring effort is closely aligned with MCC's strategic business goals, according to Mark Eaton, director of international liaison for the consortium.

Like the intelligence operation at Motorola, MCC's operation has a direct effect on company decisions and on top management support. MCC's first chief executive was Adm. Bobby Inman, former director of the National Security Agency and deputy director of the CIA, Eaton said.

He said the mission of MCC's intelligence unit — which has nine staffers and an annual budget of $750,000 — is to ensure the strategic success of MCC research by providing high-value intelligence to MCC researchers and member companies. It produces reports and a newsletter assessing foreign capabilities in 30 technologies, including speech-understanding technology, optical computing, fuzzy logic systems, parallel processing and computer-aided design.

On occasion, MCC even engages in reverse-engineering — that is, buying a Japanese product (such as a notebook computer) so that engineers can "torture components until they reveal their secrets," Eaton said.

Open-book plans

The MCC official said that corporate research plans in Japan are an open book, especially for far-out technologies. But the closer the technology gets to a commercial product, the more the research goes unpublished — much as it does in the U.S., Eaton and other speakers said.

While monitoring Japan from afar may be useful, some analysts argued that the only way to get genuine inside information is to spend a year working in a Japanese laboratory and trading information with researchers there. While many U.S. firms fail to take advantage of the opportunities to do that, there is in fact a great deal of Japanese traffic through U.S. laboratories, government officials said.

"If your company doesn't have two dozen people living in Japan, you haven't made a commitment to learn from Japan."

Continued on page 101

Monitoring the competition at the source

A sampling of companies in Japan willing to let U.S. researchers work in their research labs for extended visits

- **Fujitsu Laboratories Ltd.** (Kawasaki City)
  Telecommunications, information processing, personal computers.
- **Hitachi Ltd.** (Tokyo)
  Microelectronics, information technologies.
- **Japan Information Processing Co.** (Tokyo)
  Software engineering.
- **Minolta Camera Co.** (Osaka)
  Software engineering.
- **Nippon Telegraph and Telephone Corp.** (Tokyo)
  Networks, information processing, human interfaces, advanced electronics, software (including artificial intelligence).

Source: National Science Foundation, Tokyo office

CW Chart: Tom Monahan

Phoenix Technologies back to pretax profitablility

BY SALLY CUSACK
CW STAFF

NORWOOD, Mass. — While many computer industry companies found themselves blindsided by the recession during the recently closed first quarter of 1991, Phoenix Technologies Ltd. — a mid-1980s personal computer market highflier grounded in recent quarters — announced a return to pretax profitability.

In an announcement last week, the company reported pretax income of $343,000. After a provision for foreign withholding taxes, Phoenix Technologies reported a net loss of $188,000, or 2 cents per share for the quarter ended March 31 — its second quarter of fiscal 1991.

These results contrast sharply with Phoenix Technologies' pretax net loss of 46 cents per share reported for last year's corresponding quarter.

The company, which designs, develops and markets system software products for PCs and laser printers, last year fended off a hostile takeover attempt that was initiated by a private investment partnership consisting of Phoenix Technologies' stockholders. It recently introduced a video BIOS product designed specifically for laptop PCs.

First-quarter earnings 1991

Industry earnings continue to show brunts of recession, as Segment Computer Systems, Inc. takes its first lumps in its eight-year history

Company	Revenue January through March 1991	Percent change from 1990	Profit January through March 1991	Percent change from 1990
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ashton-Tate Corp.	$63M	10%	$3M	—
[illegible]	[illegible]	41%	[illegible]	[illegible]
Informix Corp.	[illegible]	17%	($2M)	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Northern Telecom, Inc.	$1.9B	[illegible]	[illegible]	19%
[illegible]	[illegible]	[illegible]	[illegible]	—
Silicon Graphics, Inc.	$133M	21%	[illegible]	(64%)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stratus Computer, Inc.	$101M	16%	$8M	16%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Teradata Corp.	[illegible]	5%	$2M	(71%)*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CW Chart: Doreen St. John

French firm aims to be info source abroad

BY CHRISTINE SIMONNET
IDG NEWS SERVICE

PARIS — Two years ago, Atoll, a Computer Intelligence subsidiary based here, set itself the challenge of producing a database of 100,000 leading European companies and distributing it throughout Europe. Atoll recently acquired the means to meet this challenge by opening international offices. Moreover, a merger with its French competitor, ITN Marketing, is expected to help it expand abroad.

Manuel Zebeida, managing director of Atoll and soon-to-be chief executive officer of the joint venture Computer Intelligence Europe, is not trying to hide the fact that this merger is a boost to his ambitions in Europe.

"Having more staff, and therefore more expertise, we will be able to accelerate our international development. Our two companies offer a variety of complementary services through databases. We will thus be able to offer a wider choice of services to our clients," he said.

Atoll's European venture began in 1989. Its takeover by La Jolla, Calif.-based market research firm Computer Intelligence brought it the know-how and the financial standing needed to ensure its development abroad.

When the company was founded in 1986, computer-based marketing was still in its infancy and the new firm could only offer its clients a file containing the leading 5,000 French companies, with the names of directors and department heads. As far as environment was concerned, Atoll was at the time interested only in central computer sites.

However, the economic context of the computer sector changed, and French companies, attracted by the prospect of the large single market, began to export. Their information needs soon overran the French border, and Atoll's strategy had to expand to include all of Europe.

Today, Atoll's database contains more than 100,000 references including large companies, computer professionals, smaller companies with more than 50 employees and large public bodies and services. For each company listed, Atoll gathers information on directors, computer managers, workstations, microcomputer pools, networks, terminals, printers, hard disks and tape drives, operating systems, development tools and applications, which total more than 1 million systems on record.

In September 1990, Atoll had recorded 27,133 sites in France; 15,285 in Germany; 14,076 in Italy; 7,235 in Great Britain; 5,575 in Spain and 4,741 in Ireland, Austria, Switzerland, Belgium and Luxembourg. Only the Scandinavian countries do not appear in its files. ITN Marketing's database, which comprises 36,000 French computer sites, is expected to enhance the Atoll databank.

Information is available on printout, labels and electronic media. Atoll also provides access in France through its data communications number. Access from all over Europe is already available, and Atoll also plans to offer a multilingual service.

Zebeida's company already proposes marketing services based on this file, including direct mail and telephone marketing campaigns. However, this is done for computer-related budgets only: For example, for a marketing campaign, the cost per contact varies from 26 cents to 52 cents, depending on volume. These services are offered to the marketing and sales departments of computer companies in an effort to optimize the commercial productivity of sales teams by increasing their knowledge of their potential clients. It required two years and several millions of dollars to develop the European database.

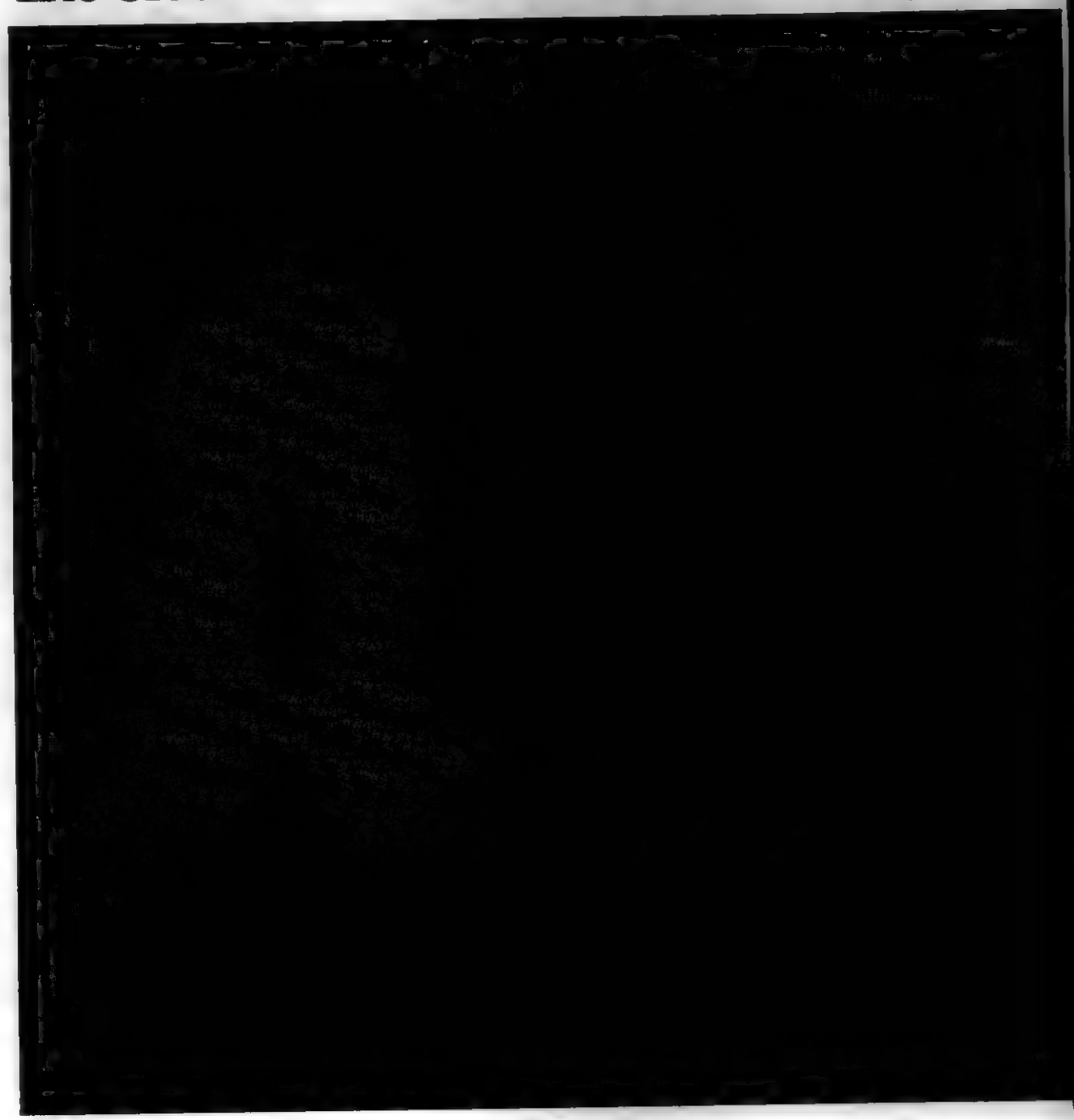
In 1990, Atoll reported a turnover of $2.6 million — most of which came from France — compared with $1.7 million the previous year. According to Zebeida, 90% of the leading 500 French computer companies have already used the company's services at least once in one way or another. About 300 work on a regular basis with Atoll, and only about a dozen are based abroad. Zebeida said that he would like to have more international clients in the near future.

"In about four or five years, France is only expected to represent 20% of the company's overall revenue. This percentage corresponds to its economic importance in Europe. It is clear, therefore, that we must forget our French identity," Zebeida said.

Simonnet writes for Computer Reseller Europe, *an IDG Communications French publication.*

TODAY, ATOLL'S DATABASE contains more than 100,000 references including large companies, computer professionals, smaller companies with more than 50 employees and large public bodies and services.

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SAP plays to global audience

BY SALLY CUSACK
CW STAFF

PHILADELPHIA — It is no secret that America's famed Madison Avenue approach to sales and marketing does not always fly in Europe, where businesses and consumers alike tend to follow more conservative lines.

This fact of global business life is posing a challenge for SAP America, Inc., the U.S. subsidiary of Walldorf, Germany-based SAP AG. The firm, which produces software for the IBM mainframe market, is establishing itself as a market force in the U.S. as well as abroad. With worldwide revenue of $350 million and 1,400 installations of the company's R/2 System, SAP appears adept at playing to both audiences.

According to James R. Bensman, president and chief executive officer of SAP America, the main challenge the company faces is cultural.

"One gets used to working with American companies with their tremendous sales and marketing programs, which focus on how things *look* as opposed to how things *are*," Bensman said.

In contrast, he said, the European approach to commerce focuses heavily on the long-term picture, with careful step-by-step movements along a charted path.

The company also provides a high degree of decision-making autonomy within the general framework of operations, according to Bensman. This approach, he said, lends itself to individual dedication to detail and excellence.

"Customers like our honest, straightforward approach," he added, alluding to the company's lack of glitzy ad campaigns. "The only common negative is that sometimes they find it hard to find us."

The traditional SAP customer is a Fortune 1,000 site with international operations. The R/2 System offers a range of business applications and supports seven languages as well as international currencies.

SAP has a worldwide clientele, including The Dow Chemical Co., Mobil Oil Corp., Shell Oil Co. and Du Pont Co.

Cinda Hallman, vice president of information systems at Wilmington, Del.-based Du Pont, said the company has enjoyed a good relationship with SAP in European operations for almost a decade.

"In 1989, we started to review areas we needed to operate on a global scale and found that SAP offered us a more extensive range of functionality for our specific operations," Hallman said.

Du Pont is running the software on IBM MVS/ESA and is implementing the R/2 System in several areas of manufacturing, including procurement, maintenance and cost management.

All SAP software is developed at the company's headquarters. The company employs 2,600 people worldwide; 650 employees are committed solely to product development. Approximately 80% of SAP's stock is still in the hands of the company's founders.

"They are extremely technology-oriented," said Erik Keller, program director at Gartner Group, Inc., a Stamford, Conn.-based market research firm. "They are continuing to gain market share in the mainframe MRP arena, where other software companies are losing ground or remaining flat."

Keller cited Andersen Consulting as SAP's primary competitor in the IBM 370 market. Second-tier competition, he said, includes Dun & Bradstreet Software's Amaps, and Computer Associates International, Inc.'s manufacturing resource planning (MRP) line.

Bensman maintained that the company will continue to guard its image of quiet, understated quality. "We believe in a long, carefully qualified sales cycle," he said, "and we will continue to balance our products and services."

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INTERNATIONAL BRIEFS

China goal

▶ Negotiations are ongoing toward **NCR Corp.**'s establishment of two joint-venture products in **China**. According to Daniel Lam, general manager of **NCR China**, one of the prospective ventures will assemble cash registers in North China, while the other will be responsible for producing printers in the south. Both ventures are expected to be operational by the end of 1992, Lam said. To a large extent, production resources will rely on local supply, as sales of the products will be focused on China's domestic market. NCR sales in China reportedly totaled $12 million in 1990, a 30% increase over 1989 figures.

The gain in Spain

▶ The **European Commission** earlier this month authorized the merger of French telecommunications firm **Alcatel** and Italian counterpart **Telettra**, provided the companies respect certain strict obligations imposed in the **Spanish** telecommunications market. Although the merger will affect markets in most of the 12 European Community countries, the commission investigation focused on the Spanish market, in which the combined forces of the two companies yield an 80% market share in transmission equipment.

High-performance computing plan offers multiple benefits

BY GARY H. ANTHES
CW STAFF

The High-Performance Computing and Communications program proposed recently by the White House — and some time earlier by several members of Congress — has received its most enthusiastic plug to date.

Gartner Group, Inc., a market research firm based in Stamford, Conn., said the program will generate a cascade of benefits, including a boost in the U.S. gross national product that could return the program's $1.9 billion investment by a factor of more than 100.

"Perhaps nowhere else could the expenditure of a relatively small amount of government funds have so great an effect on economic competitiveness," said George Lindamood, who led the study for Gartner Group. "The program would greatly improve American capability in semiconductor design, combustion efficiency, pharmaceutical design, speech and vision studies, oil and gas recovery, weather prediction and several areas of engineering."

The five-year program, unveiled by President Bush in his 1992 budget request and largely mirrored in legislation sponsored by Sen. Albert Gore (D-Tenn.), earmarks $682 million for research in high-performance computer systems, $662 million for work in advanced software, $390 million for development of a 1G bit/sec. National Research and Education Network and as much as $183 million in basic research and education.

Gartner Group's 308-page report, commissioned by the U.S. Department of Energy and the Los Alamos National Laboratory, said the program would affect both the rate and the direction of change in high-performance computing and communications. It also said the program will boost industrial productivity by increasing the rate of application of high-performance computing in industry.

Gartner Group said that while high-performance computing is considered out of the mainstream of the information industry, all computer users benefit from advances at the high end in a kind of "trickle-down effect," much as features perfected for race cars eventually end up on the family sedan.

Gartner Group's econometric model, borrowed from the University of Maryland, said the program will increase revenue to supercomputer vendors by $10.4 billion, or 28%, over the next decade. The study predicted that without the program, installed supercomputer processing power will grow by a factor of 125 over the decade; with the program, it would increase by 300 times.

An accompanying increase in supercomputer use in turn, will boost the productivity of key industries such as aerospace, chemicals and electronics as much as 3% or so. That will lead to an increase in gross national product between $173 billion and $503 billion over the decade, Gartner Group said.

Return on investment

According to an econometric model, the U.S. will get more than its money's worth from the High Performance Computer and Communications program

Economic impact of the federal HPCC program (range in 1982 constant dollars)

	Year 2000 only	1991-2000 cumulative
Gross national product	$29B to $84B higher	$173B to $503B higher
Personal consumption	$16B to $44B higher	$103B to $281B higher
Gross private domestic investment	$9B to $26B higher	$58B to $199B higher
Gross exports	$3B to $13B higher	$9B to $31B higher
Net exports (less imports)	$4B to $14B higher	$3B to $23B higher
Federal deficit	$13B to $31B lower	$75B to $190B lower

Source: Gartner Group, Inc

CW Chart: Doreen St. John

EXECUTIVE CORNER

New slate at IEEE

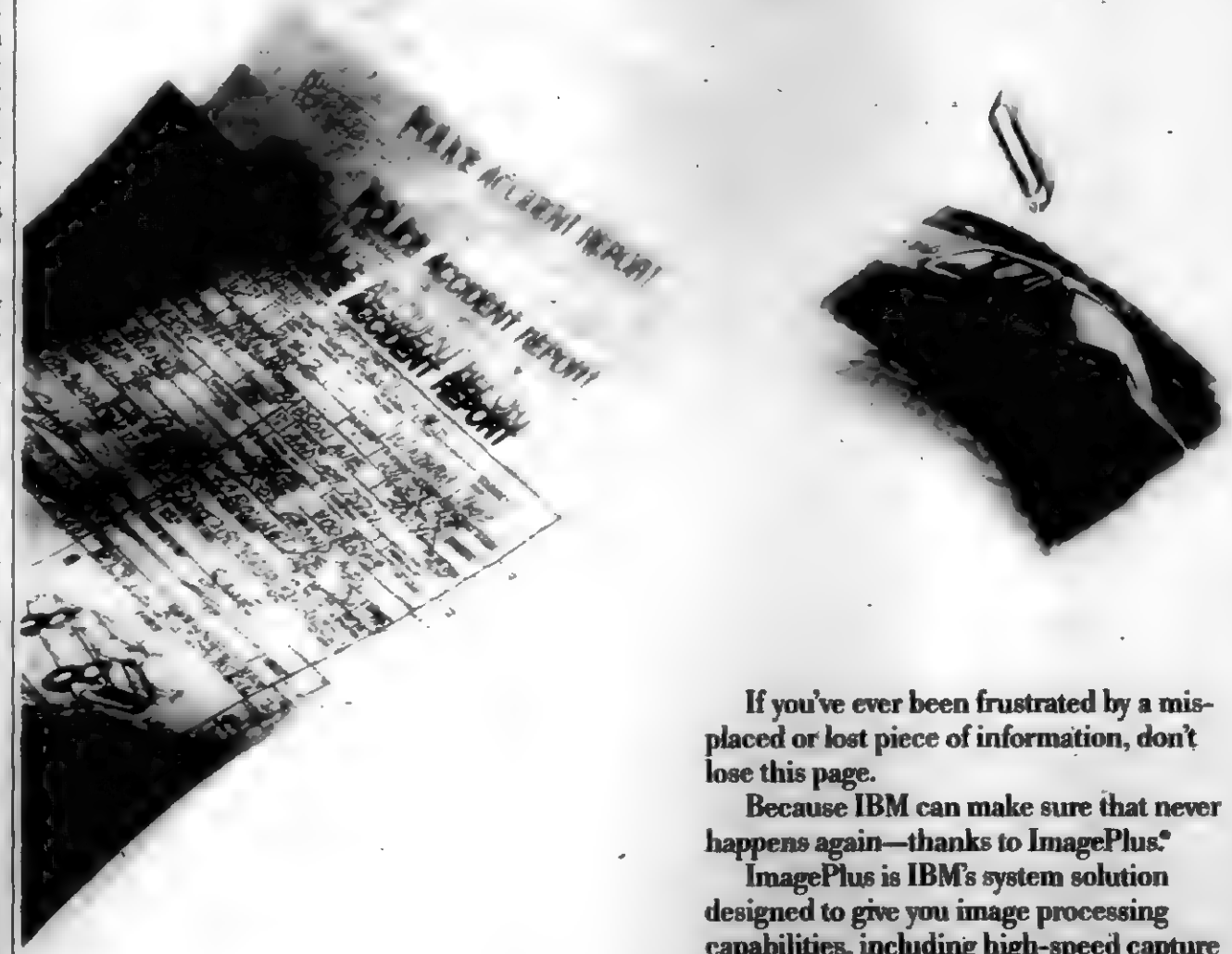


The Institute of Electrical and Electronic Engineers (IEEE) Computer Society has its 1991 slate of officers in place. At its helm is Duncan Lawrie, the head of the Computer Science Department at the University of Illinois in Urbana.

Lawrie, who served as the first director of the university's Laboratory for Advanced Supercomputers, will be presiding over the IEEE Computer Society as the Washington, D.C.-based organization celebrates its 40th-anniversary year.

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- "Japan Digest" (Arlington, Va.)
Daily and weekly newsletters; (703) 528-7570.

- Mogee Research & Analysis Associates (Great Falls, Va.)
Analysis of international patent trends; (703) 759-5104.

- National Research Council Office of Japan Affairs (Washington, D.C.)
Reports on the U.S./Japan technology relationship; (202) 334-2815.

- National Science Foundation's Japan Program (Washington, D.C.)
Awards grants for research visits to Japan, language study and studies of Japanese laboratories; (202) 357-9658.

- National Technical Information Service (Springfield, Va.)
Publishes reports of the Japanese Technology Evaluation Center, which sends teams of U.S. experts to evaluate Japanese research in advanced computing, networking, manufacturing technology and electronics. Also has directories, newsletters and an on-line database; (703) 487-4650.

- Oryx Press (Phoenix)
Publisher of *Japan's High Technology: An Annotated Guide to English-Language Information Sources*; (602) 265-2651.

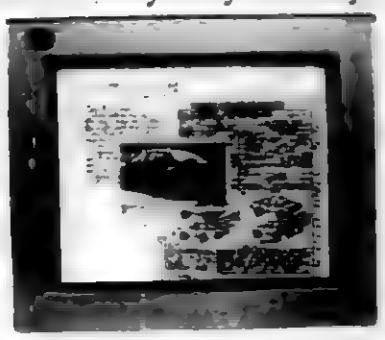
- Scan C2C, Inc. (Washington, D.C.)
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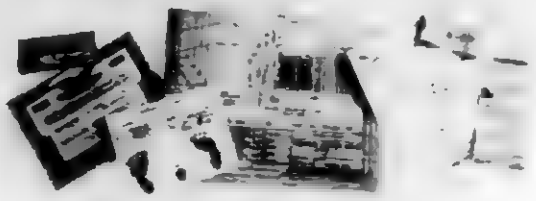
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CONTINUED FROM PAGE 97

asserted MIT professor Thomas W. Eagar.

Eagar cautioned that Japanese firms do not take kindly to American fishing expeditions and expect an equal information exchange. "Reciprocity rules," he said, explaining that if a U.S. researcher gives the Japanese a valuable, unpublished research paper, they will do the same in return.

Preparation needed

Showing up at a Japanese research lab and asking, "What have you got?" will lead only to a very formal, superficial meeting in the conference room and lots of tea, several speakers observed.

U.S. researchers need to do their homework and be sure to ask the right questions if they expect to get the right

Also, American scientists will have more fruitful relations with the Japanese if they learn to control their "awesome" egos and avoid poisoning the discussion with references to U.S./Japan trade frictions, Eaton added.

Karl Willenbrock, head of scientific, technological and international affairs at the National Science Foundation, said it is a myth that Japanese technology research is a closed operation. "There is access," he said, "but you have to do the accessing with skill."



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Middle-aged IS worker squeeze

Competition from college grads, retirees adds pressure to cutback trends

BY JANET MASON
SPECIAL TO CW

Ageism is a fact of life in the information systems profession, according to many of those in the trenches. The irony is, however, that age may be more of a negative factor for middle-aged IS professionals than their older colleagues.

IS professionals in the late 40s to early 60s age bracket are feeling the squeeze from downsizing and economic retrenchment more painfully than any other age group. Already crowded from behind by college graduates willing to start at lower salaries, they are also starting to see some competition from retirees, who provide a growing pool of on-call talent for organizations that want to minimize fixed costs.

"I've been through mergers, stages of evaluations, and I worry that if I get laid off three or four years from now and have to go out looking that I'll be in trouble," says Eric Hollenbach, a director of IS in his late 40s at Cleveland-based Lucas Aerospace, Inc.

IS professionals and recruiters say that technical workers are the ones most likely to feel the negative effects of ageism. "At the executive levels of IS, companies desire the grayer hairs and more experience," says Norm Sanders at executive recruitment firm Norm Sanders Associates in Hazlet, N.J.

On the other hand, "a technical employee in his 50s will be competing with a 22-year-old right out of Stanford University who is willing to work for $25,000 a year," says Steve Mattimore, a recruiter at San Francisco-based Professionals for Computing, Inc.

Persistent preconceptions

Salary isn't the only factor that can work against older IS workers. There are also seldom expressed yet persistent preconceptions about flagging stamina and closed minds.

Although many IS professionals of that age know better, the perception that youth equals energy is a hard one to battle.

"By law you can't ask a person's age," Mattimore says. "However, the industry tends to favor young, aggressive people who can work the 60-hour week."

The best thing an IS professional can do to refute the perception that older professionals tend to become stagnant is to take the offensive and stay current, says 61-year-old Anthony A. Vallario, who will be retiring this July from his 40-year career at Bergen Brunswig Corp. in Orange, Calif.



THE BEST THING an IS professional can do to refute the perception that older professionals tend to become stagnant is to take the offensive and stay current.

ANTHONY A. VALLARIO
BERGEN BRUNSWIG

"Some IS professionals do become stodgy in their outlook, and they try to seek a comfort level," Vallario says. "People who let themselves become stagnant fall by the wayside." Instead, they should attend local chapter meetings of organizations such as the Society of Information Management, attend seminars and read various computer publications, he says.

Hollenbach, who follows this philosophy, also finds it helpful to stay up-to-date by sitting in on business planning meetings where he can show how IS is facilitating the company's goals. "Older IS people have to show their worth more [than younger ones]," he says. "People don't like to talk about [age] prejudice, but it's there."

On the other end of the spectrum, an increasing number of companies are looking to the retired ranks for expertise that can be tapped into on an as-needed basis.

The Travelers Corp. in Hartford, Conn., recognizes that it makes good business sense to supplement its work force with retired IS professionals who represent a reservoir of talent. The company set up a program in 1981 that not only draws from the experience of its own retired employees but also takes advantage of other IS professionals out of work because of corporate downsizing in the Northeast.

The benefits of using older employees is that they are "a dedicated work force who have a knowledge of the company and its history," says Diane Bengston, human resources director for data processing at The Travelers.

In addition, The Travelers estimates that the retiree consultant program has saved the company $1.2 million.

Sovran Financial Corp. in Norfolk, Va., also set up its own temporary help agency several years ago, which draws from a staff of 1,000 retirees and employees who wish to work part-time.

Tapping retired forces

Defense contractors have historically tapped into the retired work force, says Steve Fogie at Korn/Ferry International. In general, IS employees spend their entire careers in that industry, so their acquired knowledge and superior grasp of specialized technologies is in great demand on a contractor level, he says.

While such developments are good news for seniors, they may spell added competition for their slightly younger professional brethren, who are, in some cases, being advised to seek the consulting track themselves.

If an older employee is faced with finding a new job, the best thing he can do is head for the consulting track, Fogie says. "Older individuals give a lot of value back to companies because they understand the bigger picture more than a younger person would."

The most important piece of advice to aging IS professionals comes from Vallario: "Keep your focus on technology and business; don't be afraid to explore technologies; take risks, as long as they are calculated risks; and always try to improve what you've accomplished."

Mason is a free-lance writer based in Philadelphia.

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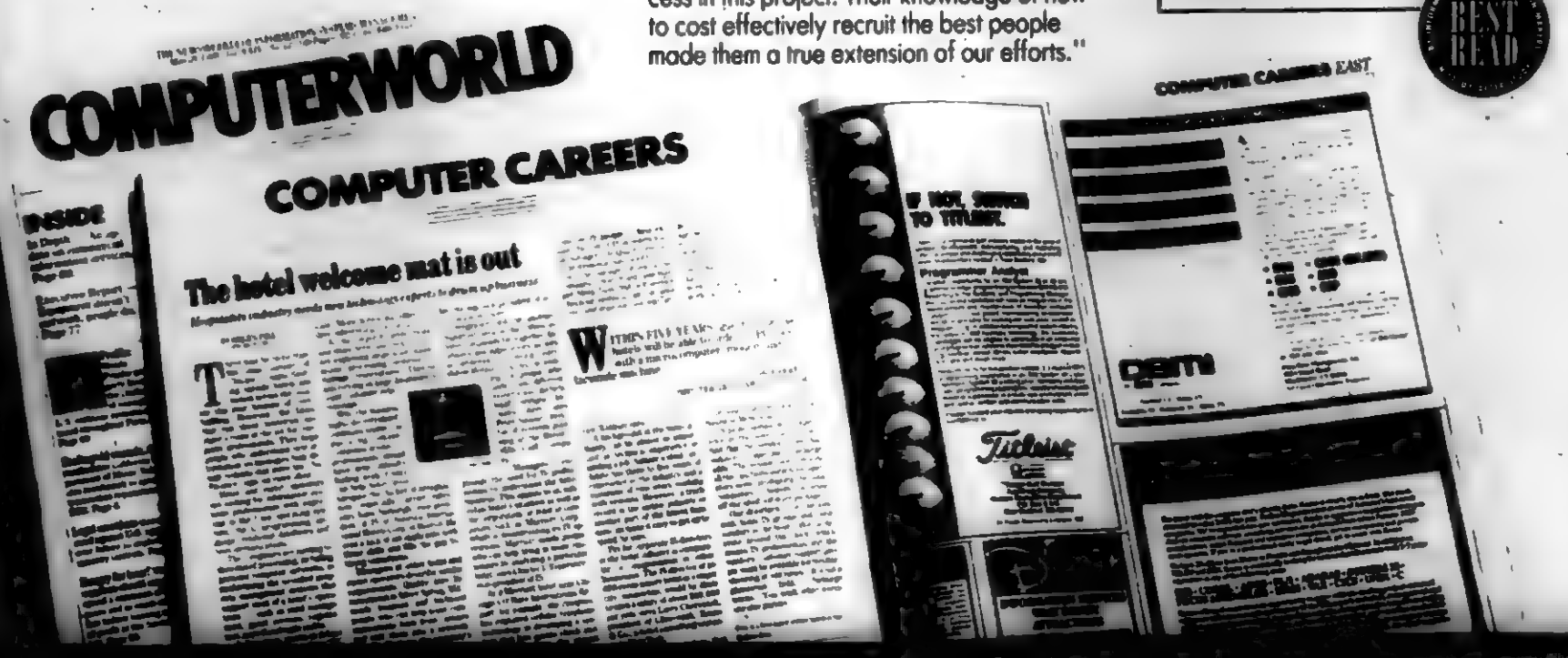
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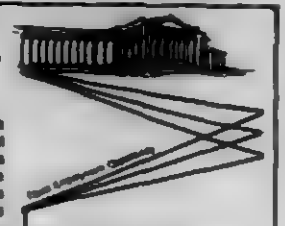
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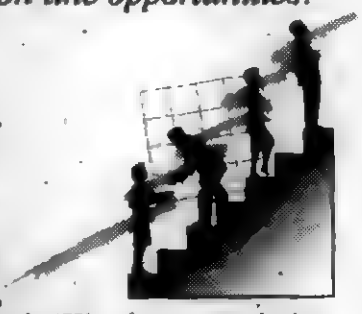
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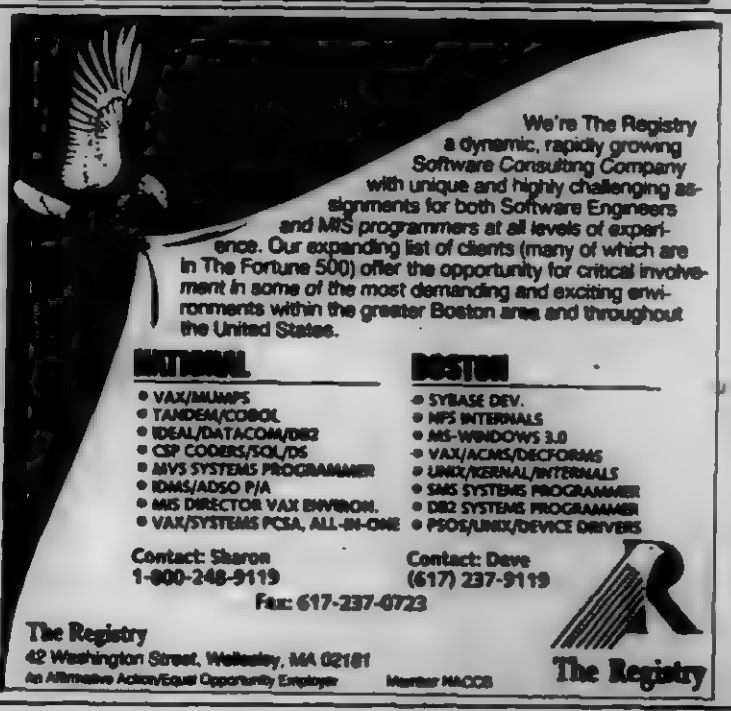
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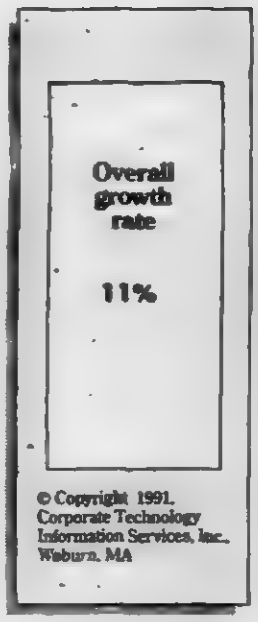
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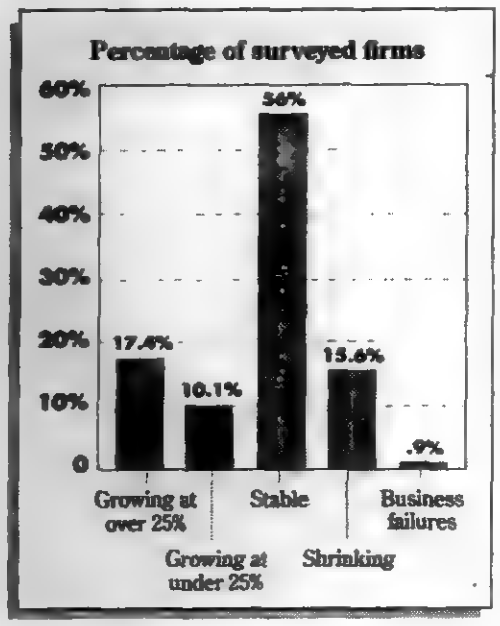
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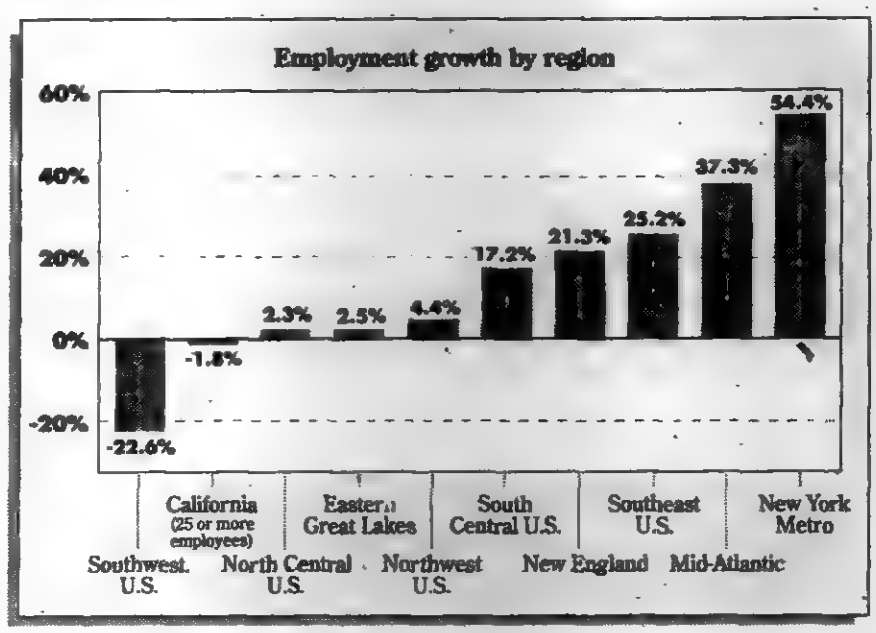
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PC dealer competition creates buyers' market

BY WILLIAM BRANDEL
SPECIAL TO CW

When Motown sneezes, car dealers get pneumonia — or so the saying goes in Detroit. Apply that adage to the slowed growth in the personal computer market, and it explains a lot of the deals and juicy service offerings information systems managers are seeing from PC dealers.

"Everyone is selling the same box, and that reduces it to a [commodity] price issue," says Dan Ness Jr., a PC analyst at Computer Intelligence, a market research firm in La Jolla, Calif. "Either the dealer has to become a high-margin, low-volume seller or a low-margin, high-volume dealer. Either way, the dealers stock in the middle are getting the squeeze."



"It's really a cutthroat business out there," says Rich Starks, manager of office technology and training at Prudential Insurance Company of America in Fort Washington, Pa. "Dealers are constantly knocking on our doors trying to make an arrangement for some new type of business."

The knocking is so frequent and insistent at Northeast Utilities in Hartford, Conn., that Ed Peczynski, manager of client services, has learned to play a good game of cut and switch.

"We might be extremely comfortable with a given dealer," Peczynski says, "but if their price is out of line, we just switch to another one." Northeast Utilities, which currently has 2,500 users working mainly on IBM Personal System/2s and Intel Corp. 80386SX microprocessors, takes the estimated annual amount that it plans to spend on dealers (about 10% of the IS budget) and divides it among a given number of dealers.

"We let them know that they are getting a given percentage of our budget but don't tell them how much that is," Peczynski says. "Then, we leverage one dealer against another."

Prices aren't the only things that have become negotiable in these tighter times. Peczynski says he is finding that dealers are willing not only to knock down prices but also to add attractive service options.

"Their big sell now is more and more service arrangements; the power deal is options," he observes. "In the past, dealers only offered razor-sharp pricing or good technical support — one or the other. Now, you can have both."

The major goal for dealers is to achieve some margin through added-value options. One salesman for a major chain says he is now making paper-thin markups on the products he sells to accounts. "The only way to make any money now is service contracts, charging for time and materials and maintenance agreements," he says. However, there is some question about how much extra these additional options are really bringing into the marketplace. These service deals may help him to stretch a dollar, Peczynski says, but they don't stretch the company's spending. What's planned at the start of the year is what Northeast Utilities spends.

With dealers falling all over themselves to cut deals, even mail-order vendors are feeling pressure to offer something more than bargain prices, such as service.

What you see is a lot of "changing stripes" in the market, Ness says. Even mail-order company Dell Computer Corp. has an agreement with Xerox Corp.: Xerox services and maintains Dell equipment at corporate sites.

However, not every IS manager considers dealers interchangeable. Some say there is a lot more to dealer selection than price and option packages, and, they say, it would take a really exceptional deal to induce them to make a switch.

For the past five years, Fleming Companies, Inc. in Oklahoma City, Okla., has worked with the same management, sales representatives and technicians at Computerland Corp., says Janis Meyer, information center manager at Fleming. She says that at this point, Computerland technicians know the department personnel, strategy and goals.

Meyer notes that "unless there is a compelling reason to change," such as a sudden deterioration in service or price rates that are totally out of whack with the rest of the market, "a small change in price alone is not a good reason to switch."

Whether they switch or stay, computer purchasers are likely to see further changes in their dealers. Many operations are either acquiring competitors or being acquired, according to Ness. For example, Computerland, tired of competing with Nynex Business Centers, signed a letter of intent to purchase the chain in March. The end result is one less dealer chain and one much larger dealer.

> "IT'S REALLY A cutthroat business out there. Dealers are constantly knocking on our doors trying to make an arrangement for some new type of business."
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Furthermore, Ness says, the superstore loaded with products on prime downtown real estate is on its way out. Dealers will want to get closer to their accounts, and that is most likely to mean more knocks on the door from salesmen who make account calls.

Brandel is a free-lance writer based in Boston.

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PS/2 Model 50	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,200	$3,500	$3,000
Compaq Portable II	$900	$1,050	$875
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SLT 286	$2,250	$2,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$2,200	$2,500	$1,900
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Detailed specs may be obtained from the CDPA office. CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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The National Railroad Passenger Corporation (AMTRAK) is soliciting interest from qualified software firms capable of providing a complete equipment maintenance/work management system for the control and management of all day to day maintenance activities (passenger car, locomotives, etc.), and related costs.

Submissions will be evaluated and shortlisted firms invited to submit detailed proposals based upon a specification provided by AMTRAK. Qualification criteria for short list is as follows:

1) Firm must own an existing, proven, readily available, "packaged" Software product and, can provide complete professional services (customization, integration, tailoring, training)

2) Software must be a complete, integrated, interactive, predominately real-time package specifically designed to support "All" aspects of equipment maintenance.

3) Software must operate on IBM (3090) main frame system, CICS/VS MVS/XA, VSAM/DB2.

Interested firms are asked to submit responses by May 13, 1991 no later than 5:00 p.m. to: Gary Pancavage, Senior Buyer, National Railroad Passenger Corporation, 30th Street Station - 5th Floor South, 30th & Market Streets, Philadelphia, PA 19104, (215) 349-1224

As a minimum, the submission must clarify, in detail, the product to be supplied, a brief company biography, professional services available, and a listing of clients currently utilizing the product (No Beta sites).

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*Source: Projected Total Audience Research Study Conducted Among Paid Subscribers of Computerworld, IDG Research Services, August 1990.

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Simulators key to nuclear plant training

BY CHRISTINE CASATELLI
SPECIAL TO CW

In the nuclear industry, one mistake can spell disaster. If anyone had any doubts about that, the accident at Three Mile Island in 1979 dispelled them.

After that incident, Congress gave the Nuclear Regulatory Commission (NRC) authority to shut down nuclear power facilities that do not conform to federal standards for the training and certification of plant operators and technical staff.

As a result of close NRC scrutiny — and because nuclear facilities lose money for every day they are shut down — training nuclear plant operators on critical applications is serious business. It is also a complex undertaking.

Nuclear plants are governed by a delicately calibrated mixture of computers and instrumentation, and bringing operators to a point of true proficiency can take one year or more, with hundreds of hours of classes and simulator experience.

A simulator is a mock, computer-driven control-room setup designed to look, sound and react just like the individual plant's actual controls.

At the Pilgrim Nuclear Power Plant in Plymouth, Mass., plant operators undergo training for 320 hours per year, says Jack Alexander, nuclear training manager. "That's why the plant has two simulators — so that training and refresher courses can continue even if one system needs to be repaired or upgraded." And when the control room systems get a major enhancement, so do the simulators.

Some plants combine simulator training with video feedback to enhance learning retention. The Tennessee Valley Authority Nuclear Plant in Brown's Ferry, Ala., for example, uses a closed-circuit television system and videocassette recorder to record what crew members are doing and then critique their actions, says Tommy Albright, simulation manager at the plant.

One of the more time-consuming aspects of training is constructing simulator models, according to Jeffrey Angstadt, a computer analyst at Pennsylvania Power and Light Co. in Susquehanna, Pa.

"What's involved is combining lots and lots of plant data to build software models, which must go through a rigorous testing criteria," he says.

Pennsylvania Power and Light is in the midst of replacing its 12-year-old simulator with an enhanced, more powerful model that runs off of an Encore Computer Corp. 2040 minicomputer and incorporates five instructor workstations. This setup will allow a trainer to monitor simulator activity from different data on all the screens and test students on anything from routine operations to big-time meltdowns. The project will cost in excess of $10 million and is slated for operation in 1992.

Because it is impossible for inspectors and examiners to certify the preparedness of nuclear plant operators unless they have a detailed grasp of what these operators need to know, the NRC puts its watchdogs through rigorous training at its own National Technical Training Center in Chattanooga, Tenn.

Training at the NRC center starts with three weeks of classroom sessions on how the plant control system works, including systems integration and appropriate responses to plant events.

Next, trainees are subjected to two weeks of simulator instruction. The speed and sophistication of today's simulators allow students to get an accurate idea of what it is like to sit at the controls of a nuclear power plant. "If you walked into the simulator room, you would think you were walking right into the control room of a nuclear power plant," says Kenneth Raglin, director of the NRC training center.

Casatelli is a free-lance writer based in Washington, D.C.

Computers, networks control sites

Over the years, nuclear facilities have relied more and more on computers to monitor plant conditions and alert plant operators when something is amiss.

For example, electronic sensors attached to critical components, such as steam pipes, take readings at least every second, digitize them and relay the raw data over communication lines to on-site plant mainframes, minicomputers or super minicomputers, which convert it into engineering terms that operators understand.

In the control room, the plant information appears in numeric or graphical form on terminal screens so operators can check conditions at a glance. "There is a historical recording feature at some of the plants, if they want to keep a record of what happened," says Pennsylvania Power and Light's Jeffrey Angstadt.

Some plants use a wideband network, which collects all of the plant's vital statistics — such as temperature and pressure — and transmits the information over a single cable.

"In older plants, the sensors are wired back to a panel, and computers obtain the information from there," says Tom Fukushima, general manager at S. Levy, Inc., a consulting firm in Campbell, Calif., that specializes in the nuclear industry. "More of the newer plants are putting in distributed networks using multiplexers, where sensors bring in information locally and use a common cable to route it back to the computers," he says.

While it is essential for the plant systems staff to have a working knowledge of computing and network strategies in order to keep the reactors humming, nuclear plant operators can also benefit from training in systems integration and communications, Fukushima says.

CHRISTINE CASATELLI

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INDUSTRY ALMANAC

ANALYSIS IN BRIEF

Semiconductor shipments and orders have skyrocketed compared with last year, but few U.S. vendors are as happy as the jump in book-to-bill ratio suggests. The ratio generalizes a business that can no longer be generalized. Different parts of the market are seeing vastly disparate business conditions. For example, integrated circuit orders have grown dramatically, while bookings of niche components such as diodes and transistors have increased only slightly.

Economic and war-related uncertainties caused computer makers to hold inventory levels low. As those issues began to lift, so did chip orders.

Texas Instruments, Inc. and Micron Technology, Inc. stand to benefit from the current upward price pulse of dynamic random-access memory chips. Look for an upside earnings surprise from Intel Corp. at the quarter's end, caused by accelerated orders for its 80386 chip. — *Systems, Silicon & Software, What's in a Book-to-Bill? Donaldson, Lufkin & Jenrette, Inc., April 1991.*

April's earnings reports show some strong spots in the technology industry, such as mainframe software and workstations, but the rest of the sectors seem to be slipping. Recessionary fears combined with a strengthening dollar and weakening economies overseas will deflate profits.

Among the safe havens where business is solid are Legent Corp., Cognos, Inc., Computer Associates International, Inc. and BMC Software, Inc. For now, however, wait for the damage to be done by negative earnings reports from other companies, then make investment picks when the dust settles. — *Technology: Computer Services/Software, Malon, Nugent & Co., April 1991.*

RECOMMENDATION CHANGES

DOWNGRADED FROM BUY TO MODERATELY ATTRACTIVE: **Symantec Corp.** (Donaldson, Lufkin & Jenrette). Reason: Shares have risen 100% this year and are now overvalued, trading at more than 33 times 1991 earnings-per-share estimate.

UPGRADED FROM HOLD TO BUY: **LSI Logic Corp.** (Alex. Brown & Sons, Inc.). Reason: Company is the best positioned semiconductor maker in the U.S. to benefit from a cyclical upturn in the chip industry; new products, including its 40-MHz Sparcstation 2 processor, are proving manufacturing prowess.

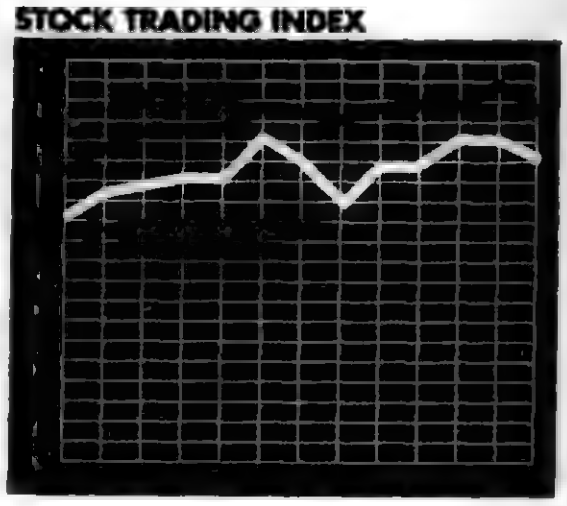
UPGRADED FROM HOLD TO BUY: **Tektronix, Inc.** (Prudential Securities, Inc.). Reason: Stock will advance into low $30 range within one year; administrative costs, combined with the probable closing of some facilities, may lead to small revenue growth next year.

UPGRADED FROM OUTPERFORM TO BUY: **Motorola, Inc.** (Shearson Lehman Brothers, Inc.). Reason: Cost control is now excellent; quarter just reported showed substantially higher profits vs. last year's figures for both the communications and semiconductor divisions.

DOWNGRADED FROM BUY TO HOLD: **Sequent Computer Systems, Inc.** (Prudential Securities). Reason: Shortfall in current quarter resulted from weak sales from OEM sector and under-par direct sales; however, once economy brightens, company's sales will increase.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- When Compaq Computer Corp. hit Wall Street with a poor earnings forecast (see story page 4), investors lashed back: Compaq's stock sank 9¼ points, closing at 52½ Thursday. Among other systems companies reporting financial results, Sun Microsystems, Inc. basked in a four-point advance to 38¼, while Sequent Computer Systems, Inc. dropped 1⅛ to 16⅛ with news of a quarterly loss. Data General Corp. achieved a second straight quarterly profit and moved up 3⅛, closing at 18.
- Market watchers were unimpressed by the restoration of Ashton-Tate Corp.'s Dbase copyright. The software maker's stock dug in at 9⅛ Thursday, down ⅛ of a point. Lotus Development Corp. jumped 2¾ points to 32¼, but Microsoft Corp. crashed 9¼ points, landing at 100¾.
- High-volume traders last week included Apple Computer, Inc., falling 2½ to 58½; Seagate Technology, Inc., fading ⅜ of a point to 13¼; and MCI Communications Corp., losing ⅝ of a point to close at 28¼.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, APRIL 26, 1991

TOP PERCENT GAINERS

Data General Corp.	16.13
Sun Microsystems Inc.	12.09
Lotus Development	11.69
Software Publishing Corp.	11.38
Micrografx	10.13

TOP PERCENT LOSERS

Legent Corp.	-16.75
Informix Systems Corp.	-16.67
Televideo Systems	-16.53
Compaq Computer Corp.	-13.40
Masstor Systems	-12.50

TOP DOLLAR GAINERS

NCR Corp.	6.75
Sun Microsystems Inc.	4.13
Lotus Development	3.38
Data General Corp.	2.80
General Motors E (EDS)	2.38

TOP DOLLAR LOSERS

Compaq Computer Corp.	-8.13
Legent Corp.	-6.75
Microsoft Corp.	-6.50
Computer Sciences	-4.75
Digital Equipment Corp.	-2.63

Communications and Network Services — Off 1.23%

Exch	52-Week High	52-Week Low		April 26 Close	Wk Net Change	Wk Pct Change
OTC	19.00	5.38	3COM Corp.	8.75	-0.25	-2.78
NYS	69.75	52.50	American Info Techs Corp.	64.00	-1.00	-1.54
NYS	44.13	29.00	AT&T	37.50	0.25	0.67
OTC	8.75	0.88	Ariel Communication Corp.	2.00	-0.13	-5.88
NYS	58.25	39.50	Bell Atlantic Corp.	47.88	-0.75	-1.54
NYS	57.63	46.00	Bellsouth Corp.	51.13	-0.50	-0.97
NYS	44.00	13.13	Cabletron Systems	39.38	-2.25	-5.41
OTC	25.88	8.25	Compression Labs Inc.	19.63	-0.25	-1.26
NYS	41.25	23.38	Comsat Corp.	41.00	0.00	0.00
OTC	5.13	1.94	Data Switch Corp.	3.75	-0.13	-3.23
NYS	28.75	8.88	Digital Comm. Assoc.	20.00	-0.63	-3.03
OTC	25.25	12.25	Dynatech Corp.	20.75	-0.25	-1.19
OTC	12.88	5.50	FiberCom Inc.	9.50	0.25	2.70
OTC	4.00	1.75	Gandalf Technologies Inc.	3.00	-0.38	-11.11
NYS	4.50	1.63	General Datacomm Inds.	3.25	-0.25	-7.14
NYS	34.13	23.50	GTE Corp.	31.13	-0.63	-1.97
OTC	4.50	0.75	Infotron Systems Corp.	1.25	-0.25	-16.67
NYS	60.88	40.25	ITT Corp.	59.13	0.25	0.42
OTC	44.13	17.88	MCI Communications Corp.	28.75	0.13	0.44
OTC	21.00	2.75	Microcom Inc.	8.00	0.50	9.09
NYS	11.63	4.00	Network Equipment Tech	7.88	0.38	5.00
OTC	14.63	4.00	Network General	9.00	0.13	1.41
OTC	18.50	8.13	Network Systems Corp.	12.25	1.13	10.11
NYS	34.50	22.13	Northern Telecom Ltd.	34.50	1.63	4.94
OTC	58.50	17.25	Novell Inc.	55.25	2.25	4.25
NYS	89.50	67.00	Nynex Corp.	72.00	-0.50	-0.69
NYS	47.88	38.25	Pacific Telesis Group	41.75	0.50	1.21
ASE	15.38	4.75	Parvi Corp.	14.50	0.00	0.00
NYS	29.13	0.88	Scientific Atlanta Inc.	15.13	-1.88	-9.70
NYS	58.88	47.25	Southwestern Bell Corp.	53.00	-1.00	-1.85
NYS	46.38	30.63	United Telecom	25.88	-0.13	-0.48
NYS	40.75	32.38	US West Inc.	37.88	-0.38	-0.98

Computer Systems — Off 2.61%

OTC	8.75	0.56	Alliant Computer Sys.	1.25	-0.13	-9.09
ASE	18.88	10.00	Amdahl Corp.	16.00	-0.50	-3.03
OTC	73.25	24.25	Apple Computer Inc.	58.50	-1.13	-1.89
OTC	13.88	4.25	Archive Corp.	8.00	-0.63	-7.25
OTC	32.75	7.50	AST Research Inc.	25.00	-2.50	-9.09
NYS	7.38	3.88	Bolt, Beranek & Newman	6.88	0.00	0.00
NYS	21.88	4.50	Commodore Int'l	16.38	-0.13	-0.88
NYS	74.25	35.50	Compaq Computer Corp.	52.50	-8.13	-13.40
OTC	1.75	0.13	Computer Automation Inc.	1.13	0.00	0.00
NYS	21.13	6.75	Control Data Corp.	12.50	-0.50	-3.85
NYS	20.88	8.38	Convex Computer	17.00	-2.13	-11.11
NYS	61.25	20.00	Cray Research Inc.	37.38	-1.13	-2.92
NYS	18.50	3.50	Data General Corp.	18.00	2.50	16.13
NYS	3.25	0.75	Datapoint Corp.	1.63	-0.13	-7.14
OTC	30.88	8.25	Dell Computer Corp.	22.50	-0.63	-2.99
NYS	95.13	46.50	Digital Equipment Corp.	89.00	-2.63	-2.88
NYS	20.13	13.75	Harris Corp.	28.88	0.38	1.42
NYS	64.25	24.88	Hewlett Packard Co.	53.63	0.63	1.18
NYS	139.75	86.25	IBM	100.00	-1.50	-1.37
OTC	14.00	7.75	Information Int'l	8.00	-0.13	-1.54
OTC	21.50	10.50	Intergraph	28.50	0.75	2.81
NYS	3.00	0.50	MAI Systems Corp.	0.69	-0.06	-8.27
NYS	149.75	114.00	Matsushita Electronics	134.88	-1.63	-1.20
OTC	28.00	9.00	Mentor Graphics Corp.	16.50	-0.50	-2.94
NYS	103.50	44.50	NCR Corp.	103.50	6.75	6.98
OTC	35.50	11.00	Pyramid Technology	25.75	-1.00	-3.74
OTC	34.00	8.75	Sequent Computer Sys.	16.88	-1.63	-8.78
NYS	47.25	18.00	Silicon Graphics	36.38	-1.00	-2.54
NYS	37.25	14.63	Stratus Computer Inc.	35.63	-0.88	-2.40
OTC	39.25	15.00	Sun Microsystems Inc.	38.25	4.13	12.09
NYS	28.88	8.88	Tandem Computers Inc.	16.75	1.13	7.20
NYS	39.50	23.50	Tandy Corp.	32.75	-2.63	-7.43
OTC	32.00	6.75	Teradata	17.88	-2.25	-11.18
NYS	7.88	1.38	Ultimate Corp.	4.75	0.00	0.00
NYS	15.88	1.75	Unisys Corp.	4.50	-2.38	-7.88
ASE	5.75	2.00	Wang Labs Inc. (b)	3.50	-0.25	-6.67

Software & DP Services — Off 1.25%

OTC	63.00	17.00	Adobe Systems Inc.	55.00	-2.00	-3.51
OTC	50.88	20.00	Aldus Corp.	48.25	-1.88	-3.74
OTC	28.50	12.00	American Mgmt. Systems	26.75	0.75	2.88
OTC	16.25	7.50	American Software Inc.	12.25	1.00	8.89
NYS	4.63	1.38	Analysts Int'l	3.63	0.00	0.00
OTC	23.50	10.00	Analysts Int'l	15.00	-0.75	-4.76
OTC	13.25	4.88	Ashton-Tate	9.63	-0.13	-1.28

Software & DP Services — Off 1.25%

Exch	52-Week High	52-Week Low		April 26 Close	Wk Net Change	Wk Pct Change
OTC	10.25	4.00	ASK Computer Sys.	8.50	-0.13	-1.45
NYS	71.25	46.25	Auto Data Processing	69.25	-0.75	-1.07
OTC	60.25	32.00	Autodesk Inc.	53.75	-2.25	-4.02
OTC	31.50	13.50	BGS Systems Inc.	27.75	-0.75	-2.63
OTC	43.88	17.75	BMC Software Inc.	40.50	-0.25	-0.61
OTC	21.50	11.00	Boole & Babbage Inc.	11.50	0.50	4.55
OTC	64.25	14.50	Borland Int'l	57.00	-1.50	-2.56
NYS	9.75	0.88	Businessland Inc.	2.00	0.13	6.67
OTC	20.88	8.13	Cognos Inc.	18.75	-0.75	-3.85
NYS	16.88	4.38	Computer Associates	9.00	0.13	1.41
OTC	17.75	10.75	Computer Horizons	12.50	-0.75	-5.66
NYS	73.25	36.75	Computer Sciences	66.88	-4.75	-6.73
NYS	11.75	5.88	Computer Task Group	10.25	-0.13	-1.20
OTC	25.25	13.00	Cornerstone Inc.	18.75	-0.13	-0.66
OTC	16.00	3.75	Corporate Software	11.75	-0.63	-5.05
NYS	48.63	27.88	General Motors E (EDS)	48.63	2.38	5.14
OTC	16.75	7.25	Goal Systems Int'l	14.25	-1.50	-9.52
OTC	5.75	1.88	Hogan Systems Inc.	5.00	0.38	8.11
OTC	19.75	7.75	Information Resources	18.00	-0.50	-2.70
OTC	17.50	2.63	Informix Corp.	8.25	-0.75	-10.71
OTC	7.88	1.38	Intellicorp Inc.	1.94	-0.19	-8.80
OTC	8.13	2.50	Interleaf Inc.	6.88	-0.63	-8.33
OTC	43.25	10.00	Knowledgeware Inc.	38.00	-1.00	-2.56
OTC	45.00	16.75	Legent Corp.	29.25	-6.75	-18.75
OTC	39.25	12.50	Lotus Development	32.25	3.38	11.69
OTC	32.00	13.63	Micrografx	21.75	2.00	10.13
OTC	117.50	60.75	Microsoft Corp.	100.75	-6.50	-6.06
NYS	10.50	4.00	On Line Software Int'l	9.88	0.25	2.60
OTC	24.00	4.88	Oracle Systems	10.13	-0.25	-2.41
NYS	14.63	7.00	Parasophic Systems	12.13	0.00	0.00
OTC	9.25	1.25	Phoenix Technologies	8.13	-0.50	-5.80
NYS	52.00	32.25	Policy Management Sys.	45.00	-2.63	-5.51
NYS	23.63	11.50	Reynolds & Reynolds	19.75	-1.63	-7.60
OTC	16.13	6.88	Sage Software Inc.	11.25	0.75	7.14
OTC	25.50	14.75	SEI Corp	24.00	0.00	0.00
OTC	21.75	12.25	Shared Medical Systems	21.38	0.38	1.79
OTC	35.25	12.00	Software Publishing Corp.	22.00	2.25	11.36
NYS	14.63	5.50	Sterling Software	13.63	-0.50	-3.54
OTC	28.00	9.50	Sungard Data Sys.	17.25	0.50	2.99
OTC	55.88	17.75	Symantec Corp	47.25	1.75	3.85
NYS	24.50	4.50	System Center Inc.	7.50	-0.25	-3.23
OTC	37.25	12.75	System Software Assoc.	20.00	-1.00	-4.76
OTC	27.38	4.75	Wallach	14.38	-0.63	-4.03

Semiconductors — Off 1.30%

NYS	14.25	3.63	Advanced Micro Devices	14.25	0.75	5.56
NYS	12.50	5.50	Analog Devices Inc.	10.63	-1.13	-9.57
OTC	21.75	5.25	Chips & Technologies	10.00	-0.25	-2.44
OTC	55.25	28.00	Intel Corp.	53.00	0.13	0.24
NYS	13.00	5.13	LSI Logic Corp.	11.88	0.13	1.06
NYS	19.13	8.75	Micron Technology	16.88	-0.88	-4.93
OTC	21.50	7.25	MIPS Computer Systems	17.63	-0.88	-4.73
NYS	88.38	45.75	Motorola Inc.	85.75	0.75	1.15
NYS	9.00	3.00	National Semiconductor	7.75	-0.13	-1.59
NYS	47.63	22.50	Texas Instruments	42.00	-0.63	-1.47
OTC	12.25	3.00	VLSI Technology	11.63	0.38	3.33
ASE	14.88	4.00	Western Digital Corp.	5.63	-0.13	-2.17

Peripherals & Subsystems — Off 2.45%

OTC	2.75	0.88	Agarius Technologies	2.44	-0.06	-2.46
OTC	24.00	7.50	Banctec Inc.	13.25	0.25	1.92
OTC	17.88	4.25	Cambex Corp.	10.50	0.50	3.33
ASE	11.75	4.13	Cognitronics Corp.	9.88	-0.38	-3.66
NYS	21.25	14.63	Conner Peripherals	20.38	-0.88	-3.21
ASE	22.00	7.00	Datatrain Corp.	10.13	-0.50	-4.71
NYS	12.25	4.25	EMC Corp.	11.88	0.25	2.15
NYS	47.25	33.75	Eastman Kodak Co.	43.00	-0.38	-0.86
OTC	11.25	4.75	Emulex Corp.	9.38	-0.13	-1.32
OTC	34.50	14.00	Evans & Sutherland	21.75	0.75	3.57
OTC	8.50	3.75	Iomega Corp.	5.63	0.00	0.00
OTC	28.25	8.75	IPL Systems Inc.	25.75	2.25	9.57
OTC	1.63	0.13	Masstor Systems	0.88	-0.13	-12.50
OTC	17.00	2.63	Maxtor Corp.	4.63	-0.50	-9.76
OTC	18.00	4.38	Micropolis Corp.	15.63	0.13	0.81
NYS	93.75	73.63	3M Corp.	87.88	0.13	0.14
OTC	14.50	8.00	Prime Inc.	8.75	-0.50	-5.41
NYS	24.75	8.50	QMS Inc.	22.63	-1.63	-6.70
OTC	27.25	12.38	Quantum Corp.	24.00	-1.75	-6.80
NYS	7.50	4.38	Recognition Equipment	7.50	0.38	5.26
OTC	11.88	4.00	Reuon Inc.	11.50	0.63	5.75
OTC	19.88	5.63	Seagate Technology	13.25	-0.63	-4.50
NYS	41.50	11.00	Storage Technology	40.00	-1.38	-3.32
OTC	4.75	1.25	Tandon Corp.	3.94	-0.56	-12.40
NYS	26.38	11.63	Tektronix Inc.	24.75	-1.13	-4.35
OTC	0.63	0.16	Televideo Systems	0.31	-0.06	-16.53
NYS	60.13	28.00	Xerox Corp.	58.13	-1.88	-2.52

Leasing Companies — Up 0.72%

OTC	16.25	6.88	Amplicon Inc.	15.00	0.00	0.00
NYS	28.38	14.63	Comdisco Inc.	27.75	0.50	1.83
OTC	16.25	9.25	LDI Corporation	14.50	0.25	1.75
OTC	5.75	2.25	Selectarm Inc.	3.75	0.00	0.00

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U.S. warms to tech programs

White House report may signal willingness to support vital technologies

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The White House strengthened signals last week that it is warming up to the idea of government-sponsored technology programs, particularly those likely to benefit the computer industry and its customers.

A technology panel appointed by the president's Office of Science and Technology Policy (OSTP) released a report detailing 22 technologies it said are critical to U.S. prosperity, national defense, energy, security and quality of life. Seven deal directly with information processing and communications (see chart at right).

Technology watchers hailed the 126-page report as evidence that the Bush administration may be prepared to support added help for U.S. industry, something it has generally opposed on ideological grounds.

"The report represents a substantial turnaround in thinking on the part of the administration," Rep. George E. Brown (D-Calif.), chairman of the House Science, Space and Technology Committee, said at a congressional hearing last week.

Micro Tech kickoff

Simultaneously, OSTP and the National Advisory Committee on Semiconductors (NACS), an industry/government advisory panel, kicked off Micro Tech 2000, a program intended to advance semiconductor technology. One goal is to help U.S. industry develop a 1G-bit static random-access memory chip by the year 2000.

More than 70 semiconductor experts from government, industry and universities last week drafted a "technological road map" to bring the U.S. to "the leading edge of semiconductor technology," said Ian Ross, chairman of NACS and president of AT&T Bell Laboratories. The road map will be made public at NACS' meeting next month.

At a press conference after the workshop, Ross said the Bush administration had made no commitment to Micro Tech 2000 beyond participation in the workshop. He said the charter of the workshop participants had been to outline a strategy for developing new "generic" technologies and not to say how or at what cost the strategy would be implemented.

The technologies list is similar to ones published earlier by the U.S. Departments of Commerce and Defense, but White House sponsorship of this latest catalog may take it further than the others.

"The value of research and development consortia needs to be assessed, and the role of federal laboratories should be examined," William D. Phillips, the OSTP official who heads the industry/government panel that prepared the report, testified at the congressional hearing.

"We also need to examine regulatory barriers, the limited available pool of capital and other inhibiting factors," Phillips said.

The White House says 22 technologies in six areas are critical:



Information and communications:
- Software.
- Computer simulation.
- Sensors and signal processing.
- Data storage and peripherals.
- High-definition imaging and displays.
- Microelectronics and optoelectronics.
- High-performance computing and networking.

Materials: 5 technologies

Manufacturing: 4 technologies

Biotechnology and life sciences: 2 technologies

Aeronautics and surface transportation: 2 technologies

Energy and environment: 2 technologies

Oracle

FROM PAGE 1

Intel 80386 — and to the fully 32-bit addressing scheme of Netware, compared with the 16-bit scheme used in the currently available version of the OS/2 operating system, on which LAN Manager operates. Netware also has lower system overhead than OS/2, analysts said.

Novell is reportedly pursuing an industrywide database strategy with other relational database management system companies, including Informix Software, Inc.

In September, Informix said it was developing another NLM for the Informix Online RDBMS, due in the third quarter.

To get performance equivalent to Oracle's unaudited 41-transactions-per-second benchmarks for the Oracle 6.0 NLM, Oracle configured an IBM-compatible Intel I486-based machine with 16M bytes of memory and 80M bytes of hard-disk capacity.

However, some beta-test site users reported configuring systems with 100M to 300M bytes of disk-drive memory to support the same functions in a production environment. The Oracle 6.0 RDBMS for Netware only needs an Intel 80386 machine with 9M bytes of main memory and 30M bytes of disk, Oracle managers said.

"You're now looking at very large networks being run from a single [LAN] machine," said Jim Reilly, senior director of marketing at Oracle's Desktop Product Division.

The Sybase SQL/Server and 18-month-old Oracle Server for OS/2 averaged about 11 trans./sec. under audited TP1 benchmarks, Reilly said. Reilly spoke at an Oracle Desktop products conference here, which drew more than 200 users, product developers and systems integrators.

Separate machines

Oracle suggested work groups of more than 50 concurrent users should seriously consider placing separate database and Novell file server Novell machines on large LANs.

"Both Novell and Oracle recommend that you separate specific tasks between database and file servers in a production environment," said Robert Bolt, a former Oracle developer who is now president of Database Server Systems, Inc. in South San Francisco. "But most companies are starting with a 10-user system, so they'll get into this technology on a single server."

Oracle said it has taken steps to prevent system crashes as additional users log on to the database.

Oracle said the product began shipping last Wednesday and is priced from $3,699 to $19,999, depending on the number of users.

Ounce of prevention

Information systems concerns could stall the implementation of industrial-strength RDBMS, such as Oracle Corp.'s Oracle 6.0 on user local-area networks. "Often, nobody takes ownership of all the pieces," said one frustrated New England database administrator who has worked with both the Sybase SQL/Server and Oracle Server for OS/2. "I want to point fingers at one person when something goes wrong."

Vendors are among those who are concerned about placing standard RDBMS products in the hands of unprepared end users. "In the proprietary world, a customer could go to one vendor and get one-point support," said Ron Ward, director of systems engineering at Compaq Computer Corp., which supports the Oracle/Novell, Inc. products on its machines. "Now people want to know how to take the pieces out of the box and to make it all come together."

Compaq, Novell and Oracle have all committed to work together to prevent such finger-pointing problems, users were told at the Oracle Desktop conference last week.

Novell Executive Vice President Darrell Miller said he expects IS groups in large corporations will, indeed, supervise data administration on work-group LANs. "In many cases, systems administrators will supervise the management of 20 to 30 Netware LANs throughout a company," Miller said.

Large companies such as Fluor Daniel, Inc., a Los Angeles construction firm, and Pfizer, Inc., a New York pharmaceuticals giant — both beta-test sites for the Oracle 6.0 NLM — may be best equipped to support work-group data administration, analysts said.

GUI support added to Cobol development tool

BY JEAN S. BOZMAN
CW STAFF

PALO ALTO, Calif. — Micro Focus Ltd. is expected to announce an enhanced version of its desktop Cobol development environment at a user conference in Orlando, Fla., May 13.

The enhanced software, Micro Focus Cobol/2 Workbench Version 2.5, has new support for graphical user interfaces (GUI). The new software is considered an upgrade of the 1-year-old Version 2.4 tool set, according to the $84 million company.

Major enhancements include support for Microsoft Corp.'s Windows 3.0 environment, mouse support, a Cobol editor and improved Help menus.

Version 2.5 is scheduled to be available in mid-May for $2,500 per unit. At the same time, the firm is also scheduled to ship Micro Focus Dialog System 2.0, a tool that will migrate Micro Focus programs written under MS-DOS to the OS/2 Presentation Manager interface without recoding.

One New Jersey beta-test user of the Version 2.5 tool set who did not wish to be identified said some longtime Cobol programmers accustomed to writing code with the IBM 3270 terminal interface may not elect to use the new GUIs.

"We have been using Micro Focus for the last two years because we have the flexibility to work on a PC in the office or at home," said this user, who likes the Windows 3.0 interface. "Otherwise, we would be using TSO on an IBM mainframe and not getting as much testing time as we would like."

AMD lets loose 25-MHz chip

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. released details last week of its answer to Intel Corp.'s best-selling 80386SX microprocessor. The AMD versions, which will begin shipping in volume by the end of June, will run at 25 MHz, compared with Intel's 16- and 20-MHz chips.

AMD has its sights set on the power-constrained notebook personal computer market for its AM386SX-25 and SXL-25. Because of their static design, both chips draw 35% less power than their Intel counterparts when running at 20 MHz, AMD said. The SXL-25, which is also capable of standby-mode operation, reportedly will eke out an extra hour of battery life from a notebook PC compared with Intel's offering.

The chips are currently shipping in sample quantities.

Pricing is expected to be comparable to Intel chip prices, as was the case with AMD's recently unveiled AM386DX clone.

RICHARD PASTORE

NEWS SHORTS

Excel gets new functions

Microsoft Corp. updated its spreadsheet offering for the Apple Computer, Inc. Macintosh last week with the announcement of Excel for the Macintosh Version 3.0. It integrates more than 100 new features, including added data analysis capabilities, a button-oriented tool bar that speeds frequently used functions and full support for Apple's upcoming System 7.0 update, due May 13. The suggested price for the new Excel is $495, but registered users of previous versions can upgrade for $129.

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Mitsubishi to sell IBM mainframes

IBM is forming a partnership in its core mainframe computer business with Mitsubishi Electric Corp. It is the latest sign of globalization in the computer industry, both firms said. The announcement was made by Mitsubishi last week in Japan and was confirmed by IBM in the U.S. IBM Japan Ltd., a wholly owned unit, will supply the key technologies of some of its mainframe computers to Mitsubishi. The Japanese company, which now commands less than 5% of the Japanese mainframe market, will sell machines in Japan under its own name.

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Lotus plans Ultrix port

Almost one year from its initial foray into the Unix market, Lotus Development Corp. announced last week that it will port 1-2-3 to the current version of Digital Equipment Corp.'s Ultrix. The multiyear agreement covers current and future versions of 1-2-3. No other details of delivery or features were released. Development efforts began one month ago. File transfer will be supported between 1-2-3 for VAX/VMS and 1-2-3 for Ultrix to the extent that the environment allows it, said David Rone, Lotus' director of Unix products. Lotus has already ported 1-2-3 to Sun Microsystems, Inc.'s Unix and to AT&T's Unix System V.

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LAN Manager OEMs team up

Twenty-four OEMs of Microsoft's LAN Manager have formed the Open LAN Manager Council to create greater interoperability among their own versions of the network operating system. Included in the council are AT&T, Ungermann-Bass, Inc., The Santa Cruz Operation and Nippon Telegraph and Telephone. The group plans to increase interoperability.

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Intel chip to fly in new fighter

Lockheed's YF-22A, an advanced tactical fighter design recently selected by the U.S. Air Force, contains an implementation of Intel's 1960 microprocessor, the firm said last week. The 1960 is the basis for the general-purpose data processor module within the Common Integrated Processor used in the aircraft. The architecture features built-in data security, fault tolerance and multiprocessing.

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X.500 directory progress

The North American Directory Forum said last week that its late-March quarterly meeting produced draft documents for setting up a standard U.S. X.500 directory of electronic mail users. A forum spokeswoman said several members of the user community expressed security concerns regarding putting all of a corporation's E-mail users on one directory. One approach suggested, she said, was to include only company personnel who deal with the outside world.

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Gandalf to take Infotron

Ottawa-based network equipment maker Gandalf Technologies, Inc. said last week it had signed a letter of intent with Infotron Systems Corp. to merge the company with a wholly owned subsidiary of Gandalf. Under terms of the proposed merger, 100 common or preferred shares of Infotron would be converted into 50 common shares of Gandalf. Infotron, based in Cherry Hill, N.J., makes wide-area network switches, multiplexers and network management systems. Gandalf also said it and Infotron had agreed in principle with Infotron's U.S. commercial bank lenders to restructure the company's loans.

NCR, AT&T merger close to complete

BY MICHAEL FITZGERALD
CW STAFF

AT&T and NCR Corp. appear locked in intense negotiations and could announce an agreement to merge at any time, analysts and others close to the situation said.

"It's a done deal," said Byron Walker, credit analyst at Moody's Investors Service. "But as they say in the business, it ain't over 'til after the deadline."

That means it could be settled any minute, or it could drag on behind closed doors for a few more days, observers said.

Still, AT&T last week conditionally met the $110-per-share, or $7.4 billion, price set by Charles E. Exley Jr., NCR's chairman and chief executive officer. On Wednesday, Exley will vacate the chair, as he lost his seat on the board of directors at NCR's annual meeting last month.

What appeared to remain on Friday was deciding how conditional AT&T's offer is.

AT&T offered a stock-for-stock deal that depends on AT&T's stock price at the time the merger is completed, perhaps as long as four months from when the agreement is announced.

Other AT&T conditions include Exley's cooperation in merging the operations and NCR's cooperation in helping AT&T convince the Securities and Exchange Commission (SEC) that it should treat the merger as a pooling of interests, which would allow the deal to be done tax-free. One Wall Street investment house, however, issued a report saying, "The SEC views pooling as 'forbidden fruit' and usually takes tough positions on it."

If the SEC does deny pooling, AT&T said it would offer to acquire 40% of NCR's stock at $110 cash per share and 60% for 2.943 AT&T shares each.

Exley's response to the offer was to send a letter to Allen stating that NCR was ready to "get on with the friendly merger you have wanted for five months" as long as AT&T would guarantee $110 per share for NCR shareholders. Exley set $110 per share as a ceiling that would double as a floor price unless AT&T's stock dipped below $32.50.

Maria Lewis, a telecommunications analyst at Cowen & Co. in Boston, said she hoped AT&T would not agree to the offer, because it could mean an extra $600 million. Others did not see this as a major obstacle.

"It's a noncash offer, so the major concern for AT&T is how much extra dilution to their earnings the additional 18.5 million shares would provide," said David J. Schofield, a computer analyst at Duff & Phelps Investment Research Co. in Chicago. "When you have 1.1 billion shares outstanding, we're talking another 1.7%."

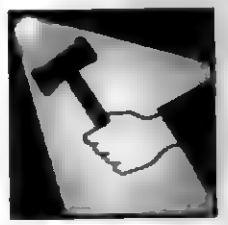
AT&T's tender offer of $90 cash per share expires Tuesday. AT&T refused to comment on whether it would extend the offer.

Dbase

FROM PAGE 1

ruling: a copyright infringement suit against database rival Fox Software, Inc. that could still find Ashton-Tate's Dbase copyright to be invalid.

A trial date has not been set, but Ashton-Tate spokeswoman Linda Duttenhaver said the firm hopes to settle the case by negotiating "an appropriate business solution," possibly including a licensing agreement that would guarantee royalty payments from Fox.



David Fulton, chief executive officer at Perrysburg, Ohio-based Fox, waved away such ideas. "There is not a line of code in common between our product and theirs, so I don't know who would need to pay royalties," he said. "Obviously, we're not happy with [Hatter's] decision, but it just means that Ashton-Tate hasn't lost yet."

Ashton-Tate's original November 1988 suit alleged that Fox's Foxbase product unlawfully copied Dbase's concept, look and feel, programming language, sequence of events and arrangement of the program as presented to the end user. Opponents of the lawsuit argued that if a legal precedent is established for claiming proprietary rights to a programming language or a program's sequence of events, it could threaten the open base of all programming.

On Dec. 13, Hatter abruptly halted proceedings in the 2-year-old case when he declared that Ashton-Tate "knowingly" and "repeatedly" misled the U.S. Copyright Office by failing to acknowledge Dbase was a derivative of the Jet Propulsion Laboratories' Document Information System — a public domain application developed at the Jet Propulsion Laboratories in Pasadena, Calif. — when a copyright was applied for in the early 1980s. Hatter subsequently invalidated the Dbase copyrights.

Although Ashton-Tate's request for reconsideration was initially denied, Hatter did not enter a final judgment, and the company later filed a statement from the U.S. Register of Copyrights that said the company had followed the proper copyright procedure.

Dbase users have not been wholly supportive of the company throughout the case, claiming that in recent years, Ashton-Tate has failed to improve on its technology and used the courts rather than the research and development laboratories to protect its products. "We count on database packages to be similar because we've got a lot of time and training invested in using and integrating them," said Roland Murphy, an engineer at the Resources Conservation Co. in Bellevue, Wash.

Other users, however, said Ashton-Tate has the right to defend its turf. "Intellectual property is a very valuable asset," said Paul Von Fange, a senior engineer at 3M Co. in St. Paul, Minn. "I don't have any problem with Ashton-Tate protecting what is theirs."

The Ashton-Tate/Fox lawsuit is one of several industry legal dramas concerning copyright infringement, including Apple Computer, Inc.'s suit against Microsoft Corp. and Lotus Development Corp.'s action against Borland International, Inc. Goodman said Hatter's decision is unlikely to affect the other cases as it is very "fact-specific."

> "THE JUDGE MADE a very radical initial decision and consequently was subjected to an accelerated learning process."
>
> PAUL GOODMAN
> ELIAS, GOODMAN & SHANKS

$46 tape

FROM PAGE 1

records were on paper or microfiche, will be applied to electronic records. At the federal level, Sen. Patrick J. Leahy (D-Vt.), chairman of the Senate Subcommittee on Technology and the Law, is drafting legislation to modernize the federal FOI Act and make it easier to obtain computerized records.

Although there is now widespread agreement that even the most old-fashioned FOI laws cover electronic records, experts said that several related issues, including the following, are more controversial:

- Should agencies be required to release electronic records in the format sought by the requester?
- How much computer programming must an agency do to respond to FOI requests?
- To what extent should software and electronic mail be covered under FOI statutes?

On the format issue, Leahy's draft bill would require federal agencies to comply with "reasonable" requests for paper or electronic formats. "The requester should be entitled to whatever format the agency has available," said Henry H. Perritt Jr., a law professor at Villanova University in Philadelphia, "but the agency should not be obligated to create new records or formats."

For example, a requester should not be able to force an agency with ASCII data to release it in Wordperfect Corp.'s format, Perritt said.

Some agencies try to honor reasonable requests, while others assert that "even if it's available on tape or disk, they're going to give you a paper printout because the [FOI] Act permits them to do it," said John Podesta, an information policy consultant in Washington, D.C. "The only reason they're doing that is to give you a headache."

Maximum access

In the Brownstone Publishers case, the city government resisted providing the computer tape because it wanted to discourage commercial enterprises from making big profits off of the city's data-gathering efforts, according to a state appeals court decision. The court ruled last October that Brownstone was entitled to the computer tape because the "underlying policy of the law is to ensure maximum public access to government records," regardless of commercial interests.

Nevertheless, state and federal agencies generally argue that they should have unlimited discretion in how they release information to the public. When the U.S. Department of Justice surveyed federal agencies on the issue, for example, the Public Health Service responded: "We release in the form most convenient to the government. Requesters should not dictate the form of response. Not only would it be very expensive, but the government would become a free electronic service bureau."

FOI burden

Agency FOI offices, typically underfunded and overworked, are also alarmed about the administrative and data processing burdens of undertaking customized searches of their databases to fulfill FOI requests. Many take the position that creating or modifying a computer program — even writing a database query — to conduct an FOI search is an unreasonable burden.

"The agencies are willing to do customized searches, but it's very much on an ad hoc basis. They do it when they feel like it and don't want to be told that they have to do it," said Harry Hammitt, editor of the "Access Reports" newsletter in Lynchburg, Va.

Federal agencies are especially concerned that businesses could abuse the FOI process, turning the FOI offices into providers of custom business research and data services to the detriment of the agency's mission-critical information processing, the federal survey showed. "We would not want to become a national trade data researcher for economic consultants and student researchers," the International Trade Commission said.

One reason for the agency resistance is that fees paid by FOI requesters are sent to the U.S. Department of the Treasury, not recouped by the agency. Leahy's draft legislation tries to address the problem by pouring one-half of an agency's FOI fees back into FOI operations.

Need flexibility

Agencies also complain that their homegrown databases are not flexible enough to retrieve and sort data the way that FOI requesters would like. On the other hand, those agencies that have installed relational database management systems reported that they could easily extract the necessary data and separate it from any information that is exempt from disclosure.

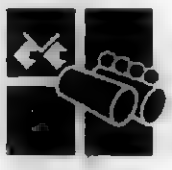
In fact, agencies such as the Federal Trade Commission and the Health Care Financing Administration said that writing small computer programs to eliminate exempt material is much less labor-intensive and less costly than making photocopies of printouts and using markers to black out the passages.

"Technology is certainly fixing the problem but not everywhere or fast enough," said Thomas M. Susman, a Washington, D.C., attorney who studied FOI issues for the American Bar Association. He said legislation is needed to make electronic FOI practices more uniform throughout the government.

While the cumbersome FOI Act may be needed for some hard-to-get data, most commercial information publishers obtain routine government statistics by purchasing computer tapes at "marginal costs," said Kenneth B. Allen, senior vice president of the Information Industry Association (IIA) in Washington, D.C.

However, according to Allen, the IIA is concerned that many states are planning to charge commercial market rates for their public information. The states view the sale of public data as a handy way to raise revenue and alleviate budget deficits, but Allen argued that the trend will discourage a competitive marketplace and drive up the cost of public information.

In the long run, it would be best for FOI requesters and agency FOI officers if government information systems were designed from the outset to allow for ad hoc queries and public access, according to several experts. Ideally, that would be just good IS management practice, but Podesta said that agencies need the prodding of a legislative mandate to consider the issues of public access at the start of systems design.



Open records?

A survey of 70 federal agencies found general opposition to any mandate to conduct customized database searches under the Freedom of Information Act, although it may be done voluntarily

Should agencies be required to create or modify computer programs to search databases for users?

YES	3
NO	53
NO POSITION	14

Should agencies be required to provide records in the format sought by the user?

YES	2
NO	41
NO POSITION	27

Source: U.S. Department of Justice report (October 1988) — CW Chart: Doreen St. John

President Bush boots up his first computer

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — President Bush, vowing to become computer literate, found the on/off switch and fired up his first computer last week.

The 66-year-old chief executive had a personal computer installed in his study near the Oval Office, spokesman Marlin Fitzwater said. Consistent with his Education 2000 initiative for continuing adult education, Bush said he hopes to dramatize that "we're never too old to learn" by taking computer lessons, according to Fitzwater.



Taking the plunge

The president was persuaded to take the plunge by Education Secretary Lamar Alexander and first lady Barbara Bush, who travels with a laptop computer to write her diary.

According to Fitzwater, the president will be getting half-hour computer lessons once or twice per week from Dorothy Crunling, a computer specialist in the White House Office of Administration.

Fitzwater and IBM refused to say what computer model the president has, but one source said the White House standard is IBM Personal System/2s running Wordperfect 5.0 software from Wordperfect Corp.

So far, Bush has mastered how to switch the computer on and has written some memos.

The president, describing his first computer experience to a group of mathematicians, said he was a little worried about pressing the buttons "but it was fun, and I will keep it up."

When reporters asked whether the president's system has a mouse, Fitzwater admitted his own computer illiteracy by asking, "What's a mouse?"

Software: Classified?

Perhaps the most controversial public-access issue of all is whether government agencies' computer software is an "agency record" that should be released under freedom of information (FOI) laws.

Many federal agencies argue that software is merely a tool and not a record, but there is little practical experience or legal guidance on how to classify software. If software is released to the public, there is also the question of how to protect the copyrights of commercial software products.

Some FOI experts argued that software should be covered by FOI laws because requesters need the software that goes with the database, but there should be exemptions to protect commercial interests. Software written by federal agencies is not copyrightable.

Villanova University law professor Henry H. Perritt Jr. said it would be a mistake to "wall off software from FOI Act disclosure because once you start dealing with electronic information there is a bona fide need to have the retrieval software if you're going to be able to use the data."

MITCH BETTS

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WYSIWYG

1. Dick Heiser opened the world's first microcomputer store in West Los Angeles in 1975. Was it called Computerland, The Itty Bitty Computer Co. or The Computer Store?

TRIVIA ? BITS

2. Only 220 examples of this computer were produced at $666.66 apiece, but they helped launch a major microcomputer company. What was the computer?

3. Who wrote the first book about personal computers in 1974? Can you name the book?

4. How long would it take to send the Encyclopaedia Britannica over a 2G-bit fiber-optic cable? Two seconds, two minutes or 20 minutes?

5. What high-tech company determined whether the 18-minute gap in the Nixon/Watergate tape was deliberate?

These questions come courtesy of the Computer Bowl contest, sponsored by the Boston Computer Museum. This year's third annual trivia event was held on the West Coast April 26, with two women as the team captains for the first time. Heidi Roizen, computer historian and president and CEO of T/Maker Co. led the West team, with computer book author Pamela McCorduck at the helm of the East team.

1. The Compute Store 2. The Apple I 3. Ted Nelson, Compute Lib and Dream Machines 4. Two seconds 5. Bolt, Beranek and Newman, Inc.

DO YOU KNOW...

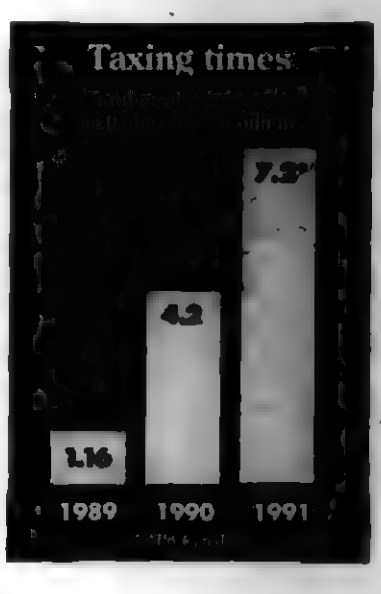
- What a Cadillac Fleetwood would cost today if its price had dropped at the same rate as that of computers during the last 37 years: Under $3
- How many attendees the now-defunct National Computer Conference drew in its heyday in 1983: 97,000
- Sabre's peak hour usage per second: 2,682 messages. Per day: 106.8 million messages
- How long it took Compaq Computer Corp. to break into the Fortune 500: 4 years (a record)
- What Lotus founder Mitch Kapor used to teach: Transcendental Meditation
- How far electricity can travel in a nanosecond: 10.8 inches

It's *spring*. That means baseball. And taxes.

Street & Smith's Baseball magazine has picked the teams it expects to lead the American and National Leagues. But how do their top four score in technology terms?

AMERICAN LEAGUE

East: Toronto Blue Jays. The Blue Jays' information systems department is hitting home runs in the scouting game. According to IS manager Hans Frauenlob, all scouts carry laptops — a combination of Compaq LTE/386s, LTE/286s and older Grid Systems Corp. machines. The team also relies on the Baseball Information System, an IBM-Major League Baseball database that contains stats, waiver, player contract, scouting and league schedule information.



West: Oakland Athletics. They may have heavy hitter Jose Canseco, but the A's strike out when it comes to IS. Pretty much a manual operation, the team gets its statistics from the Baseball Information System.

NATIONAL LEAGUE

East: Chicago Cubs. PCs score big with the Cubbies. IS specialist Carl Rice has put in place a 64-node Novell, Inc. LAN with IBM PS/2 55SXs as the PC standard. The club also has seven PS/2 Model 70s, eight Model 30s and a couple of PC XTs. Stats, salary and scouting info on the minor leagues and amateur players are kept on a Paradox DBMS.

PLAY BALL!

West: San Francisco Giants. National League champions in 1989, the Giants hope to claim back the title in 1991, but it won't be because of any breakthroughs. The Giants use Baseball Information System stats, with promotional staff occasionally taking postgame notes on Compaq laptops.

Sources: The Internal Revenue Service, Europa 1992 and the New World Power Game, John Wiley and Sons, American Airlines; Special thanks to the Boston Computer Museum

INSIDE LINES

Balloons filled with hot air?

▶ Steve Jobs got out the balloons and noisemakers a few weeks back to declare that Next has sold 8,000 of the distinctive ebony workstations in the first quarter. But on second look the numbers looked less impressive. One interviewer was told that the number included at least 1,500 upgrade boards and many back orders. International Data Corp. researchers are even more critical, claiming that the Redwood City, Calif.-based firm has sold only 4,000 machines in its history. A Next spokeswoman confirmed that about one-quarter of the 8,000 figure is back-ordered machines and that board upgrades were also included, but she couldn't say how many.

Adding to the Fleet

▶ So far, Fleet/Norstar Bank is keeping mum on its IS plans for the failed Bank of New England, which it will acquire from the Federal Deposit Insurance Corporation. Fleet Chief Information Officer Michael Zucchini continues to lead a due diligence effort on consolidation possibilities and said he will announce details later. Fleet is no stranger to this: In the past three years under Zucchini's direction, the Providence, R.I.-based bank has consolidated 12 data centers into one and 16 operations centers into four.

Could have used him in the negotiations

▶ Among the speakers at AT&T Computer Systems Division's user conference appropriately titled "Managing Change," was former U.S. Secretary of State Henry Kissinger, who told attendees that Americans like solutions and don't like processes, as is evident in our Middle Eastern policy through the years. One attendee said she thought this related to computers in the sense that "we think if we could just install the damn system, everything will be fine, but of course it won't."

Downside to street PC prices

▶ It's still too early to tell how much of Compaq's recent price reductions will filter down to street prices, but at least one large Compaq customer says the cuts look better on paper than in real life. He is getting about 15% to 20% lower street prices on certain PCs that Compaq cut by 34%. Dealers may be holding back as much as one-third of the advertised list price reductions to make up for purchase agreement changes.

New mainframe opportunities!

▶ Novell may be a little more reliant on its new partnership with IBM than it originally thought. In preparation for the May debut of Netware for SAA, Novell is holding classes on the product for its resellers who are tight with both mainframe and PC systems. Although there are thousands of current Novell resellers, only 10 qualified students showed up for the first class last week, according to one attendee.

Much to talk about

▶ In other Novell news, the firm's executive vice president of marketing and services, Darrell Miller, will be pressing the flesh with key clients this week about Novell's new product support strategy. Miller is calling the tour a "prelaunch." Network managers and resellers had little to say about the strategy except that it's about time for any new emphasis on support.

Lumpen come back to haunt

▶ The California drought has been wearing on Silicon Valley, but it landed Cypress Semiconductor President T. J. Rogers in hot water. Rogers has appeared in ads proudly boasting of his company's water conservation efforts. But the firm was recently cited for dumping industrial water into a local sewage system.

Who woulda thunk it! Wall Street's computer golden boy, Compaq, shocks investors with news that it may in fact not be immune to the ups and downs of the industry, and Data General looks like a candidate for turnaround star of the year after posting two consecutive profitable quarters. Are we witnessing history in the making? Let us know who's hot and who's not, and we'll follow up. Contact News Editor Pete Bartolik at (800) 343-6474, fax those tip sheets to (508) 875-8931 or hook up to Compuserve at 76537,2413.

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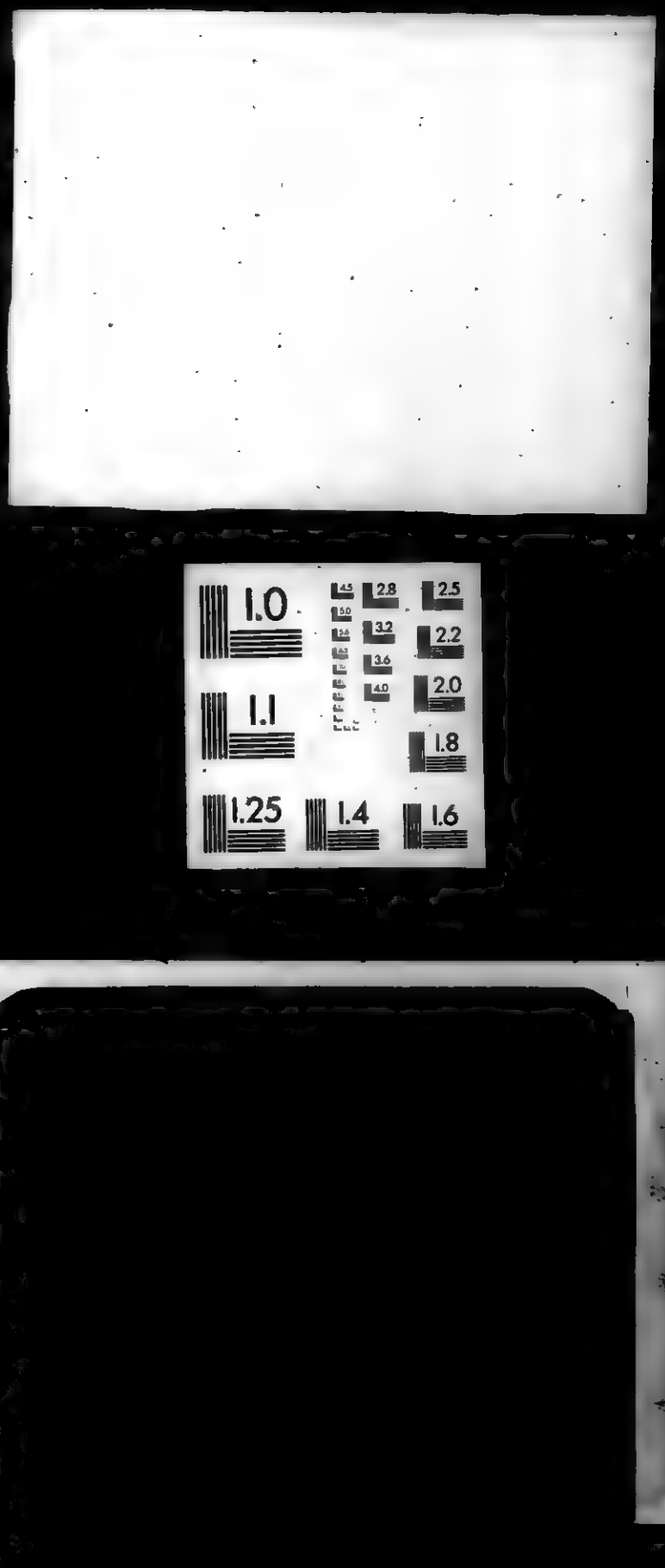
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COMPUTERWORLD

'All systems go' for desktop launches

Apple System 7.0 seeks window of opportunity

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. will deliver on a 2-year-old promise next Monday when it releases System 7.0, a snappy rejuvenation that will serve as fresh ammunition in the company's battle with Microsoft Corp.'s Windows 3.0 environment.

The new package — Apple's first major operating system upgrade for the Macintosh line in almost three years — boasts a variety of improvements, including a revamped scalable font technology called Truetype. Other highlights include multitasking, file sharing, virtual memory, 32-bit addressing and improved Help capabilities.

Packing System 7.0 with features, however, had its price: Apple missed its original delivery date by more than one year.

The delay realigns System 7.0's mission to one of combating the enormous popularity of Windows 3.0, analysts said. "System 7.0 will help preserve Apple's installed base, but if it was out when it was supposed to be out, it might have helped slow the incursion of Windows," said

Continued on page 109

Tools to bring new life to DOS in Release 5.0

BY JAMES DALY
CW STAFF

Two years after forecasting the demise of DOS, Microsoft Corp. is in the final stages of producing a major upgrade to the resilient operating system, a reinvigorated edition that is expected to be announced June 11 in New York.

DOS 5.0 will offer several advantages over the problematic and highly criticized DOS 4.0, including expanded utilities, enhanced Windows performance and increased memory-management capabilities. The update is expected to be priced at less than $100 when it is unveiled.

Since last fall, more than 7,000 beta-test users worldwide have tinkered with DOS 5.0, a product originally deemed unnecessary with the introduction of OS/2. "One thing we learned from the success of Windows is that DOS lives," Microsoft Vice President Brad Silverburg said. "There will be a Version 6.0 and a Version 7.0 as well — DOS has a long life ahead of it."

Early users of DOS 5.0 said they found it not only stable and reliable but also a quantum leap over earlier DOS editions.

Continued on page 109

Near-term directions

Operating system upgrades from Apple and Microsoft are said to have a number of key features long desired by users



Apple

- File-sharing between Appletalk-connected Macs.
- Pop-up Help facilities.
- Truetype font display.
- Store files in more than one location.
- Virtual memory support, 32-bit addressing.
- Multitasking that allows several applications to run simultaneously.

Microsoft

- Ability to address memory above 640K.
- Ability to be loaded in either upper or high memory.
- Enhanced DOS shell resembling Windows file manager.
- Text editor and new utilities.

Suit seeks to define user rights

BY MICHAEL ALEXANDER
CW STAFF

AUSTIN, Texas — The Electronic Frontier Foundation is funding a lawsuit against the federal government that some legal experts said will be the first test of whether constitutional protections apply to electronic bulletin boards and the privacy of electronic mail.

Privacy issues

▶ Prodigy on-line service says it doesn't review a file that contains fragments from user disks. Page 4.

The EFF is an advocacy group co-founded by Mitch Kapor, who is a co-founder of Lotus Development Corp., and John Barlow, a lyricist and author.

"If you are a poor bulletin board operator, you don't know ultimately whether you have the same panoply of constitutional rights that a print journalist has," said Sheldon Zenner, an attorney at Katten, Muchin & Zavis in Chicago. "That puts you at some risk. From a bulletin board operator's perspective, this is a precedent-setting lawsuit."

"What I think the EFF has done is, in an effective and timely

Continued on page 4

DG finds profit with balance of technology and business

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — Defying the gloomy predictions of analysts, Data General Corp. has racked up two consecutive profitable quarters, culminating recently in a $19.2 million profit after almost six years of red ink.

However, analysts and users are waiting to see if DG's modest string of victories is the real McCoy or simply a carefully crafted illusion of financial health.

They are also watching to see if Ronald Skates, DG's president and chief executive officer, and Senior Vice President J. Thomas West may have overcome an initial distrust of one another to create the financial and technological balance that has long eluded DG.

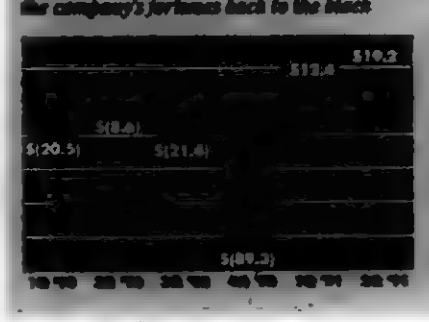
With the departure of company founder Edson de Castro earlier this year, West is the second most visible person at DG as head of the Advanced Systems Development Group.

Allowing that DG was "never product-deficient," William J.

Continued on page 16

Put away the red ink

Data General Corp. Chief Executive Officer Ronald Skates has turned the company's fortunes back to the black





Source: Data General Corp. CW Chart: Doreen St. John

Novell's impact narrow in wide area

BY JOANIE M. WEXLER and JIM NASH
CW STAFF

As a growing number of firms construct corporatewide networks, Novell, Inc. is outfitting its Netware network operating system with wide-area accoutrements.

While users are encouraged by such moves as multiprotocol support on Novell servers and a network domain naming service, many complained that several loose ends are dangling in Novell's enterprise support.

Last June, Novell announced Netware 386 Communication Services, an application program interface between the Netware operating system and Netware Loadable Modules, or applications.

However, until Communication Services ships, "I don't consider the positioning of Netware 386 as an enterprisewide network operating system a true statement," said Ray Chandler, senior network consultant at the Arco Oil and Gas Co. research center in Plano, Texas.

Novell said it expects the interface to support much of its high-end connectivity among personal computer networks and from networks to hosts. Users and industry analysts have said the first module for the interface will be Netware for IBM's Systems Application Architecture, which sources in and outside of Novell said will be delivered this month (see story page 51).

Novell's strategy behind its push for enterprisewide status can be summed up as integration, said John Edwards,

Continued on page 107

INSIDE

It's sale days at DEC, with the computer maker slashing prices for VAX 6000 systems and upgrades by 18% to 69%. Page 6.

Working overtime: The U.S. Department of Labor isn't finished with the programmer overtime pay controversy, judging by public comments about it. Page 8.

Product Spotlight — Go beyond the glitz to the true usefulness of superservers. Page 73.

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6 Just as George Washington chopped down the cherry tree, so **DEC** has taken an ax to its VAX 6000 price list — though the results have been anything but disastrous.

6 Signet passes the burden of responsibility for its IS and networking groups onto the willing shoulders of outsourcer **EDS**.

8 The computer industry claims what's confusing is not the overtime law but rather the law backer, the **Labor Department**.

10 Vendors of imaging applications are feeling hot! hot! hot! as a result of the enthusiasm of users at the **AIIM** conference last week.

12 Central Point Software's **PC Tools** upgrade numbers several Windows-compatible applications among its more than 100 enhancements.

107 Users are questioning whether **Novell**'s pending end-user team support program is a time-saving wonder or a buck-passing scheme.

108 Those expecting the guillotine to fall on NCR's line of Motorola-based Tower minicomputers were disappointed when NCR officials gave at least their verbal support last week to the line's ongoing reign.

Quotable

"One thing we learned from the success of Windows is that DOS lives."

BRAD SILVERBERG
MICROSOFT

On the coming introduction of DOS 5.0. See story page 1.

SYSTEMS & SOFTWARE

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PCs & WORKSTATIONS

41 A host of PC makers are dreaming the possible-dream of their **Intel** 1486SX-based systems becoming the new desktop standard.

49 Technology Analysis: **HP**'s Laserjet IIp and **IBM**'s Laserprinter E receive high marks from reviewers for price and flexibility.

NETWORKING

51 While **Novell**'s promise of an SAA server capable of holding 1,000 concurrent IBM host sessions is almost one year old, the product has yet to appear.

MANAGER'S JOURNAL

65 The only thing retiring about **Horace B. Deets**, technology addict and head of the American Association of Retired Persons, is his personality.

COMPUTER INDUSTRY

87 The best-laid plans of **Index** went oft astray, but its merger this year with **Sage** is fulfilling its vision of being a complete tool set provider.

PRODUCT SPOTLIGHT

73 If network server varieties are making you dizzy, a look at superservers and RISC servers may provide some needed insight.

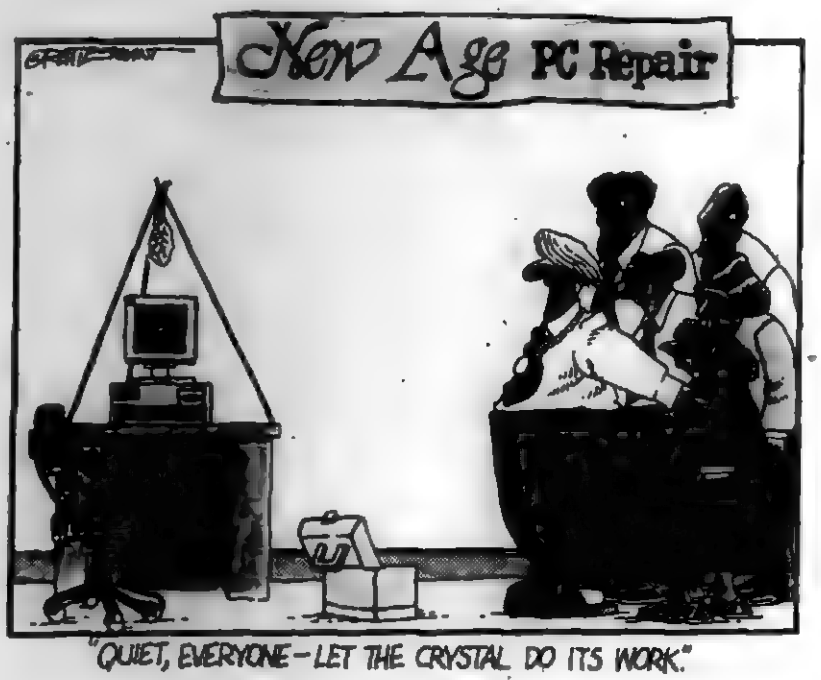
IN DEPTH

81 Deciding to go distributed? Find out about the two DBMS approaches you can take. By George Schussel.

DEPARTMENTS

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The 5th Wave



"QUIET, EVERYONE – LET THE CRYSTAL DO ITS WORK."

EXECUTIVE BRIEFING

■ **The future may be now for future desktop operating systems.** Developments are breaking in the various arenas. The two-year wait for the new release of the Apple Macintosh operating system, System 7.0, is expected to end next week when that software is introduced. **Page 1.** The latest edition of Microsoft's MS-DOS, scheduled for release next month as DOS 5.0, has been beta-tested by about 7,000 users, some of whom say DOS 5.0 offers much of what you would get with OS/2. **Page 1.** Speaking of OS/2, IBM has no sooner cleared up some of the confusion about where it is going with OS/2 Release 2.0 than people have started questioning what IBM will do about a so-called portable OS/2. **Page 109.**

■ **There are two approaches to distributed DBMSs:** "True" distributed DBMSs, which support location transparency, and client/server DBMSs, which do not. Which one is right for your distributed computing needs? The former is best for firms with physically separate but logically integrated processing setups, while the latter works well in high-performance, high-transaction rate situations. **Page 81.**

■ **As impressive as the size of the crowds may have been,** what made the Association for Information and Image Management conference interesting last week was the attitude of the attendees: Users were actually looking to buy equipment. **Page 10.**

■ **Superserver sales are forecast to grow in leaps and bounds** during the next couple of years, but most consultants say the software isn't ready to take advantage of their power. Meanwhile, RISC servers have superservers beat in terms of performance. **Page 73.**

■ **A pair of privacy cases moved into the limelight last week.** First, operators of the Prodigy service acknowledged that they had the technical ability to read some private files on users' PCs, although officials say Prodigy has never done so. **Page 4.** Then, a lawsuit was filed against federal law enforcement officials with the backing of the Electronic Frontier Foundation, claiming that electronic bulletin board communications are protected by the First Amendment's freedom of speech provision. **Page 1.**

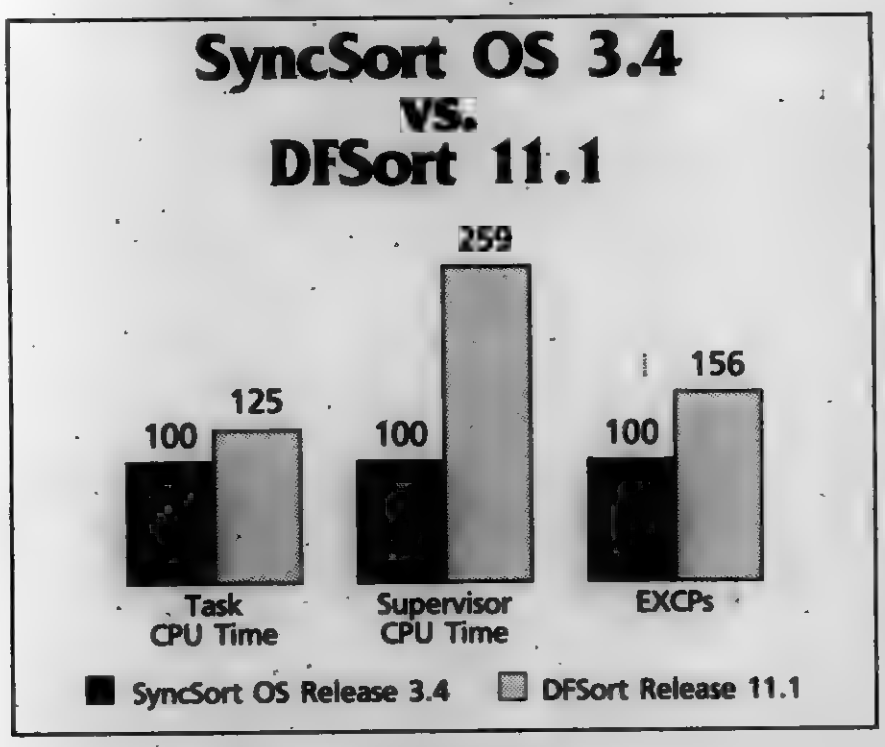
■ **MBA candidates are due to get a greater exposure to computers** as business schools move to show those future corporate leaders how information technology plays a role in all facets of modern commerce and business. **Page 65.**

■ **That programmer overtime pay controversy** is still not settled. Federal officials drafted regulations in March in an effort to carry out the law passed by Congress last year that limited overtime opportunities for programmers. By the time the period for public comment on the regulations closed last week, several organizations had found fault with the new rules. **Page 8.**

■ **Signet Banking Corp. made its outsourcing plans official last week,** signing an operations management and systems development pact with EDS. The Virginia-based bank hopes to save $137 million during a 10-year period. **Page 6.**

■ **On-site this week:** Financial Guaranty Insurance Co. hopes to turn its years of sweat and toil on a new system into company profits by marketing its downsizing knowledge through a consulting group. **Page 45.** The New York City Department of Environmental Protection is spending $4 million up front to save $2 million per year and provide better service through a state-of-the-art network. **Page 51.**

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File data upsets Prodigy users

Some customers find text from other programs in on-line service data file

BY CHRISTOPHER LINDQUIST
CW STAFF

Some Prodigy users may have been looking over their shoulders for Big Brother after they examined a file created by the on-line service's software and discovered text from personal documents and programs.

Recent published reports and messages on several electronic bulletin boards indicated that some subscribers to the service have found fragments of program source code, letters and text from other programs in the STAGE.DAT file that Prodigy creates on the user's disk as part of its installation process.

Representatives of Prodigy Services Co., a joint venture of IBM and Sears, Roebuck and Co., acknowledged that such information could find its way into the file, but they denied that the company was uploading or examining the data.

"We are not interested in anything on anyone's hard drive or any drive or in anyone's computer other than what is specifically connected with Prodigy," said Steve Hein, a Prodigy program manager.

Harold Goldes, another Prodigy program manager, said the bits of text that were discovered could have appeared in two ways. First, when the installation program creates the STAGE.DAT file, data present in the computer's memory could be incorporated into the file. So installing Prodigy after leaving a word processing application could result in some of the recently edited text, still resident in memory, being added to STAGE.DAT.

Second, when STAGE.DAT is created, DOS allocates space on the disk to the file. Some of the space is overwritten by STAGE.DAT data, but the rest remains in its original state, which could include the contents of previously deleted files.

One privacy expert indicated that it was highly unlikely that Prodigy would face any legal repercussions.

"There is no evidence at all, so far, to indicate that Prodigy has ever uploaded information from users' hard disks, so there is no indication of any privacy problem," said Marc Rotenberg, director of the Washington, D.C., office of Computer Professionals for Social Responsibility.

However, Richard de la Sota, a deputy district attorney at the Consumer Protection Division of the Los Angeles County District Attorney's office, confirmed that his department is currently involved in an investigation of Prodigy concerning both its electronic mail policy and the more recent concerns of the STAGE.DAT files, although he could release no details. De la Sota said a "significant number" of Prodigy users had called to complain about the service.

Goldes said a utility currently being written by Prodigy will allow its subscribers to erase all non-STAGE.DAT information from the files. Hein indicated that user questions are being answered as they are received, but he was adamant in stating that Prodigy did not believe there was a problem. "Perhaps people are fearful, but there are absolutely no grounds for fear."

User rights

FROM PAGE 1

way, raised critical constitutional questions about computer use," said Marc Rotenberg, the Washington, D.C., office director of Computer Professionals for Social Responsibility. "They have taken head-on the government's contention that hackers are a breeding ground for computer crime."

Attorneys for Steve Jackson and three other plaintiffs filed a civil lawsuit last week in federal district court here alleging that federal authorities violated the Privacy Protection Act of 1980, the Electronic Communications Privacy Act and the First and Fourth Amendments to the U.S. Constitution.

Jackson is the president of Steve Jackson Games, Inc., a small publisher of fantasy role-playing games whose business was raided by federal authorities in March 1990. The other plaintiffs are New Hampshire residents Elizabeth McCoy, Walter Milliken and Steffan O'Sullivan, who said they were users of Illuminati, an electronic bulletin board system operated by Steve Jackson Games.

Named in the suit on five counts were the United States of America; the U.S. Secret Service; Timothy Foley and Barbara Golden (both special agents of the Secret Service in Chicago); William Cook, an assistant U.S. attorney in Chicago; and Henry Kluepfel, a district manager at Bell Communications Research, Inc. in Redbank, N.J. Kluepfel has assisted authorities in a number of investigations into the activities of outlaw hackers.

Cook and a spokesman for the Secret Service declined to comment on the case. A telephone call to Kluepfel seeking comment was not returned.

Secret Service agents raided Steve Jackson Games in Austin on March 1, 1990 and seized personal computers (including one used to operate Illuminati), data disks and several other items. The agents also seized disks containing Generic Universal Role-Playing System (GURPS) Cyberpunk, a game book in a series of fantasy role-playing books published by Steve Jackson Games. The publication of the book, described by an agent as a "handbook for computer crime," was delayed for six weeks, Jackson said.

The suit alleged that although neither Jackson nor his company was charged with any crime, the federal law enforcers searched the business without sufficient probable cause and illegally seized property. Among many other allegations, the suit also charged that the seizures violated First and Fourth Amendment protections.

Jackson claimed to have suffered more than $125,000 in lost revenue as a result of the raid and was forced to lay off eight employees, nearly half of his staff. Most of the equipment — some of which was allegedly severely damaged — was returned about three months later. Other equipment and paper copies of GURPS Cyberpunk have not been returned.

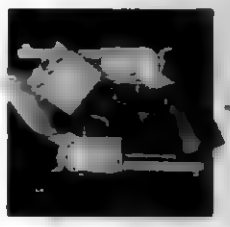
"This thing has aged me and damn near wrecked my business," Jackson said. "It also has forced me to spend more than a year on damage control instead of writing games."

The lawsuit is being led by the Boston law firm of Silverglate & Good. The EFF is picking up the tab, which is expected to go well into six figures, Kapor said. "Obviously, litigation is expensive, but we're prepared to see this all the way through."

NRA's 'instant check' computer system nixed

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — For years, the National Rifle Association (NRA) has been trying to defeat gun-control legislation by promoting a nationwide computer system that could instantly check the criminal history of gun buyers. But last week, the NRA's computer plans were shot down — or at least wounded.



In the midst of a wily political battle over gun-control legislation, NRA opponents released a draft of a congressional study that concluded it would take five to 10 years to develop a workable computer system because state criminal histories are in bad shape and only partially automated. The U.S. Department of Justice said the same thing in a 1989 study [CW, Dec. 4, 1989].

The NRA is pushing its "instant check" bill as an alternative to the so-called Brady bill, which requires a seven-day waiting period for handgun buyers. (The bill is named for James Brady, the former White House press secretary who was wounded by gunfire during an assassination attempt on former President Ronald Reagan in 1981.)

Rep. Edward F. Feighan (D-Ohio), sponsor of the Brady bill, said the draft report by Congress' Office of Technology Assessment shows that the NRA proposal "is really a phony alternative that can't be implemented any time in the near future" and is "just another NRA smokescreen."

The NRA countered that its proposal, which mandates the creation of a felon identification system for use at the point of sale, has already proved workable in two states: Virginia and Florida.

According to the NRA, the draft of the study is riddled with errors because it was released prematurely.

CORRECTIONS

A photo in the story "The road to lower fuel costs" [CW, April 1] was incorrectly identified as J. B. Hunt, Inc.'s Thomas Sanderson. The photo is of company founder J. B. Hunt.

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In "Third-party software helps maximize RS/6000 power" [CW, April 15], the Lebanon, N.H., software vendor was incorrectly identified as Computer Microsystems, Inc. The correct company name is Corporate Microsystems, Inc.

.....

The maker of the Micro Control package used by Turner Corp. is Stamford, Conn.-based IMRS, Inc., not IRMS, as stated in "Turner rebuilds on PCs" [CW, April 15].

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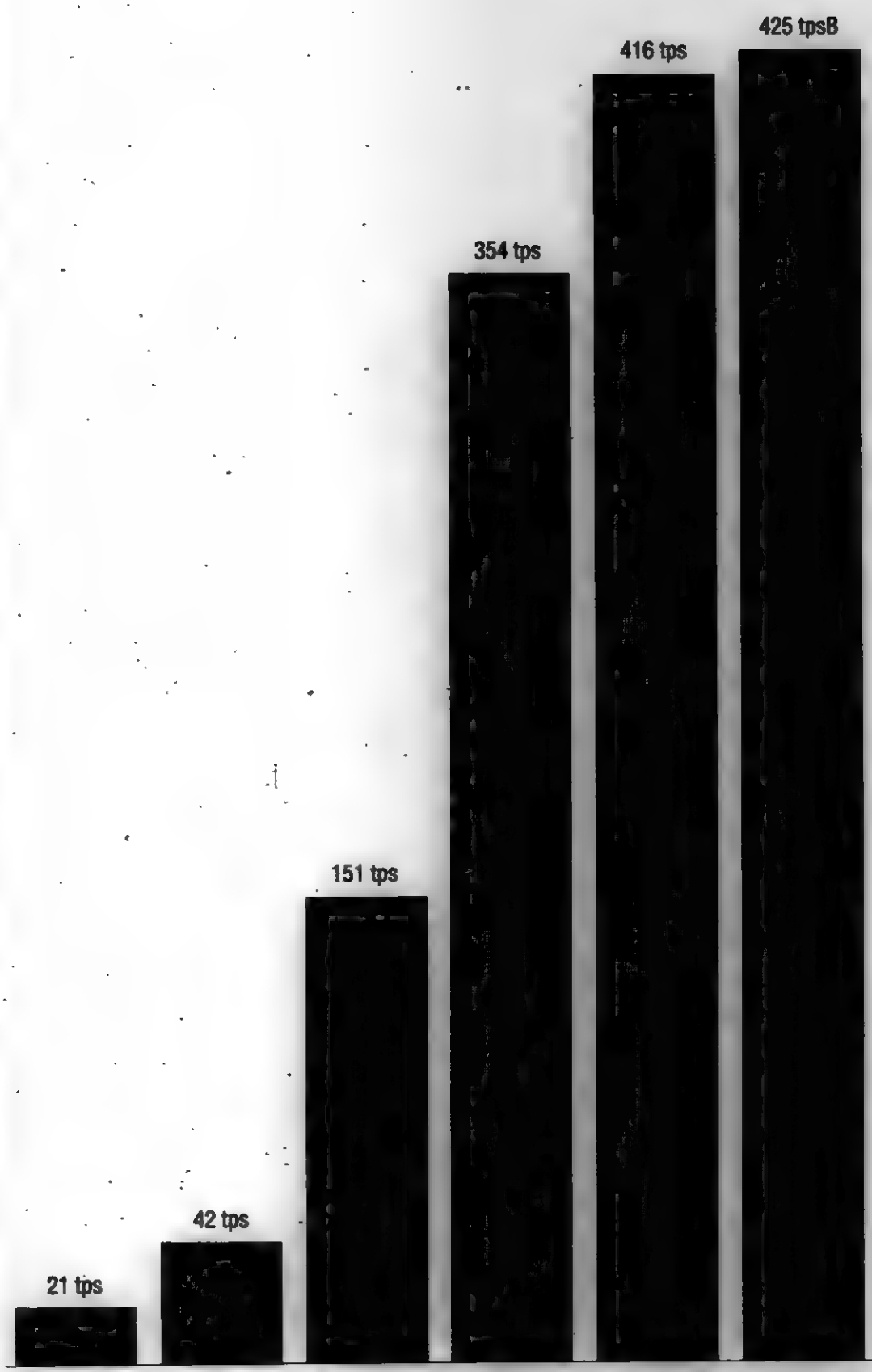
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Prices cut on VAXs, upgrades

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Beset by faltering sales on its premiere line of minicomputers, Digital Equipment Corp. took an ax to the VAX 6000 price list last week, chopping costs 18% to 69% for new systems and upgrades.

"This is great for customers. It's about time," said Dennis Morris, information service manager at the Lee County Board of County Commissioners in Fort Myers, Fla. The county is poised to upgrade its VAX 6000 Model 410 and buy a new Model 500 to run a countywide criminal justice system, and the price cuts surfaced at the perfect moment, Morris said.

"We're looking at a savings of $150,000 to $200,000, and that may put us in a position where, with an additional $100,000, we could get another VAX 9000 [mainframe] instead," Morris said. He and other customers said they expect DEC to follow the VAX 6000 repricing with a corresponding drop in VAX 9000 prices, which would bring entry-level prices for that line well below $900,000.

Industry analysts agreed that price cuts are likely for the VAX 9000s, which will be introducing a midlife "kicker" this summer with 20% better performance. Yet the mainframe business has been agonizingly slow for DEC, which expected to sell at least 100 systems last quarter but sold only about 70.

DEC officials have acknowledged that revenue from the VAX 6000 series has been "disappointing" during the past few quarters, and analysts said the Model 500s have also been a tough sell. Smaller systems such as the VAX 4000 client/server computers are reportedly selling well, but their profit margins are much narrower than the high-end VAXs.

The price cuts on the VAX 6000 Model 500s ranged from 18% to 37%, bringing the cost bracket for those six models down to $186,000 to $561,000. For users who want to upgrade their VAXs from Model 300s and 400s to the high-end 500s, the costs were reduced by a more startling 34% to 69%.

DEC also announced availability of three- and four-vector processors for the Model 500s, ramping up its supercomputer-like capabilities. The vector processors, each paired with a scalar processor, cost $26,611 each.

A slow economy and hesitant high-end buyers were the key factors pushing DEC to improve the price/performance of the VAX 6000s, said Pauline Nist, group engineering manager for the line. "Our goal is to motivate those people still sitting on the fence about spending this year," she said.

While DEC has sold 15,000 VAX 6000s since their mid-1988 debut, IBM has moved more than 100,000 Application System/400 midrange systems during that same time frame. However, DEC officials denied any connection between the firm's price-cutting action last week and the April 22 introduction of new, aggressively priced AS/400s.

The DEC bureaucracy simply cannot move that quickly, Nist said. Analysts said DEC was forced to act because its sales force was losing more competitive battles over price.

"IBM and DEC are both going after the same new business, and I would guarantee that users will see discounting on top of these price cuts," said Karlyn Kilroy, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "This is definitely like the PC price wars."

Pricing perks

Price reductions in the VAX 6000 line have made it easier to purchase a new system as well as upgrade an existing one

SYSTEMS

VAX 6000	Old price	New price	Percent reduction
Model 560	$811,000	$561,000	31%
Model 530	$523,000	$336,000	36%
Model 510	$227,000	$186,000	18%

UPGRADES

VAX 6000 upgrades from	to	Old price	New price	Percent reduction
Model 510	520	$184,000	$100,000	46%
Model 410	510	$129,000	$90,000	30%
Model 310	320	$127,000	$40,000	69%

Prices are U.S. list prices and include the cost of the VMS operating system license with a one-year product warranty

CW Chart: Doreen St. John

DEC releases low-end Unix machine

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. unveiled its latest low-end Unix-based workstation last week, advertising the system as the first machine to comply with the Advanced Computing Environment (ACE) guidelines.

Industry analysts dismissed the ACE connection as market posturing on DEC's part, saying the machine had been in the pipeline for months anyway.

"Digital didn't have to change much to make an ACE-compliant product," said Terry Shannon, an analyst at International Data Corp. in Framingham, Mass. "The only real difference with this system is the CPU sits on a daughterboard, which makes it upgradable."

Dual strategy

The 1-month-old ACE alliance of 21 computer vendors — led by DEC, Compaq Computer Corp., Microsoft Corp., Mips Computer Systems, Inc. and The Santa Cruz Operation — is backing a dual-desktop strategy to support personal computers based on Intel Corp.'s 80386 and I486 chips and reduced instruction set computing systems based on Mips' R3000 chip.

The Decstation 5000 Models 120 and 125, priced at $6,495 and $8,495, respectively, are based on the Mips R3000 chip and run DEC's Unix operating system variant, Ultrix 4.2.

The ability to upgrade Decstation 2100s and 3100s to this new low-end Decstation 5000 is more likely to pique customer interest than is the ACE connection, said Ken Krallman, MIS director at Carleton Technologies, Inc. in Orchard Park, N.Y.

"That board is the key to the whole product," Krallman said. "Instead of talking about $8,000 to $10,000 for a change in workstation, you can start giving these boxes some lifetime with an upgrade."

Some customers were glad to see DEC supporting the ACE initiative so publicly, however, because ACE will provide a clear migration path for their current Ultrix applications.

ACE predicts larger membership in future

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — Members of the Advanced Computing Environment (ACE) consortium promised last week that 10 more vendors will soon sign up for the consortium's version of a future computing culture. ACE members revealed more details of the group's product plans and strategy.

"There will be 10 more companies, with the highest interest coming from PC companies," said Jim Billmaier, vice president of software marketing at Mips Computer Systems, Inc.

The consortium, headed by Digital Equipment Corp., Compaq Computer Corp. and Mips, is composed of a group of 21 companies that have each committed to standards for high-end personal computers and workstations.

ACE will provide at least four versions of an ACE operating system, according to Gary Stimac, senior vice president of systems engineering at Compaq. There will be a reduced instruction set computing and PC operating system version from The Santa Cruz Operation as well as Microsoft Corp.'s OS/2 3.0 for the two platforms. Other operating systems may also be considered.

With the wide choice and interoperability promised by ACE, Donald Gaubatz, group manager for workstation engineering at DEC, said he expected consumers to buy from one vendor rather than picking among the offerings. He said he expected that vendor to be DEC.

Gaubatz's comment was similar to comments from other ACE members.

The consortium members are working together loosely to achieve a common goal.

Signet enters contract with EDS for outsourcing service

BY ELISABETH HORWITT
CW STAFF

RICHMOND, Va. — Signet Banking Corp. signed a contract last week that outsources its information systems and networking operations, as well as key systems development initiatives, to Electronic Data Systems Corp. (EDS).

Outsourcing seemed the right decision, "considering the state of banking today, with the real-estate environment, bank performance and the need to minimize the risk of not being able to accomplish the objectives on time," said William Dieter, executive vice president of the bank's Systems and Operations Services Group.

The bank anticipates saving approximately $137 million in hardware, software and systems support costs during the next 10 years, Dieter said. The second major benefit expected from outsourcing, he added, is slicing about two years off of the time it takes to implement certain strategic systems initiatives.

Signet chose EDS over IBM and Systematics, Inc. — its chief competitors in the bidding process, according to Ladd Willis, managing vice president at First Manhattan Consulting Group in New York. First Manhattan was brought in early to advise the bank during the outsourcing evaluation process.

"One of our up-front qualifications was for someone with experience in financial services and banks of our size," Dieter said. "EDS has had many years of experience with such companies, most recently with First Fidelity [Bancorp.]."

One initiative to be undertaken involves integrating the bank's disparate collection of applications onto a single software platform. EDS proposed migrating existing applications to Software Alliance Co.'s Reliance 2000 application set over a period of 12 to 18 months, Willis said.

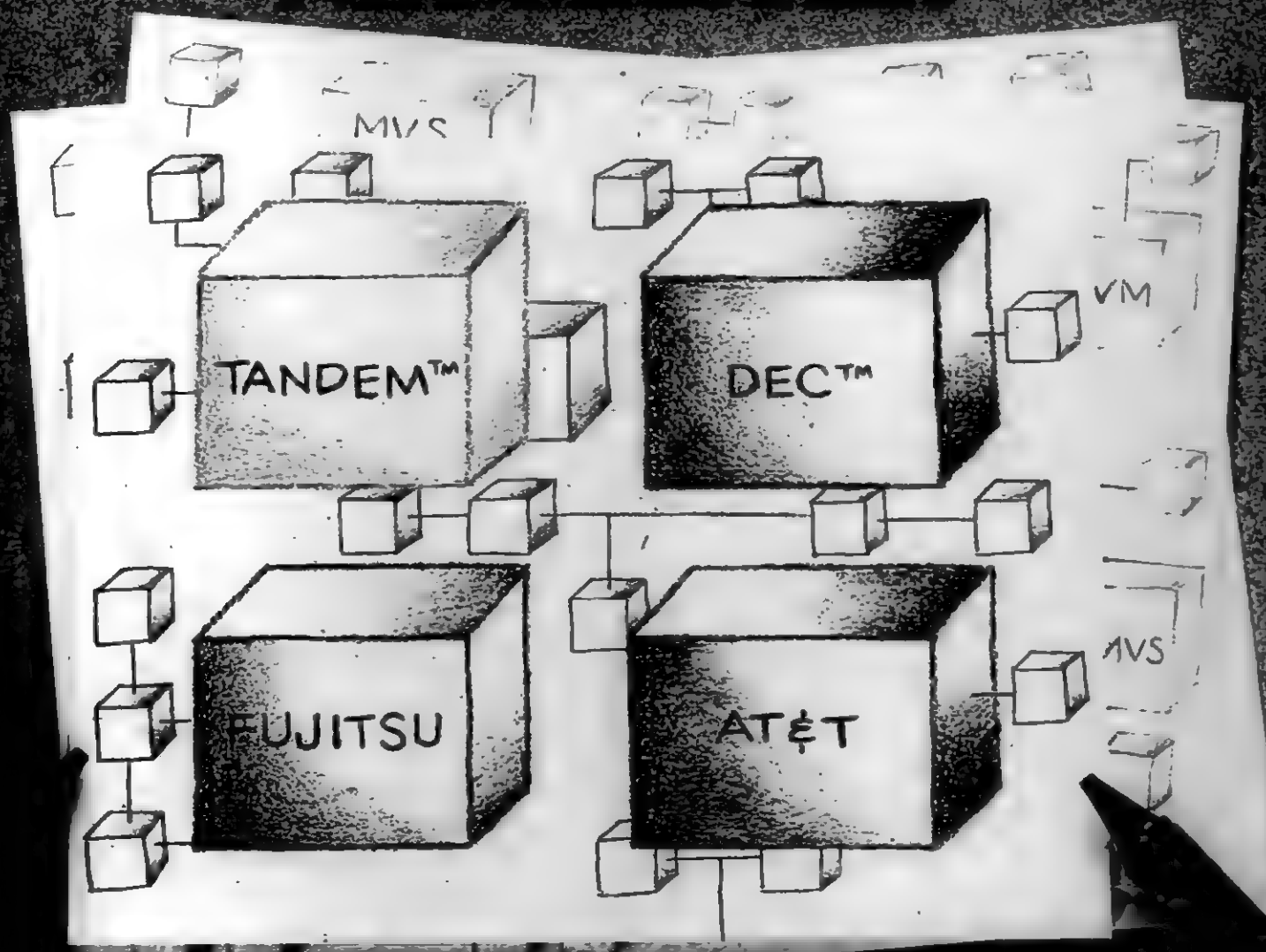
Other issues

EDS will also take responsibility for Signet's planned migration from a combination of Unisys Corp. and IBM hosts to IBM computers. EDS will assume Signet's existing Unisys leases so the bank will not have to worry about how to phase in its IBM purchases, according to Willis.

The contract calls for the bank's IS employees to be rehired by EDS, which will assume operation of the bank's data center here. Jobs were guaranteed for all 270 employees, but approximately 10% have opted to retire, leave or take jobs elsewhere in the company, Dieter said.

The bank's information services group had recommended in November 1990 that management evaluate the potential benefits of outsourcing over in-house development [CW, Dec. 10, 1990].

Four more reasons to choose NETMASTER



NEWS SHORTS

Electronic medical records pushed

The National Academy of Science's Institute of Medicine, based in Washington, D.C., published a major study last week that urged the health care industry to convert the traditional medical chart to a computer-based patient record. The study revealed that computerised records would provide numerous advantages over paper records — which are often inaccurate, illegible or missing — but the conversion will require privacy safeguards, data-exchange standards, a common data dictionary and some way for doctors, nurses and other hospital personnel to enter the data easily.

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IBM licenses HP package

IBM has licensed Hewlett-Packard Co.'s Softbench and Encapsulator software for the technical software development market. IBM will reportedly port these over to its AIX operating system and integrate various third-party packages to work within the framework. Although no time frame was given as to when this will happen, an IBM marketing manager said it will be soon.

.....

Supra ported to Unix platforms

One week after bringing its SQL-based Supra relational database to IBM's RISC System/6000 under the AIX version of Unix, Cincom Systems, Inc. announced last week the availability of Supra for The Santa Cruz Operation's (SCO) Unix. The Cincinnati-based software firm, which also has versions of Supra for Sequent Computer Systems, Inc.'s and Sun Microsystems, Inc.'s Unix, as well as OS/2, MS-DOS and IBM and Digital Equipment Corp. proprietary operating systems, said the SCO Unix version ranges in price from $1,500 to $100,000, depending on system configuration and modules.

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Mazzola promoted

McDonnell Douglas Systems Integration Co. has a new leader: John Mazzola, 47, formerly vice president and general manager of the manufacturing and engineering division, was appointed president of the St. Louis systems integration subsidiary last week. He replaced departing President Mark Kuhlmann, who was named vice president/general counsel at McDonnell Douglas Corp. in March. In 1990, the systems integration subsidiary had revenue of $271 million.

.....

Threadz, Metz in merger

Threadz Software Design Group, Inc. does File F/X utilities; Metz Software does shareware. They both do Microsoft Corp.'s Windows, and as of last week, they are doing it as a single company. The merger of the two Redmond, Wash.-based utilities vendors takes their 5-month-old strategic alliance one step further. The new firm hopes to wed the shareware provider's service agility to the technical support and marketing depth of a retail operation, Metz President Art Metz said. The company will keep the Metz Software name and will feature former Threadz President Ralph Brenner as principal in charge of business development and Metz as principal in charge of technical development. All product lines will be retained and supported, according to the companies.

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Peer-to-peer product offering

Spectrum Concepts, Inc. and Network Software Associates, Inc. (NSA) have teamed up to integrate Spectrum's IBM LU6.2 file-transfer software with NSA's packet-switching controller. The resulting product, a combination of NSA's AdaptX25 and Spectrum' Xcom6.2, is said to allow the IBM Personal Computer AT, Personal System/2 and compatibles to exchange files with other IBM systems over a CCITT X.25 network, using IBM's peer-to-peer protocol. One main target for the product, the vendors said, is Europe, where a number of companies are interested in using the popular X.25-based value-added networks to link their IBM systems to multivendor, multinational installations.

More news shorts on page 108

Information Builders adds 1-2-3 link

BY JEAN S. BOZMAN
CW STAFF

ANAHEIM, Calif. — Information Builders, Inc. is betting more heavily than ever on personal computers as users ride the downsizing wave, moving applications development to the desktop and leaving production databases on larger machines.

Last week, Information Builders told users at the Fuse '91 conference here that it would provide a link between Lotus Development Corp.'s 1-2-3 Datalens and mainframes running Information Builder's Focus application development software and Focnet communications software. Pricing has not been set for the Datalens feature, which is scheduled to ship during the third quarter.

"In the past, Lotus users had to extract mainframe data and then import it into their 1-2-3 spreadsheet," said Jim Burnham, product line manager for networked applications at Lotus. He said the new method prompts the user to select desired mainframe data, thus reducing the number of steps the user must go through.

Information Builders, which is promoting its PC/Focus application environment for client/server applications, is writing drivers for the Datalens facility. PC/Focus applications can already access IBM mainframe data stored in IBM's DB2, IMS and VSAM database structures.

Through the firm's Focnet connectivity software, PC users can also tap into data stored on Digital Equipment Corp. VAX machines and Hewlett-Packard Co. computers, among others.

Strategy questioned

Some industry analysts questioned the way in which Information Builders' client/server strategy is unfolding. "[Information Builders] has a lot of work to do before they turn their product into a true client/server product," said David McGoveran, president of Alternative Technologies in Santa Cruz, Calif. "The application front-end piece is not designed specifically to work with relational databases, and the transaction interface is weak in that it does not guarantee the integrity of the RDBMS."

McGoveran gave Information Builders high marks for its PC-to-mainframe connectivity and large user base.

At last week's meeting, Information Builders also showed a not-yet-available product for the Apple Computer, Inc. Macintosh. Called Macfocus, the product combines the Macintosh's graphically oriented screen icons and windows with the underlying Focus applications development code. Originally due to be introduced by the time of this year's Fuse conference, it is not expected to be available for several more months.

Users praised Information Builders' willingness to address a long list of user requests from previous Fuse meetings. "We're trying to provide [Information Builders] with more feedback on their products, even while the products are being developed," said Larry J. Braun, outgoing president of the national Fuse board.

Information Builders made more than a dozen connectivity announcements. Among them were support for DEC's Digital Pathworks local-area network software, support for a variety of industry-standard graphical user interfaces — including the Open Software Foundation's Motif and Sun Microsystems, Inc.'s Open Look — and support for DEC's Mumps development language.

'Simplified' federal overtime law causes more confusion

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — When the U.S. Department of Labor issued regulations on overtime pay for computer-related occupations, it tried to clarify what it thought was a confusing law. Last week, the computer industry said the law was clear, but the Labor Department was confused.

At issue is a two-sentence statute intended to eliminate the federal requirement that employers pay 150% in overtime wages to thousands of computer programmers, systems analysts and similarly skilled workers [CW, Nov. 5, 1990].

The Labor Department and supporters of the legislation — Adapso and the National Association of Computer Consultant Businesses (NACCB) — agreed that the exemption applies to programmers paid hourly and making more than 6.5 times the minimum wage, or $27.63 per hour.

However, Adapso and the NACCB said the Labor Department's interim regulation, which implements the law, left out other key provisions intended by Congress. They argued in written comments filed last week that Congress meant to exempt salaried programmers, too, no matter what they earn.

The agency's interpretation seems to exempt salaried workers only if their pay exceeds the level of $27.63 per hour. The Labor Department will review the industry comments and then determine whether to revise its regulation [CW, March 11].

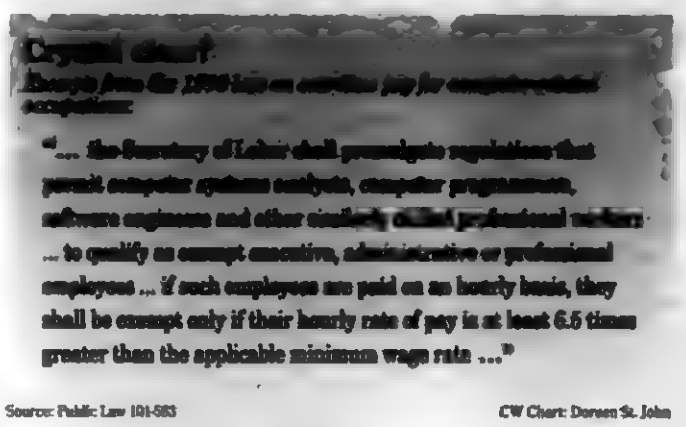
The premise of the 1990 legislation is that 150% overtime pay for computer programmers making $40 per hour is too expensive, and these professionals do not need federal protection.

However, several free-lance computer contractors said they were outraged that Congress had stripped them of premium wages for their long hours.

The free-lance programmers and engineers, variously described as job shoppers, contractor/consultants and migrant technical workers, said time-and-a-half pay for overtime work is needed to compensate them for the lack of health insurance, sick leave, fringe benefits and job security, as well as the travel and hotel bills resulting from their transient work.

"The law has the potential to cost me $25,000 a year," wrote Michael L. Boling, a computer contractor in Madison, Ala. He said independent contractors work "incredible amounts of overtime" because they are usually called in when projects are way behind schedule.

By charging $35 to $40 per hour with time-and-a-half rates for overtime, computer contractors can "reach the elusive $100,000," Boling said.



Source: Public Law 101-583 CW Chart: Doreen St. John

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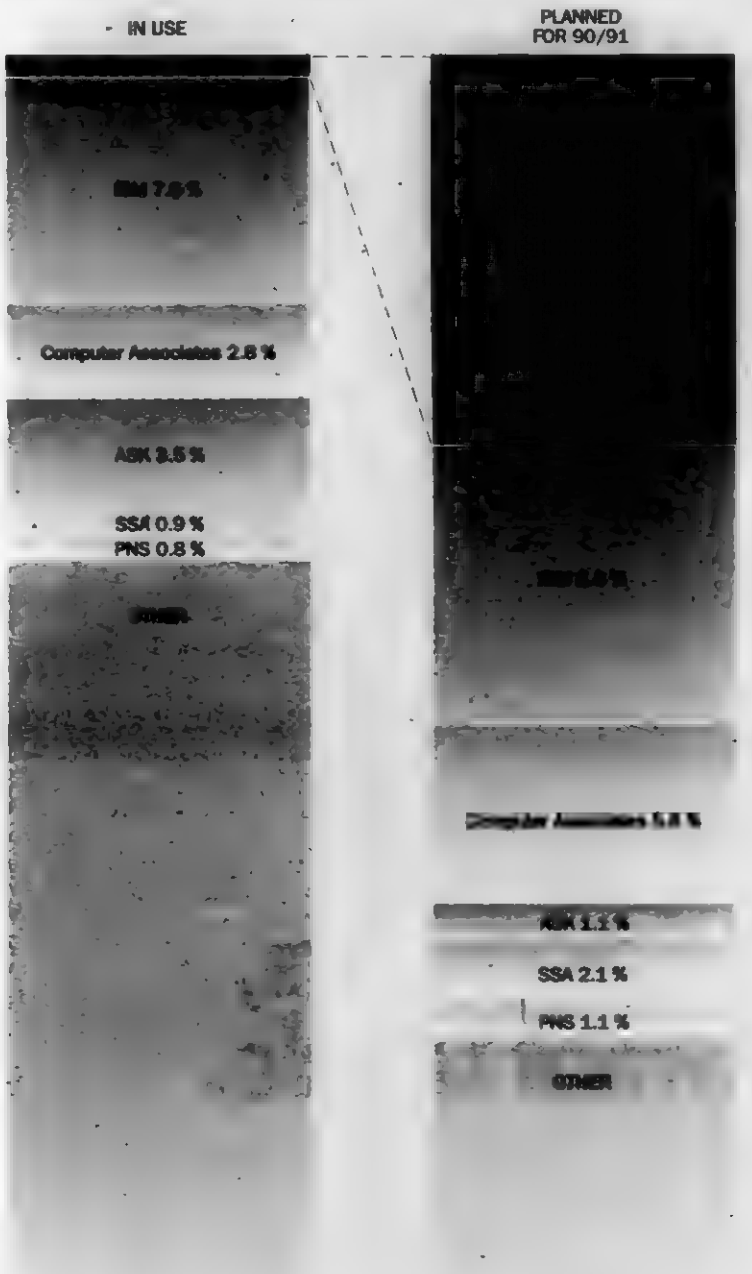
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Electronic imaging sizzles at AIIM conference

Technology could inspire a $4.5 billion hardware market by 1992, analysts say

BY ELLIS BOOKER
CW STAFF

WASHINGTON, D.C. — Judging by the crowds at the Washington Convention Center last week, electronic document imaging is here, and it is hot.

More than 32,000 attendees came to the Association for Information and Image Management (AIIM) conference and exhibition. According to analysts, the real difference this year, compared with last year, was not the 23% increase in the number of visitors but their attitude toward imaging technology.

"Consultants are no longer going to AIIM to look at products," said Thornton May, director of imaging research at Nolan Norton Research Institute in Lexington, Mass. "They're arriving with clients to ask questions and buy equipment."

Nolan Norton Research estimated there will be a $4.5 billion worldwide annual hardware market supporting imaging applications by 1992.

Products using Microsoft Corp.'s Windows 3.0 as an interface for imaging applications were almost everywhere at AIIM, and where they were not, they soon will be, developers said.

"The mistake we made was not [offering] a Windows client earlier on," said James Storm, president and chief executive officer of Toronto-based Imara Research Corp., whose product allows users to store and retrieve imaging information over a network. The developer announced at AIIM a second version of its OS/2-based imaging software that will support Windows. The new Imara version will support OS/2 at the server and Windows at the client. The Windows product is expected to ship in August.

A number of other developers privately said that market forces were compelling them to bring forth Windows and, in some cases, to postpone work on OS/2 implementations. At the same time, several developers said OS/2 enhancements, particularly the 32-bit format, are powerful features for imaging tasks.

Meanwhile, IBM staunchly defended its commitment to OS/2 at the desktop level — although it implied that the product will be able to run Windows from within OS/2 to satisfy customer demands.

Multimedia often requires multitasking, and OS/2 Extended Edition "is a terrific base" for that, said Mark Morin, vice president of IBM Image Solutions.

More broadly, Morin sketched IBM's hopes for the market. "Within IBM," he said, "[imaging] is viewed as the No. 2 opportunity for the company." However, he declined to say what IBM's No. 1 opportunity is.

Morin maintained that IBM was "on track" with its imaging product line. To date, IBM claims, it has 300 Imageplus customers worldwide, the majority of which have Application System/400 implementations.

Despite the hoopla and jockeying for position among vendors, current and potential users of imaging technology continued to deal with real-world issues.

"If I was all paper, I'd go to imaging today," said William Swarens, director of the records branch for the U.S. Marine Corps in Quantico, Va.

However, Swarens, who manages 3.9 million personnel records, has used paper and microfiche since 1979, and he complained that not enough attention was given to microfiche-to-digital conversion is-

Coming of age

However, representative of many who felt imaging was just about mature enough to meet their requirements was Geoffrey A. Best, an information systems specialist at Bell Atlantic Network Services, Inc. in Freehold, N.J.

Bell Atlantic currently has a bid out. Best wants to link scanned images of terrain maps, now in paper form, to an existing computer-aided design program used by some 2,000 engineers across the telephone company's seven-state territory.

It was potential customers such as Bell Atlantic that lured Apple Computer, Inc. to AIIM for the first time. The company had no new products to announce but rather sought visibility for its claim that its Macintosh is the most cost-effective way to bring images to the desktop.

"We believe the trajectory of this industry is headed in our direction," said Ed Forman, manager of IS solutions at Apple's large-business market group. He added that since their introduction in 1984, "all Macs have had the inherent capability to show images."

Elsewhere, Sun Microsystems, Inc. executives were busy arguing about how their Unix workstations are the natural fit for the desktop.

Sun brought price comparisons showing that a fully loaded personal computer — outfitted with extra memory and special video boards and monitors — can be as expensive but offer less expandability than a Sparcstation.

Sun claims imaging accounted for 5%, or about $140 million, of its revenue last year and that this market segment is growing at 40% per year for the firm.



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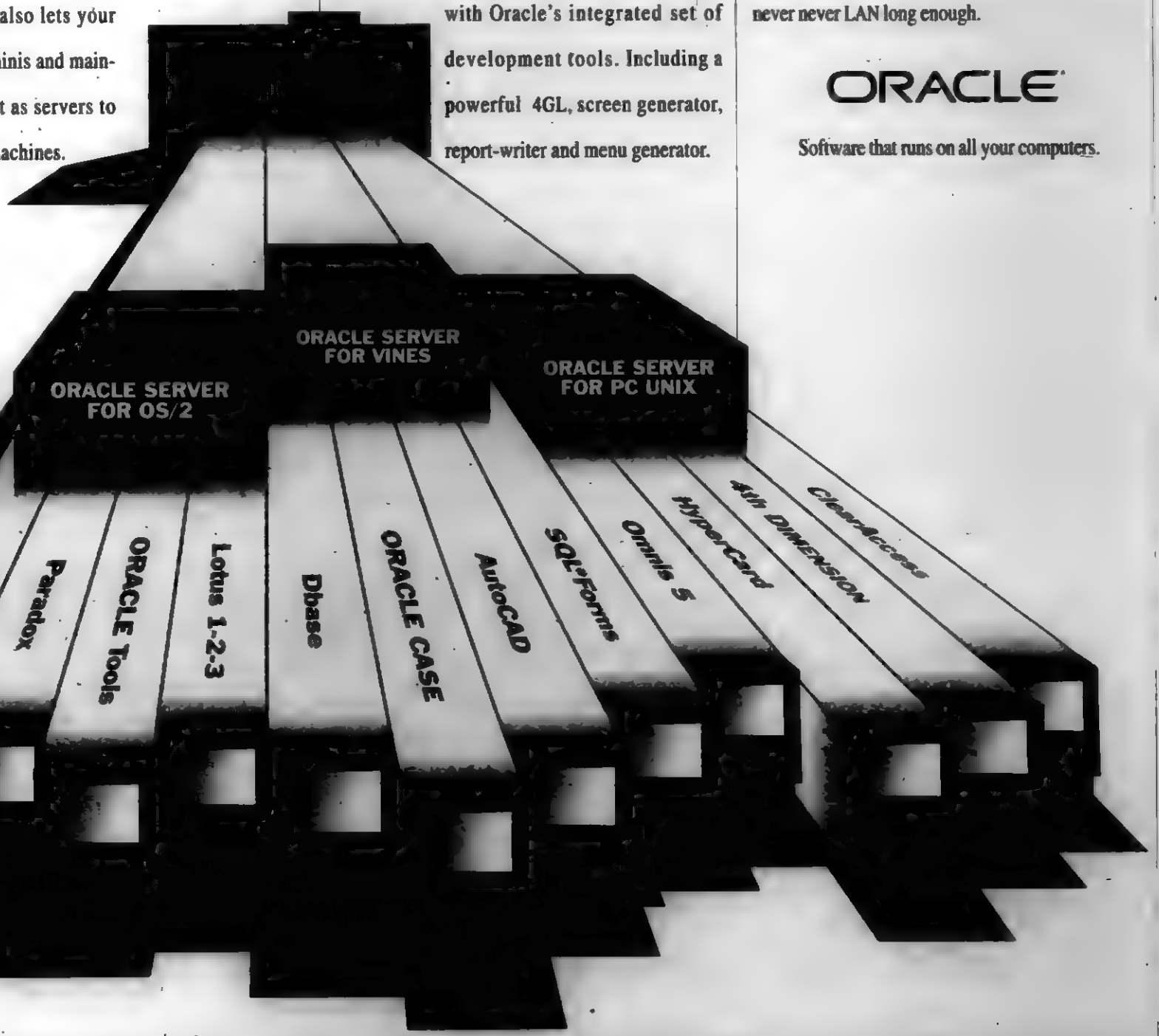
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PC Tools polishes image

BY CHRISTOPHER LINDQUIST
CW STAFF

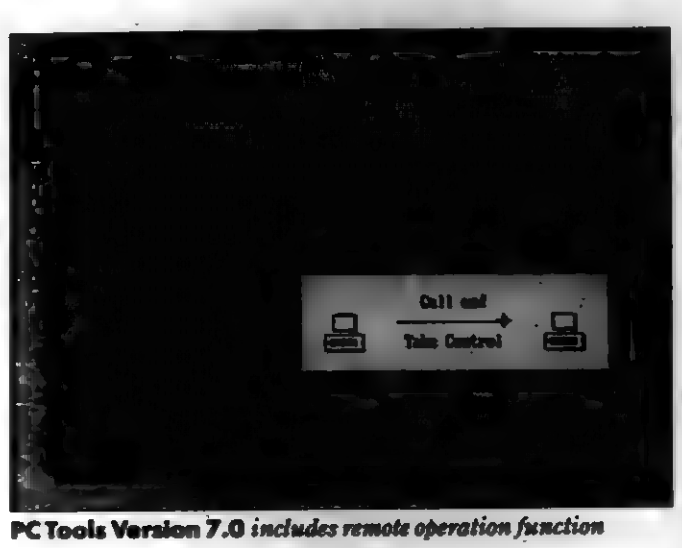
BEAVERTON, Ore. — Central Point Software, Inc. plans to deliver a major upgrade to its popular PC Tools personal computer utilities software package this month.

PC Tools Version 7.0, to be announced today, features more than 100 enhancements, including three applications designed for use with Microsoft Corp.'s Windows 3.0.

The Windows applications are Windows Backup, a disk backup program that can run while other applications are being used; Windows Undelete, for file recovery; and Windows Launcher, which allows users to start applications from the Windows 3.0 system menu.

The upgrade will reportedly allow access to all available PC Tools utilities from a main menu. This addresses complaints from some users, who charged that previous versions of PC Tools were poorly integrated, which made utility access somewhat daunting, according to Central Point Chief Executive Officer Michael Brown.

The look of the user interface has also been improved and is very Windows-like,



PC Tools Version 7.0 *includes remote operation function*

including icons and an arrow-shaped mouse pointer, Brown said.

Version 7.0 modifies the standard PC character set — a technique known as "mapping" — in order to enhance the appearance of user screens while maintaining the inherent speed advantages of text-based programs.

In addition, PC Tools 7.0 includes enhanced support for Novell, Inc.'s Netware with, for example, the addition of utilities that help undelete and locate files on network disk drives.

All applications are compatible with Windows 3.0 except for the disk defragmentation utility, which must be run from DOS. The installation program has also been enhanced to allow users to install only those pieces of PC Tools they intend to use, thereby saving disk space.

The package will reportedly be priced at $179. Registered users of all prior versions of PC Tools will be able to upgrade to Version 7.0 for $49 through July 31. Users of competing packages — products whose features overlap with those found in PC Tools 7.0 — will be able to purchase the package for $59 through Aug. 31.

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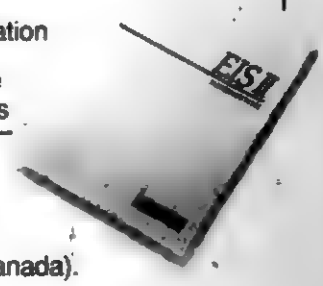
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*"David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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TCP/IP support for Decserver 300

BY ELISABETH HORWITT
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. added a few more nuts and bolts to its enterprisewide internetworking strategy last week.

DEC delivered on a statement of intent made in December 1990 to add Transmission Control Protocol/Internet Protocol (TCP/IP) support to its Decserver 300. Decserver 300 Version 2.0 software allows personal computer and terminal users to access DEC hosts concurrently via the proprietary Local-Area Transport protocol, DEC said. Non-DEC hosts can gain access via the TCP/IP terminal-to-host protocol, Telnet.

Also announced last week was the Decrouter 150, a low-end Decnet router that is said to provide the same performance as the existing Decrouter 100 at about 60% of the price. Decrouter 150 is also reportedly one of the first routers on the market to support an asynchronous and synchronous connection simultaneously.

DEC also enhanced its Decnet/Systems Network Architecture (SNA) Data Transfer Facility (DTF), which supports file transfer between IBM's SNA host environment and a variety of Decnet systems, including DEC VMS, Ultrix and RSX hosts and Microsoft Corp. DOS workstations.

DTF Version 3.0 is scheduled for release in June.

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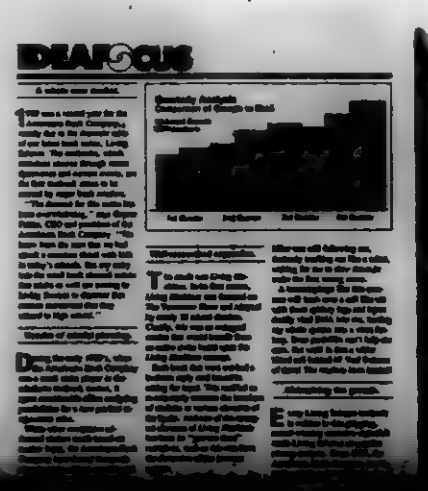
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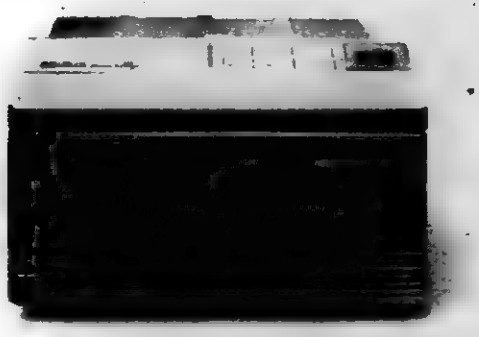
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DG profits

CONTINUED FROM PAGE 1

Milton Jr., deputy manager at Brown Brothers Harriman & Co., a New York-based financial consulting firm, said there is a "tighter focus on what Data General does well; specifically, a very narrow focus toward the Aviion server line and proprietary MV technology."

While Milton credited Skates with bringing an element of financial discipline to the company, he cautioned that it is going to be a rough road ahead as competition in the workstation and server market intensifies.

Skates came to DG four years ago as senior vice president of finance and administration. Under his direction, the company slimmed down from 15,685 employees in fiscal 1987 to its current 8,500.

Several projects have also been abandoned, most notably DG's foray into the telecommunications field — a much publicized venture with the Nippon Telegraph and Telephone Corp., code-named Asparagus.

"When Ron [Skates] arrived here, we had gone through a lot of hard times, and we weren't making any money," West recalled. "There was no clear light at the end of the tunnel, and we definitely had a need for law and order."



West said *he and Skates had to adjust to each other*

West acknowledged that it was difficult to see pet projects, including a fault-tolerant line and a desktop strategy, "go by the boards."

"Initially, we didn't understand each other well," he said of his relationship with Skates. Noting that they had to overcome stereotypes of "bean counters and arrogant engineers," West said it was painful to find and establish a dialogue.

"Data General is a technologically superior company that was going in 27 different directions," Skates said in a recent interview. "One and a half years ago, we sat down with an entire management team to decide on a strategy and determine which products fit into that strategy."

The result was a focus on the reduced instruction set computing-based Aviion as a server in several strategic vertical markets, coupled with maintenance and upgrades for the company's mainstay MV minicomputer customers.

"Looking at the DG cost structure, what I find a little ominous is the drop in research and development expenditures," said William W. Sines, director of midrange systems and server research at Technology Investment Strategies Corp., a Framingham, Mass.-based market research and consulting firm.

Less R&D funding

According to Sines, monies for research and development have decreased from $35.7 million in March 1990 to $26.1 million in March 1991. "We must watch DG closely in the next 12 to 18 months to make sure the cuts have not affected the core business," Sines said.

One core business customer, Gary Nesmith, data processing manager at Pillowtex, Inc. in Dallas, said the company "never seemed down from a performance, support and delivery standpoint."

"First-class technology has kept DG alive," Skates said. "It's my job to surround myself with people smarter than I am and provide them with the right incentives. We have a first-class team of responsible people working on our goals. My job is to make sure it happens."

West summed up his relationship with Skates: "Both of us realize that we work better together than we do against each other. We have forged a relationship of trust — the kind that usually happens after going through hell together."

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Sterling regroups software teams

WOODLAND HILLS, Calif. — Sterling Software, Inc.'s Answer Systems Division has realigned its product inventory and repositioned its marketing strategy, combining three software development teams and seeking new business relationships to fill in the gaps in its line.

Collectively, these changes are being called the Corporate Applications Management Initiative. Executives will describe details of the plan, initially outlined at a recent user conference in New Orleans, to industry analysts and journalists during the next two weeks.

"We have mapped our products against IBM's AD/Cycle so that users can map their strategy against our product offerings," said David Weir, president of the Answer Systems Division. "We are trying to address enterprise computing, meaning that we will support Unix and open systems in addition to our traditional IBM-compatible products."

John George, director of the firm's AD Labs Division in Ottawa, said Sterling will rely heavily on its Zim fourth-generation language to generate code for OS/2, MS-DOS and Unix environments.



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TECH TALK

Of microns and microchips

■ AT&T Microelectronics and NEC Corp. recently said they plan to collaborate on a manufacturing process that quadruples the amount of information and functionality that today's most advanced microchips can hold. The companies said they will develop a manufacturing technique called the .35-micron process that will let them etch lines only .35 microns wide into a chip. The chip could be used to create disk drives with all of the electronics on a single chip, handheld digital telephones and economical signal processing gear for advanced television technology, the companies said. The process is slated to be introduced in mid-1995.

A set of standards

■ The Institute of Electrical and Electronics Engineers, Inc. (IEEE) and Information Handling Services (IHS) have published IEEE standards for computers and electronics, instruments/terminology, communications, applications and power on compact discs. The four-disc set contains the full text of IEEE standards and is illustrated with charts and graphics. The disc set will be offered as a service and updated every 60 days, IEEE said. The service includes IHS' worldwide standards index.

Hard and hardy circuitry

■ Researchers at North Carolina State University at Raleigh and Oak Ridge National Laboratory in Oak Ridge, Tenn., have devised a method of forming single-crystal synthetic diamonds on a base of copper. The single diamonds were about .39-in. square and only 500 angstroms thick. An angstrom is about four billionths of an inch. The finding could lead to the development of diamond film transistors that would be packed more densely than silicon and run cooler. The diamond film chips could be used in areas where heat does not allow the use of silicon circuitry.

Visualizing cleared-off desktops

Scientists make on-screen desktop space larger with 3-D rooms and cone structures

BY MICHAEL ALEXANDER
CW STAFF

Today's popular user interfaces are metaphors for office desktops, file cabinets and other items used to store information. That worries some computer scientists because more users want to store information on their on-screen desktops but are finding them as crowded as the tops of their desks.

"Information retrieval is almost always part of some larger process of information use," said Stuart Card, a computer scientist at Xerox Palo Alto Research Center (PARC) in Palo Alto, Calif. "What is really needed from the point of view of the user isn't so much information retrieval itself but rather the amplification of information-based work processes."

Card and fellow Xerox PARC computer scientists Jock Mackinlay and George Robertson have spent three years developing an "information visualiser," an experimental user interface for information retrieval.

There is an abstract cost associated with retrieving information based on the effort or resources required to find and access it. For example, the cost of retrieving information stored in a desk is low, but the cost of retrieving it from a library is high. The scientists are developing a user interface they said they believe will help lower the cost of retrieving information.

"We're interested in methods and machines that would allow people to bring to a task more information more quickly than otherwise possible," Card said.

The computer screen as a metaphor for the desktop and other office storage devices is undergoing reevaluation because the cost of retrieving information escalates as more elements are added. Put too many items on a desktop and it becomes difficult to identify objects and the information they represent.

Computer screens are so small it is impossible to dedicate the space needed for icons all of the time, Card said. "Our technique effectively makes the screen space larger than it was."

One solution is to make the display, but that has economic and technical drawbacks. Another is to increase the number of desktops and enable the user to move from one to another with navigational aids.

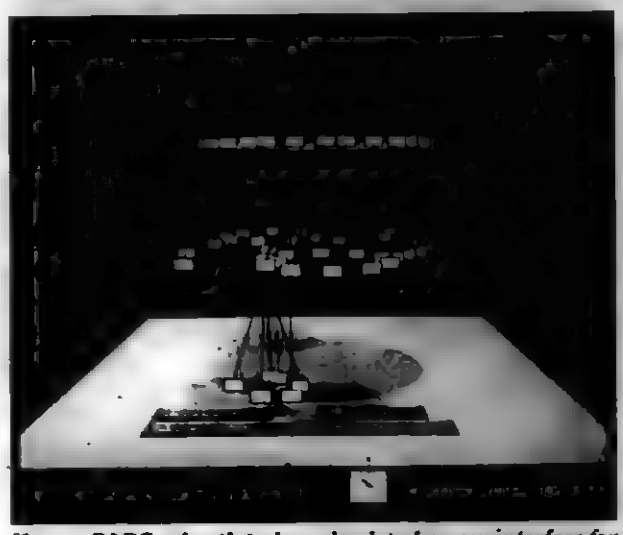
The Xerox researchers have taken that notion one step further with their development of an information work space that consists of a collection of interconnected three-dimensional rooms. Underlying the interface is a cognitive coprocessor — an architecture for animation to make it even easier to spot relationships and detect changes in the interface. Using both 3-D perspective and interactive animation makes it possible to pack the space more densely with information than would otherwise be possible, Card added. "The rooms are presented in 3-D to make the most use of the available space and to enable the user to see the entire structure," he explained. "Animation shifts some of the cognitive load to the perceptual system."

The user moves from room to room by "walking," selecting the desired room from a pull-down menu or pointing with a mouse to a room on a two-dimensional layout of the work space.

The idea is similar to artificial reality, in which users immerse themselves in computer-generated simulations. However, users need not don special gloves or goggles, Robertson said.

The information work space uses information visualization techniques the scientists have dubbed "cone tree," used to visualize hierarchical information, and "perspective wall," used to visualize linear information.





Xerox PARC scientists *have developed a user interface for information retrieval, using a collection of interconnected 3-D rooms (top) or the cone tree to visualize information*

In a simple cone tree, a single, large cone with nodes or index cards arrayed around its rim is suspended by its point from the ceiling of a room. From the cards attached to the rim of the cone are suspended several smaller cones, each with its own set of cards. The cones are shaded but transparent enough that they do not block the view of the cones behind them.

When a card is selected with the mouse, the cone tree rotates so that the selected card and each card in the path from the selected card up to the top are brought to the front and highlighted.

The hierarchy is presented in 3-D to make the most use of the available screen space and to enable visualization of the entire structure, Robertson said.

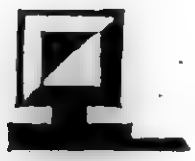
To demonstrate the cone tree's usefulness, the scientists packed an entire Unix directory, with about 600 directories and 10,000 files, onto a computer screen. "This is the first time that anyone has really seen what a Unix directory really looks like," Robertson said.

Rotating the tree lets the user look at relationships between cones.

The perspective wall is used to display information that is arranged alphabetically, chronologically or in some other linear structure, Mackinlay said. The information is displayed on a 3-D wall divided into three sections. The center panel is used for viewing details and the two adjacent panels are for viewing context. The vertical dimension of the wall can be used to visualize layering in an information space.

The scientists said they are exploring the prospect of commercializing their information visualizer interface with a number of unnamed vendors.

"While the industry is squabbling about a particular desktop look and feel, the hardware technology is moving out from beneath that," Card said. "There are a wealth of possibilities" for new interfaces, he added.



The experts say companies like yours will spend $240 billion on client-server computing.



Maybe you should start by spending a few minutes.

It is not a fad. Or a buzzword. Or somebody's vision of the future.

Client-server computing is real.

It's the fastest growing form of business computing since the PC.* And its rewards are tempting: Tremendous power for the dollar. Longer hardware lifecycles. Lower training costs. Less maintenance. Faster time-to-market. Better workgroup productivity.

Some companies are even using it to earn profits in areas of their business that once drained revenues.

That's the bright side.

There is also a dark side. Like other technologies that have come before it, client-server computing is surrounded by confusion and hype. Every major computer company has jumped on the client-server bandwagon, each with its own promises — and products — to sell you.

Since Sun® was the first systems vendor to devote itself completely to client-server computing, it's fitting that we also should be the first to make sense of it all for you.

Here goes.

The fourth wave.

Those who do not learn from history are doomed to repeat it. So what has been learned from the past half-century of technology?

In the 1950s and 60s, businesses saw how mainframes could turn centralized data into a competitive edge.

In the 1970s, companies learned to save money and boost performance by distributing data among smaller, faster minicomputers.

In the 1980s — the PC decade — we all discovered how profitable computers could be in the hands of managers, clerks, engineers, and just about anyone else who sits behind a desk.

Now, we are in the midst of a "fourth wave:" Client-server computing.

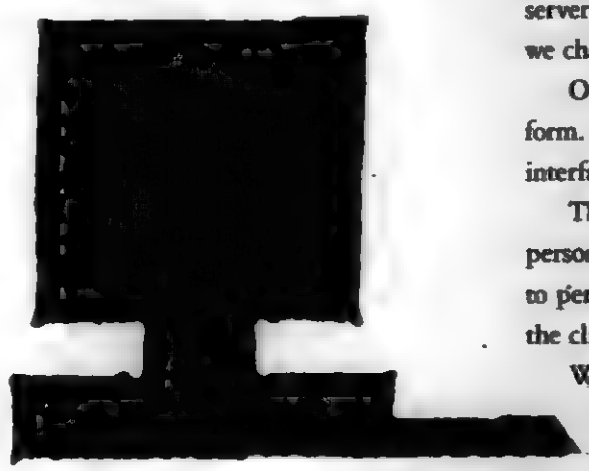
Ideally, it combines a PC's ease of use with the computing power of far larger systems. It lets people locate information on computers throughout the company — without having to know where to look, or how to get there. And it inspires workgroups to collaborate in entirely new ways.

These ideals are not just Sun's. They're shared by every vendor of client-server computing.

What makes Sun different is how we accomplish them:

1) We put the focus of computing power wherever it can do you the most good — on the desktop, on the server, or split between the two.

2) We build everything into our systems that's needed for true client-server computing (RISC processing, multitasking, Ethernet,



e-mail, audio, a graphical user interface, and plenty of memory and storage).

3) We give you a simple, consistent way to work within applications, access files, print, send mail, and manage network resources.

4) We offload processing from host computers to servers and workstations — your system can grow without limits, and in less costly increments.

5) We integrate all of your company's computers, so you can draw upon the data, applications, and processing power of every computing resource on the network.

That's what we do.

Now here's how we did it.

The luxury of nothing.

Nine years ago, when Sun began to explore client-server computing, we had a huge advantage over other computer companies.

We had nothing to lose.

No expensive hardware to sell. No proprietary networks to defend. No aging operating systems to keep alive.

It was the rarest of opportunities: Our engineers could literally start from scratch to design a total client-server environment. An environment that would, over time, embrace promising new concepts in computing, such as RISC processing, object management, digital imaging, and multimedia, to name a few.

We were free to pick and choose only those technologies that made the most sense for client-server computing. And when we did choose, we chose only one:

One operating system. One hardware platform. One networking system. One graphical interface.

That way, Sun was able to commit every person, every dollar, and every minute we had to perfecting a single, integrated approach to the client-server environment.

Which leads us to another advantage Sun had in its favor:

By starting out with a completely open mind, we ended up with completely open technology.

Open to anything.

From the beginning, we were determined that a Sun client-server system should be able to include the hardware, networks, and databases you already use.

Today, every Sun workstation and server is powered by the SPARC® microprocessor, running the UNIX® operating system, accessible by the OPEN LOOK® graphical user interface, and linked together in the ONC™ networking environment.

Each of these technologies was designed on open industry standards; or, where no existing standards were to be found, we made ours available to the rest of the computing world.

Take UNIX, for instance. It's the world's

*Independent analysts Alex. Brown & Sons estimate that commercial and technical businesses worldwide will invest $240 billion or more this decade in the desktop computers and servers that comprise client-server technology.

foremost multivendor, multitasking operating system. Every major computer company now offers it. Ten million people use it. And thousands of software developers write for it.

Our SPARC hardware platform is anything but proprietary. More than 25 vendors are now at work on SPARC laptops, desktops, servers, minicomputers, mainframes, even supercomputers. All running the same, compatible software.

OPEN LOOK brings a consistent user interface to all kinds of software, across all kinds of systems. With it, applications can actually look and act the same way on Sun, IBM, Digital, H-P, DOS, and Macintosh computers.

And as for networking, there are ONC products for all popular operating systems — UNIX, Ultrix, AIX, Xenix, DOS, OS/2, VMS, MVS, VM, and Macintosh — as well as for the PC networks made by Novell, 3Com, and Banyan.

Still, we weren't satisfied just to make our systems compatible with your equipment.

Making them compatible with your people — that was the real trick.

What you don't see is what you get.

Long ago, we asked ourselves:

Could people exploit the full power of UNIX, without seeing strange messages like *mount: /dev/fd,0a on/mnt: Invalid argument?*

Could a systems administrator manage an integrated, multivendor network without seeing its underlying complexities?

Could a software developer design around a graphical user interface, without seeing a line of its code?

The answers are yes, yes, and yes.

We've made client-server computing simpler for users by giving them a graphical interface that's as intuitive as Macintosh or Windows 3.0. Nearly 2,500 software applications run on Sun systems — a growing number of which are now committed to the OPEN LOOK environment — including Lotus® 1-2-3,® WordPerfect,® and others you may already be using.

We've made system administration simpler with SunNet™ Manager. It's a powerful set of tools that actually uses the network to manage itself.

We've made life simpler for software developers, too. With more than 400 Sun and third-party CASE tools. And with OpenWindows™ software, which lets designers create an OPEN LOOK interface with a few quick strokes of a mouse.

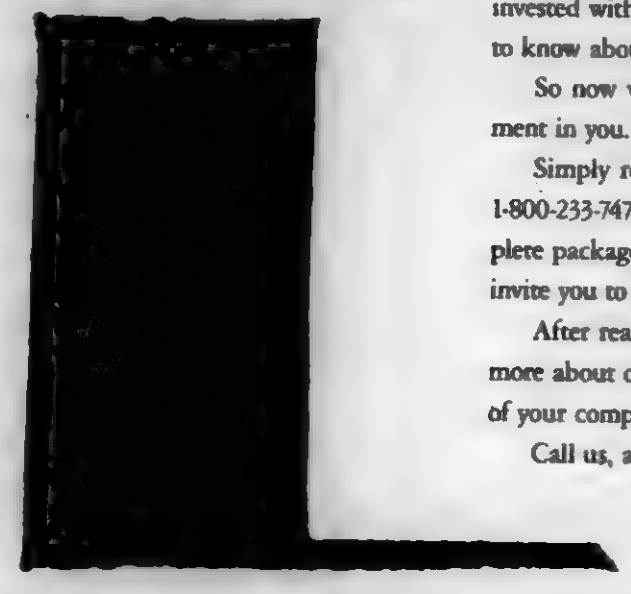
Instead of a few thousand lines of code.

Is it really worth it?

Moving from one style of technology to another is never an easy matter for a company. There's a lot of money involved. People get nervous about changes. Problems happen.

The question to ask yourself is: Do the rewards make it all worthwhile?

The *Wall Street Journal*, Mitsubishi Bank, New Zealand Inland Revenue, Northwest Airlines, Shell Oil, Xerox, NYNEX, and hundreds of other respected corporations around the world are using Sun client-server systems today. This is what they report:



We get more computing for the money. Companies find that a network of Sun servers and workstations accomplishes more work in less time than the costlier host systems they had previously used.

We're cutting costs and raising profits. For example, a Canadian insurance company's Sun system reduced overhead expenses by 55 percent, and boosted profits by 30 percent.

We not only protected our investment, we improved it. Existing host systems and PCs can be put to more efficient use as network servers and clients. Offload some of a mainframe's tasks to other servers, and you could even prolong its life expectancy.

We have more reliability than ever. If one computer on the network experiences a problem, its workload can easily be moved to another machine.

We're no vendor's prisoner. The open technologies of SPARC, UNIX, OPEN LOOK, and ONC give companies the freedom to choose among vendors for the price and performance that suit their needs.

We save a fortune on upkeep. Sun servers cost far less to keep running than a typical mainframe or minicomputer. By replacing their old timesharing system, companies could save enough on just one year's maintenance to pay the entire cost of their Sun client-server system.

The next investment is ours.

As much as we appreciate the time you've just invested with us, the fact is there's much more to know about client-server computing.

So now we'd like to make a small investment in you.

Simply return this coupon, or call 1-800-233-7472, ext. 446. We'll send you a complete package of useful information. We'll also invite you to meet with a Sun representative.

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EDITORIAL

European bailout

AFTER HAVING POURED billions of dollars into a sinkhole to support inefficiency, European governments seem at long last to have realized there's one thing money can't buy: the health of Europe's ailing computer makers.

In a fiercely competitive world market where a vendor's success is directly related to how nimble it can be, Europe's computer companies have been narcoleptic by comparison.

There are two reasons for this sad state. First, several big vendors got direct injections from the public trough to compensate for huge losses run up by inefficient and poorly run operations. The French government, for example, has diverted huge sums to Bull for almost 10 years. The result? Last month, Bull reported an annual loss of $1.2 billion.

The second governmental prop has come in the form of government computer contracts, which have bestowed great favor on the local producers. So while Siemens, for example, has not benefited from the blatant governmental largesse that has propped up Bull, roughly one-third of its domestic computer sales go to the German government, according to *The Economist*. By comparison, no major U.S. or Japanese computer maker has government sales even close to that figure.

In addition to losing prodigious sums of money, the Europeans have been painfully slow to catch the open systems wave, electing instead to stick steadfastly to their proprietary (and ostensibly more profitable) architectures. And, as *The Economist* notes, the Europeans have forged partnerships with European governments that have promulgated various forms of protectionism, resulting, for example, in European users paying 50% or more than U.S. buyers for PCs. And after all this, the vendors are still awash in red ink.

Finally, however, the governments themselves are staring at the local computer makers and saying *no mas*. Last year, the UK cut the apron strings on ICL, allowing its majority purchase by Fujitsu. (The company was reportedly then disallowed from participating in projects sponsored by a pan-European consortium. Apparently, not all lessons have been learned.) And the French government has cleared the path for the privatization of up to 49% — just under controlling interest — of state-owned companies.

The handwriting is clear. Government bailouts will work no better for the European computer makers than they did for the British carmakers. And any mass consumer of information technology — the government, for instance — that settles for anything less than state-of-the-art equipment will only harm its own drive for greater efficiency.

The real tragedy is that this laissez-faire realization may come too late to salvage much of the indigenous European computer industry.



LETTERS TO THE EDITOR

Wrong idea

I want to clarify statements I made at the Information Systems Security Association's conference that appeared in Michael Alexander's April 8 article titled "Vendor security chiefs cite LAN, laptop threat."

My comment that information security was new at Hewlett-Packard Co. referred to last year's formation of a corporate information security department. This department was established to develop corporate-wide policy and provide more service to local divisions as they develop standards and practices for security.

HP has always had controls in place to safeguard our sensitive information. What is new is the more active role corporate now takes in ensuring the security of all computer systems used at HP.

Sam Miller
Information technology engineer
Hewlett-Packard Co.
Palo Alto, Calif.

No personal choice

Marc S. Sokol's recent viewpoint article on mainframe programmers [CW, April 15] was very interesting, but I think it was directed toward the wrong audience.

I've been a mainframe programmer and consultant for more than 13 years, and I have yet to work in a shop that gives a programmer a choice of working environment.

I'm aware of some of the tools available for use on PCs. I recently saw a demonstration of the capabilities of the Micro Focus programmer's workbench, and I was greatly impressed. I know what a tool like that would allow me to do, but until the people I work for provide the resources, I'll continue to be a "mainframe programmer."

S. A. Bullard Jr.
Somerville, N.J.

Mainframe credit

Marc S. Sokol, the author of "Mainframe programmers and the V-8 mentality" [CW, April 15], appears to believe that mainframe programmers freely choose a hardware platform for applications development and that the PC platform is superior to the mainframe for development of mainframe applications. As a mainframe programmer with 25 years of experience with mainframes and minicomputers and five years with PCs, I cannot support those beliefs.

I have yet to meet a programmer who has a free choice of platforms. Personally, I have a limited choice, but generally a programmer's "choice" is dictated by the corporate platform.

What the mainframe shops need are compelling reasons to migrate to PCs; adding significant value to the existing applications development software tools might be reason enough. Simply cloning the mainframe environment onto the PC obviously is not enough.

It just seems unreasonable to categorize mainframe programmers as "V-8" chauvinists because the PC environment is not as good for mainframe applications development as the author believes, nor is it as good as it should be.

Kerry Carlin
GE Capital
Barrington, Ill.

Litigious society

"I would sue everybody, jointly and severally," said David Newman Jr., an attorney and associate professor of electrical engineering and applied science at George Washington University. This is a quote from an article titled "Who is liable? Just ask the expert" [CW, April 15].

This is a major problem with society today. No one wants to take responsibility for his own mistakes. It is easier and more profitable to sue everyone else. What is alarming is that this philosophy is being advocated by our nation's educators at institutions of higher learning.

As a result, product liability insurance can account for up to 50% of the cost of goods; medical doctors are refusing new patients, and some are even quitting the profession. The experts are now telling us that the vendor of an expert system can be held liable for the misuse of a purchased system. Is this any different from Ford Motor Co. being sued because its product was used in the commission of a crime? This madness might be curtailed if the self-serving experts' judgment was not clouded by contingency fees.

Jeff V. Pulver
Intercomp Design, Inc.
Neshanic Station, N.J.

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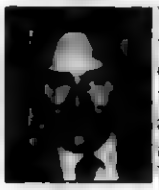
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We can't let this one slip away

High-definition technology is crucial to future of U.S. manufacturing

REP. DON RITTER



We are on the verge of radically changing the way we transmit and receive visual information. When digitally combined with computer technology and, eventually, a national fiber network, high-definition systems (HDS), including high-definition television, can change the way we all live and work.

HDS represents another benchmark in the evolution of electronic goods in the direction of digital technologies. And, like its electronic/optoelectronic predecessors — videocassette recorders, fax machines, compact discs and others — it is driving the state of the art for a number of technologies. HDS will be integrally and strategically linked to a number of high-value-added manufacturing industries — semiconductors, consumer electronics, computers and telecommunications, among others.

HDS will also be central to the changing manufacturing base of this country. We simply cannot afford to let U.S. companies be absent from the HDS market. This would almost certainly provide our competitors with a virtually unassailable advantage in the technologies that will underpin many of tomorrow's manufacturing industries.

Manufacturing matters

Toffler, Naisbitt and the other "postindustrial" pundits are simply wrong when they downplay manufacturing with a smokestack as the symbolic pejorative. Manufacturing's productivity growth and quality improvements are the brightest spots in our economy. Our exports are almost totally dominated by manufactured products, and manufacturing supports many of the best jobs in services. The continued renaissance in the U.S. manufacturing sector is critical if we are to remain a global economic power. We need a clear commitment by Congress and the Bush administration that "manufacturing matters," not more treatises on how we're becoming a "service economy."

We also need to recognize that some technologies and industries are more crucial to our country's future than others. When this is translated into action, it risks being tagged with the no-no labels of "industrial policy" or "picking winners and losers." In reality, however, the government picks winners and losers all the time. We wouldn't have a computer industry without U.S. Department of Defense funding for the first computers or a satellite communications industry without NASA. There are also whole government departments devoted to maintaining a viable U.S. national position on food and energy. Isn't it time to make the same commitment to our manufacturing industries?

Recent legislation has begun to establish a framework for a new technology policy. For example, the Advanced Technology Program (ATP) at the National Institute for Standards and Technology provides seed money to help U.S. businesses collaborate on precompetitive, generic technologies with high commercial potential. This program is explicitly aimed at technologies such as HDS, and its budget is on the way up.

Policy progress

ATP signals an important shift in the administration's technology policy. It enables the government to participate with the private sector in research activities on generic technologies that have the potential to contribute to a broad range of government and commercial applications. For example, because the Defense Department needs HDS for a broad range of video applications including targeting and battle management, the Defense Advanced Research Projects Agency (DARPA) has been working with the industry on several projects aimed at improving HDS and reducing its cost. Recognizing the importance of these efforts, Congress voted to appropriate $125 million to DARPA for fiscal 1991.

During the last session of Congress, further improvement on the existing policy framework was proposed in the form of the American Technology Preeminence Act. Though not yet enacted into law, the act is being reintroduced into the current session of Congress.

The act would amend the ATP by allowing the secretary of commerce to provide support for joint ventures to solve generic technology and manufacturing problems in emerging technologies, including HDS specifically. It also seeks to stimulate antitrust law reform to enable joint production ventures, to institute an investment tax credit for emerging technologies and to create a national commission that would study ways to reduce capital costs for HDS and other emerging technologies.

Among other provisions, the act would create a high-resolution systems board which would help coordinate the HDS activities of numerous federal agencies, monitor HDS exports from the U.S. to guard against "dumping" and promote the transfer of HDS technology into commercial products.

We must continue to take positive steps in developing a policy that ensures significant U.S. presence in HDS development, manufacturing and program distribution. World economic leadership in the 21st century depends on it.

Ritter, who is a seventh-term member of the U.S. House of Representatives (R-Pa.), chairs the Republican Task Force on Technology and Policy and is Co-chairman of the HDTV Caucus.

Adventures in the Soviet marketplace

STEVE CRUMMEY



As the walls of communism crumble and the Soviets pledge a move toward a market economy, many view the Soviet Union as a new frontier to be conquered. We at Lotus certainly agree with that view. An immense and untapped market, the Soviet Union holds promises of rapid and widespread growth. In the computer industry, for example, the installed base of personal computers is expected to grow from its current 400,000 to 28 million during the next 10 years.

As we and other companies attempting to operate in the Soviet Union have learned, however, there are also great risks in entering this truly foreign market. Political instabilities, pricing variations, copyright violations and cultural differences are just a few of the many challenges companies must face when attempting to enter into the Soviet marketplace.

Although the current political and economic upheaval cannot be ignored, we have found that most Soviet organizations are eager to work with Western companies and continue their move toward a market economy. While the desire is there, however, the knowledge of such an economy is not. The Soviets have no concept of a competitive market.

Trained as order takers in a government-regulated economy, the Soviets have never had to compete on price, quality or service. Creating an advertising campaign or generating a sales lead, for example, are unknown tasks in the Soviet Union. As a result, a significant amount of time must be invested in teaching basic Western business practices.

Structural hazards

While the move to a market economy is on, much of the old structure remains. Even in the most stable of times, the Soviet infrastructure represents a maze of state committees, republic governments and town councils. Deciding which level to approach, and how, can have significant consequences.

For example, under a tax law passed by the Soviet parliament, companies pay a corporate tax rate of 45%. A different law passed by the Russian republic parliament calls for a 38% tax. At first, the choice seems obvious. Most companies would prefer to register in Russia and pay lower taxes. However, in doing so, a company limits itself to working solely in Russia, for there is little cooperation among the other republics. In addition, a company runs the risk of offending the central authorities, who control access to banking, transportation and supplies, among other things.

Even at the most fundamental level, business is hampered by an ancient and rapidly deteriorating structure. Many of the business mechanisms taken for granted in other parts of the world barely exist in the Soviet Union.

Outside of several major cities, no mail delivery system exists. Where there is postal service, theft is rampant. The most effective means of transporting goods is hand delivery. For example, one of Lotus' dealers in Siberia — where, believe it or not, there is a significant amount of business — must fly six hours to Moscow to pick up his orders of 1-2-3. Upon returning to his territory, the dealer delivers the product to his customers.

Telecommunications consists of a 1930s German telephone system. Placing an external call from within the Soviet Union requires reserving an international telephone line two days in advance. Even then, it is doubtful that the call will be placed, leaving a company's employees in the Soviet Union virtually incommunicado with the rest of the world.

The nonconvertibility of the Soviet ruble poses a catch-22 situation for Western vendors.



Sean Mathews

Selling for dollars ensures revenues at full value and the ability to get those revenues out of the country. However, very few Soviet buyers have access to foreign currency. Pricing in rubles also has limitations. Aside from rapidly decreasing value, the three ruble exchange rates make it difficult to place a relative ruble value on a product. At the official exchange, a $495 software package should be priced at approximately 15,000 rubles. This is a major chunk of cash for a Soviet organization trying to justify purchasing multiple copies from an official dealer, especially when a pirated copy sells for as little as 60 rubles.

Piracy represents both a major business barrier and a cultural barrier. Western companies are faced with the challenge of trying to sell in a market where copying software is not considered illegal. While many former Communist bloc countries have passed copyright laws, no such legislation exists in the Soviet Union. Piracy is rampant because the notion of private ownership does not exist. Soviets even take offense at the word personal, as in personal computer.

When the challenges are met, the rewards are many. We now have 45 dealers in 25 cities throughout the Soviet Union. In the first three months of Russian 1-2-3's availability, Lotus sold more than 1,000 copies of it. But an even greater reward lies in fulfilling a need and desire for products that aid the transition to a market economy.

Crummey is senior vice president of the International Business Group at Lotus Development Corp.

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"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

Mogens Sorensen
Chief Consultant
Hydrodit (Denmark)

op information systems with uctivity and maintainability.

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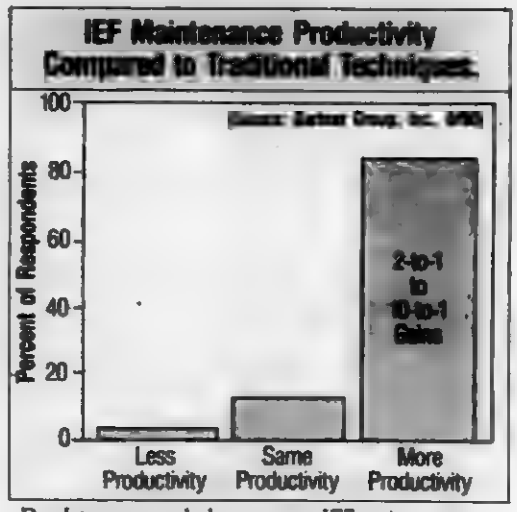
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC, and CICS) since early 1988. Soon you'll be able to develop systems in OS/2 and then automatically generate for other platforms. DEC/VMS, TANDEM and UNIX are scheduled for availability in 1991. More will follow. We are committed to increased environmental independence in support of the Open Systems concept.

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IEF tools and IEF-generated code will comply with standards as they emerge. We will adhere to CUA standards and to the principles of IBM's AD/Cycle and DEC's COHESION—and we will support Open Systems environments centering around UNIX. In any environment, the COBOL, C and SQL we generate adhere closely to ANSI standards. Our presence on standards committees helps us keep abreast of ANSI and ISO developments affecting the CASE world.

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Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

For more information, including a VHS video demo, call 800-527-3500 or 214-575-4404.
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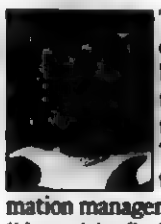
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COMMENTARY

Jean S. Bozman

All the same rules



The PC rebels of the 1980s had better put on their seat belts in the 1990s: They are about to hit the information management wall. As the "downsizing" of mainframe and minicomputer applications brings mission-critical applications to the desktop, the same rules of the road that governed the much-maligned "glass house" are still going to apply.

Case in point: Oracle recently announced that its Oracle Version 6.0 relational DBMS was available for Novell Netware 386 LANs housed on beefed-up MS-DOS machines [CW, April 29].

While it's true you can go down to Computerland and soup up your Intel 80386- or I486-based machine with more than 10M bytes of main memory and 80M bytes of disk storage to make it all work, those pesky RDBMS planning problems simply won't go away.

Hey, it's like you just left your DEC VAX in the clothes dryer too long. The hardware has shrunk down to size and is thus cheaper to buy. Now, at least some work-group users will have to learn to think like database administrators once Oracle 6.0 is running on a high-end machine. That means files must be labeled properly, naming conventions must be respected, and security levels must be established to access the all-important corporate data.

Network traffic must also

Continued on page 38

AS/400 upgrades' hidden cost

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

Into every major IBM announcement a few little "gotchas" must fall.

With the dramatically revamped Application System/400 line, customers will find a few unpleasant surprises once they have waded through the hoopla over lower prices and greater performance. Among them are the need to buy new memory and feature cards, a revised pricing scheme for future upgrades of the operating system and a performance degradation for users who run the new version of the operating system on older equipment.

What appears to be the most expensive "gotcha" is memory upgrades, which are mandated when users move from the older B and C models to the jazzy new D models.

"IBM is offering a financial trade-in based on today's memory products, not based on the price the customer originally paid," said Bill Sines, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "So if you have a $1,200 memory board that gets replaced with a $500 board, the credit you get is for $500 only."

Then again, memory that costs $1,125 per 1M byte on the older B models now costs $495 per 1M byte on the D models. While that drastically devalues a customer's current memory boards, it should make future purchases more palatable, analysts suggested.

"Many customers may feel betrayed by IBM, but it reflects the market realities IBM is facing," Sines noted. "They are offering an excellent deal, but there are several things in packaging and memory that can cost money to upgrade."

By far, the worst-case scenario will be for those customers who installed third-party memory on their AS/400s, because IBM is offering nothing but regrets when it comes to third-party memory trade-ins.

For Richard Deckard, vice president of data processing at Manheim Auto Auction Division in Atlanta, that "gotcha" will cost $9,900 per machine on 20 AS/400s with memory boards from EMC Corp. in Hopkinton, Mass. The auction company, which is in the midst of a 46-machine rollout of AS/400s, intends to upgrade those 20 machines to D models running the OS/400 Version 2 operating system.

"What that teaches me is [that] I'd better not buy any more EMC memory," Deckard lamented. "IBM sure got their point across to me."

Yet EMC plans to resolve the incompatibility problem for its customers, said John Ryan, an EMC spokesman. The vendor will swap out its own memory boards and give customers IBM

Continued on page 39

In the know

IBM added three knowledge-based software products for the Application System/400:

- Neural Network Utility/400, enabling users to find patterns and relationships among data elements in a database. One example: a finance company determining the credit worthiness of customers or suppliers within minutes of a query.
- Three new products in The Integrated Reasoning Shell, a knowledge-based platform for applications development. Programmers can use them to build business applications for OS/2, ADX/RISC System/6000, Personal System/2 and System/370 platforms.
- [illegible] from Syntek, Inc., which [illegible] applications for low-end [illegible] and AS/400s or port [illegible] and host

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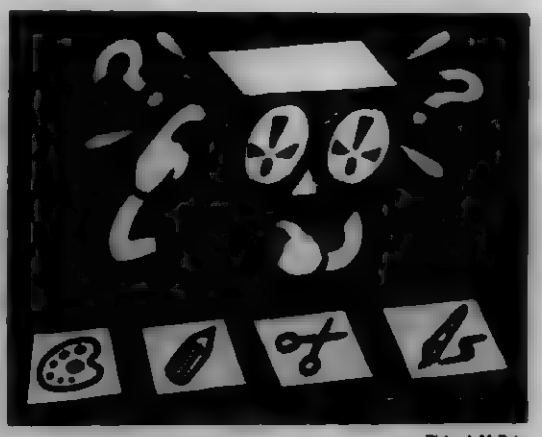
Trying to find a big-iron interface

BY JEFFREY N. FRITZ
SPECIAL TO CW

The need for mainframe access doesn't disappear when you begin working on a personal computer, but the process of achieving that access does become kludgier. Instead of the instantaneous and transparent connection offered by a dedicated terminal, PC users have to make a connection with the mainframe, and they're often stuck with a screen that doesn't behave in any way they're accustomed to.

This was not all that big an issue while character-based interfaces were the norm on PCs. However, with the popularity of Microsoft Corp.'s Windows 3.0 and the ever-increasing importance of Apple Computer, Inc.'s Macintosh, PC users are becoming accustomed to the friendliness of graphical user interfaces (GUI) and less tolerant of overly intricate DOS-style commands. Users are demanding graphical front ends for mainframe access, and corporate information systems shops are beginning to notice the GUI issue — and the problems that accompany it.

Continued on page 34



Richard McGuire



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A built-in feature of the product is that the DOS/VSE Label Area is relocated to the virtual disk. This area is one of the most frequently accessed in most DOS sites, so moving it to the virtual disk should result in significant performance improvement to the overall system, regardless of any other specific use of the virtual disk capability.

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Frank Fitzsimmons
Director, Judicial Information Systems
17th Judicial Circuit Court of Florida

The idea for IBM OfficeVision™ wasn't born in a Fort Lauderdale courthouse, but it could have been.

The story begins in 1986 when Florida's 17th Circuit Court started looking for ways to get their multiple systems behaving as one.

Says Frank Fitzsimmons, Director of Judicial IS, "It takes a lot of information to move a case through the courthouse, and we're the ones who funnel it. The trouble was, the big end of our funnel was too big and too complicated. We had office software on one platform, and data on another. And the files—the clerk's, the probation division's, the jury room's and others—were set up differently."

The plan.

So they mapped out a strategy for improving data access, communications and service for their 65 judges and staffs.

"We needed some standards, and since our data was mostly in an IBM MVS host, we installed IBM electronic mail and were making good progress at integrating applications.

"Then in '89 my IBM rep said, 'Let's go to a seminar.' The subject was OfficeVision, and I sat there amazed. It matched us so well it was like looking in a mirror. Yet it was going to be much easier, more flexible, and SAA™. We installed OfficeVision/MVS in 1990."

The entire judicial system is now using OfficeVision, mostly on IBM PS/2®s, connected by Token-Ring LANs. Along with E-mail, calendaring and other office functions, it works with both DOS and OS/2® software, plus CICS applications in three regions on the host.

The present.

According to Mr. Fitzsimmons, users and the IS people have both come out ahead.

"It's made life easier for all of us. OfficeVision lets us integrate PC and host applications—across all regions of the mainframe—without making users log on and off all the time. Also, we can customize menus almost instantly. Users see only what they need, and training is easier. We have a help desk, but it almost never gets calls about OfficeVision.

"This place was a paper mill, but no more. And our ability to communicate with each other—remember, we manage the case flow of 65 judges—is vastly improved. Since OfficeVision arrived, we've continually increased our application portfolio and usage goes up 20% every year. That's because people are getting information faster and more easily."

The future.

Frank also has some thoughts on investment protection.

"In government, you buy things a little at a time. You can't upset the applecart too much. That's what's great about OfficeVision—it wasn't a shock to our system, it fit right in. We're running it with brand-new OS/2 machines and 10-year-old DOS PCs. And we're integrating applications that were written by independent groups around the county.

"And as an SAA application, OfficeVision gives me comfort for the future. There have been skeptics, I know, but SAA is real. It lets me look down the road and see around the corners, to know what'll be there.

"As I said, this is government. If you make mistakes, you live with them. For us, OfficeVision was no mistake."

To learn more about the 17th Circuit Court's OfficeVision installation, call IBM at 1 800 IBM-6676, extension 857.

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SOFT NOTES

Docufile available

San Diego-based **Docufile, Inc.** has announced that the Docufile data management optical file server software is now available on IBM's RISC System/6000 platform. According to the vendor, the file server connects directly to existing IBM networks and supports multiple jukebox configurations with up to 5 terabytes of data spread over thousands of optical-disc cartridges.

In other image technology news, **Bull HN Information Systems, Inc.** in Billerica, Mass., introduced an imaging module for its computerized Public Safety Management System. The Imageering Mugmaster Electronic Suspect Image System was designed to aid law enforcement officials in capturing, storing and quickly identifying the images of suspects. It replaces convential film-capture image verification. The Imageering package operates on Intel Corp. 80386-based personal computers.

Stardent Computer, Inc. recently reached agreements with **IBM, Cray Research, Inc.** and **Sun Microsystems, Inc.** to port Stardent's Application Visualization System to computers made by those three vendors. With the addition of the IBM RS/6000, Sun Sparcstation and Cray X-MP and Y-MP families, the graphics and visualization package will run on systems from nine vendors.

Disaster plan helps Fed bounce back

IS operations shifted, functions restored after flood destroys mainframe

BY MICHAEL FITZGERALD
CW STAFF

MINNEAPOLIS — A water main break that destroyed a mainframe at the Federal Reserve Bank of Minneapolis last month did not drown the region's financial institutions because of a Federal Reserve System contingency plan.

"The vast majority of institutions took things in stride — there were not delays in giving credit to customers," said Fred Laing, executive director of the Upper Midwest Automated Clearing House Association (UMACHA). "I think the banking industry did a lot to help here, in terms of making sure both retail and corporate customers were made good on funds [the banks] knew were coming through."

Disaster Recovery

Laing said the biggest inconvenience during the first few days was the bank's public insistence that no delays were occurring, when in fact transactions were delayed, though not seriously.

"It was more of a public relations thing than anything else," Laing said.

A case of backup

When the ceiling water main broke at 1 a.m. on April 8, data service immediately shifted to the bank's backup site in Culpeper, Va., according to Chris Power, media representative at the Minneapolis Federal Reserve. Power said data being processed at the moment of the outage was lost but later recovered successfully.

The Minneapolis Federal Reserve's Amdahl Corp. mainframe handled automated clearinghouse functions for financial institutions in Minnesota, North Dakota, South Dakota, Montana, northwestern Wisconsin and Michigan's Upper Peninsula area. Other bank computers were unaffected, except for one Digital Equipment Corp. machine that handled electronic mail, which was up and running later the same day.

Institutions that deal with the bank entirely on-line were largely unaffected by the death of the mainframe, Power said. But institutions still using paper and large commercial institutions that took advantage of the data transfer speed of magnetic tape were slowed significantly.

But at least one institution that is entirely on-line with the bank suffered some delays for a couple of weeks.

The Metropolitan Federal Bank FSB in Fargo, N.D., did not regain full processing capabilities until April 22, according to J. B. Berg, Metropolitan's assistant vice president.

"It definitely slowed our processing down," Berg said. Transactions normally processed in the morning did not get done until afternoon or evening. Berg added that "it didn't affect our customers at all, just settlements."

> "THE VAST MAJORITY of institutions took things in stride — there were not delays in giving credit to customers."
>
> FRED LAING
> UMACHA

Laing said paper and tape transactions are still delayed at least one day but noted that the region's major banks used their own contingency plans, which included converting tape files to electronic data, and thus avoided delays. Otherwise, the impact of the problem was slight.

The National City Bank of Minneapolis, which is held by National City Bank Corp., had some employees work overtime for several days, said Donald Kjonaas, senior vice president of operations for the bank. Kjonaas said the overtime was needed to ensure all transactions were processed correctly.

Laing said processing returned to normal for most area institutions on April 11, after the bank decided to double the number of lines coming into its Culpeper backup site. Prior to then, two- to four-hour delays in connection were not uncommon, he said. The mainframe in Culpeper also went down for a short time during the first two days.

The most direct impact suffered came from direct-deposit payments that were not made on time and did not register on automated teller networks. Laing said that in many cases, financial institutions operated on trust and established relationships to honor payroll checks and complete deals.

HP establishes life-support center for aging software

BY J. A. SAVAGE
CW STAFF

ROSEVILLE, Calif. — Where does aging software go when it is on its last legs? Some vendors unceremoniously send it to an unmarked grave, leaving users to mourn their investment in new software.

However, Hewlett-Packard Co.'s customers recently persuaded the company to put some major software packages on life support. HP said it was going to cut off maintenance for its Rapid and Transact products.

"Customers came to us and said they would be willing to pay more just to keep them around," said Tony Engberg, research and development laboratory manager at HP's Advanced Systems Division Software Technology Center.

That was eight months ago. "Users told us they had made large investments in the software, and they saw no need to migrate to new platforms and packages," Engberg said. He and other HP officials were taken aback by the strength of customer reaction to their decision, so after reviewing its original decision, HP made an about-face.

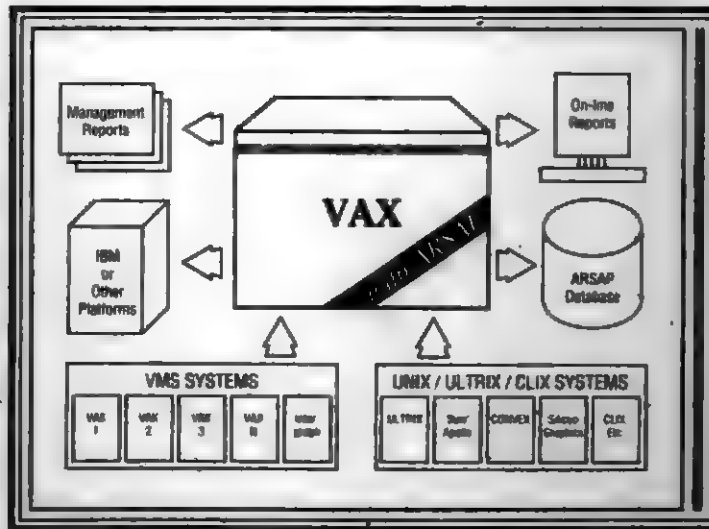
It assigned those packages that run on the company's "classic" or complex instruction set computers, as well as the MPE V operating system for those platforms, Allbase 4GL and Business Report Writer, to Roseville for continuing life support and enhancements. In the last six months, the center has grown from 35 to 135 engineers.

Higher fees

While customers have agreed to pay higher fees for services they request, HP has not yet added any premium, according to Susan Cook, product marketing manager at HP's Application Support Division. "On some very localized products, we might ask for more," she said. She added that it was too early to tell whether the change of heart will cause an increase in maintenance renewal rates.

"The fundamental premise is that if you do the right thing for customer satisfaction, it should also make a good business decision," Cook said.

However, it is costing the vendor some capital up-front to keep this software alive. "HP made the decision to get out of the business, and that software just languished for maybe six months," Engberg said. "During that time, it doesn't just sit there; it gets messy and it takes an investment in additional head count to fix it up."



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Big-iron

FROM PAGE 29

Once users accustomed to GUIs enter a mainframe session, life changes dramatically; suddenly, they are confronted with a radically different interface. This is a problem not only on the corporate mainframe but also with mainframe-based on-line bulletin board services. A few, such as America Online and Applelink, provide an intuitive graphical interface, but most do not. Mainframes expect command-line or, at best, function-key input from the user. That means the user has to perform mental gymnastics to interact with the mainframe: "Let's see, I use F3 to quit, and I press F5 to send electronic mail messages, but I use F11 to read incoming E-mail." Clearly, this is not a very intuitive way of computing.

Terminal emulation software is usually not much help either. Most emulation interfaces are not very graphical. Even emulators that are written expressly for graphical interfaces often lack GUI features; such emulators use a character-based interface running inside a graphical window. Users complain that the emulation interfaces are not consistent with the other GUI programs they use every day.

To be fair, IS managers do have worries other than arranging a GUI for their mainframes. They have to be concerned about guarding valuable mainframe CPU cycles and ensuring that interface conversion software does not place a heavy burden on the system. IS directors argue that if excessive mainframe cycles go into front-end conversion, serious processing shortages can result elsewhere. Preventing this usually means doing the graphical conversion on the local PC.

Unfortunately, this solution has similar drawbacks. CPU cycles, in this case from the user's microprocessor chip, are necessary to do the conversion and must come from somewhere.

Implementing GUIs

There are two approaches to implementing graphical front ends. The intrusive front-end approach requires programmers to write front-end code on the host. This code is interspersed with host application code. GUI support is largely done on the mainframe side.

On the other hand, nonintrusive code leaves the host code intact. The interface coding is done on the PC or Macintosh. Although this approach lightens the load on the mainframe, many IS programmers are not PC- or Macintosh-literate.

Some attempts have been made to balance loads between the mainframe and local computer. For example, the Apple Terminal Service (ATS) protocol, which should soon run with non-Apple interfaces, provides a high-level message passing environment. The host programs control — but do not support — the graphical windows. Printing and filing are also handled by the local CPU. The arrangement has been used successfully in several university environments. For example, the University of Michigan and Baylor University both support campuswide graphical interfaces using ATS.

Apple has also addressed the GUI issue with Macworkstation, a distributed user interface that gives host applications the look and feel of desktop GUI applications. It runs as a server application on a local Macintosh that understands ATS. The Macintosh provides all desktop services for the host application. Apple says IS departments and systems integrators can use Macintosh-style windows, pull-down menus and dialog boxes within their host-based applications. However, IS departments must still write mainframe code to accompany the tools provided by Macworkstation.

The cries of GUI supporters are also being heard by third-party software and hardware developers. With many more users clamoring for intuitive front ends, several vendors have set out to find a better way of providing user interfaces for main-

GUI-bound

Not all companies duck the issue of a mainframe GUI. Southern New England Telephone (SNET), which has been primarily a DOS shop with 3,000 PCs and 400 Macintoshes, has made it a priority to get an interface that will work across all of its platforms, says Ben Sevier, desktop technology consultant at SNET.

Sevier has been frustrated in his efforts to find a mainframe GUI that embraces multiple platforms. "We have a large number of old but stable programs that run on VMS and VM systems. We want to keep the programs but replace the interface. Vendors have promised us cross-platform GUI solutions, but it is very hard to find those who can actually produce such solutions," he says.

However, IS departments are often averse to the idea of supporting GUIs on mainframes or writing GUIs to front-end mainframe applications. Harry Leverette, information resource coordinator at the Harris County (Texas) Criminal Courts, encountered great reluctance when he proposed adopting a graphical interface for Macintosh connectivity to an IBM 3090.

"The initial response of our MIS department to graphical front-ending was less than encouraging. They pointed out that modifications to host applications occur so frequently that front-end development couldn't possibly keep pace. They also argued that using custom front ends would undermine the consistency of the host application and disorient our users as they move around in the organization," Leverette says.

JEFFREY N. FRITZ

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If HP LaserJet FAX devices are installed at both ends, you can send and receive faxes that are identical to the originals. And because you print on plain paper, you won't have to contend with the curling thermal paper that jams in your copier. You can also transmit to a traditional fax machine with improved quality.

The best part is that you can get all of this from your existing HP LaserJet printer. To receive a sample fax, and to find the location of your nearest authorized HP dealer, call 1-800-752-0900, Ext. 2295.

frame communications. A package called Masquerade from Connectivite fully supports a GUI mainframe interface for the Macintosh, although users must create their own screens through a Macdraw type of interface. Mitemview, by Mitem Corp., is a GUI front end that is compatible with several IBM 3270 emulation cards. Mitemview will work with the Macmainframe card from Avatar Technologies, Inc. as well as Simware, Inc.'s Simmac and Apple's MacDFT hardware.

Such interfaces provide a decent solution to the GUI problem but not without cost. Ben Sevier, desktop technology consultant at Southern New England Telephone in New Haven, Conn., says, "Masquerade does a good job of integration with the Mac interface, but there is a performance penalty exacted by the behind-the-scenes processing." Sevier reports experiencing much the same problem with user-designed Hypercard front ends.

Not all agree. Harry Leverette, information resource coordinator at the Harris County Criminal Courts in Houston, sees it slightly differently: "Masquerade appears to be an exceptionally quick development environment. Because it uses the Mac interface instead of a scripting language to build front ends, the whole process is comparable to building a database. Of course, the few MIS representatives whom we have enticed into a demo of our graphical interfaces still think we're hiding the code somewhere."

There is beginning to be some development of interfaces for platforms other than the Macintosh. For example, ALAC by United Data Corp. is a Windows ATS-compliant server that provides PC users with a graphical interface. XMWS, from Integrated Solutions, Inc., provides similar support for X Window System workstations. For asynchronous PC users running Windows, Digital Communications Associates, Inc. offers Crosstalk for Windows. Other GUIs are sure to follow.

The task facing GUI enthusiasts is to convince IS personnel that the work required to produce and support a graphical interface is worth the effort. Leverette says: "Really, the responsibility for [GUI] innovation rests with end users, and it's up to us to articulate a vision that MIS can share and support."

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

Interface laser to meld IBM, HP capabilities

BY CAROL HILDEBRAND
CW STAFF

ANN ARBOR, Mich. — Hoping to please all of the people all of the time, Interface Systems, Inc. announced an IBM-compatible mainframe and midrange laser printer based on the same engine that drives Hewlett-Packard Co.'s popular Laserjet printer.

The ISI 7028, which is aimed at the IBM 4028 printer market, supports IBM's Intelligent Printer Data Stream (IPDS) page description protocol, the standard protocol for Systems Application Architecture (SAA), as well as Advanced Function Printing, the presentation component of SAA.

The printer can be connected to a host via internal coaxial or twinaxial interfaces and can also port to personal computer or local-area network connections, allowing it to be shared by several systems.

According to Hal Davis, marketing manager at Interface, the printer will automatically switch among the systems. It will also print double-sided pages, which the 4028 cannot do, he said.

Davis added that with the mainframe printer market moving increasingly toward distributed printers, a large, 200 page/min printer in the data center does not always make sense. "Just because it's a mainframe print job doesn't mean it's a thousand pages long," he said.

The added familiarity of the Laserjet engine should also be a draw, Davis said.

"Since it's familiar to people, they already know how to take care of it, what paper works and what doesn't work," he said.

Industry analysts were not in full agreement, however. According to Mark Boer, senior market analyst at BIS Strategic Decisions in Norwell, Mass., the market is somewhat limited. "There are others out there making IPDS printers," he said.

The printer, which the company said should be available in July, will sell for about $5,000.

NEW DEALS

MIT to get VAX 9000

Digital Equipment Corp. will be providing a VAX 9000 high-performance vector computer to **MIT** in Cambridge, Mass. The $3.8 million computer will be delivered as part of a research agreement with MIT and will include disk storage, connectivity equipment, Version 4.2 of the DEC Ultrix operating system and several layered software products. According to Professor James D. Bruce, vice president of information systems at MIT, the system will be used for a variety of scientific applications as well as for economic research.

The Budapest Bank, the third largest commercial bank in Hungary, has purchased a Bull 7000/310 computer from **Groupe Bull** in Paris. The contract, valued at about $7 million, also includes 60 Bull DPX/2 systems and clusters of Bull Questar 310 terminals. Deliveries are scheduled to begin in the second half of 1991.

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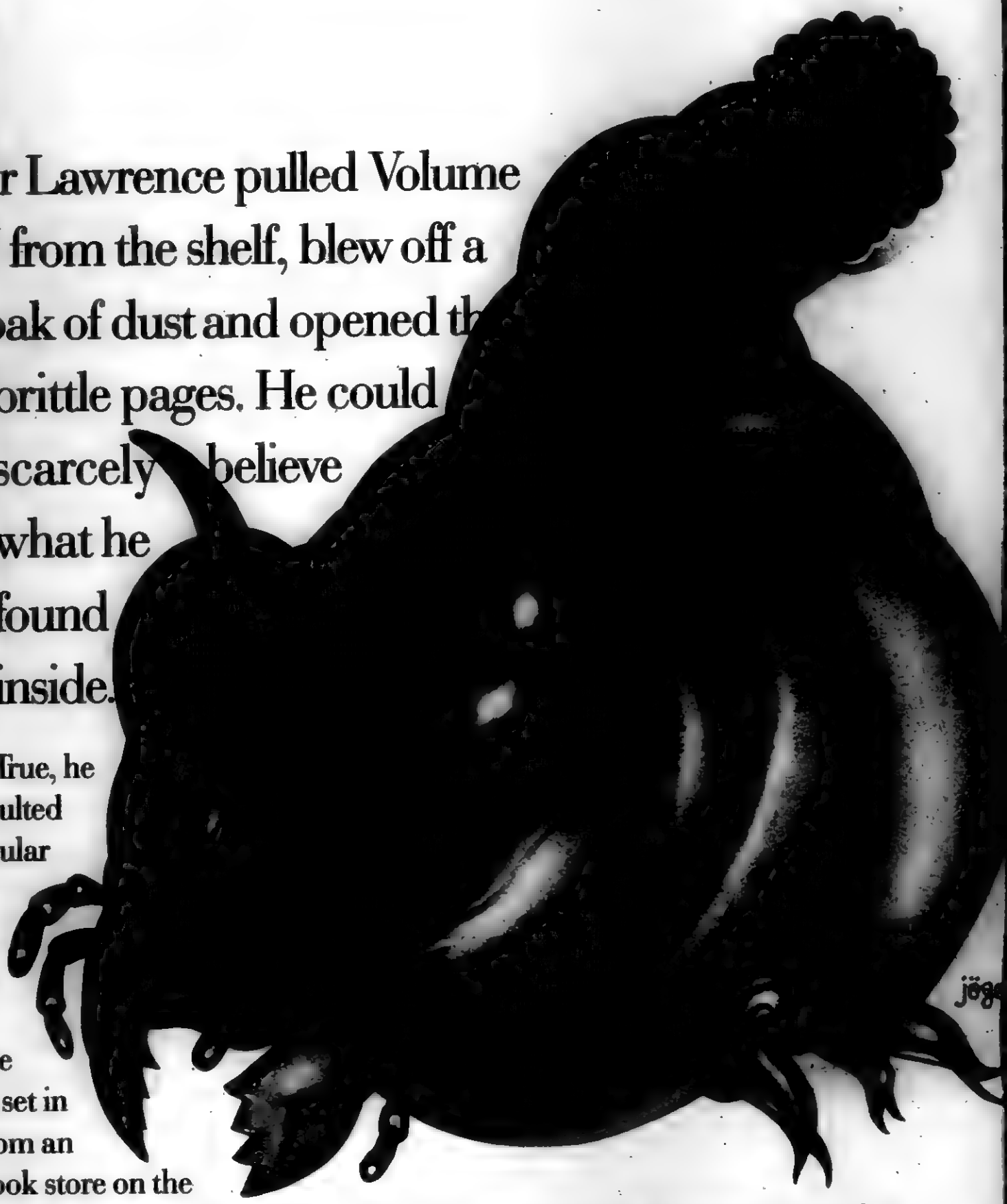
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HEWLETT PACKARD

Sir Lawrence pulled Volume IV from the shelf, blew off a cloak of dust and opened th brittle pages. He could scarcely believe what he found inside.



True, he hadn't consulted these particular journals in years and, admittedly, he had acquired the ten-volume set in his youth from an odd little book store on the Thames, but still! Holes!? A bookworm had eaten clean through the pages. Indeed, to Sir Lawrence's considerable chagrin, he found the ravenous little bugger had chewed, in a straight line, from the front cover of Volume I to the back cover of Volume X.

All of which brings us to our seemingly simple question: If each book is exactly two inches thick, how far did the bookworm travel?

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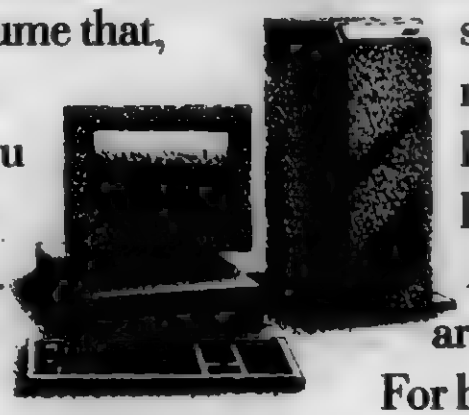


In tussling with this type of cerebral aerobics most people make a simple but serious error: They *assume* something. Of course, this happens without realizing it. But still, it happens.

As you'll see in a moment, the way to avoid making a false assumption is to work things out methodically. Carefully thinking through each step.

For instance, consider this question. A company makes one of the broadest lines of computer terminals in the world. They have for years. In fact, they've delivered over three million of them.

If you needed terminals you'd probably think of them. But what if you needed PCs? Would you assume that, since this company is so dominant in terminals, they must not do a real number in PCs?



Tsk, tsk. Have you learned nothing?

Well, as you may have *correctly* assumed, the company in question is Wyse. And if you've been assuming we don't have an impressive array of powerful, priced-right PCs it would be a shame. For both of us.

Consider our new Decision Series. Four models that offer a rich set of features. Generous power supplies, three styles of ergonomically advanced chassis, multiple configurations, popular Wyse-designed keyboards, aggressive pricing and bundled DOS 4.01.

The Decision Series PCs: 386sx/16s (shown), 386sx/20, 486/25, 486/33e (shown). Advanced ergonomics, finicky attention to detail, exceptional power for the dollar.

For starters.

Of course we realize there's a good chance some of you may have read this far because you're more interested in the answer to our puzzle than in our products. You've *assumed* we'd bury the answer down here somewhere. Well, you're wrong again. At least partially. So go look on page 90.

To learn more about our Decision Series PCs call us. We'll send you complete specs plus a poster of additional Cerebral Aerobics. To help keep your original equipment personal computer in top form. 1-800-GET WYSE.

Now that it's clear we make an impressive line of PCs, you might be tempted to assume we stop there and don't get into the even more sophisticated products like super fast multiprocessing systems for the UNIX environment. With speed in the 100 MIPS range.

But you wouldn't assume that after all this. Would you?

WYSE

You're doing it again. Just because this little type is down here and printed upside down you assumed you'd find the answer this easily. No way. San Jose. Refer back up to the ad and your patience will be rewarded.

Bozman

CONTINUED FROM PAGE 29

be controlled by deciding how much data will be generated and stored locally by the work group — and how much must be accessed from the enterprisewide data network.

The very same "warning label" about LAN database servers could apply to a variety of OS/2 server products, including the Microsoft Corp./Sybase, Inc. SQL/Server, Gupta Technologies, Inc.'s SQLbase and even Oracle's Oracle Server for OS/2.

Industry analysts such as Stuart Woodring at Forrester Research in Cambridge, Mass., think a lack of proper development tools and third-party support kept OS/2 database servers from taking off.

Even though Novell, Oracle and third-party systems integrators say they're standing by to help in case of a work-group RDBMS emergency, there's a lot you must do for yourself. That could include archiving daily copies of the database and scheduling batch updates from other hosts, such as DEC VAXs and IBM mainframes. Either there are going to be a lot of DBMS training classes for end users who want to acquire these skills, or there's going to be greater cooperation among work-group LAN managers and central information systems applications developers.

NOW, AT LEAST some work-group users will have to learn to think like database administrators once Oracle 6.0 is running on a high-end machine.

Will end users take the time to think all these problems through? Not right away, if experience serves as a guide. Rather, the problem will creep up on LAN managers as servers for 10 people grow into servers for 30, 40 or 50 people. Let's call that process "upsizing" from now on, for the ability to outgrow one's PC applications — including a PC database.

Oracle planners recommend trying out their new Netware-compatible system on a single machine — the same MS-DOS computer that also acts as a LAN file server. But large user logon lists will inevitably prompt system reconfiguration, Oracle product manager Doug Laird says, and that means database and file-server functions must be split between two LAN machines.

So, PC revolutionaries of the '80s, take note: You have reached a watershed in your relationship with IS managers. You broke away from the glass house and performed history's greatest end-run in computing when you acquired your own CPUs. You said the glass house was hopelessly mired in applications development. You were absolutely right. But now that the power to host databases falls into your hands, you may finally call on the IS establishment for help — or at least for guidelines on how to proceed. It's about time.

Bozman is *Computerworld*'s West Coast senior editor.

Bull HN announces high-end storage options

BY SALLY CUSACK
CW STAFF

BILLERICA, Mass. — When Bull HN Information Systems, Inc. added several new mainframe computers to its 9000 series recently, it used the opportunity to introduce several mass storage subsystems and a cartridge tape library.

Targeted at users with large-capacity storage requirements, the Bull MSU8390 disk drive series is available through an OEM agreement with IBM.

It is comparable to the IBM 3390 series of drives and is offered in five models providing as much as 121.2G bytes of high-end storage capacity.

This includes two head-of-string units and three secondary units, which can be attached to the DPS 9000 via a 4.5M byte/sec. channel on a Bull controller.

Pricing ranges from $130,500 for the MSU8390 head-of-string unit with 7.568G bytes of unformatted storage capacity to $283,300 for the 22.704G-byte MSU8394 secondary disk drive.

Roy McRee, general manager at Graybar Electric Co. in St. Louis, recently ordered several IBM 3390 disks for the company's Bull 9000 system.

He said he anticipates ordering the Bull products next year as the necessary system software becomes available for Graybar's particular platform configuration.

The newly announced Cartridge Tape Library System, supplied by Storage Technology Corp., stores as many as 6,000 tape cartridges.

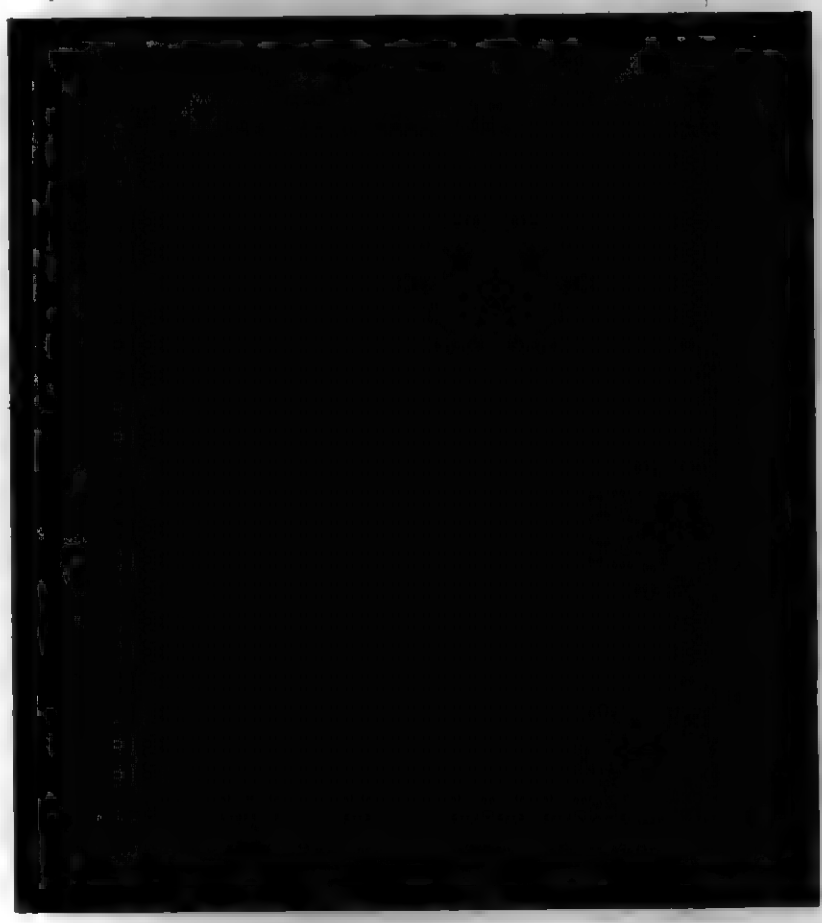
Minimum configuration prices range from $470,635 for a 3,000-tape library system to $554,635 for a 6,000-tape configuration.

The Los Angeles County Office of Education, which now uses reel tape technology, indicated it has no plans to upgrade disk storage at present but is interested in experimenting with tape cartridges.

SANDRA KURTZIG CEO OF ASK COMPUTER SYSTEMS

"If GUI application developers could be ten times more productive, what would that do for client-server computing? We're about to find out."

In December, 1990, ASK Computer Systems acquired Ingres, the acclaimed manufacturer of intelligent relational database products. Here, CEO Sandy Kurtzig discusses the dramatic productivity increases reported by developers using INGRES/Windows 4GL, the first complete application development environment for graphical user interfaces:



"I don't see how anyone can keep from getting as excited as we are about client-server computing. The amount of information it puts at the fingertips of the end user is just phenomenal.

"You'll drastically reduce the code you now have to write."

"Of course, that much information can be frustrating—even useless—without an easier way of viewing it. That's where graphical user interfaces are coming into their own. They make vast amounts of data easy to work with, and quick to comprehend.

"But writing GUI applications using a conventional programming language is incredibly tedious. It requires hundreds of thousands of lines of code—60 percent of which do nothing but

Object-oriented firms blend assets

MOUNTAIN VIEW, Calif. — East met West in a joint development and marketing agreement between two prominent object-oriented technology companies. Parcplace Systems, Inc., based here, and Object Design, Inc. in Burlington, Mass., said recently that they would work to integrate Parcplace's Objectworks C++ object-oriented language with Object Design's object-oriented database management system.

Together, the products will link object definitions with storage in Object Design's Objectstore DBMS, which runs on many Unix workstations.

Complex data objects could be retrieved for reuse in new applications programs as well.

Objectworks C++ includes a source browser with multiple views, AT&T's C++ Language System Release 2.1, a built-in debugger and a mouse-oriented editor.

The Objectstore DBMS, priced between $2,000 and $6,000 per end user, is aimed at computer-aided design/engineering, simulation and imaging applications, among others.

Objectstore is used by several large end-user organizations, including aerospace and chemical companies.

JEAN S. BOZMAN

AS/400 upgrade

CONTINUED FROM PAGE 29

memory. The EMC users can then trade in that IBM memory for D model memory. Once EMC comes out with its own D model memory products — in three to six months — the vendor will make another swap and replace the IBM memory with EMC products, Ryan said.

Follow that?

Another minor annoyance for IBM customers may crop up with the feature cards on the new high-end machines. Users moving to D50 and larger models will find that some feature cards — such as the magnetic storage device controller and certain communications lines — will not transfer from the older models, said Tony Membrino, an analyst at Technology Investment Strategies.

"The original prices on these cards may have been as high as $3,000 or $4,000, so it's not a lot of money," Membrino said. "IBM is offering 50% price reductions on the new feature cards, but that reduces the price of what the used B model feature cards will bring."

USERS WHO DALLY beyond September 1992 will have to pay for an operating system upgrade.

IBM is also determined to upgrade a substantial number of the 100,000 installed AS/400s to the new machines. Users who dally beyond September 1992 will have to pay for an operating system upgrade — a first-ever event in the IBM midrange.

Finally, it is unclear how much tweaking will be necessary to move applications from the B models to the D models, despite their object compatibility.

"One of our concerns is that we're getting the [Model D80] machine before some of our smaller software vendors get one," said Eric Corbman, director of development at Tiffany and Co.'s data center located in Parsippany, N.J. "If there are problems, we'll have to fight them ourselves."

Whatever "gotchas" may exist for the D models, however, may not count for much when users consider cost of ownership, according to Robert Djurdjevic, president of Annex Research in Phoenix. He said he figures the three-year cost of hardware, software and service for a B35 model to be $50,400, while a D35 would cost $57,800 for the same period. "Still, you have a 43% increase in performance for a less than 15% increase in cost," Djurdjevic noted.

INFORMATION SYSTEMS FOR BUSINESS

produce the GUI itself. Add that to the problems of accessing data from multiple sources, a shortage of developers, and a steep learning curve for existing GUI tools, and you're talking a huge investment of time and money. No wonder client-server applications have been so slow in coming.

"A product that makes programmers up to ten times more productive."

"Well, all that's going to change once developers get their hands on INGRES/Windows 4GL—a tool that helps programmers be up to ten times more productive. At least, that's what some of our customers tell us.

"For starters, INGRES/Windows 4GL allows you to use a mouse to interactively build windows and menus without writing a line of code. Then you assign functions to those components using a very elegant fourth generation language, which a good 3GL programmer can learn in a week or less.

"So, applications that once required thousands of lines of code now take far fewer.

"Unlike simple screen painters and HyperCard-like tools, INGRES/Windows 4GL is designed for full-scale production applications. It helps you manage and coordinate multiple development teams. It even tracks different versions of your applications throughout the company. No wonder it's now being used to create sophisticated applications like shop floor control and critical care medical systems.

"Portability is one of this tool's most profound breakthroughs. An application you create in, say, OSF/Motif will be able to run flawlessly on Windows 3.0, Open Look and other popular systems. With the appropriate look-and-feel in each environment. With full interoperability with other applications. And with no rewriting.

"Your applications will also link seamlessly to the whole range of Ingres products, and—thanks to INGRES/Gateways—to other leading databases.

"Think about it: Client-server applications with GUIs and full portability, in a fraction of the time. This could be the product that finally opens up the workstation for mainstream commercial applications.

"I think it's fair to call it revolutionary."

INGRES/Windows 4GL supports Sun SPARC, DEC VAXstation/VMS, DECstation/ULTRIX, HP 9000, IBM RS/6000, and other major workstation platforms. To learn more about INGRES/Windows 4GL, call 1-800-4-INGRES.

Ingres

In December, 1990, Ingres Corporation was acquired by ASK. For more than ten years, Ingres has been a worldwide technology leader in database management systems. The family of Ingres products includes: the first intelligent relational database; the first Windows 4GL development toolset; gateways to the most popular non-Ingres systems; powerful desktop solutions; and global customer support. Ingres' reputation for technological excellence was most recently confirmed by Digital Review—the magazine's 1990 Editor's Choice, Best Database Management Software, and Best Database Tools awards went to Ingres—as did the Sun Observers' excellence award for Best Database Management System.

ASK
SOLUTIONS AT WORK

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IAAI-91

NEW PRODUCTS — HARDWARE

I/O devices

Lansystems, Inc.'s Network Products Division has announced a print server designed to support the high-speed graphics printing features of Hewlett-Packard Co.'s Laserjet IIISi printers.

Lanspool SI operates in conjunction with the Laserjet IIISI's Token Ring or Ethernet network interface cards to send data directly to an SI printer at the printer's operating speed of 100,000 char./sec.

The product is priced at $395 per printer. HP is now bundling a test version of Lanspool SI with every network printer interface card for the Laserjet IIISI printer.

Lansystems
300 Park Ave. South
New York, N.Y. 10010
(801) 379-2200

Printek, Inc. has announced a series of printers designed for environments that print various multipart forms, such as purchase orders, invoices and bills of lading.

The Formspro 4000 series includes Model 4003, a device that allows three forms to be continuously loaded through a straight-up paper path.

The printers feature a 400 char./sec. drafting speed that enables users to print a 1,000-character form in less than six seconds, the vendor said.

Pricing ranges from $2,595 to $3,295, depending on type of model. Twinaxial and coaxial interfaces are available at additional cost.

Printek
1517 Townline Road
Benton Harbor, Mich. 49022
(708) 200-7705

Printronix, Inc. recently announced the P9012-CH Line-Matrix Printer for operation in the IBM System/370 channel environment.

The product prints at speeds of up to 1,200 lines per minute and includes standard features such as multinational character sets and a ribbon-quality monitor.

Options are available to extend ribbon life, improve paper handling and simplify printing of forms.

The price of the Line-Matrix Printer is $21,495.

Printronix
17500 Cartwright Road
Irvine, Calif. 92713
(714) 863-1900

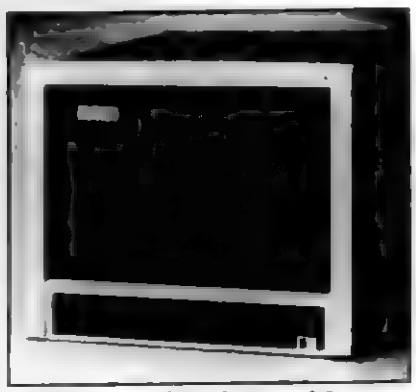
Data storage

Micro Technology, Inc. has introduced the MDI-79 Series drives for Digital Equipment Corp. VAX/VMS environments.

The drives recognize all VMS disk commands and support all DEC diagnostics, according to Micro Technology. Average disk access time for the series is reportedly 20.6 msec.

Pricing ranges from $9,872 to $33,372.

Micro Technology
5005 E. Hunter Ave.
Anaheim, Calif. 92807
(714) 970-0300



The enhanced Wide Word System 2000 *offers up to 2.5G bytes of RAM*

The Wide Word System 2000 solid-state mass storage product line has been upgraded by Dataram Corp.

The enhanced products offer up to 2.5G bytes of random-access memory capacity in a single chassis, with 160-bit wide word architecture and 32-bit addressing. The systems can be daisy-chained. Models with 200M- or 400M-byte/sec. data retrieval bandwidth are available.

Pricing starts at $43,000.

Dataram
Route 571
Princeton Road
W. Windsor Township, N.J. 08543
(609) 799-0071

Processors

Aptec Computer Systems, Inc. has announced the VSP-2, a vector/scalar processor for its IOC-100 and IOC-200 high-performance Digital Equipment Corp. VAX/VMS environment computers.

The Aptec I/O computers (IOC) manage data transfers via a parallel bus at throughput rates of up to 200M byte/sec. The add-in VSP-2 board gives IOC systems computational power of 150 million floating-point operations per second. IOCs connected to VMS systems and peripherals boost overall system speed by supplying high-speed data streams, according to Aptec.

The VSP-2 costs $60,000.

Aptec Computer Systems
8405 S.W. Nimbus Ave.
Beaverton, Ore. 97005
(503) 626-8000

Digital Equipment Corp. has announced the VAX 4 upgrade program for Microvax II and Vaxstation II/GPX systems users.

The board-level upgrade will increase performance more than 5.5 times while allowing users to retain existing I/O and storage options, according to DEC. The plan requires trading in the current processor and memory module, according to the vendor.

Pricing for the upgrade ranges from $14,000 to $50,000.

DEC
Digital Drive
Merrimac, N.H. 03054
(603) 884-8900

SOFTWARE

Development tools

Software Components of Colorado, Inc. has announced Destiny, a portable C language programming library.

Destiny includes more than 150 reusable C language functions grouped in categories such as calendars, financial calculations and character strings. The product is currently available for VAX/VMS, RISC System/6000 AIX, PC-DOS and The Santa Cruz Operation's SCO Unix systems.

Licenses are priced from $175 for a single-user personal computer to $2,990 for a large Digital Equipment Corp. Vaxcluster. There are no royalty charges for software developers.

Software Components of Colorado
6575 Denim Drive
Colorado Springs, Colo. 80918
(719) 531-6940

Utilities

Vista Control Systems, Inc. has announced Vsystem, a networked data acquisition and control software package for Digital Equipment Corp. VAX/VMS and VAX/ELN environments.

The graphical product is built around an extensible real-time database of access routines. Other components of the package include a database generating utility, a data output logger, an alarm message system and a command sequence controller usable by nonprogrammers.

Vsystem is priced by individual component. For a typically configured system, the product can be implemented for less than $25,000, according to the company.

Vista Control Systems
134-B Eastgate Drive
Los Alamos, N.M. 87544
(505) 662-2484

SAS Institute, Inc. has added Projman, a project management menu system, to the company's Applications System software package.

Projman offers a point-and-shoot environment for data entry, project scheduling and high-resolution graphics report design and output.

The menu system is available free of charge to users of SAS/OR, the project management component of the SAS Applications System.

SAS Institute
SAS Campus Drive
Cary, N.C. 27513
(919) 677-8000

Compuware Corp. has introduced CICS Radar 3.1, a systems failure locator package.

Version 3.1 supports IBM CICS architecture Release 3.1.1, as well as previous releases of CICS. It displays and analyzes information relevant to regional systems failures. According to Compuware, the product supports a variety of IBM dump formats and includes its own Fast Dump feature.

A site license costs $25,100.

Compuware
31440 Northwestern Highway
Farmington Hills, Mich. 48333
(313) 737-7300

Applications packages

Extol, Inc. has begun shipping the Extol EDI Integrator for the IBM Application System/400.

The electronic data interchange (EDI) management product includes an event-driven high-speed translator, code translation capability and support for all major EDI standards and conventions based on X.12 or Edifact syntax. All major networks are reportedly supported. According to Extol, the Integrator facilitates the integration of EDI with the user's application database.

Pricing starts at $10,000, including one year of maintenance.

Extol
99 North Line St.
Frackville, Pa. 17931
(717) 874-0695

Information Builders, Inc. has released Foccalc 2.0, a spreadsheet integrated with Focus 6.5, the company's multiplatform, fourth-generation development language.

According to the company, Foccalc 2.0 provides numerical analysis and spreadsheet formatting comparable to that of microcomputer-based spreadsheets. The integration with Focus gives Foccalc users access to data in IBM's DB2, SQL/DS and other mainframe databases, as well as to data in Digital Equipment Corp. VAX and personal computer environments, the company said.

Pricing for Foccalc 2.0 ranges from $15,000 to $25,000. A leasing option is available.

Information Builders
1250 Broadway
New York, N.Y. 10001
(212) 736-4433

Speedview 1.0, an automatic report distribution software package for IBM MVS data centers, has been announced by Cybermation, Inc.

The product allows local and remote end-user report printing. It also offers security features and automates report archiving and purging.

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MICRO BITS

Two more for PCXI

The PCXI Consortium recently announced that **Intel Corp.** and **Bitwise Designs, Inc.** had become members of the Seattle-based personal computer standards group. The consortium also announced the creation of an Extended Industry Standard Architecture (EISA) Passive Backplane Standards Committee. The committee is intended to define a standard that will allow industrial end users and OEMs to mix EISA single-board CPUs and backplanes from different manufacturers.

Helix Software Co. has announced an MS-DOS 5.0-compatible memory manager designed to enhance the memory control capabilities of Microsoft Corp.'s latest version of the DOS operating system. Both products are due for release this summer. Netroom Version 2.0 allows users of 386-based systems to move terminate-and-stay-resident programs and device drivers into high memory, thereby providing more memory for use by applications. A single-user license is priced at $79.

Hopes sky-high for I486SX

PC vendors plugging for new high-performance computing standard

BY RICHARD PASTORE
CW STAFF

Personal computer vendors, who wasted no time in unveiling Intel Corp. I486SX-based systems earlier this month, said they hope the PCs will shortly become the corporate standard for high-performance desktop computing. If price/performance values fulfill analyst expectations and vendor claims, the PC makers may get their wish.

Immediately following Intel's debut of the math coprocessorless 486, IBM, AST Research, Inc., Advanced Logic Research, Inc., Acer America Corp. and Everex Systems, Inc. unveiled boxes. In addition, Hewlett-Packard Co., Dell Computer Corp., Wyse Technology and Compaq Computer Corp. announced their intent to develop systems.

Aside from IBM's [CW, April 29], the new systems range from $3,000 to $6,000 for realistic configurations and will deliver 12 million to 16 million instructions per second (MIPS) performance. That figures out to a 35% performance boost vs. comparably configured Intel 80386DX-based boxes, according to Technology Investment Strategies Corp. (TISC) in Framingham, Mass.

For most applications, users will not miss the math coprocessor, analysts said. However, high-end spreadsheets, graphics and design applications do take advantage of the coprocessor, which may be added to the 486SX if needed.

The net result, according to TISC analyst Scott Stein, is that 486SX systems will become the strategic business workstation of choice by mid-1992.

Some vendors are making their initial forays into this market hard to resist. AST has priced its introductory Premium II 486SX 45% lower than its

Continued on page 46

Mainframes stalled in wake of micro performance gains

BY MARK AMES
SPECIAL TO CW

There have been endless predictions of the demise and rebirth of mainframes. The market for minicomputers has grown and is now in a midlife crisis, and everyone is being inundated by the overpromotion of personal computers. What, really, is happening?

The truth can be elusive and hidden behind hyperbole, marketing hype and the shadow of vested interests. It is difficult to find an objective comparison of the processing capabilities of the various processing architectures. If an objective comparison does exist, it is not easily identifiable.

For example, Intel Corp.'s I486 chip has arrived, and its performance can be called "awesome." It has been rated as high as 20 VAX MIPS.

Mainframe performance has traditionally been measured in millions of instructions per second (MIPS). The IBM mainframe instruction set has remained reasonably stable for more than 20 years, but the instruction set on a PC or a Digital Equipment Corp. VAX is significantly different from that of the IBM mainframe. It is misleading to compare PC MIPS or VAX MIPS to 3090 MIPS. While a figure of 20 MIPS sounds impressive, is it real or just more hyperbole?

To evaluate the power of the PC, it is necessary to calibrate PC performance in the most widely used measurement unit: mainframe MIPS.

To this end, a measuring stick that represented the large volume of mainframe application programs was developed. A Cobol program that performed typical business processing was selected. The program allocates state premium tax and builds large in-memory arrays. It has a heavy concentration of "if" statements, and it calculates ratios and percentages. Although I/O is important in mainframe processing, all I/O operations were removed in order to create a pure comparison of CPU speed.

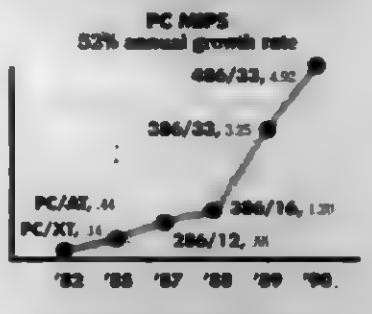
As a base, this program was run on an IBM 3090 Model 3090E rated at 15 MIPS per engine, so the program used 64.4 seconds of a 15-MIPS engine to complete.

The program's source code was recom-

Continued on page 48

Vertical takeoff

After lingering around the 1-MIPS level, the performance of PCs has accelerated since 1988, showing a much higher annual growth rate than mainframes



CW Chart: Doreen St. John



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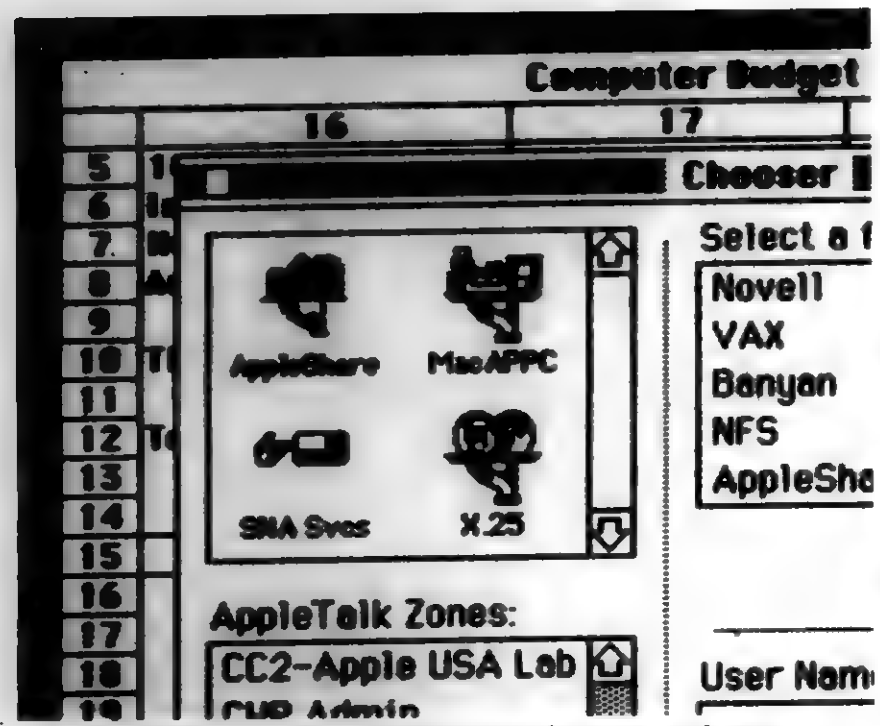
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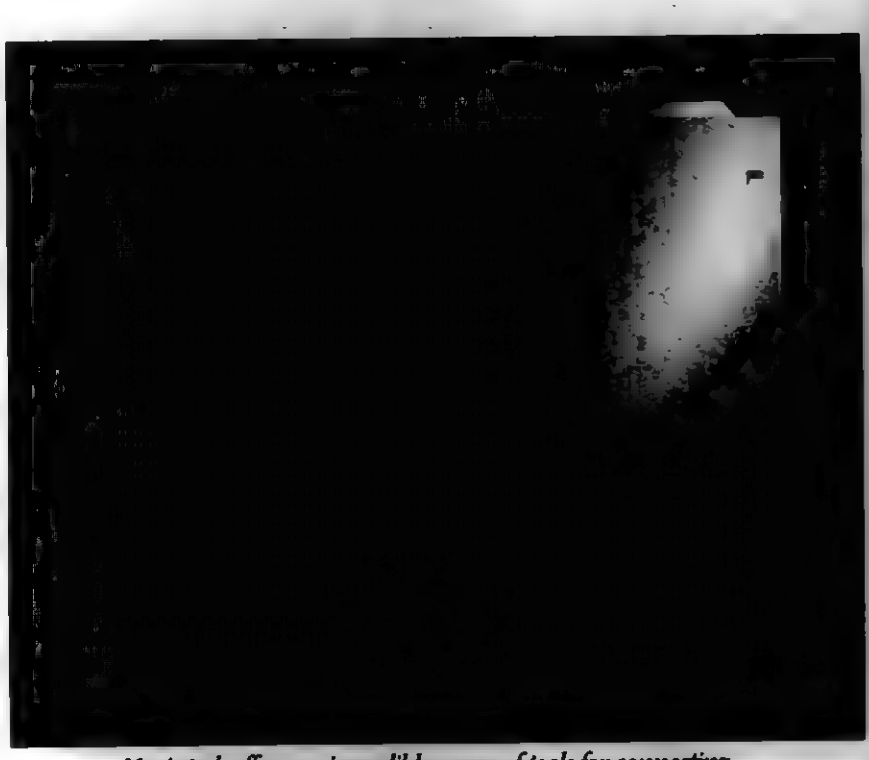
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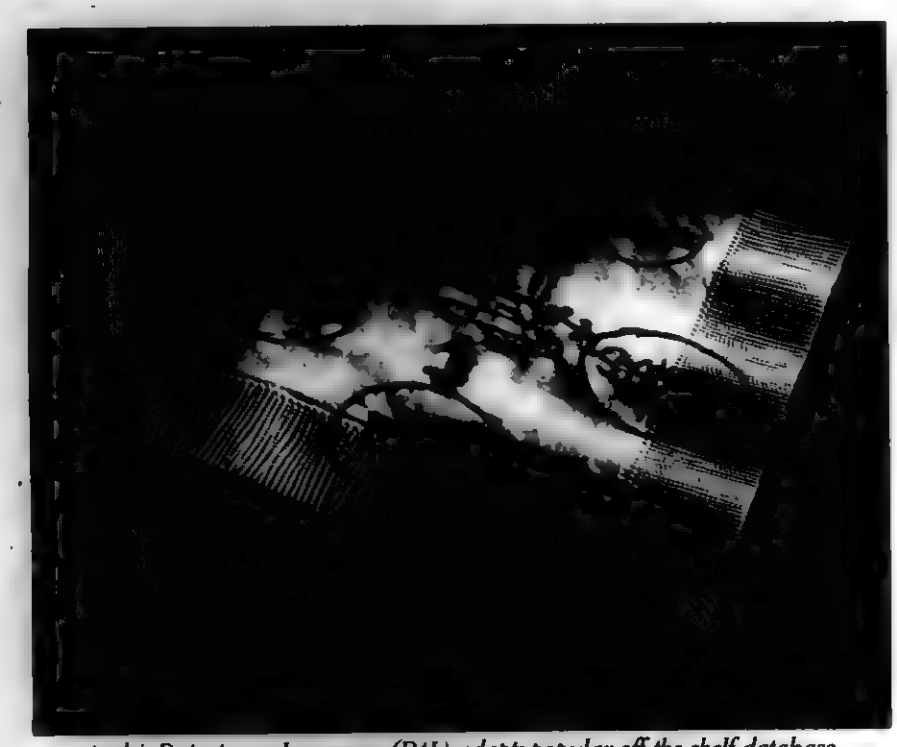
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Macintosh shares data with DOS PCs via Novell, 3Com, Banyan, and more. Macintosh reads and writes DOS files on a floppy disk. Macintosh runs DOS programs. Maybe your next DOS computer should be a Macintosh.



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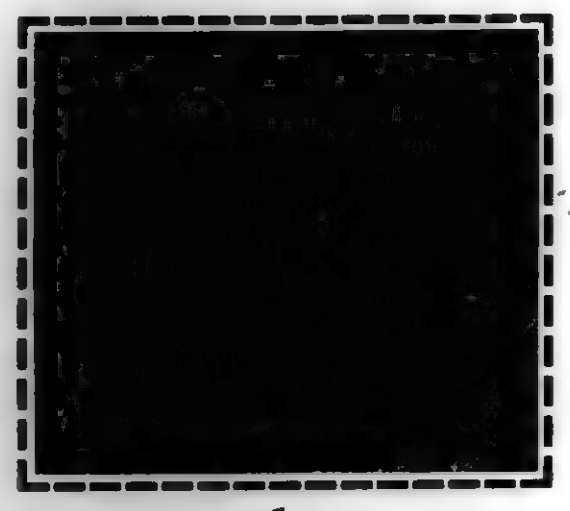
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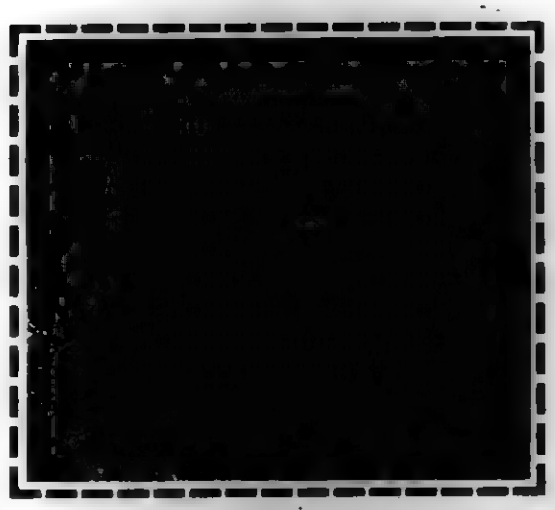


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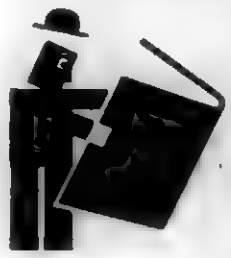
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Windows' popularity sparks call for trainers

BY JAMES DALY
CW STAFF

The phenomenal popularity of Microsoft Corp.'s Windows 3.0 has created a burgeoning market for skilled instructors who are familiar with the interface's labyrinthine programming environment and who can tutor developers scrambling to get applications out the door.

Training courses ranging from several days to one week or more blossomed faster than roses in May after developers discovered that building Windows applications was not going to be a cakewalk.



"Programming for Windows has turned out to be much more of a handful than people had originally bargained for," said Howard Sobel, executive director of the National Windows Users Group Network in Media, Pa.

Microsoft's Software Development Kit (SDK), an essential foundation for building Windows applications, was the first route many developers took on their way to crafting their dream application; more than 40,000 copies of the kit have been shipped since last year, Microsoft officials said.

Much to learn

With more than 500 functions and the number of application programming interface calls hard to remember, the SDK quickly gained a reputation as a daunting and intimidating chunk of technology.

There was also a critical time element involved. Kim Crouse, technical director at Seattle-based training firm Synaptix, said it could take nine to 24 months for a C programmer to become an expert Windows software developer.

By intensifying and focusing the programming instruction, programming teachers said they are able to provide the essential basics of Windows programming in a fraction of that time.

A typical course starts students off with simple source code examples, using the SDK tools to build increasingly complex applications. Trainees are also introduced to the key elements of Windows program development, including the Windows programming model, user interface design and construction, command and data input, presentation of data and memory management.

Many of the instruction firms offer on-site training, allowing developers to avoid travel costs. Fees for a week-long class typically run in the $1,000 to $2,000 range, and classes normally contain fewer than 20 students.

Instruction courses are now offered by dozens of firms, including Microsoft's own Microsoft University, Software Entrepreneur's Forum in Palo Alto, Calif., Software Education Corp. in Marlboro, N.J., The Instruction Set in Waltham, Mass., and Logical Operations, Inc. in Rochester, N.Y.

In addition to the classes, developers will still be able to reach for old standbys such as "Programming Windows" by Charles Petzold, a major treatise on building applications.

Microsoft has also recently announced Support Advantage, a multitiered subscription service for developers. In recent months, development environments such as Borland International, Inc.'s C++ Version 2.0 and Parcplace Systems, Inc.'s Objectworks/Smalltalk have also hit the market, allowing programmers to bypass the SDK option.

Insurer puts LAN skills on sale

ON SITE

BY RICHARD BJORHUS
CW STAFF

NEW YORK — When a company pours years of sweat and blood into a systems overhaul, it should parlay that hard-earned expertise into additional outside income. That is the notion driving Financial Guaranty Insurance Co.'s (FGIC) new consulting services scheme.

FGIC, a municipal bond insurer with $1.2 billion in assets, was one of the first companies to downsize completely from a mainframe to a personal computer-based network, beginning in 1987. It took the firm 18 months to install Compaq Computer Corp. PCs on a Novell, Inc. Netware 386 Token Ring network, write all new applications using Fox Software, Inc.'s Foxbase and ditch its IBM 4381.

The improvements were marked. Instead of spending about $6 million per year on a mainframe system that was not adequately serving the growing company, FGIC now has a budget of $2.5 million. The information systems staff size shrunk from 70 to about 20. Development backlog, once a "generation" behind, has been shortened so that now, "by the time we deliver things, they're still useful," said Andrei Chivvis, first vice president and managing director of systems services.

Spreading the knowledge

Chivvis figured that other financial firms would be willing to pay for FGIC's help in obtaining such systems benefits. Once director of internal systems, he currently heads the new group, FGIC Systems Services, that intends to market FGIC's downsizing know-how.

"We are one of very few companies with experience of three years working with mission-critical applications" in a strictly PC network environment, Chivvis said. "That experience has a lot of value."

Compaq multiprocessor Systempros with 1.6G bytes of storage run a network of 170 PCs. FGIC has stuck with Compaq over the years because the vendor continues to lead the market, pushing ahead with new technology platforms such as multiprocessing, according to John Geyer, vice president and director of systems.

According to Chivvis.

Today, legal documents that come in from clients and regulatory agencies are scanned into the network via Fujitsu America, Inc. scanners. They are stored in the form of write-once read-many optical discs in a Fujitsu "jukebox."

FGIC deliberately went for a low-cost imaging implementation, working with a budget of less than $400,000. The firm chose Viewstar Corp.'s Viewstar software because it was designed to run on any network, unlike many other packages that require proprietary hardware and operating systems, Geyer said. It involved little new hardware investment and no decompression boards.



Steve Bursi

FGIC's Geyer (left) and Chivvis *cut their IS budget by more than 50% after downsizing to a PC-based network*

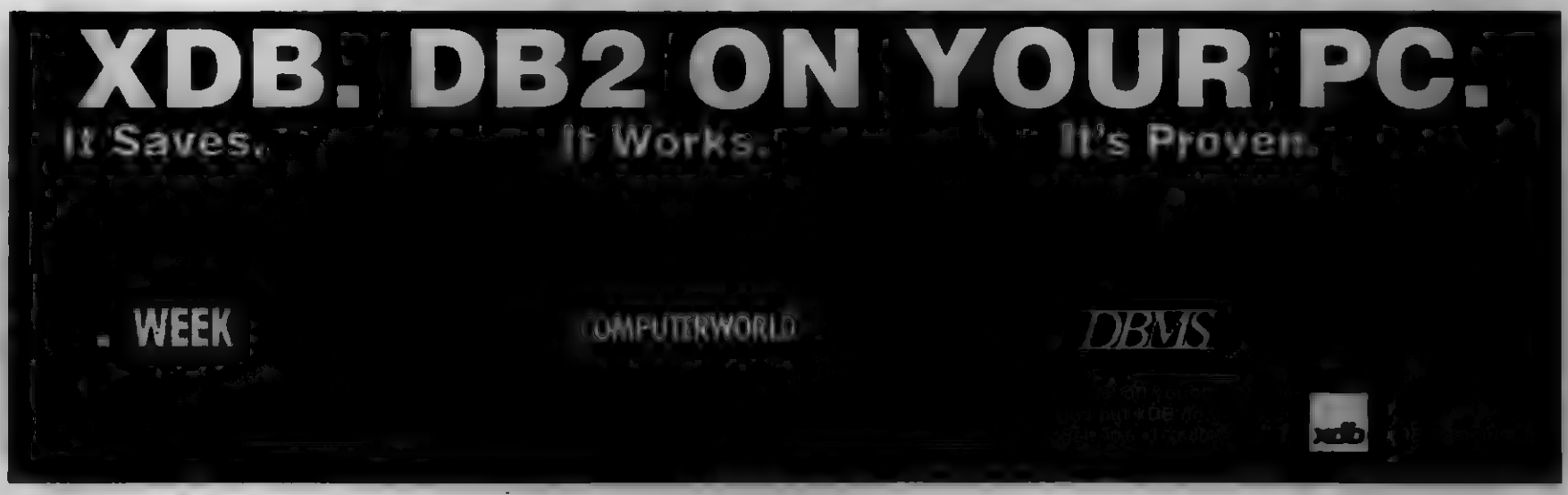
However, Geyer noted that other companies have been catching up with Compaq in advanced products. "The Dells of the world are shipping boxes that look just like the Systempro, so it puts more pressure on them," Geyer said, referring to Dell Computer Corp.

FGIC Systems Services is already working with clients within its parent GE Capital Corp. on application downsizing and wide-area networking projects.

Document imaging is another technology area FGIC feels it can leverage for consulting income. The company began evaluating imaging in mid-1989 for the myriad documents it is legally bound to generate and maintain for each insurance policy — some 200 to 400 pages. It took one whole year to implement the system, including converting a backfile of 2 million pages, according to Chivvis.

The outside consulting practice may eventually require adding another server and several bodies, Chivvis noted. He said he also realizes he is competing with such firms as Andersen Consulting, which possess many more resources.

But Chivvis feels FGIC's strength is its first-person experience and focus. "We're businessmen who understand business needs," he said. The consultancy will focus on the needs of financial firms, he added.



Wang offers diminutive desktop PC

BY SALLY CUSACK
CW STAFF

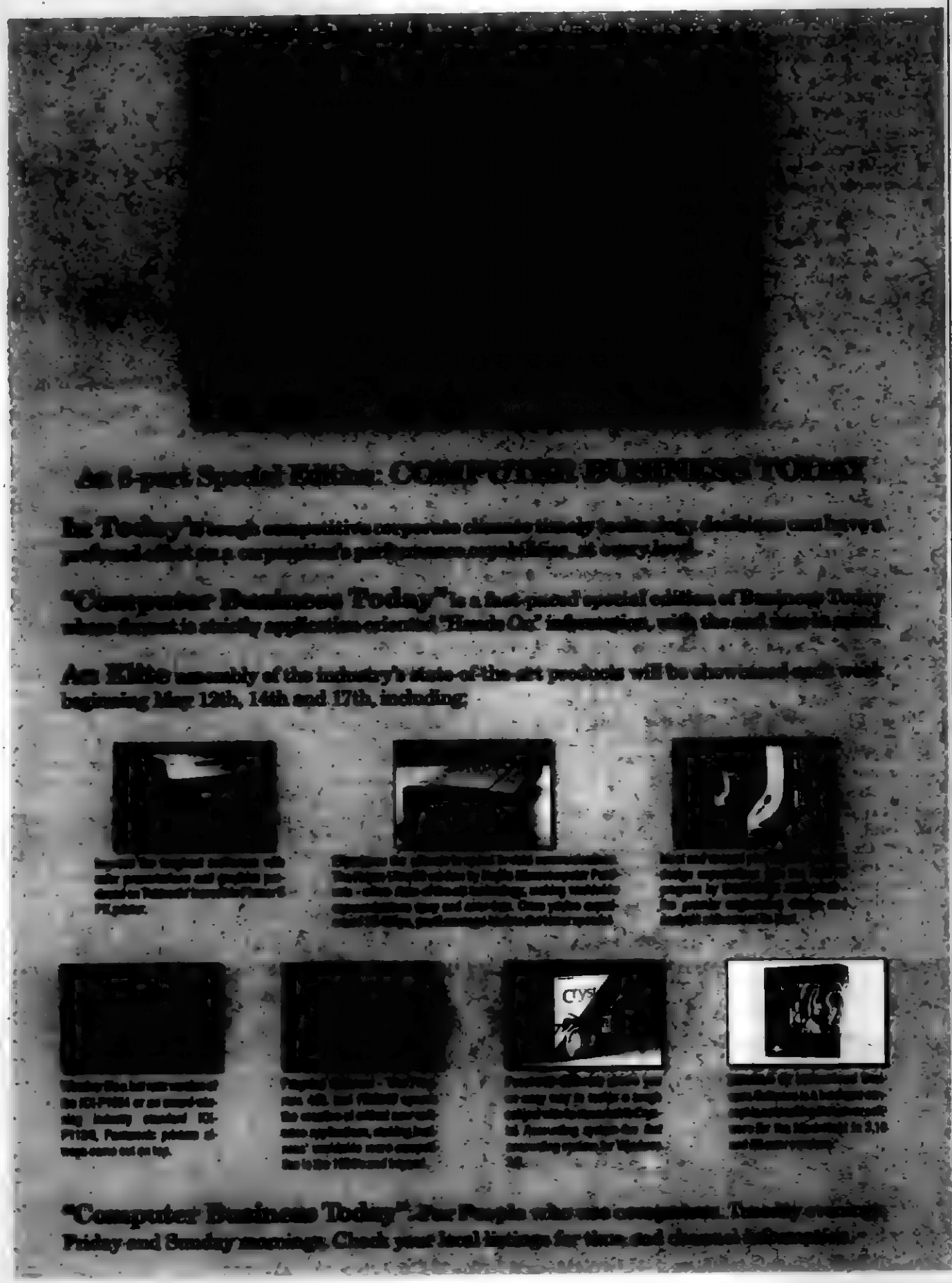
LOWELL, Mass. — Wang Laboratories, Inc. last week introduced a small, entry-level desktop personal computer that was designed for basic business applications in distributed computing environments.

Billed as a component of Wang's recently announced Office 2000 strategy, the PC 321/16S system is based on an Intel Corp. 80386SX processor and sports a small-footprint chassis measuring 3.2 inches high.

The 16-MHz machine is available in two configurations. Users may choose a unit with 1M byte of memory, one parallel port, two serial ports, a mouse port, an on-board disk controller, an Integrated Drive Electronics hard disk interface and IBM Video Graphics Array controller, a 1.44M-byte disk drive and a keyboard. The product costs $1,695.

A similar unit is available without the disk for $1,595. Both systems are currently shipping.

The system supports up to 8M bytes of memory on the main board and runs on both Ethernet and Token Ring local-area networks.



I486SX

FROM PAGE 41

base-priced 33-MHz 386 and 33% less than its 25-MHz 80386.

"This is a preemptive strike on our own product line," said Larry Fortmuller, AST's director of high-end systems marketing. "We are out to move people to this technology as fast as possible." Attractive chip pricing and potentially higher vendor margins are the motivations here.

AST predicts that its 486SX system sales will match 386DX sales by year's end. After that, 486SXs will overtake the 386DX, Fortmuller asserted.

PC vendors seem to be taking a wait-and-see attitude before repositioning their 386DX pricing in relation to the new systems. But Intel's expected June release of the 50-MHz 486DX and the ramp-up of 486SX production should send 386 prices spiraling downward 15% to 20% after that.

What will happen to 486DX prices? AST said it will price desktop models more competitively in light of the 486SX. However, 486DX tower systems, because of their relatively high-end configurations and server niches, will be more shielded from pricing pressure, Fortmuller said.

AST's Premium II 486SX/20 ships with 4M bytes of memory, a floppy disk drive and an 80M-byte hard disk for $3,695. A 210M-byte disk drive and 486DX upgrade boards are options.

Step rates 13 MIPS

Everex rates its Step 486SX/20 at 13 MIPS (25% faster than the Step 386/33 model) and ships it with 1M byte of memory and a Super VGA adapter. Base pricing ranges from $3,999 to $4,599, depending on chassis type. Everex also makes a small-profile Tempo 486SX/20 for $2,999.

ALR's entries, the Powerflex 486ASX, Businessveina 486SX, MPS 486ASX and Businessstation 486ASX lines, all feature upgradable CPUs.

They come with the IBM Personal Computer AT-style bus, the Micro Channel Architecture bus or the Extended Industry Standard Architecture bus and 1M byte of standard memory. With an 80M-byte hard disk, prices range from $2,995 to $3,995.

Acer's Acerpower 486SX comes standard with 2M bytes of memory, an Ultra-VGA chip set and a floppy disk drive. The upgradable-CPU system runs at 8.5 MIPS on a DOS Power Meter benchmark vs. 13 MIPS for Acer's comparable 33-MHz 486DX system, the company said. A base configuration costs $2,745.

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[1]Computerworld, 11/2/92. [2]PC Magazine, 9/25/92. [3]Warranty applies to HP Vectra 486/25T and 486/33T PCs. Warranty offer available only in U.S. and Canada. © 1992 Hewlett-Packard Company C5PC1012

Mainframes

CONTINUED FROM PAGE 41

piled with the Micro Focus compiler and run under MS-DOS on several PCs. The elapsed time for each PC was used to calculate the effective mainframe MIPS rating by multiplying the 3090 time by 15 MIPS and dividing that sum by the PC time.

The Compaq 486/33 took 195 seconds and earned a mainframe MIPS rating of 4.92.

That 4.92 MIPS is considerably lower than the promotional rating of 20 VAX MIPS, but it is still quite impressive. Putting this in perspective, five mainframe MIPS was about the per-engine rating of the 3081, IBM's top mainframe in 1981. This places PC technology about one decade behind mainframe technology in terms of top-of-the-line power. During the years since, the annual growth rate for mainframe power has been 20%, reaching a per-engine level of 22.5 MIPS for the 3090J family.

Better PC performance

In about that time, the PC's performance has grown from 0.14 MIPS for the original PC to 4.92 MIPS for the 486/33 processor, which equates to an annual growth rate of 52%.

Before the 486 arrived, the 33-MHz 386 was the fastest PC. The increase in speed when upgrading from a 33-MHz 386 computer to a 25-MHz 486 computer is only 14%, which is not awesome. Upgrading from a 33-MHz 386 to a 33-MHz 486 generates a 50% improvement in performance, which is more substantial.

In terms of processing power, the difference between a PC and a mainframe is closing fast.

In addition to raw processing power, there are several reasons to run a business application on a mainframe rather than on a PC. Mainframes provide access to large, centralized databases. Mainframes also control large corporate networks that provide national access to applications and data.

There are architectural solutions to these apparent deficiencies in the capabilities of the PC. Client/server processing and cooperative processing could allow databases and networks to be separated from the program execution and allow programs that run on PCs to access data and networks controlled by other processors.

A key element in capacity planning is the financial cost of performance. This is normally expressed in a price/performance ratio or in cost per MIPS. Having calculated mainframe MIPS ratings for several PCs, it is now possible to compare the cost per MIPS of mainframes and PCs. The cost for the 3090J mainframes is $110,000 per MIPS. IBM's recently announced System/390 will cost about $95,000 per MIPS. The cost per MIPS for currently available PCs runs between $2,000 and $3,000 per MIPS.

Using the initial availability dates and costs for each computer, price/performance ratios were plotted over time. Here the gap is wide and getting wider. The cost per MIPS on a mainframe has been decreasing at 11% per year, while the cost per MIPS on a PC has been decreasing at 27% per year. Because the cost per MIPS on a mainframe is about 50 times the cost per MIPS on a PC, the relative rates of decrease are inconsequential.

IN ADDITION TO raw processing power, there are several reasons to run a business application on a mainframe rather than on a PC.

Because the cost of running an application on a PC is approximately 2% of the cost of running it on a mainframe and the power of a 486 is sufficient to run most applications, there is a tremendous incentive to move applications to the PC.

Cynics answered

Presentations on client/server architectures and cooperative processing talk about off-loading processing from the mainframe. A cynic might ask, "Why would I want to do that?" There are real advantages to having all processing centralized on a single mainframe. It is easier to control, easier to protect, easier to test and easier to change if everything is in one place. It does not make sense to change the processing environment just to do things differently.

The results of these MIPS calibration tests answer the cynics. You can save a lot of money, which will make up for any inconvenience associated with the decentralization of processing.

The 50-to-1 efficiency ratio between mainframes and PCs may be overstated because mainframes are much more heavily used than PCs. Mainframe capacity planners like to run their systems at between 80% and 90% utilization.

If utilization consistently falls below 80%, the system is overconfigured and money is being wasted on unneeded resources. If utilization exceeds 90%, there is a risk of degrading performance and jeopardizing service level commitments.

PCs, on the other hand, are lightly used. Most PCs have a utilization rate of 5% or less. Even at these utilization ratios, the PC still has a 3-to-1 price/performance advantage over the mainframe.

Ames is an information systems professional based in Larchmont, N.Y.



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HP's Laserjet IIP: Great price but slow

Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Suzanne Weixel.

With a small footprint, useful features and Hewlett-Packard Co.'s reputation behind it, the HP Laserjet IIP is about as good as you'll get in a low-cost, single-user laser printer, according to reviewers.

Output: The IIP's text and graphics images are clean and crisp. It has no scalable font support, but its automatic font rotation capability is a big plus. It is compatible with Adobe Systems, Inc.'s Postscript and HP's Laserjet Series II printers.

Performance: At four page/min with the standard 50-sheet paper tray, the IIP is definitely only a personal printer. It is expandable, with multiple tray options and up to 4.5M bytes of random-access memory, but reviewers do not recommend it if speed is crucial.

Ease of use: The one-piece drum toner replacement slides in. The printer has a two-line LCD on the front panel.

Service and support: The IIP's modular design is ideal for servicing.

Value: As a desktop personal laser, the IIP is tops, reviewers said. It lists for $1,295; the 250-sheet lower cassette paper tray costs $195.

Hewlett-Packard Co. Laserjet IIP

Reviewer	Output	Performance	Ease of use	Service & support	Value	Score
Infoworld 10/8/90	Excellent	Satisfactory	Good	Excellent	Excellent	7.9
PC Magazine 6/12/90	Good with more fonts	One of the slowest	A breeze	NC	NC	Editor's choice
PC World 2/91	Good	Fair	Excellent	Superb	Excellent	Best buy
Users						
John Fortier, New York Life Insurance Co.	■■	■	■■	■	■	Unreliable
Sudie Carver, Intelco Aluminum Corp.	■■	■■	■■	■■	■■	Worth the money
Kevin Gilmartin, The Chase Manhattan Bank NA	■■	■	■	■■	■	Unreliable
Analysts						
Robert Fennell, Dataquest, Inc.	■■	■■	■■	■■	■■	Good quality
Angele Boyd, International Data Corp.	■■	■■	■■	■■	■■	Excellent
Marc Bear, BIS Strategic Decisions	■■	■■	■■	■■	■■	Reliable

Key: ■■ Very good ■■ Good ■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Wendy Abramowitz, Argus Research Corp.	■■	■
Tim McCollum, Dean Witter Reynolds, Inc.	■■	■

Hewlett-Packard Co. reported net income of $771 million for 1990, 4.7% less than in 1989. The company's first-quarter net income was $205 million, compared with $173 million in the first quarter of 1990.

Hewlett-Packard responds

David Ritchie, market development engineer:

Output: Concerning scalable fonts, automatic font rotation doubles the number of fonts.

Performance: If you are used to eight page/min, it may seem slow, but most customers are used to dot matrix.

Value: The IIP is an entry-level HP Laserjet at the best price possible.

IBM Laserprinter E: Faster and room to grow

IBM Laserprinter E

Reviewer	Output	Performance	Ease of use	Service & support	Value	Score
Infoworld 10/8/90	Very good	Very good	Very good	Good	Very good	7.0
PC Magazine 6/12/90	Good	Top speed	Good	NC	Excellent buy	Versatile
PC World 2/91	Good	Good	Fair	Dealer only	Good	Powerful, well-built
Users						
L. Robert Brown, Computer Technologies, Inc.	■■	■■	■■	NC	■■	Excellent price/performance
Jane Redfern, Bellaire Computer Center	■■	■■	■■	NC	■■	Quiet, reliable
Connie Turner, Antrim County, Mich.	■■	■■	■■	■■	■■	Good but a bit slow
Analysts						
Robert Fennell, Dataquest, Inc.	■■	■■	■■	■■	■■	Reliable
Angele Boyd, International Data Corp.	■■	■■	■■	■■	■■	Upgradable
Marc Bear, BIS Strategic Decisions	■■	■■	■■	■■	■■	Versatile

Key: ■■ Very good ■■ Good ■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Craig Kraft, Edward T. Jones & Co.	■■	■
Wendy Abramowitz, Argus Research Corp.	■	■

IBM posted first quarterly loss in its history: $1.7 billion for the first quarter of 1991, which included an unusually large restructuring charge. But for 1990, IBM earned net income of $6 billion, a 60% increase.

IBM responds

Mike Reiter, senior communications specialist:

Output: Infinite font rotation is available through the purchase of the Postscript option.

Ease of use: We have had few negative comments on the control panel. We have had numerous positive comments on ease of using other features.

Service and support: Instructions for accessing a direct support line are included in each shipment.

IBM's Laserprinter E is slightly larger and faster than other personal lasers, and according to reviewers, its upgrade path can't be beat.

Output: Text and graphics are sharp. Plotter emulation is standard, and although the standard fonts are nothing special, the font options, including an Adobe Systems, Inc. Postscript add-in board, are. Two drawbacks: The two-font slots accept only IBM cards, and there is no automatic font rotation.

Performance: The Laserprinter E clocks in at five page/min — faster than its leading competitors. It has three memory upgrade options for a total of 4M bytes. The printer's 12,000 page per month duty cycle is also worth noting, but the biggest plus, reviewers said, is that you can turn it into a 10 page/min Laserprinter 4019 with a $1,099 controller card.

Ease of use: The single toner cartridge is simple to change. The rear feeding paper tray is somewhat awkward to reach, and using the front control panel, which has no LCD, can be confusing. *PC World* suggested keeping the manual close at hand.

Service and support: IBM's dealer-only support policy is a drawback.

Value: According to reviewers, the Laserprinter E is priced right for a desktop, and it can grow into a network. It lists for $1,495.

NEW PRODUCTS

Software utilities

HG Translator, a graphics translation utility from Microsoft Corp., is currently available. The program converts Software Publishing Corp.'s Harvard Graphics files into Microsoft's Powerpoint presentation software format.

HG Translator will be shipped with the current version of Powerpoint. Previously registered users of Powerpoint may purchase the utility for $7.50.

Microsoft
One Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Quicksoft, Inc. has begun shipping Wordperfect Filter, a file conversion software product.

The program converts Quicksoft's PC-Write word processor files to Wordperfect Corp.'s Wordperfect format and vice versa. The company said translating files between the two formats requires only a few seconds.

The filter costs $19.

Quicksoft
219 First Ave. N., No. 224
Seattle, Wash. 98109
(206) 282-0452

Symantec Corp. has announced The Norton Backup for Windows, a utilities program that is capable of performing unattended, scheduled file backups.

The product can run concurrently with other Microsoft Corp. Windows 3.0 programs and can back up networks as well as stand-alone personal computers.

It can be manually activated with two keystrokes, according to the vendor.

The price is $149.

Symantec
10201 Torre Ave.
Cupertino, Calif. 95014
(408) 253-4092

Software applications packages

Triumph and Triumph/Des, a pair of DOS-based security software programs from Micronyx, Inc., are now able to support up to 32 loggable users on a single common-area personal computer.

Triumph protects data by encrypting each file rather than by limiting drive access. Up to 256 users can be listed for access to a given file. In a network, each computer requires a copy of Triumph in order to decode encrypted files.

The $195 product includes a guest user option that provides definable restricted use of a PC to visitors.

Micronyx
1901 N. Central Expwy.
Richardson, Texas 75080
(214) 690-0595

Macintosh products

Ares Software Corp. has introduced Fontmonger, an Apple Computer, Inc. Macintosh type conversion and alteration software package.

The product switches type format among three major fonts: Adobe Postscript Type 1 and Type 3 and Apple Truetype. Fontmonger also permits users to alter height and width proportions as well as slants of existing typefaces.

Fontmonger costs $99.95.

Ares Software
Suite D
561 Pilgrim Drive
Foster City, Calif. 94404
(415) 578-9090

Development tools

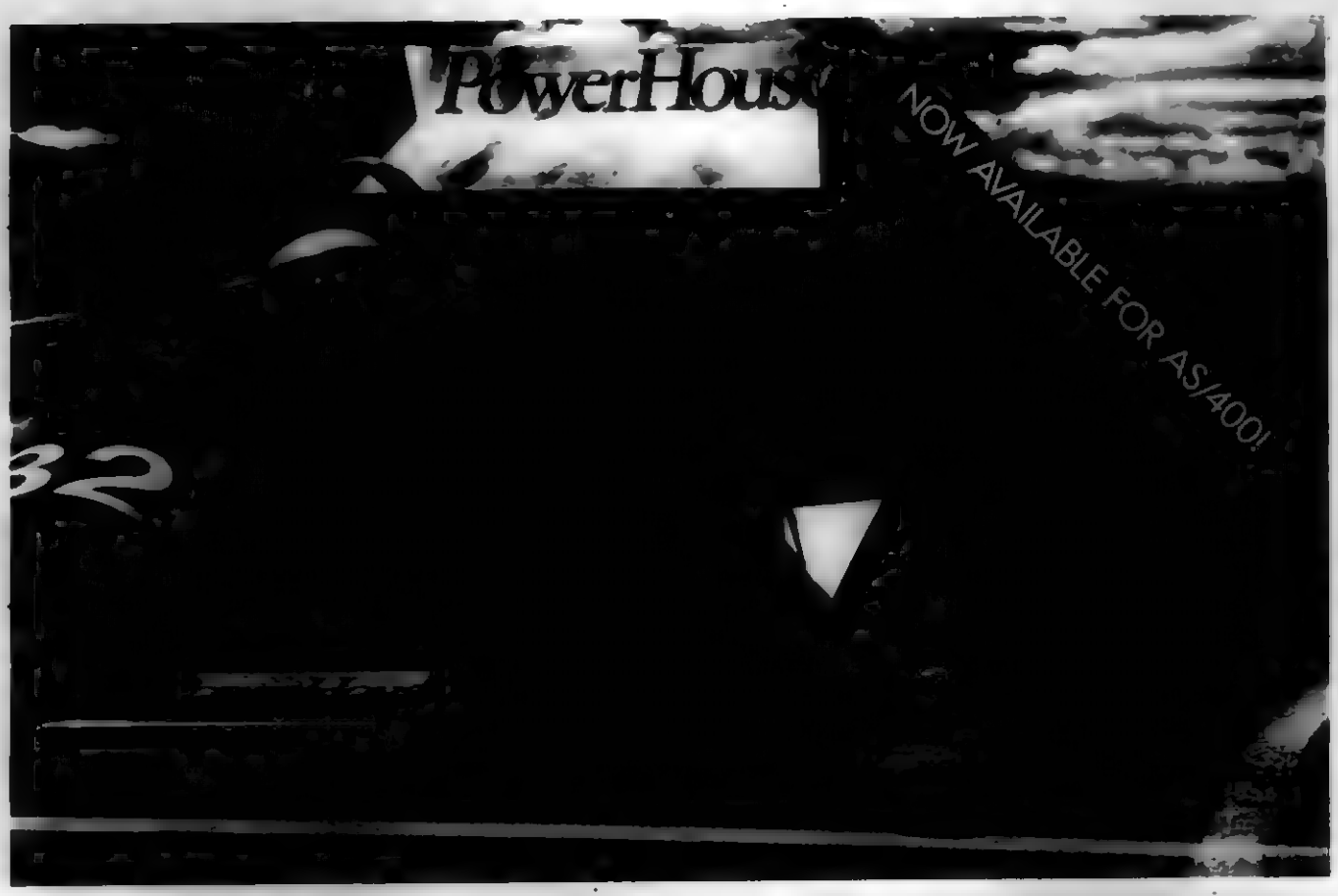
Lucid, Inc. has introduced Lucid C, an ANSI-standard C language compiler designed for Scalable Processor Architecture-based workstations.

The compiler is fully compatible with Sun Microsystems, Inc. tools and libraries, according to Lucid.

It employs a number of optimization techniques, including global register allocation, instruction scheduling and partial and total redundancy elimination.

Lucid C costs $495.

Lucid
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Menlo Park, Calif. 94025
(415) 329-8400



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BIT BLAST

GTE to use UB gear

Ungermann-Bass, Inc. reseller **GTE Telephone Operations** has reportedly decided to install a multimillion-dollar, 4,000-node network of UB's intelligent wiring concentrators in its Irving, Texas, headquarters. Fifty-six of the vendor's Access/One concentrators will link 10Base-T Ethernet networks over a fiber Ethernet backbone and will be managed by UB's Netdirector network management system.

Router vendor **Wellfleet Communications, Inc.** and T1/T3 company **Digital Link Corp.** have said that the second half of the year will see general availability of a Switched Multimegabit Data Service (SMDS) interface that links Wellfleet routers and Digital Link digital service units/channel service units. SMDS is an emerging switched digital service that transports data at speeds ranging from 1.5M bit/sec. (T1) to 45M bit/sec. (T3).

Products from internetworking vendor **Cisco Systems, Inc.** are reportedly now listed on the federal government's General Services Administration schedule. The listing is said to permit government organizations to purchase Cisco routers, router/bridges, terminal servers and network management software at 20% off of Cisco's list prices.

AT&T Easylink Services recently opened a computer processing center in Ontario to handle the electronic mail traffic in Canada. Previously, Canadian Easylink customers had to access a messaging hub in the U.S. In addition to Canada and the U.S., the E-mail provider, based in Basking Ridge, N.J., has processing centers in the UK and Japan and plans to open more centers later this year.

Novell plans 1,000 sessions

BY JIM NASH
CW STAFF

Almost one year after Novell, Inc. said it would deliver a server capable of holding 1,000 concurrent IBM host sessions, only the first shadows of the product are appearing.

In announcing its Communication Services application programming interface last June, the Provo, Utah-based networking company said it would build such a capability into its high-end Netware Version 3 network operating system.

Gerry Machi, director of marketing for Novell's communications products, said Netware Services for Systems Application Architecture (SAA) will ship this month with the capacity for 64 concurrent host sessions. It will be Novell's first SAA product.

Impressive results

Two resellers who attended Netware for SAA classes last week said they were impressed with the demonstration of the product, although connections were made only to a simulated host.

Novell already markets a Systems Network Architecture (SNA) gateway able to hold 128 concurrent sessions, although some users report that getting 128 sessions to run concurrently and efficiently is difficult.

Unlike that product, Netware for SAA will be a Netware Loadable Module based on 32-bit architecture, according to Paul Spresaart, vice president of integration support at Computer Support of North America, a reseller in Basking Ridge, N.J. Being an application that can use twice the address space, Spresaart explained, the new package should outperform the SNA gateway.

Included with the product will be a runtime version of Netware v3.11, he said. The runtime software is basically a one-user implementation of v3.11's file-server functions capable of supporting Communication Services and related Netware applications. Using it saves managers from buying a full-blown Netware v3.11 package just to disperse numerous applications over multiple servers.

It was unclear whether Novell will include a status screen with Netware for SAA, said Bob Koons, director of integration services at Inacomp Computer Centers of Georgia in Atlanta. The screen would show all logical units at once, noting which ones were connected as well as which workstations were connected and other facts. Koons said Novell told the class the feature may not make the application's debut this month.

In the future?

Machi said another version of the module — one able to hold 254 concurrent host sessions — is in the works, but he declined to say when it would be delivered. Similarly, he would not comment on when Novell would finish testing multiple SAA modules on a single server. Adding duplicate modules, Novell has said, should result in a maximum of 1,000 concurrent sessions.

Some industry consultants and users said they have seen 1,000-session servers running at beta-test sites. Machi said Novell is working toward a module that holds more than 254 concurrent sessions but refused to elaborate.

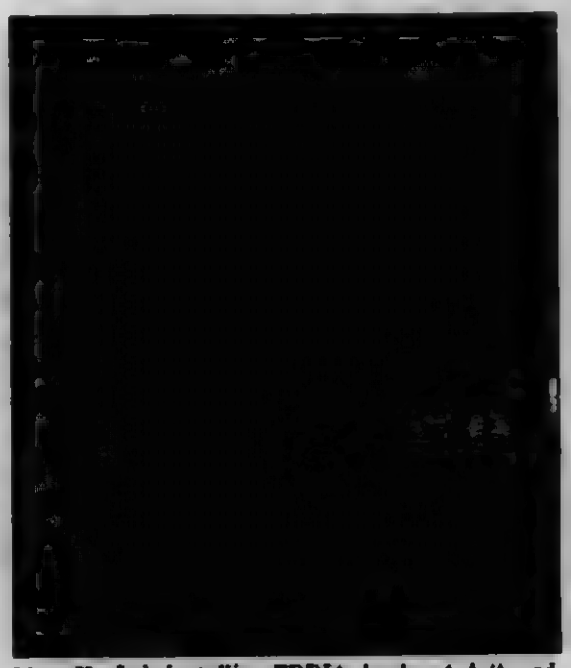
One former information systems manager who requested anonymity said he is aware of as many as 10 sites currently running 1,000-session Netware networks.

NYC agency uses FDDI to cut costs

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — Networking buzzwords abound at the New York City Department of Environmental Protection. The agency is immersed in a $4 million project to install technology such as Fiber Distributed Data Interface (FDDI), 10Base-T and smart wiring hubs in order to save $2 million in annual operating costs and respond more quickly to public health and safety issues.

In an all-out reorganization of its computing environment, the department is consolidating 15 previously independent terminal-to-mainframe-based sites into two adjacent buildings with local-area networks on multiple floors. While the organization has the luxury of implementing a whole new cabling and networking scheme from the ground up, the project has presented a steep learning curve. It is the information services staff's first brush with distributed computing, director of communications Rande Morgan said.



New York *is installing FDDI technology to better address the city's environmental issues*

Easing the revamp has been the ability of the department's longtime T1 multiplexer vendor, Timeplex, Inc., to step in with present-day technology, Morgan said. Timeplex is supplying the initial seven Ethernet-to-FDDI routers that will attach 10Base-T LANs on various floors to an FDDI backbone. Having a history with Timeplex has facilitated bringing the project together, Morgan said.

FDDI is a fiber-based 100M bit/sec. Token Ring LAN whose primary application today is to link slower speed LANs. Morgan had the foresight one

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Fibronics ties together mainframes, 'X' nets

BY JOANIE M. WEXLER
CW STAFF

Like a Gorbachev and Reagan handshake, relations between SNA and TCP/IP computing environments are warming. A recent sign was Fibronics International, Inc.'s introduction of X Window System software that ties IBM mainframes to Unix-oriented networks.

The X Window system — often called "X" — is a public-domain windowing protocol that is operating system- and architecture-independent. When installed on a computer or intelligent X terminal as "server" software, it allows users to access applications residing on other computers on the network that are equipped with X "client" software.

X has traditionally run in Unix environments. Unix applications tend to "speak" Transmission Control Protocol/Internet Protocol (TCP/IP), not the Systems Network Architecture (SNA) protocols that run on IBM mainframes.

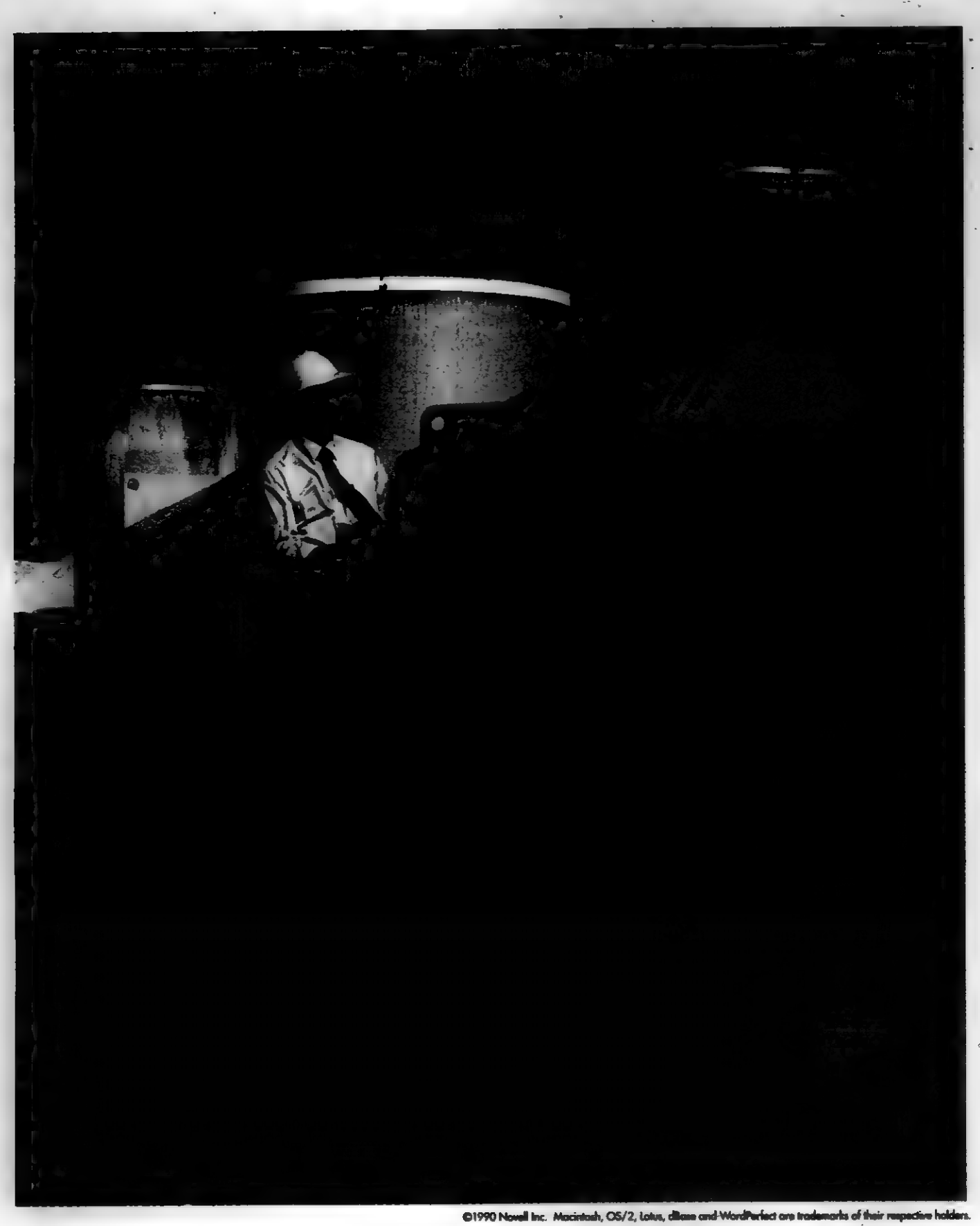
Fibronics' X client offering for IBM's VM and MVS mainframe operating systems brings together the two environments. In the X world, applications developers write code to standard X displays so they do not have to customize programs for different display devices. This allows a computer running X "server" software to display applications from multiple, incompatible hardware platforms.

Fibronics is introducing some healthy competition for today's sole provider of X for mainframes: IBM. IBM released TCP/IP software with X Window support for its VM- and MVS-based mainframes last September, although "in the X world, not a lot of people know these products exist," commented Stephen Auditore, president of X Business Group, Inc. in Fremont, Calif.

TCP/IP and X access to mainframes "is a relatively new trick," agreed Neville Per-

Continued on page 54

NetWare Solves Issues At



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Environmental The EPA.

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But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

Fact is, NetWare is compatible with more applications and hardware than any other network operating system. Which makes software incompatibility and equipment obsolescence things of the past.

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The Past, Present, and Future of Network Computing.

Three firms opt for AT&T Tariff 12

BY ELLIS BOOKER
CW STAFF

AT&T recently announced a trio of three-year integrated voice and data network contracts with customers.

The Tariff 12 contracts, totaling more than $89 million, were all with existing AT&T customers.

The largest deal, for $42 million, calls for AT&T to provide The Travelers, an insurance company in Hartford, Conn., with a digital communications network for 300 of its remote offices. According to Trav Waltrip, vice president of telecommunications at The Travelers, the benefits will be twofold. First, the company will purchase services in a package from AT&T rather than a piecemeal approach. Second, Waltrip said, Travelers will receive a machine-readable common bill rather than hundreds of paper bills.

Airborne Express awarded AT&T a contract to design and run a customized voice and data network connecting its 240 locations nationwide.

Airborne had previously used AT&T's Software Defined Network and its Spectrum Digital Services for voice and data, respectively, and looks forward to cost savings and the convenience of a consolidated bill, according to Charles Franz, manager of voice communications.

Franz said his company, which recently upgraded its digital facilities from 9.6K bit/sec. to clear 64K bit/sec. lines, will continue to use a centralized data processing architecture, with the remote offices connected to the company's multiple mainframes in Seattle.

As in the past, AT&T will staff the network management center supporting the Airborne network.

Finally, AT&T expanded its work with Hartford, Conn.-based Aetna Life and Casualty Co., renegotiating a prior $30 million contract for the insurance company's worldwide customized voice and data network. The $35 million deal brings the number of field offices served to 300.

Fibronics

FROM PAGE 51

eira, supervisor of utility company Ontario Hydro Research Division's integrated computing environment in Toronto. Pereira said Fibronics' X offering could cause him to reevaluate implementing IBM's TCP/IP on his mainframes.

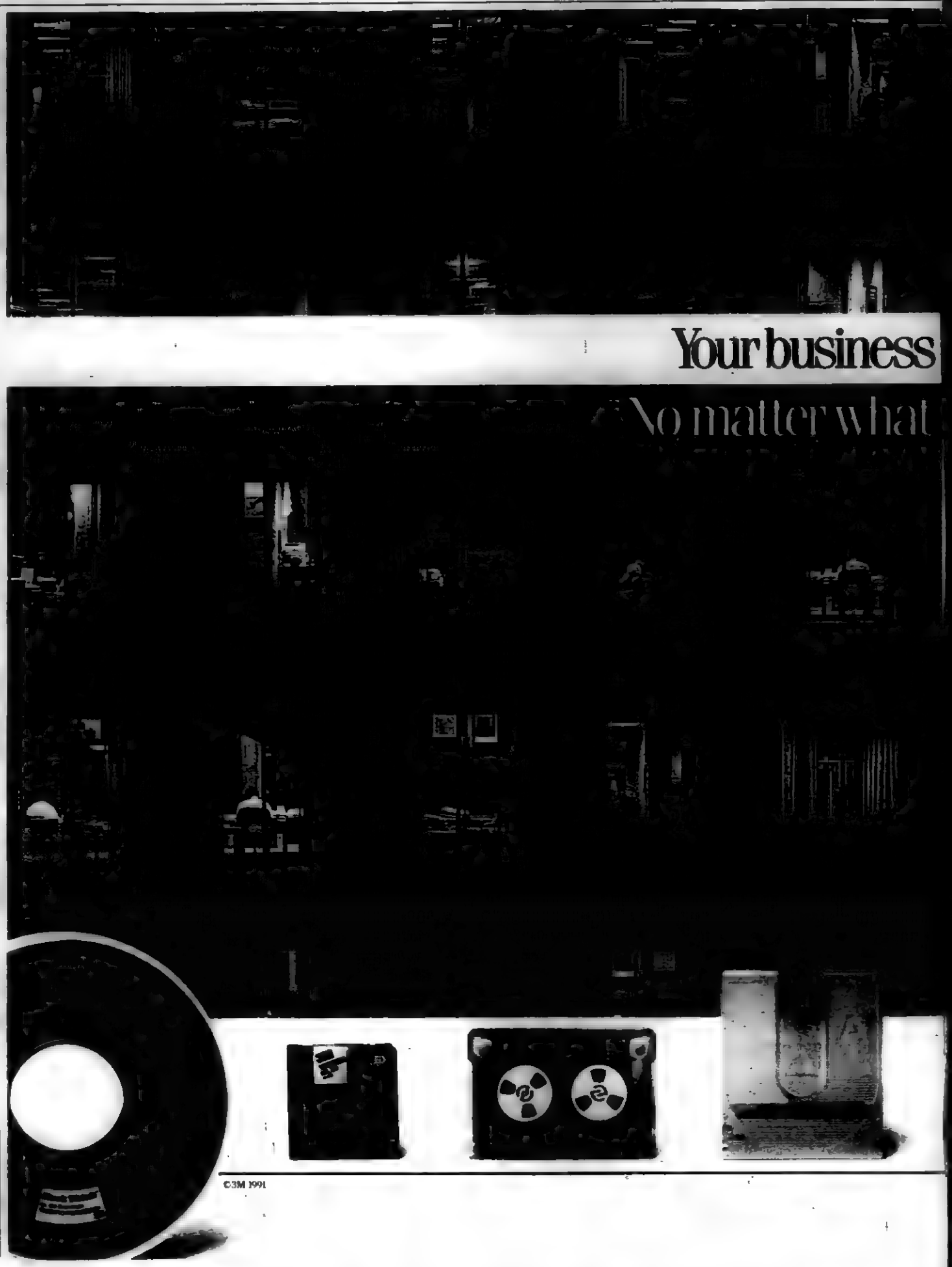
Pereira is disappointed that Fibronics' X for mainframes — Knet X Windows — requires Fibronics' Knet TCP/IP to run alongside it. He would be willing to mix and match vendors, he said, but will probably go with IBM for both functions because "we're using a Network Systems, Inc. gateway that I don't believe Knet supports."

Ontario Hydro already uses Fibronics' Fiber Distributed Data Interface local-area networking equipment. The utility company operates a plethora of disparate hardware and software platforms, including about 10 Network Computing Devices, Inc. X terminals.

Pereira said he is finding that "so many functions — such as database and transaction services — are delivered by the 'big iron' that, increasingly, you need access to these business tools no matter what facet of work you're involved in."

Paul Cubbage, associate director of Unix systems software service at Dataquest, Inc., added, "Many mainframes are starting to be used as big file servers. As more and more workstations — which are generally Unix-based — show up on the desktop, you're likely to see an increased need for X-based connectivity to the mainframe."

Knet X Windows for VM costs $4,000 to $6,000. For MVS, it costs $6,500 to $8,500. The product runs alongside Fibronics Knet TCP/IP and supports the Open Software Foundation's Motif interface.



Cellular makes room for data

BY JIM NASH
CW STAFF

Even in the most congested cellular telephone markets, room exists for data transmissions between calls. Engineers at two cellular phone companies are testing a scheme to shoehorn data channels between existing voice channels.

If the technical and marketing tests are successful, one industry analyst said, telephone companies could open the door on an estimated $2 billion worth of new data transmission services. A start-up called Cellular Data, Inc. in Palo Alto, Calif., is pushing what it calls the cellular packet data network.

Cellular Data foresees messages from several sources being handed off from one cell site to another across the continent. Miklos Korodi, president of Cellular Data, said the most apparent use is replacing leased and dedicated lines in credit-card authorizations and purchases. Other uses include alphanumeric messaging, burglar alarms and environmental telemetry.

Korodi said it may even be possible to install radio devices in portable automated teller machines that could be carted into sporting events or disaster scenes.

While only nominally a network now, the service is an affordable way to take short bursts of data, such as data involved in credit-card transactions, and pass it between voice channels, Korodi said.

Ron Grawert, vice president of technology at Houston-based GTE Telecommunication Products and Services, a division of GTE Corp., said GTE has installed Cellular Data network devices at six cell sites in the city for a three-stage test. The first phase — seeing whether data transmissions interfered with voice communications — was a success, he said.

The second phase will see whether voice interferes with data transmissions, and the third, ongoing part of the test will examine commercial viability. Similar tests are being conducted by Bell Atlantic Mobile Systems, a Bedminster, N.J., cellular company that has invested $1 million in Cellular Data.

An interesting market

GTE began working with Cellular Data 18 months ago. "We're committed to testing only," Grawert said, but "we see a pretty interesting market for wireless communications."

As part of the tests, businesses in various locations in Houston and Philadelphia have been given transceivers, or packet radios, that Korodi said should sell for $150 each.

Debit and credit cards from participating local banks are run through the device. Digital data is handed off in the 824- to 896-MHz band from cell site to cell site via Cellular Data equipment at each station.

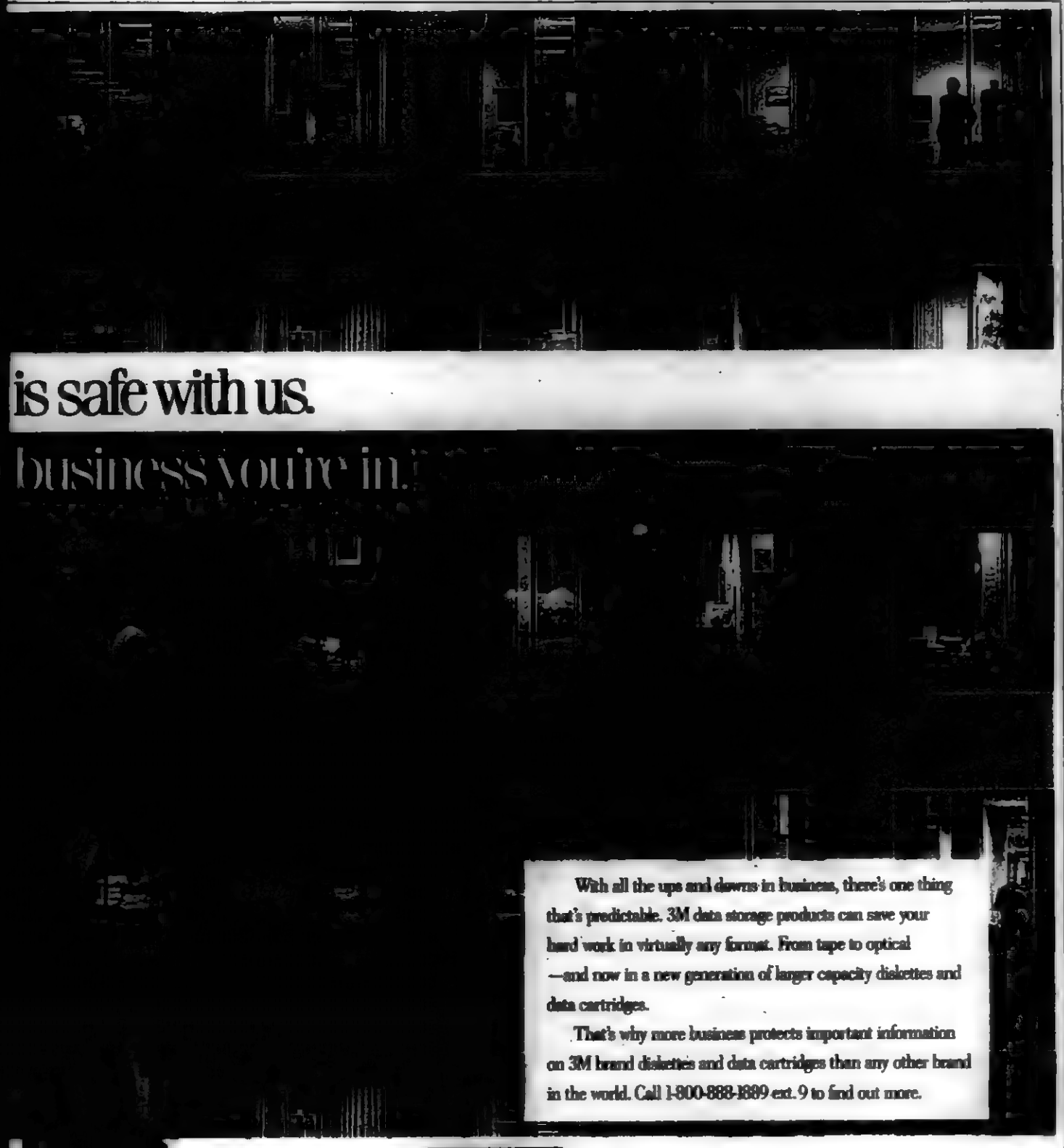
Prices for the packet radios will probably fall to $50, according to Steve Sazegari, an analyst at Dataquest, Inc. in San Jose, Calif. Sazegari said he thinks the potential market for service and equipment could be $2 billion in the next five to seven years.

Transmission rates were currently at 2,400 bit/sec.

Cellular Data has received a patent for the process of using what is called cellular sideband, and the Federal Communications Commission has given the company its blessing.

"We are fairly happy to see this kind of activity," said Tom Stanley, an FCC chief engineer. "In the late 1980s, the government relaxed regulations on existing cellular rules to encourage alternative services." He said he was unaware of any comparable service.

GTE expects to wrap up its tests by the end of June. Bell Atlantic, which has 220,000 potential customers, plans to make a decision on whether to adopt the technology this fall, said Tim White, director of business development at the company.



Presenting All The S
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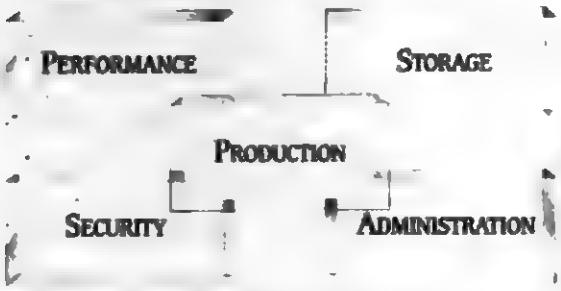
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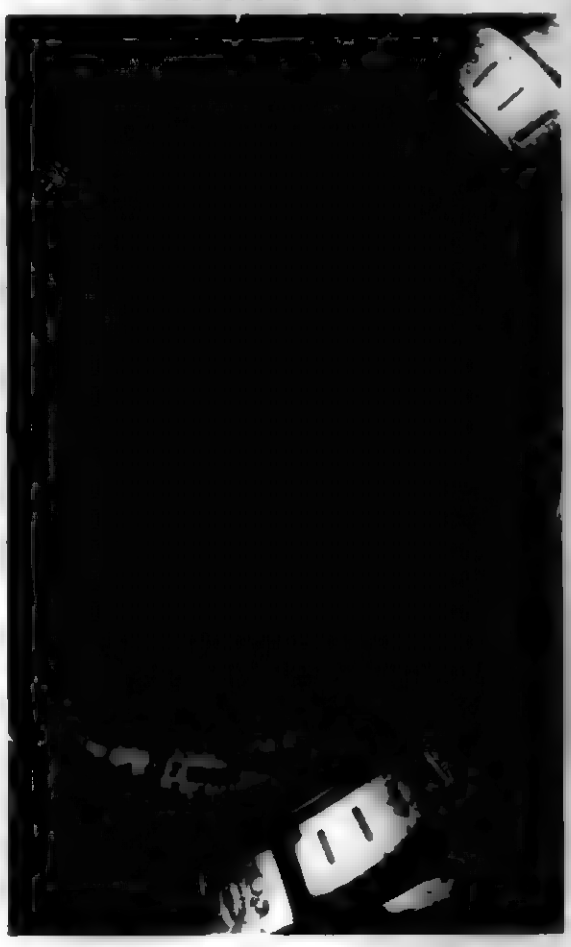
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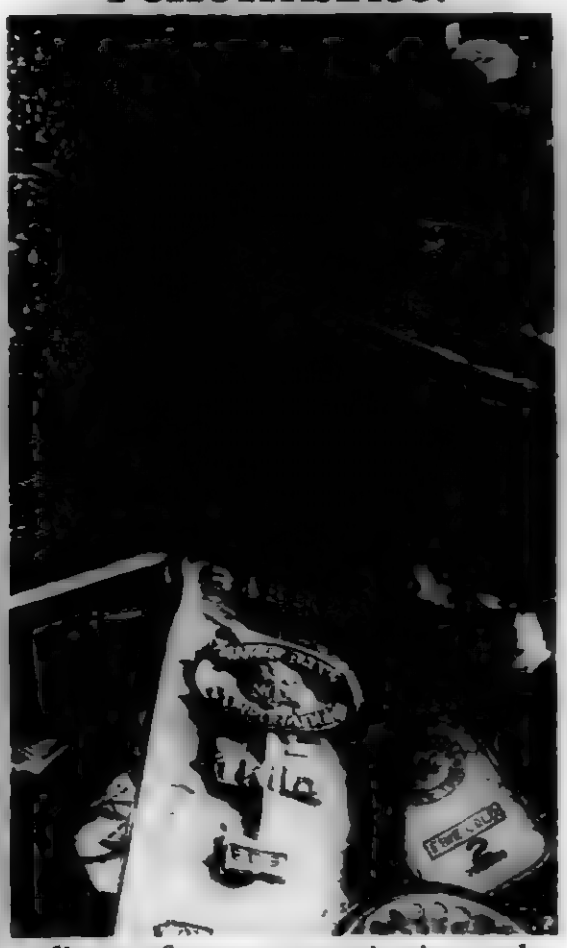
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Administration.



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NYC agency

FROM PAGE 51

year ago to install fiber, despite a user survey at the time that indicated "no one had any interest in LANs," he said. "We put in the fiber just in case; now, suddenly, everyone has decided they need LANs" that must interconnect.

For example, one wastewater treatment application involves a computer room on one building's sixth floor and 250 users on the second floor. "I wasn't going to run 250 wires between floors," Morgan said; thus, the FDDI backbone. A Prime Computer, Inc. 6350 host on the sixth floor attaches to a Timeplex router to the FDDI backbone in the elevator shaft to the second floor. From there, the traffic travels onto another router on that floor into a hub and off the hub into the appropriate 10Base-T LAN.

10Base-T is a 1-year-old standard for running 10M bit/sec. Ethernet LAN traffic over unshielded twisted-pair wiring in a star topology through a smart wiring hub. Each of the department's floors will eventually have a 10Base-T LAN running Novell, Inc.'s Netware network operating system.

In addition, the agency has standardized on Cabletron Systems, Inc. and Hewlett-Packard Co. hubs and plans to implement Cabletron's Spectrum or HP's Openview enterprisewide network management systems.

The $2.5 million cabling chunk of the project was handled by NEC America, Inc., whose price included a NEC digital private branch exchange. NEC ran unshielded twisted-pair wiring to 3,000 work areas on 16 floors of two buildings in LeFrak City, a section of New York's borough of Queens. Each work area houses a voice jack and two data jacks.

A wiring closet holds the entire agency's communications equipment, including controllers, routers, hubs and modems; the hubs bridge over wide-area communications links to the agency's two redundant data centers in downtown New York.

> "WE PUT IN the fiber just in case; now, suddenly, everyone has decided they need LANs" that must interconnect.
>
> RANDI MORGAN
> NEW YORK DEPARTMENT
> OF ENVIRONMENTAL
> PROTECTION

Previously, each of the 15 locations hooked through a Timeplex T1 multiplexer into a local hub center, where data was concentrated onto a 56K bit/sec. line to Citynet, a citywide network that taps into all the major city government mainframe sites.

With the new network, the environmental protection department will retain access to Citynet via a single hub in the LeFrak communications closet — instead of through 15 hubs.

Racking up some net gains

The New York Department of Environmental Protection's new network aims for the following:

- A $2 million annual savings in operating costs.
- Faster financial approval for urgent projects, such as fixing broken water mains or asbestos-related repairs.
- Fulfillment of federal legislation to obtain, maintain and disseminate information on hazardous materials.
- FDDI's 100M bit/sec. backbone speeds for networking advantages, such as computer-aided design (CAD) engineers in one building accessing a CAD host in another.



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PC Magazine 12.11.90, Ziff Davis Publishing. "9600 BPS MODEMS: Breaking the Speed Barrier. PC LAN Labs tests seven rapid fire modems complying with V.32 and V.42bis standards."

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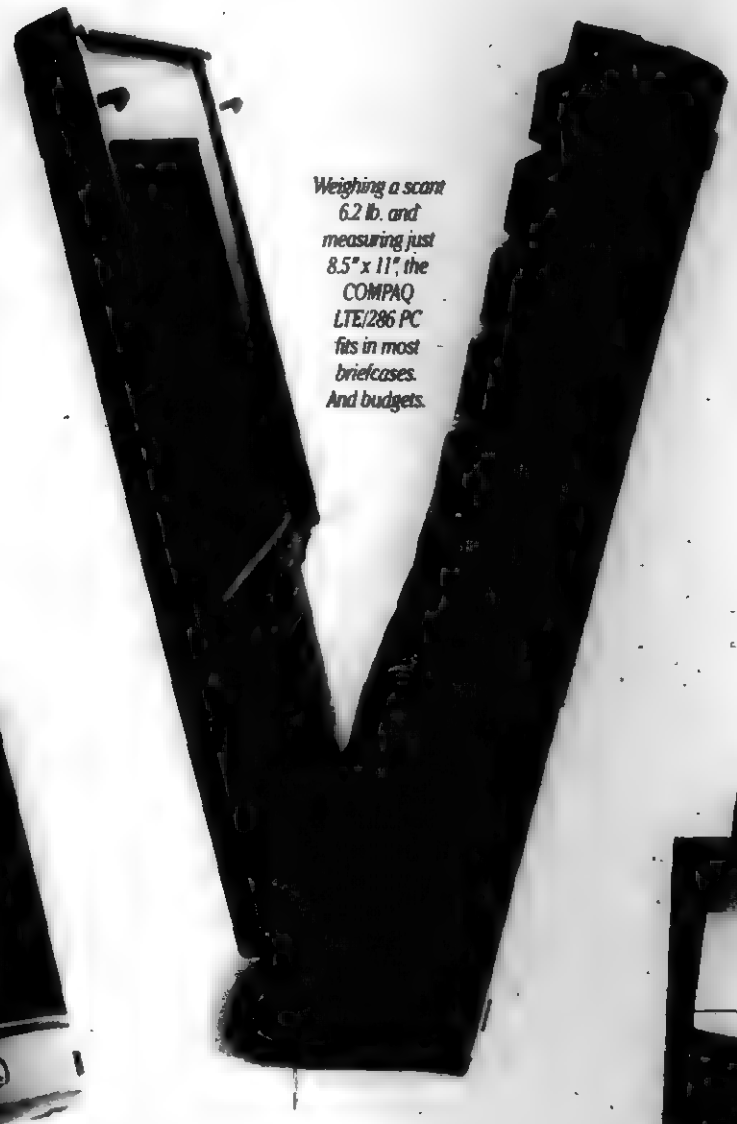
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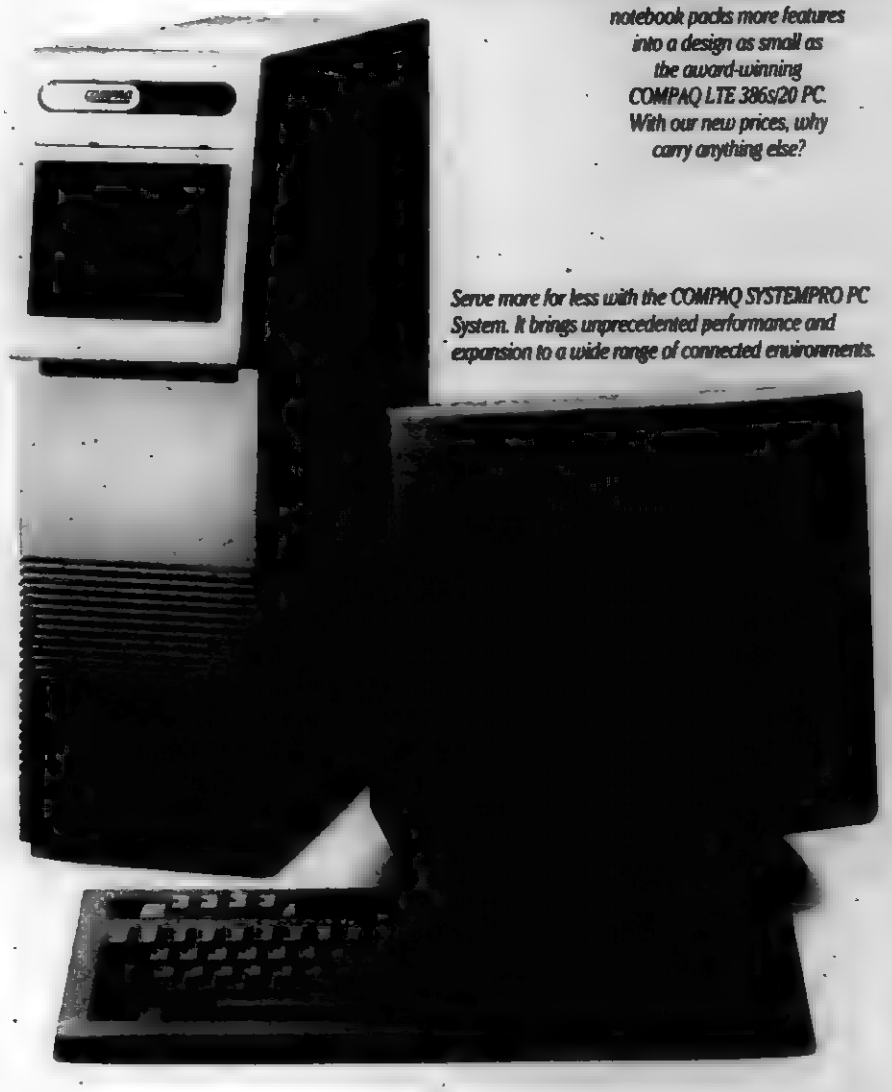
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LAN benefits Chicago treasury

Switch to information technology makes $3.1 billion budget manageable

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — From the book *1,000 Reasons To Take The Day Off*, reason No. 32: "Your company makes you manage its $40 billion cash flow using only a manual ledger system."

The only catch is, your employer is the city of Chicago, and for you, City Treasurer Miriam Santos, it would not be politically expedient to take the day off. Your answer: a local-area network and some high-powered financial management software.

"The system is working well, and even though the conversion is on-going, the availability of better information is already saving staff members several hours per day," said Santos, who is not on the network yet but is using a Toshiba Corp. T3100 portable computer on a dial-up basis.

In hard benefits, Santos said, the network immediately reduced banking fees, greatly improved returns on short-term investments and added investment flexibility.

Most of the treasury's processing is done on an IBM mainframe, but the department decided that cash accounting and investment management required more flexibility and chose a LAN. "We felt MIS didn't have the expertise we wanted or the sensitivities to our needs coming from a mainframe environment," said Carlton R. McGee, first deputy city treasurer.

Treasury staff members credit Santos with the political savvy and determination to get the city's purchasing committee to approve a $300,000 budget for installing a LAN and acquiring software to run the city's $3.1 billion annual budget.

"A bureaucracy as it exists in almost any government entity is difficult to change," Santos said. "You have to be very tenacious about change. The difficulty was in communicating why it was important to change and why we had to make the changes."

The basic reason for the switch was the existing accounting methods, which dated back to the Industrial Revolution.



Steven Gross

Chicago's Santos *was key to installing a LAN to manage the city's $3.1 billion budget*

In place today is a 16-node Ethernet network running Novell, Inc. Netware and based on a 33-MHz 386 server from Chicago-based Systems Integration Associates, with 10 Systems Integration 386-based machines and six other personal computers. The treasury uses Boston-based Thomson Financial Networks Co.'s Portia system to track its portfolio.

The treasury is adding other sophisticated software, including a package based on Blomberg L.P.'s Blomberg system. Blomberg is a New York-based maker of financial network reporting systems that tracks market fluctuations for investment purposes.

"We're just trying to catch up to the rest of the world," said John S. Henry, deputy city treasurer of accounting. Being so far behind the automation curve has some payoffs, he added. With no system in place, the treasury was able to select sophisticated software that would allow it to expand in the future. At the same time, buying for more than current needs has provoked challenges.

"The question that came back to me is, 'Why do you want something so powerful?' " Henry said. "I don't want something that's going to be obsolete a year from now. The system is not going to leave, and we wanted to buy something that had a lot of power to it in case we ever got the authority to venture off into different financial avenues."

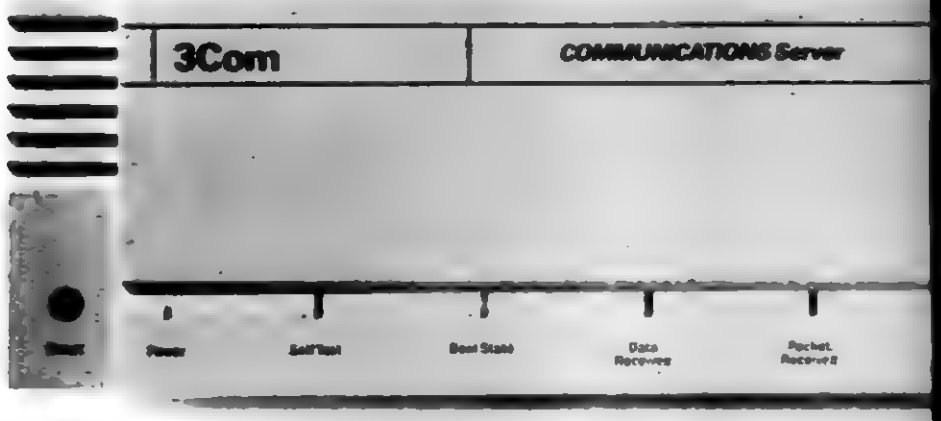
Sudden impact

Bringing the treasury into the Information Age has a huge potential impact: Besides the city's budget, the city treasurer is also treasurer of the Chicago Board of Education, invests all the city's bond proceeds, manages escrow funds and is a trustee for $2 billion worth of city employee pension funds and the Chicago Public Schools teachers' pension fund. It all adds up to a $40 billion annual cash flow.

"For me, having good, solid information means, for instance, that I know I have exactly $87 million to invest today, so I can get bulk rate prices and [use this to] compare rates," Santos said.

The treasury has even received an unexpected benefit from new technology use: In October, a check-kiting scam was uncovered thanks to a check microfilming process implemented along with the network.

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NEW PRODUCTS

Network management

Legato Networker 2.0, a network backup and recovery software package announced by Legato Systems, Inc., includes a new X Window System graphical user interface.

The upgrade also adds security options and increases user control over backup scheduling. Backup performance is raised to about 180K to 200K byte/sec., the company said.

Version 2.0 is available for Sun Microsystems, Inc. and Solbourne Computer, Inc. platforms, and it costs $4,995. An entry-level product, which can back up a maximum of four networked systems, costs $2,500.

Legato Systems
260 Sheridan Ave.
Palo Alto, Calif. 94306
(415) 329-7880

Micro-to-micro

Sofnet, Inc. has updated its unattended file transfer program to include fax transmission facilities.

Xchange Plus 7.0 can be set to relay information to remote personal computers or fax machines on a one-time or regular basis. It offers automatic data compression and encryption options for transferring files across dial-up networks. Other functionalities included are terminal emulation and electronic messaging.

A package with two copies costs $345.

Sofnet
Suite 101
775 Franklin Rd.
Marietta, Ga. 30067
(404) 499-0007

Local-area networking hardware

Intellicom, Inc. has introduced three Ethernet-to-10Base-T networking products.

The Tpair-312 Wiring Concentrator has 12 unshielded twisted-pair wire ports, each with full repeater/retiming capability. Pricing ranges from $999 for a basic hub to $1,777 for a model with an integrated Simple Network Management Protocol agent.

The Tpair-PNA Portable Network Adapter connects any portable personal computer to an unshielded twisted-pair network wiring hub.

The product ($399) includes drivers for network operating systems from Novell, Inc., Microsoft Corp. and Banyan Systems, Inc.

The Tpair-401P Pocket Transceiver provides an interface between a coaxial 15-pin network card and any 10Base-T concentrator. The transceiver weighs 2.5 oz. and lists at $129.

Intellicom
20415 Nordhoff St.
Chatsworth, Calif. 91311
(818) 407-3900

Data General Corp. has announced Novell, Inc. Netware v3.11 packaged servers for its Dasher personal computers.

Pricing begins at $10,995 for an Intel Corp. 80386-based PC with a 20-user license. A high-end, Intel 1486-based server with a 100-user license costs $19,795.

Dasher, Aviion and Eclipse systems can now be integrated under Netware local-area networks.

DG
3400 Computer Drive
Westboro, Mass. 01580
(508) 366-8911

Hayes Microcomputer Products, Inc. has announced the ISDN System Adapter, an external multimedia adapter for personal computers, workstations and hosts supporting Integrated Services Digital Network (ISDN) communications.

The adapter supports telephone, answering machine, Group III facimile and modem transmissions and meets National ISDN 1 specifications.

It provides direct access to 64K bit/sec. B-channel bit stream for transparent data transmission.

The product costs $1,599. Through December, Hayes is offering a two-for-one special sales promotion, limited to two units per site.

Hayes Microcomputer Products
705 Westech Drive
Norcross, Ga. 30092
(404) 449-8791

Local-area networking software

EDI Communications Corp. has announced a 16M/4M bit/sec. Token Ring network diagnostic tool for the Apple Computer, Inc. Macintosh.

Mactoken 3.2 runs on Tridata Systems, Inc.'s Lanway TR 16/4 Token Ring adapter for the Macintosh. Mactoken offers data frame captures and real-time network performance graphs, among various other features.

The product costs $2,500 including an Appletalk interpreter. Without the interpreter, the price is $2,000.

EDI Communications
Suite 4E
10440 Town Center Lane
Cupertino, Calif. 95014
(408) 996-1345

Electronic mail

Reach Software Corp. has announced availability of Mailman, an electronic mail software package supporting access to standard mail servers, databases and applications.

Mailman runs under Microsoft Corp.'s Windows 3.0 and Banyan Systems, Inc.'s Virtual Networking System. According to the company, Mailman will eventually support all major network operating systems. The product implements store-and-forward technology to transmit information to and from users and applications.

A license for up to 20 users costs $995. An unlimited user license costs $1,995.

Reach Software
330 Potrero Ave.
Sunnyvale, Calif. 94086
(408) 733-8685

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Cambex factory-trained technicians install and reconfigure the storage cards in just a few hours. At no cost to you. And for any rental period of 90 days or more that your site requirements demand.

If you are an IBM mainframe user, turn to Cambex for your memory today. If you are planning to acquire a 3090 or ES/9000 in the future, get just the processor and leave the memory to Cambex. You'll see savings you never thought possible.

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Cambex also designs and manufactures storage solutions for the IBM RISC System/6000.

MANAGER'S JOURNAL

EXECUTIVE TRACK



Gary D. Ginter has been named managing director of **Globex Corp.**, which will operate the global automated after-hours trading system for futures and options traded on the Chicago Mercantile Exchange and the Chicago Board of Trade.

Globex is a joint venture of the Merc and the Board of Trade and will operate a trading system developed by Reuters Holdings PLC. Reuters will supply the computer and global network.

Ginter, 44, was one of the founding principals of Chicago Research & Trading Group Ltd. (CRT) and has been a proponent of technology development in the futures industry for the past 15 years. CRT has 750 employees doing business on major futures, options and stock exchanges. Ginter was responsible for CRT's relations with U.S. and foreign regulators and for developing several of the firm's foreign involvements.

Ginter has served on the federal Office of Technology Assessment's special advisory panel on securities markets and information technology. He has also served on the strategic planning committee of the Board of Trade.

He is a Phi Beta Kappa graduate of the University of Southern California.

.....

Michele Fainor has joined **Sungard Recovery Services, Inc.** in Wayne, Pa., as a programmer/analyst in the product development department.

Fainor was formerly a programmer/analyst at The Arbitron Co. in West Chester, Pa. She holds a bachelor's degree in mathematics and computer science from Pennsylvania State University.

.....

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

IS power to the (retired) people

American Association of Retired Persons head wields computers as political weapon

BY GARY H. ANTHES
CW STAFF

PROFILE: Horace B. Deets



Katherine Lambert

Position: *Executive director of the American Association of Retired Persons*
Mission: *Applying technology to meet the changing needs of AARP's members*

Horace B. Deets is a soft-spoken man whose self-deprecating style belies his post as the head of the largest and possibly most powerful membership organization in the U.S. But his low-key style cannot hide a passion for the welfare of his 33 million members — half of all Americans over the age of 50 — or his zeal for the information systems needed to manage his huge operation.

Deets is executive director of the American Association of Retired Persons (AARP), but none of the images suggested by the word *retired* fit the Washington, D.C.-based association. AARP has 1,600 employees backed by an army of 370,000 volunteers in 4,000 local chapters.

It garners more than two-thirds of its $300 million annual revenue from a bevy of big business activities aimed at older Americans — from mutual funds to pharmacy services to travel to health insurance. It publishes a slick magazine, *Modern Maturity*, that has the highest circulation of any magazine in the U.S. To top it off, AARP enjoys a political clout that puts the National Rifle Association to shame.

Behind all that are computer and communications systems, and behind those stands computer enthusiast Deets — pushing, pulling and prodding information technology. "I'm very curious about technology. My wife calls me a gadget freak," Deets says. He has personal computers at home, in his office and on his lap when he travels. He spends between 30 minutes and two hours per day communicating with his staff and board members by electronic mail and monitoring the performance of the association by downloading data from AARP's Digital Equipment Corp. VAX computers.

When asked about IS strategy, Deets relates a tale from *Alice in Wonderland*. "The caterpillar asked Alice where she was going, and she said she didn't know," he recounts. " 'Then any road will take you there,' the caterpillar says. It's absolutely essential that we have a vision of where we want to go."

The 53-year-old South Carolinian's vision places strong emphasis on the application of technology to meet the

Continued on page 69

MBAs to receive more technology education

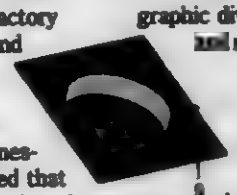
BY MITCH BETTS
CW STAFF

Business schools will soon be making curriculum changes to ensure that when MBA graduates show up for work in corporate America, they have a broad understanding of the role that technology plays in all facets of modern commerce and business.

The St. Louis-based American Assembly of Collegiate Schools of Business (AACSB), which accredits business schools, revised its curriculum standard late last month to require coverage of technology's influence on business, but the standard gives schools plenty of flexibility in how they comply.

Schools could start a course on managing technology, or the topic could be incorporated in courses for each of the business functions, such as marketing, accounting and human resources management, AACSB officials said. Either way, they said they expect schools to be experimenting with ways to provide MBAs with "cross training" in technology.

Although many MBA programs already require a course in information systems, the new standard is intended to expose students to non-IS technology subjects as well, such as factory technology, biotechnology and management of research and development.



Michael Stahl, associate dean at the University of Tennessee's business school, predicted that many schools will implement the broader requirement by starting a technology appreciation or technology management course in addition to the IS course, not as a replacement. "My guess is that will increase the amount of education concerning technology, not detract from it," he said.

Richard J. Lewis, president-elect of the AACSB and dean of Michigan State University's business school, said the change was promoted by the AACSB's Strategic Issues Committee, which identified three cross-disciplinary themes that need to be integrated into the business curriculum: globalization of markets and organizations, management of technology and the demographic diversity of the work force and marketplace.

Eventually, the topic of technology management should be blended into virtually every business course, but business schools will first need to educate their own faculty members, said Brandt R. Allen, professor of business administration at the University of Virginia in Charlottesville. "Quite frankly, not all of us are blessed with faculty who have a keen awareness of how information technology is changing everything we do."

CALENDAR

MAY 26-JUNE 1

Database World Conference and Exposition. Washington, D.C., May 29-30 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Client Server '91. Chicago, May 29-31 — Contact: Bennie Sea, Washington University, St. Louis, Mo. (314) 889-5380.

DB2 Productivity Tool Seminar. New York, May 29 — Contact: DB2 and SQL Users, New York, N.Y. (212) 986-7563.

JUNE 2-8

International Communications Association Conference and Exposition. Anaheim, Calif., June 2-7 — Contact: ICA, Dallas, Texas (214) 233-3580.

Building Systems Automation-Integration Symposium. Madison, Wis., June 3-5 — Contact: Charles E. Dorgan, University of Wisconsin at Madison (608) 262-8220.

Information Management: The Next Generation. Orlando, Fla., June 4-6 — Contact: Delphi Consulting Group, Boston, Mass. (617) 247-1511.

Systems Integration Exposition and Conference. Rosemont, Ill., June 4-6 — Contact: Sandi Eberhard, Eberhard & Co., New York, N.Y. (212) 557-6960.

Value Systems Worldwide 1991. Kensington, England, June 4-6 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

Technomart Washington, D.C. Washington, D.C., June 4-6 — Contact: Technomart Washington, D.C., Austin, Texas (512) 343-9066.

Downsizing Corporate Computing. Chicago, June 4-6 — Contact: Bob Daniel, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Managing Office Ergonomics: Toward a National Consensus. Tysons Corner, Va., June 5-6 — Contact: The Center for Office Technology Conference, Washington, D.C. (202) 466-7816.

JUNE 9-15

The Security Impact of Networks, Telecommunications and Office Automation. Denver, June 10-12 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2626.

Usenix Summer 1991 Technical Conference and Exhibition. Nashville, June 10-14 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

Computer Security Institute. Denver, June 10-12 — Contact: Computer Security Institute, San Francisco, Calif. (415) 267-7651.

Experts on Networks. Washington, D.C., June 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

FDDI Executive Symposium. Sunnyvale, Calif., June 11-12 — Contact: Joan Marie McArdle, Events Management International, Marshfield, Mass. (617) 834-4703.

EDI: Steps for Success. Atlanta, June 11-13 — Contact: Sharon Scott, Informa, Atlanta, Ga. (404) 220-2602.

Strategic Planning for Information and Systems. Chicago, June 12-14 — Contact: Burnett Data Systems, Rockville, Md. (301) 762-1288.

Windows 3.0 Developers Conference. Tyngsboro, Mass., June 12-14 — Contact: Andree Fontaine, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

The Synoptics User Group. Orlando, Fla., June 13-14 — Contact: Christine Seale, Bytex, Southboro, Mass. (508) 485-2643.

JUNE 16-22

National Educational Computing Conference. Phoenix, June 16-20 — Contact: Southwest Events, Scottsdale, Ariz. (602) 991-5131.

American Institute of Certified Public Accountants' Microcomputer Conference and Exhibition. New Orleans, June 16-19 — Contact: AICPA, New York, N.Y. (212) 575-6200.

Office Automation Society International Educational Conference. Alexandria, Va., June 16-19 — Contact: OASI, McLean, Va. (703) 821-8850.

Cincom's 1991 International User Conference. Cincinnati, June 16-20 — Contact: Cincom Systems, Inc., Cincinnati, Ohio (513) 981-2360.

Government Management Information Sciences Conference. Salt Lake City, June 16-20 — Contact: Government Management Information Sciences headquarters, Wichita Falls, Texas (817) 692-1107.

Conference on Image Processing. Tyngsboro, Mass., June 17-19 — Contact: Andree Fontaine, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

MIT Center for Information Systems Research Summer Session. Cambridge, Mass., June 17-20 — Contact: CISR, Cambridge, Mass. (617) 253-6657.

Testing Computer Software. Washington, D.C., June 17-20 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

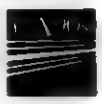
Downsizing in the Computer Industry: Making the Migration from Reliance on Mainframes to Distributed Processing in the Mini, PC and LAN Environment. New York, June 19-20 — Contact: Institute for International Research, New York, N.Y. (212) 599-1260.

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Quality controls underused

Study shows firms fail to take advantage of their computerized systems

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — Most manufacturing companies have some form of computerized quality control in place and will greatly increase spending on such automated quality systems this year, but most firms could be using their systems more effectively, according to a recent study.

The blind study, commissioned by SPSS, Inc., a maker of statistical software, polled 222 engineers, managers and executives at U.S. manufacturing companies.

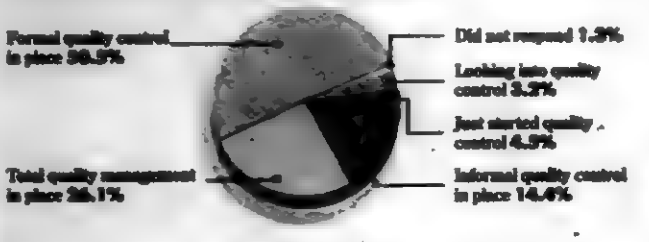
More than 90% of the companies surveyed said they practice some form of quality control, and 26% have implemented Total Quality Management programs such as those designed to compete for the Malcolm Baldrige Quality Awards that are given out by the U.S. Department of Commerce.

Respondents noted three top reasons for implementing quality control. Pride in the product was cited by 85% of respondents, management's commitment by 78% and the need for feedback on out-of-control processes by 73%.

Pushing quality as job one

More than 75% of the manufacturing firms surveyed had either a formal quality control program or a total quality management program in place

Percent of respondents; base of 222 manufacturing companies



Source: Alphastat Research Corp. CW Chart: Tom Monahan

Lost control

Firms using computer systems to track quality have implemented sampling, inspection and charting programs. Although a large number of firms use systems, many fail to regularly review the data they collect.

For example, while 61% said computerized systems were in place on the factory floor, only 29% indicated that quality control data was used for real-time reactions.

Most respondents said their companies will spend as much on quality control hardware and software in 1991 as they did in the last two years combined.

According to SPSS, it commissioned the survey, conducted by Sharon, Mass.-based Alphastat Research Corp., in order to seek out potential customers for its Quality Manager software package.

MANAGEMENT BRIEFS

CEOs to speak at SIM

Four chief executive officers and three senior business executives from user firms have been named as speakers for the Society for Information Management (SIM) annual conference next fall in Chicago.

The conference theme is "Focus on the Basics," one aspect of which is using information systems as a catalyst to establish total quality in an organization.

Two speakers from Malcolm Baldrige Quality Award-winning companies will be featured: Xerox Corp. President and CEO Paul A. Allaire and IBM Senior Vice President Stephen B. Schwartz.

Other CEO speakers are the heads of three companies noted for innovative use of IS: Robert L. Crandall of American Airlines, Ronald J. Gidwitz of Helene Curtis, Inc. and Richard F. Teerlink of Harley-Davidson, Inc.

Other high-ranking business executives who will speak on IS in their companies are James E. Annable, senior vice president and chief economist at First National Bank of Chicago, David Hale, first vice president and chief economist at Kemper Financial Services, Inc., and Larry K. Switzer, senior vice president at S. C. Johnson & Son, Inc.

The conference will be held Oct. 6-10 at the Chicago Marriott Downtown. SIM can be contacted at (312) 644-6610.

Lawrence A. Higgason, principal founder and first managing director of the Automotive Industry Action Group, has been named to the board of directors of Genzlinger Associates, a Troy, Mich.-based provider of communications and software systems to the automotive and repetitive manufacturing industries. He will also provide consulting assistance to Genzlinger.

Higgason spent 20 years at Ford Motor Co. in materials management, business planning and internal consulting. After that, he worked at Deloitte Haskins & Sells and then Renault Automotive Co. in Paris, where he led development and implementation of electronic data interchange, bar coding and computer systems improvements.

A TOAST TO THE SWEDISH S

IS power

FROM PAGE 65

changing needs of AARP's members. Shortly after becoming executive director in 1988, Deets pressed for the development of a correspondence tracking system, which is used to analyze issues and track opinion trends.

Since joining AARP nearly 15 years ago, Deets has held a succession of management positions in legislation, human resources and communications before becoming executive director. Earlier, he worked for the Equal Employment Opportunity Commission and was director of outreach at the Washington Hospital Center's project for alcoholism and drug abuse.

As AARP director, Deets also asked for an executive information system (EIS), which is being developed by AARP and tested by Deets.

Before Deets begins a trip out of town, the system combines data from several sources to produce a highly tailored briefing sheet telling him about the area he's visiting — membership statistics and key issues of interest to AARP members.

"I can tell the governor of California that 10% of the state's population — 3 million people — are AARP members," Deets says. "That gets his attention."

Deets also taps into his 1,500-name electronic Rolodex to print out a list of people in the area being visited. Deets says he works 60 to 70 hours per week.

He uses the EIS to access databases of financial, human resources, membership, legislative and volunteer information, looking for things such as unfavorable budget variances.

He can graphically display the results and print them in his office. "I might write a note on it — 'What's going on here?' — and then send it to someone," he says. "That opens some eyes."

Team effort

Unlike Alice, Deets knows where he wants to go, but he insists he does not tell his staff how to get there. "I harbor no illusions [that] I run this place single-handedly," he says. "I'm trying to be a catalyst to get things done, to be coach, quarterback, cheerleader, water boy. [IS Director] Steve Cahlk has enormous freedom."

"Horace is very supportive," Cahlk says. "He understands what we do, and he understands technology and its value. At other places, [computer technology] is viewed as an expense, not an asset." Cahlk says Deets focuses on user functionality, not technological glitz.

"I do a lot of listening," Deets says. "We've probably had more retreats than any monastery in the country."

A group Deets listens to a great deal is his board of directors. The 21 board members, who have an average age of 70, are scattered across the U.S. but tied to Washington via home computers connected to AARPnet.

AARPnet allows board members and about 100 key AARP volunteers to learn of Washington goings-on as they happen, while bringing their reactions back to AARP headquarters via E-mail.

The electronic tie-in is part of Deets' strategy to decentralize in order to get closer to the membership. AARP came under criticism — Deets says unfairly — after a catastrophic health care bill was passed by Congress at the urging of AARP, then repealed when AARP's members decided it was not what they had in mind.

Deets says the problem was the structure of the program as stitched together by Congress, "but there was the perception that there was insufficient input from the grass roots."

Now, AARP's highest priority is a national health care system. In this project, as with nearly all of AARP's activities, computers are likely to play an important role. For any issue of interest to AARP members, a highly targeted mailing can be generated, which requests that key members write to their legislators.

"You generate 50,000 handwritten letters to a congressman's office, and you've got his attention," Deets says.

Keeping current

Although AARP Executive Director Horace Deets loves the personal computer on his desk, AARP's $18 million information systems budget and 200-member IS staff support a good deal more than that.

AARP runs two large data centers, one with a cluster of five DEC VAXs in Washington, D.C., and one boasting an IBM Enterprise System/9000 mainframe in Lakewood, Calif.

The data centers are connected to each other by a 1.5M bit/sec. data line and to 15 remote sites via dial-up circuits.

This summer, AARP will move its Washington operations into a new building, one fitted with a Fiber Distributed Data Interface (FDDI) backbone. Each floor will have a local-area network and an FDDI-to-Ethernet bridge tying the LAN to the backbone. Users needing more computer capacity than is on their desks can go to the LAN server, to another LAN or to the data center. "The network will be the computer," IS Director Steve Cahlk says.

AARP has about 100 applications systems. One large batch system adds 10,000 new members per day to AARP's membership rolls while processing 20,000 to 30,000 renewals.

Another application is a custom-built database that keeps track of AARP's 370,000 volunteers, including their locations, specialties and current activities.

GARY H. ANTHES

AFETY STANDARD.

IDEA

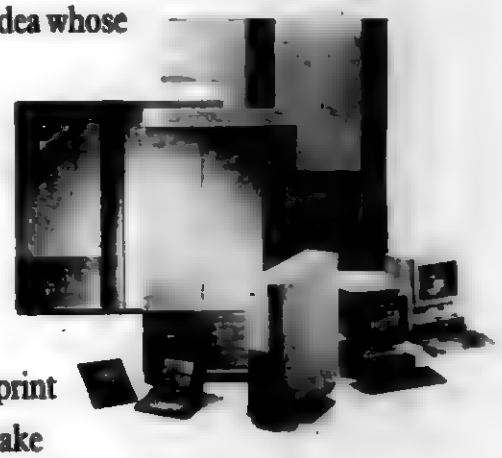
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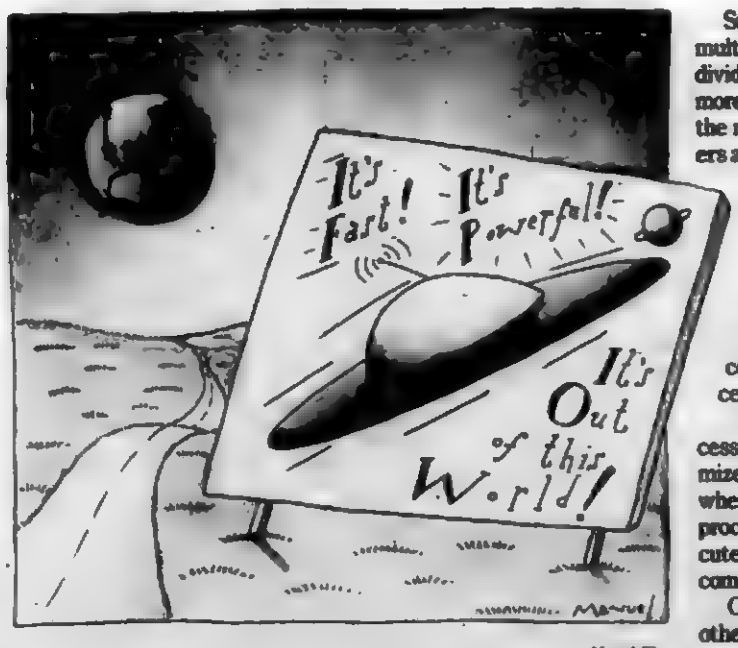
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Superman? No, superserver

LAN server vendors are touting power and speed, but buyers need to decide how much is actually too much

BY SHARON FISHER



Manuel Klug

It's getting more and more difficult to distinguish advertisements for network servers from ads for sports cars. With the emphasis on speed, power and performance, about all that's missing is the announcement in tiny print at the bottom: "Performance may vary."

Practically every hardware manufacturer has dibs on the high-gloss server market, whether it sells a minicomputer, a reduced instruction set computing (RISC) server or an Intel Corp. 80386- or I486-based machine. But the most recent and visible entrants in the price/performance rally are vendors that sell "superservers."

Those that hawk the loudest, however, are also currently selling the fewest machines. Despite all the attention they've received, superservers have a "small but growing" market status, according to David Passmore, a partner at Ernst & Young in Fairfax, Va.

There are a couple of reasons for the low number of shipments. For one, while price/performance ratios on superservers soar over their higher and lower end counterparts — the minicomputer and the personal computer — not everyone is ready for such a high-powered machine. Least ready are the software vendors, which are just beginning to catch up with the functionality offered by these relatively new machines.

Secondly, while the term "superserver" has been stretched to cover a range of machines, true superservers are actually few in number.

These machines are not simply souped-up PCs intended to run everyday tasks of data and file serving. Superservers are optimized from the get-go to handle either very large file sharing responsibilities or mission-critical applications that may previously have been run on a minicomputer or mainframe. Their prime characteristics can be boiled down to include the following:

- More than one high-performance Intel I486 microprocessor.
- As much as 12M bytes of memory and 1G byte of disk space.
- Fault tolerance through extra hard disks and disk controllers.
- Enhanced buses to improve performance.

Superservers are likely to find work as replacement machines for larger computers running mission-critical applications.

"Minicomputers can operate in office environments, but because of their [large] packaging and footprint, they usually end up in dedicated spaces," says Kevin O'Neill, vice president of network research and consulting at Business Research Group in Newton, Mass. "Superservers lend themselves to being implemented in distributed spaces, such as regional offices."

Choice for large LANs

While traditional PCs are fine for most file serving tasks, Passmore says companies with 100 or more PCs on a single local-area network could use a superserver.

An organization that has outgrown its current server and is reluctant to break up its LAN into several subnets may also consider a superserver, says David Ferris, president of Ferris Networks, Inc., a consulting firm in San Francisco.

For both purposes, superservers offer a host of hardware advantages over PC-based servers. O'Neill points to their scalability as a prime advantage. Users can add power as they need it, beyond the point at which the standard server runs out of gas.

Superservers also provide multiprocessing, or the ability to divide work between one or more processors. This allows the machine to support more users at the same time.

There are two types of multiprocessing: symmetric, where both processors perform the same tasks, and asymmetric, where one processor may be used for network processing and one for file access, Passmore says.

With asymmetric multiprocessing, each processor is optimized to perform a specific task, whereas with symmetric multiprocessing, any task can be executed by either CPU on a first-come, first-served basis.

Opting for one type or the other depends largely on which network operating system you are running. Novell, Inc.'s Netware supports asymmetric processing, while Microsoft Corp.'s LAN Manager and Banyan Systems, Inc.'s Virtual Networking Software (Vines) support symmetric.

Upping performance

Disk arrays are another performance booster: They allow the superserver to support multiple disk drives. "You can take a file and spread it across multiple hard drives, which allows you to have simultaneous reads and writes," Passmore explains. The Systempro from Compaq Computer Corp. is one machine that supports this feature, and NCR Corp. has come out with a chip that supports disk arrays as well, Passmore says.

Improving performance further are the nonstandard buses used by many superservers. However, there is a trade-off in using a proprietary bus. Without the standards, users will find it more difficult — and expensive — to find adapters and other add-ons for the machine.

Herein lies the biggest problem with superservers: None of the added hardware benefits do users any good without software that can exploit them.

For instance, superservers

Continued on page 78

Fisher is a San Francisco-based freelance writer specializing in data communications.

INSIDE

Safe Routes
There are a variety of ways to get fault tolerance. Page 79.

Product Guide
A comprehensive listing of Intel-based superservers. Page 74.

RISC Speeds
RISC servers are worthy competitors of superservers. Page 80.

Superservers: Intel Corp. multiprocessor-based machines with multiple processors and enhanced bus structures

VENDOR	PRODUCT	NUMBER OF PROCESSORS	OPERATING SYSTEMS SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	CLOCK SPEED (MHz)	RAM STANDARD/MAXIMUM (BYTES)	CACHE SIZE[1] (BYTES)	MAXIMUM DISK CAPACITY (BYTES)	TYPICAL WORK GROUP SIZE	FAULT-TOLERANT CAPABILITIES	BUS ARCHITECTURE	EXPANSION SLOTS	I/O PORTS	MONITOR (MONOCHROME/COLOR)	PRICE AND CONFIGURATION
Advanced Logic Research, Inc. (714) 581-6770 (800) 257-7017	Powerpro	1-2	DOS, OS/2, Unix, SCO MPX	Banyan Vines, Netware, NFS	33	8M-[illegible]	8K, 64K-1M	9.6G	Up to 130	Cache, mirroring, arrays, spanning, striping	EISA	10 EISA, 2 ISA	2 serial, 1 parallel, mouse	Both	$7,495-$24,595 with 1 or 2 CPUs, 8M-byte or 17M-byte memory, 868- to 1.2G-byte hard drive, floppy disk, 2 serial, 1 parallel, 1 mouse port, integrated floppy controller, integrated hard disk controller, 300-watt power supply, 15-month warranty
	Multiserver Series 3000	1-6	DOS, OS/2, Unix, SCO MPX	Banyan Vines, Netware	25 or 33	[illegible]	8K, 256K (intel/ write)	8.4G	Up to 300	Cache, mirroring, arrays, spanning, striping	C-BUS/ISA	3 C-BUS, 10 C-BUS/ISA	9 serial, 1 parallel	Both	$17,999-$38,999 with 1 or 2 25-MHz/33-MHz CPUs, 8M-byte ECC memory, floppy disk, 330M- or 664M-byte hard drive, 32-bit C-BUS SCSI bus master, 9 serial, 1 parallel port, Super VGA graphics adapter, 450-watt power supply, 15-month warranty
AT&T Computer Systems (800) 247-1212	Starserver E	1-4	Unix System V Release 4	Banyan Vines, Star LAN, Star Group LAN Manager Server	33	8M/512M	8K, 256K per CPU	4G (internal), 44G (external)	200+	Cache, mirroring, arrays, ECC memory	32-bit EISA	12 EISA	2 serial, 1 parallel, 1 mouse, 1 keyboard	Both	$27,500 with 8M-byte memory, 300M-byte hard drive, 1.44M-byte floppy drive, 320M- to 525M-byte SCSI QIC tape drive, EISA SCSI host adapter, Unix System V Release 4
Compaq Computer Corp. (713) 370-0670	Compaq Systempro 486/386	1-2	DOS, OS/2, Unix	Banyan Vines, Novell, LAN Manager	33	8M/[illegible]M	64K	4.38G	100	Cache, mirroring, arrays	EISA	11 EISA, 4 32-bit memory slots	2 serial, 1 parallel, 1 mouse	Color	$16,999 with 1 CPU, 8M-byte memory, 240M-byte hard disk
Digital Equipment Corp. (800) 457-7803	Application DEC 433MP	1-4	SCO Unix System V	Novell, NFS	33	8M, 32M (expanded) 64M	8K, 256K per CPU	14.8G	16-100+	ECC memory	Corollary system bus, ISA	8 system, 7 ISA	7 ISA	Both	$17,500 (without operating system), $18,400 (includes operating system) with 8M-byte memory, 209M-byte hard drive, monochrome monitor
NCR Corp.[2] (800) 225-5627 (810) 445-5000	NCR 3445	1-4[3]	DOS, OS/2, Unix System V Release 4, SCO Unix	Netware (DOS), LAN Manager (OS/2), LAN Manager/X, NFS, Netware/X (Unix)	33 or 50	Up to 256M	8K	9G (internal), 25G (external)	128 (Unix)	Mirroring, arrays, UPS	MCA, SCSI II	8	Serial, parallel, mouse, video	Both	$24,300 with 1 33-MHz CPU, 8M-byte memory, 327M-byte hard drive, 525M-byte tape, 1.44M-byte floppy drive, VGA color monitor, keyboard, SCSI adapter, 1 serial port, 1 parallel port, Ethernet, operating system, NCR Windows
	NCR 3450	1-4	DOS, OS/2, Unix System V Release 4, SCO Unix	Netware (DOS), LAN Manager (OS/2), LAN Manager/X, NFS (Unix)	50	Up to 256M	8K, 128K	9G (internal), 25G (external)	256 (Unix)	Mirroring, arrays	MCA, SCSI II	8	Serial, parallel, mouse, video	Both	$42,400 with 1 50-MHz CPU, 8M-byte memory, 327M-byte hard drive, 525M-byte tape, 1.44M-byte floppy drive, VGA color monitor, keyboard, SCSI adapter, 1 serial port, 1 parallel port, Ethernet, operating system, NCR Windows
	NCR 3550	2-8	Unix System V Release 4	LAN Manager/X, NFS	50	Up to 512M	8K (write), 128K (read)	20G (internal)	Up to 1,000 (Unix)	Mirroring, arrays, UPS	MCA, SCSI II	14 MCA	Serial, parallel, mouse, video	Both	$130,843 with 2 50-MHz CPUs, 32M-byte memory, 670M-byte hard drive, 525M-byte tape, 1.44M-byte floppy drive, VGA color monitor, keyboard, dual SCSI adapter, 1 serial port, 1 parallel port, Ethernet, operating system, NCR Windows
Netframe Systems, Inc. (408) 944-0600	NF100	Up to 4	Netware, OS/2	LAN Manager, Netware 386	25	8M/32M	32K[4]	21 SCSI drives	20-250	Mirroring, duplexing, UPS, ECC memory, multiple control points, parity checking on all data paths	Proprietary hierarchical multiple independent bus (64-bit wide, 200M bit/sec. peak)	2 memory, 3 I/O or application processor	Up to 3 LANs, 6 WANs	Neither. Managed from a remote console	$19,950 with main processor, 8M-byte ECC memory, 380M-byte hard drive, I/O processor, 1 Ethernet LAN, optional Token-Ring, SCSI II controller, RS-232, RS-422
	NF200	Up to 4	Netware, OS/2	LAN Manager, Netware 386	25	8M/32M	8K, 32K[4]	21 SCSI drives	20-250	Mirroring, duplexing, UPS, ECC memory, multiple control points, parity checking on all data paths	Proprietary hierarchical multiple independent bus (64-bit wide, 200M bit/sec. peak)	2 memory, 3 I/O or application processor	Up to 3 LANs, 6 WANs	Neither. Managed from a remote console	$26,950 with main processor, I/O processor, 8M-byte ECC memory, 380M-byte hard drive, 1 Ethernet LAN, optional Token Ring, SCSI II controller, RS-232, RS-422
	NF300	Up to 9	Netware, OS/2	LAN Manager, Netware 386	25	8M/32M	32K[4]	56 SCSI drives	20-250	Mirroring, duplexing, UPS, ECC memory, multiple control points, parity checking on all data paths, redundant power supplies, cooling	Proprietary hierarchical multiple independent bus (64-bit wide, 200M bit/sec. peak)	4 memory, 6 I/O or application processor	Up to 5 LANs, 10 WANs	Neither. Managed from a remote console	$35,000 with main processor, I/O processor, 8M-byte ECC memory, 380M-byte hard drive, 1 Ethernet LAN, optional Token Ring, SCSI II controller, RS-232, RS-422
	NF400	Up to 9	Netware, OS/2	LAN Manager, Netware 386	25	16M/32M	8K, 32K[4]	56 SCSI drives	20-250	Mirroring, duplexing, UPS, ECC memory, multiple control points, parity checking on all data paths, redundant power supplies, cooling	Proprietary hierarchical multiple independent bus (64-bit wide, 200M bit/sec. peak)	4 memory, 6 I/O or application processor	Up to 8 LANs, 16 WANs	Neither. Managed from a remote console	$45,000 with main processor, I/O processor, 8M-byte ECC memory, 380M-byte hard drive, 1 Ethernet LAN, optional Token Ring, SCSI II controller, RS-232, RS-422
Northgate Computer Systems (612) 943-8181	Omnipentium	1-2	OS/2, SCO Unix	Netware 386	25	8M/128M	8K, 128K optional	9G (internal)	100-250	Cache, mirroring, duplexing	EISA, 100M-byte/sec. proprietary memory bus	7 EISA, 1 ISA, 5 proprietary (optional)	2 serial, 1 parallel, 1 modem, 1 video	Both	$13,995 with 1 CPU, 8M-byte memory, monochrome VGA monitor, 500-watt power supply
Parallan Computer, Inc. (415) 960-0288	Server 290	1-2 (system), 5-8 (total)	IBM OS/2 Extended Edition, Microsoft's OS/2	LAN Server, LAN Manager	33	8M 32M/128M	8K, 128K per CPU	45G	100+	Cache, mirroring, arrays, redundant system architecture with automatic failure recovery	64-bit 200M-byte/sec. interprocessor bus with dual MCA buses	Up to 4 MCA, including 1 extended EGA	Up to 4 SCSI I or SCSI II	Color	$50,000 installed with 1 CPU, 8M-byte ECC memory, 676M-byte hard drive, 1.44M-byte floppy drive, 2 SCSI processors, 8 MCA slots, system software with remote support utilities (Model 10)
Tricord Systems, Inc. (612) 557-9095	Tricord Power Frame	1-2	Microsoft's OS/2, SCO Unix	Banyan Vines, LAN Manager, Netware	25 or 33	8M/128M	8K, 256K (second level)	385M-42G SCSI	25-300	Cache, mirroring, arrays	EISA, 132M-byte Powerbus	7 EISA, 5 Powerbus	2 serial, 1 parallel Dupboard port expander	Both	Under $20,000 with 1 CPU, 6M-byte memory, 380M-byte hard drive

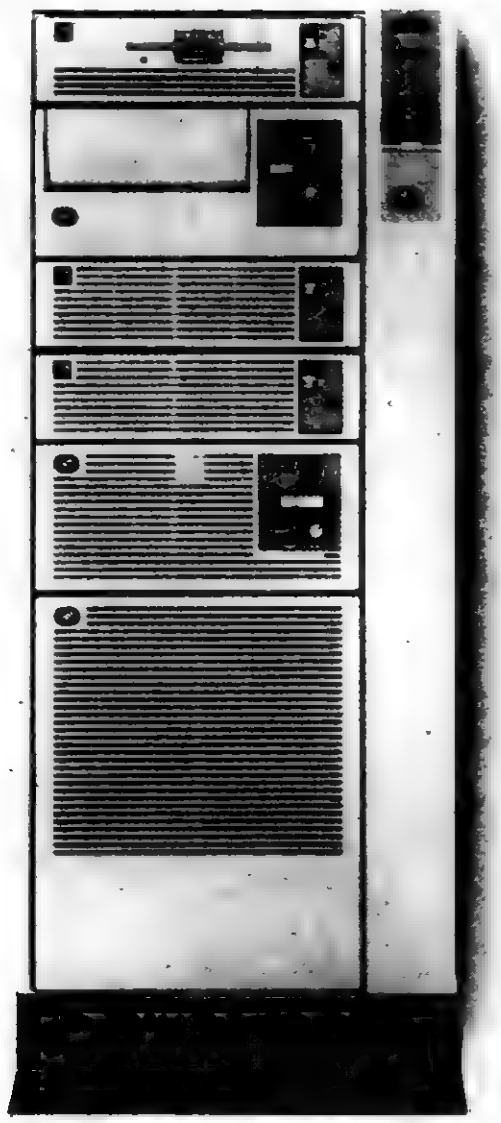
The processor type is the Intel Corp.-based 1486 chip for all products except Netframe Systems, Inc.'s NF 100 and NF 300, which have an Intel-based 80386 chip and Compaq Computer Corp.'s Systempro, which comes with either an 80386 or 1486.

[1]The Intel 1486 processor incorporates 8K-byte memory cache. [2]NCR's NCR 3450 and NCR 3550 and Unisys Corp.'s U6000/65 will ship after publication date. [3]NCR Corp.'s NCR 3445 supports one to four processors via a multiprocessing kit. [4]The Netframe design uses mainframe-style copy-back cache that caches both reads and writes.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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VENDOR	PRODUCT	NUMBER OF PROCESSORS	OPERATING SYSTEMS SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	CLOCK SPEED (MHz)	RAM STANDARD/MAXIMUM (BYTES)	CACHE SIZE[1] (BYTES)	MAXIMUM DISK CAPACITY (BYTES)	TYPICAL WORK GROUP SIZE	FAULT-TOLERANT CAPABILITIES	BUS ARCHITECTURE	EXPANSION SLOTS	I/O PORTS	MONITOR (MONOCHROME/COLOR)	PRICE AND CONFIGURATION
Unisys Corp.[2] (800) 448-1424	[illegible]	8	Unix SVR4, multiprocessor implementation	LAN Manager, proprietary PC products, Novell, Banyan	33	[illegible]	8K, 256K	40.8G	30-100	Mirroring	EISA	8 EISA	2/80	Monochrome	$58,000 with 1456-byte memory, 2400-byte hard drive, floppy drive, tape drive
	[illegible]	2-20	Unisys System V, (AT&T Unix System V Release 3.2)	Portable Netware	33	[illegible]	8K, 512K per CPU	14.4G	60 - 300, 600 [illegible]	Cache, mirroring, redundant components	Proprietary system bus, multibus, EISA, MCA	8 - 16 multibus, 8 system	1 to 2 Ethernet, 16 - 64 asynchronous, 0 - 19 synchronous, 1 - 8 parallel printer	Monochrome	$133,000 with 4 CPUs, 4456-byte memory, 2400-byte hard drive, 16 asynchronous ports, 1 Ethernet port, 1 parallel printer port
	[illegible]	2-30	Unisys System V	Portable Netware	33	[illegible]	8K, 512K per CPU	60.8G	120 - 512, 1000+ [illegible]	Cache, mirroring, redundant components	Proprietary system bus, multibus, EISA, MCA	11 - 44 multibus, 30 system	1 to 4 Ethernet, 16 - 256 asynchronous, 0 - 30 synchronous, 1 - 9 parallel printer	Monochrome	$300,000 with 4 CPUs, 6456-byte memory, 30000-byte hard drive, 16 asynchronous ports, 1 Ethernet port, 1 parallel printer port
Wyse Technology, Inc. (408) 473-1200	Series 7000i	1 - 3	Wyse Unix System V/386	Network Information System	33	4M/16M	8K, 128K	3.6G SCSI	64	Mirroring	EISA, proprietary internal 64-bit bus	9 EISA, 4 proprietary	9 EISA, 4 SCSI, 2 RS-232, 1 Centronics parallel, 1 mouse, 1 Ethernet, 1 Multidrop	Both	$14,900 with 1 CPU, 4M-byte memory, 525M-byte tape, 1.44M-byte floppy drive
	Series 9000i	1 - 8	Wyse Unix System V/386	Network Information System	25	8M/32M	8K, 128K	4G SCSI	128	Mirroring	Proprietary 32-bit internal bus, external VME bus	7 system, 4 VME, 2 Multidrop	2 dual-channel SCSI, 4 VME, 2 RS-232, 1 Centronics parallel, 1 Ethernet, 1 Multidrop	Both	$38,500 with 1 CPU, 8M-byte memory, 525M-byte cartridge tape, 1.2M-byte floppy drive

Continued from page 73

may be well-suited to run client/server applications, but there is very little shrink-wrapped software available in that category. Users can develop their own applications, but few tools are available at the moment to help users write them.

Superservers "seem to be a very cost-effective way to support client/server computing," Passmore says, "but it's difficult to develop back-end applications for those machines because of a lack of appropriate CASE tools."

An even larger problem is lack of support from the network operating systems.

So far, few can take advantage of sophisticated features such as multiprocessing. When they do, they can support only one machine at a time because the nonstandard hardware features on superservers require individualized tweaking of the network operating system.

"The superserver vendors have had to work carefully with the network operating system vendors to get them to develop, in essence, a custom-tailored version of the network operating system that supports their particular hardware," Passmore says.

Symmetric Vines

Banyan worked with Compaq to develop a symmetric multiprocessor version of Vines that can support up to eight processors, says Dana Rasmussen, Vines' product marketing manager.

In fact, some consultants say Vines is the most advanced network operating system in its superserver support because it can also take advantage of high-capacity disks, tape drives and large amounts of memory.

However, Vines supports only a few superservers: Compaq's Systempro, multiprocessing servers from Advanced Logic Research, Inc. and, in the future, the AT&T Starserver. The company is "in discussion" with several other hardware vendors, Rasmussen says.

Microsoft announced in December a multiprocessor version of LAN Manager that was also written for the Compaq Systempro. The firm has also announced support for Parallan Computer, Inc., Netframe Systems, Inc. and Tricord Systems, Inc.

Novell has announced it will provide support for multiprocessors with SFT Level III, but it does not support it now, says David Owen, vice president of engineering at the company.

According to Owen, Novell also believes it is up to the hardware manufacturer — not Novell — to exploit superservers' more powerful features.

"We don't write a specific version of Netware to take advantage of companies' individual performance things," Owen says. "They can write a Netware Loadable Module themselves to enhance their machine." One vendor that has done so is Netframe, he says, but that was mainly for installation and not performance purposes.

Regardless of whether any tweaking is done to the network operating system, the power of the superserver will still enhance its performance, and speed will still be superior to that of PCs.

Pricey

Aside from limited software, the optimized features of superservers have another downside: They are expensive.

"Superservers are expensive in terms of direct cost," Ferris says, "but most important, in terms of their life cycle. You need to amortize them over a year and a half or two years and completely write them off at the end of that time." PCs have the same life cycle, but they are less expensive, of course.

Furthermore, unlike PCs, machines designed specifically as servers cannot be used for much else once their life cycle is up, Ferris adds. "The ability to reuse these products is very, very limited. Usually you can't, so you're just going to have an expensive doorstop at the end of that time," he says.

Regardless of the pitfalls, consultants say, superservers will eventually come into their own as more companies seek replacement platforms for minicomputers and mainframes.

The maturation will depend to a large degree on network operating systems development. "The issue really gets down to the operating system," O'Neill says. "If the server environment you're running can support the right operating system environment, the underlying technology becomes less of an issue."

Superservers need TLC

Like exotic animals, superservers require a lot of care and feeding. Support and maintenance are the biggest challenges these machines face, with their large disk arrays, multiple processors and other sophisticated features, especially when people are running mission-critical applications, says Kevin O'Neill, vice president of network research and consulting at Business Research Group in Newton, Mass.

Because of concern about resellers' ability to provide such sophisticated support, many users prefer to get their support directly from the manufacturer, says David Passmore, a partner at Ernst & Young, a market research firm in Fairfax, Va. "Finding a dealer who knows how to support one of these machines may be a more important factor than knowing which machine has higher performance," he says.

Superservers may also require separate, more expensive maintenance contracts, warns David Ferris, president of Ferris Networks, Inc., a consulting firm in San Francisco. For that reason, he advises users to consider superservers from vendors with which they already have support contracts.

SHARON FISHER

Relative merits

Superservers have the highest growth forecast by far, although all server types are expected to drop in price

Dedicated server type	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PC-based (386 or 486)	$18,290	$17,250	$5,760	$15,316	39%
Superservers[1]	$31,800	$30,500	$1,165	$5,991	73%
Fault-tolerant[2]	$67,450	$61,075	$402	$546	11%
Mini and mainframe	$96,500	$86,000	$1,800	$1,415	(8%)

[1] Includes machines with proprietary operating systems and multiprocessors such as Netframe Systems, Inc. and Tricord Systems, Inc.
[2] Includes machines such as Tandem Computers, Inc., Stratus Computer, Inc., Parallan Computer, Inc.
[3] Average configuration was determined by the CPU capacity, I/O, memory and storage requirements recommended by vendors and dealers.

Source: Workgroup Technologies, Inc.

CW Chart: Janell Genoves

More than one way to achieve fault tolerance

The usual fault-tolerant functions found on personal computers may not cut the mustard when the devices assume some of the mission-critical applications of minicomputers and mainframes.

Consequently, superserver manufacturers are touting not only speed but also one or more forms of fault tolerance — the ability to recover from errors effectively. Like many other characteristics of superservers, this feature originally appeared on minicomputers such as those from Tandem Computers, Inc. and Stratus Computer, Inc.

Most vendors claiming fault-tolerant features protect the machine's disk drives because they are the parts of the machine most likely to fail. In this vein, fault tolerance tends to fall into one of three areas:

- The easiest way to achieve a level of fault tolerance is to have two copies of the same data on the same disk. This method is inexpensive because it doesn't require another hard disk. While this technique works for errors such as bad sectors, it is not as effective if something happens to the hard disk or hard disk controller.
- A better idea is to use two hard disk drives with a single hard disk controller. This method eliminates problems caused by a faulty hard disk, but if the hard disk controller fails, you lose your data.
- The most reliable and expensive method of fault tolerance is to use two hard disks and two controllers. Novell, Inc.'s Netware, Microsoft Corp.'s LAN Manager and Banyan Systems, Inc.'s Virtual Networking Software support this method to some degree. Novell has announced what is probably the highest level of fault tolerance available, says David Passmore, a partner at Ernst & Young.

Another type of fault tolerance built in to some superservers includes the ability to recover from power failures. For example, Parallan Computer, Inc.'s Server 290 includes a built-in, battery-operated power supply that, in the event of a power failure, allows the machine to keep running just long enough to store all open files and applications.

Reduced instruction set computing-based servers tend to provide even more fault-tolerant capabilities than do superservers. For example, Hewlett-Packard Co.'s 9000 Model 1240 features multiple "logical servers" in the same cabinet.

In terms of general reliability, it is difficult to determine how superservers compare with the minicomputers they generally replace, says Kevin O'Neill, vice president of network research and consulting at Business Research Group in Newton, Mass. "From a hardware standpoint, they're probably no more or less reliable than minicomputers," he says. ●

SHARON FISHER

Overcrowded conditions

BY JOHN MCDONOUGH

After outgrowing a high-end personal computer not once but twice, Keith Venzke, a local-area network administrator at Scheduled Airlines Traffic Offices, Inc., may opt for a superserver.

Venzke bought The Network Connection's (NET) Triumph TNX 386/33 in January to run the travel agency's airline ticketing database.

The Triumph machine uses Nantucket Corp.'s Clipper over a Novell, Inc. Netware 386-based LAN to maintain ticketing information for all of the agency's sales offices.

The Triumph — which is configured with four 670M-byte enhanced small device interface (ESDI) disk drives — hit the wall at 1.3G bytes of disk storage. This came as a surprise to Venzke, who says he was told he could fit four drives and have 2.7G bytes of continuous storage on one file server.

"I could physically hook up four drives," Venzke says, "but I could only access two of them."

Toby Victor, president of Isyx, Venzke's dealer, says he was told by NET that although its TNX 386/33 server supports only two 670M-byte drives, the drivers allow the servers' ESDI controller to support four drives.

NET did so for Netware 286, but it was too difficult to do the same for Netware 386, Victor says.

Isyx ended up supplying Venzke with a second server to support all four drives.

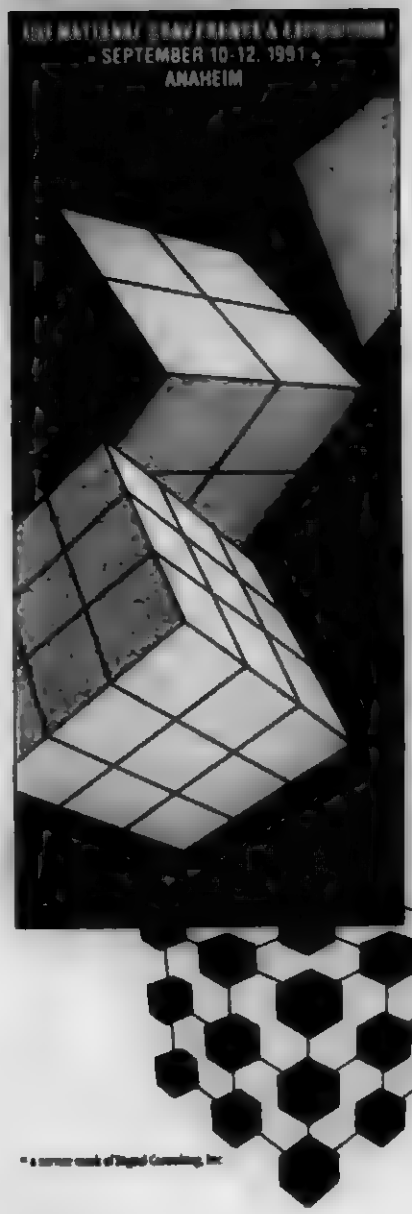
Venzke says the dual LAN server "blows away" his former server, a Compaq Computer Corp. Deskpro 386/25, but he plans to upgrade to a 10G-byte system eventually. For that, he is eyeing Tricord Systems, Inc.'s Power Frame superserver.

"With our upgrade to 10G bytes — well, NET won't like this, but we're going to go with one file server. NET makes a great product, but I get nervous with a PC holding 10G bytes of data," Venzke says.

McDonough is an editor at Faulkner Technical Reports in Pennsauken, N.J.

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RISC server leaders

The following are the top six vendors in the reduced instruction set computing (RISC) server market. This list includes products that have shipped since January 1990.

▶ **Digital Equipment Corp.**
(800) 344-4825
Decsystem 5000 (Model 200), 5100, 5500
Operating systems: Ultrix, Pathworks for Ultrix.
Network protocols: Transmission Control Protocol/Internet Protocol (TCP/IP), Network File System (NFS), optional Decnet Ultrix.
Prices: **Decsystem 5000** costs $14,995 with 8M-byte memory, thin-wire Ethernet, small computer systems interface (SCSI) controller, Ultrix four-user license and Ultrix workstation server license. **Decsystem 5100** costs $10,995 with 8M-byte memory, Ethernet port, four asynchronous lines, SCSI controller, 209M-byte SCSI disk drive, Ultrix four-user license and Ultrix workstation server license. **Decsystem 5500** costs $41,900 with 32M-byte memory, embedded Ethernet, SCSI and digital small systems interface controllers, Ultrix four-user license and Ultrix workstation server license.

▶ **Hewlett-Packard Co.**
(800) 752-0900
Series 700 Models 720, 730, 750
Operating systems: HP-UX, OSF/1.
Network protocols: ARPA Telnet, TCP/IP, NFS.
Price: $11,990, $19,990, $43,190 with 16M-byte memory, up to 660M-byte hard disk and monitor.

HP 3000 Series 948, HP 3000 Series 958.
Operating systems: MPE/XL, Novell, LAN Manager/X.
Network protocols: IEEE 802.3, X.25, ARPA Telnet, Systems Network Architecture (SNA).
Price: $107,300, $229,800 (server versions) with 64M- to 96M-byte memory, 1.3G-byte hard disk, Dataphone Digital Service tape backup, HP's Allbase/SQL, operating system and console.

HP 3000 Series 980/100, Series 980/200.
Operating systems: MPE/XL, Novell, LAN Manager.
Network protocols: IEEE 802.3, X.25, ARPA Telnet, SNA.
Price: $615,000, $975,000 with system processing unit, 192M-byte memory, Allbase/SQL and operating system.

HP 9000 Model 822S, 832S
Operating systems: HP-UX Release 7.06.
Network protocols: TCP/IP, ARPA Telnet, NFS, LAN Manager/X, Map 3.0, SNA.
Price: $19,950, $32,250 with 8M- to 16M-byte memory, 335M-byte hard drive and eight-user HP-UX license.

HP 9000 Model 842S, Model 852S
Operating systems: HP-UX Release 7.06.
Network protocols: TCP/IP, ARPA Telnet, NFS, LAN Manager/X, Map 3.0, SNA.
Price: $85,000, $143,000 with 32M- to 64M-byte memory, 670M-byte hard drive and eight-user HP-UX license.

HP 9000 Model 860S, 870S/100
Operating systems: HP-UX Release 7.06.
Network protocols: TCP/IP, ARPA Telnet, NFS, LAN Manager/X, Map 3.0, SNA.
Price: $230,000, $350,000 with 48M- to 96M-byte memory, eight-user HP-UX license and two channel I/O adapters.

▶ **IBM**
(800) 426-3333
RISC System/6000 Powerserver 320
Operating systems: AIX Version 3 for RISC.
Network protocols: TCP/IP, SNA, Open Systems Interconnect (OSI), NFS, NCS.
Price: $19,312 with 16M-byte memory, 320M-byte fixed disk, Ethernet, SCSI adapter, ¼-in. tape drive, AIX operating system and Fortran.

▶ **Intergraph Corp.**
(205) 730-2000
Interserve 2000, 6000, 6105, 6505, 6509
Operating systems: Clix, Decnet, Novell, Inc. Portable Netware, NFS over 802.3.
Network protocols: TCP/IP, ISO/OSI, XNS, SNA, BSC.
Price: $9,900, $16,900, $43,400, $79,900 and $99,000.

▶ **Silicon Graphics, Inc.**
(514) 335-1773
4D310, 4D/320, 4D/340, 4D/380
Operating system: Irix.
Network protocols: TCP/IP, Decnet, SNA, NFS.
Price: $24,900, $59,900, $84,900, $144,900 with 8M- to 256M-byte memory and up to 256M-byte disk capacity.

▶ **Sun Microsystems, Inc.**
(415) 960-1300
Sparcserver 2
Operating system: SunOS.
Network protocols: OSI, Message Handling System, Internetwork router, X.25.
Price: $24,595 with 16M-byte memory, 876M-byte SCSI drive, 2.3G-byte 8mm tape, compact disc/read-only memory (CD-ROM) and monitor.

Sparcserver 470
Operating system: SunOS.
Network protocols: OSI, Message Handling System, Internetwork router, X.25.
Price: $59,900 (SCSI), $74,900 (IPI) with 32M-byte memory, 669M-byte SCSI drive, 150M-byte tape, CD-ROM or 911M- to 6M-byte/sec. IPI.

Information compiled by Jodie Naze, a Computerworld *researcher, features.*

Racy RISC servers put pedal to metal

When it comes to speed, superservers face a worthy challenger in RISC servers.

RISC servers are very similar to the workstation versions of the same architecture, according to Phil Magney, general manager at Workstation Laboratories in Irving, Texas. However, they offer much higher capacities than their desktop counterparts in terms of memory, disk storage and I/O boards.

High clock speed RISC processors, combined with large amounts of random-access memory and cache, allow RISC servers to perform CPU-intensive tasks at much higher rates than Intel Corp.-based servers, Magney says.

Benchmarking servers or multiuser systems can be difficult because the actual events must be simulated, he warns. However, it is possible through simulated multiuser benchmarks to determine performance characteristics and the relative strengths and weaknesses of a product.

A good benchmark for measuring multiuser performance is transaction processing. Workstation Laboratories uses a test that is similar to TP1 but written entirely in C for reasons of portability. This test is very disk-intensive and does a good job of measuring multiuser disk access.

The following are average transactions per second based on Workstation Laboratories' transaction processing benchmark as found on a network of 20 users.

- **High-end PC:** 12 to 18.
- **RISC workstation:** 12 to 15.
- **Multiprocessor machine (superserver):** 20 to 30.
- **RISC server:** 25 to 40.

Because RISC servers are Unix-based, however, they pose even more complications on the network operating system front than DOS- and OS/2-based superservers.

While the major network operating systems are beginning to support Unix in recent versions, few machines as yet support them, and few users have experience with them.

The most heavily used network operating system is Novell, Inc.'s Netware. Its Portable Netware is more readily ported to chips with different architectures, such as those from Motorola, Inc., Sun Microsystems, Inc. and other RISC chips. Few machines currently support Portable Netware, however (see RISC workstation listing and chart, page 74).

Microsoft Corp. also announced a Unix implementation of its OS/2 LAN Manager, but it is not widely used. Banyan Systems, Inc.'s Virtual Networking Software (Vines) does not support RISC processors such as Sun's Scalable Processor Architecture (Sparc), says Dana Rasmussen, Vines' product marketing manager.

RISC- and Sparc-based servers can support Sun's Network File System, however. This widely supported software stores data in such a way that computers from various vendors can read and understand it, thus enabling file sharing.

NFS is a good environment for client/server applications; however, it does not provide the user shell available from true network operating systems. This shell helps the user access facilities without having to know where they are.

SHARON FISHER

Another favorite

Some high-power applications demand no less than the performance available on RISC-based servers.

So found 27 research scientists in the radiology department at the University of Washington in Seattle. The researchers, who use Data General Corp.'s Aviion, are conducting cancer research by studying complex images of human metabolism on their Apple Computer, Inc. Macintoshes.

Two Aviions act as the central source for these images — which can number 40,000 to 60,000 per year — and send them to the Macintoshes across a Novell, Inc. Netware LAN.

Thomas Lewellen, a radiology professor at the university, chose the Aviion 6240 and 6220 for performance reasons after evaluating several other workstations, including those from Sun Microsystems, Inc., IBM, Silicon Graphics, Inc. and Hewlett-Packard Co.

According to research scientist Robert Harrison, the Aviions topped the other servers when running benchmark tests on the in-house medical imaging applications. Harrison credits the workstation's fast data transfer rates and robust file system for the impressive benchmark results.

The Aviion has help doing the job, however; heavy number crunching is performed on the department's DG Eclipse MV/18000 minicomputer, which downloads the data to the workstations. Previously, all the work was performed on the Eclipse.

"As far as performance and operating cost, [the Aviion] is our only option," Lewellen says. "It allows us to solve our compute-time problems at a much more reasonable cost [than other servers], and maintenance problems are much less than with [the Eclipse]."

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Distributed DBMS decisions

Will you go with a client/server DBMS or a 'true' distributed DBMS? Find out what makes each distributed computing approach tick

BY GEORGE SCHUSSEL

Thanks to a distributed database management system, Citicorp's securities traders can execute trades, perform analyses and monitor groups for profitability and risk from their desktops worldwide. This New York institution has been using distributed computing during the last few years to gain a technology edge in the cutthroat field of financial services.

Citicorp is doing what many organizations today are only contemplating: distributing data to smaller, cheaper platforms in hopes of achieving distributed computing's much-touted benefits of downsized costs and improved productivity.

What about your company? If you're deciding to distribute, read on. Understanding the two distributed DBMS approaches used today and the products that put them into practice is a key part of your decision-making process.

Distributed DBMSs

Distributed DBMSs are software products that support distributed computing over a network (see functionality list page 83). At least two separate remote processors split the work for a transaction, with one of the processors supporting DBMS processing.

With the emergence of SQL as a de facto standard, DBMS vendors have begun to add distributed or client/server computing functions to their products as well as support for object approaches, database semantics and relational functionality.

The distribution of relational processing to multiple lower priced DBMS servers, furthermore, enables relational DBMSs to compete effectively in transaction processing. For users, this lowers the cost of computer cycles used.

The distributed DBMS arena primarily consists of "true" distributed DBMS and client/server DBMS approaches. As the downsizing trend progresses in the 1990s, information systems shops will turn to true distributed DBMSs and client/server options to provide high-level IS services on "downpriced" personal computer platforms.

The difference between true distributed DBMSs and client/server DBMSs is in the concept of location transparency. With location transparency, a program running at any node need not know the physical location of the computer in which the requested data resides.

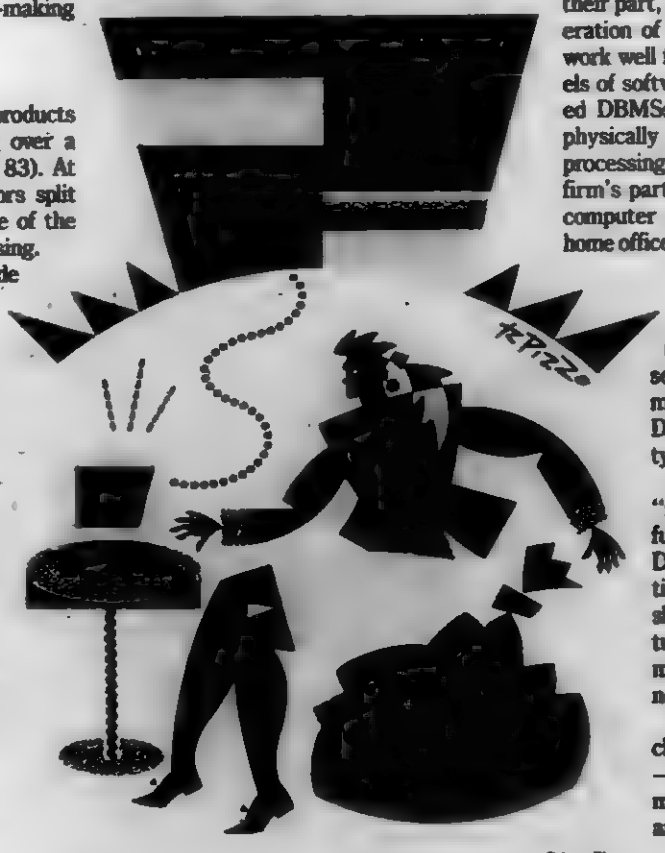
True distributed DBMSs support location transparency, with each separate physical node in the network running a copy of the DBMS and associated data dictionary. It is the true distributed DBMS' responsibility to determine an access strategy to that data.

In a client/server DBMS, a limited number of designated nodes run the DBMS. Normally, there will not be a full physical copy of the DBMS at nodes that run the bulk of the application logic. Client/server DBMSs do not support location transparency, so the application must contain logic that knows where data is located.

In client/server computing, the bulk of the application logic and control of the application rest on the client; the DBMS and data operate on the server.

Although both client/server and true distributed DBMS products support network-based DBMS computing, the approach a company chooses depends on its goals. Client/server DBMSs are based on database machine concepts of the 1980s and are best for high-performance, high-transaction-rate computing. Client/server DBMSs can form the cornerstone of a cooperative processing setup and could help cut the costs of the large systems hardware/software environment for building industrial-strength applications by as much as 90%.

True distributed DBMS products, for their part, can be thought of as the next generation of relational SQL processing. They work well for companies needing higher levels of software functionality. True distributed DBMSs are a good fit in implementing physically separate but logically integrated processing, such as when a manufacturing firm's parts data is located on a warehouse computer while customer data is on the home office computer.



Robert Fram

True distributed DBMSs

True distributed DBMS products occupy the Mercedes-Benz segment of the distributed DBMS marketplace, supporting a local DBMS and data dictionary capability at every network node.

Industry analysts have published "rules" or lists of requirements a fully functional true distributed DBMS should meet. These functions are listed as follows, but they should not be taken as a product feature checklist. Today's products meet some of the requirements, but no product meets them all fully.

For example, many products claim to have software optimizers — intelligent software that determines the best navigation path for an SQL query — but only a few

Continued on page 82

Schussel is president of Digital Consulting, Inc. in Andover, Mass., and chairman of the National Database and 4th/5th Generation Language Symposium.

- **One has location transparency, one doesn't**
- **Product breakdown**
- **The two approaches may merge by 1993**

Continued from page 81

have good functionality in this area.

• **Location transparency.** Programs and queries access a single logical database view; this logical view is physically distributed over a number of different sites and nodes. Queries access distributed objects for both reading and writing without knowing the location of those objects.

A change in the physical location of objects without a change in the logical view does not require a change of application programs. To meet this requirement, a full local DBMS and data dictionary must reside at each node.

• **Performance transparency.** It is essential to have a cost-based software optimizer to determine the best use of computing facilities in accessing data to satisfy a query.

In doing its job, the optimizer should understand where the data is located, how to access it efficiently, the speed and availability of computing resources and the cost and availability of communications facilities.

With a software optimizer, a query should cost the same amount to run, regardless of whether it originated from point A or point B. Software optimization technology in existing products is primitive.

• **Copy transparency.** As an option, a true distributed DBMS can support multiple physical copies of the same logical data. Advantages to this capability include superior performance gained from having local rather than remote access to data and nonstop operation in the event of one site going down. If a site does go down, the software must be smart enough to reroute a query to another source where data exists.

• **Transaction transparency.** The system supports transactions that update data at multiple sites. Those transactions behave exactly as local ones do; that is, they commit or abort. Distributed commit capabilities are made possible through the two-phase commit technical protocol.

A key concern for users is that two-phase commit uses twice as much communications capability as a more common update process running entirely within one machine. Updating data in a single logical record implemented or duplicated at several physical sites is much more complex than an update process occurring within one computer.

The question for companies, then, becomes whether faster response time, reduced processing costs and improved programming productivity compensate for the increased costs of communications and management.

• **Fragmentation transparency.** A true distributed DBMS allows a user to cut relations into pieces horizontally or vertically and place those pieces at multiple physical sites. The software is able to recombine those tables into units to answer queries as necessary.

• **Advanced applications development.** The software should support an advanced applications development environment. It should allow the easy creation of business rules that execute on the server.

These stored procedures execute from within the DBMS operation. The software should support triggers — rules executed when data equals certain values. Event alerter notice from the database to programs is available.

All of those functions go beyond the basic relational functions of domains, entity and referential integrity. Applications in client machines may be built with fourth-generation languages (4GL).

• **Schema change transparency.** Changes to database object design need be made only once in the distributed data dictionary. The dictionary and DBMS automatically populate other physical catalogs.

• **Local DBMS transparency.** Distributed DBMS services are provided regardless of the brand of the local DBMS. This means support for remote data access and gateways into heterogeneous DBMS products is necessary.

There are no products now on the market that support transaction processing standards. The concept of remote procedure calls will eventually enable implementation across heterogeneous DBMS products.

What does what

A breakdown of client/server functions



CLIENT
- Application program
- Screen forms
- SQL generation
- Application control

NETWORK
- Hardware/wire
- Communications software
- Multiple clients and servers

SERVER
- Optimize and execute SQL
- Manage transactions
- Stored procedures and triggers
- Security
- Concurrency management
- Logging and recovery
- Database creation and definition
- Data dictionary

Source: Digital Consulting, Inc. CW Chart: Doreen St. John

Taking sides

Distinguishing true distributed and client/server DBMS products

CLIENT/SERVER DBMSs

Sybase Corp., Microsoft Corp.: SQL Server

Gupta Technologies, Inc.: SQLbase

Oracle Corp.: Oracle Server

Novell, Inc.: Netware SQL

XDB Systems, Inc.: XDB-Server

TRUE DISTRIBUTED DBMSs

Ask Computer Systems, Inc.'s Ingres Division: Ingres Star

Oracle: Oracle

Computer Associates International, Inc.: Datacom

Ashton-Tate Corp.: Interbase

DMI: Information Warehouse

Digital Equipment Corp.: EDIL Information Network

Source: Digital Consulting Inc CW Chart: Doreen St. John

How the vendors stack up

Among true distributed DBMS products, the technology high ground is shared by Star from Ask Computer Systems, Inc.'s Ingres Products Division and Interbase from Ashton-Tate Corp.

Ingres' Star comes closest to fully implementing the requirements in the list above. Its software optimization capability is especially noteworthy. Even as the functionality leader, however, Ingres does not provide full distributed functionality. For example, it does not support event alerters or distributed transactions over heterogeneous DBMSs.

Interbase provides a high level of true distributed DBMS functionality and is a good seller in the engineering workstation/Unix world. The software extends the relational model with additional functions such as extendable field types and event alerters. Ashton-Tate recently acquired vendor Interbase Software Corp. and its namesake product; therefore, it is likely there will be future Dbase/Interbase product integration.

Oracle Corp., the largest independent software DBMS vendor, has pursued high performance in its distributed strategy to date rather than adding relational functionality such as referential integrity or stored procedures.

In its distributed products, Oracle functionality is limited to reading, not updating, distributed data. As a server, Oracle supports only a rudimentary software optimizer.

Computer Associates International, Inc. also has a high-performance distributed implementation built on top of its proprietary Datacom product.

This distributed implementation isn't currently based on SQL, but as SQL becomes more fully implemented in the Datacom kernel, support for distributed Datacom SQL will become available.

Limited use

Because vendors have been taking the better part of a decade to deliver all of the pieces that constitute a true distributed DBMS, companies' use of true distributed DBMSs has been hindered.

In fact, of the 630,000 database systems in use at banks, financial institutions and insurance companies, 8,350 are considered client/server systems, while only 25 are true distributed DBMSs, according to a 1988 study by Business Research Group in Newton, Mass.

By 1993, those numbers are expected to grow to 63,000 and 1,600, respectively.

If true distributed DBMS products are the Mercedes-Benzes, then client/server DBMS products are the Mazda Miatas — trim, nice looking and low-priced (savings come from computer cycles used and the ease with which they are installed and managed). By accepting some reduction in location transparency function, a user is able to use client/server technology to build a distributed computing environment that runs well with today's hardware and networks.

Client/server computing provides the industrial-strength security, integrity and database capabilities of minicomputer or mainframe architectures while allowing companies to build and run their applications on PCs, Apple Computer, Inc. Macintoshes or minicomputer networks. Unlike file-based network computing, client/server software provides secure multiuser concurrent access to shared databases. Furthermore, client/server DBMSs enable one application to connect to multiple database servers; however, not all client/server systems support this.

Three components

A client/server computing environment consists of three principal components: the client, the server and the network that connects the two (see chart at left for individual functions).

The application program runs on the client and may be written in a 3GL or 4GL. An emerging group of "Windows 4GLs" allows painting of applications under windows-based operating systems. Windows 4GLs support windows-oriented applications development and execution.

Powersoft's Powerbuilder, Ingres' Windows 4GL and Gupta Technologies, Inc.'s SQLwindows fall into this category. Using any of these application-building approaches results in a runtime configuration in which the I/O and application control come from the client, while the database and associated semantics run on the server.

The transaction capabilities of client/server software working with lower end PC servers or "superservers" — minicomputer-style cabinets built with microprocessors such as Intel Corp.'s I486 or Mips Computer Systems, Inc.'s R4000 — are astounding.

For example, on the low end of the hardware scale, Gupta's SQLbase and Microsoft Corp.'s SQL Server can both run on Intel 80386-based PCs processing approximately 10 TPC-A transactions per second. (A rate of 10 transactions per second is adequate to support 250 automated teller machines on a single server.)

PC hardware can support disks with 16-msec access times and 2M- to 3M-byte transfer rates. Such a machine can

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However, companies need not relegate client/server DBMSs to the low end of the transaction processing spectrum, especially if they combine the DBMS with high-end superservers from Solbourne Computer, Inc., Pyramid Techology Corp., Concurrent Computer Corp., Compaq Computer Corp., IBM or Digital Equipment Corp.

This high-end superserver hardware is typically going to be built with parallel Intel 80386, I486 and/or reduced instruction set computing chips from Mips Computer Systems or Sun Microsystems, Inc.

More for less

Configurations consisting of a server with a multiprocessor design and an "open" operating system such as Unix, Banyan Systems, Inc.'s Virtual Networking Software, Microsoft's OS/2 or IBM's LAN Manager give users a machine with hundreds of millions of instructions per second of processing power and 250G bytes of disk data storage at a cost of less than $500,000.

Combining this technology with small computer systems interface or other high-speed channels and a client/server DBMS offers a configuration that can replace a $14 million IBM System 3090 running DB2. That's a potential savings of up to 95%.

Companies must weigh IBM's DB2 and DEC's RDB sophisticated operating functions and utilities against the cost savings the combination of distributed DBMS, open systems and superserver technology can provide.

For high-performance computing and transaction processing in the Unix and DEC VAX markets, Sybase, Inc. is the current client/server DBMS leader. Although Sybase doesn't support location transparency, it is at the forefront of DBMS embedded stored procedures and open gateway technology — an important piece in heterogeneous DBMS computing.

Sybase and Microsoft have teamed up to provide the OS/2 market with a version of Sybase's SQL Server. The offering's functionality, however, is less than what Sybase provides on Unix and VAX platforms.

The functional gap between client/server and true distributed DBMS products is closing. Increasingly, client/server DBMSs will be able to support multiple data servers and perform functions across those servers.

In fact, by the time true distributed DBMSs mature — about 1993 — the technical differences between client/server and true distributed DBMSs will likely have disappeared. This means users can have it their way, with either technology being a good choice for downsizing and distributing applications. •

Form and function

Distributed DBMS software, of which client/server DBMSs and true distributed DBMSs are a part, has to provide all the functionality of multiuser mainframe database software and allow the data in the database to exist on a number of different but physically connected computers.

Distributed DBMSs should have the following functions:

- Data integrity through automatically locking records and rolling back partially complete transactions.
- The ability to attack deadlocks, automatically recovering completed transactions in the event of system failure.
- The ability to optimize data access for a wide variety of application demands.
- Specialized I/O handling and space management techniques to ensure fast and stable transaction throughput.
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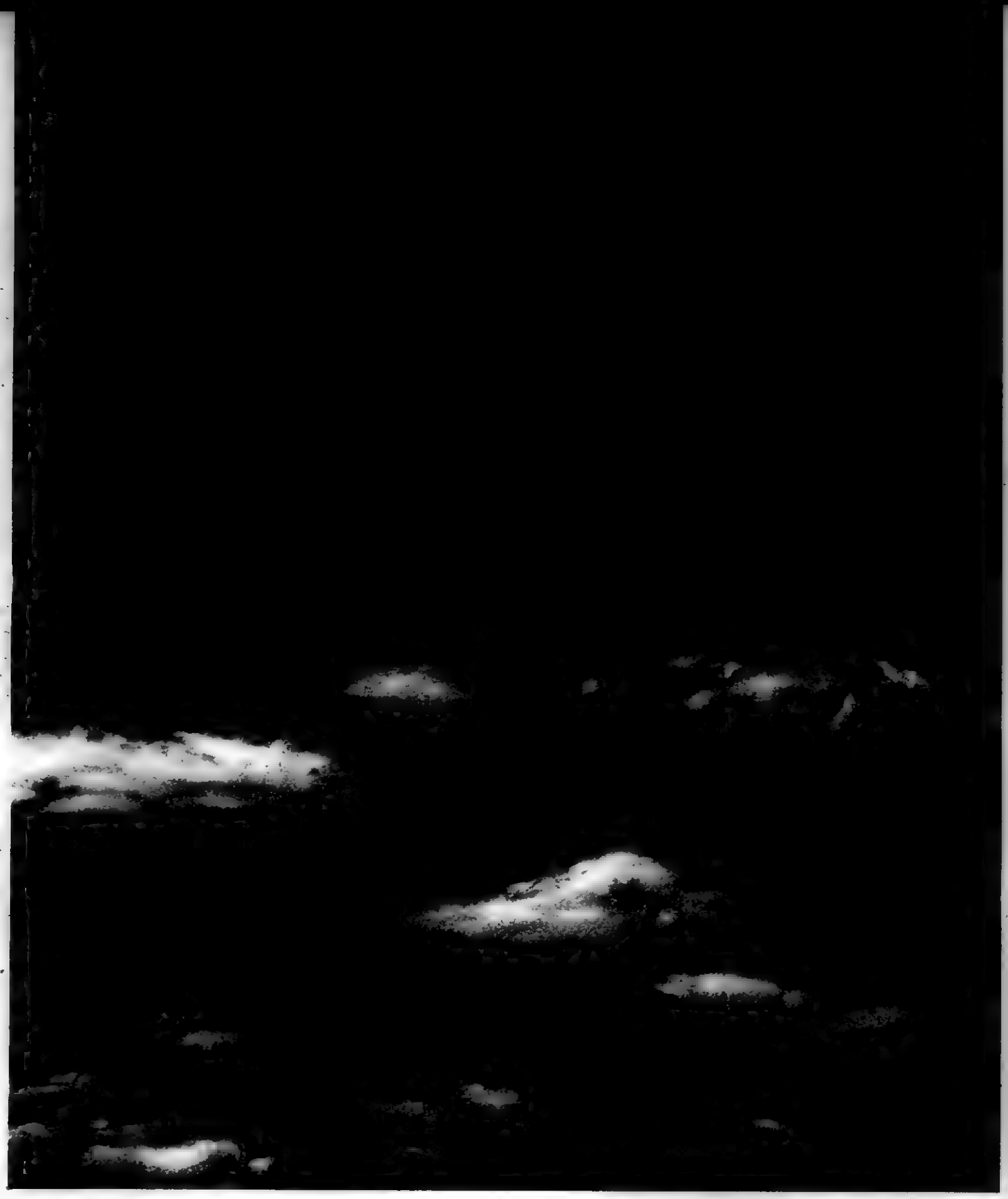
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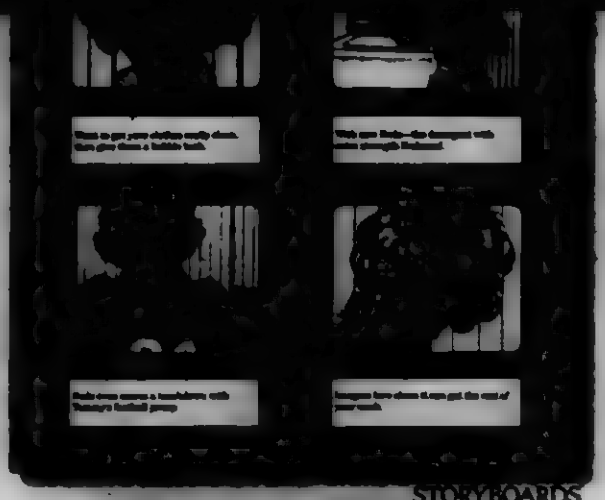
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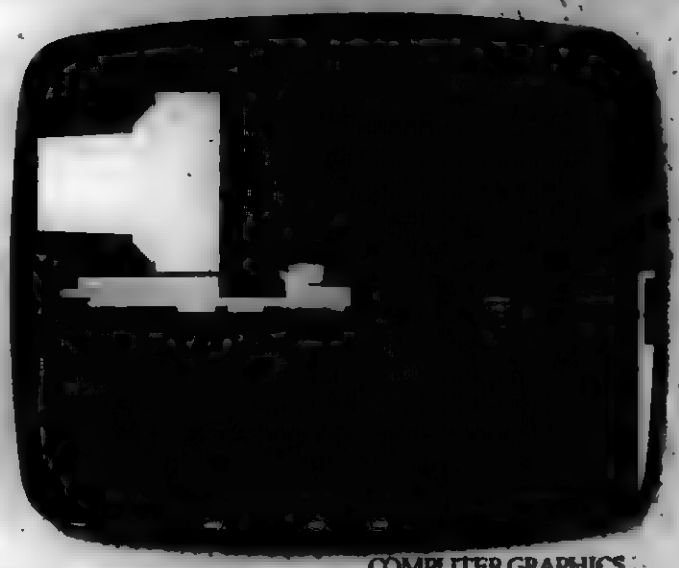
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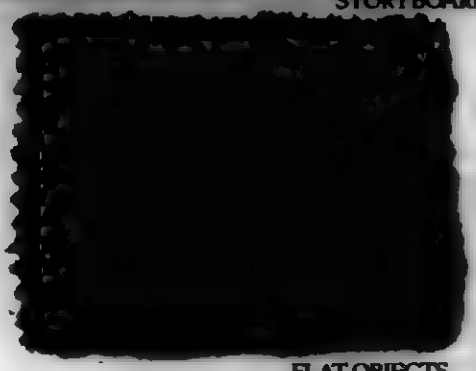
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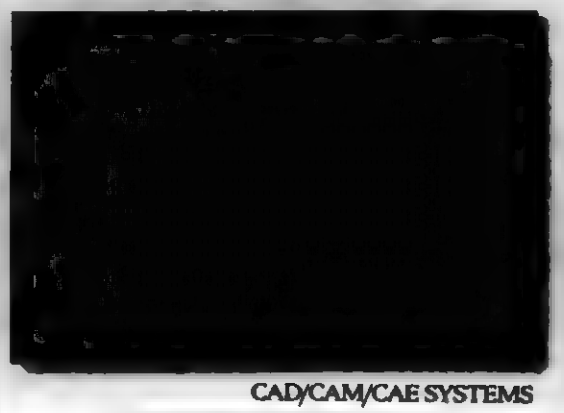
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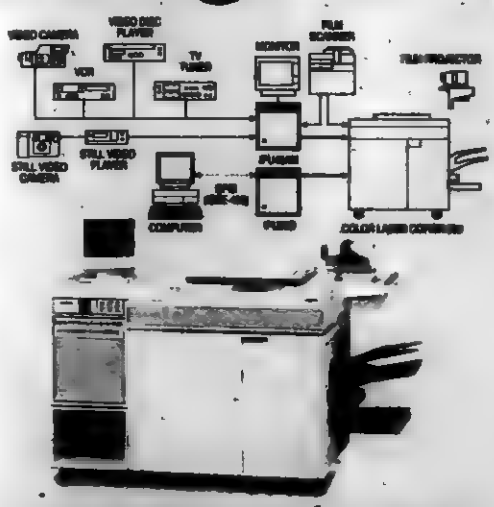


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COMPUTER INDUSTRY

NATIONAL BRIEFS

First the good news

▶ Cherry Hill, N.J.-based wide-area network management systems provider **Infotron Systems Corp.** and Ottawa-based local-area network products vendor **Gandalf Technologies, Inc.** are poised for a stock swap merger aimed at offering users soup-to-nuts networking connectivity from a single source. Infotron's news that it had found the partner it recently said it was searching for coincided with its quarterly report of a $33.3 million loss and revenue off 11% for 1990.

Am I blue?

▶ We don't know — and won't know now until after the trial. When last seen, Northport, N.Y.-based **Big Blue Products, Inc.** — a six-person computer and software distributor — was battling **IBM** before the Trademark Trial and Appeal Board over which of the two had the superior right to the name "Big Blue." Last month, a panel of the board found a "genuine dispute of material fact" as to whether the public had come to identify the nickname with IBM before little Big Blue took it on in 1984; the board denied IBM's motion for summary judgment and set a series of trial dates. Stay tuned.

The white stuff

▶ Within one month of posting its 119th consecutive quarter of double-digit profit increases, Roseland, N.J.-based **Automatic Data Processing, Inc.** paid an undisclosed amount of cash last week to acquire payroll services firm **Robert F. White & Co.** White currently serves some 13,000 companies in the Chicago, Milwaukee, Dallas and Miami areas.

Elementary, my dear

▶ The quarter ended March 31 was kind to Mr. Watson's company — you know, the one with the three initials: **BMC.** A 116% growth rate in its DB2 product line helped fuel Sugar Land, Texas-based **BMC Software, Inc.** to fiscal fourth-quarter net income up 56% to $9.9 million on revenue up 50% to $43.5 million. Accountable for 15% of BMC's bottom line in 1990, DB2 products are currently kicking in 21% of the company's total revenue, according to Chief Executive Officer Max P. Watson.

Index, Sage pool forces to take on CASE

BY ROSEMARY HAMILTON
CW STAFF

In 1990, front-end computer-aided software engineering (CASE) pioneer Index Technology Corp. had big plans to expand its product line to all segments of the applications development life cycle. The Cambridge, Mass.-based company was reaching beyond its design tool business into re-engineering territory and spoke of a code generator under development.

Today, Index's wish to be a complete tool set provider is coming true, but not exactly in the way it had once planned.

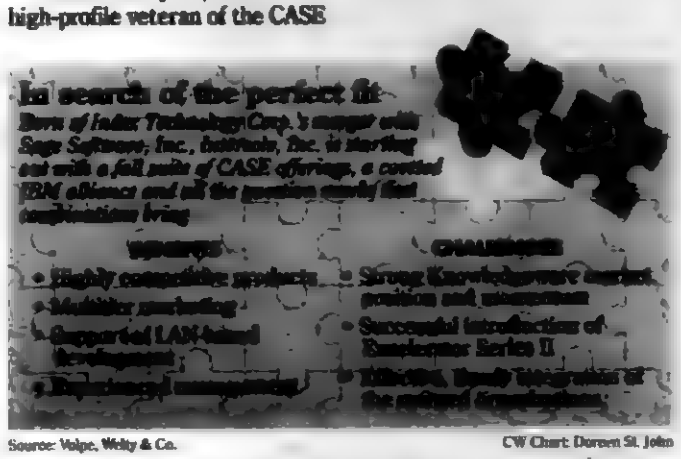
Earlier this year, Index — a high-profile veteran of the CASE field — merged with Rockville, Md.-based back-end CASE vendor Sage Software, Inc. to become a new entity: Intersolv, Inc. The merger announcement came in late 1990, when Index was preparing to announce an annual loss.

However, Intersolv executives insist the deal simply joins two companies with complementary products and was not driven by Index's financial condition.

In the major league

The merger creates a $75 million company, which, in the CASE market, is a big-time player. The combined user base will number about 100,000.

Between Index's flagship Excelerator design tool line and Sage's APS generator, Intersolv's product line addresses most of the CASE life cycle, including front-end design, re-engineering and code generation. Plus, the firm has a coveted alliance with IBM that makes it one of the key AD/Cycle inner circle members.



Source: Volpe, Welty & Co. CW Chart: Doreen St. John

This relationship, developed specifically around AD/Cycle, goes well beyond IBM's traditional marketing partnerships.

"Knowledgeware was overwhelming the industry with its marketing and sales, and that's not healthy," said Aaron Zornes, a vice president at Meta Group, Inc. "I think the merger is very important for the health of the industry," he added.

As separate companies, the picture was not so rosy, particularly for Index. Although the firm had a well-established reputation in the CASE market, it started to lose ground last year. Knowledgeware, Inc., which belonged to the IBM AD/Cycle core group along with Index, was emerging as the dominant player in the IBM CASE market.

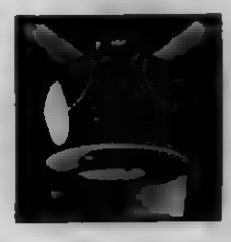
Although Knowledgeware announced an IBM OS/2-based product at the end of 1990, Index was unable to do so. Index spoke of a March 1991 date for shipment of an OS/2-based version of Excelerator. Intersolv executives now say that target date was only for a beta-test re-

Continued on page 91

Blend of old and new

In legal terms, the deal between Index and Sage is a merger. Company officials point to the new name as the most obvious symbol that this is not a takeover story.

Nonetheless, Kevin Burns, who was in charge at Sage, will head up the new organization. Intersolv will also keep the former Sage corporate headquarters location in Rockville, Md. Richard Carpenter, Index's former chief executive officer, will serve as vice chairman at Intersolv. Fred Luconi, who had been president of Index, will not be working at the new firm.



Company officials said the merger is an idea that was brewing for some time. According to Burns, he and Carpenter would chat about the market "over a cup of coffee" from time to time. In 1990, both expressed their desires to become a "one-stop shopping" tools provider, and the idea of a merger crystallized.

"There's no question the merger was a shift from doing it on our own," Carpenter said. "I think that what happens is [that] on any path you are pursuing, you always look to alternatives. If you see an option that gets you better long-term results and gets you where you want to get to, you evaluate that in parallel with what you're doing."

"[Index] had a large expense base toward the latter half of 1990, but there was also the promise of a whole new revenue stream," Carpenter said. "You had to weigh that against the alternatives. It was certainly part of our thinking. The combination of the merger and the new identity made more sense."

ROSEMARY HAMILTON

IBM's Akers points up long-term strategy

BY NELL MARGOLIS
CW STAFF

KANSAS CITY, Mo. — IBM is learning what the Boy Scouts have always known: When it comes to creeds, you can't beat "Be prepared."

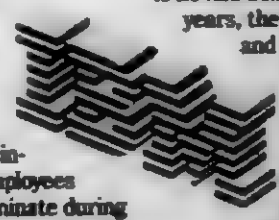
"While we cannot control recessions or international conflicts or volatile currencies," Chairman John Akers told the 1,100 stockholders who gathered here for the firm's annual meeting last week, "we can control how well we manage our business."

The extent to which IBM has done just that, Akers said, positions the firm for a swift, sure and sustainable surge ahead as soon as the recession lifts.

Many analysts agreed. To gauge how well a company is likely to emerge from the recession, S. G. Warburg analyst David Wu said, "look at its condition on the way in." On the eve of the recession, IBM batted in impressive 1990 bottom lines.

In addition, Akers noted, hefty investments — $30 billion in research and development over the past five years and $1 billion annually in education and training — will leave IBM with "a strong hand to play" across all product lines once the economic situation starts to improve.

Corporate efficiency initiatives will have pared some 50,000 employees, 70,000 staff positions, 8,000 managerial jobs and three management layers from the firm's profile by the end of this year, Akers said. These numbers include 14,000 employees IBM expects to eliminate during the current year without layoffs and without cutting into the meat of any firm operations, Akers noted.



He also underlined focus on customer satisfaction as IBM's once and future corporate commitment and commercial ace. "We're not there yet," Akers said, "but we're seeing the results in tangible ways."

According to Norman Vincent, vice president of data processing at Bloomington, Ill.-based State Farm Mutual Automobile Insurance Co., this is no idle boast. For the past two years, the insurance company and IBM have been working together to tailor mainframes and Personal System/2 machines into a system aimed at automating State Farm's independent agencies.

"Everything we've gotten has been of the highest quality," Vincent said, "and IBM has delivered it all on time — or early."

A proposal to withdraw operations from South Africa was defeated at the meeting.

Group urges end of encryption export ban

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A federal ban on the export of computer products able to encrypt data is increasingly harmful to users and vendors and useless in safeguarding national security, industry representatives who met here recently said.

Officials from computer firms told the U.S. Department of Commerce's Computer Systems Technical Advisory Committee (CSTAC) that the ban harms U.S. industry by leading overseas customers to choose products from countries without such restrictions. This hurts some U.S. suppliers by forcing them to develop and support two versions of products, one for domestic use and one for export.

The vendors also said the problem trickles down to users, who face product introduction delays, higher prices or poorer security, depending on how the vendor reacts to the export regulations.

Adding insult to injury, most acknowledge, the export restriction does little to keep encryption capabilities out of the hands of those on whom U.S. intelligence agencies would like to spy. The two most common encryption algorithms are available from libraries and bulletin boards, and hardware and software implementations are widely available from foreign sources. "The horse is out of the barn, guys," said Stephen T. Walker, president of Glenwood, Md.-based Trusted Information Systems, Inc. "We're hurting ourselves in some fundamental ways."

CSTAC — 48 officials from government and industry — has recommended that mass-produced software, with or without encryption, be completely freed from export regulations. That move would have to be approved by the U.S. Departments of Commerce, State and Defense and possibly by the National Security Council. But the agencies disagree about how far to go in decontrolling software, and officials from the Commerce and State Departments attending the CSTAC meeting publicly clashed over which agency has jurisdiction over encryption exports.

The State Department, acting with the guidance of the National Security Agency (NSA), will not allow export of computer products that encrypt data using the federal government's Data Encryption Standard (DES) algorithm or the widely used RSA method available in the U.S. from RSA Data Security, Inc. Products that encrypt only passwords can go overseas with few restrictions.

"You can buy DES chips outside the U.S. and you can buy them in the U.S., but you can't export a U.S. product with a DES chip in it," Walker said. "And you can't export RSA, but RSA is in use all over the place in Europe."

CSTAC Co-chairman James E. Schlaeppi, a trade official at Control Data Corp., said industry is partly to blame for the impasse. "The only comment we've had from industry is that [the export ban] is stupid," he said. "We agree."

Schlaeppi said CDC lost a big contract for computer terminals and software for the Irish Sweepstakes because the company was not allowed to export gear with the security features needed.

Microsoft Corp. sees rapidly growing demand for better security coming from users in the U.S. and abroad, and the company wants to include encryption capabilities in all 45 of its products.

According to Sam Jadallah, district manager of Microsoft Federal Systems, Microsoft could develop dual versions of the products, at a cost of millions of dollars, but the domestic versions with the better security would be illegally shipped overseas as fast as they were introduced. "We couldn't even compete with our own pirates," he said.

Tales from the crypt

Only a few companies, such as Microsoft, can afford staffs of lawyers to untie the Gordian knot of export controls. HDC Computer Corp. in Redmond, Wash., makes personal computer utilities. It had one with a DES file-encryption option ready to ship when it learned that the NSA would not allow the product out of the U.S. "We were completely surprised," said Joan Bateman, director of international operations at the firm.

After ample discussion with the NSA, HDC stripped out DES, added a less secure encryption method blessed by the NSA and now has an exportable version of the utility. Bateman declined to estimate the cost of the modifications to software, documentation and packaging.

She said there is also an intangible cost associated with the dissatisfaction of customers outside the U.S. who are told they may not buy the best the firm has to offer. "The lessons learned from this will make us think twice about adding encryption to future products," she said.



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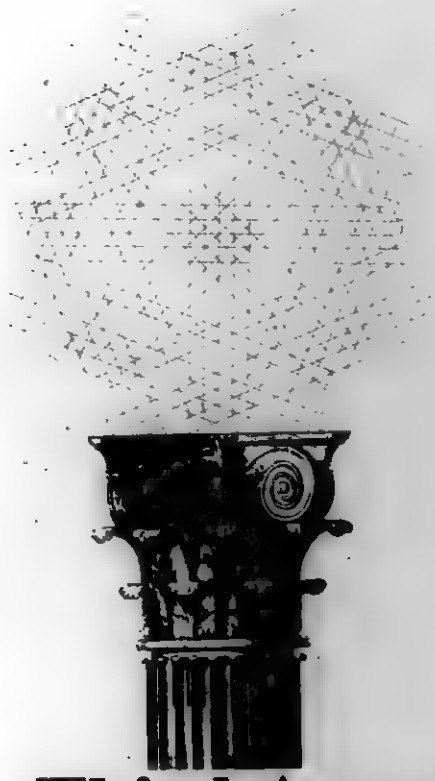
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EXECUTIVE CORNER

Adviseurs names subsidiary president



John Z. Dorn is the first president of New York-based **Adviseurs, Inc.** The new North American subsidiary of Paris-based information data center decision support systems vendor **Adviseurs, SA** opened its doors in March.

Dorn has served the technology industry as a management consultant for major national and international firms for the past 14 years.

Former Texas Instruments, Inc. Information Technology Group Vice President **Kenneth V. Spenser** is at a new post: president and chief executive officer of Novi, Mich.-based **Micro Engineering Solutions, Inc.**

The firm, a computer-aided design and manufacturing tool vendor, was acquired last May by a venture capital consortium that launched an extensive executive search as part of its acquisition game plan. Spenser replaced interim general manager **William Parker**, who helped coordinate the acquisition and will now join the executive team.

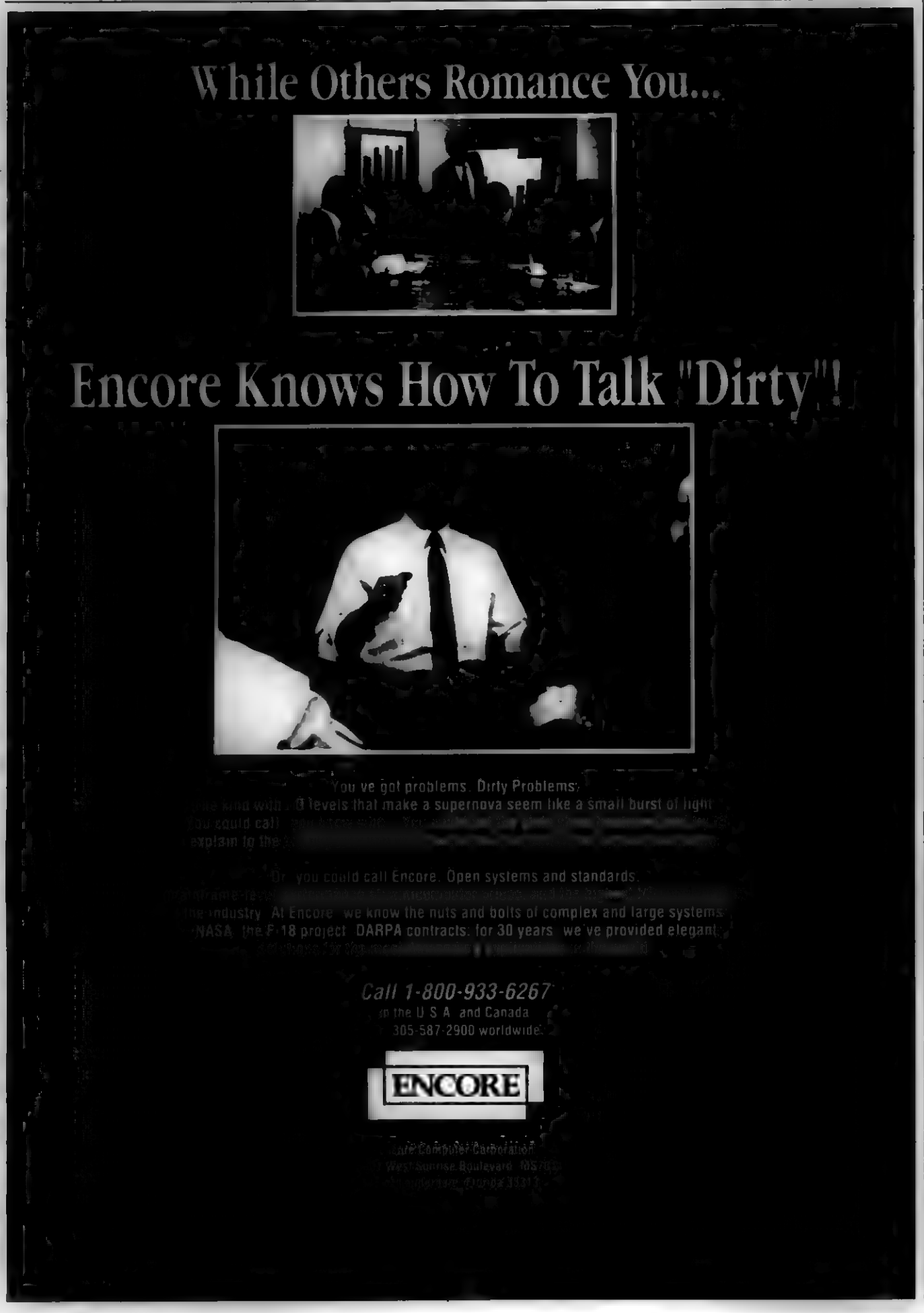
Nick Copping was named president and CEO of Sunnyvale, Calif.-based software development firm **Atherton Technology**. Copping, 41, joined Atherton in 1989 from **Hewlett-Packard Co.**, where he headed the company's advanced laboratories for future-generation software development. Formerly Atherton's vice president of technical services, Copping succeeds **Arthur G. Goldberg**, who has left the firm.

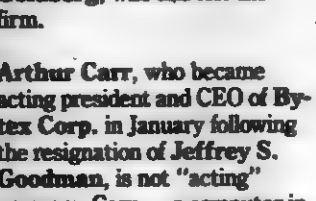
Arthur Carr, who became acting president and CEO of **Bytex Corp.** in January following the resignation of **Jeffrey S. Goodman**, is not "acting" anymore. Carr — a computer industry veteran who, among other achievements, co-founded Stellar (now Stardent) Computer, Inc. — was recently elected president and CEO of Bytex, as well as a member of the board of directors.

Ronald Cornell has been promoted to president and CEO of Fremont, Calif.-based image processing hardware and software vendor **Vicom Systems, Inc.**

In a related move, former Vicom President and CEO **Al Winegar** assumed the office of chairman of the board.

S/Cubed, Inc., a Stamford, Conn.-based start-up formed to create and market application development products beginning with a personal computer-based expert system trained to produce information systems, has selected a president to spearhead the effort: **John Rade**, former head of **Information Science, Inc.** Prior to his stint at Information Science, where he presided over a large-scale corporate restructuring, Rade was with European software and services firm **Cap Gemini Sogeti**.





He rounded his way through 16 inches. Because, as you obviously figured out by now, the cover of Volume I is on the right, while the back of Volume X is on the left.

No3

Central Aerobics Program

WYSE

Answer To

Index

CONTINUED FROM PAGE 87

lease. They also say they now expect to deliver the product by year's end.

With the merger, Index "gets a second chance," according to Vaughan Merlyn, a partner at the Boston-based Ernst & Young Center for Information Technology and Strategy. "They had established the [design and analysis] market, but then others started stealing their market share," Merlyn said. "Then, the financial situation had weakened them to the point where they weren't going to easily make it by themselves," he added.

Sage, meanwhile, maintained a solid reputation with its code generator but was not perceived as a core CASE tools vendor, in part because it was not closely associated with IBM's AD/Cycle. By combining forces, the two companies have the chance both to fix their individual problems and to focus on their common goal of providing a full set of tools, analysts said.

Intersolv also intends to promote a less rigid approach to CASE, which could appeal to users who have been struggling with the strict methods some tools impose. Kevin Burns, Intersolv's chief executive officer, said the strategy calls for tools that are flexible enough to accommodate different methodologies. This reflects a CASE approach that Index promoted with Excelerator. The design tool could be tailored to different methodologies, including information engineering.

"It has to be flexible enough to be configured to the different cultural and project requirements," Burns said. "The premise [espoused by] our competitors holds that the reverse is true."

The biggest challenge for the new Intersolv will be integrating the product line, analysts said.

"They have to smash their product lines together, by either integrating them or coming out with a new product line," Merlyn said. "They have some technological challenges, and they are nontrivial. It will be tough."

A second challenge springs from the IBM relationship. While it will no doubt give Intersolv a marketing boost, it will also place the company in the strange position of simultaneously being IBM's partner and competitor. The AD/Cycle agreement covers some Intersolv products; however, it excludes the company's applications generator because IBM is determined to make its own generator, Cross System Product, a success.

"The customer should decide," Burns said. "There will be times when [Cross System Product] is right, and at other times, [Intersolv's] APS will be right for the requirements."

At the same time, Burns said, he expects the IBM relationship to open doors. "We are targeting MIS development, and that's largely an IBM world," he explained.

While some analysts said Index could be overshadowed by Sage in the new company, they also said the end result will be a stronger company overall. In fact, one of the new company's first official moves was a layoff of 150 people and a $20 million charge against earnings for the fourth quarter, ended last month.

"They had too many people," said Paul Bloom, an analyst at San Francisco-based Volpe, Welty & Co. "It was a powerful move and a necessary consequence of the transaction."

INTERNATIONAL

BRIEFS

One Europe? Maybe not yet

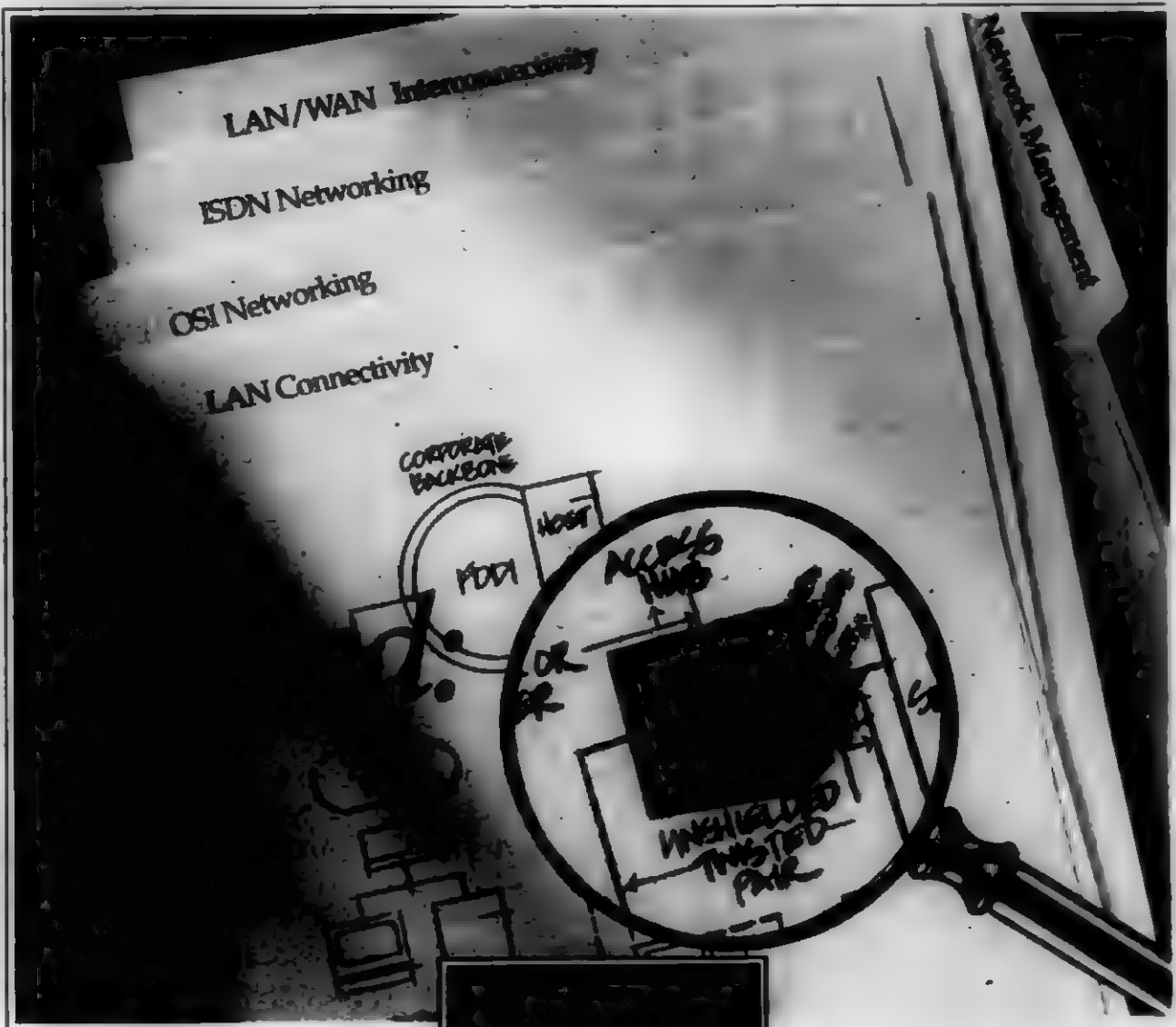
▶ European computer manufacturers met secretly in France last month to try to persuade the European Commission to give them breathing space in which to muster their forces against foreign competition. However, demands presented to European Commission President **Jacques Delors** came in several accents, according to a report in the British business press. **Olivetti** head **Carlo de Benedetti** and **Philips N.V.** Chairman **Jan Timmer** argued for the commission to act against nationalistic purchasing policies, which is in line with the commission's long-term goals, while French delegates **Alain Gomez** of **SGS-Thomson** and **Francis Lorentz** of **Groupe Bull** want the commission to turn a blind eye to state subsidies for struggling national suppliers, the report said. Some manufacturers also urged stronger antidumping measures, while all wanted a delay in the implementation of tough new antitrust laws.

Big Blue rising sun

▶ **IBM** will supply the technology underlying its 9121 mainframe as well as its MVS/ESA operating system to Japanese giant **Mitsubishi Electric Corp.** to use as its future top-of-the-line system, to be known as the **Melcom 900**, both companies said late last month. IBM subsidiary **IBM Japan** will supply the technologies to Mitsubishi, which currently commands a scant 2% to 5% of the Japanese mainframe market.

Northern lights

▶ Oslo-based storage and display vendor **Tandberg Data** posted pretax profits of $2 million for its first six months of fiscal year 1990-1991, up from a $350,000 loss in last year's first half. Revenue for the period climbed 62% to $78 million. President **Arne Ramstad** credited the healthy developments to "hard work over a long period of time."



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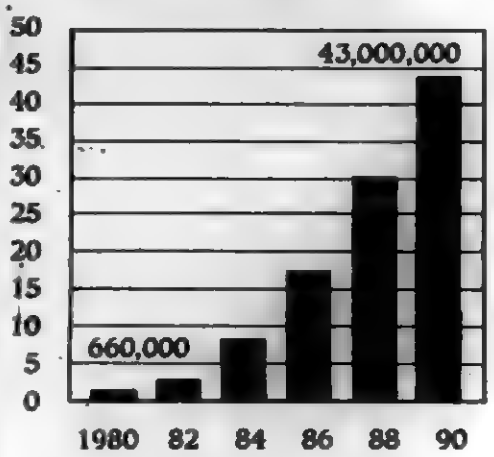
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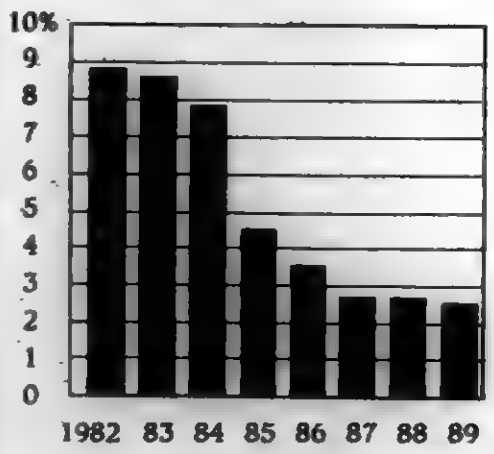
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MBA good choice to broaden marketability

Fast Track is a monthly column dedicated to answering questions on career directions.

BY MAX MESSMER
SPECIAL TO CW

Q I am 34 years old with nine years' experience as a business programmer/analyst in IBM mainframe shops. I hold a bachelor's degree in information systems.

I'm considering returning to school to complete a master's. Does it make more sense for me to pursue an M.S. in computer science or an MBA?

Initials and town withheld

A Companies today are looking for both technical and business skills and experience. Your experience and your undergraduate degrees are technical, so an additional technical degree is unlikely to broaden your opportunities as much as some background in marketing and finance.

An M.S. degree would be desirable if you wish to work for an engineering-oriented company, but an MBA is a better choice for general career marketability.

Q I am a Canadian citizen with 23 years of information systems experience. How could I go about obtaining a position in the Tampa, Fla., area? Under the Free Trade Act, my citizenship should not be a difficulty, but most of the companies I've contacted refuse to consider my application.

Initials and town withheld

A When several equally qualified candidates are available, employers favor those who live in their geographic area. A local person's acclimation is easier, and relocation costs are not a factor. In addition, visas for people with a professional background and education are usually obtainable, but they can take several months, and many employers are unfamiliar with the process.

If relocation is a priority, you could consider a position elsewhere in the U.S. (closer to the Canadian border where businesses are more accustomed to dealing with visas) that offers an opportunity to transfer to Florida during a subsequent job change.

Your best luck might be at software development and consulting firms with offices in both countries.

Q I am a vice president at a Fortune 100 company. I have 20 years of information systems experience ranging from personal computers to mainframes and everything in between. I would like to make a mid-career change to teaching, either secondary education or college. Where do I start?

Initials and town withheld

A Many areas have a shortage of teachers with experience in applied computer fundamentals. So as long as you are open to a possible reduction in salary, you should be able to find employment in the teaching field.

Network with your peers in IS-related organizations such as the Data Processing Management Association or the Society of Information Management. Talk to local community colleges, vocational schools and the evening divisions at area universities.

You might begin by teaching one or two classes on a part-time basis, remaining in your current position until you are sure academia is the right place for you.

Q I am a 23-year-old information systems manager with several years' experience. When I apply for positions, I'm generally only offered entry-level ones. Employers assume they can pay me a lower salary than they would an older person with my experience. Further, they assume I can handle later hours and heavier work loads because I'm young. How can I help make people respect me for my skills, instead of taking me for granted?

S.M.
Bakersfield, Calif.

A Start by taking a careful look at how you are presenting yourself to employers. If your resume indicates the same chronology of experience that you describe, you probably are not packaging yourself well.

Begin by taking a closer look at your resume. Put yourself in the eyes of an employer and look for anything that might cause him to view you as an entry-level person. You should be emphasizing the results you have achieved for your employers, your progressively increasing responsibilities and your technical and managerial skills.

You might also consider whether you are projecting the most professional image possible during interviews and in your daily work. Rehearse your interview technique with a mentor, or seek advice from your peers and from a professional recruiter.

Q I've been looking for a career overseas, preferably in Europe, without success. I'm currently a project leader with 4½ years' experience. How might I improve my chances?

S.E.
Las Vegas

A While the elimination of many trade barriers in 1992 is expected to trigger strong growth in Europe, some European countries are experiencing the same economic softness as the U.S. right now. Your search should emphasize areas such as western Germany, where the demand for people is stronger.

The most common overseas assignments are within multinational and public accounting firms with overseas branches. These firms take stateside applications.

Messmer is chairman of Robert Half International, Inc., which places permanent and temporary IS professionals in the U.S. and abroad.

We welcome your questions. Send them to Cathy Duffy, Careers Fast Track, Computerworld, *375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Letters may be edited for brevity and clarity. Your initials and town will be printed unless you request otherwise.*

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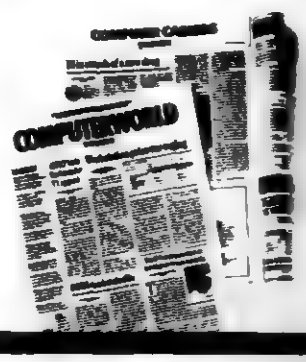
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Computer Systems Analyst, Business Applications: Design computer systems, including system requirements, layout, and procedures. Consults with users and/or supervisor to define the needs, objectives and scope of project. Prepares system documentation according to standard operating procedures. Develops new system specifications and flow charts. Analyzes existing systems and makes recommendations to users for changes/improvements. Assists in implementing new system. Helps users with related data processing problems. Requires bachelor's degree in computer science or bachelor's degree in business administration with 30 hours or more college credit in computer science. Coursework must include one class each in the following: Discrete Structures, Basic Communication Systems, Internal Structures Programs using "C", COBOL, Data Processing, FORTRAN; and Operations Research. Also requires one year experience in the job or one year experience as a cost accountant or cost analyst, both in business or manufacturing applications. Must have proof of legal authority to work permanently in the U.S. Hours: 9:00 a.m. to 5:00 p.m. Forty hours per week at an annual salary of $30,000.00. Please send resume to or contact Manager Mrs. Lu-Lu Wu. Top Wu Computer, Inc., 1795 B Carlsend Court, Addison, Illinois 60101

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Data Processing

ANALYST/PROGRAMMERS

American Greetings, Cleveland-based Fortune 300 manufacturer of greeting cards and related products, has several openings for experienced Analyst/Programmers. Applicants should possess, and be able to demonstrate above-average user interaction and communication skills. A bachelor's degree in a related field is strongly preferred. Our data processing environment includes an IBM 3090 mainframe and networked IBM PC's. Applicants should have one of the following skill sets:

- COBOL, IDMS, ADS/O - 2 years minimum experience
- PL/1, COBOL, IDMS - experience with graphics is a plus. Minimum 2 years experience
- Macintosh Specialist - experience with graphics packages. Minimum 2 years experience

American Greetings offers benefits which include health care insurance paid life insurance paid vacations, tuition assistance and a profit-sharing based retirement plan. Interested applicants (no agencies, please) should send their resumes to:

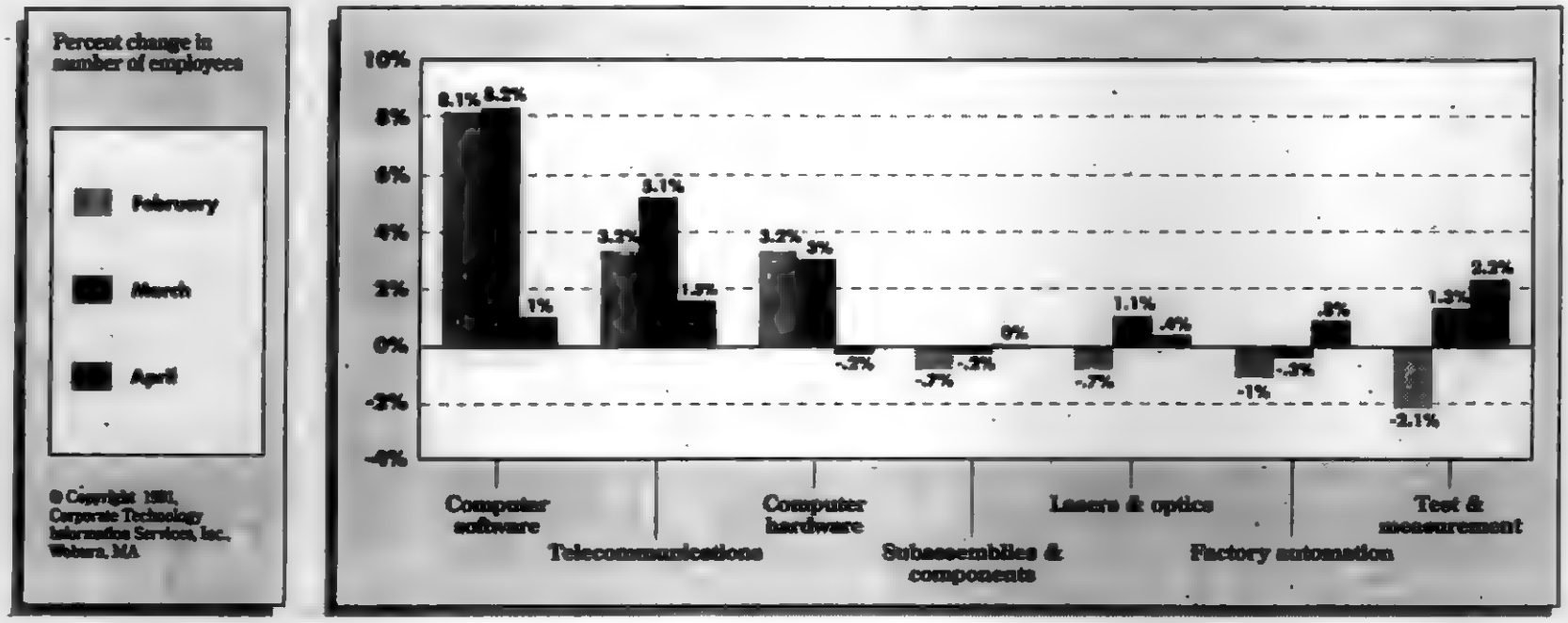
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Computerworld/CorpTech Career Index

INFORMATION TECHNOLOGY COMPANIES — Employment growth in small- and medium-sized computer software companies slowed in April, while employment growth in test and measurement companies advanced, based on a survey of 2, 473 technology manufacturers



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Your duties will be varied, and will include debugging, technical consulting, design support, and other independent projects related to improving the IMS environment. Excellent communication skills and a strong customer service orientation are essential to this position, as you will be working with all levels of users. Your superior technical ability, including an in-depth knowledge of IMS database functions, should be complemented by a sense of initiative.

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Two or more ACP/TPF SOFTWARE ENGINEERS required. Design and develop new ACP/TPF applications in a Real Time environment using Assembler. Design of system functionality, coding, testing, and implementation of new software. Ensure that software and system standards are maintained according to the principles of an ACP/TPF environment. Utilize IEF applications CASE tools to provide design structure, perform system maintenance and maintain system integrity. Applicants required to have a Bachelors Degree or its Equivalent in Computers, Math or Engineering with at least two years ACP/TPF Programming and Assembler Coding experience. Experience must include at least one year with IEF applications CASE tools. Annual salary will be $42,000.00 per year for a 40 hour work week. Additional salary up to $30,000.00 may be paid if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001. J.O. number 6342681. This advertisement paid by an Equal Opportunity Employment Employer.

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INFORMATION MANAGEMENT RESOURCES (IMR) is an international software development company with offices in Florida, in the United States and SEEPZ, Bombay, in India. IMR provides software development and consulting services to Fortune 200, Software Development and Systems Integration Companies in the United States.

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Two or more SENIOR ACP/TPF SOFTWARE ENGINEERS required. Design and develop new ACP/TPF applications in a Real Time environment using Assembler. Design of system functionality, coding, testing, and implementation. Assist programmers and other analysts in program applications, design, testing and implementation of new software. Ensure that software and system standards are maintained according to the principles of an ACP/TPF environment. Utilize IEF applications CASE tools to provide design structure, perform system maintenance and maintain system integrity. Applicants required to have a Bachelors Degree or its Equivalent in Computers, Math or Engineering with at least four years ACP/TPF Programming and Assembler Coding experience. Experience must include at least one year with IEF applications CASE tools. Annual salary will be $45,000.00 per year for a 40 hour work week. Additional salary up to $55,000.00 may be paid if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O. number 6342682. This advertisement paid by an Equal Opportunity Employment Employer.

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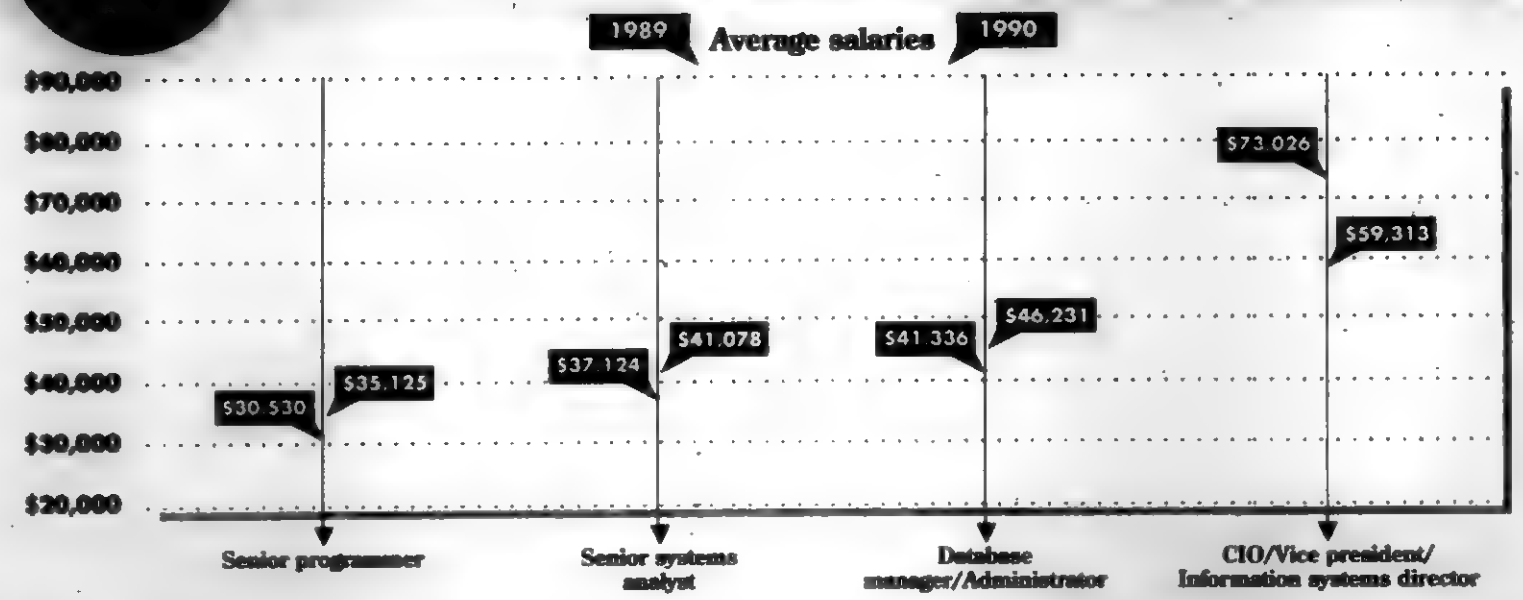
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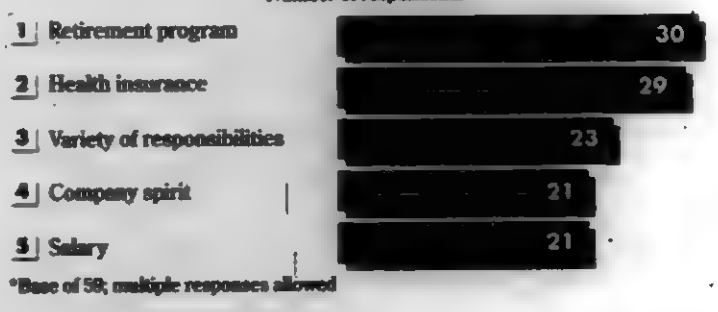
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Source: Computerworld salary and job satisfaction surveys

CW Chart: Tom Monahan Illustration: David Flaherty

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Warranties: An ounce of prevention . . .

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY JOEL B. GILMAN
SPECIAL TO CW

You would expect an information systems professional buying a half-million dollar computer system to spend at least as much time reviewing the paperwork as someone spending half that much money on a new home would. Unfortunately, all too many IS organizations fail to study systems purchase and support agreements to make sure they are adequately protected against failures.

Whether IS managers deal with a value-added reseller, a dealer, a single large vendor or many little vendors, they should carefully review sales contracts to understand what promises are made therein. They may be surprised to discover that the contracts promise very little.

A seller's contractual pledges regarding the quality and performance of systems and support services are called "warranties," which may be expressed verbally or in writing or be implied by law.

For example, when an IS buyer purchases tangible goods such as hardware or off-the-shelf software, the Uniform Commercial Code implies a warranty that requires them to be adequate for normally intended uses and to meet or exceed the customary quality of similar goods.

The exact implications of these warranties with respect to a specific product aren't always clear, so buyers will invariably see a bold-faced "DISCLAIMER OF IMPLIED WARRANTIES" in virtually every computer contract they ever read. Although many vendors will provide some sort of protection in lieu of the implied warranties, few vendors are willing to risk liability for failure to meet the vague standards of these implied warranties.

Basic protection

A vendor cannot simply disclaim warranties of quality or performance. Most states recognize a doctrine known as "failure of essential purpose." For example, if a buyer signs a contract for the purchase of a widget and the vendor refuses to warrant that it is even a widget, the doctrine of failure of essential purpose says the warranty disclaimer is invalid. In other words, the vendor has to offer some sort of assurance that buyers will in fact get what they are paying for.

These implied warranties do not apply to a contract for services, however. Usually, a consultant is held only to a requirement that his work will be performed competently, consistent with standard industry practices. This has little meaning in the context of computer consultants, unfortunately. Although there are many extremely competent and professional consultants, the industry as a whole has yet to evolve a clear definition of its "standard practices."



The following are some of the more important warranties IS professionals should have written into final purchase agreements:

• **Functions:** When acquiring a database management system, for example, be sure the contract spells out in detail as many attributes as are known at the time the deal closes, such as table and record parameters, number and design of input screens, specifications for reports and functions and data flow between screens, tables and reports.

Often, such detailed information won't be available until after a prototype is built, so consider having a separate pilot project to develop a prototype before going into a more costly full-development agreement.

• **System response time:** This is becoming less important with high-speed, decentralized, networked microcomputers. However, in some applications, this might be a critical feature and should be included in the seller's warranty.

• **Support response time:** If a computer goes down halfway through the year-end accounting, how long will it take the vendor to get the system up and running again? This is not always a critical factor for every system, but more often than not, the buyer risks severe havoc to his business if he can't be assured of a minimum response time.

• **Runtime environment:** The sales literature says the software "runs under Unix," but which flavor of Unix and which hardware implementation? Great strides have been made toward standardizing the Unix application interface, but a buyer never really knows until he runs a given application on his specific hardware configuration. When acquiring new software to run on existing hardware or in conjunction with existing software, insist on a trial period long enough to thoroughly test the software — typically 30 days.

• **Training:** Let's face it. People in a busy organization simply do not have time to learn a new system by reading the manuals — no matter what the seller tells you. Have the seller document the availability and cost of training programs, whether or not the seller actually does the training.

Once the deal is on the table and the sales representative is waiting for the buyer to sign a preprinted form contract, it may not be easy to have such items included in the final agreement.

However, one way for a buyer to get the protection he needs is to incorporate warranties into the initial request for proposal. By doing so, the buyer puts all potential vendors on notice that he expects to have these matters addressed in the final deal.

Vendors may balk at these requests, but the IS buyer owes it to himself and his company to be sure he gets exactly what he pays for. Written warranties are the only way to do this when buying something as complex as a computer system.

Gilman is an attorney in Seattle who practices in the field of computer law.

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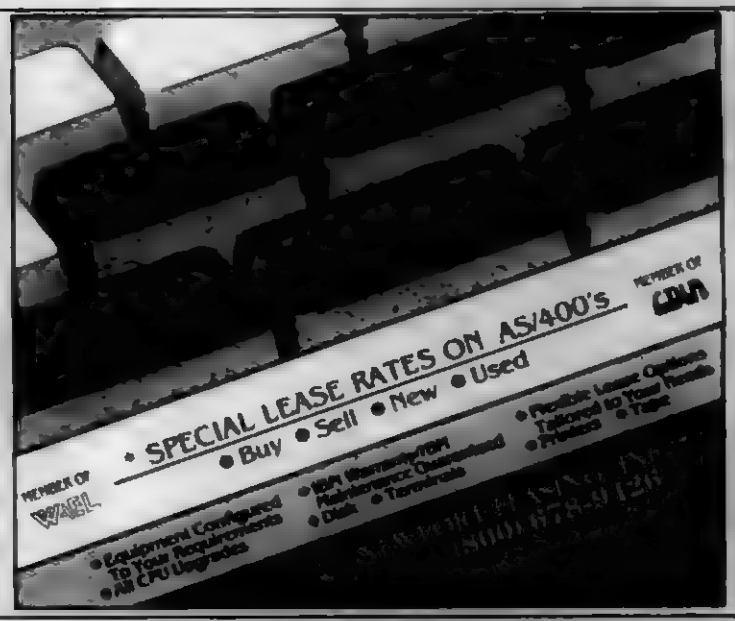
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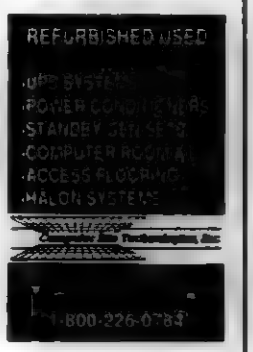
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XT Model 099	$500	$625	$400
AT Model 099	$650	$775	$500
AT Model 239	$750	$925	$700
AT Model 339	$925	$1,000	$900
PS/2 Model 30-286	$1,200	$1,300	$1,000
PS/2 Model 60	$1,400	$1,700	$1,300
PS/2 Model 70P	$3,300	$3,500	$2,500
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,350	$1,000
SLT 286	$2,900	$3,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$2,200	$2,500	$1,900
Desktpro 286	$800	$1,000	$700
Desktpro 386/20	$2,850	$3,000	$2,300
Apple Macintosh Plus	$750	$975	$700
SE	$1,150	$1,350	$1,100
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RFP 2607, due Tues, 5/21/91 at 3:30 p.m. for hardware, software, installation services & technical support for the implementation of a local area network for the PAT HARRISON WATERWAY DISTRICT.
RFP 2608, due Wed, 5/22/91 at 3:30 p.m. for 85 microcomputer, 83 printers & various software for the MS STATE TAX COMMISSION.
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Instructors adapt to downsized companies

BY SUZANNE WEISET
SPECIAL TO CW

Picking up the pieces in the aftermath of a corporate downsizing isn't easy for any department at any company. But for trainers, downsizing is particularly hard: There are fewer dollars to work with and even more training to deliver.

Ideally, trainers say, the challenges faced in a downsized environment should not be any different from those faced before the change. But in reality, downsizing impacts training in many ways.

Specifically, trainers must contend with changes in the kind of training employees require, smaller training budgets, fewer trainers and general confusion in the wake of the cuts.

However, trainers recommend the following ways to get around these obstacles:

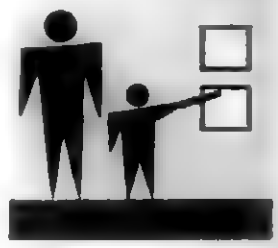
- Perform needs analyses to assess the new skills required by workers.
- Learn to understand the changing training needs from the beginning of the downsizing so training won't be forgotten in the budget.
- Rethink in-house and off-site training strategies.
- Customize in-house training.
- Develop information systems and training links.

Meet needs

Immediately after Englewood, Colo.-based US West's Management Information Services Division downsized in 1990, training coordinator Angela Waller conducted a needs assessment that determined what users wanted to learn and how they wanted to learn it.

For instance, Waller explains, if a layer of management disappears, support staff may need to learn Lotus Development Corp.'s 1-2-3, and executives may suddenly find themselves doing their own word processing when support staff members are eliminated. Some people may be willing to sit in a classroom for a few days; others may want to take a self-study approach to save time. Discovering where such shifts occur and how the training group can best support them is vital.

Needs assessment surveys are also instrumental in justifying training costs to line managers. If a trainer points out areas in which a company cannot afford losses in productivity, managers will more likely build training costs into their budgets, says John Bruce, vice president of training at Ameritech Bell Group in Schaumburg, Ill., which is currently in the throes of a major data center consolidation.



Trainers are also adjusting their training formats to deal with shrinking budgets.

At Ameritech, Bruce says, the priority of training needs as well as the resources available help determine which courses are handled internally and which ones are handled externally. It makes the most sense to offer the highest volume training, such as specific computer language skills, in-house, he says. Almost all end-user computing, however, is now contracted to outside sources. "As recently as last year, we did it in-house. Now we have to commit our staff resources elsewhere where the need is greatest," Bruce says.

McDonnell Douglas Aerospace Information Services in St. Louis has found a way to squeeze more value out of sending employees off-site for courses, according to David Borlin, director of central computing services. "We may send one or two people, where before we'd send everyone," he says. When those one or two come back, they pass on what they have learned to the rest. "We're learning to work smarter," he adds.

Customization is another driving force in helping trainers cut costs and save time. In-house training can be adapted to suit specific applications requirements, which makes it more cost-effective and more precise, according to Borlin.

Courses at MCI Communications Corp. were designed as modules so that in addition to being focused on a specific application, they can also be focused on a specific project team, says Patty Flaherty, senior manager of systems engineering training.

For instance, a project team coming in to study analysis techniques can use its own analysis documents, work on its own deliverables and come out with a gain in productivity as well as a gain in knowledge, according to Flaherty. If employees only need to study a section of analysis, such as business event modeling, they don't have to sit through a five-day course. MCI will provide just the section on business event modeling. If employees need the whole course but can't invest an entire workweek, they can meet one day per week for five weeks or half a day per week for 10 weeks. "We can eliminate extra, general-audience material, and there's no wasted time," Flaherty says.

In a twist on providing training in-house, US West — faced with fewer dollars to spend on outside sources and fewer trainers available in-house — turned to IS employees for help. According to Waller, the IS professionals were willing and able to conduct training sessions. Trainers still design and plan the courses, but Waller has found that the people who use the technologies every day understand how they work and how they fit into the local environment.

Weisel is a free-lance writer based in Framingham, Mass.

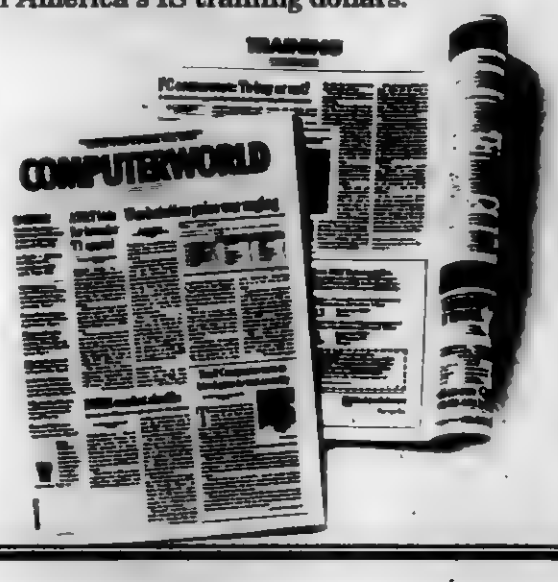
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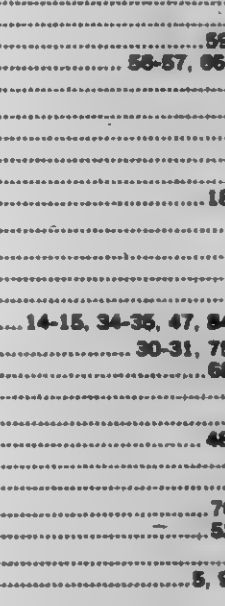
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

DOWNGRADED FROM HOLD TO SELL: Compaq Computer Corp. (Prudential Securities, Inc.). Reason: Lagging international sales pulled down first-quarter financials; no quick turnaround in overseas business expected; company continues to lose market share to second-tier personal computer clone makers including AST Research, Inc. and Dell Computer Corp.

UPGRADED FROM HOLD TO BUY: Symbol Technologies, Inc. (Prudential). Reason: A 38% increase in revenue boosted first-quarter results; large laser scanner orders from J. C. Penney Co. and United Parcel Service placed during the first quarter will also bolster second-quarter sales.

UPGRADED FROM AVOID TO HOLD: Advanced Micro Devices, Inc. (Bear, Stearns & Co.). Reason: Company has made impressive turnaround after three quarters of losses; projects it will sell more than $100 million worth of its AM386-based products this year.

UPGRADED FROM HOLD TO BUY: Teradata Corp. (Prudential). Reason: Although most recent quarterly results fell short of estimates and may contribute to a short-term stock slide, firm has controlled expenses, and retailing and telecom businesses are strong; share price should climb into the mid- to high-$20 range within the next 12 months.

ANALYSIS IN BRIEF

Microsoft Corp. will not usurp Novell, Inc.'s networking market dominance in the near future. Novell's Netware dominates the local-area network operating system business almost as completely as DOS rules the desktop. Providing that it is not swallowed by a larger predator, Novell will remain the biggest fish in the network pond, owning half of the 12 million network nodes that will be installed in the U.S. during the next four years.

Customers who have invested in Netware and the training needed to learn it are not likely to switch without good reason. The company grew cash reserves by 83% to $173 million last year while virtually eliminating long-term debt. With financial strength comes the freedom not only to continue high research and development spending — currently $80 million per year — but also to acquire technology it can't easily develop internally.

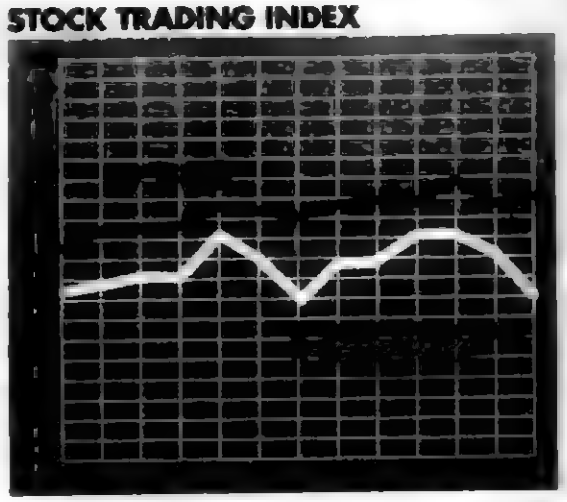
Not all rosy

Microsoft's unique networking strengths — DOS and Windows on the desktop and OS/2 on the server — position it to control both ends of the client/server scheme that is coming into vogue. Novell, meanwhile, must evolve from simple file- and print-server networks to the client/server architecture. It also must get more developers to write applications for Netware, and it must stake out leading positions in network management, electronic mail, database applications and directory services.

Novell knows this and is working on a messaging engine that will pull together four key E-mail standards. Also, it is handling future development of a message handling service, a major E-mail protocol. Network management and directory services are reportedly getting a lot of Novell attention. Furthermore, Novell plans to bring Netware clients and servers under Netview, IBM's network management product. — *On the Line, Technologic Partners, April 22, 1991.*

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Quarterly results continued to rock stocks. Apple Computer, Inc. warned of an impending profit decline for the quarter; its shares plummeted 9⅛ points last week, closing Thursday at 49.
- Seagate Technology, Inc. sank 1⅜ points to 11⅞. Bear, Stears & Co. recently downgraded the stock from Hold to Avoid, citing lower-than-expected earnings for the quarter just reported and concerns about lower profit margins in the low end of the product line. Rival Conner Peripherals, Inc. lost 1⅞ points, closing at 24½.
- Chips and Technologies, Inc. slipped ½ of a point to 9⅛ after recently issuing disappointing profits for the third quarter. Motorola, Inc. tumbled 2⅝ points to 63¼, and Texas Instruments, Inc. lost 2¼ points to 39¾.
- Both NCR Corp. and AT&T stumbled ⅛ of a notch last week as they trudged further through merger talks. NCR closed Thursday at 103⅛ while AT&T fell to 37⅝ points.

Computerworld Stock Trading Index

CLOSING PRICES THURSDAY, MAY 2, 1991

TOP PERCENT GAINERS

Alliant Computer Sys.	50.00
Systems Center Inc.	29.31
MAI Systems Corp.	18.17
Advanced Micro Devices	15.15
Microcom Inc.	14.29

TOP PERCENT LOSERS

Quantum Corp.	-42.63
Apple Computer Inc.	-16.42
Commodore Int'l	-15.85
Micrografx	-14.94
Sequent Computer Sys.	-14.18

TOP DOLLAR GAINERS

Legent Corp.	3.38
Matsushita Electronics	3.00
Policy Management Sys.	2.75
System Center Inc.	2.13
Symantec Corp.	2.00

TOP DOLLAR LOSERS

Quantum Corp.	-10.13
Apple Computer Inc.	-8.63
Borland Int'l	-5.50
Hewlett Packard Co.	-5.38
Knowledgeware Inc.	-4.75

Exch	52-Week High	52-Week Low		May 2 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Off 0.68%**			
OTC	19.00	5.38	3COM Corp.	6.50	-0.38	-4.23
NYS	89.75	52.50	American Info Techs Corp	83.75	-0.38	-0.58
NYS	44.13	28.00	AT&T	37.38	-0.63	-1.64
OTC	6.75	0.88	Ariel Communication Corp.	2.00	0.00	0.00
NYS	56.25	39.50	Bell Atlantic Corp.	48.75	0.63	1.30
NYS	57.63	49.00	Bellsouth Corp.	51.25	-0.63	-1.20
NYS	44.00	13.13	Cabletron Systems	39.50	0.50	1.28
OTC	25.88	8.25	Compression Labs Inc.	19.00	-1.00	-5.00
NYS	41.25	23.38	Comsat Corp.	41.00	0.00	0.00
OTC	5.13	1.94	Data Search Corp.	3.88	0.00	0.00
NYS	26.75	8.88	Digital Comm. Assoc.	18.25	-1.50	-7.59
OTC	25.25	12.25	Dynatech Corp.	20.25	-1.00	-4.71
OTC	12.88	5.50	Fibronics Int'l Inc.	9.13	0.00	0.00
OTC	4.00	1.75	Gandalf Technologies Inc.	3.13	0.00	0.00
NYS	4.50	1.63	General Datacomm Inds.	3.00	-0.25	-7.69
NYS	34.13	23.50	GTE Corp.	31.25	0.38	1.21
OTC	4.50	0.75	Intecom Systems Corp.	1.13	-0.06	-5.30
NYS	60.88	40.25	ITT Corp.	59.88	1.00	1.70
NYS	44.13	17.88	MCI Communications Corp.	36.13	-0.25	-0.68
OTC	21.00	2.75	Microcom Inc.	8.00	0.75	14.29
NYS	11.63	4.00	Network Equipment Tech.	8.00	0.00	0.00
OTC	14.63	4.00	Network General	8.25	-0.50	-5.71
OTC	15.50	8.13	Network Systems Corp.	12.88	0.63	5.10
NYS	36.00	22.13	Northern Telecom Ltd.	35.63	0.63	1.79
OTC	58.50	17.25	Novell Inc.	53.00	-1.00	-1.85
NYS	89.50	67.00	Nynex Corp.	72.50	0.00	0.00
NYS	47.88	36.25	Pacific Telesis Group	41.50	0.13	0.30
ASE	15.38	4.75	Parvi Corp.	14.50	0.00	0.00
NYS	29.13	8.88	Scientific Atlanta Inc.	14.88	0.25	1.71
NYS	58.88	47.25	Southwestern Bell Corp.	52.88	-0.38	-0.70
NYS	46.38	29.63	United Telecom	36.00	0.00	0.00
NYS	40.75	32.38	US West Inc.	37.13	-0.75	-1.98
Computer Systems			**Off 2.19%**			
OTC	6.75	0.59	Alliant Computer Sys.	1.13	0.38	50.00
ASE	18.88	10.00	Amdahl Corp	15.00	-1.00	-6.25
OTC	73.25	24.25	Apple Computer Inc.	49.00	-9.63	-16.42
OTC	13.88	4.25	Archive Corp	7.25	-0.75	-9.38
OTC	22.75	7.50	AST Research Inc.	21.88	-2.50	-10.26
NYS	7.38	4.00	Bolt, Beranek & Newman	6.50	-0.38	-5.45
NYS	21.63	4.50	Commodore Int'l	15.25	-2.88	-15.88
NYS	74.25	35.50	Compaq Computer Corp.	49.88	-0.88	-1.72
OTC	1.75	0.13	Computer Automation Inc.	1.25	0.13	11.11
NYS	21.13	6.75	Control Data Corp.	12.13	-0.88	-6.73
NYS	20.88	8.38	Convex Computer	17.63	0.50	2.92
NYS	51.25	20.00	Cray Research Inc.	39.25	-0.63	-1.58
NYS	18.13	3.50	Data General Corp.	16.50	-0.69	-3.86
NYS	3.25	0.75	Datapoint Corp.	1.63	0.00	0.00
OTC	30.63	8.25	Dell Computer Corp.	21.13	-2.63	-11.06
NYS	85.13	45.50	Digital Equipment Corp.	67.38	-2.50	-3.58
NYS	36.13	13.75	Harris Corp.	25.75	-1.00	-3.74
NYS	85.13	24.88	Hewlett Packard Co.	47.88	-5.38	-10.09
NYS	139.75	96.25	IBM	100.00	-1.25	-1.17
OTC	14.00	7.75	Information Int'l	8.25	0.25	3.13
OTC	31.50	10.50	Intergraph	28.75	-1.25	-4.17
NYS	2.88	0.50	MAI Systems Corp.	0.81	0.13	18.17
NYS	149.75	114.00	Matsushita Electronics	126.00	3.00	2.40
OTC	26.00	9.00	Mentor Graphics Corp.	15.00	-2.00	-11.76
NYS	104.25	44.50	NCR Corp.	103.38	-0.50	-0.48
OTC	35.50	11.00	Pyramid Technology	24.25	-0.75	-3.00
OTC	34.00	9.75	Sequent Computer Sys.	14.38	-2.38	-14.18
NYS	47.25	18.00	Silicon Graphics	34.25	-3.38	-8.97
NYS	37.25	14.63	Stratus Computer Inc.	32.00	-2.50	-7.25
OTC	38.63	16.00	Sun Microsystems Inc.	36.88	-0.88	-2.32
NYS	28.88	8.88	Tandem Computers Inc.	15.25	-1.13	-6.87
NYS	39.50	23.50	Tandy Corp.	32.38	-0.25	-0.77
OTC	32.00	6.75	Teradata	17.13	-0.13	-0.72
NYS	7.88	1.38	Ultimate Corp.	5.13	0.38	7.88
NYS	15.88	1.75	Unisys Corp.	4.25	0.00	0.00
ASE	5.75	2.00	Wang Labs Inc. (B)	3.38	-0.25	-6.90
Software & DP Services			**Off 1.18%**			
OTC	63.00	17.00	Adobe Systems Inc.	52.50	-1.25	-2.33
OTC	59.88	20.25	Aldus Corp.	46.50	0.00	0.00
OTC	28.50	12.00	American Mgmt. Systems	26.00	1.63	6.16
OTC	18.25	7.50	American Software Inc.	11.75	-0.13	-1.05
NYS	4.63	1.38	Answerp Inc.	3.88	0.25	6.90
OTC	23.50	10.00	Analysts Int'l	15.50	0.00	0.00
OTC	13.25	4.88	Ashton Tate	8.63	-0.75	-8.00
OTC	7.88	0.88	ASK Computer Sys.	7.88	-0.88	-7.35
NYS	71.25	34.25	Auto Data Processing	34.25	-0.06	-0.18
OTC	60.25	32.00	Autodesk Inc.	50.75	0.25	0.50
OTC	31.50	13.50	BGS Systems Inc.	26.50	-0.69	-2.30
OTC	43.88	17.75	BMC Software Inc.	41.25	1.00	2.48
OTC	21.50	11.00	Boole & Babbage Inc.	12.50	-0.50	-3.85
OTC	64.25	14.50	Borland Int'l	50.75	-5.50	-9.78
NYS	9.75	0.88	Businessland Inc.	1.75	-0.13	-6.67
OTC	20.88	5.13	Cognos Inc.	18.63	0.63	3.47
NYS	19.88	4.38	Computer Associates	8.25	-0.88	-9.59
OTC	17.75	10.75	Computer Horizons	12.75	0.50	4.08
NYS	73.25	36.75	Computer Sciences	57.25	0.00	0.00
NYS	11.75	6.63	Computer Task Group	10.00	-0.25	-2.44
OTC	25.25	13.50	Comshare Inc.	17.50	-1.25	-6.67
OTC	18.00	3.75	Corporate Software	11.00	-0.75	-6.38
NYS	49.00	27.88	General Motors E (EDS)	47.50	-0.13	-0.26
OTC	18.75	7.25	Goal Systems Int'l	14.25	0.00	0.00
OTC	5.75	1.88	Hogan Systems Inc.	5.00	0.13	2.56
OTC	19.75	7.75	Information Resources	19.13	1.13	6.25
OTC	17.50	2.63	Informix Corp.	6.88	0.25	4.00
OTC	7.88	1.38	Intellicorp Inc.	1.94	0.06	3.36
OTC	8.25	2.50	Interleaf Inc.	7.13	-0.38	-5.00
OTC	43.25	10.00	Knowledgeware Inc.	34.50	-4.75	-12.10
OTC	46.00	18.75	Legent Corp.	32.13	3.38	11.74
OTC	38.25	12.50	Lotus Development	33.25	-1.13	-3.27
OTC	33.00	13.63	Micrografx	18.50	-3.25	-14.94
OTC	117.50	50.75	Microsoft Corp.	100.50	-0.25	-0.25
NYS	10.50	4.00	On Line Software Int'l	6.88	-0.69	-8.97
OTC	24.00	4.88	Oracle Systems	9.88	0.00	0.00
NYS	14.63	7.00	Parasphic Systems	12.25	0.00	0.00
OTC	9.25	1.25	Phoenix Technologies	7.50	-0.75	-9.09
NYS	52.00	33.38	Policy Management Sys.	47.88	2.75	6.09
NYS	23.63	11.50	Reynolds & Reynolds	20.25	0.50	2.53
OTC	16.13	6.88	Sage Software Inc.	10.13	-1.12	-10.00
OTC	25.50	14.75	SEI Corp.	24.25	-0.25	-1.02
OTC	21.75	12.25	Shared Medical Systems	20.75	-0.63	-2.92
OTC	35.25	12.00	Software Publishing Corp.	22.25	1.38	6.59
NYS	14.63	5.50	Sterling Software	13.13	-0.38	-2.78
OTC	28.00	9.50	Sungard Data Sys.	16.75	-0.50	-2.90
OTC	55.88	17.75	Symantec Corp.	48.50	2.00	4.30
NYS	24.50	4.50	System Center Inc.	9.38	2.13	29.31
OTC	37.25	12.75	System Software Assoc.	17.50	-1.75	-9.09
OTC	27.38	4.75	Wang	14.00	-1.75	-11.11
Semiconductors			**Off 3.81%**			
NYS	14.25	3.63	Advanced Micro Devices	14.25	1.88	15.15
NYS	12.50	5.50	Analog Devices Inc.	10.50	-0.38	-3.45
OTC	21.75	5.25	Chips & Technologies	9.50	-0.25	-2.56
OTC	66.25	28.00	Intel Corp.	48.25	-3.88	-7.63
NYS	13.00	5.13	LSI Logic Corp.	10.75	-1.00	-8.51
NYS	19.13	6.75	Micron Technology	15.25	-1.50	-8.96
OTC	21.50	7.25	MIPS Computer Systems	17.88	-0.63	-3.38
NYS	68.38	45.75	Motorola Inc.	63.13	-1.38	-2.13
NYS	9.00	3.00	National Semiconductor	7.63	-0.13	-1.61
NYS	47.63	22.50	Texas Instruments	39.75	-1.50	-3.64
OTC	12.25	3.00	VLSI Technology	10.00	-1.13	-10.11
ASE	14.88	4.50	Western Digital Corp.	5.00	-0.50	-9.09
Peripherals & Subsystems			**Off 4.58%**			
OTC	2.75	0.88	Aperture Technologies	2.56	0.13	5.13
OTC	24.00	7.50	Bantzac Inc.	12.75	-0.75	-5.56
OTC	17.50	4.25	Cambex Corp.	13.50	-1.25	-8.47
ASE	11.75	4.13	Cognitronics Corp.	9.25	-0.88	-8.64
NYS	31.25	14.63	Conner Peripherals	24.50	-1.38	-5.31
ASE	22.00	7.00	Datarem Corp.	9.88	-0.38	-3.66
NYS	12.50	4.25	EMC Corp.	12.00	0.00	0.00
NYS	47.25	33.75	Eastman Kodak Co.	41.13	-1.63	-3.80
OTC	11.25	4.75	Emulex Corp.	8.25	-1.06	-10.91
OTC	34.50	14.00	Evans & Sutherland	21.50	-0.25	-1.15
OTC	6.88	3.75	Iomega Corp.	5.44	0.00	0.00
OTC	28.25	6.75	IPL Systems Inc.	28.25	0.00	0.00
OTC	1.63	0.13	Maxstor Systems	0.94	0.06	7.30
OTC	17.00	2.63	Maxtor Corp.	3.88	-0.50	-11.43
OTC	18.00	4.38	Micropolis Corp.	13.63	-1.88	-12.10
NYS	88.75	73.63	3M Corp.	88.25	0.88	1.00
OTC	14.50	8.00	Prenotrix Inc.	9.25	0.25	2.78
NYS	24.75	8.50	QMS Inc.	22.75	0.38	1.68
OTC	18.25	8.25	Quantum Corp.	13.63	-10.13	-42.63
NYS	7.63	4.38	Recognition Equipment	7.25	-0.13	-1.69
OTC	11.50	4.00	Rexon Inc.	10.38	-0.88	-7.78
OTC	19.88	8.63	Seagate Technology	11.88	-1.00	-7.77
NYS	41.75	11.00	Storage Technology	41.75	1.88	4.70
OTC	4.75	1.25	Tandon Corp.	3.50	-0.31	-8.21
NYS	26.38	11.63	Tektronix Inc.	24.00	-0.25	-1.03
OTC	0.63	0.16	Televideo Systems	0.31	-0.03	-8.51
NYS	80.13	28.00	Xerox Corp.	57.88	-1.00	-1.71
Leasing Companies			**Up 0.45%**			
OTC	16.25	6.88	Amplicon Inc.	16.00	1.00	6.67
NYS	28.38	14.63	Comdisco Inc.	27.00	-1.00	-3.57
OTC	16.25	9.25	LDI Corporation	14.25	-0.13	-0.87
OTC	5.75	2.25	Safecorp Inc.	3.75	0.00	0.00

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Novell

FROM PAGE 1

Netware product manager at the company's Provo, Utah, headquarters. Edwards said Communication Services and most other products in Novell's Netware Version 3 line were designed to integrate existing and future products and standards.

A Netware user attending a recent Novell conference in New York expressed frustration that Novell internetworking software performance shortcomings were not being addressed. "Novell's T1 throughput falls short. We're getting into larger and larger data transfers, and Novell's T1 capability can't handle it," said Brian F. Pasch, senior communications engineer in the Information Technology Group at Goldman, Sachs & Co.

Novell added T1 support to its servers last year, a key move that Business Research Group in Newton, Mass., said prevented the vendor from losing customers to local-area network competitor Banyan Systems, Inc. Unlike Netware, Banyan's Virtual Networking System LAN was originally architected to embrace corporatewide networks spanning multiple sites.

Edwards said he had heard no complaints about the product's performance.

Novell's internetworking software has also received poor reviews from John Loo, head of technology development at $7 billion engineering and construction firm Fluor Daniel, Inc. in Irvine, Calif. Loo runs nearly 5,000 Novell nodes and said he is considering replacing Novell's dedicated interconnect software with Vitalink Corp. bridge/routers for "much more reliable throughput and connections."

Edwards said Netware v3.11 works well in less intense networks. It also works well in combination with high-speed dedicated routers.

Chandler said that for communications among Netware networks, Arco uses Cisco Systems, Inc. T1 links because Netware's dedicated interconnect software supports only Novell's proprietary protocols.

Novell hit a milestone when it announced a multiprotocol version of Netware in February that opens up the LAN to other networking environments and network management systems. However, no corresponding upgrade has been made to its dedicated internetworking software.

Loo said Netware v3.11 thus does not address the interoperability problems he is experiencing. He said, however, that at the work-group level, Novell offers "enough functionality in terms of speed and convenience of local administration that we're willing to overlook some of the wide-area hassles." He stated that "it's certainly possible to use Novell as a wide-area vendor; we're doing it. But there's got to be an easier way."

CHIEF AMONG SEVERAL managers' concerns is Novell's lack of a directory service to rival Banyan's Streettalk.

Other users excited about the capabilities of v3.11 were less impressed with its accompanying price tag (see story at left).

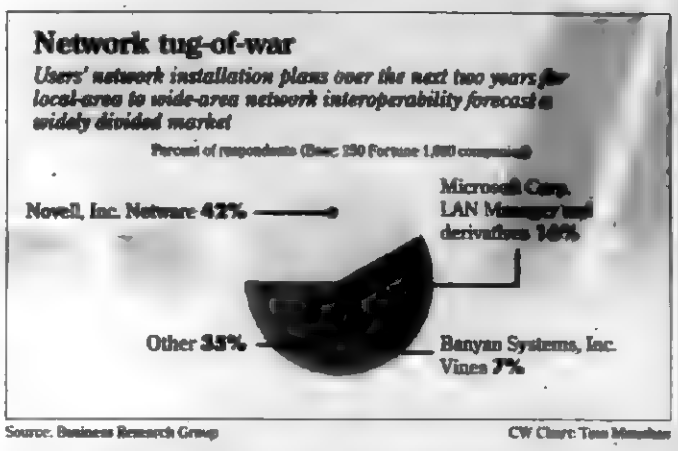
"Novell needs to forge some alliances with workstation vendors so their workstations can run 3.11 server software," said Neville Pereira, supervisor of integrated computing environment at Ontario Hydro Research Division in Toronto.

Chief among several managers' concerns is Novell's lack of a directory service to rival Banyan's long-heralded Streettalk global service. Streettalk allows users to communicate directly with remote computers over wide areas without having to know and specify locations.

Novell's domain naming service, introduced this year, allows a user to access just eight servers at a time, and domains cannot overlap, Loo said.

Edwards said the naming service was designed to simplify the log-on process for managers and end users who must have access to a specific number of servers within a domain. To that end, Edwards said, "the naming service does a good job."

He added that Novell is considering opening the service enough to assign users access to servers in multiple domains.



Piggy-bank buster

For the U.S. Environmental Protection Agency (EPA), Novell's February announcement of an "enterprise" version of its Netware network operating system — v3.11 — was a mixed blessing.

The EPA runs 190 Novell servers, as well as some Decnet protocols in its research and development division, so the heterogeneous capabilities of v3.11 were the good news. The bad news was that v3.11's cost structure "priced Netware out of our market," said David A. Bittenbender, chief of the telecommunications group at the EPA's central data processing center in Research Triangle Park, N.C.

Bittenbender said v3.11 boosted some product prices "300% to 400%," adding that it would cost the agency "about $1 million" to upgrade to v3.11. Many of the agency's Netware networks are still running Netware 286 versions, which receive no upgrade price breaks.

The agency had standardized on Netware over Token Ring and "had no reason to look at anything else until this price increase," which happened during the agency's 1993 budget process, Bittenbender said. "We can't afford v3.11 plus network management, so we're rethinking our Netware application."

Bittenbender said v3.11's Transmission Control Protocol/Internet Protocol (TCP/IP) support is particularly attractive in light of the requests for proposal he has for two TCP/IP-speaking supercomputers. "It's too bad not to be able to take advantage of great technology because you can't afford it," he said.

Netware v3.11 started shipping in March. Prices are $3,495 for a 20-user version, $6,995 for a 100-user version and $12,495 for a 250-user version.

Until Sept. 30, Netware v3.0 and v3.1 customers who purchased their software before Novell's February announcement can get upgraded to v3.11 for free.

JOANIE M. WEXLER

Novell readies revised end-user support plan

BY JIM KASE
CW STAFF

Novell, Inc. is expected to announce tomorrow an end-user support program that will coordinate the technical staffs of several hardware and software vendors with networking products, according to industry observers.

Novell's support policy has been to discourage direct inquiries to the company, preferring instead that calls be made to resellers. The new program would come in the wake of growing dissatisfaction expressed by users of Novell and many other networking vendors.

Novell has refused to comment in any detail on the reports other than to say that executives have been previewing a new support setup with key customers.

Dave Vinzant, president of Vinzant, Inc., a reseller in Portage, Ind., said Novell is spearheading an effort begun one year ago to organize several networking hardware and software vendors into a support team.

Vinzant, as well as other resellers and analysts, said that under the program, managers calling one company with a problem that seems to be rooted in another vendor's product will be handed over to that vendor. In some instances, support personnel from several companies would also hold conference calls with customers, he said.

Vinzant and another reseller, who requested anonymity, said Novell has deliberately waited until now because it feels it has gathered enough support partners. Although both resellers said Microsoft Corp.'s applications division recently signed on to the idea, a spokeswoman for Microsoft said she knew of no formal support agreements. "We would join," the spokeswoman said, "if we were approached."

Some network administrators said they are encouraged by the news. Managers must now deal with finger pointing by vendors and long minutes spent on hold, said Sally Hernandez, network systems specialist for the city of Fresno, Calif.

Frank Goodyear, leader of the Orange County Netware Users' Association, said he was less impressed with the plans. "Basically, [vendors] will be able to pass the buck a lot faster," said Goodyear, who is president of Ostech Consultants.

Toward total LAN control

Bytex claims 99.9% uptime with intelligent hub

BY JOANIE M. WEXLER
CW STAFF

SOUTHBORO, Mass. — Bytex Corp., a major player in fault-tolerant communications, said it will announce today an intelligent hub that makes mission-critical applications running on local-area networks less vulnerable.

The company, long profitable with its high-end matrix switches that help prevent host-based communications from faltering, will apply fault tolerance to LANs with an intelligent wiring concentrator dubbed Maestro.

The move aims to address user concerns over network uptime during an era when many are downsizing from costly mainframe computing power to networked personal computers and workstations.

"There is an incredibly high growth curve in corporate America for putting mission-critical applications on LANs," said Cheryl Currid, president of consulting firm Currid & Co. in Houston. Until two months ago, Currid ran 1,000 LAN nodes at Coca-Cola Foods, where LANs are viewed "as a corporate utility and installed in a mission-critical way," she said.

Maestro will increase LAN uptime to 99.9%, Bytex said. A switching function will allow centralized control of growing networks by allowing network administrators to swap stations and file servers from one Token Ring LAN to another remotely from a central management station. That, according to Bytex, will eliminate time-consuming trips to the wiring closet to repatch cables — a main contributor to the average 6% downtime LANs now experience.

"To us, Maestro's main advantage is the ability to switch test equipment in and out of different LANs remotely and perform networkwide diagnostics from one spot," said Anthony J. Casciotti Jr., an assistant vice president at National Westminster Bank in Melville, N.Y. Casciotti runs 40 departmental LANs in 25 buildings and said he will start beta-testing Maestro in about one week.

Other hubs, such as Synoptics Communications, Inc.'s Lattisnet, allow users to disable stations remotely but still require a physical trip to the wiring closet to move or reconfigure users, Casciotti explained.

NEWS SHORTS

Group blasts credit reports

Nearly half (48%) of the 161 computerized credit reports reviewed by the Consumers Union contained inaccurate information, and 19% had "major" credit-related errors, the nonprofit publisher of *Consumer Reports* magazine said last week. The American Financial Services Association called the study "rubbish" because of its small sample and said any consumer database is bound to have some minor errors. But U.S. Rep. Esteban E. Torres (D-Calif.) said he was shocked by the findings and scheduled a June 11 hearing to consider legislation to increase the accuracy and privacy of credit databases.

Apple frets over third quarter

Demand may be strong for Apple Computer, Inc. Macintosh computers, but that does not translate into greater profits, according to Apple officials. Apple Chief Financial Officer Joseph A. Graziano said last week that signs in the first month of Apple's third fiscal quarter indicate the company faces a quandary similar to what happened three months ago when unit shipments were up but gross margins were down.

Toshiba chops prices

Toshiba America Information Systems, Inc. cut prices across its entire line of portable computers last week, including a $1,600 price cut on the T2000SX/20, its Intel Corp. 80386SX-based notebook. The price cuts affected 17 models, from its T5200C color laptop down to its T1000 notebook, which now sells for $799.

Legent, Software AG pair up

A joint development agreement was announced last week partnering Software AG of North America, Inc. and Legent Corp. to produce an interface between their change management software products. It will let Software AG's Predict Application Control and Legent's Endevor/MVS products work together, giving users consistent management over applications built with Software AG's Natural fourth-generation language.

Marcam buys financial line

Marcam Corp., which sells manufacturing software for IBM computers, announced last week that it will acquire marketing and support rights to J. D. Edwards & Co.'s financial applications, which run on IBM Application System/400s. Marcam will integrate business applications from J. D. Edwards, including general ledger, accounts payable and report writer, into its process manufacturing software.

Memory for rent

When times get tough, users lease, according to computer industry lore. Memory vendor Cambex Corp. has a new take on the old saw: When times get *really* tough, users rent. Last week, Cambex announced what it said is a first: a memory rental program aimed at IBM high-end mainframe users, particularly the approximately $50 billion System/3090 installed base. Cambex will rent either its own or IBM's central and expanded memory for terms of 90 days and more at approximately 35% less than the comparable purchase price.

CGI buys Transform Logic products

CGI Informatique, a French software giant, said last week that it had reached a tentative agreement to acquire several upper CASE products from Transform Logic Corp. in Scottsdale, Ariz., for an undisclosed sum. The personal computer-based products, Designaid II, Lifecycle Manager and Source/RE CASE, aid in automating the planning and analysis portions of the software life cycle. They would complement CGI's PC-based Pacbus and mainframe-based Pacbase computer-aided software engineering (CASE) tools, CGI said. Transform Logic, which is for sale, sold the products to raise capital, company sources said, noting that Transform Logic will continue to sell and maintain its code-generation products.

NCR promises Tower line lives

Users claim product line abandoned for Intel-based System 3000

BY MICHAEL FITZGERALD
CW STAFF

SAN ANTONIO — Conventional wisdom held that NCR Corp. would kill its Motorola, Inc. 68000-based Tower line of minicomputers after it announced its System 3000 strategy, based on Intel Corp. microprocessors. But at the NCR Users Conference (Nucon) here last week, the Tower appeared to get a reprieve.

Several NCR representatives, both in panels and on the show floor, denied that the Tower line was dead and said it would be upgraded and enhanced as long as there was user demand and as long as Motorola continues to enhance the chip family.

A panel on Unix, in particular, drew fire from users unhappy with NCR over what they called its orphaning of the Tower.

"It seems like they're abandoning the Tower users and the Tower — they're pretty much going away from small business in general, the way I see it," said Cari Baron, technical support manager at Millstone Coffee, Inc., which last year bought a Tower 32/825 and NCR personal computers.

Disgruntled user

Baron said the 68040 expansion was a solid upgrade option, but he felt "misled" by NCR's sales efforts last year. "I'm real grim about the third-party software that'll be created for the Tower in the future," he said.

Away from Nucon, NCR is coy about its plans for Towers based on versions of the 68000 beyond the 68040, other than to say it will not put AT&T Unix System V Release 4 on the Tower. A spokesman refused to comment on what might happen after the release of this year's 68040-based Tower products: the 32/750 in July and the Tower 32/825 and 32/850 multiprocessor versions.

Still, David Wightman, systems programming manager at the California Insurance Group in Monterey, Calif., said his firm would move to the System 3000 in the future.

Tower shaken

NCR Corp.'s bold strategy has caused some nervousness among the large installed base of Tower minicomputer users



CW Chart: Doreen St. John
Source: International Data Corp.

REPORTER'S NOTEBOOK

Intel Corp.'s 50-MHz 1486 microprocessor, the current cornerstone of NCR Corp.'s System 3000 strategy, is expected to be announced next month, according to some sources at Nucon. Intel will only confirm a summer release date for the chip. Sources close to NCR also said Intel will release a 66-MHz version of the 1486 before the end of 1991.

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One source close to NCR reported NCR employees were jubilant on April 15 for reasons that had nothing to do with taxes. That was the day NCR got software to run on a four-processor prototype of its 3550, which is expected by some beta testers within the month and due for delivery late in the third quarter.

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NCR's stylus-based computer, expected to be released in September, will be based on Intel's 80386SL power management chip, but several NCR speakers, including President Gilbert Williamson, said it will be SX-based, causing even the notepad's product manager to wonder briefly if development plans had been changed without his knowledge.

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At least one vendor in the exhibit area near Nucon was preparing for the NCR/AT&T merger by giving away AT&T cordless telephones to attendees.

Employees, users tire of AT&T/NCR discord

BY MICHAEL FITZGERALD
CW STAFF

SAN ANTONIO — The question was asked on the Riverwalk here last Monday: Did Gil Williamson bring his AT&T speech or his System 3000 speech?

Williamson, NCR Corp.'s president, brought the System 3000 speech for his keynote address at the NCR Users Conference (Nucon). AT&T's takeover effort was not mentioned until a user stood up afterward to ask Williamson for an update, drawing applause from the audience and a terse response from Williamson: "I have no developments to report other than what's been in the papers."

Last week, the papers simply reported the joint AT&T/NCR announcement on April 28 that progress had been made and NCR's board had expanded to 14 members, reinstating Chairman and Chief Executive Officer Charles E. Exley Jr. as well as Williamson.

"We felt it prudent to have the CEO and the president of the company on its board in this critical time," NCR spokesman Mark Feighery said. Exley and Williamson were due to be replaced last Wednesday by AT&T candidates elected at NCR's annual meeting March 28.

Williamson, at a reception for user group management, implied that NCR has battled so doggedly against AT&T in part because it wanted to get its open, cooperative computing products well under way before having to deal with a merger.

"When this first happened," Williamson said, he and Exley "went to the board and said, 'We're out of cycles here. We're out of brains; we don't have any one to spare for this.'"

Get it over with

The consensus at Nucon was that users and NCR employees would like to see this deal done. "We're all just sick of it," said one high-ranking NCR official, who added that some NCR sales representatives have placed bets as to how long it will take a customer to ask about the AT&T situation.

Some users would like to see the merger occur because they think it will benefit them. Robert L. Merrick, MIS director at Windmere Corp., an 18-year NCR user, said he expects improved software and telecommunications benefits.

"NCR's always had superior hardware but lacked software," Merrick said.

DOS 5.0

FROM PAGE 1

"It looks like a winner," said Earl Robinson, a telecommunications consultant in New York who has worked with the new system since last fall.

Insiders said the extraordinarily large beta-test group — most beta tests consist of approximately 100 sites — resulted from the plethora of software incompatibility complaints about the IBM-produced DOS 4.0. The bugs were eliminated when Microsoft later reworked the code into DOS 4.01, but the prestige of DOS took a hit and many users stayed with the earlier DOS 3.1 and 3.3 releases.

"Microsoft's reputation was on the line with DOS 5.0 — they want it right the first time," a software dealer in Atlanta said.

Beta-test users said the new operating system offers a reworked graphical shell as well as an array of built-in utilities from Central Point Software, Inc.'s PC Tools application (see story page 12) including backup, file mirror, undelete and unformat features.

The result is a system that offers much of what you get with OS/2 for the price and compatibility of DOS. "DOS 5.0 is certainly a worthy competitor to OS/2," said Joel Diamond, technical director of the Windows Users Group Network in Media, Pa. "There is a lot of competition between the DOS and OS/2 development groups at Microsoft — [Chairman] Bill Gates likes to see that."

The refurbished DOS begins with a menu system that allows the selection of a series of installable components, including a menu shell, character-based file system and task switcher. If all features are selected, DOS 5.0 will require as much as 3M bytes of disk space — 1M byte more than OS/2 1.3 requires.

Third-party punch

Disk space can be regained, however, by deleting the older replaced utilities — something that is worrying utilities makers who are already scrambling to respond: Symantec Corp. is reportedly beefing up its best-selling Norton Utilities with an upgrade planned for the third quarter. "No doubt about it: DOS 5.0 is going to take a punch out of the third-party utility market," said Paul Cassel, a computer consultant in Albuquerque, N.M.

Some beta-test users, however, chose to skip the new utilities. "I like to stick with as many of my tried-and-true utilities as possible [to] avoid having to start at the bottom of the learning curve again," said one user, who requested anonymity because he had signed a nondisclosure agreement.

DOS 5.0 also includes an option that allows it to be loaded into upper memory — an area between 640K bytes and 1M byte that is typically unused or relegated to features such as video device drivers — with memory management built in. Previously, users needed to employ products such as Quarterdeck Office Systems, Inc.'s QEMM and 386Max from Qualitas, Inc. in order to achieve those same results.

The update can also be loaded into high memory, the 64K chunk of memory right above 1M byte. Because this capability frees up more conventional memory, the payoff for Windows users is about a 10% increase in speed. An improved File Allocation Table that can be read by pre- and post-4.01 disk utilities and recognized by OS/2 is also included.

Beta-test users were generally pleased with the initial high quality of DOS 5.0. "One of the objectives of beta-testing is to eliminate features that just can't be made workable, and there just didn't seem to be that many bad apples," one St. Louis-based user said.

OS/2 migration not for the squeamish

Uncertainty over IBM's New Technology OS/2 clouds desktop migration

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

Here are two words of advice for those trying to craft a long-term strategy for migrating mission-critical applications to the desktop: Good luck, especially if your plans involve OS/2.

Three weeks ago, IBM went all out to convince users and developers that it is committed to OS/2. And it is — at least with regard to the forthcoming 32-bit version, Release 2.0.

Yet no sooner did IBM clear up questions about the capabilities and viability of OS/2 2.0 than the haze of uncertainty shifted to cloud the next planned generation of OS/2, the 32-bit — but portable — New Technology under development at Microsoft Corp. Last week, Lee Reiswig, IBM's assistant general manager of programming and personal systems, promised to outline IBM's position on New Technology either late this year or early next year.

This time frame means that corporate developers, some of whom have had a tough time defending their support for OS/2, cannot present a game plan that extends beyond the end of 1992. Strategic plans typically cover at least five years, Reiswig said.

The New Technology system, which can be cross-licensed, is slated to ship in 1993; the developers' kit should ship by year's end. In the meantime, New Technology, also called OS/2 3.0, will probably come under assault before ever reaching the alpha-testing stage.

Competition from within

Competition may come in the form of a separate effort by IBM, which may combine OS/2 and Unix, Reiswig said. It will come from Unix System V Release 4.1. Also known as Unix Easy, this next-generation follow-on to the current System V Release 4.0, is described as modular, smaller, faster and easier to use. A desktop version is slated to ship either late this year or in early 1992, said Roel Pieper, executive vice president of sales and marketing at Unix System Laboratories, Inc.

While Pieper moves to protect the rear, IBM is having second thoughts about where Microsoft is taking New Technology. Both IBM and Microsoft have acknowledged that the two could go separate ways on a portable OS/2 platform.

Reiswig and IBM General Manager Joseph Guglielmi confirmed that IBM has been sending out signals during the last six weeks indicating a lessening of support for New Technology.

"We are keeping our hand in a number of [portable platform] efforts. New Technology OS/2 has a long way to go before it's cooked, so we need to have alternatives available," Reiswig said.

Kernel technology such as the Open Software Foundation's OSF/2, now under development, might prove to be a viable tool for porting OS/2 to other platforms, they said. "There could be a convergence; we could bring the Unix and OS/2 worlds together on one common world," Reiswig said.

"In this scenario, IBM would take selected components of OSF/2, like the distributed computing environment and the remote procedure calls, and put them into OS/2," said John Dunkle, a consultant at Workgroup Technologies, Inc. in Hampton, N.H.

IBM's hesitancy has not escaped Microsoft's notice. "Yes, there has been a lessening of support [on IBM's part]," said Steve Ballmer, senior vice president of system software, calling IBM's hedging on New Technology another manifestation of IBM's viewpoint that it will not depend on another company for technology.

System 7.0

FROM PAGE 1

Jim Poyner, an analyst at research firm William K. Woodruff & Co. in Dallas.

Several users praised a Help feature that opens an information balloon at the click of a button. It's "especially useful for applications used only occasionally," said one user, who is an official at the National Aeronautics and Space Administration (NASA). He also said a feature allowing file sharing without a server is helping NASA scientists at different sites collaborate on research papers.

Others praised the ease of updating. The upgrade can be downloaded to all Macintoshes on the network, so there is no need to carry a floppy disk to all units. "Apple is doing a good job of getting it into our hands; it's very easy to update a large group of users," said a U.S. Army officer at a press briefing in Washington, D.C., last week.

While many Macintosh users carped about the delay, many others who have seen prerelease versions praised the new system for its ability to integrate significant additions without adding undue complexity. "It's a major upgrade, but it doesn't seem dramatic, and that's to its credit," said Craig Danuloff, author of *The System 7 Book* and several other Macintosh-related publications. "System 7.0 has a lot of subtle conveniences, and that's what makes it very nice to work on."

System 7.0 also presents Apple with a curious corporate discrepancy. Although Apple executives have strenuously affirmed their commitment to the low end of the Macintosh line, System 7.0 memory requirements are not exactly entry-level: A hard drive, at least 2M bytes of random-access memory and 3M bytes to 5M bytes of hard disk space are suggested to use System 7.0 and all of its related files.

One factor in Apple's favor is the decreasing price of add-in memory: An additional 1M byte of RAM can be purchased for as little as $35, according to Danuloff. Still, he conceded, there is a natural aversion to the upgrade process. "People think that they have to open up the machine or lug it down to the dealer, and it scares them away," he said.

System 7.0 could help Apple on the corporate front by shoring up its defenses against Windows. Users said many of the new features strengthen their commitment to Apple. "Adding features like multitasking [to the Macintosh operating system] is another reason why there still is no comparison between Apple and Windows," said James Brown, systems specialist at Nissan Motor Corp. in Carson, Calif.

A $99 System 7.0 personal upgrade kit will include 90 days of toll-free telephone support. A $349 group update kit will include 180 days of free telephone support.

Senior Correspondent Gary H. Anthes contributed to this report.

Inside the Macintosh

System 7.0 highlights:

- **Truetype** — an alternative to Adobe Systems, Inc. Postscript.
- **Virtual memory** — allows users to create RAM using free space on their hard disk.
- **Multitasking.**
- **32-bit addressing.**
- **Aliasing** — creates duplicate icons for any file, folder or volume, easing file management and tracking.
- **Help balloons** — simple explanations of commands, dialog box options and on-screen icons.

CW Chart: Doreen St. John

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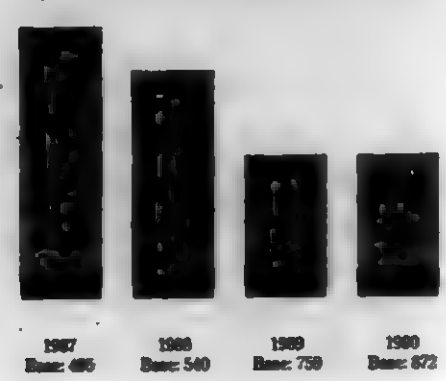
TRENDS

MANUFACTURING INFORMATION SYSTEMS

Manufacturing IS executives see a growing role for automation but admit that the technology implementation is relatively slow

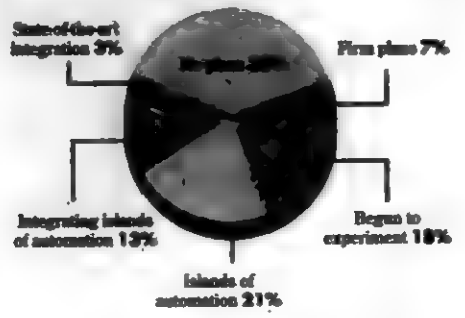
"Does technology yield benefits?"
Percent indicating significant benefits

Only 30% of U.S. manufacturers feel they're getting benefits from technology, compared with 63% claiming positive results in 1987



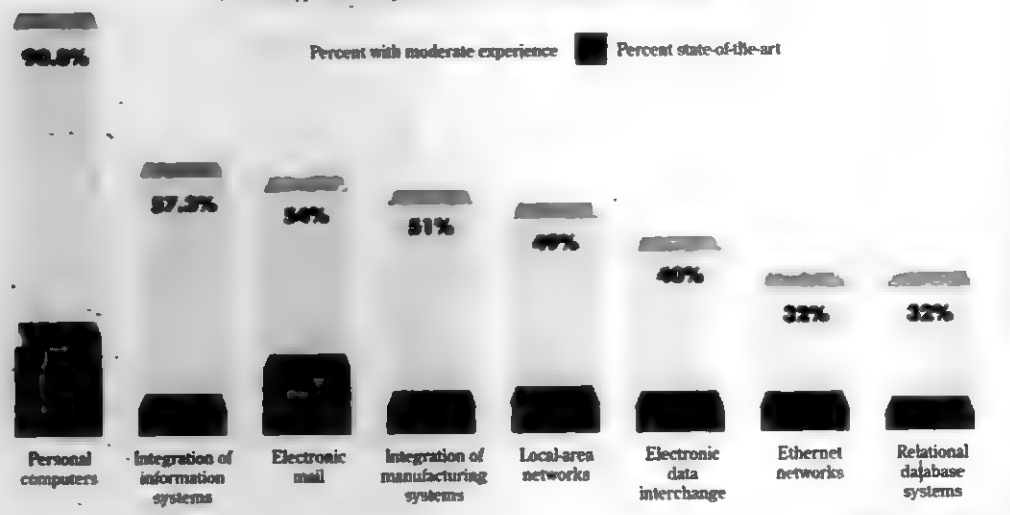
Status of adoption of computer-integrated manufacturing
Percent of respondents (Base: 872)

More than one-third of the manufacturers surveyed have no plans for computer-integrated manufacturing, but many agree they are well on their way



Information technologies in use
Percent of respondents (Base: 872)

Experience with technology has increased slightly since last year, particularly for PCs. However, few manufacturers have state-of-the-art capabilities



Source: Deloitte & Touche, Chicago

CW Chart: Tom Monahan

NEXT WEEK

Once high-flying Pan Am is now under Chapter 11 bankruptcy protection, and IS has felt the hit. Cutting costs, upholding employee morale, postponing projects — all this has accompanied a shift from strategic to tactical IS. Vice President of Information Services Robert O. Wagner shares these challenges and more in Manager's Journal. ▶



Jochen Stein

Next week, In Depth kicks off its roundtable series on how vertical industries are assessing the value of IS spending. Insurance industry IS chiefs reveal that while they can justify what has already been spent on technology, they find it difficult to gauge how much bang they will get from the next buck spent on new systems initiatives.

INSIDE LINES

Old hackers go to corporate heaven

▶ An ex-hacker reported last week that the Legion of Doom, perhaps the most notorious hacker group to have operated in this country, is now defunct. Our contact said the remaining two or three members have set up a security consulting practice to advise on how to protect against outlaw hackers.

It's in the mail!

▶ A *Computerworld* reporter found himself in the uncomfortable position last week of being the first to inform William Cook, an assistant U.S. attorney in Chicago, that Cook had been named in a civil lawsuit by the Electronic Frontier Foundation (EFF). Cook has spearheaded the government's campaign to rein in computer users suspected of illegal activity. When told that Cook had not been served papers in a timely manner as legal protocol mandates, members of the EFF said they had sent the documents to the wrong office.

Blue-light special

▶ IBM will announce a slew of price cuts and performance boosts tomorrow for its RISC System/6000 Unix-based workstation and server line, sources close to the company confirmed last week. Price reductions from 25% to 40% are expected across the product family, along with software upgrades that improve performance. No new models or hardware changes are in the cards yet, however.

For the people, by the people?

▶ Free-lance computer contractors — programmers hired to work on troubled computer projects — are not happy with the way Congress passed legislation eliminating the federal requirement for 150% overtime pay. The provision was attached to a bill dealing with the American Samoa tuna industry, with no hearings or testimony from the working class. Dennis D. Leonard of Brainerd, Minn., said in a letter to the U.S. Department of Labor: "I don't think a law of this magnitude should be passed as an amendment to a law concerning Samoan fishermen. How can you expect us to respect you, the government, when you pull stuff like this? What is next? A mandatory report date for installation of manacles and chains?"

IBM problems? Form a committee

▶ A group of third-party outsourcing vendors met last week at the Adapso conference in Miami and formed a committee to gather information on whether IBM's outsourcing practices amount to an arguable consent decree violation. Affiliated Computer Services Chairman Darwin Deason had previously charged such violations. The committee's report is due by the end of June; the final decision on whether to call in the federal authorities is expected by the end of July.

And they said it could never be done!

▶ IBM told *Computerworld* it will live up to its promise to protect customer investments in the IBM Type 2 cabling system by soon providing 100M bit/sec. data rates over Type 2's shielded twisted-pair medium. IBM said it will deliver those data rates — specified in the FDDI standard, which uses glass fiber as a medium — over Type 2 shielded copper during the same time frame that it rolls out its FDDI products. In September 1990, IBM said its multiprotocol 3172 controller would have an FDDI adapter by December 1991 and its deadline for a RISC System/6000 FDDI adapter is February 1992.

Just the facts, please

▶ International Data Corp. (IDC) estimated that Next has sold 15,000 machines since its inception, not 4,000 as was reported here last week. The latter figure referred to IDC's estimate of Next's first-quarter shipments.

Know any leading-edge open systems users? If so, an award selection committee sponsored by the Unix Expo trade show wants to know who they are. The award, to be given out at the show in late October, will be presented annually to the organization "that best exemplifies, illustrates or advances the cause of open systems." News Editor Pete Bartolik is among those collecting nominations, so contact him at (800) 343-6474, fax a summary to (508) 875-8931, or drop a line on Compuserve at 76537,2413.

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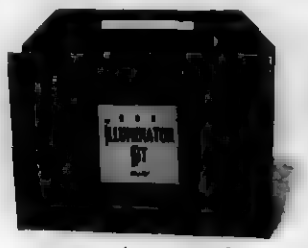
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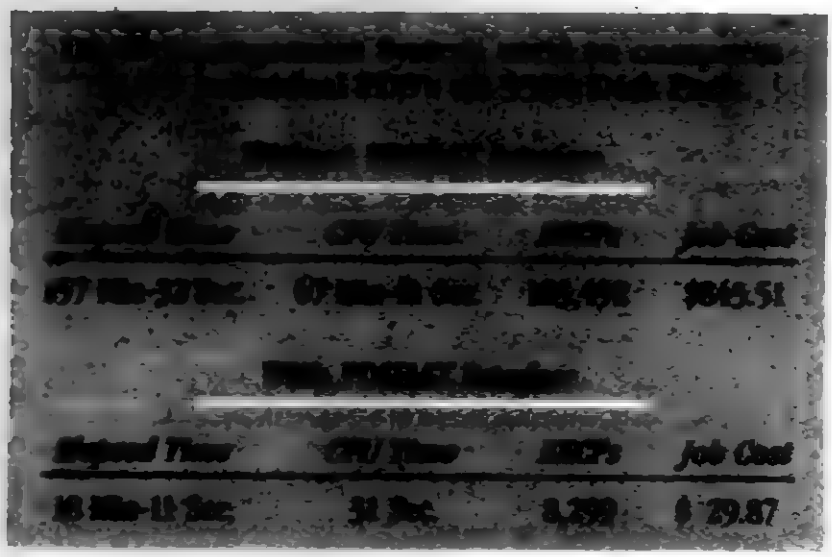
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COMPUTERWORLD

Industry shifts erode customer dependence

IBM SOFTWARE GIANT IN TRANSITION

Part 1 of a three-part series researched and written by Computerworld's Rosemary Hamilton, Johanna Ambrosio, Patricia Keefe and Kim S. Nash

IBM raked in nearly $10 billion in worldwide software sales last year. That means its software business alone was nearly as big as the second largest U.S. computer maker and six times the size of the largest independent software vendor.

Yet IBM's recent performance in the software business has been a mixed bag, and its future holds both promise and uncertainty.

The company that was once the compelling force in software is now trying to redefine its role in an information systems world in which customer requirements have become too complex and computing platforms too numerous for one company to reign supreme any longer.

"Five or six years ago, when [IBM] did something or said they were going to, it froze a lot of people. Not anymore," said Roger Bast, director of MIS at Air Products and Chemicals, Inc.'s gases group in Allentown, Pa. "IBM's an important supplier, but they don't call the shots."

Since the mid-1980s, IBM has been refocusing and diversifying its software business to adjust to these changes. It has had high-profile successes and mistakes. For example, it rules

Continued on page 8

Massive merger task begins

Users expecting AT&T to buy into strategic directions set by NCR

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — AT&T placed a $7.4 billion bet last week that NCR Corp. will erase AT&T's years of frustration in the computer market — along with an estimated $2 billion in losses over six years.

AT&T is gambling that a transition team of top executives from both sides will make this merger different from those that preceded it (notably the union of Burroughs Corp. and Sperry Corp. into Unisys Corp. and Hewlett-Packard Co.'s swallowing of Apollo Computer, Inc.), which have met with more misfortune than success.

"It's going to take a major effort to make this one work," said Robert Kidd, an analyst at Dataquest, Inc. "If it does work, they will represent a considerable competitor [in the marketplace]." The companies would proceed as rapidly as possible to consolidate AT&T's computer operations into NCR in advance of the legal consummation of the merger, which could take several months, NCR Chairman Charles E. Exley Jr. said in a statement Friday.

Users of both companies' computers reacted to the merger with little concern, perhaps because they have had nearly six

Continued on page 112

At a glance

AT&T
1990 revenue: $37.3B
1990 profits: $2.7B
Employees: 273,000

AT&T computer operations
1990 revenue: $2B*
Employees: 8,200
*Estimated by Northern Business Info/Datapro. Loss figures not available

NCR
1990 revenue: $6.29B
1990 profits: $369M
Employees: 55,000

CW Chart: Tom Mu...

Global goals of technological convergence hinge on unproven 'open vision' and critical mass

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

What AT&T Chairman Robert E. Allen wants is a global, enterprisewide company that is equally adept at computing and telecommunications. What he has is a company that has yet to realize its ambitions, let alone his vision of the future.

Conventional wisdom holds that Allen's acquisitiveness hinged on NCR Corp.'s Open, Cooperative Computing Architecture strategy, based on open systems and standards. That is hogwash, one analyst said.

"This isn't about technology; it's about critical mass, scope and scale, internationalization — that's what [AT&T's] getting," said Robert Kidd, an analyst at market research firm Dataquest, Inc. in San Jose, Calif.

That point was affirmed by Bill O'Shea, AT&T Computer Systems Division's vice president of systems development and marketing. "We desire to become a more global company; we see a tremendous need for data networking and a convergence of the technology foundation for computing and communications," he said.

In London, Robert Baird, vice chairman of the NCR Users Association, said the merger should work "very well as long as AT&T does not try to turn NCR into the AT&T computer division."

Claiming that AT&T's Computer Systems Division had been on the right track, O'Shea indicated the problem was that it was just not large enough to

Continued on page 113

Pan Am's IS chief opts for land route

BY RICHARD PASTORE
CW STAFF



Jochen Stein

Wagner leaves *Pan Am to join Consolidated Rail*

NEW YORK — Robert O. Wagner recently said his toughest job has been motivating his information systems employees to stick with Pan American World Airways through the trials of Chapter 11 bankruptcy protection. But the temptation to leave proved to be too strong for Wagner. Last week, it was announced that he will leave his post as vice president of IS and move to Consolidated Rail Corp.

Wagner, 54, will start June 1 as vice president of IS at the Philadelphia-based rail freight company. There he will report to David Levan, who oversees corporate strategies, administrative

Continued on page 111

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FCC opens local access doors

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The Federal Communications Commission struck a blow against the last bastion of monopoly power in the 100-year-old Bell telephone system last week. By a vote of 5-to-0, the FCC proposed allowing independent telephone companies to connect with the networks of local Bell companies through the local companies' central offices.

That will give users communications alternatives that are not now available on a cost-effective basis. For example, a firm will be able to send data from its headquarters to its branch offices over the fiber-optic network of one of the new private telephone companies, routing it through the local Bell company's central office. Currently, users have to pay for both the private fiber lines and the parallel traditional telephone lines.

"Competition [at the local level] is the best thing that could happen to us," said Augie Biegen, executive director of the Association of Data Communications Users, Inc. "I can't see anything that is not positive in this."

The idea, while endorsed by business users who said increased competition will lead to lower prices, better service and greater innovation, was opposed by the Bell companies. "The

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Executive Report — Data center efficiency: Improve it or lose it. Page 71.

Businessland losses expected to be severe, clouding the future viability of the once high-flying PC retail chain. Page 111.

In their own words: Gates and McNealy detail their respective definitions of what really makes up 'open systems.' Page 21.

Tandy grabs for multimedia brass ring with jazzed-up PC line featuring CD-ROM and stereo sound. Page 6.

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NEWS

4 The growing rivalry among supercomputer makers heated up last week with the announcement of a new **Convex Computer** line that will compete head-on with **Cray Research.**

6 **Lotus** has introduced a new low-end member of its 1-2-3 spreadsheet family, but the sibling may be overshadowed by the forthcoming 1-2-3 for Windows.

7 **DEC** takes another stab at the high-end PC market in an attempt to stem the tide of DEC users crossing over to **IBM** for their PCs.

10 For the first time, a suit filed by the **Software Publishers Association** has been dropped for lack of merit.

14 IS managers responsible for keeping their shops secure will now have extra help: **National Security Association** will officially kick off an on-line service dedicated solely to computer security.

111 A reported 120 research employees at **Wang** received pink slips last week; the company says the cutbacks are part of an ongoing plan to improve the company's bottom line.

112 Will the **AT&T/NCR** merger be good or bad for the companies' users? Most observers aren't worried — provided AT&T doesn't mess with NCR's successful product lines.

Quotable

"At some point, we'll all have a computer on our desk and a phone in our shoe, but who will pay for it?"

SHERRIE P. MARSHALL
FCC

On the future of telecommunications. See story page 55.

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25 Clouds of doubt settle over the once-reliable **Specmarks**, the benchmark that measures CPU speed on workstations.

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37 Recent price cuts haven't made much of a dent for **Compaq** computer users: Only small savings are trickling down to customers.

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The 5th Wave



"WE'RE USING A FOUR-TIERED SYSTEM—PC TO MINI TO MR. SMOOTHY TO MAINFRAME."

EXECUTIVE BRIEFING

■ **IBM is no longer the only software game in town,** and the industry leader is struggling with the transition from being the dominant player in the computer industry to becoming one of many. Although some segments such as DB2 have been hugely successful, more recent directions, including Officevision and AD/Cycle, have had mixed market and technical results. IBM says its software business is meeting growth goals, but customers say they are increasingly basing software decisions on product quality rather than account control. The first of a three-part *Computerworld* series. **Pages 1 and 8.**

■ **Pan Am's top IS executive departs** to hop on board at Conrail. Robert O. Wagner, vice president of information services, follows the lead of many other IS employees who have left Pan Am since its filing for Chapter 11 bankruptcy protection. Wagner will likely be replaced by an internal candidate. **Page 1.**

■ **The Software Publishers Association** withdraws a piracy lawsuit for the first time. Employees at Snap-on Tools convinced the SPA that they had valid ownership of software from Lotus, Ashton-Tate, Wordperfect and Microsoft. **Page 10.**

■ **AT&T and NCR users say the $7.4 billion merger can work** — if AT&T leaves well enough alone. Although AT&T says it will preserve NCR's recently announced product strategy, some users still want more information about how the combination will fit. **Pages 1, 112, 113.**

■ **The threat of outsourcing is forcing many data centers** to adopt performance-boosting tactics including consolidation, automation, facilities sharing and relocation. **Page 71.**

■ **Wang reportedly lays off 120 more employees,** although the company refuses to confirm the figure. Meanwhile, the next installment of Wang's Office 2000 strategy has been delayed until next month. **Page 111.**

■ **IBM slashes prices on the RS/6000,** but the real cost difference to customers may be minimal. One analyst calls the cuts little more than "IBM going public with its discount schedule." **Page 4.**

■ **DEC users can expect a tenfold price/performance increase in VAX/VMS products by 1993,** a DEC vice president tells Decus members. **Page 14.**

■ **Office ergonomic issues are increasingly important to IS managers.** But the sudden awareness is spawning a marketplace of instant ergonomic "experts" and products. Managers should be wary. **Page 63.**

■ **Insurance IS chiefs are under pressure to assess the business value of technology,** but no one ultimate measure exists. Instead, they've had to mix and match business measures with IS gauges. **Page 81.**

■ **IS career opportunities in retail aren't sizzling,** but there are a few bright spots at mail-order firms, retail suppliers and prescription drug companies. **Page 97.**

■ **Users trying to dispose of an older minicomputer** or midrange machine may be surprised by the degree of effort involved and disappointed by the prices they receive. **Page 104.**

■ **On-site this week:** The tie that binds scattered DEC VAXs at Chaparral Steel in Midlothian, Texas, is Suitetalk, a message bus for client/server computing from Suite Software. **Page 29.** A Bull DPS 6 Plus minicomputer speeds processing of vocational rehabilitation services needs at Kentucky's Department of Vocational Rehabilitation in Frankfort. **Page 29.**

"Have You Heard What They Did With CA-DATACOM?"

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COMPUTER ASSOCIATES

IBM slashes RS/6000 prices

BY PATRICIA KEEFE
CW STAFF

Touting its commitment to provide more bang for the buck, a nimble IBM beefed up its RISC System/6000 line last week with new compilers and added memory while cutting prices on most models. Cost savings range from $830 to $52,140.

However, users may reap few benefits from the seemingly impressive price cuts, which one analyst claimed are nothing more than IBM going public with its discount schedule.

David Card, an analyst at International Data Corp. in Framingham, Mass., said that while IBM will continue to offer discounts to its customers, they will probably not be as significant as they were before the cuts.

Users will also have to wait until mid-September for a previously promised low-end workstation, according to analysts.

Analysts praised IBM for its quick response to the March release of Hewlett-Packard Co.'s HP 730. As a result, IBM's prices are right in line with HP's, Card said.

IBM had to respond in some way to HP, which Card and other analysts said is the current price/performance leader in reduced instruction set computing (RISC) workstations. Card said the players in the RISC workstation market are constantly changing the rules — that is, resetting the pricing parameters.

However, Card noted that in 1990, IBM managed to move only 250 of the big rack-mounted System 900 family; conversely, the System 550 was much more successful.

IBM also increased the amount of standard memory and disk storage capacity on selected models and slashed prices on the RS/6000 entry-level three-dimensional color graphic adapters. The 8-bit adapter was $4,160; it now costs $2,320. The 24-bit card was $10,400; it now costs $4,520.

However, the bottom line for users, who were already benefiting from deep discounting by IBM, should prove to be either a wash or negligible, claimed Nili Young, a vice president at Meta Group, Inc. in Stamford, Conn. She challenged a statement by Jeff Mason, IBM's advanced workstation and AIX systems director, who said the announcement will enable customers to run their applications "faster and more cost-effectively."

Young claimed that all IBM really did was translate into public prices what it was already offering users privately. Those discounts are said to have ranged from 30% to 60%. Formalizing the process means lower discounts from IBM; hence, users can expect to pay the same prices or a shade less, she claimed.

The Model 950 received the heaviest price cut. It has yet to ship, but users made it clear to IBM after its announcement that it had been mispriced, Young said.

The performance increase is attributed to a new Fortran compiler, which includes a new release of AIX XL Fortran Run Time Environment/6000.

Senior Writer Maryfran Johnson contributed to this report.

Change at the top

The high end of the IBM RISC/System 6000 family was most affected by the significant price cuts

System	Old base price	Old memory range (bytes)	New base price	New memory range (bytes)
[illegible]	$51,780	[illegible]	[illegible]	[illegible]
930	$22,330	8M-256M	$21,990	16M-256M
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
580	$130,000	64M-896M	$92,500	64M-896M
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
930	$61,910	16M-672M	$59,500	32M-672M
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Source: IBM

CW Chart: Doreen St. John

Convex targets low end of Cray supercomputer line

BY J. A. SAVAGE
CW STAFF

RICHARDSON, Texas — The rivalry in the supercomputer arena was jacked up a notch last week when Convex Computer Corp. announced a system family aimed at the lower portion of Cray Research, Inc.'s processor line.

Convex introduced the C3 series, ranging from 44 sustained million floating-point operations per second (MFLOPS) Linpack performance to 111 MFLOPS per CPU.

The high end of the family, the C3800s, are most closely targeted at Cray. Intensified competition with Cray combined with recessionary cutbacks on high-end buying are likely to mean good deals for supercomputer consumers in the next six months, said analyst Gary Smaby, president of Smaby Group, Inc. in Minneapolis. "Both Cray and Convex could get bloodied, and buyers are going to benefit," he said.

The C3800s begin at $2 million and depend fully on gallium arsenide for speed. They can be configured with up to eight processors.

Analysts agreed that the midrange systems, the C3400s, which sustain 34 MFLOPS in a single-processor configuration, are likely to be the most popular. Starting at $650,000, the C3400 also includes gallium arsenide technology in its processors.

At the low end, the C3200s, which Smaby said are positioned as huge workstation servers, start at $350,000. The C3200 is a streamlined model of the company's current C2 system, said Frank Marshall, vice president of engineering at Convex.

Scheduled delivery dates are staggered throughout the year. The C3200s are available now, the C3400s are scheduled to ship in the third quarter and the C3800s are expected to have limited availability by year's end.

"The announcement protects Convex's position as middleweight champion," said George Lindamood, director of high-performance computing at Gartner Group, Inc. in Stamford, Conn. He added that the midrange systems could even attract new supercomputer users.

New frontiers

Convex Computer Corp.'s C3 series not only builds on the earlier C2 architecture with the C3200 but also expands into the worlds of gallium arsenide and RISC

Model	CPUs	Maximum memory	[illegible]	Base price
C3200	1–4	2G bytes	[illegible]	$350K
C3400	1–8 (RISC)	2G bytes	800 MFLOPS	$650K
C3800	1–8 (gallium arsenide)	4G bytes	[illegible]	$2M

Source: Convex Computer Corp.

CW Chart: Tom Monahan

FCC

FROM PAGE 1

most important point is that this will bring end users some choices," said FCC Commissioner Andrew C. Barrett.

Industry watchers compared the FCC's proposed action with court rulings in the late 1970s that allowed MCI Communications Corp. and others to connect to the public network in order to offer long-distance services in competition with AT&T. That resulted in new services and sharply reduced costs.

Local-access charges total $25 billion, with only about $100 million now going to alternate providers such as Metropolitan Fiber Systems, Inc. (MFS), which brought the local-access petition to the FCC 18 months ago.

MFS provides fiber-optic communications services in 11 cities in competition with local telephone companies. Access to the local networks will enable MFS to serve midsize and small businesses that cannot now afford direct dedicated links to MFS facilities. These users will now be able to tie into an MFS fiber-optic net via existing local telephone lines.

Royce Holland, president of MFS, said the company has invested more than $100 million in a plant and equipment.

Without the connections to the local telephone companies, 10 to 20 major markets can be economically served by the alternate fiber-optic carriers. With it, the market will expand to 50 to 75 metropolitan areas, he said.

Holland said co-location of MFS equipment at telephone companies' central offices can also offer users a backup.

He added that MFS will seek reciprocal arrangements with the Bell companies so traffic can be switched from one network to another in the event of a network outage.

Implementation details for the FCC proposal will be worked out after a period of additional public comment. A final order could be issued in eight to 12 months.

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NEWS SHORTS

And the winners are . . .

The Fourth Awards for Achievement in Managing Information Technology were handed out last week in New York. The five winners are David M. Carlson, senior vice president for corporate information systems at K Mart Corp.; Richard A. Dotzwiller, vice president and professor of psychology at Drew University; John F. Maraztone, chief of the Reconfiguration Management Division of the National Aeronautics and Space Administration's Johnson Space Center; John W. Turbo, vice president and director of management IS at Kennametal, Inc.; and C. Diana Whitehead, executive director of marketing support at Pacific Bell. The awards are sponsored by American Management Systems, Inc. and Carnegie Mellon University.

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Prime adds to minicomputer line

Prime Computer, Inc. expanded its proprietary line of mid-range 5000 series systems last week with the announcement of the 5270. The system incorporates a dual CPU design on a single board and employs CMOS technology. Available immediately, the standard 5370 configuration is priced at $226,000.

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IBM center to service Kodak

IBM opened a 180,000-sq-ft data center last week in Rochester, N.Y., to help manage Eastman Kodak Co.'s IS operation under a 1989 outsourcing agreement. About 300 employees will staff the facility, which will help IBM consolidate operations now performed at three Kodak sites.

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Jessel named IS chief at EMI

EMI Music in New York has named former McKinsey & Co. IS consultant Peter G. Jessel to fill its vacant position of senior vice president of information technology. The post had been open since the resignation of R. Anne Payne [CW, Feb. 4]. Jessel had been an industry consultant for the information technology/systems practice at McKinsey for five years.

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Micrografx upgrades Designer

Micrografx, Inc. shipped the 3.1 upgrade to its popular Microsoft Corp. Windows-based Designer illustration package last week. An IBM Presentation Manager version of the product will be available by the fourth quarter, the company said. Registered users of Designer 3.0 and up can upgrade for $49.95; all other Designer users can upgrade for $99.95. New features include file compatibility with more than 30 other file formats. Also built in are two new special effects — text along a path and object blending — as well as a Windows-based installation program and network file locking.

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DEC, Hyperdesk team up

Hyperdesk Corp. and Digital Equipment Corp. last week announced their joint development of a distributed computing technology that the companies are proposing as an industry standard for software developers. DEC and Hyperdesk will merge their definitions of a central communications and integration manager — called Object Request Broker (ORB) — that ties together various types of software objects across diverse platforms. The ORB manager is the first of several standards being defined by the Object Management Group.

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Lotus seeks ruling in Borland case

Lotus Development Corp. asked a federal judge in Boston last week to forget about a trial and award it a win with a summary judgment ruling in its copyright infringement suit against Borland International, Inc. The two sides are scheduled to appear in court in June to work out a trial date. However, Lotus jumped the gun in its request for a summary judgment by saying that there are no factual differences to be settled in a trial. Lotus claimed there is no doubt that Lotus' 1-2-3 was copyrightable and that Borland copied elements of that program. Borland continues to deny this.

More news shorts on page 111

Multimedia PCs make appearance

BY JAMES DALY
CW STAFF

The industry's slow crawl toward multimedia enjoyed a microburst of momentum last week when hardware manufacturers Tandy Corp. and Compaq Corp. unveiled new offerings and Sun Microsystems, Inc. sketched out future multimedia-based product directions.



Analysts, however, noted that the link between multimedia — the blending of audio, video and animation into traditional data presentations — and the needs of the average computer user remain elusive and could represent a serious marketing challenge.

The five-member Tandy offering is the equivalent of the firm's current line of business computers with Microsoft Corp.'s Multimedia Extensions for Windows preinstalled. The machines include a compact disc/read-only memory drive and are priced from $2,599 to $5,499 — approximately $250 to $800 more than similarly configured nonmultimedia Tandy personal computers. The new units are scheduled to be in all 7,000 Radio Shack stores by summer, officials at the Fort Worth, Texas-based firm said.

While the Radio Shack connection represents a significant distribution advantage, analysts said the price of the new models could result in slow sales.

"Tandy has a good feel for the home market, but these machines are still too pricey for most consumers, who right now have little need for what multimedia offers," said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif.

Austin, Texas-based Compaq took the multimedia plunge with the announcement of an Intel Corp. 80386SX-based PC that provides photolike images, stereo sound, television, AM/FM and CD capabilities.

Available soon

The Compaq setup sells for $2,995, and a multimedia upgrade kit will cost $895. Both are scheduled to ship to developers this week and will be generally available in July.

While Tandy and Compaq were demonstrating what they could do today, Sun officials looked to the future and plotted out its first strides into multimedia territory. Wayne Rosing, vice president of advanced technology, demonstrated a Sparcstation-based multimedia setup last week at Demo '91 in Palm Springs, Calif.

The hookup simulated a live video conference connecting two Sparcstations over an Ethernet network.

The arrangement also included a prototype of a modified Sun S-bus wired with Intel I750 chips to carry the video feed.

1-2-3 users split on 2.3 upgrade, Windows version

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. jazzed up the low end of its spreadsheet family last week with the debut of 1-2-3 Release 2.3. But by now, user interest may have shifted to the Release 3 generation, particularly the forthcoming Windows version.

Lotus accounts said users of Release 2.2, the predecessor to 2.3, tend to fall into two groups: those who refused to purchase 1-2-3 3.0 after it finally shipped and are now waiting for 1-2-3/Windows and those who are tied to Intel Corp. 80286-based computers. At minimum, the latter group is expected to upgrade.

Leapfrog to 3.1

At Lehman Brothers, Inc. in New York, the decision was made a while ago to leap from 1-2-3 Release 2.01 to 3.1. "We are much more interested in the Windows version than in 2.3," said Jude Gartland, senior vice president of investment banking. He said many current Release 2.2 users are probably using 8088- or 80286-based machines that lack the memory needed to run later versions of 1-2-3, such as Release 3.0.

"If they are not about to buy 386s, or they have no interest in Windows, then they will probably be very interested in 2.3," Gartland said. Most user surveys indicate interest in Windows and 386 personal computers.

Sheldon Laube, director of technology at Price Waterhouse, is another Release 2.2 (and 3.0) user. He, too, has long since made a decision to move to the Version 3 family. "We just want to make one more jump, to a Windows spreadsheet. It's just not worth all this fiddling around [with other releases]," he said.

But for those content with the tried-and-true Release 2 generation, their annual upgrade fix comes with improved graphical and analytical features.

Priced at $495, 1-2-3 Release 2.3 includes interactive what-you-see-is-what-you-get display and presentation-quality output capabilities, spreadsheet auditing tools, a file-finding feature and other ease-of-use improvements such as interactive dialog boxes, "vastly improved" Help facilities and improved error-handling, Lotus said.

Also unwrapped was 1-2-3 for DOS Release 3.1+. It includes the Viewer and Auditor capabilities introduced in Release 2.3 as well as the Solver technology first introduced in 1-2-3/G for OS/2. Currently in beta testing, 3.1+ is expected to ship within 60 days.

Four versions of 1-2-3

Lotus now has four key versions of 1-2-3 on the market: 2.2, 2.3, 3.0 and 3.1 — a release that is Windows 3.0-compatible only. A fifth version, 1-2-3 for Windows, was designed to take advantage of Windows 3.0. It is now in beta testing, and industry observers expect a June ship date.

The aging Release 2.2 remains a best-seller, according to users and software resellers. It tops the sales list at Corporate Software, Inc. in Canton, Mass., a spokeswoman said.

An Englewood, Calif.-based Meriael spokeswoman said 1-2-3 Release 2.2 has consistently placed third or fourth on the firm's hot list since December.

CORRECTIONS

Because of an editing error, we reported that the estimated cost of the National Weather Service's new Advanced Weather Interactive Processing System (AWIPS) was $3 billion [CW, April 1]. That is the cost for the entire Weather Service modernization, including three major components, in addition to AWIPS.

. . . . . .

TPL Tables, a personal computer-based cross tabulation and table production software package, was incorrectly referred to as TP Tables in a new product announcement [CW, April 15]. TPL Tables is a product of Arlington, Va.-based QQQ Software, Inc.

. . . . . .

The article "IS adjusts as portables fly the coop" [CW, April 22] incorrectly said Hyundai Motor America's information systems department is not in charge of laptop management. It does in fact have this responsibility.

DEC to take PC high road

BY PATRICIA KEEFE
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. will take another stab tomorrow at the high end of the personal computer market, focusing on direct sales to its installed customer base.

The latest foray, which comes on the heels of some resounding failures in this market, will serve DEC in two ways, analysts said: It will stem the tide of DEC accounts crossing over to purchase PCs from IBM, and it will get DEC on the PC bid lists. DEC is planning to unwrap a family of PCs tomorrow.

DEC is expected to position its systems as a natural extension of its VAX and terminal businesses. DEC is "trying to make the affinity to the VAX look more desirable," said Nili Young, a vice president and analyst at Meta Group, Inc.

Analysts were agog over DEC's plans to be extremely price-competitive. Several said it will be difficult for DEC to make money on the actual PCs. However, the PCs are expected to provide incentive for more add-on sales related to DEC's monitor, network software and VAX equipment. For example, some of the boxes will come equipped with Ethernet cards but not DEC's Pathway network software — hence the extra sales.

"DEC is in the terminal business; why shouldn't they be in the diskless workstation business? It's perfectly logical," said Frank Dzubeck, a consultant at Washington, D.C.-based Communications Network Architects, Inc..

Hampton, N.H.-based Workgroup Technologies, Inc. said the new machines will come from multiple sources. The models are said to include the following:

- An Intel Corp. I486DX-based box. Priced at approximately $6,000, it also features 26.2 million instructions per second, a turbo cache, Ethernet and SCSI 2 (possibly on a single board); 8M bytes of memory (expandible to 64M bytes); a Texas Instruments, Inc. graphics processor; 178K vector per second graphics performance; and 2M bytes of graphics memory.
- A Tandy Corp.-sourced 486DL. Priced in the vicinity of $11,500, it will run at 33 MHz and have six Extended Industry Standard Architecture slots, 10 5¼-in. drive bays, 4M bytes of memory and a 1G-byte disk.
- Two Ing. C. Olivetti & Co.-based portables. One is a 6-pound notebook priced at $4,850 that is based on a 386SX 25-MHz chip. (Intel has not announced a 386SX with that speed rating, but Advanced Micro Devices, Inc. has said it will deliver a 25-MHz clone chip.) It has 2M bytes of memory, a 60M-byte disk, an internal modem and a 9-in. display. Also slated to debut is a heavier (about 11 pounds) luggable priced at roughly $6,460. It will feature a 386DX running at 33 MHz with 2M bytes of memory, a 60M-byte disk, a removable display and an 11-in. LCD Video Graphics Array support (32 gray scale). Pricing was unavailable.

Dzubeck and Young dismissed the view held by some analysts that DEC's offering represented the first collision of PC and workstation technology.

Court tosses Inslaw appeal

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A three-judge panel of the U.S. Court of Appeals threw out two lower court rulings last week that said the U.S. Department of Justice had stolen software from Inslaw, Inc. and had conspired to drive the firm out of business.

The Court of Appeals for the Washington, D.C., circuit did not consider the validity of the lower court findings but said the bankruptcy court that first upheld Inslaw's charges had exceeded its authority.

This is a serious setback for Inslaw, which said it has spent five years and $6 million in legal fees on the matter, but the company vowed to fight on. It may ask the full court to reconsider, it may appeal to the U.S. Supreme Court, or it may go to more specialized tribunals set up by the government to hear disputes over contracts, trade secrets and copyrights, Inslaw President William Hamilton said.

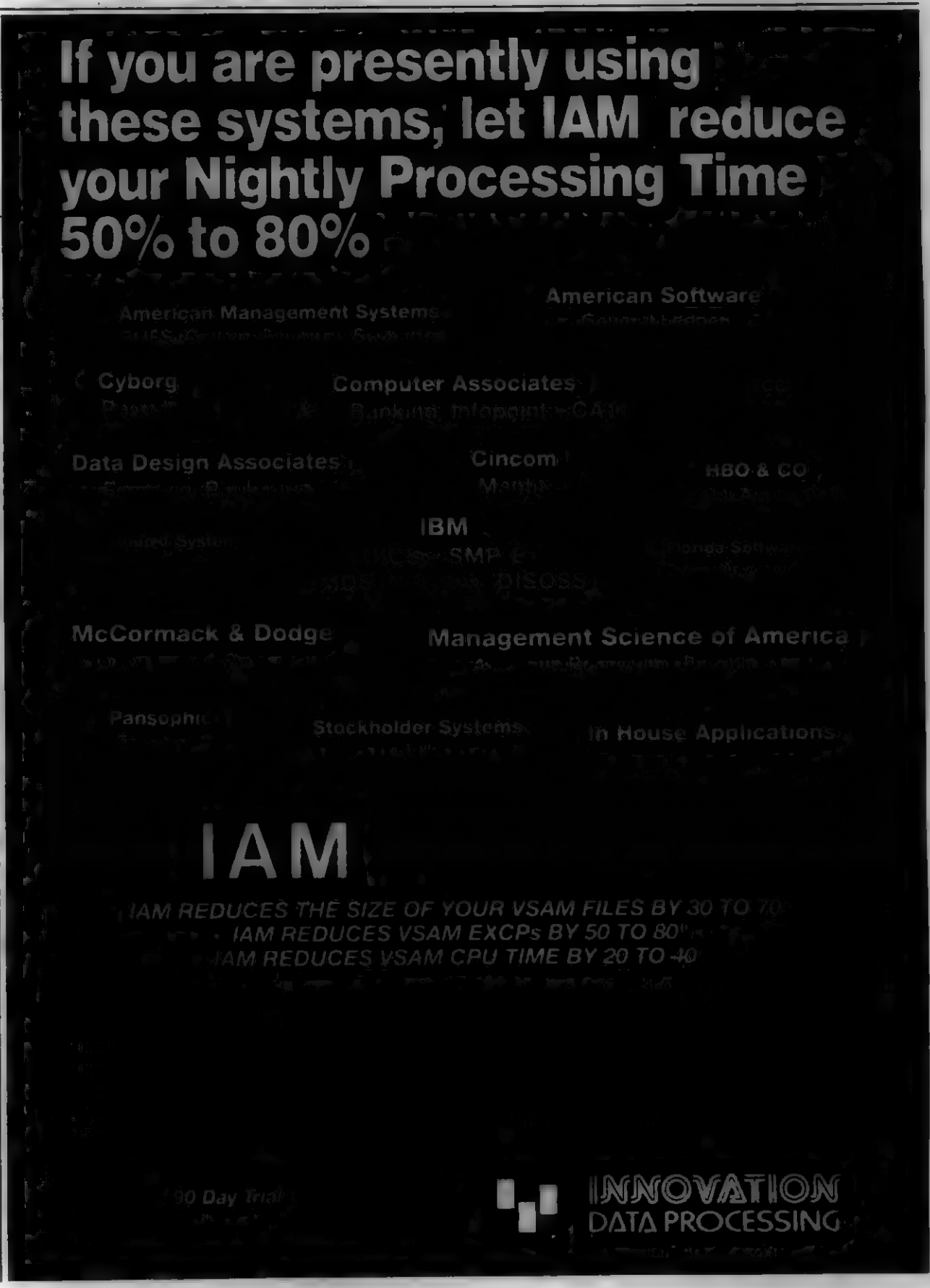
"Not many firms could have lasted this long, and now to have this happen is just unbelievable. But there's no way in hell we will put up with it," an obviously embittered Hamilton said. It may cost the tiny firm "millions more" to reach the next major legal milestone, he said.

Double trouble

Since the bankruptcy court trial in 1987, Inslaw has learned of additional alleged wrongdoings by the Justice Department.

"The new evidence indicates that the motive for the [software theft] was to put Inslaw's software in the hands of private-sector friends of the Reagan/Bush administration and then to award lucrative government contracts to those political supporters," Hamilton said.

He said other evidence suggests that the software was also illegally sold to foreign intelligence agencies [CW, April 1].



IBM

FROM PAGE 1

the mainframe relational database management system market with DB2, but it has struggled for more than one year to release a full-function version of its strategic Officevision. In total, IBM is simultaneously leader, follower and flounderer.

"I think their portion of the overall software pie is decreasing," said Michael Sitzenberg, a vice president of information systems at Manufacturers Hanover Trust Co. "Mainline software is staying stable, while many, many other disciplines are springing up that IS shops are spending dollars on. And in those areas, IBM is not as strong, and in some is just one of many."

Image shift

The general perception of IBM that is emerging among customers and observers goes beyond individual market results. IBM is now perceived as an influencer and no longer as the rule maker and dominant product provider it once was. While customers look to IBM to provide computing architectures and guidance, they want to make their own product decisions.

IBM executives agreed there has been a shift, but they said it is one of moving away from a product focus and zeroing in on the complex set of customer requirements. To IBM executives, the bigger job is to get systems to customers by providing core technologies and encouraging other suppliers to provide additional pieces, said Robert Libutti, director of market strategies at IBM's Programming Systems Division.

In addition, IBM hopes to provide whatever services are necessary to make these complex systems work. "The goal is to realize the capability that the customer needs and to do it quickly," said Richard Goldberg, IBM's assistant general manager of software marketing.

For IBM, the emerging role of influencer means that when it comes to future software revenue, there will be far fewer sure bets than there once were. Its influence assures it will continue as a significant factor, particularly in large systems markets, but does not guarantee that customers will put their software dollars in IBM's pockets.

IBM has a goal of achieving one-third of its revenues from software and services in this decade. A company spokesman said it is close to that goal now. Last year, worldwide software and services revenue accounted for 31% of total revenue, according to the IBM annual report. The company does not publicly state a separate goal for percentage of revenue from software. That revenue has been creeping up since 1986, when it accounted for 10.6% of revenue, to 14.4% last year.

Customer perceptions

Although IBM is on track, it faces an increasingly competitive market. Interviews with more than 50 users, analysts and third-party executives show that IBM now faces some of the following customer perceptions:

- Many large-system and mid-range customers look to IBM to provide an overall framework for corporatewide computing. While they want IBM to paint the big picture, they also want the flexibility to fill in the details with their own product choices.
- They continue to rely on IBM to provide core software pieces such as operating systems.
- Many count on IBM to provide the core subsystems, such as databases, as well. But what is more important to customers is for IBM to set the standards here, which does not always translate into revenue for IBM. Customers are willing to license a non-IBM product if it fits with IBM's scheme.
- Beyond databases, IBM typically becomes only one software supplier among many.
- With some exceptions, customers do not perceive IBM as an applications provider.
- On the desktop, IBM is respected for its ability to set operating system and network standards but not for its skill in programming any applications on its own. IBM has practically given up on the single-user applications market.
- Many customers give IBM credit for finally making the plunge into open systems. However, there is healthy skepticism about how committed IBM is.

Work hard for the money

In short, as IBM moves further away from its traditional base, it faces increasingly competitive pressures that will force it to work harder for each software dollar.

Even within the IBM core base, it is hardly a sure bet. While some large IS shops are closely wedded to IBM products and direction, others prefer to keep their distance.

For example, Chuck Myer, director of data resource development at Pacific Bell, has a close and strategic relationship with IBM and calls the company a "business partner."

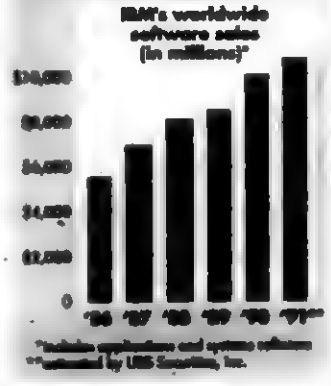
However, several other customers suggested IBM does not have all the answers.

"We look at what they say, look at their partners, and that helps guide us in the tools that we pick," said James Stuber, a vice president at Mellon Bank Corp. "But we wouldn't pick one just because IBM says it's the one. If I found a tool that was really good and it wasn't AD/Cycle, I would have no hesitation."

Next week: The highs and lows of IBM's software performance in the 1980s.

IBM has fattened its income with software sales ...

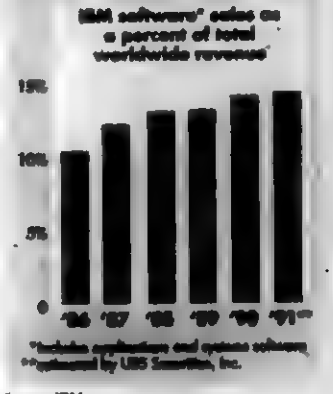
For the past five years, IBM's sales force has pushed software sales



Source: IBM

... and bulked up software as a portion of annual revenue

Although software is a growing part of total revenue, the rate of growth is leveling off



Source: IBM

IBM's slice of worldwide software sales

America's biggest computer company holds less of the software market now than it did five years ago



Source: Gartner Group, Inc.

Learning to listen

Asked to compare today's IBM with the company of earlier times, IS managers said one major difference is that IBM has finally learned to listen.

"I would say they can still do better, but we have to realize from where they came," said Richard Kolbe, director of MIS at Harley-Davidson, Inc. in Milwaukee. "They seem to be extremely receptive to discussing what we at Harley are doing instead of saying, 'Hi, we're IBM, and we have all your answers.' "



Since the late 1980s, IBM has set up user councils that give customers a chance to convey their requirements to IBM before a product is complete. Users also noted a change in their on-site relationships with IBM representatives.

However, these actions do not spring from kindness, and IBM is the first to admit it.

"Customers have the best vehicle to tell us what to do: their purses," said Richard Goldberg, an IBM assistant general manager in charge of software marketing. "When you go back to 1985, 1986, we began to look at the way customers wanted to spend their money, and we were obviously not listening to what they were saying. That's what got us refocused."

Dan Cavanagh, senior vice president of IS at Metropolitan Life Insurance Co., said that in the early 1980s, IBM made an effort to hear what users had to say, but "you felt like it wasn't serious, like they really weren't listening."

However, Cavanagh said, he remembers a turning point in IBM's approach in the late 1980s. Metropolitan Life had set up a meeting with IBM to discuss communications software. While these meetings were usually attended by IBM representatives, he explained, this time Ellen Hancock, an IBM vice president and general manager of communications systems, showed up.

"Something changed in terms of who was listening," Cavanagh said. "That was far different than just having a bunch of staff people."

Surveying a giant

IBM's huge size and mainframe roots are both its greatest strengths and its most frustrating weaknesses, according to IS managers who were interviewed recently.

On one hand, IBM's size gives users a sense of comfort. "After being with Cullinet [Software, Inc.] and seeing it die, it scares you to think of being tied to a smaller, independent vendor," said John Fisher, a software manager at Bergen Brunswig Corp.

At the same time, customers said IBM's software business is so big and bureaucratic that it often takes too long to ship products, and many products are too generalized in an attempt to meet many users' needs.

"They have a tendency to try to do everything for everybody," said Jack Cooper, chief information officer at Joseph E. Seagram & Sons, Inc. "They could use more focus."

IS managers said IBM's traditional business — mainframe operating systems and support of the large-systems environment — is still a significant strength. "When something doesn't work, they will darken the skies with support help to fix it," said Thomas Loome, head of IS at Alamo Rent A Car, Inc., of his mainframe environment.

Yet some users suggested this long-term focus on large systems has precluded IBM from doing well with applications.

"They tend to do a poor job with end-user products," said Terry Lowder, vice president of technology research at Banc One Services Corp. "That's why they are working more and more with business partners."

Doug Underhill, a vice president at CSX Technology, Inc., the IS arm of CSX Corp., said that while mainframe expertise is a plus, he also often feels that IBM staff members have not caught up with the faster pace and new dynamics of today's environment.

"There are a lot of people who are quite knowledgeable about the way it used to be," Underhill said.

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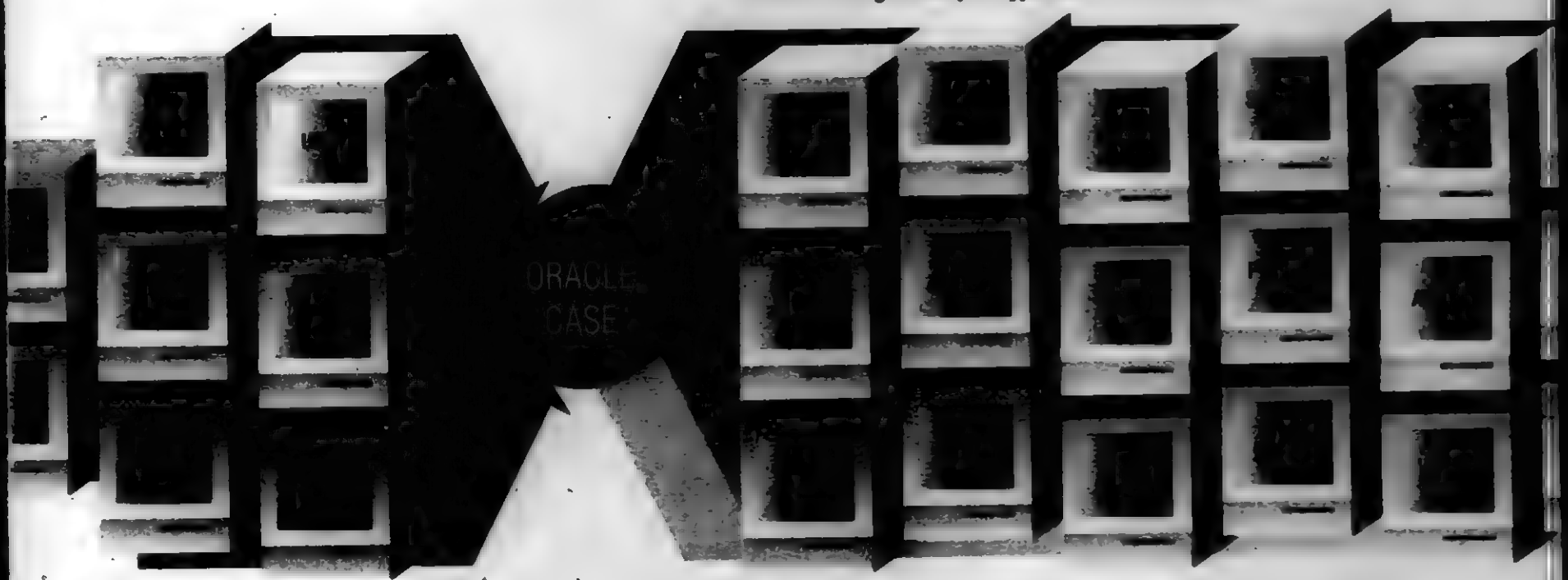
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SPA drops piracy suit against Snap-on Tools

Association dismisses charges after tool company proves ownership of software following raid

BY CHRISTOPHER LINDQUIST
CW STAFF

WASHINGTON, D.C. — The Software Publishers Association (SPA) announced last week that a software piracy suit filed against Snap-on Tools Corp. had been dropped for lack of merit — the first time a lawsuit brought by the SPA has been withdrawn.

The suit, which listed Ashton-Tate Corp., Lotus Development Corp., Wordperfect Corp. and Microsoft Corp. as plaintiffs, claimed that Snap-on had violated the copyright on several software products by illegally copying them.

The SPA had a signed affidavit from a former Snap-on employee that indicated Snap-on was in possession of pirated software, according to Ken Wasch, executive director of the SPA. The SPA then gathered more evidence from the software suppliers, including software registration forms. It subsequently obtained a search, seizure and impoundment order.

Following a March 20 raid on Snap-on's Kenosha, Wis., headquarters, the SPA audited all of the personal computers on the premises, Snap-on spokesman David Heide said.

The next step for the SPA was to throw the ball back into Snap-on's court, leaving the company to demonstrate ownership through manuals, invoices, disks and purchase orders, Heide said.

Snap-on employees spent "a couple of weeks" collecting the evidence needed to prove ownership of the software, he added.



> "IT COULD HAVE been truly embarrassing and disastrous for the company."
>
> DAVID HEIDE
> SNAP-ON TOOLS

When that evidence was presented to the SPA, the case was dropped. Despite the raid, Heide said, Snap-on did not hold any grudge against the SPA. "We're just glad it's over, and we can get back to work. It could have been truly embarrassing and disastrous for the company," he said.

Wasch said the SPA felt "no remorse" over the situation and said the finding that Snap-on was innocent showed that the judicial system was working properly.

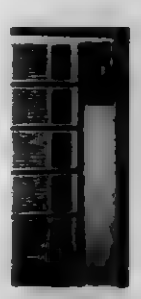
He also indicated that the dropped suit would have no impact on the SPA's future investigations into software piracy violations. "The prosecutor that wrongfully accuses somebody of burglary does not stop arresting people for burglary," he said.

In keeping with this, one day after announcing that the Snap-on suit had been dropped, the SPA reported it had concluded a suit against Parametrix, Inc., a Seattle-based environmental and engineering consulting firm. The settlement, under which Parametrix will pay $350,000 plus attorneys' fees, was the largest in SPA history, according to Wasch.

Joel B. Gilman, a Seattle attorney who specializes in computer law, said a company found innocent in an SPA suit could have some legal recourse for recovering lost revenue and the cost of staff time during the raid.

However, Heide indicated that Snap-on did not intend to seek reimbursement. "We're not going to try to recover expenses," he said. "Certainly, the information that [the SPA has] operated on up until now suggests that their track record is really pretty good. I think our feeling is, 'Let's just mark it up and get back to work.' "

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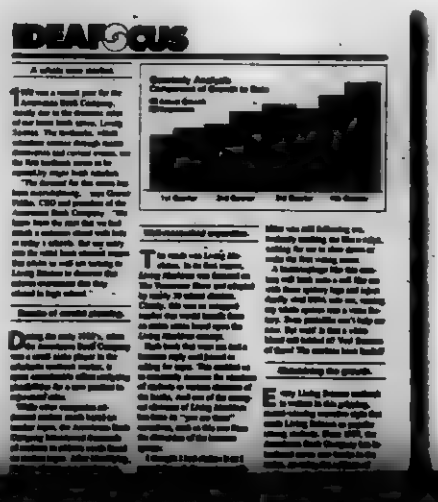
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VAX line set for complete overhaul, DEC says

BY MARYFRAN JOHNSON
CW STAFF

ATLANTA — Digital Equipment Corp. users can expect a tenfold increase in VAX/VMS price/performance by 1993, a senior DEC official told a user group convention here last week.

William Demmer, vice president of VAX systems and servers, said such enormous strides in cost efficiency and performance hinge on the VAX architecture's move onto a reduced instruction set computing-based CPU.

Software developers will have the so-called Alpha VAX next year, and customers can expect system deliveries the following year, Demmer said in the keynote speech at the DEC Users Society (Decus) convention.

In the meantime, DEC will unveil new models to replace every computer in the product line over the next year, he said.

While some users later expressed skepticism about such ambitious delivery schedules, many others said they found Demmer's message on the future of VAX/VMS reassuring. "I liked hearing that the driver is still VMS, with bridges into other software," said Richard N. Wolf, assistant systems manager at the Walter Reed Army Institute of Research in Washington, D.C.

"Opening" the proprietary VMS operating system through compliance with a variety of industry standards is another strategy users applauded.

"This open VMS certainly looks like a step in the right direction. It may mean their survival with shops like ours that are looking for more bang for the buck," said Donald Benthusen, VAX project manager at Sandia National Laboratories' computer center in Livermore, Calif.

"I'm a bit confused about what the increasing price/performance will mean to us," said Ronald Hoffman, manager of the academic computer center at Pennsylvania State University's Behrend College in Erie, Pa. "What kind of systems do I want to purchase now so they won't be obsolete in two years?"

Before his visit to Decus, Hoffman had settled on a VAX 4000 Model 200 as a server for his department's personal computer network. Now, he is reconsidering the decision, after discovering that the Q bus connecting peripherals to the machine will no longer be used by DEC on any future systems.

Other Decus discussions

Other hot issues at the convention, which drew more than 4,900 DEC customers to the Georgia World Congress Center, centered on finding better ways to manage networks of PCs and secure VAXs against intruding hackers.

Customers packed the seminars dealing with PC integration strategies and details on the latest version of DEC's Pathworks software, which many still call by its former name of Personal Computer Systems Architecture.

Du Pont Co. in Wilmington, Del., for example, is working with Pathworks as it prepares to connect 3,000 PC users, said Steven Seiler, a senior software engineer at Walldett-Burns Ltd. in Great Valley, Pa., a consulting firm working with Du Pont on the project.

"It's one thing to manage a network of 50 PCs, but what we need to find out is whether Pathworks is up to managing 3,000 of them," Seiler said.

Among the improvements in Version 4 of Pathworks, he noted, are interaction with Microsoft Corp.'s Windows and the ability to use the VAX server as a common area to store data from IBM Personal Computer compatibles and Apple Computer, Inc. Macintoshes.

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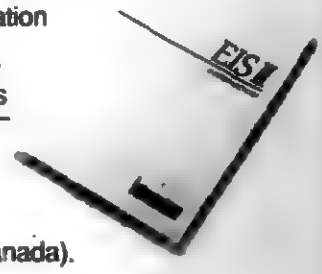
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Systems security tips go on-line

BY MICHAEL ALEXANDER
CW STAFF

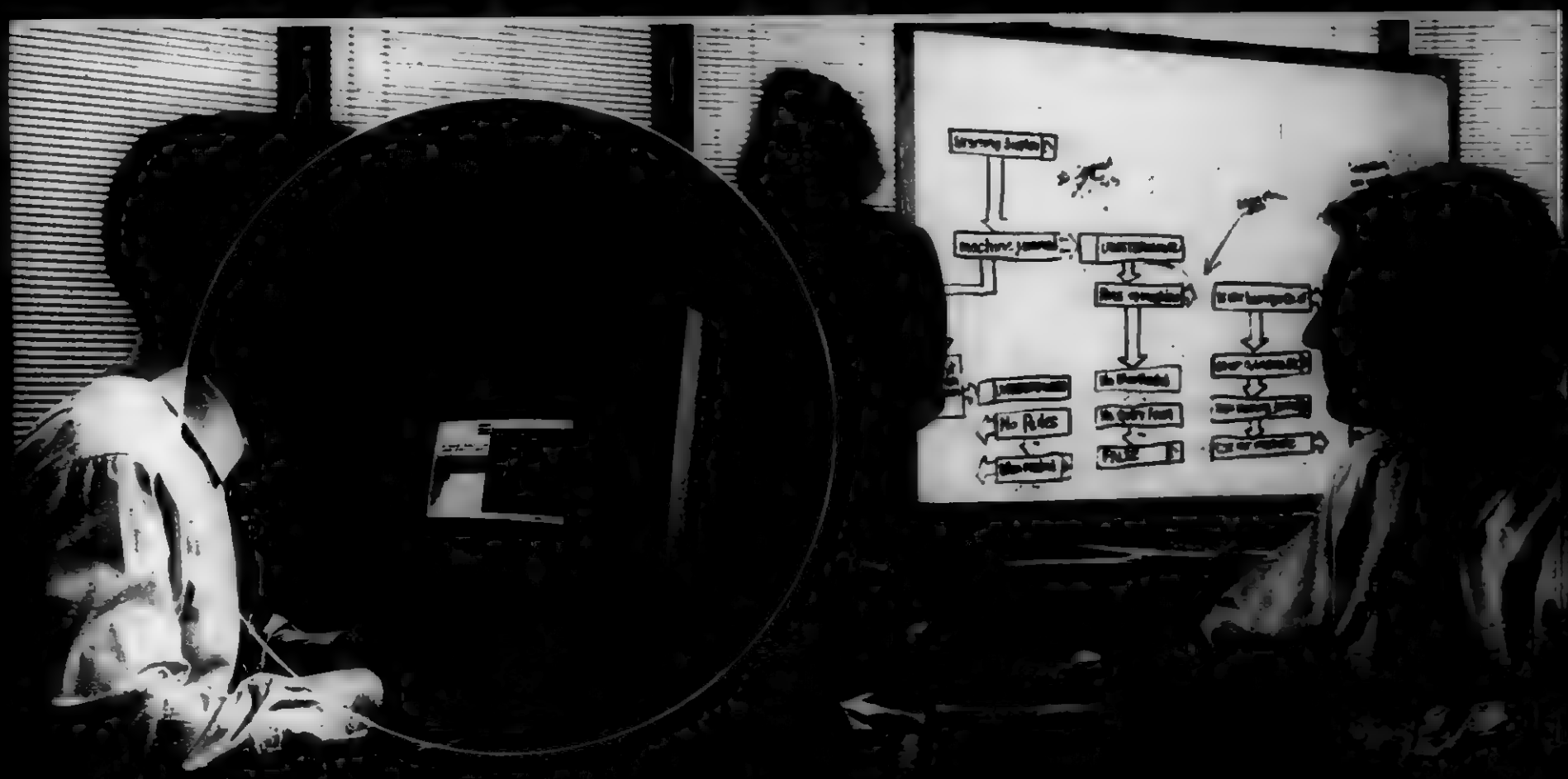
FAIRFAX, Va. — Information systems security managers, electronic data processing auditors and others involved in systems protection know that it can often be difficult to keep on top of security technology and fast-breaking news. This week, National Security Associates, Inc. will officially kick off an on-line service dedicated solely to computer security.

The repository contains databases of such items as articles on computer security that have appeared in 260 publications, computer security incident reports and vendor security products. One database is devoted to activity in the computer underground and to techniques used to compromise systems security.

"This is a tough industry to keep up with," said Dennis Flanders, a communications engineer with computer security responsibilities at Boeing Co. Flanders has been an alpha tester of National Security Associates' system for about six months. "Security information is now being done piecemeal, and you have to go to many sources for information. The appealing thing about this is [that] all of the information is in one place."

The service costs $12.50 per hour. There is a onetime sign-up charge of $30, which includes $15 worth of access time.

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Vendor heavyweights form support alliance with Novell

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — Network managers said they are skeptical but optimistic about a vendor support alliance announced last week by Novell, Inc. The alliance consists of industry heavyweights such as Microsoft Corp., Intel Corp., Apple Computer, Inc. and IBM.

Under what is being called the Technical Support Alliance, Novell and 11 other firms have said they will cross-train their support staffs, exchange information and equipment and consult directly with one another on problems [CW, May 6].

The object is to reduce vendor finger-pointing in network snafus by offering Novell resellers and customers holding direct-support contracts a single contact when tackling multivendor problems, said Darrell Miller, executive vice president of Novell's marketing and services.

The plan will work in reverse, too, Miller said. It will allow IBM customers, for example, to contact their account team to get answers about Novell Netware on IBM hardware.

"I think support on all levels has been an issue for a very long time," said Ted Kreutzer, systems administrator at Pacific Bell Directory in San Francisco. "To boost sales and get good public relations, [alliance members] have to do this."

"Alliances like these tend to go through a period of hoopla," said Steve Kissinger, information systems manager at Western Commercial Services in Mountain View, Calif. "But if customers continue to put pressure on [the alliance], I'm optimistic we'll see better service down the road."

"We [resellers and users] are going to have to make alliance members make it work," said Tom Thibault, a principal at Thibault Associates, Inc., a reseller in Walnut Creek, Calif. Thibault, who also leads a San Francisco-area Netware users' group, said an agreement such as this has been needed for years.

The alliance could work negatively, allowing members to make an end run around technology standards, Kissinger said. He said vendors could use the group's structure to come up with non-standards-based integration solutions.

Mike Butler, automation manager at Palm Beach International Airport in West Palm Beach, Fla., said his worry would be that competition would get between the alliance members and hinder long-term cooperation.

Alliance partners:

Ungermann-Bass, Inc., 3Com Corp., Oracle Corp., Novell, Inc., Netframe Systems, Inc., Microsoft Corp., Intel Corp., IBM, Hewlett-Packard Co., Compaq Computer Corp., Borland International, Inc. and Apple Computer, Inc.

Novell gears up for alliance

BY JIM NASH
CW STAFF

PROVO, Utah — Novell, Inc. is spending an estimated $20 million to grease its service wheels as part of the Technical Support Alliance it has spearheaded. Specifically, Novell has hired about 100 new support employees, purchased a $1 million telephone call-routing system and increased the education level of its service people.

The 12-company Technical Support Alliance that was announced last week allows resellers, or in some cases end users running Novell and any other ally's products, to call either of the two companies and get coordinated support.

If the alliance works as billed, Novell will need the new resources. The firm's goal is to become a hub surrounded by its present and future support allies, said Darrell Miller, executive vice president of marketing and services at Novell.

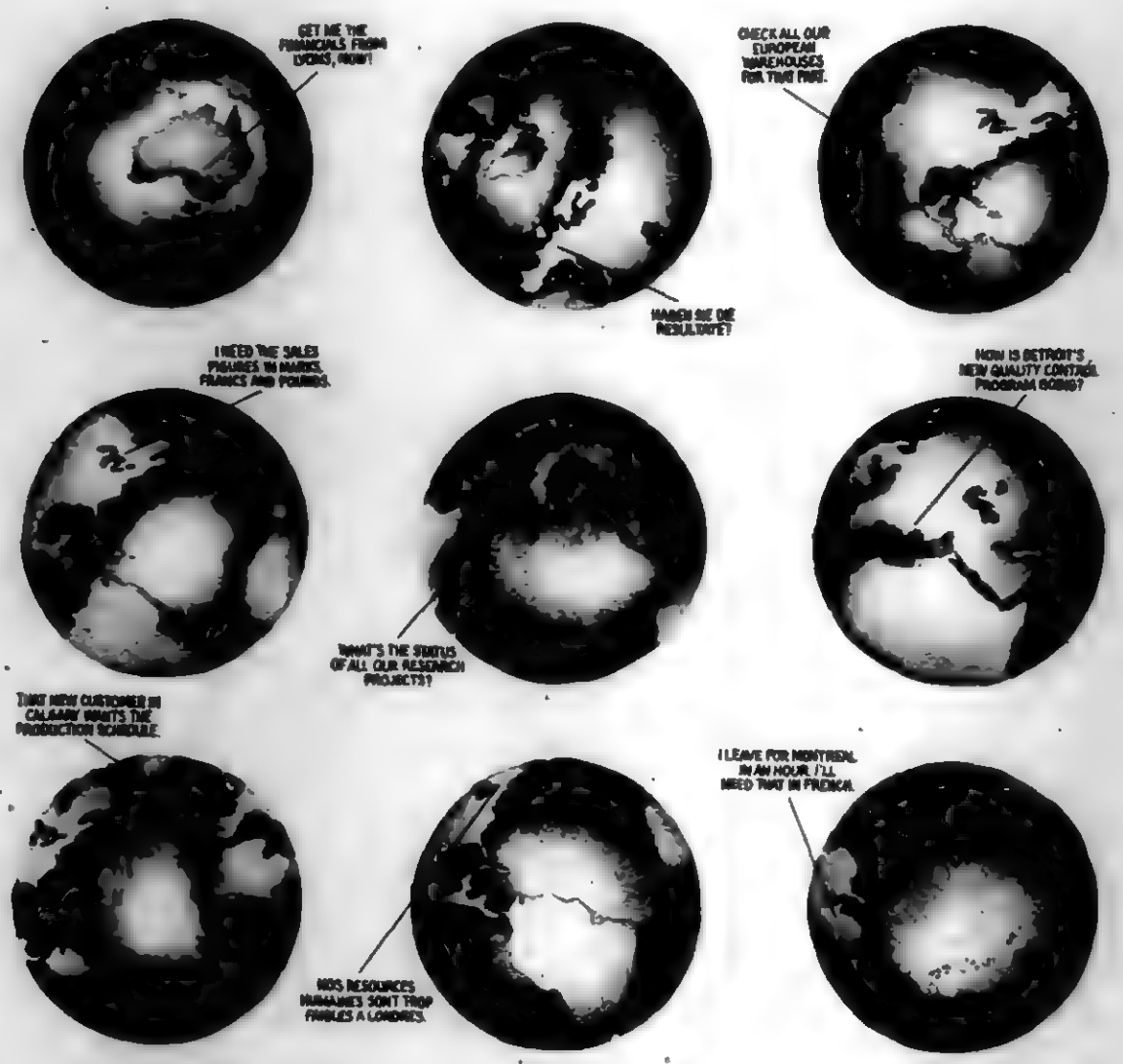
Subject to agreement

The service is subject to each company's existing support policies. Novell's partners can call one another to solve problems unrelated to Novell, but such communication is not part of this alliance, Miller said.

Notable in their absence from the group are Wordperfect Corp. and Lotus Development Corp.

During the past year, Novell said both companies were working with it to develop an integrated service pact such as the alliance. Observers said they had expected Lotus and Wordperfect to be the first alliance members.

Miller said Lotus' legal staff is still reviewing the agreement and is expected to join the alliance this year. He would only say that he hopes Wordperfect customers will petition the company to join the alli-



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ADVANCED TECHNOLOGY

TECH TALK

Portable portable

■ Park Engineering Associates, Inc. has taken the meaning of portable computing to new heights. The Spokane, Wash.-based company has introduced two versions of a portable computer called Compcap, each small enough to wear. The computers can be mounted on a hardhat or a softband model can be built into a belt or vest. They use a miniature display called the The Private Eye made by Reflection Technology. The display's image appears to float a few feet in front of the wearer when positioned in front of the user's eye. The portable computers, which are equipped with either Intel Corp. 80286 or 80386 microprocessors, are intended for mobile use. Possible applications include construction, industrial maintenance, manufacturing and medicine. The devices are priced between $1,500 and $3,000.

Illuminating work

■ An instant camera that produces holograms may be one of the products to come from the discovery of a polymer that has the optical characteristics previously found only in a few small, expensive crystals. Researchers at IBM's Almaden Research Center in San Jose, Calif., said the polymer is the world's first to exhibit the "photorefractive" effect. Illumination by light causes electrical charges within the polymer — a mix of epoxy and organic material — to move, altering its index of refraction. When two laser beams cross within a photorefractive material, they create a pattern of electrical charge similar to a hologram that changes the optical properties of the material it is passing through. This effect makes it possible to store 100 complete holograms or images in a tiny space no larger than the head of a pin, researchers said. If coated onto goggles, a photorefractive film could disperse a laser beam so the wearer would not be blinded by the intense light.

Let your 'knowbots' do the walking

These software pieces will do away with users' need to know information locations

BY GARY H. ANTHES
CW STAFF

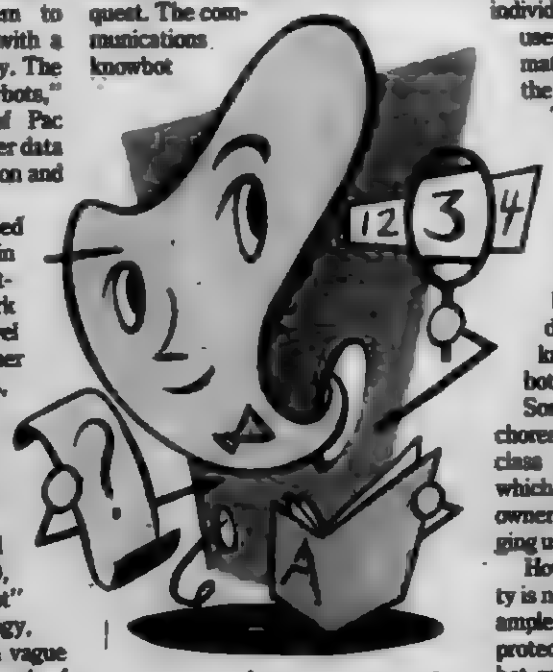
An emerging technology may free users of networked databases from the need to know where and how information is stored, enabling them to navigate vast digital libraries with a power and ease unheard of today. The magic will come from "knowbots," small, self-contained pieces of Pac Man-like software that travel over data networks, gobbling up information and doing their master's bidding.

Knowbots take specialized forms, like bees. Some remain in one place — in the user's computer, a database server or a network gateway — while some travel about, even transporting other knowbots. They can be couriers, police officers, housekeepers or diagnosticians. They can be cloned, modified or destroyed. Knowbots communicate by exchanging messages.

The Corporation for National Research Initiatives (NRI), which coined the term "knowbot" and is pioneering in the technology, said it foresees the day when a vague user request might spawn thousands of invisible exchanges among cooperating knowbots searching through databases separated by thousands of miles and returning the results seconds later to an unsophisticated but grateful user.

David Ely, manager of software development at NRI, gives a knowbot residing on his Sun Microsystems, Inc. workstation a few key words about a medical topic of interest. The knowbot moves over the Internet — a huge, loosely coupled aggregation of research networks — to the National Institutes of Health in Bethesda, Md., where it takes up residence in a Sun gateway.

After being cleared by a resident knowbot policeman, the user knowbot tells another knowbot, this one a communications specialist, of the user request. The communications knowbot



John & Wendy

translates the request into the format required by the specific database needed, performs the query and hands off the results to the user knowbot, which then scampers back over the network to its master.

If the communications knowbot had been unable to satisfy all aspects of the query from databases under its control, the traveling knowbot might have sent a clone of itself to a location where the information could be found.

In another application developed by NRI, knowbots offer Internet users a "white pages" directory service by traveling over the network looking in more than one dozen major directories for the electronic mailbox addresses of individuals sought by the user. The user does not need to know the formats, organization or locations of the various directories.

There are nitty-gritty technical challenges to making all of this work, but Ely said two of his biggest worries are billing and security. How can he protect users from huge and unexpected access charges for browsing through commercial databases the users may not even know exist? As the power of knowbots increases, so do the risks.

Some accounting and security chores can be assigned to a trusted class of knowbots called couriers, which protect the rights of information owners by authorizing access and logging usage data needed for billing.

However, ensuring complete security is not easy, according to Ely. For example, he said, it would be difficult to protect against a Trojan horse knowbot, which might work like this:

John gives a knowbot with outwardly benign and useful functions to Mary. Code is hidden inside to send confidential data to John, who is not authorized to get it on his own. John knows Mary is cleared for the information, and when Mary uses the knowbot, it surreptitiously retrieves the confidential data and ships it to John.

"There are a few Ph.D. dissertations waiting in the wings on the topic of knowbot security," Ely said.

Architect brings 2-D computer designs to life

BY MICHAEL ALEXANDER
CW STAFF

Computer-aided design (CAD) has replaced mechanical drawing boards, but it is still a struggle to translate two-dimensional ideas into three-dimensional prototypes that can be handled and tested.

In recent years, several companies have introduced desktop manufacturing systems that turn computerized designs into 3-D prototypes. One type of system, based on a process called laminated object manufacturing, fabricates models one layer at a time from sheets of acrylic, paper or other material. The sheets are cut with a personal computer-guided laser.

One drawback of this type of rapid prototyping system is that it is difficult to stack the layers in precise registration and adhere them to each other. Another drawback is that this system is mainly limited to manufacturing single-color prototypes.

Patent pending

This week, Norman Kinzie, an architect and model maker, will receive a patent for what he said is a technique that will make it possible to produce full-color 3-D prototypes of computerized designs.

"There is nothing like an actual model that you can hold [in your] hand and pass around," said Kinzie, who is also the research and development director at Landfoam Topographics. "With color, it can convey an incredible amount of information."

Kinzie's patent covers a process of coating each sheet with toner and bonder before it is cut with the laser. Colored toner is applied only to the surface of the sheet material; the color is transmitted by diffusion or absorption to the sheet material's edges.

Kinzie said his technique could be used in 3-D computer printers and copiers that could turn out 3-D prototypes from computerized designs as easily as modern photocopiers produce duplicates of paper documents. The 3-D printer would also operate much like a copier to selectively place toner and bonder on individual sheets of material. Additional technology beyond that of copiers would be needed to stack the individual sheets in perfect alignment and fuse them together.

The first systems will initially be limited to producing black and white models, Kinzie said. Eventually, they will be able to create "photorealistic" models with 500 dot/in. of color, he said.

The inventor has no plans to manufacture the 3-D printers and copiers but said he hopes to interest a copier manufacturer in his technique.

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EDITORIAL

Open competition

Open, locks,
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— William Shakespeare, *Macbeth*

Openness as it relates to information systems is like a 75-degree cloudless day in May. Everyone agrees it's good.

It can be argued that there is not a more important concept in the 1990s than open systems. Without getting into a discussion of what open systems means (see opposite page for that debate), we can safely say what open systems is supposed to do for customers. And that is to unhinge them from proprietary, relatively expensive solutions historically offered by the vendor community without sacrificing the tremendous performance advantages and *robusto* that closed systems have provided and, to some extent, still do.

Rest assured that the path to openness will be anything but smooth or quick. The reason is that unlike standards, which are set by customers, openness is determined largely by vendors.

There is not a lot of agreement between Bill Gates and Scott McNealy. This is not a small point, given that these men arguably are among the half-dozen or so most influential people in the computer industry. In regard to open systems, they just might be the two most influential individuals.

In McNealy's open world, a product such as Windows would essentially become part of the public domain, with open interface specifications available at low cost or no cost and with different implementations available from different vendors.

While we've suggested here that Microsoft conform to some open practices exhibited by independent standards groups, it will be an icy day at the equator before Microsoft goes as far as McNealy suggests, notwithstanding the ongoing Federal Trade Commission investigation into Microsoft's competitive practices.

Gates' vision of open systems has little regard for Unix in its many and disparate versions (which do look pretty proprietary after a while). But neither Sun nor Microsoft have done a whole lot to bring unity to Unix, nor is it in their best interests or necessarily those of their customers to do so.

If there is a single point of confluence in both camps, it is in the belief that open systems, however defined, yields choice not only for the customer but for thousands of third-party developers of software and peripherals. That's easy to agree on, but whose vision provides the broadest menu of choice?

The answer is neither, as they are both predicated on self-interests. And before anyone gets the wrong idea, be it known to all present that in their pursuit of self-interest, both Microsoft and Sun and their CEOs have provided the kinds of choices that are the true manifold expression of the one "open" that really matters — open competition.



LETTERS TO THE EDITOR

Imperfect survey

Your Buyers' Scorecard on PC Cobol [CW, March 25] was the first PC Cobol presentation in a long time that was well-conceived. The "key ratings" were germane to the topic. The survey seemed well-conducted and thorough.

The unfortunate part is that you couldn't include the other two Cobol compiler vendors who make up the remaining 10% of the PC Cobol market: Mbp and Acucobol. Having done this, *Computerworld* would have presented a comprehensive analysis of the entire PC Cobol industry.

Your readership and the business community at large would have benefited from a more useful and valuable Product Spotlight. In addition, you may have discovered a Cobol compiler that would generate still better ratings.

It's too bad when only the big guys can play.

Michael L. Hicks
Vice president
Mbp Software and Systems Technology, Inc.
Alameda, Calif.

Little guys lose out

In "Military sees problems, promise in viral strikes" [CW, April 8], Michael Alexander unknowingly exposed a means by which small business gets shafted by big government and its friends. He mentioned Sparta, Inc. as having received two Small Business Innovation Research (SBIR) awards.

In 1988, Sparta's revenues were $55,335,000 and growing, according to its annual report. It qualifies as a small business because it has less than 600 employees. Sparta took a double share of the SBIR available funding.

Is this fair? Mr. Cheney is closing bases across the nation. Defense contractors are laying off workers. Minority-owned businesses cannot achieve their fair share of defense contracts as mandated by Congress. Women-owned business enterprises are forgotten.

Yet a company with revenue about 500 times larger than the truly average small business can, within the rules, take away the few crumbs provided to small business.

Sparta used the rules to its advantage. Bad rules can be manipulated if you know the federal acquisition regulations. Mr. Alexander indicated that Sparta stands to obtain $1,000,000 in Phase 2 SBIR funds.

Congratulations, Sparta. Regrets to small business.

Thomas V. Sobczak
Application Configured Computers, Inc.
Baldwin, N.Y.

Credit the fax

Regarding Mitch Betts' column titled "Catch a ride on the fax wave" [CW, April 8], I found the statements regarding MIS "resisting fax" to be quite contrary to our view of fax systems. At Victor Products, fax systems were under the control of information services for a number of years.

A few years ago, fax systems became a commodity. Everyone had one for sale, and they all were compatible. When we had executives purchasing home fax machines, it was time for information systems to get out of the business and move on. We did move on — to more important issues.

We are now finding that fax is back and filling an important need for electronic data interchange communications. We have designed and implemented a transparent fax gateway system from our PC LAN as well as our manufacturing system. We found that departments had fallen in love with the fax system capabilities but were wasting time pushing paper — which was printed on computer system printers — into fax machines.

The second area in which the fax gateway paid off was communications with our foreign affiliates. We developed a system to allow our affiliates direct dial into our DEC VAX systems and network. The affiliate then downloads the compressed file with the use of Xmodem, Kermit or other file-transfer systems — including dial-up Decnet.

We opted to use the fax gateway, tied to the DEC VMS mail package to notify them that files needed to be transferred. Thanks to the fax gateway, I was well-prepared.

Keep up the good work.

Warren Smith
Manager, Information Services
Victor Products Division
Dana Corp.
Lisle, Ill.

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What does 'open systems' really mean?

Giving customers the chance to vote on a roster of choices

BY BILL GATES



"Open system" is a term that we at Microsoft feel has a very simple definition: customer choice. Customers are able to choose their products and solutions from a host of hardware and software vendors.

To create this level of choice, there must be a small set of standards, widely accepted by both software and hardware vendors, and the technology to implement the standards must be available equally and easily to any vendor.

An open system means that users are not limited to a single hardware system provided by a single vendor or a very limited set of vendors. Users do not want to have the same hardware vendor providing a unique operating system implementation, acting as the primary source of peripherals or offering the bulk of the applications software, as has been the case with proprietary mainframe and minicomputer systems.

Users do not want to be locked in, but they do want standards. They want the economics that come from buying in quantity, and they want the same applications on all their machines.

This is not contradictory. The personal computer industry shows how this can be accomplished with great benefits to the user. The microprocessor architecture and operating system are the same on PCs, but this binary standard is available through an open marketplace of hardware manufacturers. These manufacturers compete on performance, features, price and service. Competition is fierce, but users buy in quantity. The growth brings in more software developers, so more applications are available, which attracts more customers and sells more machines.

The DOS market is a widely hailed self-reinforcing phenomenon that now encompasses more than 60 million machines and is growing at a rate in excess of 20 million systems per year. The DOS — and now Windows — market has developed to include more than 400 hardware manufacturers, at least as many providers of add-on equipment, thousands of software vendors and more than 10,000 actual applications.

This is choice

Competition on a single standard is the crux. If a customer is unhappy with a hardware or software vendor, any number of alternatives are only a phone call away. This is choice. This is an open system.

Standards are generally created in an evolutionary way. Whether based on input from customers, industry groups or committees, new standards are continually created and old ones updated. Truly open systems benefit from this evolutionary process. The real winners, of course, are the customers because they gain the ability to choose.

Unix is often promoted by its vendors as an open system, but there is no single version of Unix. Our own version, originally developed in 1981 and now developed and marketed by The Santa Cruz Operation (SCO), remains the most popular Unix by unit volume. But even we have to admit that the market is fragmented among competing hardware designs and not-quite-identical Unixes.

To compete with Windows, Unix needs a standard graphical user interface. This is crucial in getting developers. As we learned with Windows 3.0, critical mass is everything.

Among Unix vendors, there is no unanimity about what an open system is. There are still two major competing camps — the Open Software Foundation and Unix Systems Labs — and dozens of competing and incompatible implementations. Despite these iterations, Unix is still owned and controlled by a single company, AT&T. The five largest vendors — Microsoft/SCO, IBM, DEC, Sun and Hewlett-Packard — have significantly different offerings, and they largely disagree as to whether their competitors' systems are truly open.

PC futures

The recent Advanced Computing Environment (ACE) initiative of 18 hardware manufacturers and key software vendors, including Microsoft, is a good example of how the DOS/Windows approach to open systems can be leveraged by allowing the huge wealth of PC applications to be moved to a new platform. ACE is a cooperative agreement to establish an open hardware and software platform for RISC-based personal computers (using Mips Computer Systems chips) compatible with Intel-based PCs. The two software platforms are Microsoft's advanced operating system (OS/2 Version 3.0) and SCO's unified Unix (Opendesktop).



Gordon Studer

Microsoft's advanced system will incorporate DOS, Windows and OS/2 in a single environment. Thousands of existing DOS and Windows applications can be up and running on these new machines much, much faster than they could be moved to other systems — increasing choices for customers once again.

This is the latest example of how an open system really works. Because it's customer-driven, all vendors — hardware, systems software, applications software — are driven to get better every day. When hardware advances, the entire environment can be carried over as a whole, and users benefit again.

This is the PC legacy. It's the best kind of open system — it's one that customers vote on every day, day after day, year after year.

Gates is chairman and chief executive officer of Microsoft Corp.

Sharing the basics, so customers get no-risk innovation

BY SCOTT D. MCNEALY



In recent years, most companies that built their fortunes on single-vendor proprietary computing strategies have jumped on the open systems bandwagon. And why not? They've heard the market. Customers are voting for open systems with their wallets. In droves.

However, while the demand for open systems is clear, the meaning of the term isn't — at least, not anymore. Most proprietary companies singing the open systems theme song these days sound suspiciously like they're crooning Sinatra's "My Way" in the background.

"Open" is the most used and abused word in computing today. It's become an all-purpose marketing buzzword.

Some common misuses include:

- "My computer architecture is open because I can network to and get files from the mainframe." This confuses interoperability and portability with openness.
- "My computer is open because it uses Unix." This confuses ease of software portability with openness and doesn't even begin to cover all the other hardware and software interfaces developed by a vendor.
- "My personal computer is open because it runs binary-compatible software from one PC vendor to another." This confuses openness with compatibility and compatibility with logos. A PC clone is still an Intel/Microsoft computer, no matter what distribution channel you buy it from or what logo you put on it.
- "My computer complies with standards because it conforms with the XYZ consortium." This confuses openness with standards and standards with press releases from endorsement bodies.

Misused but worthwhile

"Open" is a term worth saving, though. It says a lot about the way computer companies can and should compete and about the value provided customers through innovation. The theory behind openness is that all technology can benefit from improvement and that all customers benefit from such innovation. Ultimately, the industry benefits too, as a result of increased demand brought about by more useful products.

Basically, openness is a simple concept. It refers to a specification, a blueprint or, as we call it in the computer business, an interface — one that's written down for the world to see and use, one that invites improvement and innovation. In the auto industry, the brake pedal is an open interface. Car companies don't pay royalties to use the specification; they all use it freely as the basis for competitive improvements such as antilock braking systems, hydraulic brakes or disk brakes. And because it *is* an open interface, customers don't have to relearn how to drive.

In the computer industry, interfaces describe many of the important elements that tie a computer system together — the microprocessor architecture, the system bus, the operating system, the window system, the graphical user interface and the important application binary interfaces and application programming interfaces.

The fundamental premise in defining openness is a positive answer to the simple question: Can this technology benefit from innovation and from being faster, more full-functioned and cheaper? Apply the question to an actual case — Microsoft's Windows. Could Windows improve through innovation? Everything I've heard in the market says no. But while Microsoft gives developers the information to create applications that run with Windows, the company does not provide the information to innovate on Windows itself. As a result, Windows is a proprietary (not open) interface.

Simple tests

Following is a simple checklist of criteria for openness:

- The interface should have a specification that's openly available (meaning published). This allows other vendors to create their own value-added implementations.
- The interface specification should be well-written — clear enough so that, if you sent four or 400 engineers into a room with it, they'd come out with a reasonable implementation.
- An open interface should be inexpensive or free — no huge royalties.
- The interface should be legally clean, meaning you can't be sued for using it.
- Multiple implementations of the interface should be available from multiple companies.
- There should be a reference implementation available for a reasonable fee.
- In a best-case scenario, there would also be an independent branding and compatibility testing organization to ensure the specification is protected and enhanced in an equitable way.

Many vendors equate open systems with standards. However, these are not the same thing. The dictionary definition states that a standard is "regularly or widely used . . . the preferred way of doing things." Standard interfaces are set by high-volume sales (in other words, by users). Of course, Sun's philosophy is that a robust open interface will be adopted by many vendors and users, eventually achieving the volume to become a standard.

We're talking freedom of choice here, not freedom *from* choice. It's a scary notion to many companies in the computer business. That's why they try so hard to obfuscate the facts.

McNealy is president and chief executive officer of Sun Microsystems, Inc.

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COMMENTARY

J. A. Savage

Software joyriding



In January, I bought an old sports car. It sounded good, and it looked good. It's a 1976 Alfa Romeo. But it's a lemon.

I thought I could sell it, but being terminally honest, I can't sell it to anyone for anything but parts. That means it's not worth much. Now that spring is here, I figure the only way to make back any money on my rolling piece of citrus is to use it as a taxi. Take the top down and offer rides. That way, I sell something, but I still have everything I started out with.

In the profits crunch of open systems, where formerly expensive hardware now goes to the lowest bidder, vendors are trying to find new ways of making money. Hewlett-Packard, for one, is treating its systems software divisions like taxis: You can take a ride or license the stuff, but HP still has all the original parts it began with to license again.

A HALF-DOZEN SOFTWARE vendors are licensing parts of HP's CASE software to incorporate into their own products.

About the time I bought my Alfa, I talked with Bob Frankenberg, who was then head of software at HP. He said the company planned to increase software licensing revenue from 10% to 30% within the next three years. Ever since then, there's been a steady stream of press releases from HP announcing this, that and the other licensing agreement for its systems software.

For instance, IBM (which is well-known for its solitary enthusiasm for its own systems software) has recently licensed parts of HP's network management software as well as its CASE framework. A half-dozen software vendors are licensing parts of HP's CASE software to incorporate into their own

Continued on page 33

Specmarks lose their luster

The once-promising benchmark is catching some new flak from critics

BY J. A. SAVAGE
CW STAFF

Specmarks, a benchmark that vendors hoped would remain noble and untainted, have lived long enough to be maligned.

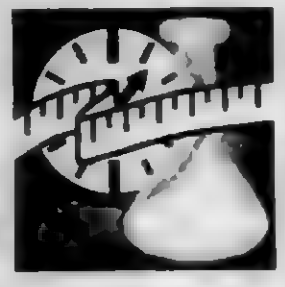
The widely used benchmark, which measures CPU speed on workstations, is under growing criticism as the same vendors who developed it jazz up their ratings with software not yet commercially available.

Specmarks arose because for the last few years, vendors have largely denigrated the million instructions per second (MIPS) benchmark. In the last year, for instance, some workstation vendors have refused to even provide a MIPS rating for their workstations.

Private compilers

Recently, both Hewlett-Packard Co. and Sun Microsystems, Inc. have released Specmarks boosted by using compilers not available to the general public at the time products were announced.

However, Specmarks are also coming into increasing disfavor now, said Tom Kucharvy, an analyst at Summit Strategies, Inc. in Boston. "At first, they were thought to provide an objective means of benchmarking that couldn't be manipulated like MIPS can. But now that people are becoming familiar with them, they are being manipulated."



When HP announced its HP 9000 Series 700 workstations in March, the company said the machines topped out at 72.2 Specmarks.

That number, however, was obtained by using an optimizing compiler that will not be available until June, at which time it will be sent automatically to customers that have bought the workstations, according to an HP spokesman.

In November 1990, Sun introduced its Sparcstation 2 with a Specmark rating of 21. It was also using an unreleased compiler that was not made available until last month, according to a Sun spokesman. Sun sells compilers separately.

Spokesmen from both companies said customers were warned that their performance would vary because some software was not available immediately, although the degree of variance was not made clear in the companies' marketing material.

Even the former chairman of the Systems Performance Evaluation Council (SPEC), Robert Novak, who is also manager of Mips Computer Systems, Inc.'s performance group, acknowledged that there are "some problems" with the benchmark. "Various vendors have found pieces of code they can optimize," he said.

In the future, SPEC plans on updating its benchmarks often enough to keep ahead of vendors' ability to optimize it for themselves, he added.

More information

Because Specmarks in effect measure MIPS and million floating-point operations per second (MFLOPS), at least one analyst claimed that users are getting no more information from Specmarks than they would if they just relied on the older MIPS and MFLOPS benchmarks.

Lloyd Nirenberg, president of Competition Technology Corp. in Campbell, Calif., has an equation that adds MIPS and MFLOPS with a constant number and comes quite close to landing on the Specmark benchmarks for 19 workstations.

"Vendors have no need to be so contentious of MIPS and MFLOPS; they sneer at everyone as if [Specmarks] are something new," Nirenberg said.

Some independent analysts tend to agree with Nirenberg. "Either SPEC picked the wrong benchmarks, or no matter what CPU-intensive benchmarks you pick, they won't tell you much more than MIPS plus MFLOPS — however loosely derived," said Omri Serlin, president of Itom International, Inc. in Los Altos, Calif.

AS/400 takes its place at head of the SAA line

BY MARYFRAN JOHNSON
CW STAFF

IBM's Application System/400 has finally secured itself a prominent place under the distant sun of Systems Application Architecture (SAA), the grand scheme for unifying the IBM product line and eventually playing in a multivendor environment.

With the announcement last month that certain distributed relational database capabilities will appear first on the AS/400 platform, IBM sent a much-welcomed signal to customers struggling to cope with growing networks of diverse computers.

"IBM didn't provide a lot, but they announced a lot of direction," said Douglas Pleacia, vice president of information systems at Toyota Motor Sales U.S.A., Inc. in Torrance, Calif. "We're encouraged that they're recognizing the issue."

"This was a blockbuster announcement for the AS/400 and the SAA database," said George Zagelow, manager of architecture and standards at IBM's laboratory in Santa Teresa, Calif. "When the AS/400 delivers the distributed relational database, it will leapfrog completely across homogeneous protocols right into heterogeneous solutions."

In this case, a homogeneous protocol refers to a pair of like databases talking to each other — DB2 to DB2, for example — while a heterogeneous protocol means the SQL/400 database will be able to exchange data and files with the DB2 database under MVS, SQL/DS under VM or OS/2 Extended Edition Database Manager on Personal System/2 workstations.

The springboard for this leap is Distributed Relational Data Architecture (DRDA). The first piece of DRDA will be generally available on OS/400 in March 1992, allowing applications to execute multiple SQL requests to other IBM databases that support DRDA.

"What DRDA really talks about and defines is what flows on the wires between the machines," Zagelow explained. "It is a set of rules that resolves things like naming inconsistencies across various environments. If your product can put the right bits in the right sequence on the wire, it can play."

The other SAA operating systems — MVS, VM and OS/2 — are also "well on their way" to providing distributed database capabilities under DRDA, Zagelow added, but only the AS/400 has announced a product availability date.

SQL failings

One of the major problems the AS/400 faced in catching up to the other SAA platforms was its weak SQL capabilities, Zagelow noted.

The debut of OS/400 Version 2.0 next month, however, will fill in many of those missing SQL functions, such as common return codes, numeric data types and variable length fields. "As the AS/400 strengthens its support for SAA/SQL, applications written on System/370 or OS/2 in the SAA languages become easier and easier to move to the AS/400," Zagelow said.

Under the SAA distributed database, there are four types of requests: remote request, remote unit of work, distributed request and distributed unit of work. When the first piece of DRDA shows up next year, it will

Continued on page 32

New and improved

In March 1992, IBM will deliver the second release of OS/400 Version 2.0, with significant improvements in the AS/400's SAA functions. The following are among them:

- Support for the first stage of DRDA, which allows an application to execute multiple SQL requests as remote units of work to a single, remote IBM SAA relational database system.
- Greater consistency in SQL to allow applications to access data anywhere in the network.
- Enhancement of the AS/400's Common User Access interface through extensions to Data Description Specification (DDS) support. New keywords in DDS will allow developers to create applications with pop-up windows for Help text.

MARYFRAN JOHNSON


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NEW DEALS

D&B scores contracts

Dun & Bradstreet Software, a company of The Dun & Bradstreet Corp., recently scored two substantial contracts with its General Ledger software system.

One was with San Francisco-based **Pacific Gas & Electric Co.**, which awarded a $750,000 contract to D&B. The agreement calls for the license and installation of D&B's General Ledger software at the utility company to replace the existing in-house-developed General Ledger system. The software is valued at $500,000, with the remainder of the contract covering several additional services.

Lockheed Aeromod Center, Inc., an aircraft maintenance services subsidiary of Lockheed Corp., signed a $1 million contract with D&B Software for the General Ledger system and related professional services. The software will be used to track direct and indirect expenses and determine project-specific revenue figures.

Consolidated Edison Company of New York, Inc. has selected **Intergraph Corp.** in Huntsville, Ala., to supply an automated mapping and facilities management system. Intergraph will provide Con Edison with approximately 200 Intergraph Series 6000 and 2000 Unix workstations and related hardware, software, training and maintenance services. The contract is valued at $12.6 million.

The Defense Systems Division of Loral Corp. has selected **Concurrent Computer Corp.**'s 7000 Series of Motorola, Inc. 68040-based real-time Unix systems for the real-time computer portion of the Special Operations Force Aircrew Training System (SOF ATS). To date, the SOF ATS program is the largest aircrew training system program awarded by the U.S. Air Force. Concurrent expects the value of the contract to exceed $1 million, excluding maintenance and support.

Chaparral suite talks way on to message bus

ON SITE

BY CAROL HILDEBRAND
CW STAFF

MIDLOTHIAN, Texas — When Chaparral Steel Co. began dividing its product processing system into server functions, it found that to keep communications among machines up to date, it needed a good valet: something dependable and discreet that guaranteed the job would get done.

Chaparral, which operates a minimill here, produces its product from scrap using electric furnaces. According to Scot Shepherd, manager of system software at the company, efforts to build guaranteed data delivery among its Digital Equipment Corp. VAXs, which are scattered throughout the factory, led Chaparral to Suitetalk, a "message bus" for client/server computing from Suite Software in Dallas.

The company uses a cluster of VAX 6520s, a cluster of 8550s and 8530s as well as two MicroVaxes to run the product processing system, which covers everything from order entry through shipping. The VAXs are linked via Ethernet.

According to Shepherd, they took the server approach to improve application speeds. Chaparral uses DEC's RDB relational database management system and had developed a system using Smartstar, a fourth-generation language tool from Smartstar Corp., a part of Signal Technologies. Shepherd said that rather than rewriting the system, Chaparral decided to separate the back-end database activity into the server process. Thus, he said, "we needed a way to communicate between the front-end process that a user deals with and the back-end one, but in a fail-safe manner."

Shepherd said the firm found out about Suitetalk through a Suite Software consultant who works on-site as an RDBMS specialist.

The staff had already spent several weeks writing an in-house program handle message delivery for the first application, a print server. "It worked," Shepherd said, "but if something happened to the message — a buffer was full or a printer went down — the information could just get lost or dropped. Some things would end up just not getting printed out."

Shepherd said that Suitetalk's guaranteed message delivery was a strong drawing card, especially when the company used the server approach for the database updating function. "We couldn't afford to think that we're doing something and not have that transaction take place in the database."

What the firm discovered with Suitetalk, he said, is that not only did it take care of the problem more efficiently, "it will confirm back to the sender that the data was in fact sent or received or is pending in the receiving queue or whatever. When it finally does get delivered, you will get confirmation."

According to Shepherd, that feature helped erase his uncomfortable scenario of people printing invoices that did not reflect what was in the database.

The alternatives were slim pickings, Shepherd said. Other than the homegrown approach, he said, Chaparral looked at a product called Digital Message Queue, from DEC. "But it was as much a consultant service as a product," he said.

Shepherd said he discovered several ways to use the product. The company also uses it to help the production system in the mill talk to the VAXs and get that information into the database. It is also used to monitor database lock.



Chaparral Steel *uses a 'message bus' for its client/server system*

Taking the wait out of rehab services

BY SALLY CUSACK
CW STAFF

FRANKFURT, Ky. — Try telling an accident victim that he has an "indefinite" wait for vocational rehabilitation services while the paperwork is being processed.

Scenarios such as this prompted the Kentucky Department of Vocational Rehabilitation to automate client service functions in centers across the state to better serve its 15,000 active clients.

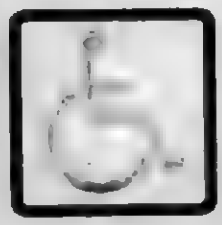
The department also hopes to expedite processing on a waiting list of 9,000 applicants.

Robert Beverly, division director of support services at the Cabinet for Workforce Development, credited the installation of Bull HN Information Systems, Inc. DPS 6 Plus minicomputers at 16 district offices throughout the state with "cutting six days' turnaround time off the application process."

The minicomputers, each equipped with 16M bytes of memory, connect via dumb terminals to a Bull DPS 8/49 at the headquarters here over the state of Kentucky's proprietary network.

There are 41 remote offices throughout the state, and each connects to one of the 16 district centers with direct or dial-up lines.

Prior to putting minis in the field, all information was documented by counselors at individual offices and mailed to headquarters, Beverly said. Once received in Frankfurt, the information was reviewed and then authorized for keypunch into a Honeywell Bull system running in a batch processing environment.



Batch programs are now run from the district offices on a nightly basis, Beverly said, and the process takes about one hour.

There is a DPS 6 Model 95 at the main data center for front-end editing programs, and the data is stored in files before transfer to the mainframe.

In addition to reporting to the central office in Frankfurt, each district office is responsible for maintaining its own client files for day-to-day record keeping and client program management.

The Department of Vocational Rehabilitation is an agency of the Kentucky Cabinet for Workforce Development and was established to provide adults with all kinds of rehabilitation. This includes services for victims of automobile accidents, drug dependency, broken home environments, paralysis and learning disabilities.

"We provide any type of training necessary to get these people back on track," Beverly said.

To accomplish this, the department must maintain extensive database files of medical, vendor-related and other rehabilitation information.

In addition, the federal government mandates that the state tabulate, process and coordinate detailed client data, such as complete hospitalization information and family history.

All client data and related information is stored on Bull's DM-IV database software, which resides on the DPS 8000 mainframe.

"The software was the real challenge," Beverly said. "We designed our screens to match the government forms from A to Z, and the federal requirements change on a monthly basis. We are always changing our menus and screens."

When the department decided to automate its field offices two years ago, Bull agreed to work with the staff on software applications development, Beverly said. The primary objective in developing the Cobol-based programs was to ensure easy configurability.

The software was developed on a Bull DPS 6 platform using Bull's proprietary operating system and office products software.

The system went into full production mode last August, and, according to Beverly, the final field installation will be completed this month.

Future unlimited

While there are currently only 10 personal computers used in the field, Beverly said he sees an unlimited future for them — especially laptops.

"Very often counselors must go to client homes. It would be convenient if all the information could be entered directly onto a PC," he said.

Beverly said the department is satisfied with Bull's service and support and would most likely purchase laptops from Zenith Data Systems Corp., a wholly owned Bull subsidiary.



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AS/400

FROM PAGE 25

handle only the first two remote types, allowing users to send a single SQL request out to execute on another system and then return the answer.

A distributed request, on the other hand, would enable users to send that single SQL request out to a network, updating several systems rather than just one. However, IBM is unlikely to pull that off until 1993 or 1994, analysts said.

Zagelow maintained that "a significant number of customers" will be satisfied with the remote access because it will allow them vertical connectivity across their environments. "Customers can do single-site updating, like writing an application in one place that populates a table somewhere else," he explained.

"Ultimately, you should be able to do remote work on DB2 from a PS/2 or an AS/400, with one request able to update all the others," said Jim Louys, an analyst at ADM, Inc., an AS/400 consulting firm in Cheshire, Conn. "Most AS/400 customers won't care about DRDA now, but those who will care have multiples of AS/400s."

At Toyota Motor Sales, for example, the data center in Torrance does all the data processing for Toyota and its affiliates, while more than 200 AS/400s serve as primary distribution systems for the car dealerships. The auto parts database and national car information database reside on the corporate 3090 mainframe under DB2.

"The concept of full support for SAA on the AS/400 is terrific. We always felt it would be a significant platform," Plescia said.

"We really are committed to a cooperative environment where we can maintain all the corporate databases at the central facility and provide portions of that database for use locally."

The company intends to grow its AS/400 network to "well over 1,000" within the next decade, according to Plescia. "In a distributed corporation like ours, trying to support dealers across the nation, you can't do all the things you need from a central host," he said.

Image booster

Among the more interesting components of the recent AS/400 Model D announcements was IBM's introduction of a 5¼-in. write-once read-many optical drive.

Analysts said the IBM 3995 Compact Optical Library Dataserver finally gives IBM access to small to midsize imaging systems customers. The $52,000 introductory Model 042 jukebox can store an unformatted 20G bytes, the equivalent of the digitized images of 300,000 pieces of paper.

"It's the first IBM-logoed, 5¼-in. jukebox for any platform," said Walter B. Novinger, vice president of the Image Systems Division at Rothchild Consultants in San Francisco. Users have been "clamoring" for this capability, he added. Up to 14 Model 042s can be attached to an AS/400 9406 Model D; two other models were announced for the System/370 and System/390 architectures.

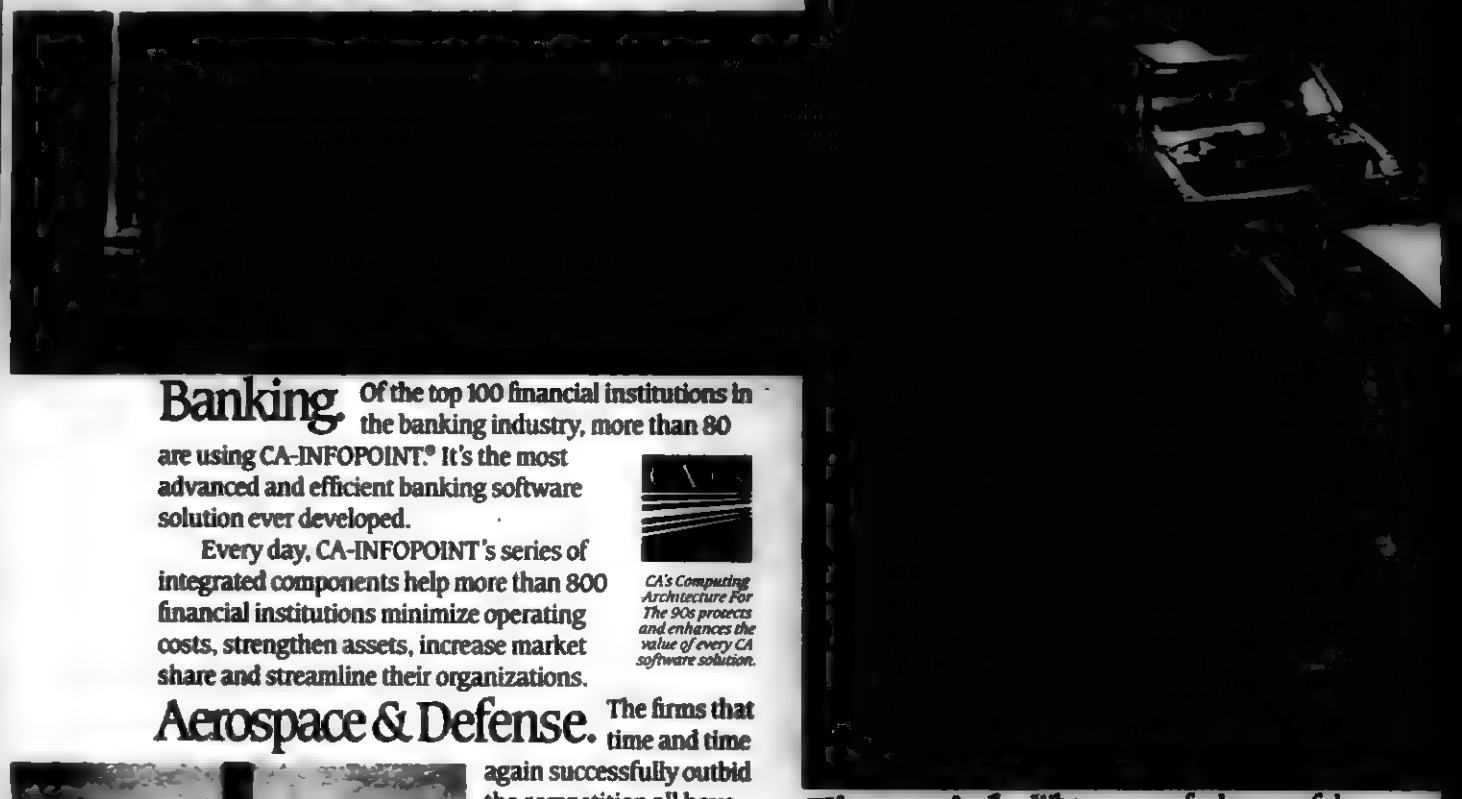
In another move to attract developers, IBM broke out a subset of application programming interfaces from its Workbidder Application Facility, a module to image-enable RPG and Cobol applications.

"This subset is what the software developers have said they really needed," Novinger said. "Now they can image-enable applications much less expensively. It's a very welcome announcement for the AS/400."

ELIZ BOOKER

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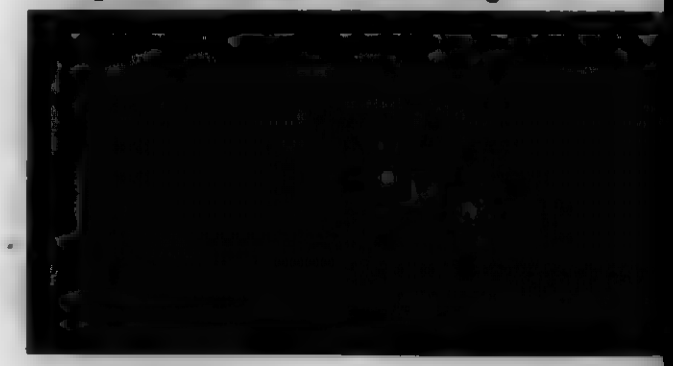
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Passport moves changes across databases

Programmers can now link RDBMS applications to multiple databases

BY JEAN S. BOZMAN
CW STAFF

RONKONKOMA, N.Y. — Insync Software Corp., a small Long Island, N.Y., software firm that sells the Passport fourth-generation language for relational database management applications, announced that it has found a way to update multiple databases made by different vendors from a single application screen.

Passport Interconnect, a new product that began shipping May 1, allows programmers to link a single relational database management system application to multiple databases over a corporate network.

"A lot of people want to move their software tools from one RDBMS to another," said Insync President and founder Alan Tonnesen. "We're saying that you can link multiple RDBMSs together and share the data among them all."

The interconnect products, which range in price from $4,000 for a Unix workstation to $70,000 for a Digital Equipment Corp. VAX 9000, can be used to create new distributed database applications, according to Tonnesen. Separate pieces of software must be installed on each of the linked RDBMSs, however.

Passport applications run on RDBMSs from Oracle Corp., Sybase, Inc. and Ask Computer Systems, Inc.'s Ingres Division as well as with DEC's RDB.

The firm has said Passport Release 5.3 would allow simultaneous access and two-phase commit transactions among any of the four supported RDBMSs, according to Gartner Group, Inc., a market research firm based in Stamford, Conn.

New use for old product

Users can also build Passport applications using an older product, Insync's SQL*Forms Connect. That product links an Oracle SQL*Forms application with RDBMSs from Sybase, Ingres and DEC. The older product had required that applications be customized for each target database.

Several Insync users said they are interested in the new product but have not yet seen it. "We use Passport as a front end for all our data-entry screens," said one user who manages a large-scale Oracle database at a New York investment house. "But, right now, we're an all-Oracle shop."

Insync, with 15 employees, was founded in 1988 by Tonnesen, who formerly worked for Fortex Corp.

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Savage

FROM PAGE 25

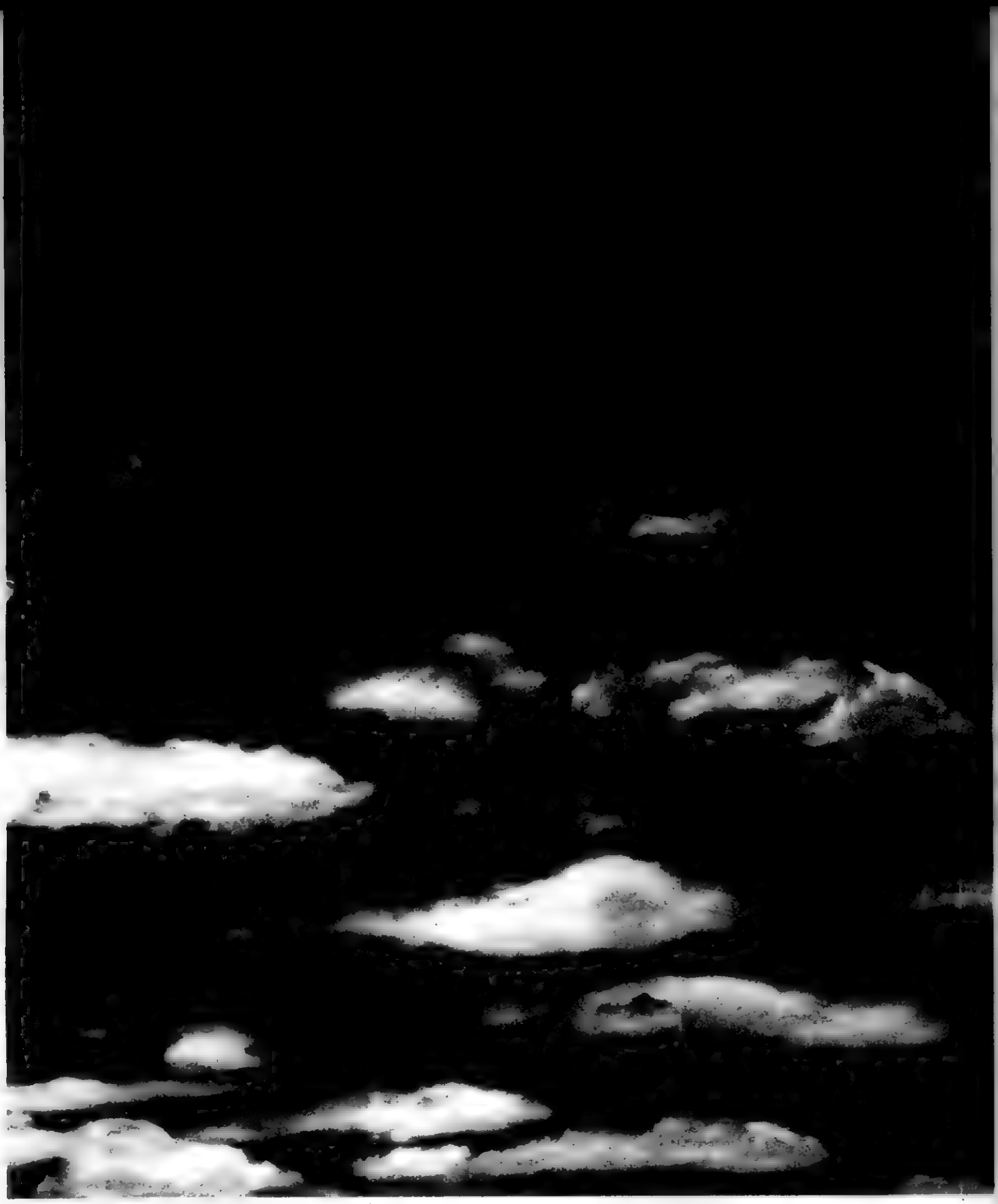
products. At an applications level, HP said it would offer its CASE software on Sun's workstations — yet another form of income.

Companies such as NCR have licensed HP's object-oriented PC software, New Wave, to incorporate into their own bundled software offerings. Archrivals HP and Sun have even gotten together to promote object-oriented management code as an underpinning of new object-oriented software. If accepted by the object-oriented standards group, it could bring in more licensing fees.

Moreover, all of this joyriding on systems software revenue is not limited to HP. Sun, too, is getting into the software business. (In Sun's case, I guess that would be Bill Joyriding.) This summer, a Sun subsidiary called Sunsoft will be actively licensing Sun's offerings on the open market.

In the era of open systems and thus, cheap hardware, HP and Sun seem to be onto something.

Savage is a *Computerworld* West Coast senior correspondent.



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NEW PRODUCTS — HARDWARE

Data storage

Delta Microsystems, Inc. has added several tape backup products to their massive storage device line.

Delta has announced the SS-8500T ($12,495) a 5G-byte, 8mm tape drive with 480K byte/sec. data transfer; the SS-10TS 8mm tape stacker ($28,495 including 10 5G-byte tapes and software); and the SS-116TJ tape jukebox, which costs $122,980 including four 5G-byte drives and capacity for up to 116 tapes.

The firm also announced Databanker ($150,000), an automatic backup and retrieval program that can back up all Unix-based machines on a network through a Sun Microsystems, Inc. server.

Delta Microsystems
5039 Preston Ave.
Livermore, Calif. 94550
(415) 449-6881

Processors

The Real/Star series of reduced instruction set computing systems has been added to Modular Computer Systems, Inc.'s (Modcomp) Tri-Dimensional family of real-time computers.

The machines are based on Motorola, Inc. 68000 and 88000 processors and implement Modcomp's Real/IX real-time Unix operating system.

Uniprocessor, symmetrical multiprocessor and asymmetrical multiprocessor systems are available. Pricing ranges from $25,000 to $240,000.

Modcomp
1650 W. McNab Road
Ft. Lauderdale, Fla. 33309
(305) 974-1380

Mercury Computer Systems, Inc. has announced the MC860VS, an embedded VME-card multicomputer with four Intel Corp. 80860 microprocessors.

The product is available for Sun Microsystems, Inc. Sun-3 and Sun-4 and Silicon Graphics, Inc. workstations, as well as for Scalable Processor Architecture computers running Unix or Wind River Systems, Inc. Vxworks. Eight MC860VS cards can be configured together, providing up to 2.5G floating-point operations per second, according to the company.

Pricing begins at $48,600, depending on system memory and quantity purchased.

Mercury Computer Systems
600 Suffolk St.
Lowell, Mass. 01854
(508) 458-3100

SOFTWARE

Database management systems

VM Systems Group, Inc. has announced the immediate availability of DB/Center, a comprehensive management system for SQL/DS databases in the VM operating environment.

The product monitors database performance, manipulates data objects and includes reporting and applications-building facilities.

DB/Center pricing ranges from $15,000 to $55,000, depending on IBM processor group.

VMSG
1604 Spring Hill Road
Vienna, Va. 22182
(703) 506-0500

Progress, a fourth-generation language and relational database management system from Progress Software Corp., is now available on all Digital Equipment Corp. hardware platforms.

Progress has added support for ApplicationDEC 433 workstations, the company announced. The product is designed for distributed, mixed-platform environments and is portable across numerous network types, operating systems and databases, according to Progress Software.

Pricing for the complete development version running on the ApplicationDEC 433 platform ranges from $7,600 to $34,400.

Progress Software
5 Oak Park
Bedford, Mass. 01730
(617) 275-4500

Development tools

Cortex Corp. has announced the availability of Corvision Version 4.41. Corvision is an applications development product for Digital Equipment Corp. VAX systems.

Version 4.41 incorporates features such as screen style sheets, real-time data updates and enhanced third-generation language integration. Annual licensing ranges from $40,000 to $325,000.

Cortex
100 Fifth Ave.
Waltham, Mass. 02154
(617) 622-1900

Applications packages

International Business Information Systems (IBIS) has developed Sourcemaster, a source code library management product for MVS environments.

Sourcemaster identifies code according to language, system, group (such as batch- or macro-level CICS) and target (such as macro, object or source).

A perpetual license costs $9,500. IBIS is offering a 30-day free trial period.

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1926 Marengo St.
New Orleans, La. 70115
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COMMENTARY

Jerrold M. Grochow

A better OS/2 than . . .

Thank you, Bill Gates. Knowingly or not, you seem to have given IBM just the kick it needed to produce the OS/2 we should have had all along. To quote Jim Cannavino, general manager of IBM's Entry Systems Division, OS/2 Release 2.0 is "a better Windows than Windows, a better DOS than DOS and a better OS/2 than OS/2 Release 1.3." He not only said it — he proved it.

It will be several months before the average user will be able to get a production copy of OS/2 Release 2.0, but it will be well worth the wait. By now, you probably know that IBM unveiled this product to groups of consultants, end users, the press and independent software developers last month. It was quite a show. I'm not sure anybody expected an OS/2 that would perform reasonably well on an Intel 80386-based machine with 2M bytes of memory running an OS/2 application and a DOS application simultaneously. On a Personal System/2 Model 70 with 6M bytes of memory, OS/2 executed Windows applications faster than the same machine booted with a native version of Windows 3.0.

OS/2 Release 2.0 supports every kind of PC application on the market, right out of the box, without you having to buy

Continued on page 48

Compaq cuts shrink on street

Actual price reductions are only a fraction of those publicized, users say

ANALYSIS

BY RICHARD PASTORE
CW STAFF

Compaq Computer Corp.'s recent pricing overhaul is proving too good to be true. Many users said street-price cuts are only a fraction of the published reductions. So far, the cuts have failed to boost sales substantially, according to dealers.

For the most part, Compaq dealers are not passing the full discount down to their customers because Compaq has made it relatively more expensive for dealers to buy the hardware. To avoid profit erosion, resellers are cutting back on the discounts they give customers — effectively withholding a portion of the manufacturer's publicized reduction.

"They're expecting a walloping discount, and we're unable to give it to them," said Tom Hudspeth, a Compaq dealer at Valcom, Inc. in Wichita, Kan.

Pharmaceutical firm Rhone Poulenc Rorer, Inc. said it is seeing roughly a 15% to 20% street-price reduction on products Compaq reduced on paper by 34%.

Deloitte & Touche in New York reported a 34% to 38% corporate discount on Compaq list prices before the April 16 pricing overhaul. Since then, its discount rate is down to 20% to 25% off the new list prices.

Companies buying equipment in small quantities may see

Continued on page 44

Taking it to the street

Compaq Computer Corp. customers are realizing smaller price cuts than Compaq advertised because the manufacturer changed dealer price structures

Sample Compaq DX 2/66/20 notebook computer system

Prereduction		Postreduction	
• List price:	$7,000	• List price:	$4,800
• Compaq discount to dealer:	40%	• Compaq discount to dealer:	30%
• Dealer cost:	$4,200	• Dealer cost:	$3,360
• Dealer discount to customer:	30%	• Markup added to dealer cost to maintain profit margin:	16%
• Dealer profit margin:	16%	• Customer cost:	$3,900
• Customer cost:	$4,900		

CW Chart: Darren St. John

Mathcad upgrade to offer Windows access

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Next month, users of Mathsoft, Inc.'s Mathcad application should be able to take advantage of Microsoft Corp.'s Windows 3.0.

Mathsoft, a developer of technical calculation software, said Mathcad 3.0 will also include "electronic handbooks" for instant access to standard formulas and constants, symbolic calculations for computer algebra and other features based on requests from a survey of more than 120,000 users.

Mathcad provides a blackboard metaphor for engineers and scientists and is the leader in the technical calculation market, said Tony Picardi, an analyst at International Data Corp. (IDC) in Framingham, Mass.

IDC recently surveyed 535 users of 11 mathematics packages. Mathcad led the pack with purchases by 12% of those interviewed. The closest competitor was Mathematica, which garnered a 5% share.

Only 3% continue to use slide rulers, Picardi added.

Priced at $495, Mathcad 3.0 will take full advantage of Windows, including the dialog boxes, pull-down menus, mouse point-and-click support, extended memory support and context-sensitive Help.

Time-savers

The built-in electronic handbooks are said to save time by providing researchable hypertext access to problem-solving information, which can be put to immediate use in Mathcad applications. Specifically, users can access information from Chemical Rubber Co. (CRC) reference handbooks.

External resources, including paper handbooks, are used by 74% of those surveyed by IDC; 15%, the largest grouping, use the CRC handbooks. Putting them on-line both speeds up the process for the user and takes him by the hand through calculations he may or may not remember how to do, Picardi said.

Support for symbolic calculations, an advanced math function, allows users to select symbolic functions from a Mathcad menu automatically. These are used to simplify formulas, expand or factor polynomials, solve for a variable and differentiate and integrate symbolically.

Other new features will include improved equation editing, enhanced plotting, improved memory support, built-in units and additional numerical functions. Optional Mathcad applications packs are available from Mathsoft and can be used to create customized capabilities for different disciplines.

Investing in Tomorrow's Bottom Line



Jerry Barnes, Chrysler Corporation

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In the fiercely competitive auto industry, programmers at Chrysler Corporation are using Micro Focus PC-based productivity tools to cut program development time and help move products from the drawing board to the showroom floor faster.

"The bottom line is that our business needs change quickly and we want to streamline the software development process as much as possible so Information Systems can be responsive to all of our operating units," said Jerry Barnes, Chrysler's Manager of Systems Engineering Technology.

Moving application development to a workstation environment allowed Chrysler to use its mainframe resources more efficiently and speed up development cycles by taking advantage of productivity tools not available in the mainframe programming environment. With this solution, programmer productivity improves greatly without a large investment in additional mainframe resources: an important consideration in uncertain economic times.

"The mind-set here a few years ago was, 'why would anyone want to do anything away from the mainframe.' Now, we have over 200 trained COBOL/2 Workbench users."

With the Micro Focus COBOL/2 Workbench, programmers can develop and maintain full-scale CICS/VS and CICS DL/I applications independent of the mainframe in a fraction of the time.

"We quantified the time spent on typical software development activities. We showed how we could make a code change, compile the program, detect an error, correct the error and recompile the program again in less time than it would take someone to logon to the mainframe and submit the first compile. In many cases, the developer would make the change on the PC in two to three minutes, while it could take close to 20 minutes on the mainframe."

Jerry Barnes made his case for Micro Focus COBOL/2 Workbench based on greatly improved productivity. The Micro Focus edit-check-debug cycle, now an industry standard for PC-based programming made a big impact on throughput and costs.

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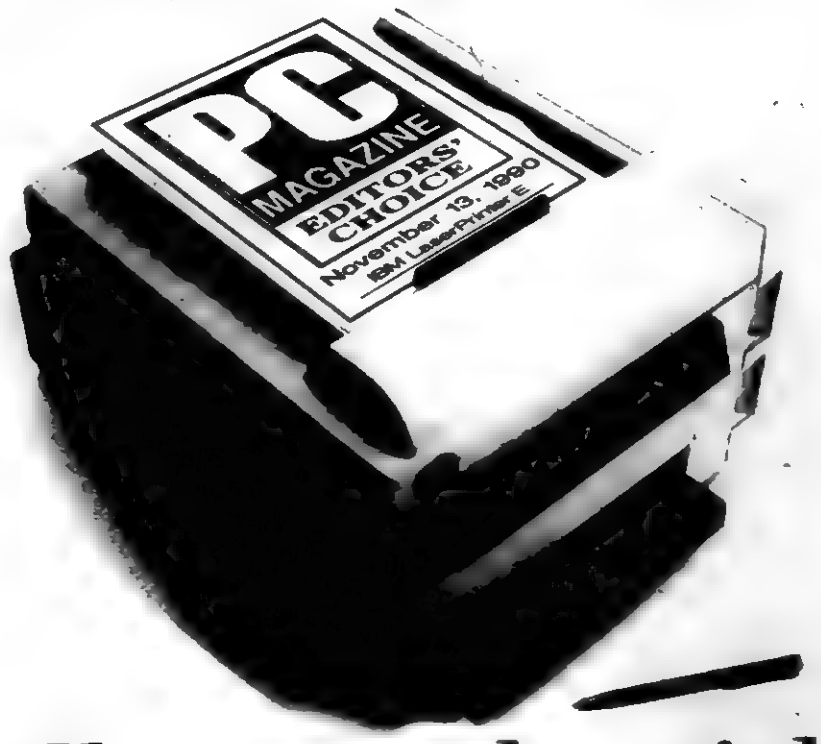
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Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
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AT&T furnishing wall-to-wall laptops

BY MICHAEL FITZGERALD
CW STAFF

BASKING RIDGE, N.J. — AT&T, hoping to lop 50% off its office leasing costs nationwide, is preparing to replace the four walls of an office with laptop computers for as many as 10,000 of its corporatewide salespeople.

"The vision we had was the application of technology so we could maximize the effectiveness of our sales force while maintaining customer service," said John Guerra, director of sales at AT&T's Business Network Sales Division.

According to Guerra, AT&T decided to look into the virtual office concept to see if it might improve its competitive position: "Our perspective was [that] it was risky not to do something in the marketplace that was dramatic," he said.

AT&T also aimed to address what it saw as a changing sales environment and demonstrate to its customers that it was committed to technology they use, Guerra said.

Two years ago, AT&T began discussing how to implement this vision. After it devised a plan in late 1989 for what it calls "the virtual office," it gave laptops to 2,500 salespeople in the southwest region of its Commercial Markets Group and sent them out into the field.

Late last year, AT&T decided to roll out the project on a nationwide basis.

What made the virtual office concept possible was the breakup of AT&T's telephone monopoly, which forced the firm to reorganize. Over the next four years, it developed a business automation platform centered on IBM and Amdahl Corp. mainframes linked to 25 smaller data centers with AT&T 3B-class minicomputers running AT&T's Unix.

The laptop users, who will standardize on the new laptop from Safari Systems, the AT&T and Marubeni Corp. joint venture, now use Intel Corp. 80286-based laptops from Grid Systems Corp. and Toshiba Corp. and 80386SX-based notebooks from AST Research, Inc.

AT&T is in the process of deciding what software applications will be standard; Microsoft Corp.'s Windows 3.0 will be the operating environment. An in-house product, Terra Nova, handles data communications.

The laptops function as mobile terminals connected to one of these data centers, said Roger Dalrymple, division manager of information technology.

Guerra said AT&T's Commercial Markets salespeople reported productivity gains between 5% and 45%, with a median increase of 15% to 20%.

Flexible technology

AT&T said it plans to implement technology on a flexible basis based on environmental factors. The density of New York will probably mean the area will operate traditionally, but California, with its concern for traffic flow and the environment, may see AT&T sales offices virtually disappear.

AT&T has been working with Indiana University's Just-In-Time Knowledge project to work out the societal and educational issues that face its workers as they move into a virtual office setting.

AT&T treats each office separately and attempts to do the same with each employee, encouraging employees to think about the impact of the concept on their work style and family life.

For those who do work out of the office most of the time, the plan is to keep common office space available.

Guerra said AT&T will implement the program "where it makes sense," which means that a significant part of its sales force will have a virtual office.

The Commercial Markets experiment worked well in part because the group was relatively new and expanded rapidly during the experiment's run. More established business units might not be as open to change.

Still, AT&T is committed to the rollout of the project. "This is something that will go on with no time restraint," Guerra said.

Child's play

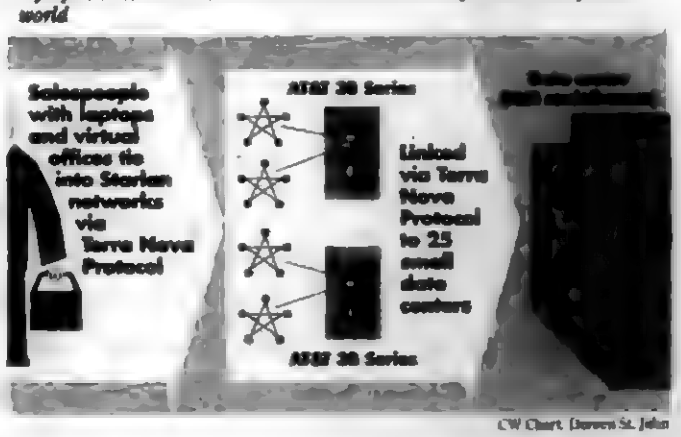
To define the information needs of a virtual office, AT&T put 12 people in a room with three sets of Tinker Toys and told them not to come out till they had a model for the architecture.

"It was kind of like an EST experience," commented Roger Dalrymple, manager of information technology at AT&T's Business Network Sales Division.

The approach worked. Four days later, the dirty dozen emerged with an information architecture "that allowed for continuous improvements and maximizing of customer service information," said John Guerra, the division's director of sales. "And that began our journey to what we call the virtual office."

Walls tumbling down

Many AT&T salespeople will be virtually without offices when they take laptops on the road and communicate electronically with the corporate world



CW Chart: Doreen St. John

Asymetrix boosts Toolbook

BY JAMES DALY
CW STAFF

BELLEVUE, Wash. — Asymetrix Corp. has announced a revamped and speedier version of Toolbook, its object-oriented programming tool kit for Microsoft Corp.'s Windows 3.0 graphical environment.

Toolbook Release 1.5 addresses many of the performance concerns users have voiced about the 1-year-old application, including the need for faster page drawing, sorting and searching. The update offers support for bit-map files of up to 1M byte, the ability to import graphics and increased networking and printing support.

One of the most impressive aspects of the update is an improved Daybook personal organizer that can load, display, sort and search at twice the speed of the sluggish earlier version, Asymetrix President Paul Allen said.

Release 1.5 also includes a utility that helps create three-dimensional buttons and lists box fields and dialog boxes.

Beta-test users said the new features will make Toolbook an important addition to their development environment. "Release 1.5 eliminates all prior excuses for writing complex applications in C," said Keith Crosier, president of Windows developer Intelilink, Inc.

Toolbook 1.5 also features enhanced dynamic link library support that allows users to exchange data between custom Toolbook applications and non-Toolbook applications. Expanded dynamic data exchange (DDE) support also improves performance for applications requiring heavy DDE use.

Toolbook will be available this month for $395, Asymetrix said. The upgrade from Version 1.0 will cost $75. Version 1.5 of the Toolbook Author's Resource Kit, a package of development utilities and applications examples, is slated to be available next month for $450.

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SPF/2 takes advantage of OS/2's powerful features. It uses virtual memory to handle very large files. In addition, HPFS (High Performance File System) long file names are supported. And SPF/2 uses OS/2's REXX for its macro language—75 mainframe-compatible ISREDIT edit sub-commands provide the interface.

SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 even displays the same status indicators.

SPF/2 has features not available on the mainframe. For example, SPF/2 supports 48 PF keys, automatically adapts to the various OS/2 video modes (full-screen or text-window), and scrolls the file as you move the cursor. In addition, SPF/2 has virtually instantaneous response time, 100% system availability, and no connect-time charges.

If you have a departmental or company-wide need for SPF/2, a special cost-effective Multi-User License is available directly from CTC. For information, call our Sales Department at (800) 336-3320.

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Tool makes databases graphical

BY CHRISTOPHER LINDQUIST
CW STAFF

ATLANTA — Users looking to integrate images with their current database applications may find some help in Quickpix, an image tool created by software firm Powersoft, Inc.

Quickpix reportedly allows users to assign images to database records through the use of "triggers," or keywords, from application screens. When a trigger appears, a terminate-and-stay-resident program locates the proper image on the user's hard disk and displays it on the screen. Users can define the size and location of the images, which can be scrolled, zoomed, resized and displayed in either color or gray scale on color graphics adapters through Super VGA monitors.

Steve Hadjistyllis, a programmer/analyst at Management Information Technology, Inc., a software company in Long Beach, Calif., used Quickpix to develop a software package that assists users in choosing pumps for oil wells. The program asks the user questions while Quickpix displays explanatory pictures.

The firm included the pictures because the pump selection package was to be operated in foreign countries by users who would not necessarily have a sufficient understanding of English.

Hadjistyllis said Quickpix was easy to configure and operate and added that his firm plans on using it again, especially if Powersoft designs a way to keep the image on-screen while the primary application continues working underneath it. "The way it is now, if you want to continue with your program, the picture has to go off the screen," he said.

Richard Hooker, president of Powersoft, said the next release of Quickpix would include such a feature.

Tom Isaac, a principal at ICA-Trinova, Inc., an international consulting firm in Newnan, Ga., has been using Quickpix for about one month. His firm is currently developing a software product for the utility industry to help manage such functions as site work, repairs and inventory. He said that Quickpix could display 256-color Super VGA images in about 10 seconds, which he said he considered an acceptable delay.

Quickpix is currently available and is priced at $495 for a single unit, which includes a license for up to four additional users.

Compaq

CONTINUED FROM PAGE 37

virtually no reduction. "We haven't seen any change in the last two weeks," said MIS Director Sam Colello, who priced two Compaq portables for Oil-Dri Corporation of America. "Compaq just moved some dollars around; I don't think they significantly lowered the cost," added Bruce Greif, project analyst at County Natwest, Inc. in New York and a member of the Microcomputer Managers Association.

Compaq's dealer-charge restructuring may let resellers offer better deals on competitors' products. For example, Compaq's LTE 386S/20 now lists for $1,200 less than IBM's new laptop. But superior discounts on the IBM product bring its street price down to only $250 more than the LTE's, one dealer said.

This hard pricing reality has disgruntled some users.

"What good do the cuts do us if our [dealer] discount goes down?" said Don Stevenson, technical services analyst at financial services firm The Boston Co., which lost 14 percentage points off of its corporate discount. The firm will now offer its clients a low-cost clone alternative to Compaq and IBM Personal Computers, a decision it might not have made had the full Compaq reductions been realized, Stevenson said.

Other users are more forgiving. The discount is deflated, but "it's still the same machine for less money," said Fred Zickert, manager of microcomputer support at Cleveland-based Eaton Corp. "Now, clearly, the value is with Compaq equipment" vs. other clones, he said.

A minority of users reported some dealers passing the entire list reduction to users. The resellers are willing to sacrifice profit to generate volume and win accounts from competitors. But this practice has devastated dealer profitability in the past and is not likely to be the norm.

"It would be nice for a change to see dealers try to hang on to the profit and not cut the price all the way to the floor," said Valcom President and Chief Executive Officer William Fairfield, who predicted that most dealers will withhold a share of Compaq's cut.

There is little evidence so far that the cuts have increased sales, several dealers said. But Compaq purchases at Eaton have indeed gone up. Departments have been able to order more machines because the new prices come in under the wire of departmental budgets, Zickert said.

Compaq North America Vice President Ross Cooley said early anecdotal evidence shows significant numbers of customer accounts reconsidering Compaq over low-priced clones. Cooley admitted the price cuts may look better on paper than on the street, but he stressed that "the price of Compaq products today is absolutely less in each and every product than before we made the change."

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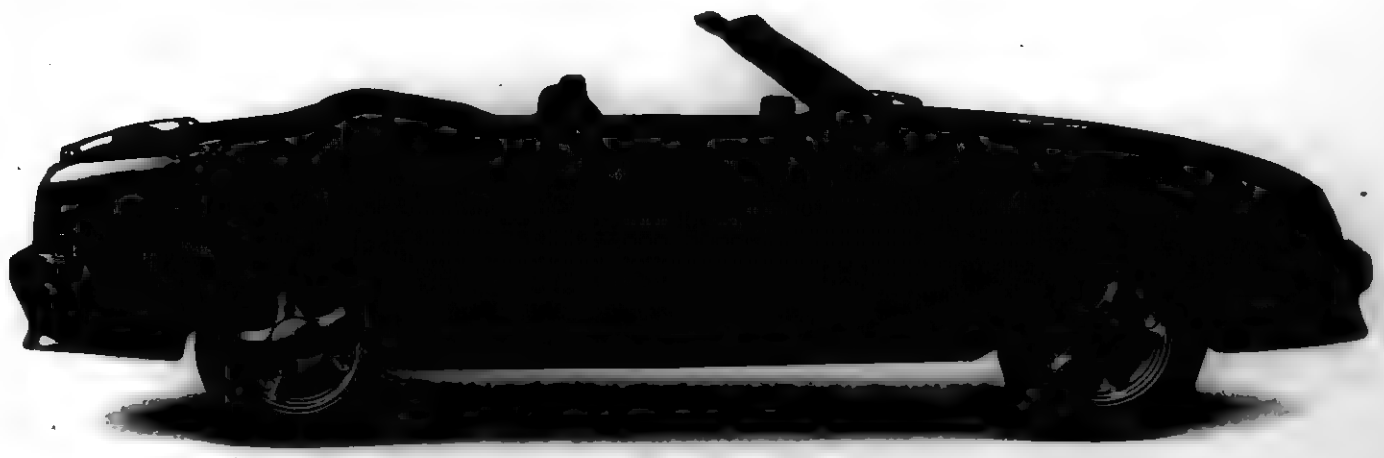
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MICRO BITS

Microsoft unveils its first Macintosh scheduling tool

Microsoft Corp. unveiled its first scheduling application recently with the introduction of Schedule+ for the Apple Computer, Inc. Macintosh. The new time management package can be added onto Microsoft Mail for Appletalk networks Version 3.0. Schedule+ is expected to be available at the end of this month and will cost $195 for five nodes and $775 for 20 nodes. Separately, the Redmond, Wash.-based firm said it will provide developers with its object-oriented architecture format in order to encourage the production of object-oriented development tools for Windows.

Computer Associates International, Inc. has slashed the suggested retail price of its Supercalc5 from $495 to $149 — a 70% drop.

Software Publishing Corp. in Mountain View, Calif., demonstrated its new Virtual Media Control Interface at the recent **National Computer Graphics Association** trade show. The interface is compatible with Microsoft's Media Control Interface for multimedia extensions to Windows 3.0 and will be integrated into future products from Software Publishing, including the Harvard Graphics presentation graphics package.

Revelation Technologies, Inc. recently announced that it has formed an alliance with **Hunter Systems, Inc.** Under the agreement, Hunter will port Revelation's Advanced Revelation relational database management system to Unix. Advanced Revelation currently runs on DOS and OS/2.

Grochow

FROM PAGE 37

DOS or Windows. Users can view either one DOS application using the full screen or simultaneously view multiple programs in individual windows. It was pretty impressive to see Lotus' 1-2-3, Ashton-Tate's Dbase and an asynchronous communications package, each running in separate windows in a true multitasking mode (which means that IBM has licked the problem of how to put "ill-behaved" programs such as 1-2-3 inside a window). The same is true for Windows 2.1 and Windows 3.0 applications. You can even transfer data back and forth among them.

There are some other interesting goodies. If you try very hard, today's DOS gives you about 600K bytes of memory for applications. DOS applications running under OS/2 Release 2.0 will have almost 630K bytes available, including mouse and network drivers, and you can "dial" as much extended memory as you need, up to 32M bytes. All this for as many simultaneous DOS sessions as you want, with real memory and disk space as the only constraints.

If you have special drivers for terminate-and-stay-resident programs you want to check out under a particular version of DOS Windows, you can boot that version in any number of multiple DOS sessions.

As for network connections, the questions are not all answered. The folks from Novell demonstrated their client drivers in "alpha" form. They said that if the betas aren't ready soon, normal DOS drivers will run in a DOS session. Simultaneous LAN Server connections will be there, too, on both Novell and LAN Server. IBM also showed an Open Software Foundation Distributed Computing Environment setup between OS/2 and a RISC System/6000 running AIX.

The question now is, why would any 386 user buy DOS or DOS with Windows? The answer will become more apparent when OS/2 2.0 ships later this year. As you become more adventurous, you can open up some of the other capabilities and begin to see how OS/2 can make all but the most novice PC user more productive. Certainly, this is IBM's strategy for rapidly increasing the number of copies of OS/2 in the field, and I think it will work — particularly for a $99 trade-in from any existing DOS version until the end of the year. (If IBM still has its marketing smarts, it will extend the offer.)

Meanwhile, hundreds of beta-test copies are already in the field. Any IBM employee can download it from the company's internal systems, and hundreds of additional copies will go out during the next several months. In fact, IBM is sending disks of the beta-test copy to any press conference attendee who wants one. This shows the high degree of confidence IBM has in OS/2 reliability and the likelihood that it will ship as scheduled.

In OS/2 Release 2.0, IBM is promising delivery of everything Gates promised for OS/2 Release 3.0 (also called New Technology OS/2) in 1993 (and arguably more). Why IBM waited until now to demonstrate these capabilities and let Windows get such a runaway head start on the market is anybody's guess. My reckoning is that it took Microsoft to publicly commit to a Windows application programming interface to stoke up the fires at IBM. The results are very impressive. For that, I say, "Thank you, Bill Gates."

Grochow is vice president of the Corporate Technology Group at American Management Systems, Inc.





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Panasonic's KX-P4420: Small price, big size

Technology Analysis — A roundup of expert opinion about new products. Summaries written by freelance writer Suzanne Weixel.

Panasonic Communications and Systems Co.'s KX-P4420 laser printer presents a bit of a paradox, reviewers reported. It is priced inexpensively enough to serve for personal use, yet it is too big for a desktop, and its lack of paper-handling features is a drawback in a shared environment.

Output: The KX-P4420 has fine print quality, in part because of its print density controls. It has 11 resident fonts and uses proprietary font cards, which, if you already own other font cartridges, may be a problem.

Performance: Despite its eight page/min speed, which is fast enough to support a small office or work group, the KX-P4420 lacks some paper-handling features, such as dual-bin capacity. It has 512K bytes of random-access memory, expandable to 4M bytes.

Ease of use: The KX-P4420 is difficult to set up and has an awkward shape, reviewers reported.

Service and support: Panasonic's support line can be hard to reach.

Value: With features best described as standard, the KX-P4420's most compelling quality is price, reviewers agreed. It lists for $1,395.

Panasonic Communications and Systems Co. KX-P4420

Reviewers	Output	Performance	Ease of use	Service & support	Value	Score
Infoworld 12/10/90	Excellent	Excellent	Very good	Good	Excellent	7.5*
PC/Computing 8/90	Standard	Good speed	Bare-bones features	NC	A bargain	Fast, inexpensive
PC World 2/91	Excellent	Excellent	Fair	NC	Excellent	Best buy
Users						
David Kantroff, Pipeline Management Services	■	■	■	▙	■	Fast, quality output
Richard Bellobet, Dutch Maid, Inc.	■	■	■	NC	■	Great value
James Ambrosino, Reliable Packaging, Inc.	▙	▙	▌	NC	■	Meets expectations
Analysts						
Susan Reiss, Datapoint, Inc.	▙	▙	▙	▙	■	Excellent
William Gott, Gartner Group/Infocorp	▙	▙	▙	▙	▙	Good deal
Marc Bass, MIS Strategic Decisions	▙	▙	▙	■	■	A bargain

Key: ■ Very good ▙ Good ▌ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC: No comment. *Infoworld score based on 1 to 10 ratings

Panasonic financial ratings

Analysts	Long-term stability	Short-term performance
Takahisa Okabe, New Japan Securities	■	▙
Ross O'Brien, Pyramid Research, Inc.	■	■

Matsushita Electric Industrial Co., Panasonic's parent company, earned $36.7 billion in 1990, a 9% increase over 1989. The printer division increased sales by 24%

Panasonic responds

Peter Rayman, product manager, laser printers:

Output: Our product line includes an Adobe Systems, Inc. Postscript printer.

Performance: Although it is fast enough to be shared, it was designed for a single user who does a lot of printing in an office environment.

Service and support: We have upgraded our telephone support within the past few months.

Okidata's OL 820: Lightweight, fast, reliable

Okidata Corp.'s OL 820 LED Page Printer

Reviewers	Output	Performance	Ease of use	Service & support	Value	Score
Byte 12/90	No difference	Fast	Good	May be more reliable	NC	Lower alternative
PC Computing 8/90	Admirable	Blew past competition	NC	NC	Best bet	Fast, not fancy
PC World 9/90	Poor	Excellent	Fair	NC	Fair	Not without its merits
Users						
John Carven, Jupiter Technology, Inc.	▙	■	▙	■	■	Good buy
Joyce Farnsworth, JEF Associates	■	▙	■	■	■	Reliable
Christopher Horvath, Stonybrook Technologies, Inc.	■	■	▙	▙	■	Reliable, with a plus
Analysts						
Robert Parnell, Datapoint, Inc.	■	■	▙	▙	■	Good, but not for everyone
William Gott, Gartner Group/Infocorp	■	■	▙	▙	▙	Good price
Marc Bass, MIS Strategic Decisions	■	■	▙	■	▙	Niche product

Key: ■ Very good ▙ Good ▌ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC: No comment

Okidata financial ratings

Analysts	Long-term stability	Short-term performance
Takahisa Okabe, New Japan Securities	■	■
Ross O'Brien, Pyramid Research, Inc.	■	▙

Okidata Corp. does not release financial information. Ratings were obtained from financial analysts who follow the company

Okidata responds

Michael Grabel, product manager:

Output: Sometimes printing is lighter because of environmental factors such as humidity.

Performance: There are currently seven DOS applications that support the OL 820 in font-scaling mode.

Ease of use: Keeping the toner and drum separate maximizes life span and is more cost-effective.

Using LED technology rather than laser, Okidata Corp.'s OL 820 LED Page Printer offers a lightweight, fast and reliable alternative to mainline laser printers, [illegible].

Output: Some reviewers claimed the OL 820's output is lighter than a laser's, even on the darkest of five settings. Font and graphics support, however, is extensive, including a proprietary font-scaling scheme, font rotation, shadowing and shading.

Performance: The OL 820 prints at eight page/min. It has a front-loading 200-sheet paper tray, two slots for proprietary font cards and 512K bytes of random-access memory, expandable to 4M bytes.

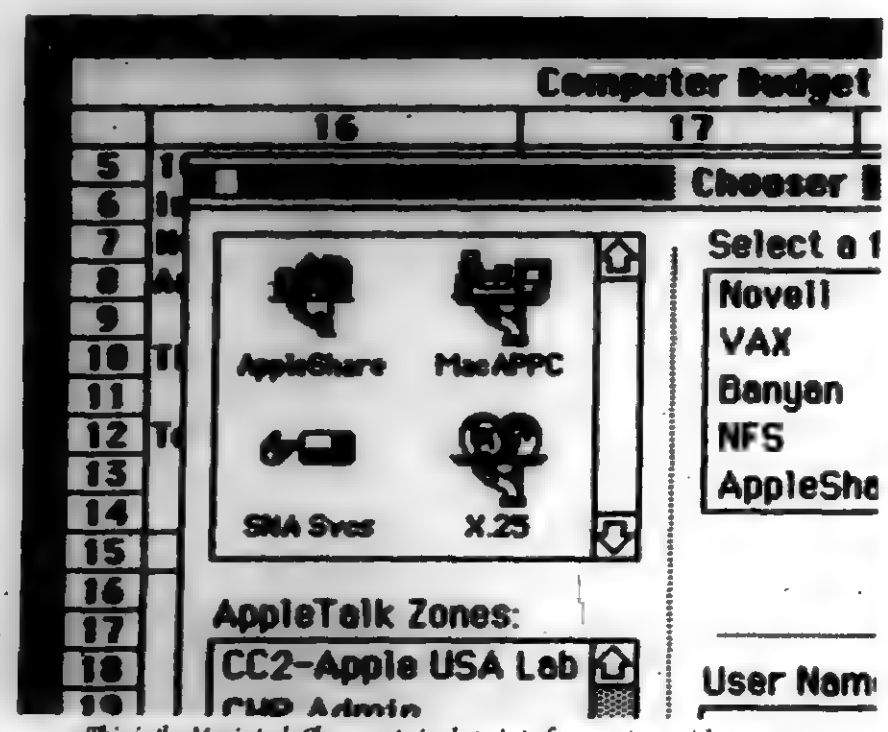
Ease of use: The toner cartridge and drum must be replaced separately. Otherwise, the printer's design is simple, and its controls are intuitive.

Software and support: LED printers have fewer moving parts than lasers, so they should be more reliable. The OL 820 comes with a five-year parts warranty.

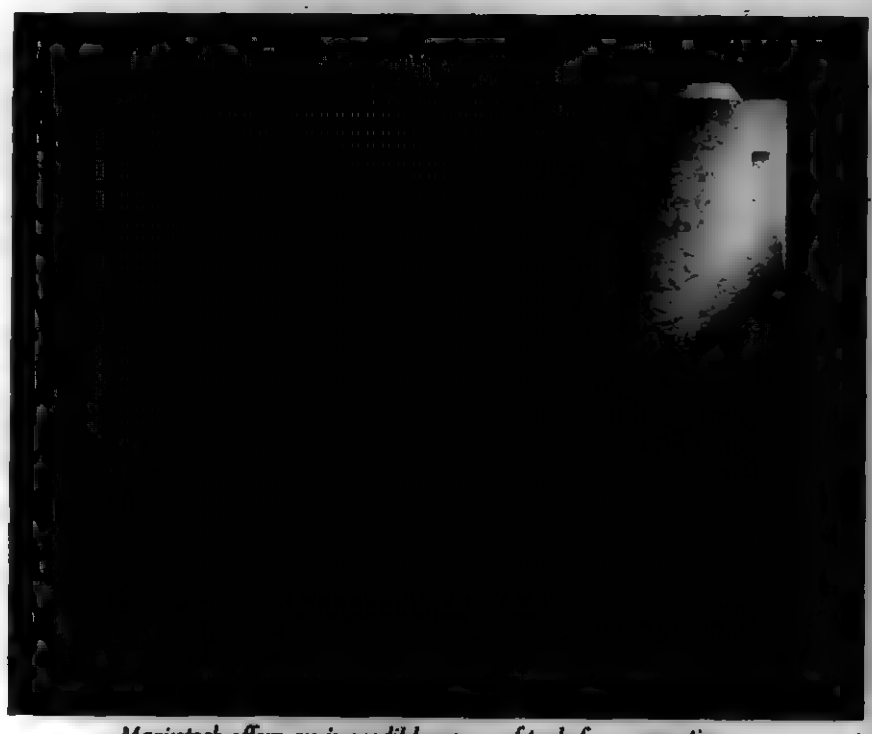
Value: Reviewers agreed that if you can do without Adobe Systems, Inc.'s Postscript, this printer offers low price, high performance and a little extra in terms of font support.

It lists for $1,999. An additional 200-sheet paper tray costs about $300, while a replacement controller for adding Postscript costs $1,595.

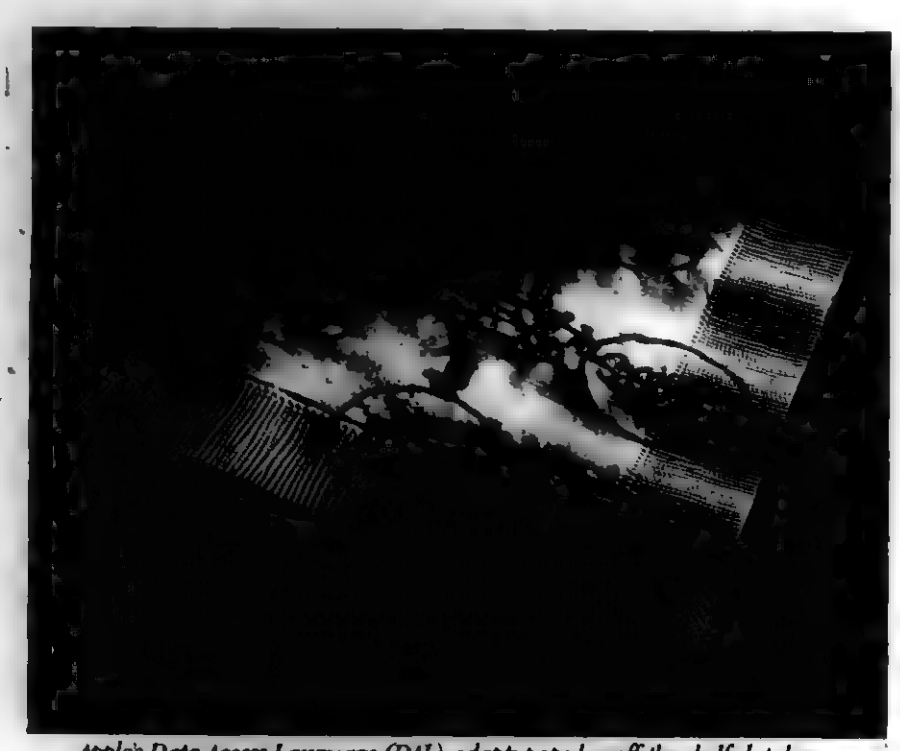
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Apple A/UX® lets Macintosh run UNIX® applications plus thousands of Mac® programs. At the same time you can run X-Window and MS-DOS applications, and cut, copy, and paste between any of them. No other desktop computer can do this.

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to anything.



Macintosh shares data with DOS PCs via Novell, 3Com, Banyan, and more. Macintosh reads and writes DOS files on a floppy disk. Macintosh runs DOS programs. Maybe your next DOS computer should be a Macintosh.



Information isn't much good to people who can't get to it. Macintosh sorts out the complexities of multiple computer systems and presents vast information to people at the desktop in a single, consistent way.

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While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

What is politely referred to as the "multi-vendor environment" is an amalgam of disparate hardware, incompatible operating systems, dissimilar databases, and multiple networks. Nevertheless, IS people are expected to make these all work together in perfect harmony.

But lately, a lot of people are finding the source of their solution a pleasant surprise: the Apple® Macintosh® computer.

They're finding that Macintosh comes out of the box with sophisticated networking capabilities designed right in.

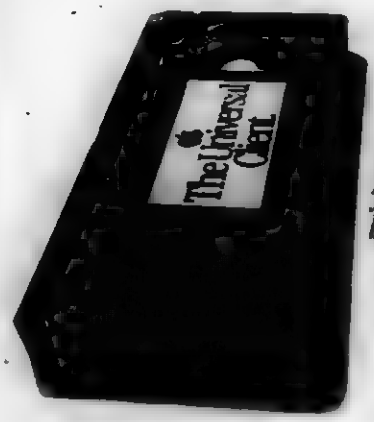
That Macintosh is open to virtually any host, any file server, or any database, through any network.

That Macintosh makes the desktop the place where diverse systems come together.

And that with Macintosh you can build systems that let even nontechnical users access information from the desktop, no matter where that information resides.

And because Macintosh works with all your networks, databases, and hosts in one consistent and graphic way, it delivers major savings in implementation and training.

In short, Macintosh gives you the power to make information systems more valuable to the people who use them. The power to be your best.®



Macintosh gives people a single, simple view of the information and services that can help them do their jobs and serve your organization. See for yourself. Call 800-635-9550, ext. 551, and we'll send you a free video showing how Macintosh helps unify complex systems.

NEW PRODUCTS

Systems

Packard Bell has released some additions to its Legend series of personal computers.

Included in the line is the Legend 100, an Intel Corp. 80286-based computer with a 40M-byte hard disk, priced at $1,499. The company said it expects street prices for the system to be less than $1,000. Packard Bell also introduced Legend computers based on Intel 80386 and 80386SX processors.

A graphical user interface called PB Desktop will be installed on all Legend systems.

PB Desktop is mouse-driven and includes an on-line tutorial, menu creation facilities and Packard Bell support policy information.

Packard Bell
9425 Canoga Ave.
Chatsworth, Calif. 91311
(818) 773-4400

Aquiline, Inc. has released a 4½-pound, 1.4-in. thick notebook computer based on the Intel Corp. 80386SX processor.

The standard configuration includes a 20M-byte hard drive, 3½-in. floppy drive, 1M byte of system memory and an IBM Video Graphics Array display. DOS 4.01 and several utilities programs are included with the system. Memory is expandable to 4M bytes.

The notebook computer is priced at $2,995.

Aquiline
449 Main St.
Bennington, Vt. 05201
(802) 442-1828

Software applications packages

Bestinfo, Inc. has unveiled Picbase, an OS/2-based image archiving system intended for use with networked publishing systems.

Picbase stores high- or low-resolution images and features sort-and-search relational database facilities based on user-defined image labels. The product ranges in price from $15,000 for the first seven users to $80,000 for networks of more than 50 users.

Bestinfo
1400 N. Providence Road
Media, Pa. 19063
(215) 891-6500

Xing Technology Corp. has announced extensions for the VT-Compress Joint Photographic Experts Group (JPEG) image compression software.

VT-Compress for Windows adds JPEG compression capability running under Microsoft Corp.'s Windows 3.0. Compression ratios of up to 20:1 can be achieved for color images, according to Xing.

VT-Compress Linkable Libraries allow integration of JPEG compression into user-developed applications written in Borland International, Inc. or Microsoft versions of the C language.

VT-Compress for Windows costs $259. VT-Compress Linkable Libraries cost $179 per copy.

Xing Technology
456 Carpenter Canyon
Arroyo Grande, Calif. 93420
(805) 473-0145

A compact disc/read-only memory-based database of marketing information on U.S. businesses has been released by American Business Information (ABI).

The product, Lists-On-Disks, contains data on 9.2 million businesses. Information on company size, location and primary business is included.

A free update with a contact name at each target company will be released in July, according to ABI.

A one year license costs $750.

ABI
5711 S. 86th Circle
Omaha, Neb. 68127
(402) 593-4500

Software utilities

PC Dynamics, Inc. has announced Menuworks Advanced, a hard disk access and menuing utility for novice personal computer users.

Menuworks compiles a list of all applications that are present on the hard disk and groups them according to their general function. The program then constructs a menuing system using single-stroke commands.

PC Dynamics reported that the program allows first-time computer users to become productive very quickly. Also included are security features, macros and time-delay backup capability.

Menuworks Advanced costs $129.

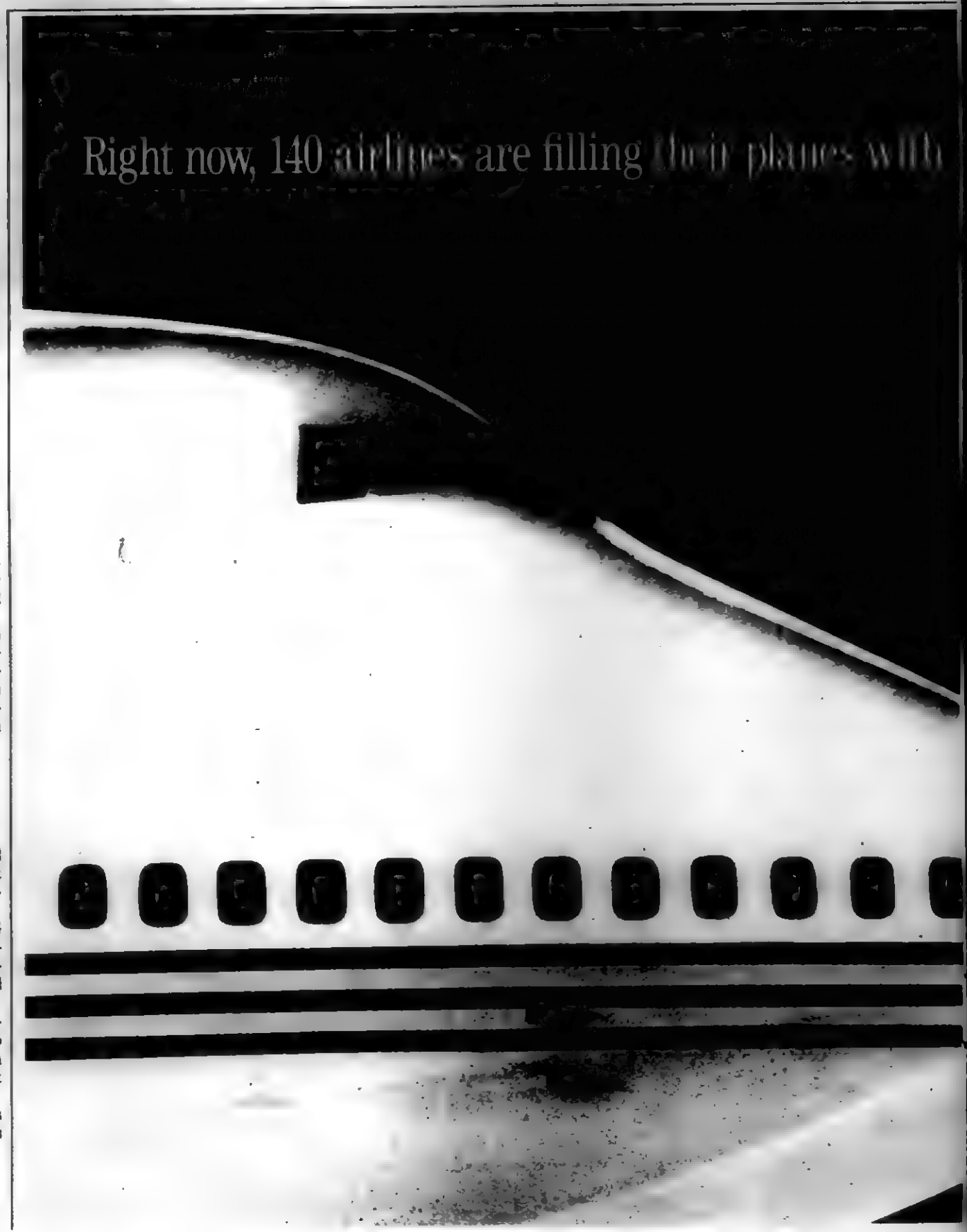
PC Dynamics
31332 Via Colinas #105
Westlake Village, Calif. 91362
(818) 865-1741

Development tools

32 Bit Software, Inc. has enhanced its Zbasic-PC, a product for developing 32-bit software on any DOS-based personal computer.

Version 4.6 allows code written on an IBM Personal Computer AT to be recompiled for Intel Corp. 80386 and I486 machines. It includes network support, communications capabilities and device-independent graphics.

The retail price is $150; however, an introductory price of $100 is offered for a



limited time. Upgrades from previous versions cost $60.

32 Bit Software
Suite 865
3232 McKinney
Dallas, Texas 75204
(214) 720-2051

Template Graphics Software, Inc. (TGS) has introduced Figaro+ for IBM RISC System/6000 workstations.

Figaro+ is a three-dimensional graphics programming tool kit that implements the Programmer's Hierarchical Interactive Graphics System standard for engineering and scientific applications development.

The product includes enhanced graphics control, programmable triggers, immediate mode support and simulated input devices.

Pricing for Figaro+ on the IBM workstation platform begins at $3,000.

TGS
3510 Dunhill St.
San Diego, Calif. 92121
(619) 457-5359

Innovative Data Solutions, Inc. has begun shipping Paragen 2.2 code-generation software for Borland International, Inc.'s Paradox relational database.

Paragen includes a file manager element that retrieves a specified Paradox file from the user's hard disk. When a file and a Paradox Engine function to be performed on the file are selected, Paragen automatically generates the necessary code in C, C++ and Pascal languages. The product also creates new database tables without loading Paradox.

The product costs $129.

Innovative Data Solutions
4318 Stewart Court
East Chicago, Ind. 46312
(219) 397-8952

Peripherals

Great Software Ideas, Inc. (GSI) has introduced the GSI-EHD, a 2.88M-byte floppy disk controller for personal computers.

The product transfers data from a 2.88M-byte disk at a rate of 1M bit/sec. It uses standard floppy disk cables, supports two disk drives and is backward-compatible with 1.44M-byte disks.

The GSI-EHD controller, with cables and frame, is priced at $115. A kit including the controller, a 2.88M-byte floppy drive and one disk is available for $295.

GSI
17951 H Sky Park Circle
Irvine, Calif. 92714
(714) 261-7949

Moniterm Corp. has announced a high-resolution display system for laptop computers.

The system combines the company's 20-in., 1,280- by 1,024-pixel monochrome Viking 3/91M monitor and the PC1280M, a short-slot video board that is compatible with many portable computers.

The system was designed for fast, hardware-driven screen refresh rates, according to Moniterm.

The product costs $1,490.

Moniterm
5740 Green Circle Drive
Minnetonka, Minn. 55343
(612) 935-4151

Film Division, Inc. has announced a service providing high-resolution slides and transparencies from computer images.

The technology supports most personal computer graphics and computer-aided design programs and some Apple Computer, Inc. Macintosh presentation graphics packages, according to Film Division. Files submitted either on disk or by modem can be reproduced in color 35mm slides or 4- by 5-in. transparencies or negatives. Resolution is 8,000 lines per image for transparencies and 4,000 lines per image for slides.

Rates start at $7 per slide.

Film Division
676 N. LaSalle St.
Chicago, Ill. 60610
(312) 642-3362

Macintosh products

Aura CAD/CAM, Inc. has lowered prices for its Aura computer-aided design software line for the Apple Computer, Inc. Macintosh.

The price for the two-dimensional Auracad 3.0 has been lowered from $1,399 to $599. Copy protection has also been removed, and the company announced it will include both color and black-and-white versions of the software in every package.

Aura CAD/CAM
2335 Alaska Ave.
El Segundo, Calif. 90245
(213) 643-5300

PSI Integration, Inc. has introduced two products to expand the capabilities of the Apple Computer, Inc. Macintosh LC.

The PSI Multicolor is a color video single in-line memory module that allows the Macintosh LC to use 16-bit color without adding a video card. The Multicolor is priced at $159.

The PSI Crunch-It is a math coprocessor card based on a 16-MHz Motorola, Inc. 68882 chip, priced at $179. According to the company, adding the card gives users access to several spreadsheet packages that could not otherwise be run on the Macintosh LC.

PSI Integration
Suite 200
851 E. Hamilton Ave.
Campbell, Calif. 95008
(408) 559-8544

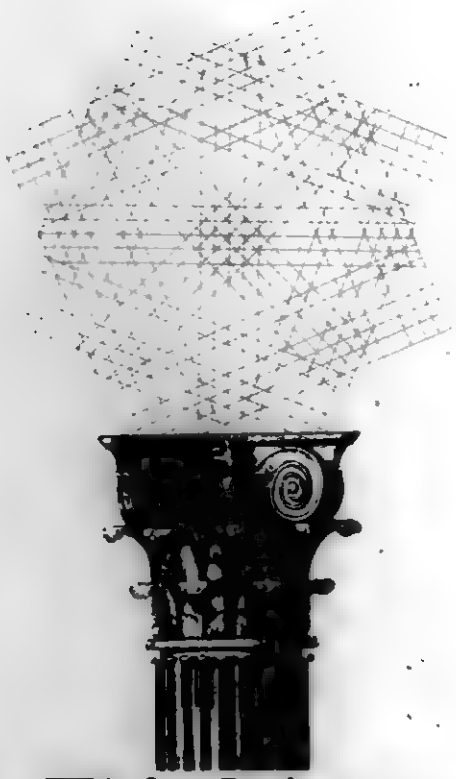
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23. Dir./Mgr Sys Development, Sys. Architecture
31. Mgrs., Supvr of Programming, Software Dev.
32. Programmers, Software Developers
99. Sys Integrators/VARs/Consulting Mgt.
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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management



OTHER PROFESSIONALS
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13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management



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80. Educator, Journalists, Librarians, Students
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Fresh faces give FCC new views

ANALYSIS

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — A rare thing happened over at the Federal Communications Commission earlier this month — rare because it did not involve any lawyers trying to tweak or exploit communications regulations for their clients.

The five commissioners held an unprecedented hearing on "Networks of the Future" to get advice from people they do not ordinarily hear from, including network users, technologists and assorted public policy experts. The FCC needs to do more than react to the "regulatory in-box," explained Chairman Alfred C. Sikes. "We need to understand commercial, technical and regulatory relationships better."

What the FCC heard from the witnesses is that rapid changes in technology will soon make today's regulations, derived from a 1934 statute, very outdated. "We need to . . . rethink the current structure of regulation from the bottom up," said G. Mitchell Wilk, a commissioner at the California Public Utilities Commission.

Dale N. Hatfield, a telecommunications analyst in Boulder, Colo., said the trend toward multimedia communications — fluid combinations of video, audio and text or data — leads to a blurring of traditional service distinctions and raises a host of regulatory issues.

Under current regulations,

Continued on page 57

IBM edges closer to Netware

Move to Netware not seen as end to LAN Server, IBM executive claims

BY JOANIE M. WEXLER
CW STAFF

IBM wants to make the nuances between IBM's OS/2 LAN Server and Novell, Inc.'s Netware as subtle as those "between a Buick and an Oldsmobile," said Bob Roth, IBM's manager of enterprise local-area network communications strategy and design. That is the goal of technical cooperative efforts between the two vendors, he said in an interview at IBM's Research Triangle Park, N.C., facility recently.

IBM is holding fast to the "separate but equal" position it took in February, when it announced it would market Novell's widespread Netware network operating system alongside its own offering, OS/2 LAN Server. The move was deemed by some industry observers to be a death knell for LAN Server, a perception Roth said was incorrect.

On a technical basis, Roth said, customers today could choose either network operating system. "We don't know what people will do. That decision will depend on individual preferences."

However, he added, "I really do feel we're putting the same energy and attention into both LAN environments. The two networks are very close to each other functionally, though people have trouble believing that."

Roth said that "interoperability from a communications and management perspective is the biggest customer issue today."

However, Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C., said that while "interoperability is what the whole Novell/IBM relationship is about, by definition, if two things have to be made interoperable, that's an admission that they're not the same."

He said that the Netware/LAN Server choice is not the "draw" Roth paints. In situations where a company requires a stand-alone LAN, "there's no reason for Netware not to be sold." But for integrated LANs needing security and interconnection to mainframes, he said, LAN Server is the better choice.

> "IT'S NOT CLEAR to me which way IBM is going to go."
>
> JERRY NOBLE
> AMERICAN CANCER SOCIETY

IBM decided in mid-1989, Roth said, that it could not ignore the Novell-dominated distributed environment, "just as Novell couldn't escape the mainframe path." IBM formed the Enterprise LAN Group in mid-1990 to bring together the two [illegible].

The relationship has "caused confusion for the IBM customer," commented Steve Morse, an information systems officer at Manufacturers Hanover Trust Co. in New York, a large Netware shop. "Many customers aren't sure which to buy or why. For us, we know we want Netware. Once you have it and it's satisfactory, why mix envi-

Continued on page 61

FEATURE: UPGRADING OLD NETWORKS

Money talks, managers balk

BY LARRY STEVENS
SPECIAL TO CW

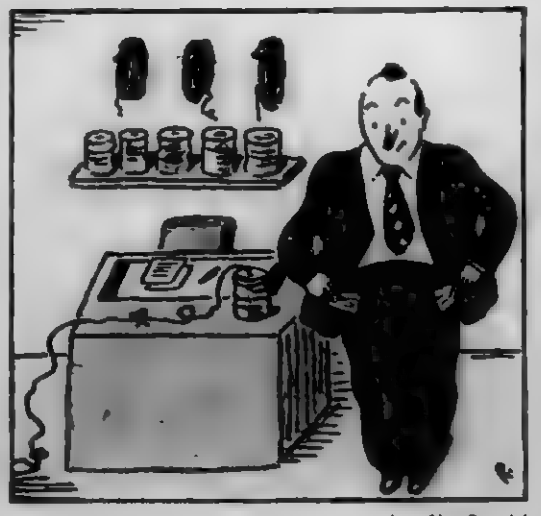
Arcnet. PC Net. Netware 86. MAP 2.1. These and other proprietary networks and protocols were the engines that drove computing communications in the early to mid-1980s. Now, they have long since been outstripped by more open, efficient choices. But that doesn't mean they have gone away. A struggling economy and a continuing cost consciousness within information systems have left managers tending relatively ancient networks, waiting for the day they can upgrade.

In almost all cases, the reason to remain with an old network is an economic one. "Our current [Datapoint Corp.] Arcnet system costs us virtually nothing now," says Timothy Ostrom, IS director at Data Forms Co. in Brighton, Mass. "We have no lease payments, no installation costs, no maintenance fees."

Since 1986, Data Forms has been doing all maintenance in-house; when Ostrom needs parts or additional equipment, he can buy them on the used market for far less than their old retail price. For example, he recently picked up a 100-user system, including terminals and cables, for about $400. The same system would have cost more than $6,000 in 1985, he says.

Companies have to weigh two factors when considering upgrading: the advantages of a modern system vs. the cost of converting. For some, that cost is simply too great. William Lawrence, supervisor of the network engineering group at Southern California Edison, says his expected

Continued on page 60





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IBM gears AS/400 for enterprise network

BY ELISABETH HORWITT
CW STAFF

With its most recent wave of Application System/400 announcements, IBM continued repositioning the midrange system from a departmental processor to a key player in large customers' enterprisewide distributed networking strategies.

"Originally a stand-alone application processor, the AS/400 is obviously changing, with IBM's recent networking enhancements, to a much larger part of much larger networks," said Mark Leary, director of communications research at Framingham, Mass., research firm Technology Investment Strategies Corp.

Among the announcements that significantly added to the AS/400's networking prowess were the introduction of Open Systems Interconnect (OSI) support; internal Integrated Services Digital Network (ISDN) support; integration with Novell, Inc.'s Netware; and greater flexibility in network configuration.

IBM announced an AS/400 version of the OSI Communications Subsystem, which previously ran only on IBM MVS and VM hosts. The subsystem is said to allow AS/400s to communicate with and manage non-IBM systems using OSI protocols and to act as a gateway to the OSI environment for attached devices running OSI-compatible applications.

The initial OSI software for the AS/400 has several limitations, however. First, it supports only CCITT X.25 packet-switched networking environments. Support for Token Ring and Ethernet local-area networks, which are also part of OSI, has yet to be announced.

In addition, IBM will not release key OSI applications for the AS/400 for one year. These include the X.400 electronic mail protocols and the File Transfer, Access and Management protocol.

Finally, OS/400 will support the OSI Common Management Information Protocol (CMIP) and Common Management Information Service (CMIS), but only the 1986 versions of those protocols. While IBM has committed to supporting the OSI Network Management Forum's version of CMIP and CMIS, the current versions of these protocols for OS/400 and other IBM systems are five years old and unlikely to interoperate with other vendors' more recent implementations.

IBM's announcement that AS/400s on different networks can now communicate on a one-to-one basis is "very, very key," Leary said. Until now, the only way to provide such a link was to combine those networks into a single topology. "That was a pain in the neck, given that many companies want to set up different [AS/400] networks for different functions and yet have all the networks communicate on an occasional but regular basis, for financial reporting or product planning," Leary said. Combining all AS/400s into one network can also cause routing, fault isolation and traffic management problems that grow in intensity as the number of midrange systems increases.



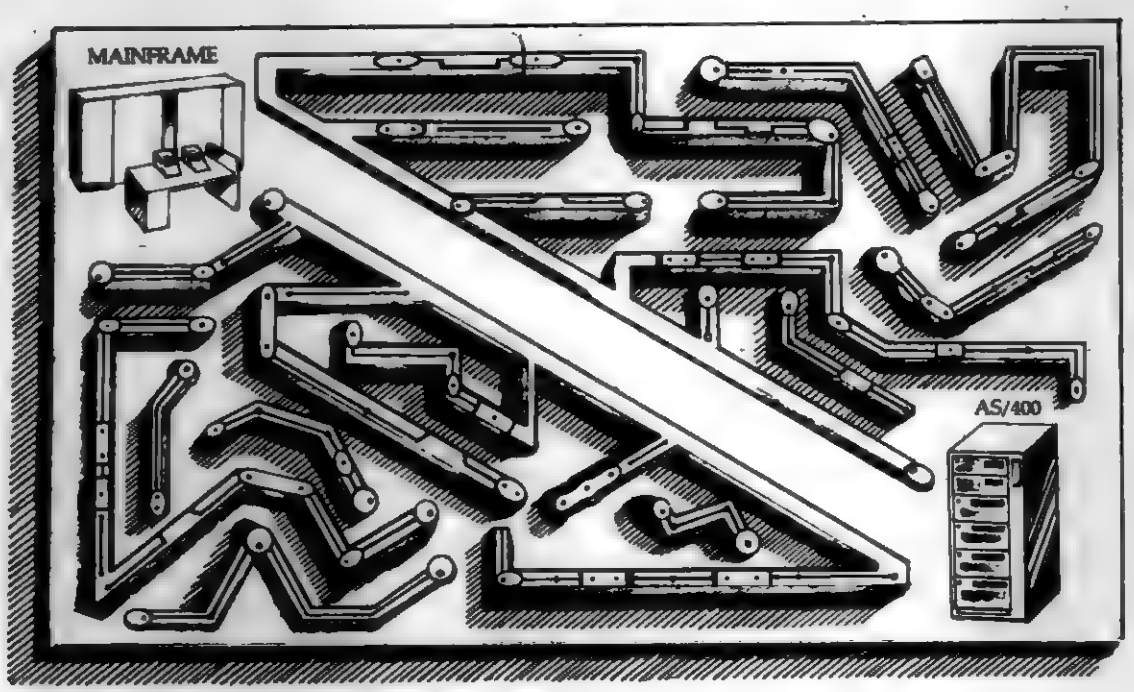
CW Chart: Doreen St. John

IBM also announced that the 5394, a cluster controller for AS/400 5250 terminals, will be able to communicate with remote AS/400 hosts over an IBM Systems Network Architecture backbone. This is another boon to growing AS/400 installations that previously had to set up separate leased-line networks to link geographically dispersed terminal clusters and AS/400 hosts.

IBM and Novell's announcement of plans to integrate Netware and AS/400 servers followed the lines of the earlier announcement to integrate Netware and IBM's LAN Server. Initially, users will be able to access a Netware server or an AS/400 running PC Support/400 from the same client workstation. However, as with the earlier OS/2-Netware announcement, IBM and Novell plan to provide greater integration between the two systems, according to Steve Carter, IBM's manager of AS/400 distributed products.

Also announced was OS/400 support for the Common Programming Interface for Communications (CPIC), an IBM Systems Application Architecture protocol that provides a common application interface for IBM LU6.2 protocols. Applications written to CPIC on one system are said to be migratable to, and interoperable among, other CPIC-compliant systems.

IBM also introduced an internal ISDN Basic Rate Interface board for the AS/400. The existing AS/400 external board, developed jointly with Teleos Communications, Inc., supports the higher speed Primary Rate Interface.



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FROM PAGE 55

for example, a long-distance voice call made via an interexchange carrier to retrieve voice mail incurs access charges, but a long-distance data call to retrieve messages via an enhanced service provider such as an electronic mail service does not.

"What happens when these previously distinct services are offered on a common, all-digital network utilizing some form of fast-packet switching?" Hatfield asked.

Competition to the max

Stanley M. Welland, manager of corporate telecommunications at General Electric Co., said the ideal regulatory climate features maximum competition at both the interstate and local levels because then the vendors compete to provide better services and lower prices.

For example, Welland said, the FCC should stop making AT&T file tariffs (GE is a customer of AT&T's Tariff 12) that rival firms MCI Communications Corp. and U.S. Sprint Communications Co. do not have to file.

George Gilder, a senior fellow at the Hudson Institute in Indianapolis, said that regulators high and low are stifling the nation's ability to install fiber-optic cables to homes and offices.

Gilder said he envisions a time when these fiber pipelines will deliver a rich menu of video and information services to powerful "telecomputers."

> "AT SOME POINT, we'll all have a computer on our desk and a phone in our shoe. But who will pay for it?"
>
> SHERRIE P. MARSHALL
> FCC

Visions of tomorrow

In a similar vein, Michael N. Liebold, a technologist at Apple Computer, Inc., demonstrated full-motion video snippets embedded in documents, while Mitch Kapor, co-founder of Lotus Development Corp., extolled the virtues of a national public network full of advanced bulletin board systems, multimedia messages and virtual town halls.

While the technologists provided grand visions of tomorrow's networks, they were not as successful at answering the commissioners' questions about how the nation's rate payers can afford it all.

Replacing the nation's copper wires with fiber-optic cables, for instance, would cost an estimated $230 billion.

Even big business users are leery of paying for a massive upgrade of the public network [CW, April 9, 1990].

"At some point, we'll all have a computer on our desk and a phone in our shoe," FCC Commissioner Sherrie P. Marshall said. "But who will pay for it?"

Several witnesses said the U.S. telecommunications infrastructure will become a complex web of public and private subnetworks, raising policy issues concerning technical compatibility, financial arrangements, network quality and privacy protection.

FCC's starring role

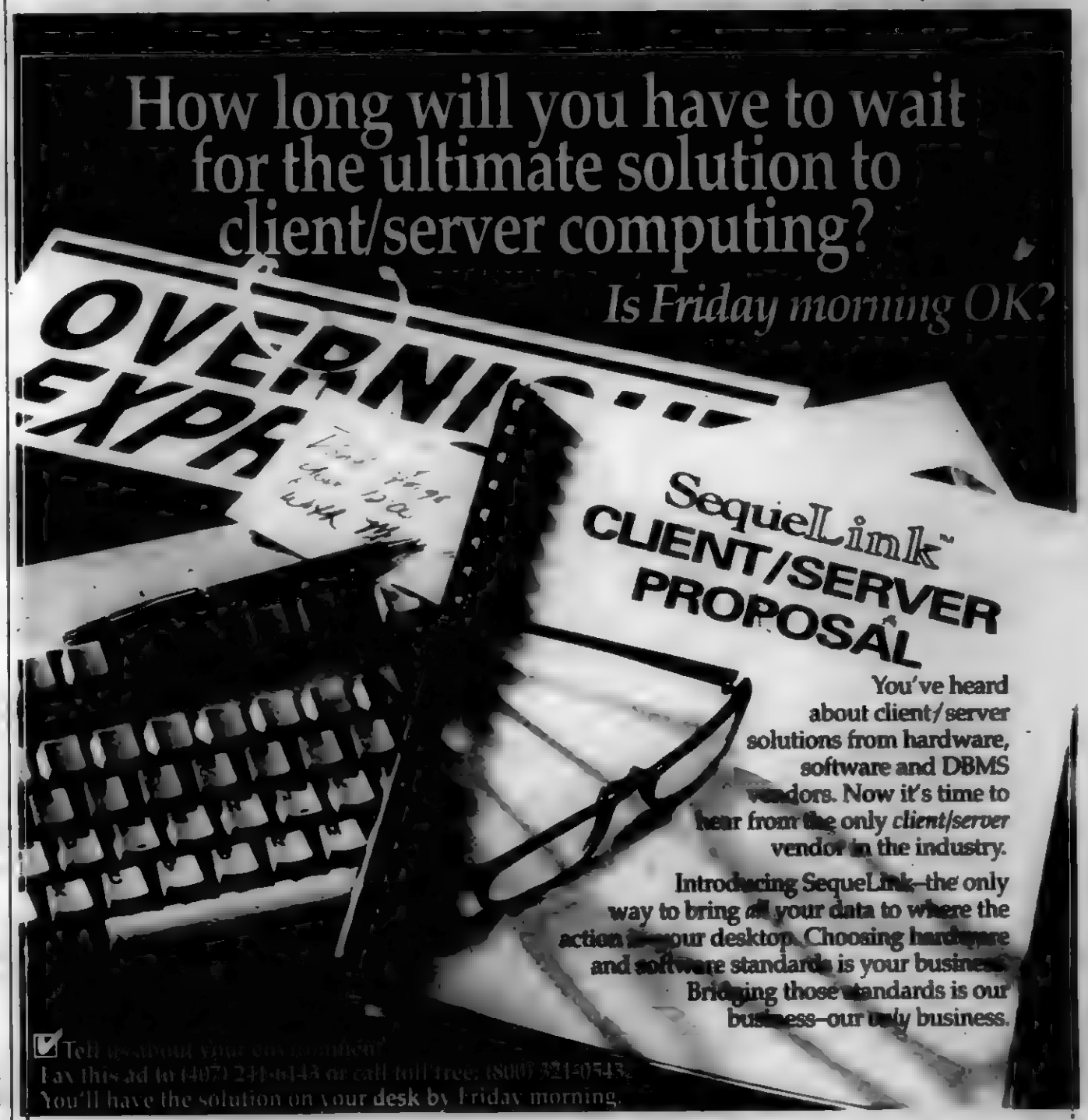
"The FCC should play the role of the nation's systems integrator" for this fragmented network of networks, said Eli M. Noam, a professor at Columbia University in New York.

For example, the FCC could promote interconnection standards by giving the slow-moving standards bodies some timetables and mediation help.

First, however, the FCC may need some internal reorganization to match a world in which telecommunications, mass media and private radio technologies are converging.

The FCC, which now has separate bureaus for regulating each technology, may instead want to have functional bureaus for conduit, finance and technology, Noam suggested.

"All of us need to strive to liberate tomorrow's communications potential from the tyrannies of yesterday's regulatory rules," Sikes concluded.



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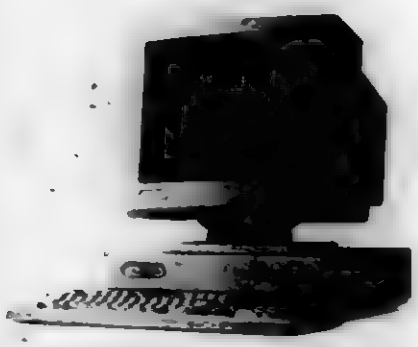
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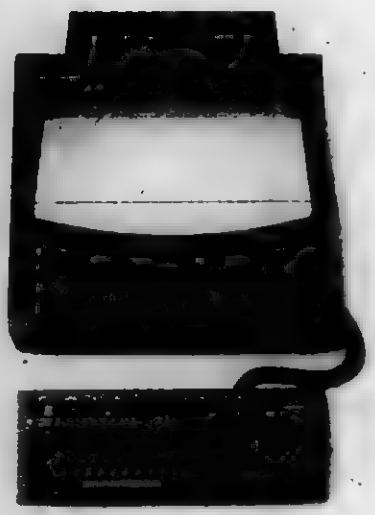
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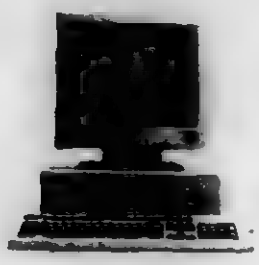


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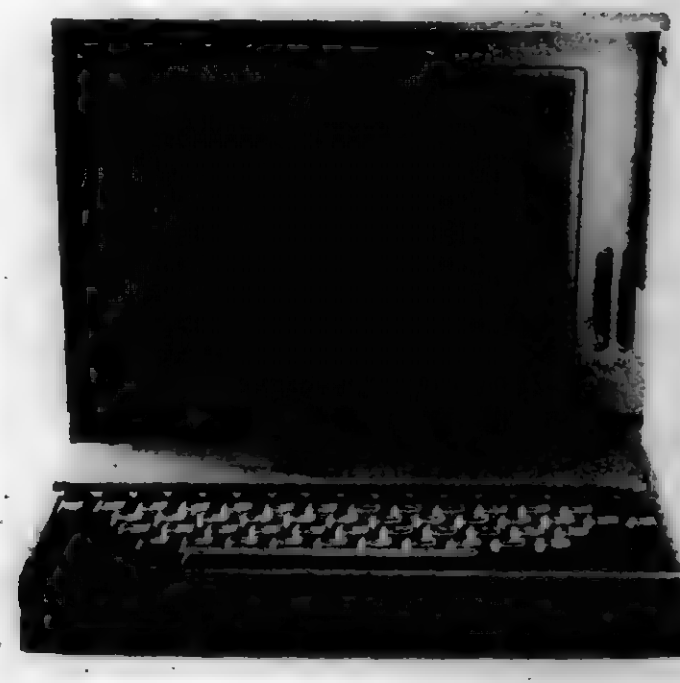
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Money talks

CONTINUED FROM PAGE 55

conversion costs are so high that no presently available network provides enough of a power advantage to make conversion a viable option. "Tell us what we could do with today's technology that is significantly better and worth the trouble of converting. When we jump, we'll leapfrog to a network technology that doesn't exist yet," Lawrence says.

Lawrence manages two facilities. Both sites are joined by a wide-area network. One has an 1,800-node Arcnet system used for office automation, while the other has been upgraded to a Token Ring network that has 4,000 nodes.

To maintain adequate performance on the Arcnet network, Lawrence has to subdivide the network into smaller physical networks to avoid degradation in response time.

Only so much you can do

Steven Bayus, director of information systems and services at Academy Insurance Group, Inc. in Atlanta, agrees that maintaining speed on an older network takes some planning. He says Academy has reached the limit of network expansion. "If we try to add a few more nodes, we'll blow our nose off our face," he says.

Most experts say that when a network reaches the point when it is no longer viable, network managers will have little trouble selling the new network to upper management. Frank Drubeck, president of Communications Network Architects, Inc. in Washington, D.C., says that when the time is right to convert, upper management will usually know it: "More likely, they'll be coming to the network guy, asking him what can be done to solve the network problems, such as speed."

Until that point, one key to keeping older networks alive is the ability to do in-house maintenance. When Bayus realized he was going to have a problem getting maintenance support for his Arcnet network, he had his people follow vendors around while they installed or repaired devices on the network. "Pretty soon," he says, "we realized they weren't doing anything we couldn't do ourselves."

The other task that often falls on the shoulders of managers of older systems is programming. Data Forms' customers run Datapoint terminal emulator software on their personal computers to place orders, look up the status of old orders or check on inventory. While there is enough canned office automation software available for systems running over Arcnet, the complex order entry and forms database at Data Forms had to be developed in-house, Ostrom says.

At many firms, an attitude of "we can get by with this" continues to prevail. Michael Kaminsky, manager of the advanced engineering staff at General Motors Corp.'s technology center, says managers should be able to justify an upgrade based on advantages to the company.

His company is using that criterion to decide when each GM site should discard the defunct Manufacturing Automation Protocol (MAP) 2.1 in favor of the current MAP 3.0. Kaminsky says MAP 2.1 has no accepted programming language standard, but the Manufacturing Message Format Specification (MMFS) had become somewhat of a de facto standard.

Unfortunately, MMFS was not entirely compatible with Manufacturing Message Standard, the standard with MAP 3.0. As a result, many GM networks that had systems and applications software written in MMFS could not work with MAP 3.0.

Kaminsky says that while there is still a fairly good selection of devices available for MAP 2.1, some of the newest releases work only with MAP 3.0. He said he expects that situation to get worse. "We can't count on vendors to continue to support a network that fewer and fewer companies are using," he says.

But, he adds, until a GM plant finds itself in need of an unavailable technology because of running MAP 2.1, it will stay with the older system. "There is nothing technologically wrong with Version 2.1," he says. "Until a plant hits upon something it can't do with it, they'll keep it."

Harry Saal, president of Menlo Park, Calif.-based Network General Corp., adds that a situation similar to Kaminsky's is occurring in the office automation world: Many companies that are able to keep an older network alive are finding themselves out in the cold when looking to buy newly released equipment.

Saal says, "If you need fringe technology stuff, you have to be in step with most of the world."

Not much choice

While some organizations were forced by lack of choice to buy networks that eventually became obsolete; the problem might have been avoided if the company had estimated growth more accurately.

Thomas Hartman, telecommunications manager at McDonnell Douglas Corp., installed an Arcnet network three years ago. Initially, his company intended to have only 45 nodes at the site. If the system had remained as planned, there would have been no problem.

However, Hartman says, "the network grew out of control, and it is taxing the limits of our Arcnet system."

Now, as he chooses a new network, Hartman acknowledges he is playing it very carefully. "We'll be considering the possibility of further growth," he says. "The network will have to have a lot of room for expansion."

Stevens is a free-lance writer based in Springfield, Mass.

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IBM

CONTINUED FROM PAGE 55

ronments? It sounds like IBM is walking away from a product line, but it's really hard to say."

"It's not clear to me which way IBM is going to go," said Jerry Noble, director of telecommunications and personal computer support at the American Cancer Society in Houston, an OS/2-oriented shop. He said his organization is currently running Netware because its accounting package requires it to manage its hard disk drive storage; otherwise, he would have installed LAN Server.

Now, however, since Netware is slated to be ported to the OS/2 platform when Version 2.0 is released at the end of the year, "we'll probably stick with Novell," Noble added.

Noble said he hopes the need for two LAN operating systems will eventually disappear. The organization will be downsizing its computing operations and installing 600 to 800 OS/2-based LANs during the next two years, and there are a lot of in-house support issues involved with running two LANs.

Roth acknowledged that IBM has "not been as successful as [Novell President and Chief Executive Officer] Ray Noorda" in the LAN business, citing 20,000 to 30,000 LAN Server installations to date; Novell represents the lion's share of the network operating system market with millions of installations.

Fruits of the IBM/Novell union

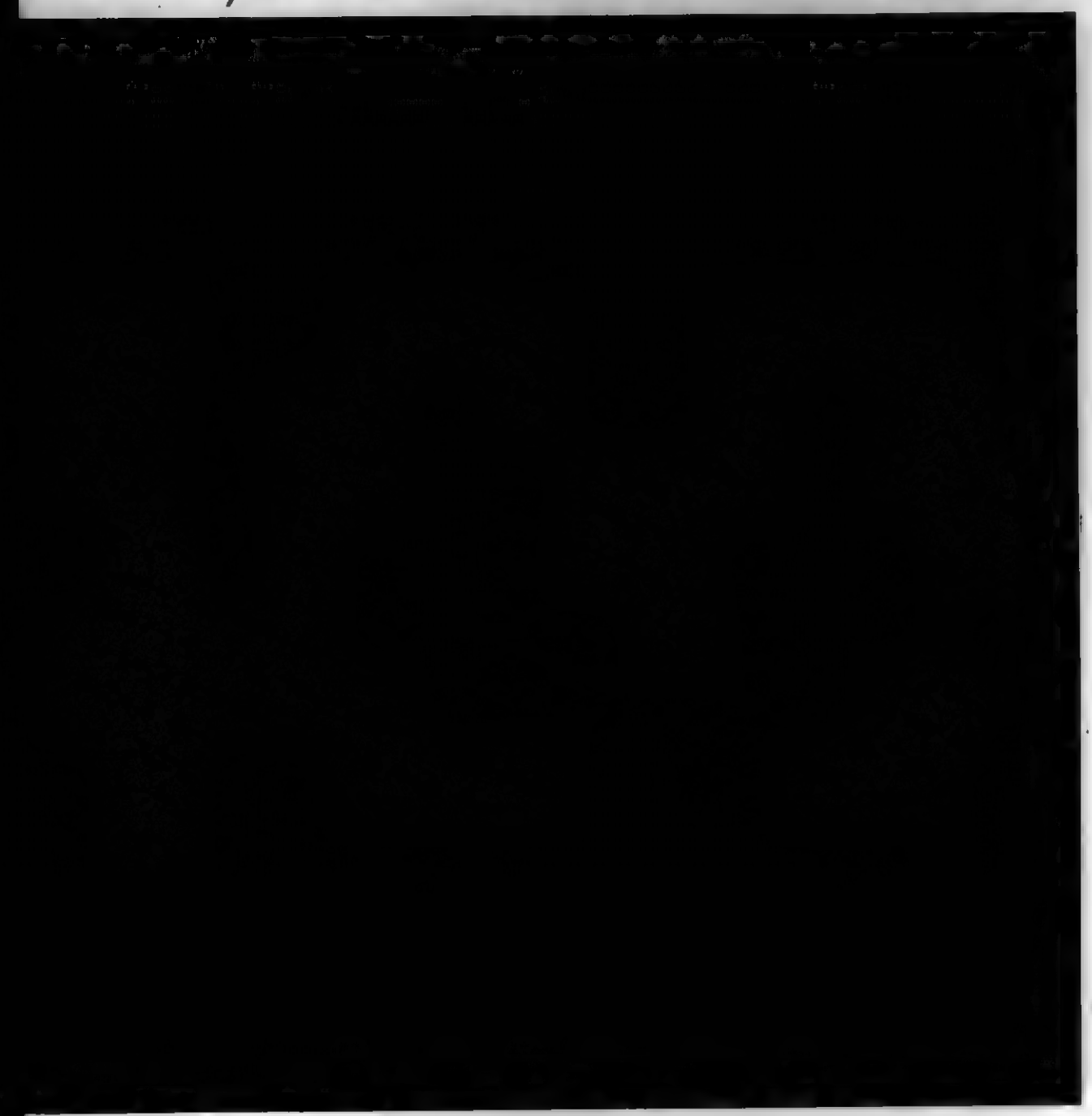
The following are some of the benefits of the IBM/Novell relationship:

- In April, IBM announced DOS PC client coexistence with Netware v3.11, allowing PC clients to access either IBM's Application System/400 midrange computers or Novell's Netware servers.
- In March, Novell announced IBM Advanced Peer-to-Peer Networking (APPN) end-node support for Netware. APPN, the routing protocol for IBM's LU6.2 application programming interface, allows communications between computers without the intervention of a mainframe.
- In March, IBM announced Lanres/VM, which lets Netware 386 Token Ring LANs and IBM VM mainframes share printers and disk files and allows users to administer Netware on the mainframe.

Other possibilities include Netware for IBM 32-bit OS/2 and RISC System/6000 platforms and Netware/LAN Server interoperability.

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3Com's NFS no standout

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — Network managers are offering conditional praise for 3Com Corp.'s recently introduced load-on-demand Network File System (NFS) software. While noting its limitations, administrators who have completed beta tests on 3Com NFS Version 1.0 said it is on a par with other available products.

When combined with 3Com Transmission Control Protocol (TCP) Version 1.2, 3Com NFS connects servers running MS-DOS with Unix machines. It allows users to hold concurrent sessions for file and print services between Microsoft Corp.'s LAN Manager, Novell, Inc.'s Netware and NFS-based Unix servers.

"It's not the best TCP [remote procedure call] NFS implementation I've seen," said Jim Woodard, senior network systems programmer at Rockwell International, Inc.'s Network Transmission Systems Division.

Woodard said FTP, Inc.'s PC/TCP Plus is about 20% faster than 3Com NFS. In fact, he and other programmers at Rockwell wrote their own NFS software, which performs 2½ times faster and consumes one quarter of the 80K bytes of memory used by 3Com NFS, he said.

Their software is only an NFS program, without the added baggage of TCP and other protocols used with 3Com's and FTP's products, Woodard explained.

Needs speed

The product would be better, Woodard said, if it could run faster on PCs below the Intel Corp. 80386SX-class machines, as does FTP's application. Connection to Unix machines can take seconds with smaller machines, and I/O rates can fall to levels equal to those of the IBM Personal Computer XT hard drives, he said.

However, it is a good product, Woodard said. 3Com NFS allows users to load and unload NFS protocols when they need to, which conserves memory, he explained.

Another beta-test site manager, who requested anonymity, said he liked 3Com NFS on the surface. But, he said, he will wait to test the new version of Sun Microsystems, Inc.'s PC NFS software against 3Com's product before making a purchase decision.

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Maxm: Flexible alternative to IBM Netview/PC interface

BY ELISABETH HORWITT
CW STAFF

VIENNA, Va. — Companies that want to manage their telecommunications networks via IBM's Netview but find IBM's Netview/PC interface too restrictive now have another option to consider: Maxm from International Telemanagement.

Co-developed by International Telemanagement and IBM, Maxm collects information from a wide variety of telecommunications devices and sends it on to a Netview host for integration with Netview's IBM Systems Network Architecture (SNA) management applications.

A major differentiator is that Maxm runs on Unix workstations, while Netview/PC runs on either OS/2 Extended or Microsoft Corp. DOS workstations.

In addition, Maxm may be the first product to take advantage of IBM's LU6.2 link to Netview, which is due next fall with the release of Version 2 of IBM's network management platform.

Maxm's support of IBM's LU6.2 protocol allows it to be more tightly integrated with Netview applications, according to Ronald Hardy, director of marketing at International Telemanagement.

"The product is a Unix version of Netview/PC," said David Pasamore, a partner at Ernst & Young. A growing number of network equipment vendors are basing their network management systems on Unix systems such as Sun Microsystems, Inc.'s SunOS, he added, "so you can link those products back to Netview without putting OS/2 in the middle."

RISC- and Unix-compatible

Maxm currently supports IBM's RISC System/6000 AIX platform but will support other types of Unix, including Sun's, Pasamore said.

Another advantage to Maxm is that Unix is more scalable than OS/2, Pasamore said. Users can continue to migrate to more powerful systems that can act as Netview service points for increasingly complex and extensive networks.

An OS/2 Personal System/2 workstation that acts as Maxm's user console is attached to such systems. Users sitting at the console can display and consolidate management information in a windowed IBM Presentation Manager environment, Hardy said.

The console also provides the manager with direct access to Netview functions through a 3270 link to a Netview host. The operator can also set up terminal links to control various intelligent network devices directly, Hardy said.

International Telemanagement has already developed connections between Maxm and some 40 types of networking systems, including leading routers, private branch exchanges, digital service units and T1 multiplexers, Hardy said.

The system does not yet support Simple Network Management Protocol (SNMP), a de facto network management standard for a growing number of bridges, routers, intelligent hubs and Transmission Control Protocol/Internet Protocol (TCP/IP) devices.

However, Maxm has its own applications for managing TCP/IP networks, bridges and routers, Hardy said, and it will eventually support SNMP. Tools are provided for users and vendors to configure additional devices to the system.

Maxm will be able to load network management data directly into IBM's Graphic Monitor Facility Workstation when IBM's software is capable of accepting non-SNA data, Hardy said.

NEW PRODUCTS

Local-area networking hardware

David Systems, Inc. has created the Expressbus architecture, which allows the company's Intelligent Concentrators to integrate Ethernet, Token Ring and Fiber Distributed Data Interface (FDDI) networks.

The Expressnet Concentrator with Expressbus includes capacity for four 10M bit/sec. 10Base-T Ethernet networks, four 16M/4M bit/sec. Token Ring networks and two FDDI networks. The Supervisor Module with Expressbus support manages all connected devices.

Pricing is as follows: $1,495 for a concentrator with five slots or $1,995 for a 12-slot version; $2,995 for the Supervisor Module with Expressbus support; $1,700 per 10Base-T module; and $2,000 per Token Ring module. An FDDI module has not yet been announced.
David Systems
701 E. Evelyn Ave.
Sunnyvale, Calif. 94088
(408) 720-8000

Advanced Digital Information Corp. (ADIC) has announced EISA DCB, a bus mastering disk coprocessor board for Extended Industry Standard Architecture (EISA)-based servers.

EISA DCB allows bus transfer rates as high as 33M byte/sec. and small computer systems interface channel transfer speeds of up to 5M byte/sec. ADIC says the product supports Novell, Inc.'s Netware Versions 2.1 and higher as well as Netware 386. The product costs $895.

ADIC has also upgraded its Enhanced Disk Coprocessor Board software to cut disk access times by as much as 50% and support 19 new drive types, the company reported. The software costs $699; upgrades are available free of charge.
ADIC
14737 NE 87th St.
Redmond, Wash. 98073
(206) 881-8004

Network management

Visinet Live, announced by Technology Dynamics, Inc., offers graphical presentation of network data.

The Microsoft Corp. Windows 3.0-based product includes a scripting language that allows network managers to define alarm conditions in precise terms, according to Technology Dynamics. Network displays may include background geographical maps, and network layouts can be illustrated with computer-aided design-based floor plans.

Pricing starts at $1,995.
Technology Dynamics
Suite S-008
430 10th St. NW
Atlanta, Ga. 30318

Bytex Corp. has introduced the Unity Event Manager, a network automation software option for the company's Unity Management System.

Unity Event Manager provides single console management for Bytex switching systems and other equipment. The product supports multitasking and includes extensive alarm management features.

The price of the Unity Management System ranges from $12,000 to $18,000. Unity Management System owners may add the Unity Event Manager for $2,900.
Bytex
Southboro Office Park
120 Turnpike Road
Southboro, Mass. 01772
(508) 480-0840

Micro-to-host

Structured Software Solutions, Inc. has announced Facetterm Version 2, a windowing interface software package for character-based Unix terminals.

Facetterm gives users pull-down menuing and multitasking ability. It is currently available for The Santa Cruz Operation's Unix, Digital Equipment Corp.'s Xenix, NCR Corp.'s Tower and Unisys Corp.'s Unix-based systems.

License costs run from $495 for five users to $7,995 for 100 users.
Structured Software Solutions
Suite 205
4031 W. Plano Pkwy.
Plano, Texas 75093
(214) 985-9901

Network Computing Devices, Inc. has begun shipping a Digital Equipment Corp. LK401-compatible keyboard with all of its X terminals.

The keyboard includes special keys supporting alternate functions found on workstations. It is bundled at no extra charge with the company's monochrome and color terminals, or it may be purchased separately for $150.
Network Computing Devices
350 N. Bernardo Ave.
Mountain View, Calif. 94043
(415) 694-0650

Age Logic, Inc. has announced Xoftware Manager 2.0, an update to its X terminal server software supporting IBM Xstation 130.

The product connects Xstation display terminals to personal computers running The Santa Cruz Operation's Unix and to hosts from Sun Microsystems, Inc. and Digital Equipment Corp. in X Window System environments.

Xoftware Manager includes facilities for caching, memory paging and font serving on the network server.

A single-user license costs $495; a multiple-user license is $990.
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MANAGER'S JOURNAL

EXECUTIVE TRACK



David W. Braun Jr. has been named director of information services at Amway Corp., a $2.2 billion home products company based in Ada, Mich., with 1 million independent distributors in the U.S. and abroad.

Braun is responsible for Amway's telecommunications department and information center, which includes personal computers, computer networks and end-user access to data.

Braun was most recently director of information management at British Petroleum Co. PLC's Cleveland office. His previous positions in information systems and telecommunications management included statistician and computer manager at Memorial Sloan-Kettering Cancer Center in New York.

Braun holds a Ph.D. in statistical science from the department of computer science at the State University of New York at Buffalo. He also served as a cryptolinguist while stationed in Cyprus as a sergeant in the U.S. Marine Corps.

.....

Robert K. Malik has been appointed senior vice president of the Technology and Staff Services Division at Lincoln National Life Corp. in Fort Wayne, Ind.

He is responsible for information technology, business systems development, telecommunications, data center operations, computer equipment and software acquisition and strategic technology planning for Lincoln National Life, one of the 20 largest life insurance carriers in the U.S.

Malik was formerly responsible for the development and implementation of systems strategies in several business groups at The Travelers Corp. in Hartford, Conn. Before that, he worked in business and systems positions at Cigna Corp., Touche Ross & Co., W. R. Grace Co. and Mobil Oil Corp.

Malik holds a bachelor's degree from Hofstra University and a master's degree in computer science from Pratt Institute of Technology.

Stuck between a VDT and a hard place

Even conscientious managers must be wary of pitfalls in seeking ergonomic advice

BY J. A. SAVAGE
CW STAFF



Like the spontaneous group intuition that eschewed bacon and eggs every morning in favor of oat bran, an almost instant awareness of the need for ergonomic workplace design for computer users has arisen among management. However, as a San Francisco official said, "The snake oil salesmen are coming out of the woodwork on this issue." With all the hoopla and hype, it is difficult for an enlightened manager to go about redesigning the workplace.

Information systems managers report an increased awareness of ergonomics issues, according to a recent survey by International Data Group (IDG) Communications Research Services. In a random survey of large IS departments, nearly three-fourths of the 184 respondents expect ergonomic requirements to become local law within the next three years.

Businesses in San Francisco — which passed one of the nation's first VDT laws in December 1990, requiring ergonomically designed workplaces for computer users — are now coming to grips with just what that means. They are finding that compliance can be expensive or relatively cheap, depending on which designer or ergonomist is hired to do the job.

Managers are faced with hiring professional ergonomists when there are no reliable guidelines for the profession. If managers turn to designers, they have to be wary of those designers turning into furniture salesmen. If managers want to implement ergonomic design themselves, there is some homework involved.

To get around the difficulty of finding an ergonomist, many San Francisco businesses, such as Chevron Corp.'s legal services department, have simply consulted furniture designers. "We have three buildings and 5,000 VDT users," said Robert Kozlowski, manager of legal support services. By going an inexpensive route, primarily with add-ons to allow desk adjustments rather than new desks, "it will cost about $1,000 per employee, but we'll get it back in productivity. They won't have bad backs, headaches, and they won't [complain as much]."

Relying on furniture designers, how-

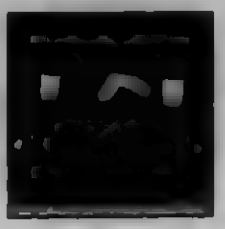
Continued on page 67

Legal legwork smooths outsourcing strides

BY CATHLEEN A. DUFFY
CW STAFF

A broadway show without a choreographer would produce the same result as a major outsourcing deal without a contract: A group of team players stepping on one another's toes.

Or so it would seem after listening to Michael Pearlman, corporate counsel for Eastman Kodak Co., who spoke at the recent Computer Law Association conference held in Washington, D.C.



Pearlman attributed much of the success of Kodak's 1989 decision to place its information systems operations in the hands of IBM, Businessland, Inc. and Digital Equipment Corp. to its detailed outsourcing contracts, which were developed in conjunction with Conflict Management, Inc., a consulting firm based in Boston.

"Outsourcing contracts need to be detailed and thorough and have the responsibilities of the parties spelled out as much as possible to avoid confusion at a later date," Pearlman said.

The approximately 25-page IBM contract, which took several months of negotiation to complete, orchestrated such things as responsibilities of Kodak and IBM, pricing, commencement date, use and ownership of current computer hardware and data, warranties and indemnities, geographical limitations, personnel and regulatory issues.

According to Pearlman, all sections of the contract are important and carry equal weight under the law.

"But some of the more novel things on the IBM contract had to do with the way pricing was handled. Coming up with a formula that attempted to measure usage objectively was a complicated process," Pearlman said.

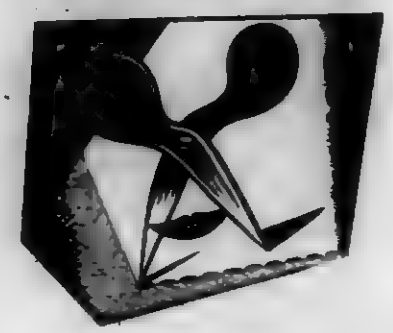
The most detailed portion of the contract, Pearlman said, focused on personnel issues. Namely, what would become of Kodak's IS personnel when IBM took over operations?

Basically, the contract made provisions for these workers to be hired by IBM. Out of a total of 700 workers picked up by the service providers, 300 left to work for IBM.

The bulk of the detail in the personnel portion of the contract surrounded requirements of the Employee Retirement Income Security Act and pension accounting matters, which are very complicated.

"In order to be sure that the amounts to be transferred were properly calculated, [when an employee left to work for IBM], the language had to be very detailed," Pearlman said.

CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"Telcot: An application of information technology for competitive advantage in the cotton industry"

By Darryl Lindsey, Paul H. Cheney, George M. Kasper and Blake Ives

MIS Quarterly
December 1990

■ As producer of roughly 10% of the world's cotton, the Plains Cotton Cooperative Association (PCCA) in Lubbock, Texas, had to find an efficient vehicle to market the cotton produced by its members. In 1975, the first version of Telcot was produced as a marketing system. Today, the computer-based system provides cotton traders with functions much like those available to traders on the New York Stock Exchange.

The way the system works is simple. Any PCCA member can offer his cotton over Telcot using a number of trading alternatives. Market information is also available. Members can display current market value for their lots of cotton and view information such as lots that have recently sold, their quality characteristics and the price per pound paid by the buyer. This helps farmers immediately assess the value of their crops based on actual trading. Approximately 40 buyers are online with Telcot at any given time.

Telcot's features include the following capabilities: firm offer, where members can offer their cotton to buyers at a firm asking price; autonated counter offer, which gives buyers a quick opportunity to counter firm offers; buyer selection, which allows buyers to specify only the cotton they wish to buy; and monitor summary, which displays the prices of all trades to everyone on the system.

Telcot is run on a leased IBM 3090 mainframe over 65G bytes of direct-access storage device, a 3725 front-end processor and thousands of miles of telephone lines.

The success of Telcot is a clear illustration of how small organizations can use information technology for competitive advantage. — *Kelly E. Dwyer*

"Outsourcing as a mechanism of information technology governance: A cross-sectional analysis of its determinants"

By Lawrence Loh and N. Venkatraman

MIT working paper
March 1991

■ Poor business performance and high dependence on debt financing lead to a higher degree of information technology outsourcing, according to a study of 57 U.S. corporations.

When profits are low, companies are more likely to make drastic restructuring moves, perhaps to prove to capital markets that corporate management has a strong commitment to improving the firm. Also, unlike in-house operations with their fixed costs, outsourcing gives firms the advantage of variable costs.

Outsourcing is also a way for companies to mitigate debt financing. Increased debt has been a major impetus for cutting cost in the information systems area, thus supporting the use of outsourcing. Companies can search out experienced, low-cost providers through the bid process and subsequent contract negotiations. — *Lory Zottola*

"Mergers and acquisitions: Their impact on the IS department"

By Norbert J. Kubilus

Journal of Information Systems Management
Spring 1991

■ The information systems department in the typical company is more likely to face a merger or acquisition than to deal with a fire, yet many IS departments are ill-prepared to handle a merger.

As part of their regular chores, IS managers should maintain a well-documented technical architecture, keep customization of vendor-supplied software to a minimum, and negotiate vendor contracts that permit the transfer of rights to new owners.

The documentation will be invaluable during the premerger research stage. IS has always been the business function least studied before mergers but asking the right IS-related questions can save time, money and headaches. If senior management is not asking the IS questions — and it probably is not — the IS manager should take the initiative.

When a merger is announced, managers must give the IS staff all the details, such as how the transition will be managed and any job changes. — *Mitch Betts*



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CIOs say downsizing is in the cards

BY CLINTON WILDER
CW STAFF

LAS VEGAS — Amid the desert sun and glittering neon here, two leading information systems executives from the financial services industry mapped a future of decentralizing and downsizing at last week's Association for Systems Management (ASM) annual conference.

In separate presentations at ASM's executive issues forum, Chief Information Officers John J. Alexander Jr. of Unum Life Insurance Co. and Charles H. Mayer of The First Boston Corp. shared their companies' plans for technological and organizational change. Although Alexander focused on software development and Mayer on corporate structure, both had a similar message: Small is beautiful.

"Five years from now, we will wonder how anyone ran an organization on a centralized 3090," Mayer said.

Although New York-based First Boston currently runs three IBM 3090 Model 500Js in its New Jersey data center, Mayer said he believes large Unix-based servers from vendors such as Pyramid Technology Corp. and Sequent Computer Systems, Inc. could eventually take over the mainframe role at the departmental level.

Organizational change

First Boston is also considering outsourcing its data center operations and voice and data communications to IBM. Organizationally, Mayer has created four new "business unit CIO" positions since taking over the top IS post at First Boston seven months ago. Each manager heads IS for a business division — the divisions are fixed income securities, equities, investment banking and back-office support. They currently report to Mayer, although that could change.

"I don't think it makes that much difference where they report," Mayer said.

The goal of delegated IS authority, first and foremost, is the decentralization of systems development, Mayer said. Technical software experts will remain centralized, but they can be called upon by any of the business units as needed.

Developing applications at the business unit level will also promote more cross-functional skills-sharing between business and IS, Mayer suggested. In addition to more effective development, the process opens up career paths.

"We're teaching technical people the business so that they can also become traders, salesmen or investment bankers," he said. "On the other side, we are hiring more technical graduates and electrical engineering majors as traders."

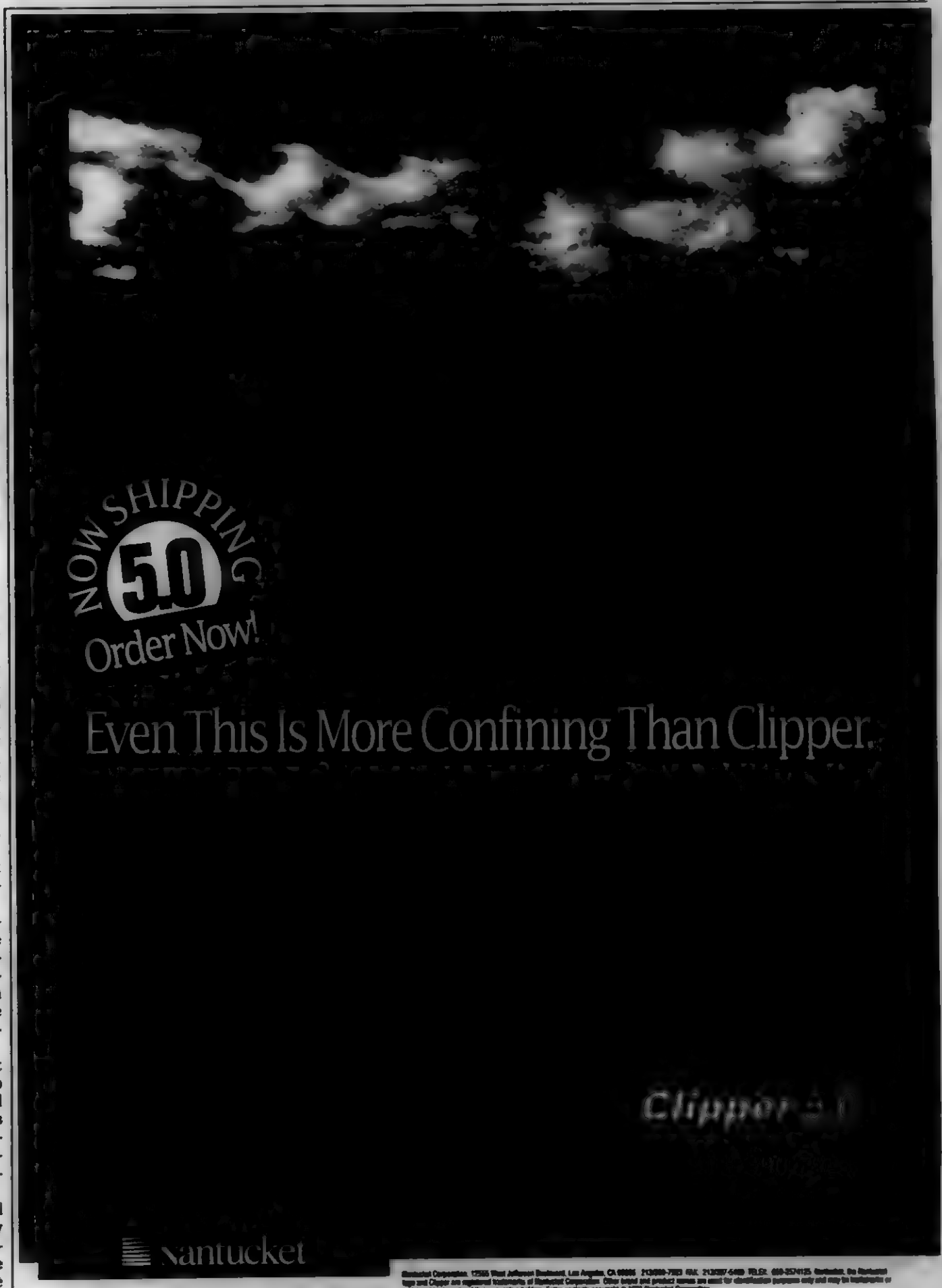
At Portland, Maine-based Unum, more and more systems development has moved to the personal computer. "We'd like to reach a point where it is impossible to conceive of development on the 3270," Alexander said.

Working with software productivity consultant T. Capers Jones, Unum has estimated that traditional mainframe-based development was costing Unum users between $2,000 and $25,000 per month in charge-back costs. Developing mainframe applications on IBM Personal System/2s cut those charges in half, and developing local-area network-based applications on the PC reduced the charge to roughly $200 per month.

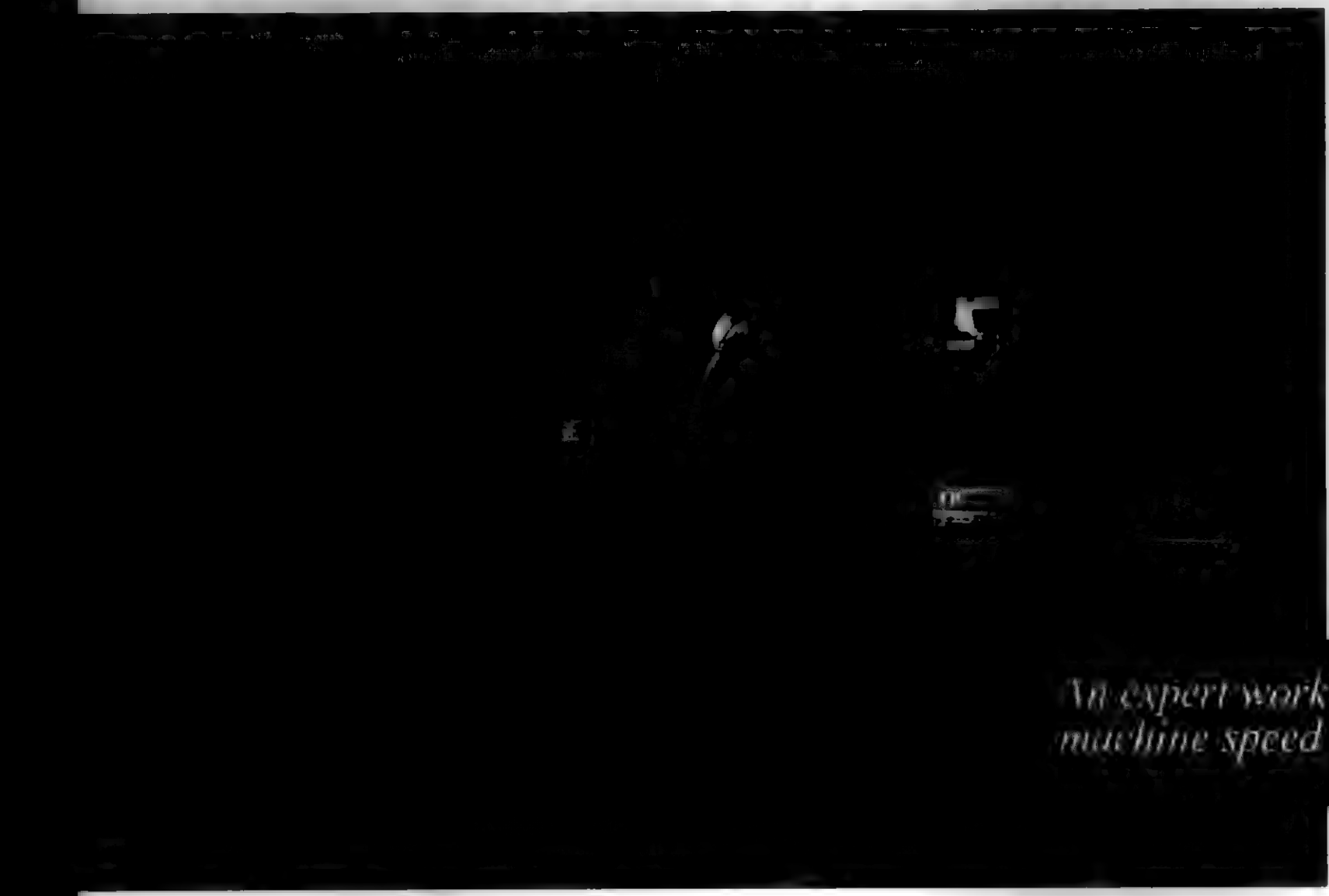
"Whatever [applications] you can move to the micro platform, you should do so," Alexander told ASM members.

On the other hand, Unum does have a large suite of CICS, Cobol and VSAM-based mainframe applications with an average age of 10 years. One system supporting Unum's life insurance business, which it has since exited, dates back to 1970, Alexander said.

Unum, IBM's first customer for the AD/Cycle development environment, hopes to see full availability of the IBM Repository by 1993, Alexander said.



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VDT

CONTINUED FROM PAGE 63

ever, is tricky. "If you work with a furniture salesman who calls himself an ergonomist, you're going to buy more furniture than you need," said Tom E. Signore, a consulting ergonomist based in San Francisco. With a little work, most managers can do a credible job of instituting ergonomic workstations for employees, he said, "but most companies want one-stop shopping — someone to find the furniture, redo the lighting and train employees — and that doesn't really exist yet."

Even San Francisco's municipal IS manager, Judy Johnston, director of the controller's information services division, is unsure whether to use designers or ergonomists or to attempt to manage the change in-house. She is coordinating the effort for San Francisco's 4,000-plus VDT workers.

"We're working with purchasing departments so they don't go about it in a piecemeal way," Johnston said. She said that so far, it was not clear whether she needed an ergonomist or if she was hemmed in by a certain budget. "It's a matter of sitting down [with the health department] and figuring what kind of substance we need to buy. What furniture, hand rests and the like."

A local government VDT committee, which has yet to be finalized, will be interpreting the law and setting guidelines for businesses during the next year. Companies have a four-year lead time to comply with the ordinance. The health department is putting together a list of vendors but refuses to endorse any of them, according to Bill Lee, director of health and safety for San Francisco. The city is also holding training classes for businesses.

Molly McMurray, corporate facilities project manager at World Savings and Loan Association in Oakland, Calif., is assembling ergonomic designs for her company. "The key is having flexible furniture to make sure you meet potential legal guidelines," she said. Like most of the IS managers in IDG's survey, World Savings is outside of San Francisco County and is not required to provide an ergonomic workplace, but McMurray said the writing is on the wall. She has been asking San Francisco businesses what they are doing to comply with the ordinance. "We'd rather figure it out now than later."

Figuring out workplace design is a step — but only part of the equation, according to Don Morelli, an ergonomist based in San Carlos, Calif. The other part is getting VDT users to accustom themselves to new surroundings. "A company can spend $500 on a chair with all the bells and whistles, but employees might not bother with it," he said. "The last line of implementation is with the user."

Morelli said that getting employees to take advantage of ergonomic furniture and otherwise protect themselves is even more elusive than training them. A manager has to imbue employees with responsibility for their own well-being.

The hunt for ergonomists

Got a backache but don't know a good chiropractor? When weeding the quacks from the docs, a good rule is to look for professional membership — for example, in the American Chiropractic Association.

If you are a manager who needs a professional ergonomist to fix poor working conditions for your staff, particularly those working at VDTs, where do you look? There is no professional ergonomists' association, and there are only about 300 professional ergonomists in the entire U.S.

Linda Morse, director of the Repetitive Motion Institute in Santa Clara, Calif., suggested that managers first get a copy of a prospective ergonomist's resume or curriculum vitae and look for formal coursework in ergonomics. The ergonomist could also be an industrial hygienist, a nurse, nurse practitioner or physician. However, Morse advised asking the latter three about specific ergonomics-related coursework. She also recommended the physical and occupational therapy departments of colleges for firms outside of urban areas.

Where and at what level an ergonomist received training could also be important, according to Morse. While some may have taken college-level classes, others may have actually worked alongside ergonomists in on-the-job training.

Lastly, Morse suggested asking for references. "Act like you are going to hire an employee. Call up the references and ask whether they followed through on the work, if they produced usable solutions and whether employee health problems have been ameliorated."

Professional ergonomists warned there are a growing number of well-meaning people who set themselves up as ergonomists but are not. This, they said, is particularly true of salespeople. "Be careful when they try to sell you one product, like a glare screen, as a solution for everything," said Don Morelli, an ergonomist in San Carlos, Calif.

J. A. SAIGE



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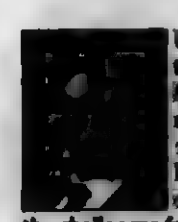
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• 10/24 Morristown, NJ	• 11/15 Chicago, IL

COMMENTARY

Clinton Wilder

No more easy answers



Uncertainty reigns as the IS management profession hurtles into the recession-plagued global economy of the 1990s. Do not look for guideposts or definitive answers to the challenges facing you because they don't exist anymore.

Almost every traditionally accepted rule in IS management can be turned on its head. One of the first to go was "No one ever got fired for buying IBM," but the list goes on. What used to be a mark of competence may now be considered bad and vice versa — all depending on the circumstances.

A chronicler of our time, Woody Allen, made this same point. In the film *Annie Hall*, Woody's pal is trying to sell the dyed-in-the-wool New Yorker on the virtues of southern California, one of which is sunshine. "But sun is bad for you," Woody retorts. "Don't you understand that everything our parents said was good for us is bad? Sunshine, red meat, college?"

Actually, if it were that simple, life in IS would be easier — if you could be assured of keeping your job by not buying IBM, for example. Unfortunately, life in IS today seems more like an unending procession of gray areas, with everything dependent on circumstances — your company's financial health, your relationship with top management and end users, the age of your applications base and more.

Try to answer the question "good or bad?" for each of the following maxims:

- **Cut IS spending.** Good idea during a recession, right? Not necessarily. Many analysts say this is the best time to beef up applications development or modernize IS infrastructure so that your company can capitalize on IS-enabled capabilities the moment the economy picks up. On the other hand, it's no time to put in the capital request for that new Cray that you've heard is not just for scientific calculations anymore.
- **Be the leader in implementing leading-edge technology.** I suppose the question of whether to be on the leading (or is it bleeding?) edge has always been controversial, but never more so than now. Obviously, it costs money. But if we are talking about imaging, expert systems, point-of-sale data capture or other technologies, many leading-edge products can reap instant benefits and very fast paybacks.
- **Consolidate IS resources to exercise better control and gain economies of scale.** Scores of companies are consolidating data centers and saving big bucks, but caution is the watchword: Beware of the return of centralized, monolithic, unresponsive IS.
- **Outsourcing means internal IS has failed to do the job.** Very true in some cases, but what about the roster of IS executives who are heroes to their upper management because of wise outsourcing decisions? Again, whether it is good or bad depends on the circumstances. In the case of many outsourcing contracts, the company may not even know if the experience is positive or negative for several years to come.
- **Be a bold leader in IS.** This one is perhaps the hardest of all to get a handle on. Obviously, the days of achieving career success by hiding in the glass house are long gone. But IS managers who forge boldly ahead into the future without working in lockstep with the business management team are headed right out the door.

> WHAT USED TO be a mark of competence may now be considered bad and vice versa — all depending on the circumstances.

Suppose business management is resistant to the direction in which IS leadership wants to go? Tact, skillful communication and mastering the art of corporate politics come into play here. But if you're looking for easy-to-read guideposts and pat answers, it may be time to consider another profession.

You have heard it before: The importance of information technology to business success has given IS professionals unprecedented opportunities to make a difference — and, not coincidentally, to make a lot more money. With all of that, however, comes unprecedented opportunities for failure.

Greater rewards, greater risks. That demands being proactive, open, intelligent and, above all, flexible. Because the era of unassailable truths in IS is over.

Wilder is Computerworld's senior editor, management.

CALENDAR

Guide 80, "IS: The Next Generation," will take a look at IS in the year 2000. The conference will be held July 14-19 in Boston.

Keynote speaker John Imlay, chairman of Dun & Bradstreet Software, will deliver a speech entitled "From Computing Power to Competing Power."

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Building Systems Automation-Integration Symposium. Madison, Wis., June 2-8 — Contact: Charles E. Dorgan, University of Wisconsin at Madison (608) 262-8220.

The IBM Imperative. Arlington, Va., June 3-5 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Information Management: The Next Generation. Orlando, Fla., June 4-6 — Contact: Delphi Consulting Group, Boston, Mass. (617) 247-1511.

Systems Integration Exposition and Conference. Rosemont, Ill., June 4-6 — Contact: Sandi Eberhard, Eberhard & Co., New York, N.Y. (212) 557-6960.

Voice Systems Worldwide 1991. Kensington, England, June 4-6 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

Technonnect Washington, D.C. Washington, D.C., June 4-6 — Contact: Technonnect Washington, D.C., Austin, Texas (512) 343-8066.

JUNE 9-15

Computer Security Institute. Denver, June 10-12 — Contact: Computer Security Institute, San Francisco, Calif. (415) 267-7651.

Experts on Networks. Washington, D.C., June 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

PBDI Executive Symposium. Sunnyvale, Calif., June 11-12 — Contact: Jane Marie McArdle, Events Management International, Marshfield, Mass. (617) 834-4703.

SDL Steps for Success. Atlanta, June 11-13 — Contact: Sharon Scott, Inforum, Atlanta, Ga. (404) 220-2602.

Strategic Planning for Information and Systems. Chicago, June 12-14 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Windows 3.0 Developers Conference. Tyngsboro, Mass., June 12-14 — Contact: Andree Fontaine, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

The Bynet User Group. Orlando, Fla., June 13-14 — Contact: Christine Seale, Bytex Corp., Southboro, Mass. (508) 480-0840.

JUNE 16-22

National Educational Computing Conference. Phoenix, June 16-20 — Contact: Southwest Events, Scottsdale, Ariz. (602) 991-5131.

MIT Center for Information Systems Research Summer Session. Cambridge, Mass., June 17-20 — Contact: CISR, Cambridge, Mass. (617) 253-6657.

Testing Computer Software. Washington, D.C., June 17-20 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

Engineering Systems Design and Analysis Conference. Istanbul, Turkey, June 17-20 — Contact: The American Society of Mechanical Engineers, Dallas, Texas (214) 746-4901.

Imaging at Work '91. Tyngsboro, Mass., June 17-20 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

International Trade Computerization Conference. Washington, D.C., June 18-19 — Contact: NCITD, New York, N.Y. (212) 925-1400.

Videotex Industry Association Conference and Exposition. Washington, D.C., June 18-21 — Contact: Debbie Tricle, Videotex Industry Association, Silver Spring, Md. (301) 495-4955.

Downsizing in the Computer Industry: Making the Migration from Reliance on Mainframes to Distributed Processing in the Mini, PC and LAN Environment. New York, June 19-20 — Contact: Institute for International Research, New York, N.Y. (212) 826-1260.

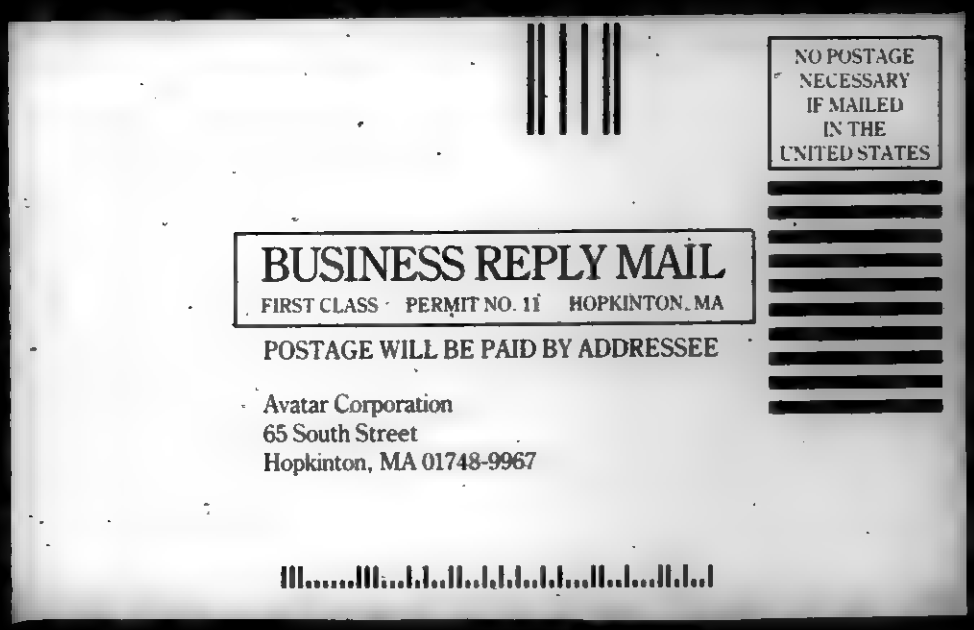
Interlingua '91. Hong Kong, June 19-20 — Contact: International Telecast, McLean, Va. (703) 556-7778.

HL7 Working Group Meeting. Malvern, Pa., June 19-21 — Contact: Sue West, SMS, Malvern, Pa. (215) 251-3164.

Supercomputing 1991 USA/Pacific. Santa Clara, Calif., June 19-21 — Contact: John Derryberry, Angus & Rudin, Inc., Redwood City, Calif. (415) 363-0982.

Mac Hack '91. Ann Arbor, Mich., June 19-22 — Contact: Conference Management Exptotech, Inc., Grosse Pointe Park, Mich. (313) 882-1824.

Document Image Processing Symposium. Toronto, June 20-21 — Contact: C. J. Howes, Price Waterhouse, Toronto, Ontario (416) 863-1133.


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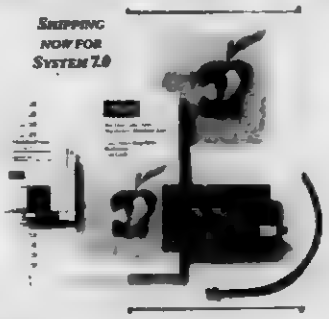
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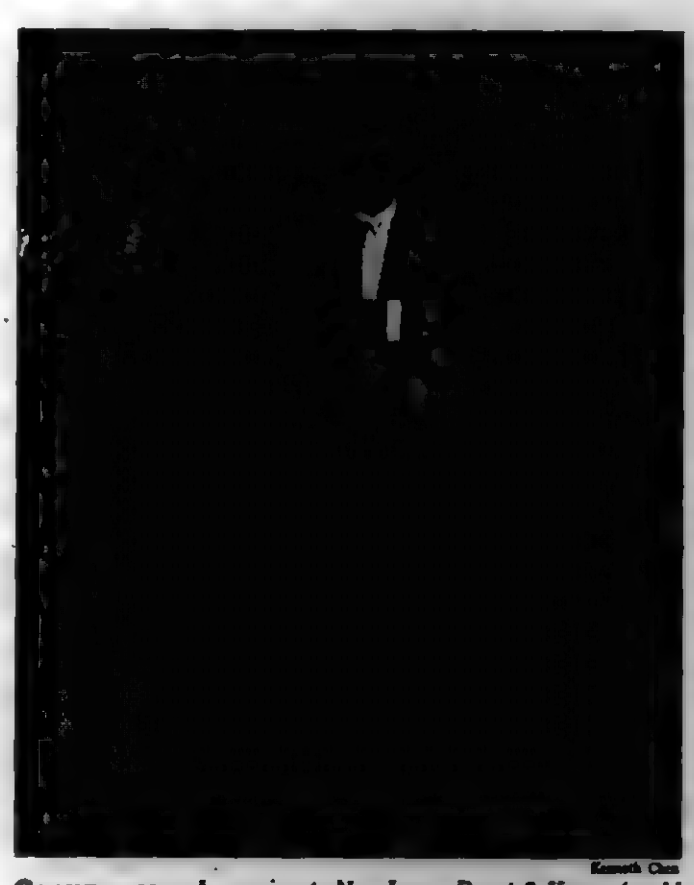
- Where does our data center rank and why? And by how much?
- Is outsourcing the right solution for us?
- Is our data center improperly staffed? If so, where? Why? And by how much?
- Is our production quality comparable to world-class data centers?
- If our data center is cost efficient, do customers, management, and staff know it?

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Improve it or lose it

Rising money and user pressures mean data centers must shape up or . . .



Kenneth Chen

Germann says by moving to New Jersey, Ernst & Young 'could attract higher quality people who didn't want to go into New York'

BY ALAN RADDING

Many data centers today have arrived at a crossroads: They must improve or die.

Faced with flat or declining budgets, increased user service demands and outsourcing alternatives, many information systems departments are wrestling with a strong mandate to do more with less — or else.

"We are being asked [by internal IS groups] how to make the data center more efficient," says John Ebersole, managing consultant at Index Group, Inc. in Cambridge, Mass. "But at the same time, management asks, 'Should we be doing this at all?' "

Indeed, with their multimillion dollar budgets, data centers are big, juicy targets for cutbacks. Worse, there's evidence that data center productivity has peaked in many cases, thanks to automation.

Of course, many of the pressures facing data centers aren't really new; they're just heightened. "The problems haven't changed, except the economy is a lot worse," says Leonard Eckhaus, president of the Association for Computer Operations Management in Orange, Calif.

The tougher economy has left many data centers with two choices, according to consultants and IS managers: Shape up or outsource. Today, "shaping up" most often means relocating, consolidating and automating.

"You have to automate to become more efficient and consolidate to achieve economy of scale. If you can't, then outsource," says Michael Connolly, senior manager at Nolan, Norton & Co., a Lexington, Mass.-based consultancy.

To cope with performance and financial pressures, IS organizations have successfully adopted several strategies. A brief look at some proven approaches follows.

Ernst & Young relocates

From a technical standpoint, the simplest strategy is relocation, according to Thomas Lalor Jr., president of St. John's Consulting Group, Inc. in Westfield, N.J. Moving data centers can offer big paybacks in cost savings and improved performance, Lalor says.

Low-cost, high-speed telecommunications makes it practical to move the data center out of the high-cost, metropolitan headquarters location.

"Now you can put the hardware in a geographically optimal location," while applications development and support people can remain at headquarters, where they work directly with users, Lalor says.

Other payoffs include reductions in rent, utility costs, taxes and even salaries, thanks to the generally lower cost of living outside of major urban areas. Lower living costs often make it possible to attract quality people for less money, consultants say.

The former Arthur Young, now known as Ernst & Young, an accounting and consulting firm, relocated its data center and applications development from New York's borough of Manhattan to New Jersey and saw immediate benefits.

"That put us into a lower rent district, and we could attract higher quality people who didn't want to go into New York City," explains George Germann, national director of MIS at Ernst & Young in Lynnhurst, N.J.

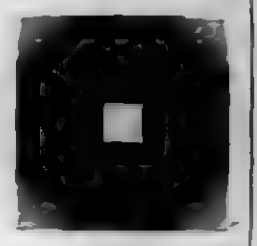
Utility bills have dropped 40%, and annual savings from the relocation approach about $1 million, Germann says. He adds that the company recouped moving costs during the first year.

There are other benefits, too: Germann and other workers say they don't miss the Manhattan grind. They also enjoy shorter commuting times, less downtime and improved morale.

Ernst & Young picked its new location carefully. "We wanted to be close enough to New York so that we would have no trouble attracting talented people from there," Germann explains.

Even so, about 80% of the New York-based staff left during the first 1½ years. But, Germann

Continued on page 72



Data Center Efficiency

Key points

▶Growing financial and user pressures have forced data centers to improve or face outsourcing.

▶Popular options for boosting efficiency include relocating from urban areas, sharing facilities, consolidating and automating.

▶Some data centers hire outside consultants to analyze operations and find out how they stack up against others (see story page 75).

▶Bigger isn't necessarily better. Experts say data center efficiency starts to level out at about 160 million instructions per second (see story page 76).

▶Brief case studies include The Chase Manhattan Bank NA, Physicians Mutual and Life Insurance Co. and Yale School of Medicine (see story at left).

▶QUOTABLE:

"The problems haven't changed, except the economy is a lot worse."

LEONARD ECKHAUS
ASSOCIATION FOR COMPUTER OPERATIONS MANAGEMENT

Continued from page 71

adds, "If we had moved *really* far away, they would have left the first day."

The trick to preventing immediate panic flight by the staff, Germann says, is honesty. He advises: "You have to recognize that this kind of thing affects lives. As soon as rumors start to circulate, you have to be up front with everybody."

The company informed everyone about the move at the same time and assured them they would be able to keep their jobs.

Also, planners stressed that the move wasn't actually that far from Manhattan and permitted "reverse commuting" against the traffic.

Because costs were lower and space was plentiful, the new data center was built to accommodate growth, "which proved to be very fortunate three years later when we merged with Ernst & Whinney," Germann notes.

The merged data centers were consolidated into the Lynnhurst site, resulting in a 25% reduction of the total staff.

Today, Ernst & Young "automates as much as possible" in a drive toward lights-out operation, according to Germann.

Yale shares facilities

A new twist on the relocation theme is the idea of shared facilities. The basic strategy is to join two organizations that are related or friendly to save money on redundancy, power and environmental systems.

Yale School of Medicine in New Haven, Conn., for example, built a new data center shared by three separate systems groups in hopes of gaining some of the efficiencies of consolidation without actually implementing it.

The three School of Medicine data centers share a single computer room and staff, but they keep their own computers, says Howard Newstadt, assistant director for financial affairs at Yale School of Medicine. Two IBM Application System/400s handle clinical and administrative tasks, while a Digital Equipment Corp. VAX 8800 is used for academic applications.

Previously, clinical IS, medical administration and biomedical computing each had separate systems, facilities and staffs, Newstadt explains.

Now, the groups also share related services, such as an office services group and the report distribution operation. Committees are still working out the best way to assess actual costs, but Newstadt says he expects the costs will be split equally among the three centers.

The main goal of sharing was not to reduce the head count, Newstadt explains — "We're in a high growth phase," he says — but rather to stem future personnel increases. "It's a way to control long-term costs, not reduce current costs," Newstadt says.

The school will also join Yale New Haven Hospital later this spring to share power, backup and environmental systems.

School officials say they expect that the move will help data center operations become even more efficient because facilities will be shared with the hospital data center located in the same building. Cost allocation between the school and hospital will be prorated based on the amount of service used by each.

The organizations will share a large backup power generator, environmental systems and the halon exhaust system. "We each have our own halon system, but we share the exhaust system," Newstadt explains.

"There are some immediate cost savings, but the real advantage is if we had stayed on our own, we would not have invested in as good a backup system," he says.

Chase consolidates

The Chase Manhattan Bank NA consolidated four data centers, combining two from New York and one from Lexington, Mass., into its Lake Success, N.Y., site. As part of an effort to get better economy of scale, reduce overhead and improve operational efficiency, the bank also embarked on a major automation project.

"Our goals were to improve quality

Avoid these deadly mistakes

Experts say mistakes in capacity planning and failure to consolidate and automate are the biggest drags on data center performance.

Specifically, the problems are as follows:



- **Doing too much too early.** One of the most common gaffes is early installation of new equipment, which provides high capacity long before it's needed. Being a few months premature isn't a problem, experts say, but some organizations jump the gun by 18 months.

So by the time organizations really need the new high-capacity equipment, not only have they overpaid, but the equipment may also be obsolete.

- **Failing to consolidate.** Another common problem is ignoring the need to consolidate. Large organizations with four, eight, 10 or more data centers can realize tremendous savings simply by combining operations, experts say.
- **Underautomating.** Several problems, including overstaffing, can be blamed on the failure to take advantage of automation tools.

Quality often suffers without automation, experts say. By removing the potential for human error, data center performance and efficiency often rise while costs plummet.

ALAN RADDING

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and reduce the head count, and we have done that," says Tony Graziano, manager of technology planning at Chase Infoserve International, a service subsidiary of Chase Manhattan.

While Graziano declines to provide specific numbers, he says Chase Manhattan's consolidated data center costs less than the combined costs of the individual data centers. And although the data center budget continues to grow, he adds, it's not growing as fast as in the past.

Staff has been reduced to the point at which it nears lights-out efficiency in parts of the data center, Graziano says. No one was laid off as a result of the consolidation, he adds. Instead, people were moved into technical support positions.

The shop runs two IBM 3090J machines with 700G bytes of direct-access storage. It has a staff of 63 in direct operations — a number Graziano plans to reduce through automation. "We hope to shift some of those people into support and services to supplement technical areas," he says.

Graziano advises would-be consolidators to standardize hardware and software, especially the latter. "Hardware is not as hard to consolidate as software," he says, adding that Chase Manhattan is still converting to a standard software platform.

"This was not a onetime project. It's effective management, a part of an ongoing process," he says.

"Automation is necessary for survival," declares Arnold Farber, president

Continued on page 74

DATA CENTER SAVERS

•Relocate	•Eliminates problem •Attractive return on investment	•Logistically complex •Temporary disruption risk •Significant investment
•Software to reduce equipment needs	•Savings vary	•Some solutions labor-intensive or cumbersome
•Share facilities	•Significant operating and capital savings	•Difficult to find satisfactory partnership
•Facility capacity planning and service-level analysis	•Savings vary	•Increased demands on technical planners and close cooperation with facility planners/engineers
•Lights-out operations	•Significant operating and capital savings	•Work flows and cable-length restrictions complicate layouts and designs
•Remote data centers	•Attractive return on investment •Large operating savings after large capital investment	•Major undertaking with risks of temporary disruptions and major personnel issues •Logistically complex
•Energy-saving equipment	•Significant savings requiring significant capital investment	•Cutovers of environmental systems are complex and involve significant risk
•Hire consultant	•Attractive return on investment with fast results	•Finding the right consultant and limiting the scope of study to yield fast return on investment
•Outsourcing	•Savings vary	•Long-term consequences include reduced control over technical direction •Difficulty of reversing decision in the future
•Labor- and space-saving technologies	•Savings vary	•Advanced technologies require more highly skilled technicians, offsetting some labor reduction savings

Source: St. John's Consulting Group, Inc.

CW Chart: Doreen St. John

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HEWLETT PACKARD

Continued from page 73

of Farber/LaChance, Inc., an automation consultancy based in Richmond, Va. But he and others caution that there are limits to what automation can do.

That observation is backed up by Connolly, who headed Nolan, Norton's new annual data center study. "This year, we noticed data center productivity leveling out," Connolly says. The falloff, he explains, appears to be because of automated operations.

Some large data centers that had been automated in the past are now experiencing flattened efficiency, mostly because the efficiency gains from automation have hit a wall, according to Connolly.

Physicians automates

However, smaller data centers that aren't as far along in the automation life cycle can continue to see productivity gains, Connolly reports.

Physicians Mutual and Life Insurance Co. in Omaha, Neb., embarked on its automation drive six years ago and still sees room for improvement. "Our goal is to eliminate as much human intervention as possible," says Bob Jones, technical service manager.

AUTOMATION CAN BE expensive, especially at the start.

The company has experienced a dramatic increase in computer utilization. "We're keeping the machine busy 99% to 100% of the time, and our response time is less than half a second," Jones notes.

Physicians Mutual's data center runs a Hitachi Data Systems Corp. machine equivalent to an IBM 3090J. The system requires only two operators and one tape librarian per shift (only one operator overnight) through the use of automation.

During the six years the company has been automating, its processing capability has grown from 18 million instructions per second (MIPS) to 50 MIPS without adding a single operations person, Jones reports.

So far, Physicians Mutual has concentrated on automating computer operations, which eliminates the need for human response to systems messages. It also uses performance management tools that constantly tune the system and a systems analyzer that monitors systems status and performs diagnostics. In addition, the company uses hardware utilization software for direct-access storage device management.

Automation can be expensive, though, especially at the start, Jones says. Automation tools from Candle Corp., Computer Associates International, Inc. and IBM "were a big hit to the budget when we brought them in," he says, but they eventually helped reduce overtime costs and improved hardware utilization.

"Now we don't have to upgrade as soon," Jones notes. With the help of automation, Physicians Mutual's data center operating budget has increased only 5% annually, despite dramatically increased work loads, he adds.

As a next step, Physicians Mutual will add Candle's remote automation tool, which will let the mainframe run unattended.

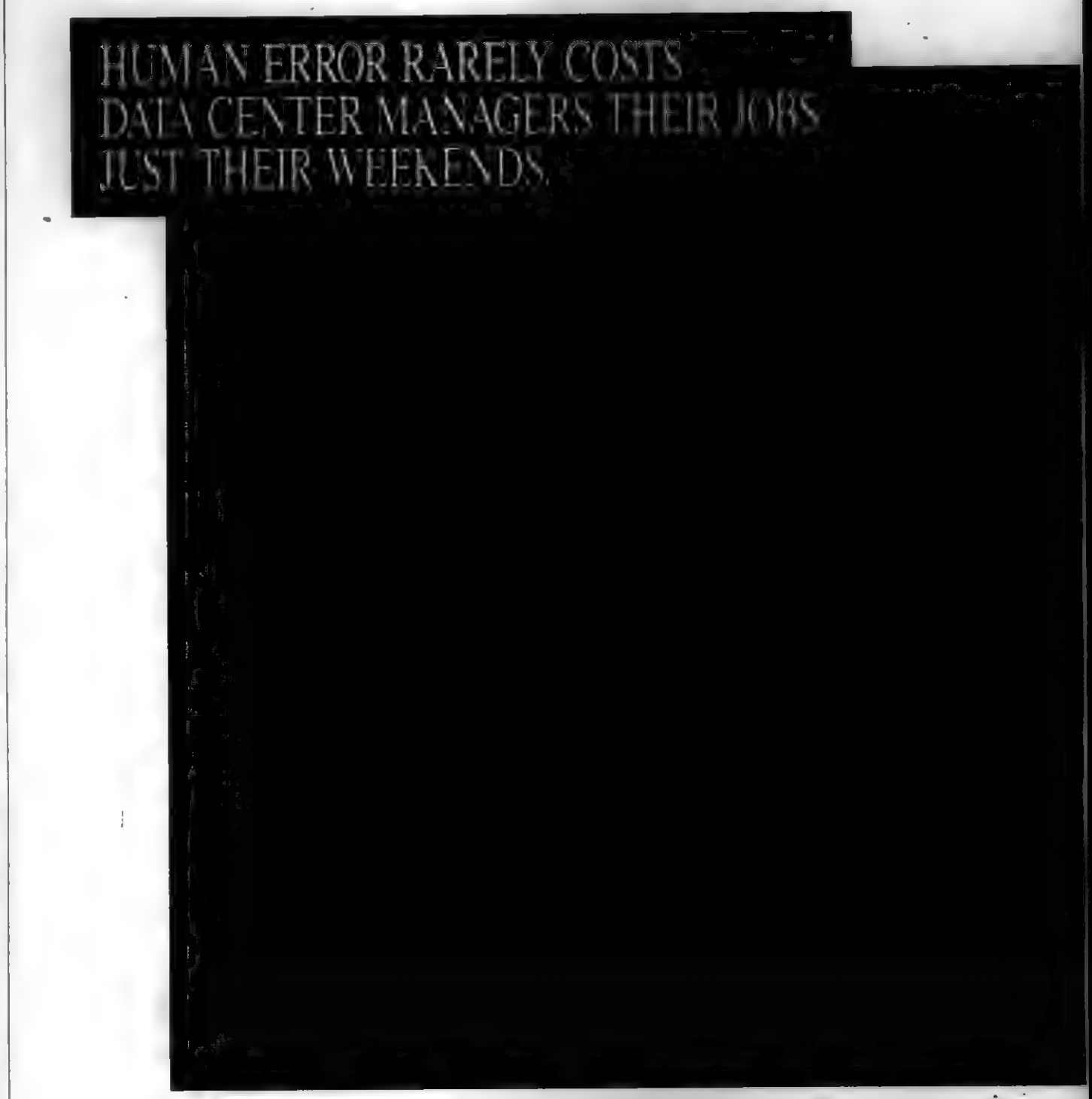
"The remote tool will talk to the automated operator tool. If there is some unique problem, it will notify an individual by phone," Jones explains. The live operator can respond to the problem using a personal computer from home.

"Eventually, we'd like to get to lights-out operation overnight and on weekends," he adds.

Ultimately, Physicians Mutual would like to automate tape handling and report distribution.

Ironically, during the automation drive, Physicians Mutual moved the data center to a bigger space because of larger anticipated work loads. The work load did increase, but without additional personnel, the extra space was unnecessary. "Because of the automation, we're using fewer people than we expected," Jones says. ●

Radding is a free-lance writer based in Newton, Mass.



Does your data center measure up?

IS managers increasingly turn to consultants to rate their performance

BY ALAN RADDING

Rather than relying on seat-of-the-pants judgments, some information systems managers are turning to firms that can help them compare their data center performance against that of their peers.

Nolan, Norton & Co., Compass America, Inc. and Real Decisions Corp. are among the best-known firms that offer IS organizations comparative data center information.

Such consultants pitch themselves as desirable alternatives to outsourcing. Without solid information, they argue, data centers either overcompensate or get caught short. Data center measurement is a key part of a large corporate effort to measure IS performance and payoffs (see story page 81).

While methods vary, these vendors typically analyze computer-generated activity reports, the nature of the work load and the data center's own financial, staffing and operational records. This process usually takes about three months, and vendors charge anywhere from $50,000 to $100,000, depending on the complexity of the analysis.

The results of the study are compared with other companies in the vendor's database, and recommendations are made.

Valuable information

IS managers, in turn, use the performance measurement reports to get a detailed, objective analysis of their operation, identify areas for improvement and show management and users that they're worth the money.

"We charge our users for our services, and we need a way to prove to them that they're getting a competitive rate," says Russ Bohart, director of the California State Health and Welfare data center in Sacramento.



"We were surprised that we came out better than we anticipated," Bohart says.

A Compass study of the data center at Brown Group, Inc., a St. Louis-based shoe manufacturer, also led to several changes.

"They recommended we take action on personnel — something we were already doing — and use more automation," says Lee Peterson, manager of MIS administration. "We thought we were well-automated, but the study showed where we could do more."

Matter of interpretation

Interpreting the results can be tricky, however. For example, when Brown, which has a large retail trade, asked to be compared with a retailing organization instead of another shoe maker, several low marks disappeared, Peterson says.

To ensure that the recommendations have teeth, Brown's management required IS managers to respond to issues raised by the study when annual goals were set.

Henry Ford Health System in Detroit, a $1.1 billion diversified health care organization, avoided a CPU upgrade by doing a performance audit, says Thomas McNulty, senior vice president and chief financial officer.

"We were surprised to discover that our CPU capacity was in good shape, but our storage wasn't," he says. "A storage crunch rather than the suspected CPU capacity created problems with the job stream."

Henry Ford Health System's CPU dilemma is symptomatic of a larger issue addressed by performance measurement. "You never know how much is enough," McNulty says. "You never know when you are OK." ●



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Getting the best for your buck

IS managers find thorough facility analysis key to efficiency

INSIDE EDGE

BY THOMAS LALOR JR.

Are you getting the most for your data center dollars?

That's a big question today for many information systems managers struggling with tighter budgets, deteriorating infrastructures and escalating facilities costs.

Value-minded IS managers can use a variety of strategies (see table page 73) to get their money's worth. Many of the smartest companies are focusing on physical facilities, environmental systems and capital equipment.

IS managers whose budgets are being cut face a double bind: They need to provide more service while spending less. Capacity planning and service-level analysis can help them make informed trade-offs.

Capacity planning helps managers assess the work load and corresponding need for staff, computers, materials and space. They can then determine the best way to balance capacity with cost. In determining the frequency of paper shipments, for example, they must consider cost, equipment, labor and space.

Service-level analysis focuses on two factors: reliability, or the length of time between failures, and availability, or the duration of failures. For improved reliability, managers identify development redundancies in key areas.

Availability can be improved by shortening downtime. Managers might determine, for example, that they should purchase a service contract or hire more maintenance staff.

Such analysis can help data center managers determine which of the following data center strategies is best for them. They are listed from greatest to least return on investment:

• **Design and build a new facility.** Ideally, the facility should be remotely located in a locale with low taxes, low utility rates and infrastructure-dependent services. It should be designed with energy- and space-saving priorities using lights-out and related design concepts.

• **Improve existing facility.** A more realistic alternative for many organizations is to improve their current facilities with new technologies that save on labor, space and energy.

These include tape silos, electronic vaults, continuous paper feeds for laser printers and sophisticated air-conditioning systems and energy-monitoring equipment.

Software tools can reduce equipment needs, and terminal managers can consolidate command centers to reduce personnel, equipment and floor space.

• **Outsource operations.** Outsourcing can provide limited immediate savings, but there are two important caveats: First, the outsourcer's price commitment is typically short term, so it's difficult to determine long-range paybacks. Second, once the technology decisions are handed to the outsourcer, it becomes difficult to backtrack, which will force trade-off decisions. •

Lalor is founder and president of St. John's Consulting Group, Inc., a consulting firm based in Westfield, N.J.

How big is big enough?



What's the optimum size for a data center? Is it 40 million instructions per second (MIPS)? 80 MIPS? 150 MIPS? More?

While opinions vary, data center consultants say bigger isn't always better. "At 160 MIPS, efficiency starts to level out," says Len Bergstrom, executive vice president at Real Decisions Corp. "From 400 MIPS and up, it flattens out quite a bit. Really large shops might even have diseconomies of scale."

Conventional wisdom puts the ideal data center size at 40 to 50 MIPS, a figure experts agree is too low. "We've found the optimum size is at least three times that and increasing — if you have the load to support it," says Thomas Blitz, president of Compass America, Inc., a consulting firm.

For example, The Chase Manhattan Bank NA's consolidated data center is 210 MIPS, just about the ideal size, according to Blitz (see story page 71).

While larger data centers may enjoy even greater efficiency, the gains are less dramatic. "The largest data center we know is 900 MIPS, which is marginally more efficient than 500 MIPS," Blitz says.

Consultants say small data centers can still be efficient, but they must follow different strategies, such as purchasing used equipment.



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Is technology worth it?

Assessing the business value of IS is a hot issue in the insurance industry. IS chiefs reveal the ways in which they are justifying IS investments

The first in an occasional series on assessing the value of information technology in vertical industries.

BY MICHAEL L. SULLIVAN-TRAINOR

Pursuing a way to measure the business value of information systems is a lot like seeking the Holy Grail. The path is littered with scattered bits of academic research, with no completely successful measure available. For IS executives, this quest is more than an academic pursuit, however. Without a value measure, how can they convince management of the need for new IS investment?

IS executives in the insurance industry have developed some creative ways to answer that question. While none of their methods represent the ultimate measure of IS business value, they do help the executives persuade bosses and peers to continue investing in IS.

The need for such tools has become pressing. The industry has been experiencing declining profits (down an average of 16% in 1990 for the Top 40 insurance companies) and increased competition from financial service firms offering life insurance. In addition, the ever-present search for new revenue has led to increased market segmentation among the major companies in both the life and property casualty businesses.

These factors combine to squeeze profit margins and place more emphasis on cost reduction and justification.

"I don't think anybody has a formal process for assessing the business value of IS," says John Pajak, executive vice president at Massachusetts Mutual Life Insurance Co. in Springfield, Mass. "It's quite subjective."

IS a hot item

IS spending is a big-ticket item at the major insurance companies, accounting for more than $2.5 billion in 1990 IS budgets alone. Yet no one claims to know how much revenue or profit was produced by that investment.

To find out how executives determine the value of IS spending despite the lack of a hard measure, *Computerworld* interviewed insurance IS chiefs at a roundtable held at the semiannual Life Office Management Association's (LOMA) Systems Forum in Orlando, Fla. Participants included John Alexander, senior vice president and chief information officer at Unum Life Insurance Co.; Jack Crawford, vice president of information management at ITT Hartford; and Jim Massengale, senior vice president of operations and systems at Protective Life Corp. Pajak was interviewed separately.

All four executives acknowledge they are frequently asked to justify IS expenditures. The questions come from both the chief executive officers to whom they report and the line managers who pay for IS services. Their answers can be divided into two categories: business measures that show an impact on the company's revenue or profit and IS performance measures that reveal processing efficiency and applications quality.

Business measures include the following:

- Industry-specific company performance statistics, such as overall earnings growth and return on equity. These are used to claim success for IS operations, which are deeply woven into the fabric of the insurance industry.
- Cost displacement — the amount of money the company did not have to spend because processes were made more efficient through IS — is used to justify new IS expenditures. This is a business measure in the sense that if IS lowers the company's costs, the company can keep more of its profit.

IS performance measures include the following:

- Chargeback — assigning the cost of data processing services proportionally to each line of business — is the most prevalent way of measuring IS costs. The IS operation is performing more efficiently if it is reducing its chargeback costs.
- Data center costs, which determine efficiency and are viewed as a business necessity by senior management, are compared with insurance industry averages provided by objective third parties. This is perhaps the most quantifiable of all IS performance measures. (For a detailed look at measuring data center efficiency, see Executive Report beginning on page 71.)



Joel Shapiro

IS chiefs *Massengale (left), Crawford (center) and Alexander discuss ways to determine the value of IS*

IS is the business

While these measures help the cause by justifying what's been spent on IS, they do not answer the question of how much bang managers will get for the next buck they spend on new systems initiatives.

"The greatest dilemma we face is that in the past, we have justified the automation investment by determining labor displacement," Crawford says. "Now that we're talking about redesigning the business process, and the technology is so inseparable from the business change, how do we factor it into the benefit determination? It's not strictly labor displacement any longer."

Faced with the absence of hard business value measures for future investments, IS

Continued on page 82

Sullivan-Trainor is a *Computerworld* senior editor, features.

Insurance industry measures

Here's what companies are using to gauge IS and its effect on the business

Insurance business performance measures

- Earnings growth
- Return on equity
- Amount of assets under management
- Amount of surplus capital
- Net gain from operations
- Interest-adjusted net product cost
- Market share
- Customer awareness of company

Insurance IS efficiency measures

- Cost displacement
- Cost avoidance
- User productivity gains
- IS expense as a percentage of premium income
- IS expense per unit of user effort
- Network/system availability
- Lines of code produced per work-month
- Industry chargeback statistics

Continued from page 81

managers look at what can be measured. In many cases, that means measuring the business and arguing that IS is so integral to it that business success equals IS effectiveness.

"There used to be a perception that there was a separation between IS and the business, but we can't do business manually anymore, so it's no longer relevant to think of IS as separate," Alexander says.

In addition, insurance executives focus on historical measures of cost savings provided by systems already in place. For example, when $5 billion Mass. Mutual installed a new life and health claims adjudication system, the department was able to to process 10% to 12% more claims with 35% to 40% fewer staff members, Pajak says.

"That's an extremely important measure that goes right to the bottom line because it reduces costs, creates gain and produces capital surplus," he says.

Another argument to justify IS investments is suggesting that market share or revenue would be lost if a new IS initiative is not undertaken.

Take laptops and sales information applications as an example. While they provide more resources for insurance agents, they do not directly result in increased premiums or cost savings from work force replacement, Pajak says. However, he adds, "What happens if you don't make the technology investment, and competitors do?"

Productivity measurements within IS also help insurance executives feel more comfortable about IS investments. To demonstrate productivity gains, Pajak maps the efforts of IS staffers in terms of "work months." Programmer/analysts are expected to maintain more lines of code over fewer and fewer work months.

You can't always get what you want

While insurance IS chiefs say they need to quantify the business value of IS, how to do so remains elusive



Jim Massengale
Protective Life Corp.

"I need to make sure I'm delivering the best value I can."



John Alexander
Unum Life Insurance Co.

"Everyone's concerned about cost."



John Pajak
Massachusetts Mutual Life Insurance Co.

"I don't think anybody has a formal process for assessing the business value of IS."



Jack Crawford
ITT Hartford

"Now that ... the technology is so inseparable from business change, how do we factor it into the benefit determination?"

Photos: Jeff Blanton

CW Chart: Nancy Kowal

Based on organization

The way IS performance is measured depends a great deal on how it is organized. For example, Mass. Mutual's IS department is highly centralized, and its measurements are based on overall statistics for the entire organization.

On the other hand, $2 billion Unum distributes the responsibility for the management and cost of its $80 million in IS activities to individual business units. This approach fits in with the company's niche-oriented business strategy, which emphasizes unique product lines.

"Everyone's concerned about cost," Alexander says. "There are a lot of functions we could do across product lines, but we have to spend so much time gaining concurrence from the business units, it ultimately ends up being cheaper to implement them on an individual basis."

At $8.5 billion The Hartford, IS is a hybrid — centralized authority with IS resources divided among the functional business units. IS spending is based on the business units' assessment of their IS needs. Crawford assembles and monitors the overall IS budget of $150 million.

In these cases, as well as at $390 million Protective Life, the business unit managers see IS as part of their individual product cost structures and are therefore concerned that it be controlled. The primary measure is cost reduction, which is equated with efficiency.

For Massengale, this means IS value is measured by how much IS charges individual business unit managers. He engages in continual negotiation with the business unit managers to provide IS services at acceptable costs. Protective Life's annual IS budget is $7 million.

"Our strategic business units know what they can afford to pay for IS services," Massengale says. "IS is one element in their pricing margin, and they have to stay within that margin because of the competition. I need to make sure I'm delivering the best value I can."

Crawford takes a more direct approach, measuring the IS cost per unit of work performed by the users in each business unit. Total operating costs are divided by this ratio to determine the amount by which IS support boosts productivity.

While this approach provides an overall figure for Crawford to hang his hat on, it does not allow IS value to be forecast for specific systems initiatives because it is based on historic costs rather than future benefits.

Mass. Mutual's IS organization addresses the business unit managers' need to know the value of IS services by providing an annual IS business plan and IS Stewardship Report. While the business plan outlines objectives and measures of success that describe how IS activities are aligned with company goals, the Stewardship Report provides detailed statistics on IS services within each business unit function.

The measurements were selected by the business unit executives, who pinpointed what

Continued on page 86

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Finding out what others are doing

Insurance executives have few places to turn to for IS comparisons

Insurance executives in search of comparative information about their competitors' IS organizations have few places to turn to. Apart from reading computer industry publications or hiring a consulting firm, they have five main resources:

Information: Life Office Management Association's cost survey and database of insurance company IS investment statistics.
Price: Free to members.
Contact: Ann Purr, manager, management resources, (404) 984-3733 in Atlanta.

Information: Nolan, Norton & Co.'s database of more than 200 data centers. Provides benchmarks and comparisons.
Price: Negotiated individually.
Contact: Mike Connolly, senior partner, (617) 862-8820 in Lexington, Mass.

Information: Compass America, Inc.'s database of mainframe installations. Focuses on data center spending statistics. The service analyzes data center efficiency.
Price: Averages $50,000, based on the size of data centers analyzed.
Contact: John Thomas, vice president, marketing, (703) 709-7600 in Herndon, Va.

Information: Real Decisions Corp.'s database of data center costs and IS service levels.
Price: Averages $30,000.
Contact: Len Bergstom, executive vice president, (203) 656-1500 in Darien, Conn.

Information: Gateway Information Services, Inc., in partnership with Real Decisions. Offers services and software for assessing data center efficiency in insurance companies. Its product, DP Choice, utilizes an expert system to lead users through Real Decisions' database evaluation criteria and to normalise the individual IS organization's data from its competitors. It runs on standard PC hardware.
Price: Although Gateway also offers consulting services, it licenses DP Choice for $10,000 without any consulting service required.
Contact: Mark Klein, senior vice president, (212) 880-9300. Gateway has offices in New York and Indianapolis.

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INTERSOLV

PRESS RELEASE

AGER AND INDEX FINALIZE MERGER, FORMING INTERSOLV

Rockville, Md., March 19, 1991 – Sage Software, Inc. and Index Technology Corporation today announced completion of their previously announced merger, forming a new entity to be called INTERSOLV, Inc.

Kevin J. Burns, former chief executive officer of Sage, will serve as chairman and CEO of INTERSOLV.

Burns said the merger creates the industry's largest supplier of computer aided software engineering (CASE) tools, with more than 100,000 customers at over 10,000 sites worldwide.

"The formation of INTERSOLV enables users to turn to one vendor for CASE products that span mainframe, workstation and PC platforms. These products deliver to users the very best of integrated CASE in an open architecture, as their needs dictate," said Burns. "[illegible] solution as a company is to serve our customers by [illegible] information systems solutions."

[illegible] following key areas of the [illegible] products, application [illegible] management through [illegible] engineering through Design [illegible] to offer a LAN-based desktop

[illegible] and expand its [illegible] Partner, in [illegible]

[illegible] Gude Boulevard, Rockville,

E Co[illegible]y That's s Si[illegible]March 19, 1991.

[illegible] Software and [illegible] does far more than just [illegible] two strong CASE companies. [illegible] companies with complemen[illegible] strengths to focus on a common vision [illegible] where the market must go to [illegible] the promise of CASE.

At INTERSOLV our combined 17 years of CASE experience has taught us that you can't build applications in a hyperintegrated and open environment. We have a unique solution: the benefits of I-CASE, but with a [illegible] implementation approach that [illegible] costs and risks.

[illegible] takes into account the [illegible] development [illegible] methodologies, meth[illegible] work [illegible]

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entire development lifecycle. They include Excelerator for design, APS for application generation, PVCS for configuration management, and Design Recovery for maintenance/re-engineering.

Just as important, we're the only CASE vendor to offer solutions that support a true multi-user development environment using workstations and LAN server technology.

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Continued from page 82

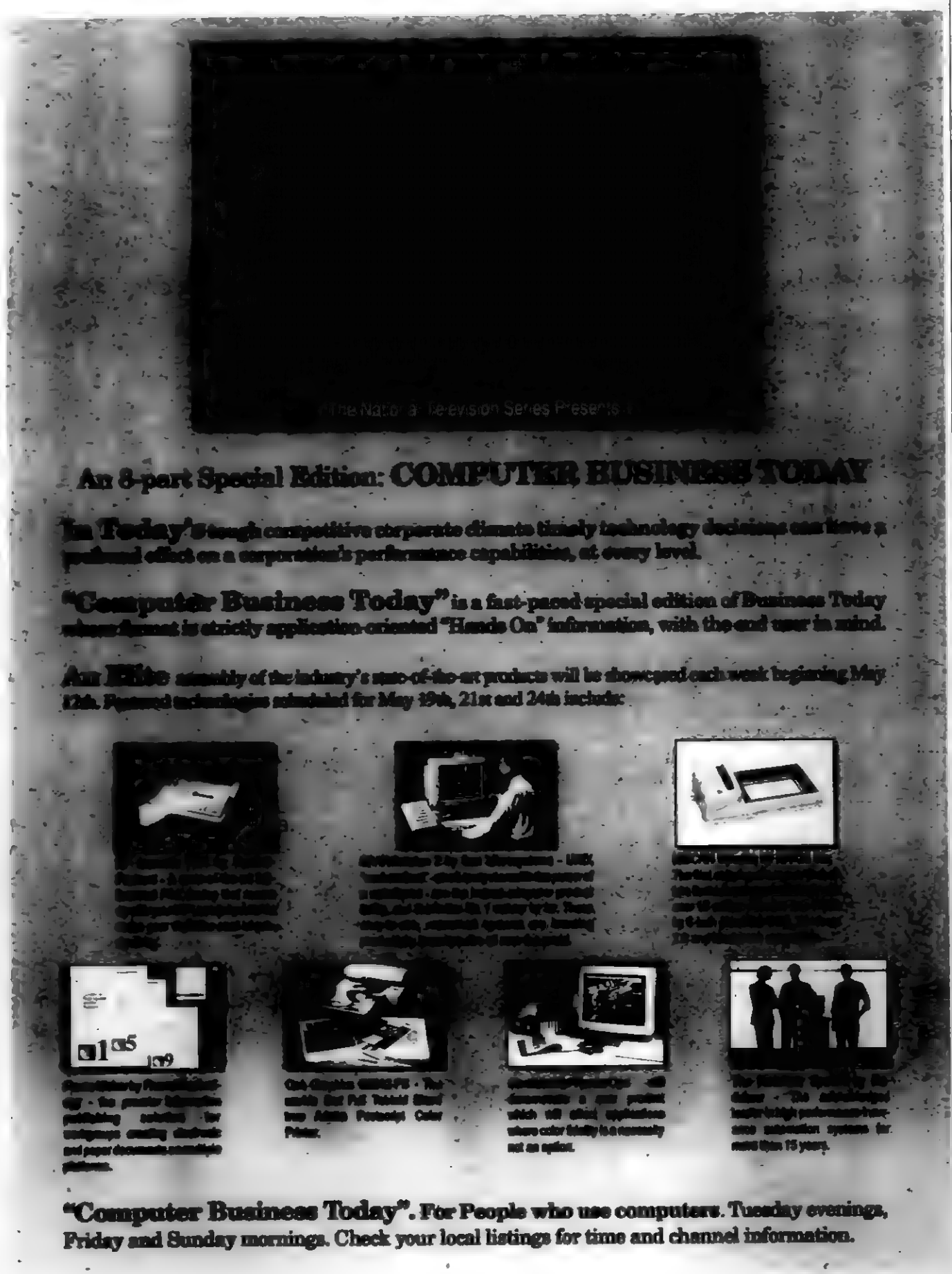
they wanted to know about IS to assess how effectively their money was being spent. Their suggestions were incorporated into measurements such as year-to-year data on the daily number of processed cases, transaction volume and the number of systems-issued policies.

"We're not a separate profit center because there's no value in that for the company. We see value in running a $65 million organization like a business unit," Pajak says. "We write a business plan because if we were an outside organization competing for the business, we damn well would have to be ready to articulate a plan."

In addition, Pajak has instituted a client advisory board that includes representatives from each of the business units. The board meets monthly to receive IS activity reports, such as quality of applications and network availability statistics. "Our philosophy is that all our books are open. We want them to understand how we measure everything from CPU charges to DASD and print activities," he says.

The value of this exercise is that when a business executive makes a decision to add to IS effort, he'll know the cost. For example, if he asks for storage of two to three additional years of historical information, he will understand how much it costs for a pack of direct-access storage devices (DASD) to accomplish his request. "That will make him step back and assess whether

Continued on page 87



CASE benefits are a mystery

Proving the business value of internal IS investments such as computer-aided software engineering (CASE) is not any easier than measuring the contribution of IS to the business.

The four insurance IS managers *Computerworld* talked to are investing or looking to invest in CASE for different reasons. None of them are sure about the business benefits it will provide.

Unum is investing about $30,000 per programmer. With a staff of 250, the total cost will be $7.5 million.

Because measurement systems could be implemented to track different aspects of CASE benefits, John Alexander, senior vice president and chief information officer at Unum, offered his board a choice of benefit assessments. "I told the management board they could have a choice in terms of how we think about the benefits of CASE: improved quality, productivity or time. They chose time," he says.



John Pajak, executive vice president at Mass. Mutual, justified his investment in Texas Instruments, Inc.'s IEF CASE tool by citing the changing nature of IS.

"IS permeates the fiber of the insurance business, so you can make a good argument for investment just because you need to move forward with technology," he says.

The Hartford's Jack Crawford, vice president of information management, says he also sees CASE as an evolution. "The benefits are 1) quality, 2) time and 3) less cost. But it's hard to prove because we're not building the same kinds of applications we were [building] before."

The benchmark applications for many CASE projects are written in Cobol and execute a routine set of operations. But new CASE projects such as those at Unum are aimed at complex universal life insurance applications.

Jim Massengale, senior vice president of operations and systems at Protective Life, is in the prototype stage with his CASE projects to sift through the possible benefits before full-fledged implementation.

He has not made an investment decision. "It would be foolish not to capitalize on new technology," he says. However, "we want to add value and find a long-term payoff. If it turns out to be just expensive and fun, we'll postpone it."

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Continued from page 86

he'll get enough benefit to justify the expense," Pajak says.

While chargeback systems provide a method of measuring and allocating IS costs to the business units, they are often difficult to manage in the face of changing business trends, the executives say.

For example, $500,000 of Unum's data center charges are paid by the individual life insurance business unit. The unit no longer sells policies, but IS must maintain records for 70,000 policyholders.

The unit's business manager has launched a cost-reduction offensive, trimming his staff from 150 to 50. Now he wants to trim his IS costs by moving processing from the data center's mainframe to a personal computer local-area network.

Because Alexander bases his cost measurement on spreading IS processing expenses across the business units, the change in strategy leaves him with a large expense and no place to charge it to.

"It's a good business decision but a tough IS trade-off. A mainframe MIPS costs a thousand times as much as a PC MIPS," Alexander says, "but now I have to find a way to replace $20,000 to $30,000 worth of transactions per month or cut my expenditures."

This kind of balancing is common among all four companies. "We make a basic assumption that the requirements for processors are relatively stable. That ain't necessarily so," Alexander says.

Crucial costs

Unlike spending on new applications, investments in data centers and large networks are viewed as essential activities. Measurement here focuses on efficiency.

"If the network is down for any period of time, it brings the company to its knees," Pajak says, "so one of my accountabilities to the chief executive is network availability. We have a quantifiable measure — zero downtime."

For data center evaluations, the executives compare their efforts with databases of insurance industry IS costs maintained by LOMA and Real Decisions Corp., a Nynex Corp. subsidiary (see story page 82). These firms collect data on IS spending for various categories of data center activities and maintain historical databases of these expenses for the insurance companies that participate in their surveys. Averages for the survey base or a select group of competitors are provided to participants.

"The comparison is helpful and useful to rationalize what we're doing for the boss," Alexander says. "It helps us improve and shape up in certain areas."

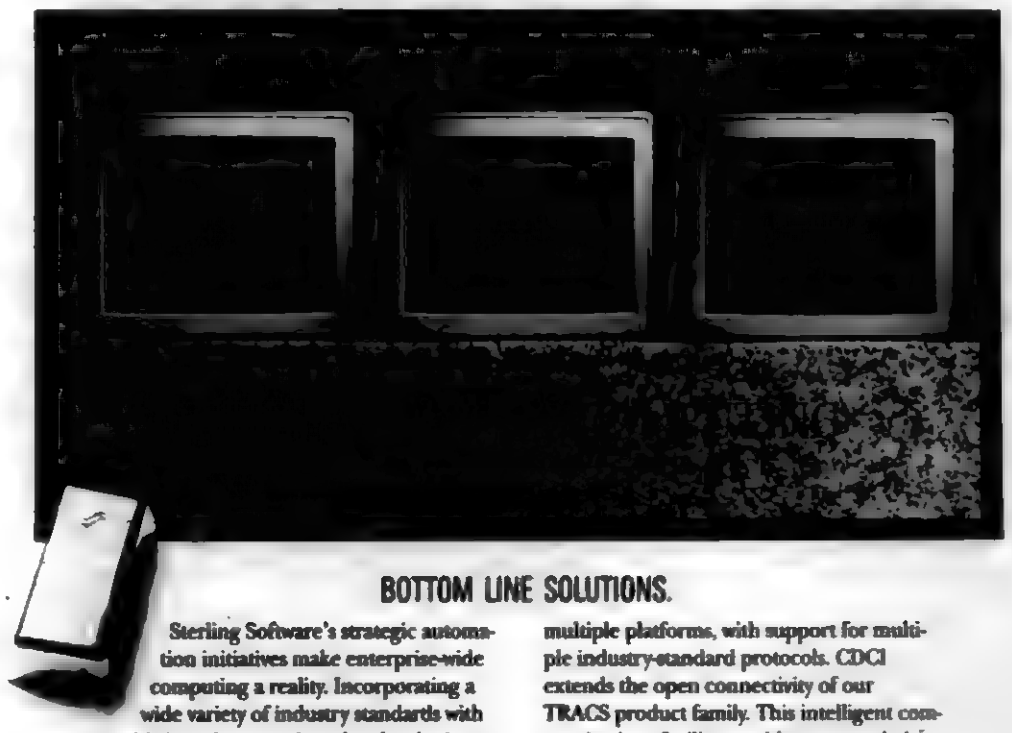
The Hartford draws on statistics from LOMA and Real Decisions to develop ratios of IS cost as a percentage of premiums and as a percentage of underwriting expenses. "We track trends with these percentages to see where we stand," Crawford says. •

Gut feelings

In the absence of hard business value measures, insurance IS managers rely on the following softer arguments for justifying new technology investments:

- **New math:** "IS is so integral to the business that business success equals IS effectiveness."
- **Negative sell:** "We'll lose market share or revenue if we don't get this new system. Nearly all our competitors have one."
- **Cost displacement:** "We avoided spending X amount of money because IS has made our processes more efficient. IS has lowered costs, so we get to keep more profit. This system will continue to help us do that."
- **Good old productivity:** "Our productivity gains have been excellent using technology. An upgrade will increase those gains."

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Bullish at home

▶ **Adapso**, the computer software and services association, released a survey last week showing that 80% of software companies polled expect higher revenue and profits this year. But 58% said economic conditions are affecting them "somewhat negatively," and 42% said customers are taking longer to pay. Only 16% said they will try to cut costs this year. Of those, 41% will cut staff, 37% will trim advertising and marketing expenses, and 4% plan to sell off operations.

Ross on the rise

▶ The first quarterly report issued by **Ross Systems, Inc.** in its newly public capacity featured the same kind of bottom lines that led the firm to voluntarily report earnings in its last quarters as a privately held firm. The Redwood City, Calif.-based exclusive purveyor of business and financial software to the Digital Equipment Corp. market posted revenue up 54% to $12.6 million for the quarter ended March 31. Quarterly profit of $330,000 contrasted with a $1.5 million third-quarter loss last year.

Lapping it up

▶ **Selecterm, Inc.**, a computer products rental and maintenance firm based in Danvers, Mass., early this month acquired the assets of **Lapstop Corp.**, a start-up in the upstart field of short-term laptop rentals in the travel arena. The deal, according to spokesmen from the respective firms, will give Lapstop a shot of financial and corporate backing needed to expand and will speed Selecterm into the business of renting fax machines and laptops to traveling businessfolks at airports.

General acclaim

▶ The computer industry has pitched the ultimate curve ball to Wall Street, it would seem: "**Data General [Corp.]** has reported two excellent quarters in a row," a recent Salomon Brothers, Inc. report said, "and analysts don't know what to do." At least one group of analysts came up with an answer: conceding that its move might initially incur "incredulity and skepticism," Salomon said the one word analysts are out of practice mouthing with regard to DG is "buy."

Northgate financials fool the naysayers

BY MICHAEL FITZGERALD
CW STAFF

EDEN PRAIRIE, Minn. — Northgate Computer Systems, Inc.'s choice of April 1 as the release date for its 1990 financial results only underscored the irony: Could we believe the positive postscript to a loss-wracked report, or should we wait for the almost inevitable cry of April Fool?

It was, after all, as recently as November [CW, Dec. 3, 1990] that Northgate posted a third-quarter loss and warned that it was likely to lose money in the fourth quarter, reported that it was no longer meeting the agreements of its bank loans and replaced its chief executive officer. At the time, rumors circulated that Northgate, a mail-order systems vendor heavily reliant on advertising, was not paying its bills to trade magazines and could be in danger of being cut off.

One analyst went so far as to look at the former highflier's catalog of misfortunes and curtly concluded: "I think it's a company you and I will not remember in two years." So, barely four months later, it was natural to raise an eyebrow when new CEO Gary Held said, "Northgate in the last 120 days has been a Harvard Business School [type of] case study on how to turn a company around. We have had an absolutely phenomenal and complete turnaround."

The figures issued on April 1 offered some support for Held's optimistic statements. According to the report, Northgate posted a $6.9 million loss on revenue of $203 million for fiscal 1990, compared with a $2.4 million profit on $112 million in sales in 1989. The firm attributed the loss largely to a onetime, $7 million restructuring fee.

However, good news came along with the bad: Held said Northgate had posted profitable numbers for December and continued in the black during January and February, heading for what he predicted would be "a solid first-quarter profit." Last month, Northgate reported a $2.24 million profit on revenue of $46.94 million for the first quarter of fiscal 1991, which closed on March 31.

Which way Northgate?

Northgate Computer Systems, Inc., which once seemed headed south, could be on the rise again with a new leader and a tightened focus

	NET SALES	PROFIT (LOSS)
1989:	$91.80M	$(616,000)
1990:	$203.37M	$(6.92M)

Source: Northgate Computer Systems

CW Chart: Doreen St. John

Some new turnaround

A turnaround of this sort was not a completely unforeseeable event, some analysts said. Even at the time of Northgate's public disclosure of its problems, some analysts said they thought the company would pull through.

"Can they come out of it? Sure — take a look at AST a few years ago," said Seymour Merrin, president of Palo Alto, Calif.-based Merrin Information Services. He referred to earlier financial reverses at Irvine, Calif.-based AST Research, Inc. "Everybody had crossed them off the list," Merrin noted, "but now they're very strong."

Earlier this year, another analyst talked about how Northgate could overcome its troubles.

"Things aren't looking real great right now, but it's certainly not beyond salvaging," said Eric Zimits, an analyst at Rauscher Pierce Refsnes, a regional brokerage firm headquartered in Dallas. "If management takes the necessary steps and pulls in the reins, I don't think it's destined for bankruptcy."

Zimits said he believed Northgate's problems stemmed from overspending on marketing and a disastrous foray into establishing a corporate sales force.

"I think it's a matter of the company going back to what they know best, and that's direct-mail, low-cost, quality computers direct to customers," he said.

Held seems to have been listening. Where his predecessor, Lawrence Greenberg, was valued for his financial acumen, Northgate's board — on which Greenberg still sits — tapped Held for his operating experience. His reign as president and CEO has seen the company slash 22% of its work force and focus on its core mail-order business.

In addition, Northgate has rolled out new products. In March, the company introduced several new desktop machines. It also began shipping its first notebook, based on Intel Corp.'s 80386SX chip, in the first week of April.

The firm is also counting on its recent switch in service contractors to further buff an already glowing reputation for fine service. Northgate Chairman Arthur Lazere said. He praised former Northgate service contractor Bell Atlantic Corp. but said new choice NCR Corp.'s ability to provide same-day service throughout the U.S. should help win corporate accounts.

No stranger to struggle

Held, who has been with Northgate for two years and is Lazere's son-in-law, is no stranger to struggling companies. He took over the Connecting Point retail chain the day it declared bankruptcy and turned that around in a year and a half.

"Those situations don't bother me — that's when I do my best work," Held said.

Held said Northgate's business plan in the future would continue its three-point push: Focus on quality improvement, beef up service, and improve internal procedures, including system development.

Once-mighty Maxtor fumbles '91 earnings

BY RICHARD PASTORE
CW STAFF

Maxtor Corp., once the leading vendor of high-end 5¼-in. Winchester disk drives, has dropped the ball and suffered a penalty shot to its earnings with a $49.8 million loss for the latest quarter and a $45.4 million loss for fiscal year 1991, ended March 31.

Maxtor's problems began under the stewardship of recently deposed Chief Executive Officer George Scalise, analysts said. Engineers who were unhappy with management left the San Jose, Calif.-based firm. Consequently, Maxtor fell behind on development of 5¼-in. and 3½-in. drives with capacities over 1G byte, several analysts said.

"That leadership advantage not only eroded, it vanished," said James A. Stone, an analyst at Ladenburg, Thalmann & Co. in New York. Maxtor has few OEM deals for its latest generation of high-end drives, he said.

Maxtor competitors Seagate Technology, Inc. and Micropolis Corp. have picked up the slack and taken over the lead, netting significant OEM deals for their high-end drives, said James Porter, president of Disk/Trend, Inc. in Los Altos, Calif.

Just 13 months ago Maxtor was looking much more formidable, when it virtually doubled its size with the acquisition of the former Miniscribe Corp. and leapt from fourth place into the No. 2 position among 5¼-in. and 3½-in. drive manufacturers, behind only Seagate.

Maxtor paid $46 million to buy Miniscribe — which posted



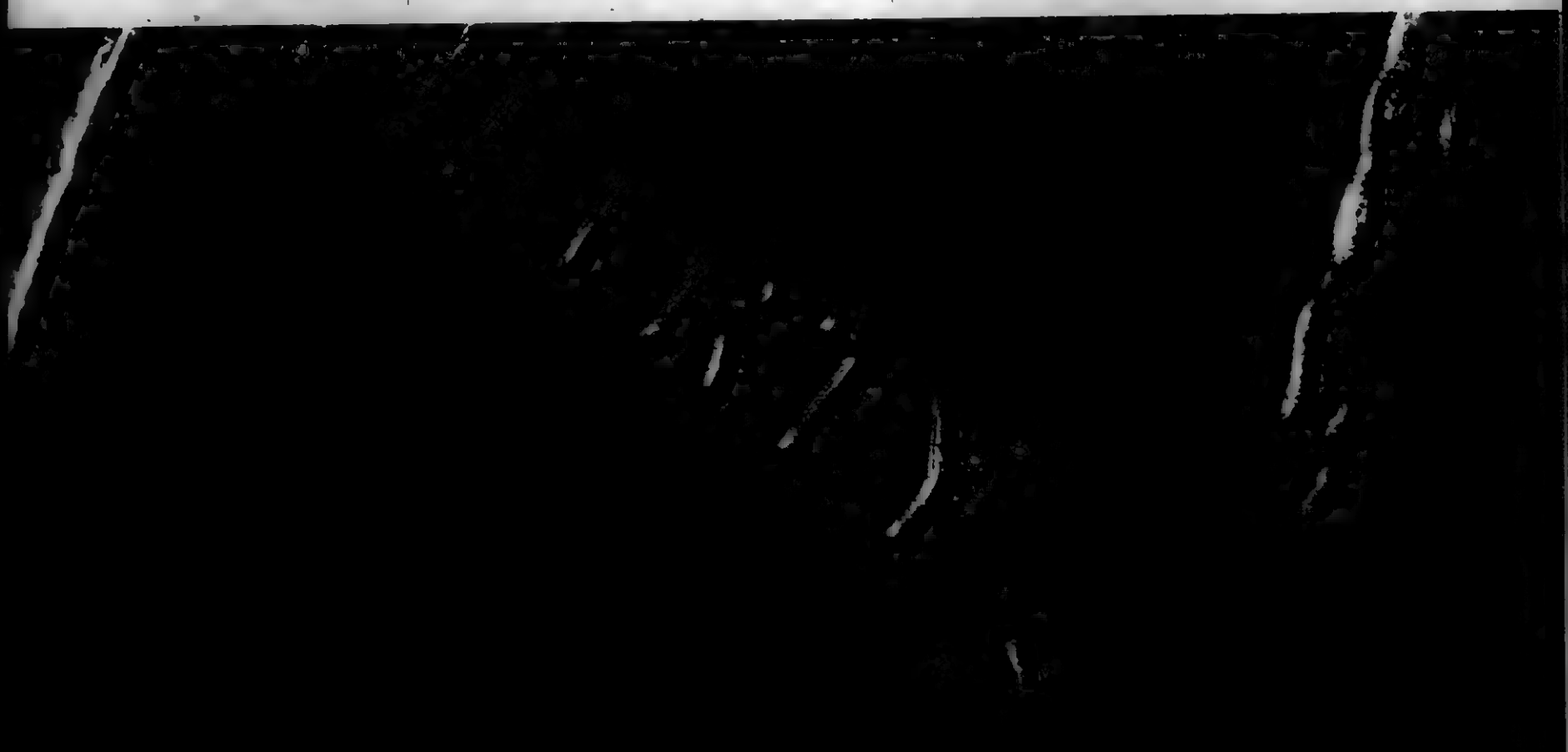
$70 million in 1989 sales — in a court-ordered auction. A new management team has stabilized the Miniscribe operation, Porter said.

In January, Scalise was replaced by former chairman and company founder James McCoy. The new CEO's primary objective is to "rebuild the engineering ability to get new products out earlier," Porter said.

Others said they expect that Maxtor will not have a chance to regain a leadership role in the next generation of high-end drives before 1992. The window of market opportunity for drives greater than 1G byte is already closing, Stone pointed out, while the window for the next generation has barely opened.

The firm reported the losses on $223.6 million in sales for the quarter and $871.3 million for the fiscal year. Roughly 59% of the loss came from onetime restructuring and other charges, including consolidation and layoff costs. The company ended fiscal 1990 with $491 million in sales and $18.9 million profit.

The cost crunch.



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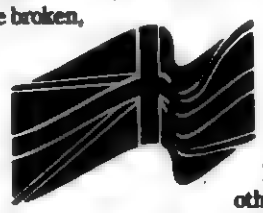
British Rail spins off telecommunications unit

Operator aims to position itself alongside British Telecom as major public telecom carrier

BY BRIAN CRUMP
IDG NEWS SERVICE

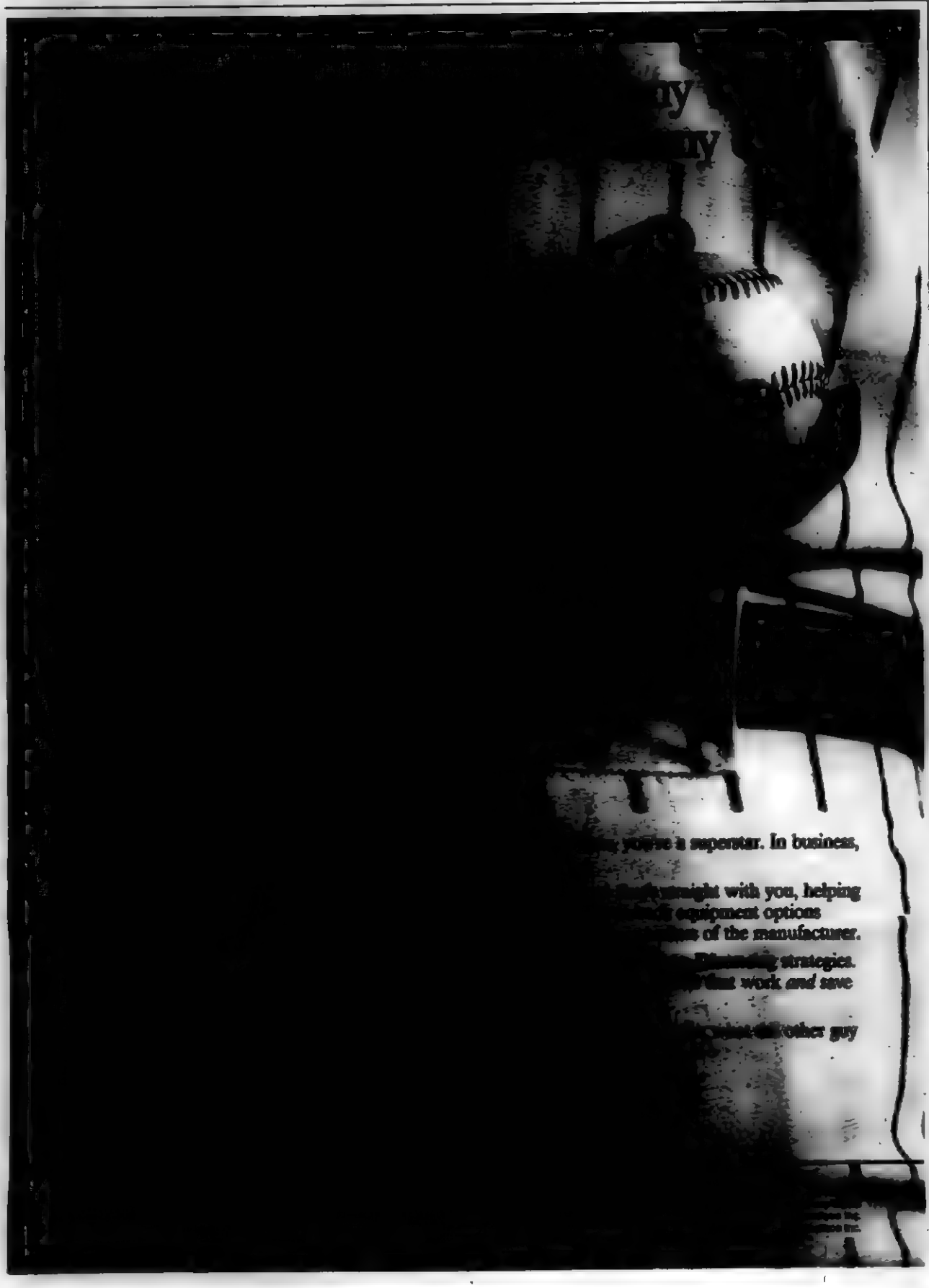
LONDON — What does telecommunications have to do with trains? What gives British Rail Telecom, part of a company that operates a rail network with its origins in the last century, license to sell communications technology for the next?

Peter Borer, managing director at BR Telecom, answered both questions by pointing to BR Telecom's long history as a telecommunications operator, during its tenure as a part of British Rail. Good communications are vital to a railway, Borer said. If stations cannot talk to each other, or if the lines to the signals are broken, then trains cannot run.



Officially formed as a separate company last September, BR Telecom runs about 60,000 internal lines for British Rail's business operation. The railroad's signaling staff still has its own network.

Borer's mission is simple: to establish the firm alongside British Telecom and to rival Mercury Communications as one of the three major public telecommunications carriers in the UK. With the March release of the government white paper on telecommunications competition for the 1990s giving the green light for the scrapping of the telecom "duopoly" that prevented companies other than British Telecom and Mercury from offering a public fixed-line service, Borer's team is ready to swing out onto the marketing mainline — once he has found another business partner.



Borer is looking for a solid, privately owned telecommunications carrier with plenty of money and marketing expertise to share with his fledgling company. "They've got to be pretty substantial companies," he said. "We're talking about hundreds of millions of dollars."

However, it is the marketing as much as the money that BR Telecom wants. Until now, the firm has had only one customer: British Rail. Selling telecom services to the rest of the UK will not be so easy, Borer conceded. While he has no doubts about his firm's ability to come up with the telecommunications goods, he said he thinks BR Telecom will need help in tailoring them to the marketplace.

Aside from being BR Telecom's sole customer, British Rail could be the fledgling firm's biggest liability: British Rail always seems to be struggling against bad press. Borer acknowledged that it is a big problem, but he said he believes the right advertising will help BR Telecom bypass the issue. "Some people are always going to knock us, but good branding can change the customer perception of what you are trying to sell. Intercity [Rail] has managed to do that, and they are 100% [British Rail]," he said.

Borer is no stranger to the realities of the marketplace. He has spent most of his working life in the service of telecommunications companies: first at IT&T in Brussels, Paris and the U.S., and since 1984 at Kingston Communications, a UK telecommunications company.

Firsthand knowledge

Borer's stint at Kingston gave him an opportunity to experience what it is like to compete against British Telecom firsthand. His conclusion: Sometimes it is better to be smaller. Kingston's small size meant it was relatively easy to become a 100% digital network, a task it completed shortly after Borer joined British Rail.

His point is that small firms are often better placed to take advantage of market changes. Changes such as the rise in the use of computers has led to greater demand for data as well as voice lines. Borer said he expects telephone demand to stay constant throughout the '90s.

"Growth seems to be insatiable, even within British Rail. British Telecom's weakness is that it has difficulty in moving quickly in an entrepreneurial way to take advantage of this," Borer said.

But isn't Mercury small, too? Borer agreed but said Mercury serves limited areas of the UK. BR Telecom's cables go everywhere the railway goes.

When it comes to those cables, Borer has no worries about his firm's expertise. About 70% of its lines are digital, and the network has 1,500 miles of fiber-optic cable. In two years, he said, the network should be 100% digital and fiber.

If it succeeds, BR Telecom will not be the first telecommunications firm to spin off from a railway. Borer cited the case of Japan Telephone Co., No. 3 in its national market, as a case of a telecom supplier formed from the telephone network of the country's national rail network. Railways in Canada, the U.S. and New Zealand have also attempted to sell spare capacity on their telephone systems.

Borer said the business is there. If BR Telecom can get on the same bandwagon, Borer may find he has booked a permanent seat on the gravy train.

Crump writes for PC Business World, *an IDG Communications British publication.*

Privacy issues cloud software future

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C.— A report just issued by the National Research Council points up a burgeoning problem for the software industry: Not only is the law unclear on the critical issue of intellectual property protection as applied to software, but leading lights in the field are at loggerheads over what direction legal development should take.

Meanwhile, as confusion proliferates, a double-edge irony is mounting: The law's inability to keep pace with software technology is starting to impede that technology, while failing to protect the rights of its developers.

Results of a December 1989 workshop, which brought together 100 computer specialists, entrepreneurs, legal scholars and lawyers are laid out in the report published by the council, an arm of the National Academy of Sciences. The report has been updated to reflect recent developments in technology and case law.

According to the report, "Some see [industry's future] obstructed by uncertainty over intellectual property protection for software and by the adversarial behavior that has arisen in this climate of uncertainty. "The result," said Robert Spinrad, director of corporate technology at Xerox Corp., "is confusion, which is having a 'stultifying, dulling effect' and is 'slowing down the activity' of firms big and small."

A unique situation

Workshop attendees said that none of the three ways by which software may be protected — copyright, patent and trade-secret laws — really offers a good fit for the uniqueness of software. As a result, gaps in protection are hard to avoid, while some areas of coverage are too stringent. Proposals ranged from "do nothing" to hybrid patent-copyright approaches to the development of a new body of law specific to software.

Copyrights cover the expression of ideas, not the ideas themselves. That often works well in the software world where independent developers may implement the same functions in a different way, as in competing word processing systems. But viewing software as analogous to literary works, as courts generally do, ignores its status as technological processes, the purview of patent law.

To augment intellectual property protections, the U.S. Patent and Trademark Office has begun granting patents for software and for software-dominant products. Some applauded the accelerating practice, saying it properly recognizes software as technology while offering powerful incentives for innovation.

However, some attending the workshop saw the practice as "a little black cloud on the horizon," saying it will inhibit independent invention and lead to skyrocketing litigation.

Others said the slowness of the patent process would impede product deployment, and one observer said it could put a "stranglehold" on scarce supplies of efficient algorithms for some processes.

The report also looks at proprietary interest in interface code, particularly at the hotly contested issue of what can and cannot be protected in the "look and feel" of the user interface. It "is one of the nastiest and most difficult areas" the software industry has to grapple with, said Frank Ingari, a former Lotus Development Corp. executive. Last summer, Lotus won a major "look and feel" suit involving its 1-2-3 spreadsheet interface. It is currently in court on another.

In a controversial proposal, Harry C. Reinstein, chairman at Aion Corp., said all interfaces should be considered "open," allowing independent implementation of publicly available specifications but not copying of code. "Let us just not protect interfaces . . . interfaces are legitimate points of competitive entry," he said.

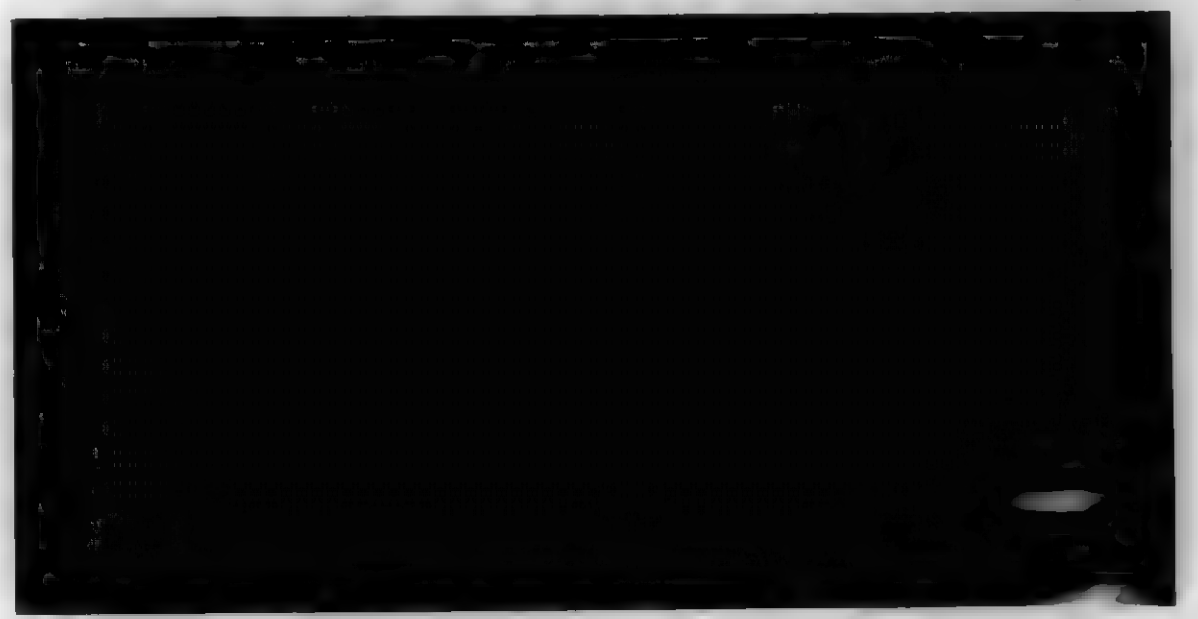
Five Cs

The following are suggested goals for a software protection system:

- **Coverage.** Protection should extend to the brilliant ideas and the hard work — the inspiration and the perspiration — that goes into a product.
- **Continuity.** The ability to build on existing standards and conventions at a reasonable cost should be assured.
- **Consistency.** This is key in the application and scope of intellectual property protection. Surprises from belated declarations of property rights are to be avoided.
- **Cognizance.** The timely awareness of competing property rights claims should be facilitated so that developers will not be blindsided by competitors.
- **Convenience.** A straightforward intellectual property system that minimizes litigation and conflict should be the ultimate goal.

Source: Robert Spinrad, Xerox Corp., as reported by the National Research Council

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Network Systems acquires vital link

BY ELISABETH HORWITT
CW STAFF

Just as AT&T was finally dropping its net over NCR Corp. last week, Network Systems Corp. was finalizing an agreement to acquire local-area network interconnectivity vendor Vitalink Communications Corp. for approximately $45 million.

Unlike the AT&T/NCR rapprochement, however, the Vitalink acquisition was friendly on both sides, according to company spokesmen.

Minneapolis-based Network Systems has historically specialized in high-speed, channel-based networks between IBM mainframes and supercomputers.

During the past several months, the firm has plunged into the LAN interconnectivity business through a reseller agreement with Wellfleet Communications, Inc. and a slew of announcements.

The sticking point for Network Systems is that "they have no present in terms of installed base, distribution channels or reputation," Vitalink spokesman Dana Henrickson said.

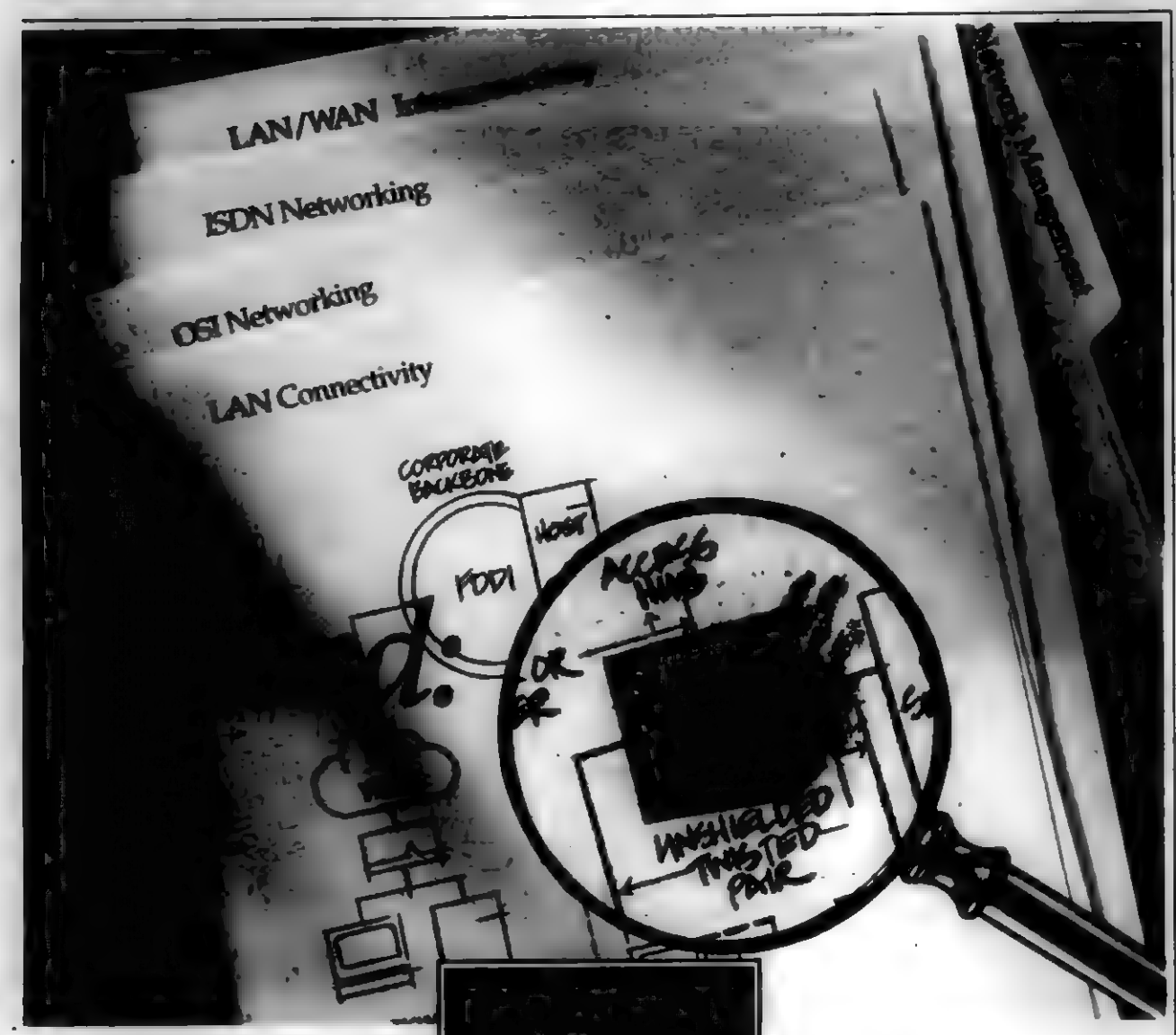
Vitalink can fill this gap, he added.

Vitalink, for its own part, has been losing out recently to aggressive router vendors such as Cisco Systems, Inc. and Wellfleet. "It would take our internal program two to three years to come up with a full range of [LAN interconnectivity] products . . . and the market won't wait," Henrickson said.

"Vitalink was really hot when people thought remote bridging was viable, but time has shown that bridges are not the answer for large networks," said Janet Hyland, an analyst at Cambridge, Mass.-based Forrester Research, Inc.

Integration of the LAN interconnectivity side of the house is still down the road, Network Systems spokesman David Flanagan said.

Vitalink will continue to operate under its own name as an autonomous business unit responsible for all of Network Systems' LAN interconnectivity products, according to Flanagan.



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COURT REPORT



Atlanta-based Hayes Microcomputer Products, Inc. was recently awarded additional damages in its patent infringement lawsuit against **Everex Systems, Inc., Ven-Tel, Inc.** and **Omnitel, Inc.** Federal Judge Samuel A. Conti doubled the damages awarded by a jury in San Francisco four months ago as a result of its finding that the defendants had willfully infringed on a Hayes modem patent. Conti also granted Hayes' request to recoup litigation expenses and added, "The court hopes that its holding will deter future would-be infringers from plunging into complex, expensive litigation . . ."

Meanwhile, Signature Systems, Inc. is asking a U.S. District Court to resolve the copyright dispute that has been brewing for the past five years between Sebastopl, Calif.-based Signature and Hayward, Calif.-based **Qantel Business Systems.** Back in 1985, Signature began to market Comet, a software package that allows software written in Qantel's Qbasic to run on personal computers other than Qantel's. Qantel threatened suit in 1985. Subsequently, the two companies engaged in negotiations for the sale of Comet to Qantel; the sale, however, went the way of the suit. Last month, with Qantel once again hinting at litigation, Signature beat them to the bench. The firm's suit asks for a declaratory judgment that Comet does not infringe on any Quantel copyrights.

One of the computer industry's more ballyhooed legal affairs — the lawsuit fired off by **IBM** leasing and financing subsidiary **IBM Credit Corp. (ICC)** against leading independent lessor **Comdisco, Inc.** on the grounds that certain Comdisco upgrades and reconfigurations of IBM computers in the hands of ICC lessees amounted to theft of ICC's property — got its day in court late last month. The result is another wait. The Delaware Chancery Court heard arguments for and against Comdisco's motion to dismiss ICC's complaint and has the matter under consideration. A ruling is expected any day.

Intergraph moves tentatively to open systems

Despite cross-system compatibility, the firm will license its software only for its own platform

BY J. A. SAVAGE
CW STAFF

HUNTSVILLE, Ala. — Intergraph Corp., the first company to market a reduced instruction set computing (RISC) workstation, claims it is moving into open systems. If management has its way, however, the company will not be dragged into mix-and-match computing.

During the past year, Intergraph has moved to interconnect its engineering workstations and other systems. It also acquired Dazix, an electronic design firm that offers software on Sun Microsystems, Inc.'s workstations. Despite these moves into heterogeneous computing, Intergraph plans on "licensing its software only for our own platform," said Robert Glasier, vice president of marketing.

In the near future, Intergraph will adopt the Open Software Foundation's OSF/1, abandoning AT&T's System V.3. Although that would mean the company's software should be able to run on any other hardware that conforms to the OSF/1 standard — IBM's or Hewlett-Packard Co.'s, for instance — Intergraph would rather it did not. "I can't say we'd leap at the opportunity to license our software to run on HP," Glasier said.

Dave Burdick, vice president of Dataquest, Inc.'s systems group, said the strategy of not-quite-open open systems will not hurt the company in the short run. "Intergraph is a follower rather than a leader," Burdick said. "It doesn't need to waste a lot of time trying to be a leader in open systems."



Glasier: *'It's necessary to be able to support standards'*

The firm has chosen to ignore the larger commercial market that RISC vendors including HP, IBM and Sun are pursuing. According to Glasier, the company assembled a commercial sales force three years ago, but it was refocused on technical sales.

Intergraph is doing fairly well in its niche. Its revenue crested at $1 billion in 1990, up from $860 million in 1989; annual profits slipped from $79.5 million in 1989 to $62.6 million, driven down by the costs of the Dazix acquisition, Intergraph said.

In fact, Burdick said, in coupling a workstation business mode with systems application software, Intergraph has carved out "a unique existence in the workstation market."

But its foray into open systems remains limited to networking. "To be competitive, to tie our systems to an MIS department, it's necessary to be able to support standards," Glasier said. Last month, the company announced products that communicate and share data with Digital Equipment Corp., HP, IBM and Sun computers as well as Open System Interconnect, Token Ring and X.25 interface standards.

INTERNATIONAL BRIEFS

Open up in the name of Microsoft

▶ Acting on a complaint filed jointly by **Microsoft Corp.** and **Autodesk, Inc.**, Brazilian officers of justice raided the Sao Paulo offices of **Westinghouse Brasil** late last month and discovered a cache of unauthorized copies of MS-DOS and Autodesk's Autocad software, Microsoft said last week. If Westinghouse and the software vendors fail to reach an accord by May 27, Microsoft said, Westinghouse could face a civil suit as well as copyright infringement fines in the ballpark of $2 million.

Bull regroups in Asia

▶ **Groupe Bull** said it has reorganized its Asian operations to better serve Pacific Rim customers. Previously, **Bull SA of Europe** and **Bull HN Information Systems, Inc.**, based in the U.S., maintained sales and marketing operations in that region. The reorganization consolidates all Asian sales and marketing under Bull HN. Bull has segmented the area into four operations, all of which will report to John Noonan, vice president and general manager of Asia Operations, at Bull HN headquarters in Billerica, Mass.

Turn for the worse

▶ Hopes that economic fluctuations would leave **Finland**'s technology sector relatively unscathed evaporated as the Finnish technology industry's bankruptcy rate soared 90% over last year's, a recent report in the Finnish business press said. From January to March, said Mikko Parjanne, executive officer of Finnish market research firm **Asiakastieto Oy**, 1,524 creditors' petitions were filed against technology firms, driving many smaller firms into bankruptcy.

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Prospects for minorities in computing.
- Merits of an Electrical Engineering degree for a computer career.
- Information Systems salaries from Computerworld's annual survey with the Data Processing Management Association.

Shining spots on the retail horizon

BY BARBARA FRANCETT
SPECIAL TO CW

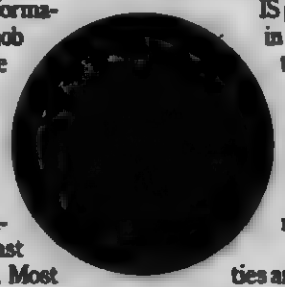
It may come as no surprise that opportunities for information systems professionals aren't exactly sizzling in the struggling retail industry. Fortunately, there are some bright spots, namely suppliers, prescription drug companies and mail-order firms.

For example, Walgreen Co., a drugstore chain in Deerfield, Ill., reports a growth of more than 100 stores per year from a base of 1,500-plus stores, according to Pam Schmitz, a technical recruiter for the company. "We're in a recession-resistant business. People don't stop buying prescription drugs," she says.

As the number of Walgreen stores increases, existing stores are being outfitted with in-store processors — an IBM Application System/400 in each store — as well as point-of-sale and scanning equipment, Schmitz says.

Walgreen is also implementing a system to manage inventory, and it subsequently needs people to develop and maintain them, according to Schmitz.

Overall, the company is looking for professionals experienced with IBM midrange and mainframe computers. "We have all that point-of-sale data, so we want to use the information to do a better job of purchasing at the right price and the right time of year."



The company has increased its IS hiring by approximately 7% since last year, Schmitz says. Most of the new hires are programmer analysts with two to five years of experience. Not much is happening at the project leader or management level, she says, because Walgreen generally hires at the lower end and promotes from within.

Job hunters with a hankering for retail might also find pockets of opportunity at mail-order and direct-sales companies. Both of these segments are computer-intensive businesses and are reportedly growing.

"Basically, we're strong and moving ahead. We haven't been touched by setbacks," says Raymond Perry, vice president and chief information officer at Avon Products, Inc. in Rye, N.Y.

"IS is an exciting place to work because our business strategies have an IS component," Perry says. The most recent of these is a new direct-mail program Avon plans to launch nationally during the next year.

IS professionals skilled in telecommunications, database and applications programming and design are in the heaviest demand, according to Perry.

Hiring opportunities are also flourishing at retailers' suppliers, a related employment avenue. Retailers are starting to demand that their suppliers invest more in technology, says Dean Trilling, vice president of IS at American Greetings Corp. in Cleveland. The greeting card and gift wrap company supplies retail stores and maintains a small retail division of its own.

"We're spending money on developing technology like EDI that helps us build better relationships with retailers," Trilling says.

However, the majority of retailers are riding out a difficult economic storm, making IS employment opportunities slim. Although they have started to invest in information technologies such as inventory control systems and electronic data interchange (EDI), retailers are currently refocusing and consolidating the responsibilities of their existing staffs.

For example, retail managers are asking their systems analysts to perform coding and their technicians to demonstrate administrative skills.

"Many retailers want state-of-the-art systems, but they don't want to buy the expertise to run them," says Allan Grossman, senior partner at A. Davis Grant & Co., an Iselin, N.J.-based recruiter. "In the last year, we haven't seen any pickup at the management level in the retail sector."

But if retailers want to compete successfully, they need an up-to-date and technically proficient IS department, says Murray Forseter, editor and associate publisher of *Chain Store Age Executive* magazine in New York.

While the overall retail career picture is gloomy now, it may nevertheless improve in the near future, analysts say. "In the long run, the emphasis on technology will translate into more jobs," says Burton M. Nudelman, a management consultant specializing in the retail industry in Portland, Ore.

> "MANY RETAILERS want state-of-the-art systems, but they don't want to buy the expertise to run them."
>
> ALLAN GROSSMAN
> A. DAVIS GRANT

The summer should bring a more positive outlook. "We've turned the corner of the retail recession," says Herb Kleinberger, a partner responsible for retail systems consulting at Price Waterhouse's Management Horizons Division in New York.

"I wouldn't call it boom time, but there will be opportunities."

Francett is a free-lance writer based in Bloomfield, N.J.

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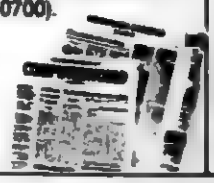
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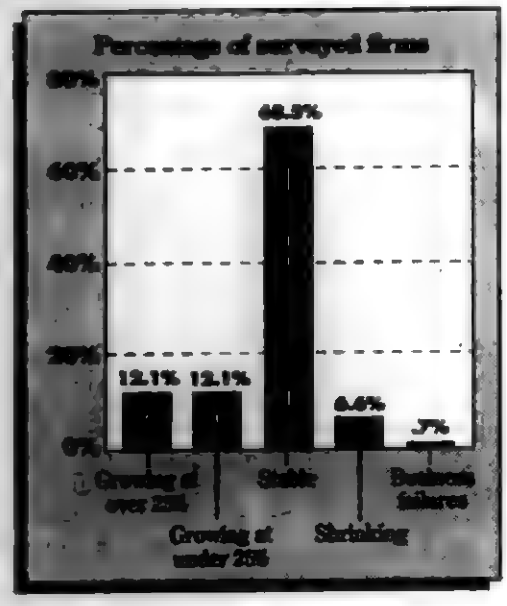
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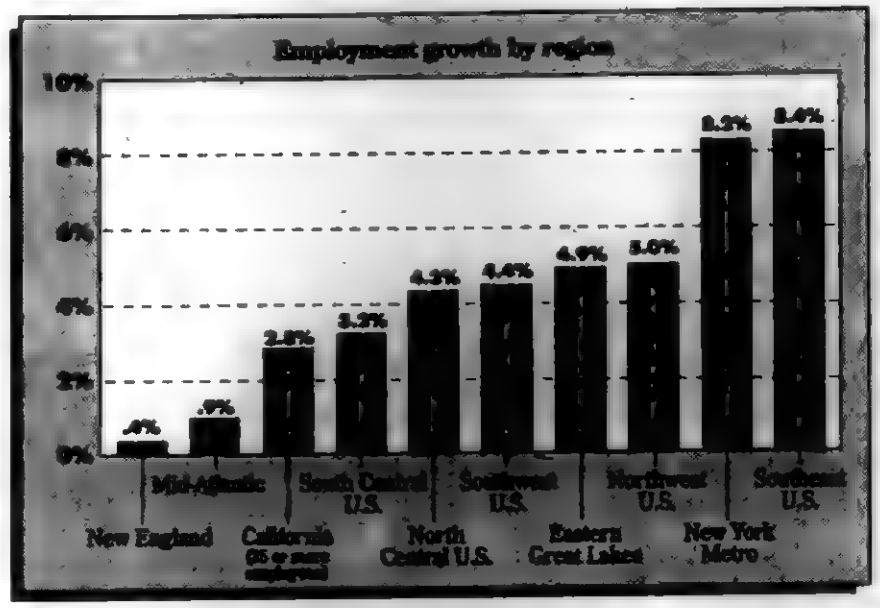
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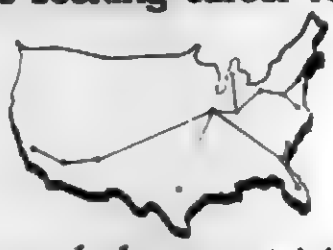






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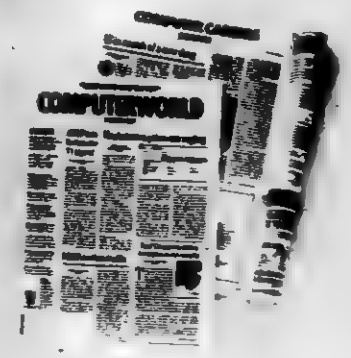
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Singing those used-computer blues

BY ALAN RADDING
SPECIAL TO CW

Anybody want an old Unisys Corp. B-series computer cheap?

Bob Connors, a vice president at Peoples Bank & Trust in Indianapolis, is beating the bushes for anyone who might take the machine off his hands. He gave up hopes of getting any significant amount of money for the machine. Now he just wants to cut his losses.

Despite a large and active market in used minicomputers, users trying to dispose of an older minicomputer or midrange machine may be surprised by the degree of effort involved and disappointed in the prices they receive. Disposing of a used minicomputer today takes work, patience and organization.

With a leased computer, disposal is easy. When the lease expires, the user simply returns it to the leasing company, unless he wants to extend the lease or buy the machine.

Alternatives to leasing

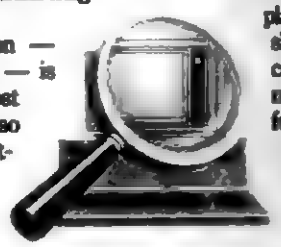
Otherwise, there are four ways to get rid of a used minicomputer: 1) Pass it along to another part of the organization, 2) Trade it toward the purchase of the next computer, 3) Find an end-user buyer or 4) Sell it to a used-computer dealer.

The first option is the easiest, if other parts of the organization will accept the machine. For instance, Lou Riley, MIS manager at Advanced Environmental Technology Corp., a hazardous waste management company, easily passed small, used IBM System/36 machines along to newly opened branch offices. The company relies exclusively on used System/36s although it intends to convert to the Application System/400.

The second option is also uncomplicated, provided the seller trades in a machine the vendor carries. For instance, Bruce Bills, library systems administrator at Ricks College in Rexburg, Idaho, bought a new computer directly from IBM but wasn't able to trade in a non-IBM machine for it.

For many managers, the trade-in option is attractive because a seller can kill two birds with one stone: He can get the old system off his hands and get a discount on a new system at the same time.

Users seeking an end-user buyer for the old computer — option three — often find themselves looking for the proverbial needle in a haystack unless they are disposing of a current, popular machine. "We really have to find a unique buyer," says Connors, whose efforts to dump his old Unisys B-series machine have so far been in vain. The most likely buyer is a bank that has a similar machine and wants to acquire another for redundancy. To find such a buyer, the bank is putting a classified ad in various banking operations magazines.



The last option — selling to dealers — is among the most popular, but it is also the most complicated.

When Tactech, Inc. in Yorba Linda, Calif., downsized from a Digital Equipment Corp. VAX 8250 to a network of Sun Microsystems, Inc. Sparcstations for the company's major on-line transaction processing application, Information Systems Director David Troutt spent two weeks locating potential dealers and buyers and sending them faxes on specifics of the machine. By thumbing through ads in the back of computer magazines, he identified about 12 used-computer dealers, four of which showed interest.

That was the easy part.

Then the horse trading began. Troutt had difficulty pinning down the price. "The buyers were very cagey when it came to price. They wanted to know who I had talked to, what kind of prices I was getting — they were trying to see how knowledgeable I was," he says.

To bring himself up to speed, Troutt studied the prices of the used equipment for sale in the magazine ads. "I expected to receive about 25% less than what they would turn around and sell the stuff for," he explains, "but it pays to shop around." He received offers for his memory cards that differed by $2,000.

Whatever avenue a seller chooses to take, there is more to selling used computers than just unloading them or jockeying for the best price. The machines have to be in certifiably excellent condition. The seller must show that the machine has been under a maintenance contract and, in some cases, have a vendor acceptance certificate. If a software license transfer is involved, all of the documentation of license ownership must be in order.

"DEC came out to de-install the 8250, and the buyer wanted the [Labor Activity Reporting System] report," Troutt recalls. The report accompanies an official letter from DEC certifying that the machine has been maintained to DEC's standards.

With the documentation in order, users can dispose of computers in the used market, but they shouldn't expect to get rich. Except for popular machines that are still in production, used computers receive only a small fraction of their original value — 10 to 14 cents on the dollar in many cases.

Depreciation factors

Connors says he hoped to recover the value of the machine remaining on the bank's books, but that doesn't appear likely. In a moment of wishful thinking, he adds: "It would be nice, at least, if we could depreciate it faster," so it wouldn't look so bad on the books.

How much a used minicomputer brings in depends on the make and model. Machines currently in production, such as the AS/400, bring top dollar. However, the popular System/36, especially the larger models, still brings a good price because of the large, active market for it.

Prices fall off steeply for equipment that is out of production and for which the market has dwindled. The System/38, dealers report, has very little value. In the end, some machines are worth only what they provide in the way of a few spare parts.

Radding is a free-lance writer in Newton, Mass.

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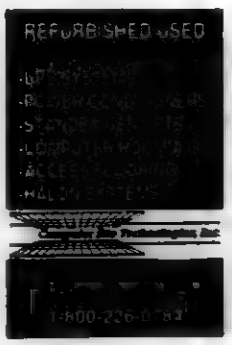
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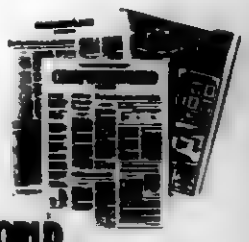
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Steelcase creates sleek, effective training

BY GLENN RIFKIN
SPECIAL TO CW

Steelcase, Inc., the world's largest manufacturer of office furniture, had a problem. Each year, the company would spend more than $100,000 on outside personal computer training for its employees, and each year, the information systems department would feel more than a bit dissatisfied with the results. Only 10 classes were held per month with only five students attending each class. Out of an employee population of 4,000, only 600 were able to get training each year.

To Phil Camillo, a former public school teacher and head of Steelcase's training program, this method seemed futile and self-defeating.

One year ago, Camillo decided enough was enough. So he set out to design a learning center within Steelcase that would allow the company's end users to teach themselves in a state-of-the-art multimedia environment. The premise was simple: Given control of their own learning program, students will ultimately get far more out of the experience.

"I wanted to avoid the typical classroom setting in which the teacher knows everything and the student knows nothing," Camillo says.

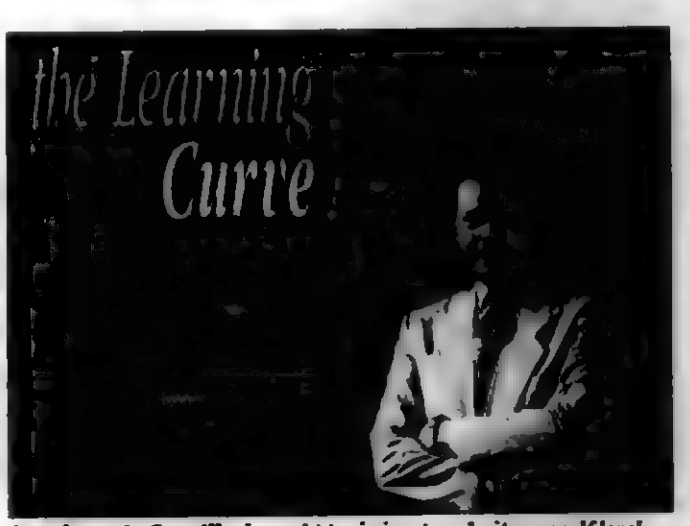
"By turning over the learning responsibility to the student, it allows him to schedule his own time, plan his own curriculum and manage his own education," he explains. "It's a basic shift in thinking."

Aiming for the wallet

Before he could proceed, Camillo had to sell the concept to management. He pushed where he knew he would get a response: at the purse strings. He promised a reduced training budget — $80,000 rather than $120,000 — with far more participation and payoff.

Working closely with IS, Camillo set up The Learning Curve, an in-house multimedia training room filled with computer-based training, video and audio learning modules, IBM personal computers, Apple Computer, Inc. Macintoshes, laser discs, books, magazines and periodicals. The center's courseware featured 300 multimedia training programs, covering everything from PC software to project management to leadership skills to product information.

Since its opening last May, The Learning Curve has far exceeded Steelcase's and Camillo's expectations. In nine months, the facility has served nearly 3,000 students. When the center is a full year old, Camillo said, he expects 4,000 students will have used the classroom, including repeat users. He figures that the cost of training has already been reduced from $200 per student per year to $20.



Steelcase's Camillo *brought training to a do-it-yourself level*

Training wheels

Camillo designed some innovative tools to facilitate students' introduction to and use of the center. The IS department helped him create student identification cards with bar codes so that each visit and use of the center could be easily tracked. Students begin their training with an introduction by the on-site counselor, who guides them to a workstation where they run an expert systems program.

The expert system is a two-module program that allows students to determine how they learn best and helps design their courseware.

The first module, the Learning Style Adviser, does a right brain/left brain analysis, giving students a chance to determine their best learning style.

The second module, the Training Plan Adviser, questions students about the tasks they want to perform and determines their level of experience with various technologies.

Success story

Student response bears out Camillo's enthusiasm. For example, Bob Hall, Steelcase's manager of facility management, did a course of self-directed training at The Learning Curve, seeking information about certain computer-aided design tools.

Hall needed help in new program pricing, development costs, distribution costs and the like. "I found the experience quite productive," Hall says. "I could go on my own time, on my own terms. It was great for my schedule. I definitely want to use the resource again."

Hall, an 18-year Steelcase veteran, says that prior to the establishment of The Learning Curve, he would have been forced to look outside for help with such tools. "I just never did that," he says. "Now, I have a place inside where I can find these tools."

Camillo says that the gee-whiz technology is helpful in getting students into the center and targeting their courseware. But the biggest reason for success is "turning over the learning responsibility to the student. If you are given control, you tend to move toward that environment," he says.

Rifkin is a free-lance writer and a former *Computerworld* features editor.

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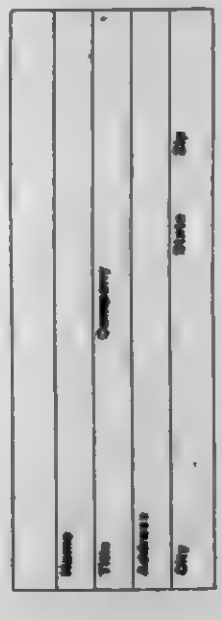
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INDUSTRY ALMANAC

INSIDER ACTION

Several high-level executives at major semiconductor firms have recently cut loose a substantial part of their insider holdings.

One of the hotter potatoes was Motorola, Inc. Company vice presidents, directors and other top dogs have sold more than half a million Motorola shares since December 1990, according to reports filed with the Securities and Exchange Commission through April. Likewise, nine executives at Cypress Semiconductor Corp. trimmed their portfolios by a combined 255,000 common shares (see chart below).

Some Wall Street watchers said widespread insider selling portends a near-term drop in stock prices. Executives in this case "are probably cashing in," said John Girtner, an analyst at Van Kasper & Co. in San Francisco. Consistent insider selling within a single sector usually signals that those stocks have topped out for the time being, Girtner said. Indeed, some chip firms hit new 52-week highs during the semiconductor group's first-quarter climb of more than 30%.

The group, however, may be in for a decline. A few factors are converging to cause a potential fall, according to Daniel Kleskken, an analyst at Prudential Securities, Inc. For example, chip orders have been strong, but the book-to-bill ratio, which tracks the number of new orders received against those actually shipped, is expected to undergo a seasonal decline now through September. Profit-taking may pervade in anticipation of this cyclical lull, Kleskken noted.

Also, the buoyant buy mood that helped propel the Dow Jones industrial average past 3,000 on April 17 has receded, in part because of poor reports from some big technology names, according to a recent analysis from Donaldson, Lufkin & Jenrette, Inc.

KIM S. NASH

Out of our hands

High-volume insider selling by semiconductor executives since December, as reported to the Securities and Exchange Commission through May 1

	No. shares sold[1]	Total dollar value (in millions)[2]	No. selling[3]
Altera Corp. San Jose, Calif.	194,308	$2.59	7
Advanced Micro Devices, Inc. Sunnyvale, Calif.	31,600	$.19	3
Chips and Technologies, Inc. San Jose, Calif.	102,000	$1.05	2
Cypress Semiconductor Corp. San Jose, Calif.	255,593	$3.20	9
Dallas Semiconductor Corp. Dallas	62,665	$.56	2
Intel Corp. Santa Clara, Calif.	27,599	$1.37	5
Motorola, Inc. Schaumburg, Ill.	561,817	$24.08	10
Texas Instruments, Inc. Dallas	48,274	$2.00	3
Xilinx, Inc. San Jose, Calif.	168,513	$2.36	6

1 Common shares directly owned by company executives sold on open market

2 Calculated according to stock prices on days of sales

3 Board members, directors, vice presidents, presidents and chairmen

Source: Invest/Vet, Inc. CW Chart: Dwero St. John

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Apple Computer, Inc. gained 1⅜ points, closing Thursday at 50⅜. On Monday, Prudential Securities, Inc. advised investors to sell the stock, citing poor currency translation rates caused by the dollar's strengthening value overseas.
- IBM joined Hewlett-Packard Co. and Compaq Computer Corp. in the rush to cut workstation prices. IBM lost ground early in the week, then rebounded, ending Thursday unchanged at 105⅝. HP moved up 1⅛ points to 49, and Compaq gained 1¼ points to 51.
- Spreadsheet rivals Borland International, Inc. and Lotus Development Corp. both gained after introducing new products last week. Lotus jumped 1⅜ points to 34⅜, while Borland surged 3¼ to 54.
- Amdahl Corp. picked up 1⅜ points to 16⅛. The stock has advanced 25% since mid-March.
- Microsoft Corp., which announced a 3-for-2 stock split last week, soared 5¼ points to close at 105⅜.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, MAY 10, 1991

TOP PERCENT GAINERS

Computer Automation Inc.	40.00
Hogan Systems Inc.	38.94
Advanced Micro Devices	17.53
Network Equipment Tech.	14.52
Amdahl Corp.	11.67

TOP PERCENT LOSERS

Businessland Inc.	-33.68
Masstor Systems	-21.50
Artel Communication Corp.	-12.50
Alliant Computer Sys.	-11.11
Viking Labs Inc. (s)	-11.11

TOP DOLLAR GAINERS

Autodesk Inc.	5.13
Intel Corp.	4.50
Altus Corp.	2.75
Apple Computer Inc.	2.25
Dell Computer Corp.	2.13

TOP DOLLAR LOSERS

Matsushita Electronics	-6.25
American Info Techs Corp.	-4.63
Nynex Corp.	-3.88
Southwestern Bell Corp.	-3.25
Bellsouth Corp.	-3.13

Exch	52-Week High	52-Week Low		May 10 Close	Wk Net Change	Wk Pct Change
Communications and Network Services					Off 1.02%	
OTC	19.00	5.38	3 COM Corp.	8.38	-0.13	-1.47
NYS	69.75	52.50	American Info Techs Corp.	58.13	-4.63	-7.38
NYS	44.13	29.00	AT&T	36.00	-1.38	-3.69
OTC	6.63	0.88	Artel Communication Corp.	1.75	-0.25	-12.50
NYS	58.25	38.50	Bell Atlantic Corp.	46.50	-3.13	-6.43
NYS	57.63	47.88	Bellsouth Corp.	47.88	-3.13	-6.13
NYS	44.00	13.13	Cabletron Systems	38.88	-0.38	-0.96
OTC	25.88	8.25	Compression Labs Inc.	20.00	0.88	4.58
NYS	51.25	23.38	Cordel Corp.	41.00	0.00	0.00
OTC	5.13	2.44	Data Switch Corp.	4.25	0.13	3.03
NYS	26.75	8.88	Digital Comm. Assoc.	18.50	0.63	3.50
OTC	25.25	12.25	Dynatech Corp.	20.25	1.00	5.19
OTC	12.88	5.50	Fibronics Int'l Inc.	9.25	0.25	2.78
OTC	4.00	1.75	Glenayre Technologies Inc.	3.25	0.00	0.00
NYS	4.50	1.63	General Datacomm Inds.	3.00	0.00	0.00
NYS	34.13	23.50	GTE Corp.	29.38	-1.75	-5.62
OTC	4.50	0.75	Inforon Systems Corp.	1.13	0.00	0.00
NYS	60.88	40.25	ITT Corp.	58.25	-1.88	-3.12
OTC	44.13	17.88	MCI Communications Corp.	28.88	0.38	1.13
OTC	21.00	2.75	Microcom Inc.	5.25	-0.25	-3.85
NYS	11.63	4.00	Network Equipment Tech.	8.88	1.13	14.52
OTC	14.63	4.00	Network General	8.13	0.13	1.56
OTC	15.50	8.13	Network Systems Corp.	12.25	-0.63	-4.85
NYS	36.50	22.13	Northern Telecom Ltd.	36.50	0.75	2.10
OTC	58.50	17.25	Novell Inc.	54.38	1.75	3.33
NYS	69.50	57.00	Nynex Corp.	60.13	-3.88	-6.31
NYS	47.88	38.25	Pacific Telesis Group	38.25	-2.38	-5.71
ASE	15.38	4.75	Parvi Corp.	14.50	0.00	0.00
NYS	29.13	8.88	Scientific Atlanta Inc.	14.38	-0.25	-1.71
NYS	58.88	47.25	Southwestern Bell Corp.	49.88	-3.25	-6.12
NYS	46.38	29.63	United Telecom	28.00	1.88	7.18
NYS	40.75	32.38	US West Inc.	35.00	-2.50	-6.67
Computer Systems					Off 0.01%	
OTC	8.75	0.88	Alliant Computer Sys.	1.00	-0.13	-11.11
ASE	18.88	10.00	Amdahl Corp.	16.75	1.75	11.67
OTC	73.25	24.25	Apple Computer Inc.	51.25	2.25	4.59
OTC	13.88	4.25	Archive Corp.	7.38	0.13	1.72
OTC	32.75	7.50	AST Research Inc.	23.75	1.25	5.56
NYS	7.38	4.00	Bolt, Beranek & Newman	6.38	-0.25	-3.77
NYS	21.63	4.50	Commodore Int'l	15.25	0.13	0.83
NYS	74.25	35.50	Compaq Computer Corp.	50.75	0.88	1.00
OTC	1.75	0.13	Computer Automation Inc.	1.75	0.50	40.00
NYS	21.13	6.75	Control Data Corp.	11.50	-0.63	-5.15
NYS	20.88	8.38	Convex Computer	17.38	-1.25	-6.71
NYS	51.25	20.50	Cray Research Inc.	33.75	-0.75	-2.17
NYS	18.13	3.50	Data General Corp.	15.63	-0.88	-5.30
NYS	3.25	0.75	Datapoint Corp.	1.38	-0.13	-8.33
OTC	30.63	8.25	Dell Computer Corp.	22.88	2.13	10.34
NYS	85.13	45.50	Digital Equipment Corp.	85.88	-0.25	-0.30
NYS	35.13	13.75	Harris Corp.	25.38	-0.50	-1.93
NYS	55.13	34.88	Hewlett Packard Co.	48.25	2.00	4.32
NYS	138.75	86.25	IBM	105.25	-0.38	-0.36
OTC	14.00	7.75	Information Int'l	8.00	-0.25	-3.03
OTC	31.50	10.50	Intergraph	28.63	0.63	2.19
NYS	2.75	0.50	MAI Systems Corp.	0.88	-0.06	-6.27
NYS	148.75	114.00	Matsushita Electronics	122.75	-5.25	-4.10
OTC	28.00	9.00	Mentor Graphics Corp.	15.25	0.00	0.00
NYS	104.25	44.50	NCR Corp.	103.13	-0.38	-0.36
OTC	35.50	11.00	Pyramid Technology	24.63	0.63	2.60
OTC	34.00	9.75	Sequent Computer Sys.	13.25	-1.00	-7.02
NYS	47.25	18.00	Silicon Graphics	38.00	1.63	4.73
NYS	37.25	14.63	Stratus Computer Inc.	33.00	1.38	4.35
OTC	38.63	15.00	Sun Microsystems Inc.	36.50	-0.63	-1.69
NYS	28.88	8.88	Tandem Computers Inc.	15.13	-0.25	-1.63
NYS	39.50	23.50	Tandy Corp.	31.88	-0.38	-1.16
OTC	32.00	8.75	Teradata	17.00	0.00	0.00
NYS	7.88	1.38	Ultimate Corp.	5.25	-0.25	-4.55
NYS	15.88	1.75	Unisys Corp.	4.00	-0.25	-5.88
ASE	5.75	2.00	Viking Labs Inc. (s)	3.00	-0.38	-11.11
Software & DP Services					Off 1.09%	
OTC	63.00	17.00	Adobe Systems Inc.	52.50	-0.50	-0.94
OTC	59.88	20.25	Altus Corp.	49.13	2.75	5.93
OTC	29.50	12.00	American Mgmt. Systems	27.25	0.00	0.00
OTC	18.25	7.50	American Software Inc.	10.88	-0.63	-5.43
NYS	4.63	1.38	Anacomp Inc.	3.63	-0.25	-6.45
OTC	23.50	10.00	Analysts Int'l	15.50	0.00	0.00
OTC	13.25	4.88	Ashton Tate	8.88	0.13	1.43

Exch	52-Week High	52-Week Low		May 10 Close	Wk Net Change	Wk Pct Change
OTC	19.25	4.00	ASK Computer Sys.	8.00	0.00	0.00
NYS	36.50	22.63	Auto Data Processing	35.50	1.75	5.04
OTC	60.25	32.00	Autodesk Inc.	56.25	5.13	10.02
OTC	31.50	14.00	BGS Systems Inc.	26.00	-0.50	-1.89
OTC	43.88	17.75	BMC Software Inc.	38.75	-2.25	-5.48
OTC	21.50	11.00	Boole & Babbage Inc.	13.25	0.75	6.00
OTC	84.25	14.50	Borland Int'l	51.13	0.38	0.74
NYS	9.75	0.88	Businessland Inc.	1.25	-0.38	-23.08
OTC	30.88	5.13	Cognos Inc.	17.00	-1.50	-8.11
NYS	16.88	4.38	Computer Associates	7.88	0.13	1.61
OTC	17.75	10.75	Computer Horizons	11.75	-1.00	-7.84
NYS	73.25	38.75	Computer Sciences	67.50	-1.63	-2.36
NYS	11.75	6.63	Computer Task Group	9.13	-0.88	-8.75
OTC	35.25	13.00	Comshare Inc.	17.88	-0.83	-3.42
OTC	14.00	3.75	Corporate Software	10.75	-0.50	-4.44
NYS	49.00	27.88	General Motors E (EDS)	47.38	-0.63	-1.30
OTC	16.75	7.25	Goal Systems Int'l	13.25	-1.00	-7.02
OTC	6.50	1.88	Hogan Systems Inc.	6.50	1.75	36.84
OTC	21.00	7.75	Information Resources	21.00	1.38	7.01
OTC	17.50	2.63	Informix Corp.	5.88	-0.38	-6.00
OTC	7.88	1.38	Intellicorp Inc.	1.75	-0.19	-9.70
OTC	8.25	2.50	Interleaf Inc.	8.88	0.25	3.77
OTC	43.25	10.00	Knowledgeware Inc.	33.25	-0.25	-0.75
OTC	45.00	16.75	Legent Corp.	29.50	-1.75	-5.60
OTC	39.25	12.50	Lotus Development	32.38	-2.00	-5.82
OTC	32.00	13.63	Microgratx	19.00	0.00	0.00
OTC	117.50	59.75	Microsoft Corp.	102.75	1.50	1.48
NYS	10.50	4.00	On Line Software Int'l	8.13	0.00	0.00
OTC	24.00	4.88	Oracle Systems	8.50	-0.38	-4.00
NYS	14.63	7.00	Parametric Systems	11.88	-0.13	-1.04
OTC	9.25	1.25	Phoenix Technologies	7.25	0.00	0.00
NYS	52.00	39.38	Policy Management Sys.	48.25	1.38	2.93
NYS	23.63	11.50	Reynolds & Reynolds	20.13	-0.88	-4.17
OTC	16.13	6.88	Sage Software Inc.	10.50	0.38	3.70
OTC	25.50	14.75	Sas Corp.	25.00	0.50	2.04
OTC	21.75	12.25	Shared Medical Systems	20.88	0.13	0.60
OTC	35.25	12.00	Software Publishing Corp.	22.88	1.88	8.93
NYS	14.63	6.50	Sterling Software	13.38	0.00	0.00
OTC	26.00	9.50	Sungard Data Sys.	16.75	-0.50	-2.90
OTC	35.88	17.75	Symantec Corp.	46.25	-2.75	-5.73
NYS	24.50	4.50	System Center Inc.	9.00	-0.63	-6.49
OTC	37.25	12.75	System Software Assoc.	16.75	-1.38	-8.94
OTC	27.38	4.75	Wallick	13.00	-0.88	-3.57
Semiconductors					Up 1.76%	
NYS	14.25	3.63	Advanced Micro Devices	14.25	2.13	17.63
NYS	12.50	5.50	Analog Devices Inc.	11.25	0.38	3.45
OTC	21.75	5.25	Chips & Technologies	9.25	-0.50	-5.13
OTC	55.25	26.00	Intel Corp.	53.00	4.50	9.28
NYS	13.00	5.13	LSI Logic Corp.	10.63	-0.25	-2.30
NYS	19.13	6.75	Micron Technology	16.00	-0.38	-2.44
OTC	21.50	7.25	MIPS Computer Systems	17.38	-0.88	-4.79
NYS	58.38	45.75	Motorola Inc.	53.75	0.88	1.66
NYS	8.00	3.00	National Semiconductor	7.63	-0.25	-3.17
NYS	47.63	32.50	Texas Instruments	40.13	1.38	3.56
OTC	12.25	3.00	VLSI Technology	10.50	0.38	3.70
ASE	14.88	4.00	Western Digital Corp.	5.13	0.00	0.00
Peripherals & Subsystems					Off 1.79%	
OTC	2.75	0.88	Aperture Technologies	2.44	-0.06	-2.40
OTC	24.00	7.50	Benotec Inc.	13.50	0.25	1.89
OTC	17.50	4.38	Cambex Corp.	12.50	-0.50	-3.85
ASE	11.75	4.13	Cognitronics Corp.	9.63	0.00	0.00
NYS	31.25	14.63	Conner Peripherals	22.38	-2.13	-8.67
ASE	22.00	7.00	Datarem Corp.	10.25	0.38	3.80
NYS	12.50	4.25	EMC Corp.	11.88	-0.13	-1.04
NYS	47.25	23.75	Eastman Kodak Co.	41.38	0.25	0.61
OTC	11.25	4.75	Exabyte Corp.	8.00	0.50	6.66
OTC	34.50	14.00	Evans & Sutherland	19.75	-1.75	-8.14
OTC	9.50	3.75	Iomega Corp.	5.75	0.19	3.36
OTC	38.25	8.75	IPL Systems Inc.	24.00	-3.00	-11.11
OTC	1.63	0.13	Maxstor Systems	0.75	-0.22	-21.90
OTC	17.00	2.63	Maxtor Corp.	3.88	-0.13	-3.13
OTC	18.00	4.38	Micropolis Corp.	14.75	1.25	9.26
NYS	83.75	73.88	3M Corp.	80.38	0.38	0.43
OTC	14.50	8.00	Peripheral Inc.	8.00	-0.75	-8.57
NYS	24.75	8.50	QMS Inc.	23.13	0.38	1.65
OTC	18.25	8.25	Quantum Corp.	13.13	-0.13	-0.94
NYS	7.63	4.38	Recognition Equipment	7.00	-0.50	-6.67
OTC	11.50	4.00	Reson Inc.	9.88	-0.13	-1.25
OTC	19.88	9.63	Seagate Technology	12.00	0.13	1.05
NYS	43.00	11.00	Storage Technology	43.00	-2.25	-4.97
OTC	4.75	1.25	Tandon Corp.	3.50	0.00	0.00
NYS	28.38	11.63	Tektronix Inc.	22.88	-0.50	-2.14
OTC	0.88	0.16	Televideo Systems	0.38	0.03	9.01
NYS	60.13	28.00	Xerox Corp.	58.00	-1.25	-2.16
Leasing Companies					Off 1.91%	
OTC	18.25	6.88	Amgilcon Inc.	15.25	-0.75	-4.69
NYS	28.38	14.63	Comdisco Inc.	25.88	-1.13	-4.17
OTC	18.25	9.25	LDI Corporation	14.88	-0.13	-0.83
OTC	5.75	2.38	Safeclarm Inc.	3.75	0.00	0.00

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NEWS SHORTS

IBM vacation plan aims at costs

IBM's ongoing effort to rout inefficiency from its operations surfaced again last week as the company issued internal cost-cutting guidelines aimed at travel and vacation practices. The firm declared open season on travel expenses and off-site meetings. Employees were asked to use their allotted vacation days sooner rather than later and to cluster vacation days with official company days off whenever possible. Under the program, which includes a cutback in the number of vacation days an employee will be allowed to carry over to future years, IBM is shutting down headquarters for the week of July 4, forcing staff to take three vacation days along with the official July 4 and July 5 holidays.

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Sears to push networks

Sears Business Centers, a division of Sears, Roebuck and Co., formed a Network Integration Division last week. While Sears Business Centers said it sold more than 1,800 local-area networks in 1990, President William Lenahan called the formation a "strategic necessity."

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Johns Hopkins to honor innovators

Johns Hopkins University in Baltimore will award a $10,000 grand prize to the winner of its nationwide "Search for Computing Applications to Assist Persons with Disabilities." The national search is a competition for ideas, systems, devices and computer programs to aid the more than 25 million Americans with physical or learning disabilities. The grand prize will be awarded at the National Exhibition at the Smithsonian Institute in Washington, D.C.

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Arthur Young alumni win

Systems integrator Technology Solutions Co., based in Chicago, won its case against Big Six accounting firm Arthur Young Co. (now Ernst & Young). TSC, which was formed by 11 former Arthur Young employees, sued Arthur Young in a California court to continue working for a former Arthur Young client in California, in hopes of having noncompete clauses in their contracts voided.

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Callaghan to head Shearson group

Shearson Lehman Brothers, Inc.'s information systems profit center spin-off last week tapped the former top IS executive at competitor Bear Stearns & Co. as its president. Jeremiah M. Callaghan, 48, will head the American Express Securities Information Group, the unit formed in January from the brokerage IS operations of Shearson. Callaghan left Bear Stearns in 1987 to do community service and philanthropic work in the New York metropolitan area. Shearson has abandoned plans reported earlier to merge back-office operations with Prudential Securities, Inc., a spokesman said.

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IBM adds PCs in Japan

IBM introduced several personal computers in Japan earlier this month that set a new low price point for Personal System/2-equivalent units. The models, some priced at just $1,445 excluding monitor and keyboard, fill out the Japanese P/55 and 53Z lines. It does not follow that such a low-cost system would be unveiled in the U.S. because the customer base is different, an IBM spokesman said.

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Lotus ships Freelance package

Lotus Development Corp. is now shipping Freelance Graphics for DOS 4.0, which was first announced in March. It runs in 640K bytes of memory and features the following: a graphical what-you-see-is-what-you-get environment; Grandview LT, a customized version of Symantec Corp.'s outliner; enhanced presentation management tools; new charting capabilities; additional symbols; and master presentation backgrounds. Prices start at $495. A Windows version of Freelance is slated to be shown at the Windows World Pavilion at Comdex Spring '91 next week.

Wang cuts research, delays plans

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — The waters were still roiling last week at Wang Laboratories, Inc., where an unconfirmed number of employee layoffs occurred and scheduled product and strategy announcements were postponed for approximately 30 days.

Various sources reported that 120 research employees were laid off at Wang.

While Wang would not confirm the exact number, Frank Ryan, vice president of corporate communications, acknowledged that the cutbacks are part of the company's previously announced plans for ongoing turnaround efforts.

Ryan indicated that the next installment of Wang's Office 2000 strategy has been delayed until early June in order for Wang to iron out the fine details.

Ryan also responded to rumors that the proprietary VS line was to be discontinued after the delivery of one more large VS system by citing Chief Executive Officer Rick Miller's letter to customers, which went out early last month.

In the letter, Miller pledged Wang support for VS customers through new products and continuing services. The company is also making a transition to provide an open desktop-oriented strategy through the recently announced Office 2000.

"We realize that there are rational and reasonable concerns among our customers, and we are doing everything humanly possible to get the message out," Ryan said, alluding to Wang's commitment to VS clients.

Roger Sullivan, vice president of BIS Strategic Decisions, a consulting firm in Norwell, Mass., said Wang will have customer migration and protection plans in place as it unfolds its Office 2000 strategy.

"It's ridiculous to suggest that Wang would slam the door on the VS installed base," Sullivan said, adding that he is confident the next stage of Office 2000 announcements will be substantial and structured. "They're taking this very, very seriously. It's not your typical Wang strategy announcement of years past."

Pan Am

FROM PAGE 1

services and resource development as well as IS services.

The departure comes at a tough time for Pan Am, which is suffering an IS turnover rate double that of last year. Up until now, Wagner had played the role of staff cheerleader, "making people believe there is significant life for Pan Am and for their career here," he said.

Wagner was apparently less sure of his own career's longevity with the airline. The most likely scenario for Pan Am's salvation is a merger with one of the larger domestic carriers, he said, "and they certainly don't need two CIOs at that point." Pan Am has already sold routes and merged reservations data and frequent flyer programs with United Airlines.

A Pan Am spokeswoman said the company will replace Wagner, though a successor has not yet been named. The candidate will likely be from within the company; Pan Am has found it difficult to hire outsiders because of the Chapter 11 onus.

Wagner's departure is the latest blow to the firm's IS department. Since last year, the airline has put several IS developments on hold, cut back on others and trimmed its IS budget and staff about 25% and 30%, respectively. It has shifted focus from strategic projects with a three- to four-year implementation time to tactical developments taking no more than six months to pay off.

Insiders expected few IS changes to result from Wagner's departure. "We have our hands full with the financial reorganization, and we aim to continue doing the best we can for Pan Am," said Al Castan, Pan Am's system director of telecommunications.

Since plans to outsource the airline's IS staff and systems came as a mandate from Pan Am's top executives, a feasibility study is expected to continue. The proposed contract would be worth $500 million over five years [CW, April 8].

Wagner said the outsourcing plans for his department were not a factor in his decision to move on and that a significantly greater salary and stock package attracted him to Conrail.

At Conrail, Wagner said, he looks forward to evolving systems to aid in "the firm's transition from a railroad company to a transportation company." The company has been endeavoring to allow its systems to communicate with those of other rail and trucking services in order to create a seamless system for customers whose freight is transported by multiple carriers.

Wagner has a long history with IS in the transportation industry, including seven years with Pan Am and several years with another airline and Avis Rent-A-Car Systems, Inc. "Whether you choose a plane, train or car, companies that want to be successful in the 1990s need to look at themselves as being [overall] transportation companies," Wagner said.

Bad financial news expected from Businessland this week

BY JAMES DALY
and RICHARD PASTORE
CW STAFF

SAN JOSE, Calif. — The Businessland, Inc. reseller chain is expected to report a potentially crippling quarterly financial loss early this week. Businessland spokesman Tom Pelandini said the company's revenue line "hasn't held up as well as we'd hoped," but he would not comment on projected losses.

Sources close to Businessland said the operating loss could be as high as $15 million, with additional onetime restructuring and lawsuit settlement charges on top of that. Other sources put the figure at $50 million. Until recently, Wall Street had expected the company to lose anywhere from $3 million to $10.5 million.

More unnerving, analysts said, may be the expected 15% drop in sales over the previous quarter last year to about $275 million. Businessland has built its restructuring on a certain level of revenue, which it is unlikely to realize. That means its costs become a larger percentage of overhead, which, in turn, accentuates losses, analysts said.

The dip in sales is indicative of the entire domestic personal computer market this past quarter, analysts said. The firm's turnaround is a "difficult challenge in its own right, but in an environment such as this, it's nearly impossible," said Kevin McCarthy, an analyst at Mabon Nugent & Co. in New York.

A large revenue dip and significant quarterly loss could be potentially devastating for Businessland, which has suffered six consecutive nonprofitable quarters, lost $35 million since July 1, 1990, and cut 35% of its employees since last June.

To its advantage, Businessland has postponed the due dates of much of its debt, including a reported $25 million from IBM. It also has about $60 million in cash on hand to stave off disaster. "But they won't turn around if they continue to have these losses," Dillon, Read & Co. analyst Benny Lorenzo said.

Merger

FROM PAGE 1

months to prepare for it.

"I think it's advantageous to both parties," said Noel R. Levasseur, president of First American Data Services, an NCR user. "It adds credibility to NCR, and for AT&T, like their acquisition of Paradyne, they're acquiring something stronger to bring them up to speed."

Gordon Kerr, MIS director at Hyatt Hotels and Resorts Corp., which uses NCR point-of-sale systems and AT&T System 7000 high-end Unix boxes, agreed: "In the computer business, it will only affect us in a positive way as far as I can tell. I've committed to Unix systems, so if I don't like the combined companies, switching vendors is of little concern."

Robert L. Merrick, MIS director at Windmere Corp. in Miami Lakes, Fla., an NCR user employing V series mainframes, said he expects business as usual, "as long as AT&T doesn't go in and change NCR." He asked, "Since [AT&T] didn't make their Computer Systems Division work, why would they go in and screw around with an outfit that's starting to make progress?"

Merrick's question was echoed by a number of NCR users. At the press conference announcing the deal, AT&T Chairman Robert E. Allen, along with Exley and President Gilbert N. Williamson, talked as though NCR were buying AT&T.



NCR's Williamson (left) and Exley are treating the deal as if NCR is buying AT&T — rather than the other way around

Most users and analysts said a successful merger strategy will see AT&T treat NCR like Greta Garbo and leave it alone.

Allen reasserted during the press conference that "NCR's corporate structure, corporate leadership and name will remain intact." Analysts said AT&T has indicated it will follow a hands-off policy.

"It's really tough to say at this point," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass. "Once there is a clear mandate for who is in charge and how much power they have, then things will fall into place."

Woodring added that if NCR finds itself needing to get decisions approved by AT&T, "then we're probably going to have a lot of compromises, and that is not going to make anybody overly happy."

Some users want more information on how the merger will actually work out. "We'd like to know exactly how this is going to affect NCR, and it's kind of hard to read between the lines at this point," said Larry Hicks, manager of information systems at Cardinal Scale Manufacturing Co.

Barry Gilmore, president of Capricorn Computing, Inc., a Unix consultancy in Lake Forest, Calif., took a more fatalistic view: "You know they aren't going to leave NCR alone like they said they were."

Williamson said last week that "the migration path and product directions are going to be relatively easy to maintain. I don't see any huge issues there. I think we're going to be able to easily protect both organizations' customer product direction."

Still in control

One analyst said he thinks the NCR organization will maintain control over the deal. "AT&T is emphatically coming down in support of NCR's plans and will subordinate its own prior strategies to NCR's," said Thomas Nolle, president of CIMI Corp., a technology assessment firm.

That is a direction that would be welcomed by David Evans, vice president of IS at J. C. Penney Co. in Dallas, a beta-test site for some NCR products. "I think that NCR has announced a tremendously elegant strategy, and they have a lot of work to do to pull it off. I hope that this drama is not detracting from that effort," Evans said.

AT&T indicated, however, that NCR's System 3000 is not the only product line NCR will sell. A spokesman referred to "the next generation of products from the combined companies" and said this could likely mean some "amalgam" of System 3000 machines and AT&T offerings. Software is less clear.

NCR shareholders must approve the merger by at least a two-thirds vote. Allen and Exley estimated the process will take four to five months.

In the meantime, Exley and AT&T Computer Systems President Richard McGinn will lead a transition team. After the merger is completed, Exley will retire from NCR, but he will remain as a consultant. Williamson will become chief executive officer, joining AT&T's board and executive management committee.

R. Elton White, currently NCR's executive vice president, will then become president.

Cooperative triad

NCR's vision of the future of computing — its Open, Cooperative Computing Architecture (OCCA) — earned it AT&T's acquisitive interest.

OCCA consists of three parts:

- Cooperation, a distributed, object-oriented software strategy based on Microsoft Corp.'s Windows 3.0 and Hewlett-Packard Co.'s New Wave.
- System 3000 series hardware, seven platforms ranging from Level 3100 portable computers, including a stylus-based notepad built around the Intel Corp. 80386SL chip, to Level 3700 machines, which will feature more than 1,000 loosely coupled microprocessors running at more than 100,000 million instructions per second.
- Open Network System, a networking and network management strategy.

The OCCA strategy effectively made NCR a start-up company with $6 billion in revenue.

Absorbing AT&T could make it a $7.5 billion start-up, although one that may lack the profit margins enjoyed by NCR, which benefits from having all of its products based on the same basic engine but would probably have seen a slump in earnings as it made the transition to its OCCA strategy.

Unix may smooth migration wrinkles

BY MICHAEL FITZGERALD
CW STAFF

No one is predicting it will be easy for AT&T to smoothly absorb NCR Corp. Some said it could work well, though.

"I've seen [AT&T and NCR] work together, and I'm encouraged," said Jim Wegmann, senior vice president of the Electronic Data Processing and Systems Division at Talman Home Federal Savings and Loan Association in Chicago.

Both sides agree that current users will be migrated to systems that run AT&T's Unix System V Release 4. The hardware platform looks almost certain to be NCR's System 3000 series, top to bottom.

This does not mean AT&T's 3B2 will be killed. Rather, Robert Kavner, AT&T's group executive for data/federal systems, said he expects it will be upgraded and sold into its installed base.

In networking, NCR is the OEM for AT&T's Starview. AT&T executives said its 10Base-T networking hardware and NCR's Token Ring focus would work well as a "chocolate and vanilla product offering."

The software picture is murkier. AT&T has several products that bear similarities to strategies NCR has announced.

AT&T's Rhapsody, a workflow automation package based on Hewlett-Packard Co.'s New Wave, is in use at several sites. NCR's Cooperation, also New Wave-based, has work-flow elements to it. However, Judith Hurwitz, vice president of Patricia Seybold's Office Computing Group in Boston, said Cooperation is largely an object-oriented development tool.

AT&T's Tuxedo, a Unix online transaction processing (OLTP) package, is a low-end package that does not compete with NCR's mainframe-oriented Top End Unix OLTP. How that will influence AT&T's agreement with Unisys Corp. to develop a mainframe version of Tuxedo is unclear. Problems could develop quickly if the two sides start debating the relative merits of their product lines.

"If NCR decides to take part of AT&T around the corner of the barn and shoot it, [AT&T] has to let them do it," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass.

It is widely assumed that the merger will not affect NCR's core retail and financial systems businesses. "AT&T is not stupid," one user commented.

Away from the product side, analysts said the transition team has three major tasks: to merge the corporate cultures, to keep the technical engineers and middle management, particularly on NCR's side, around and happy and to keep customers satisfied.

While the AT&T Computer Systems Division's loss-ridden history has caused many to look at this as a case in which AT&T will gain more than NCR, analysts noted potential benefits for NCR: NCR's niches are banking and retail, while AT&T has found its successes in lodging, transportation and government. AT&T also has more extensive research and development resources and a better track record with value-added resellers and dealers than does NCR.

Food chain

AT&T's takeover of NCR is the biggest acquisition in the computer industry, which has seen many buyouts in recent years



1986 Burroughs Corp. acquires Sperry Corp. for $4.8 billion to form Unisys Corp.

1986 Honeywell, Inc. sells 67.5% stake in Honeywell Information Systems to Groupe Bull and NEC Corp. In 1987, it sold almost half of its interest to those two companies for $527 million. Last month, Honeywell sold its remaining interest to Bull.

1987 Computer Associates International, Inc. buys Uccel Corp. for $800 million.

1988 Prime Computer, Inc. buys Computervision Corp. for $400 million. Nine months later, a besieged Prime sells out to J. H. Whitney & Co., which pays $1.3 billion and takes the company private.

1988 CA buys Applied Data Resources from Ameritech for $170 million.

1989 Dun & Bradstreet Corp. buys Management Science America for $333 million and merges it with McCormack & Dodge to form D&B Software.

1989 CA buys Cullinet Software, Inc. for $308 million.

1989 Hewlett-Packard Co. buys Apollo Computer, Inc. for $470 million.

1991 AT&T's $7.4 billion buyout of NCR tops the list of computer industry acquisitions in recent years.

Source: Broadview Associates — CW Chart: Doreen St. John

The changing of the guard: A rapid move

Upon the retirement of NCR Corp. Chairman and Chief Executive Officer Charles E. Exley Jr., Gilbert N. Williamson, currently president of the company, will become CEO of AT&T's NCR unit and a member of the AT&T board. In a recent interview with Computerworld *Midwest Correspondent Michael Fitzgerald last week, Williamson offered his views on the upcoming transition.*

You've indicated your biggest concern would be keeping NCR on its Open Cooperative Computing Architecture course. Does that still hold true?

I'm far less concerned today than I was a week ago . . . Bob Allen publicly committed that the direction would be our Open Cooperative Computing Architecture; the people I've met with from the computer systems division are very receptive to this idea — there's no argument about that.

What is your biggest concern at this time?

My biggest concern is to get the job done as quickly as possible. It is forecast that the legal aspect of this could take five, maybe six months. I don't think five to six months of uncertainty is an acceptable situation. So what we're working to do is very rapidly bring the organizations together, even before the merger agreement is completed.

Is the transition team in motion?

We have selected the team, and since the [merger announcement], the team is meeting. As I speak, in this building there are guys working on the transition aspect. It's a small group that will expand over time, but it's compartmentalized from the AT&T and NCR people who have to serve the customer.

Users want to know what is going to emerge from the transition team meetings.

It's too early to tell . . . We are looking to do this as rapidly as possible, even to the extent that [with] any new requirements of customers that come up, we will team up to ensure that we provide the best solution for them, and I think we're going to be able to rapidly integrate the services capacity. In general, our No. 1 objective is to continue to serve our customers and not disturb either their product direction or their level of service.

AT&T is planning on keeping its hands off?

So far, all evidence is that we will have all the autonomy we need to be successful . . . At the same time, we want to get the benefits of our combined resources — for example, their networking capability and Bell Laboratories' technology. I think we'll have the freedom to strike that balance. The ball will be in our court.

When large equals small

A relatively small – and declining – share of NCR Corp.'s revenues is derived from sales of large computer systems

	1990	1989
Retail products	$623	$596
Financial products	$973	$802
Small computer systems/workstations	$444	$391
Midrange computer systems	$765	$850
Large computer systems	$264	$289
Communications processors	$113	$141
Other (i.e., services, semiconductors and components)	$3,103	$2,888

Revenue in millions

Source: NCR Corp. CW Chart: Marie Hanes

NCR to show parallel processor

Lack of applications and target audience raises analysts' concerns

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — As if NCR Corp. wants to prove it has not been holding its breath during its takeover fight with AT&T, it will follow last week's merger announcement by unveiling its System 3600 today.

The mainframe-class machine will run on up to 288 loosely coupled Intel Corp. I486 microprocessors.

NCR must make the 3600 work if it is to succeed in its System 3000 strategy. But while analysts said they were optimistic about the possibilities of success, the lack of applications for massive parallel processing raises some doubts.

"The question is, where's the application for that?" asked Gordon Kerr, director of MIS at Hyatt Hotels Corp. in Chicago. Hyatt is using Unix in an on-line transaction processor (OLTP) environment. "I don't know that there is a ready market for a 10,000-user Unix box," he said.

The 3600 is based on fairly straightforward, existing technology. NCR essentially will link multiple versions of the eight-processor motherboard from its 3550 (in prototype now), and link this to a specialized database "cruncher" similar to that produced by Teradata Corp.

The front-end box will run off-the-shelf software, although analysts said commercial purchasers will probably develop their own specialized applications for it.

Mainframe revolution

NCR claimed that its first 3600, due to ship to beta-test sites in September with a fourth-quarter release date, will run at 2,000 million instructions per second (MIPS), or four times as fast as an IBM Enterprise System/9000. AT&T's Unix System V Release 4 will serve as the operating system.

"It could start a small revolution in mainframe computing," said George Lindamood, an analyst at Gartner Group, Inc.'s Large Computer Strategies Group in Stamford, Conn.

Pricing for the smallest 3600s will start at $855,000, with initial high-end systems costing $8 million. The boxes will cost approximately $5,000 per MIPS, according to NCR. NCR also said it will offer by the end of 1992 a 3600 that can achieve 10,000 MIPS, with an I/O bandwidth of 3.8G bytes per second and capable of processing 1,200 transactions per second.

The 3600 will be targeted toward new markets, according to analysts, who said they expect it to be used mostly by companies that develop their own applications based on large databases in an OLTP environment. In some ways, the 3600 simply contains multiple versions of NCR's 3550, eight-processor minicomputer due out later this year.

Market hunt

Analysts said it may not find a market, but they think companies with massive databases actually might want this sort of product.

"The truth is, airlines are trying already to use parallelism to keep up with demand. They have multiple [IBM] 3090s lashed together because they can't build a single monolithic processor that'll do it," Lindamood said. "NCR's saying rather than patch and tweak and design, let's build it from the ground up and do it right."

Just how much demand exists is unknown. "If there were zillions [of companies] out there wanting to do this, one would imagine there would be more competitors in the market," said David Card, an analyst at International Data Corp. in Framingham, Mass.

Global goals

FROM PAGE 1

fulfill AT&T's goals. "Let's say we were a $2 billion or $3 billion company and generating a profit — we wouldn't be the engine of growth for a $50 billion to $60 billion company."

NCR derives more than half of its sales from computers and has done well in the vertical markets of retail and banking, but general-purpose computers represent only $1.5 billion of its $6.2 billion in sales, according to analyst estimates. In sales to large customers, it is frequently an also-ran to IBM — started by onetime NCR executive Thomas Watson Sr. — and stacks up as the fifth largest U.S. computer maker behind IBM, Digital Equipment Corp., Unisys Corp. and Hewlett-Packard Co.

NCR had been changing its structure for years to make a bigger change: the jump from being a proprietary vendor to selling open systems. It had barely set foot on this path when AT&T made its buyout bid.



Allen would like a global, enterprise-wide firm, but is that realistic?

NCR has to meet its delivery dates for the System 3000, the hardware side of OCCA, and for Cooperation and the Open Network System, the software side. It simultaneously has to migrate its customer base from proprietary boxes to Unix and also sell to a corporate clientele that has shunned it in the past. Now, it must also merge AT&T's computer operation with its own.

Migrating users may be the least of its worries. Surveys done by CIMI Corp., a Voorhees, N.J.-based technology assessment firm, showed that nearly 90% of NCR's users "believe emphatically" that the company will be able to migrate them successfully to Unix, and NCR has a strong history of migrating users from old products to new.

Users and analysts reported that NCR is being invited to compete for contracts at companies that previously shunned it. It is perhaps 30 days behind schedule on its System 3000 product deadlines and significantly behind on Open Network System, though its other software initiative, Cooperation, appears on target.

Whether Unix will be accepted in the commercial marketplace is a ticklish enough question that when NCR announced the pieces of its OCCA strategy (see story page 112), Steve Lair, Dataquest vice president and director of its microsystems group, called it a "bet-the-company" strategy.

Before the merger, observers generally bet that NCR could pull off its open systems gamble and do it in a big way. Today, they say they will stick by their earlier statements if AT&T lets NCR lead the way, as it has said it will do.

As for Allen's vision, analysts were less confident. "It's dangerous to make the assumption that you can just melt telecom with computers — IBM tried it with Rolm [Systems] with less than stellar success," Kidd said.

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Great names

- Chase Manhattan Bank (New York): **Elaine Bond**, senior vice president of corporate systems
- U.S. Defense Logistics Agency, Memphis Depot: **Beverly Major**, chief of technology division
- Asset Management Technology (Marblehead, Mass.): **Alan Loss**, president

W.Y.S.I.W.Y.G.

What's it?



The Computer Museum, Boston

1. Porcupine pinup
2. Don King's hair curler
3. Magnetic drum memory for the Univac I

SNAZZY CORPORATE NAMES DEPARTMENT

HYPERACTIVE SOFTWARE, A MINNEAPOLIS DEVELOPER OF HYPERCARD APPLICATIONS

QUIPS & QUOTES

He votes "no" on groupware

"Creative ideas do not spring from groups. They spring from individuals. The divine spark leaps from the finger of God to the finger of Adam, whether it takes ultimate shape in a law of physics or a law of the land, a poem or a policy, a sonata or a mechanical computer."

A. Whitney Griswold (1957, then president of Yale University)

Scratch one T1 line

"Our inventions are wont to be pretty toys, which distract our attention from serious things. We are in great haste to construct a magnetic telegraph from Maine to Texas; but Maine and Texas, it may be, have nothing important to communicate."

Henry David Thoreau (1854)

Better dead than high-tech

"The American stake in literacy as a technology or uniformity applied to every level of education, government, industry and social life is totally threatened by the electric technology. The threat of Stalin or Hitler was external. The electric technology is within the gates, and we are numb, deaf, blind and mute about its encounter with the Gutenberg technology, on and through which the American way of life was formed."

Marshall McLuhan (1964, Canadian educator)

?

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at 1-800-343-6474. If we use your ideas, we'll send you a gift.

Sting operation

Two Texas A&M University scientists are formulating a computer-aided map depicting the U.S. migration of the Africanized honeybee (popularly known as the "killer bee").



Sources: Bureau of Electronic Publishing, Inc., Special thanks to The Computer Museum, Boston

INSIDE LINES

Programming in the visual age

▶ Sources close to Microsoft said programmers at the Redmond, Wash., software giant's headquarters may soon be "drawing" applications using a new code generator, dubbed "Visual Basic." The loosely kept secret about Visual Basic, which is expected to debut shortly, has been bubbling up around the Silicon Valley in recent weeks. "People will be pleasantly surprised to see how powerful it is and how easy it is to use," one source close to the billion-dollar software firm said.

The Ugly American . . . recruiter

▶ Here today, gone tomorrow. A certain Swiss IS manager reported that an American headhunter systematically ran through the roster of his department, offering employees 40% to 50% more if they jumped ship to a U.S. company setting up shop in Switzerland. However, the headhunters' targets were gun-shy because of American companies' hire-and-fire mentality, our source said. Swiss IS managers, who tend to stay six to eight years in one job, did not want to find themselves out of a job or transferred to Singapore in two years.

Just don't call it 'Quayleshacker'

▶ Hewlett-Packard may have the fastest workstations around at 76 million instructions per second (MIPS), but the company still doesn't have an entry-level RISC system. That should be remedied this fall with a workstation code-named "Bushwhacker."

Which brings us to . . .

▶ President Bush may have woken up to the Electronic Age with his new PC [CW, April 29], but the electronic voter has not warmed up to his lieutenant. A poll last Monday on Prodigy attracted more than 15,500 responses, only 16% of which were from people who said they were "very confident" of Vice President J. Danforth Quayle's qualifications for the presidency. Twenty-one percent were fairly confident; 20% were not very confident. They posted a mandate of 55% in favor of Bush selecting a new running mate for 1992.

Don't tell us!

▶ While acknowledging rumors of impending employee layoffs and pay cuts circulating within the walls at Dun & Bradstreet Software, a spokeswoman for the company emphatically stated earlier this week that there have been no discussions to that end. Several internal sources have speculated that the software giant would be laying off staff at both the Framingham, Mass., and Atlanta offices in June.

Toeing the chips

▶ Playing clean-up, Motorola will have its next RISC chip out by year's end. The 8810 will run between 58 and 84 MIPS, three times the speed of the current chip. Motorola has announced that its next chip, available sometime next year, will run between 50 and 150 MIPS. LSI Logic, which is a maker of Sun's architecture, said it would have a chip that runs up to 80 MIPS this year, and HP's recent 700 series runs 57 to 75 MIPS.

How you say, better be good!

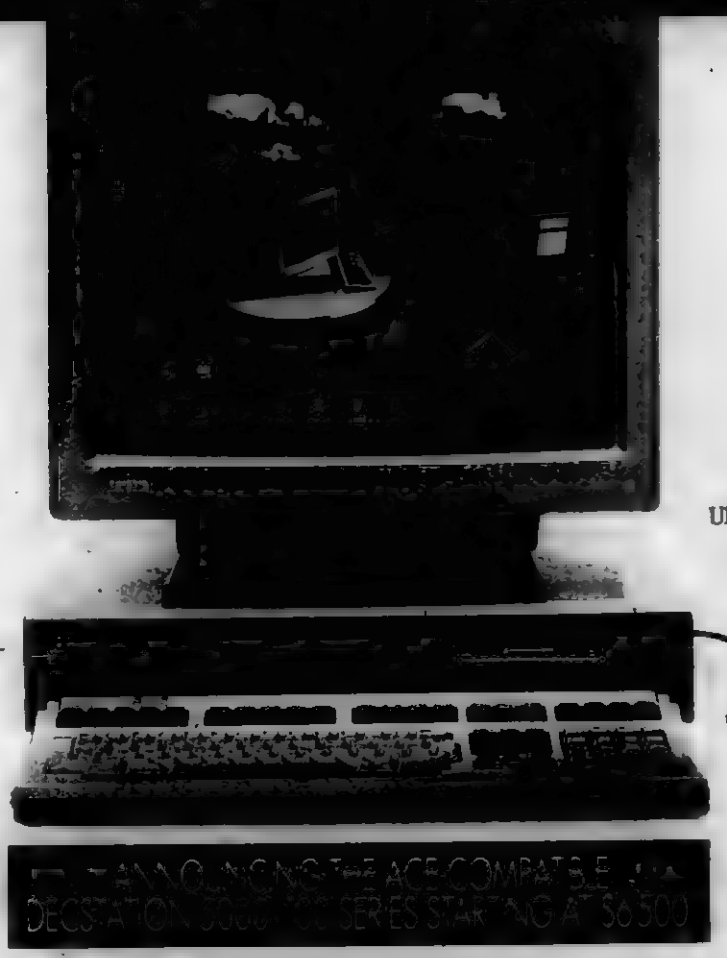
▶ Zenith Data Systems' market presence has suffered since its takeover by Groupe Bull, but at Comdex Spring '91, Zenith will come out with five new portables, which will include an Intel 80386SL-based model and some new high-powered desktop servers, including one running an I486SX. A source close to Zenith said this is its biggest product announcement since 1988, when it came out with the first battery-operated 286 and 386 portables. Analysts said it had better be good, or Zenith may be in as much trouble as its parent.

You can take it to the bank, and maybe you should! An open letter from the suddenly compatible AT&T and NCR managements appeared Friday as a full page ad in daily newspapers assuring customers that "you can buy either AT&T's or NCR's products — right now, or in the future — with confidence." Cynics wonder just how many are willing to belly up to the 3B bar these days. As always, we'll follow this merger closely and depend on our readers to be our eyes. Contact News Editor Pete Bartolik at (800) 343-6474, fax your stuff to (508) 875-8931, or hook up with us on Compuserve at 76537,2413.

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On April 9th, when Digital joined 21 other hardware and software vendors to form ACE (Advanced Computing Environment), it was a symbol of our continued commitment to open standards. The ACE initiative has developed a set of hardware and operating system standards for RISC computing. This will give customers the ability to choose from tens of thousands of off-the-shelf applications for any ACE-compatible system.

Today, with the announcement of our DECstation™ 5000/100 Series workstation, Digital goes beyond symbol to reality. As a member of the DECsystem™ 5000 family, the 100 Series workstation is compatible with ACE standards by incorporating the MIPS® R3000 chip, little endian byte ordering and OSF™ technologies.

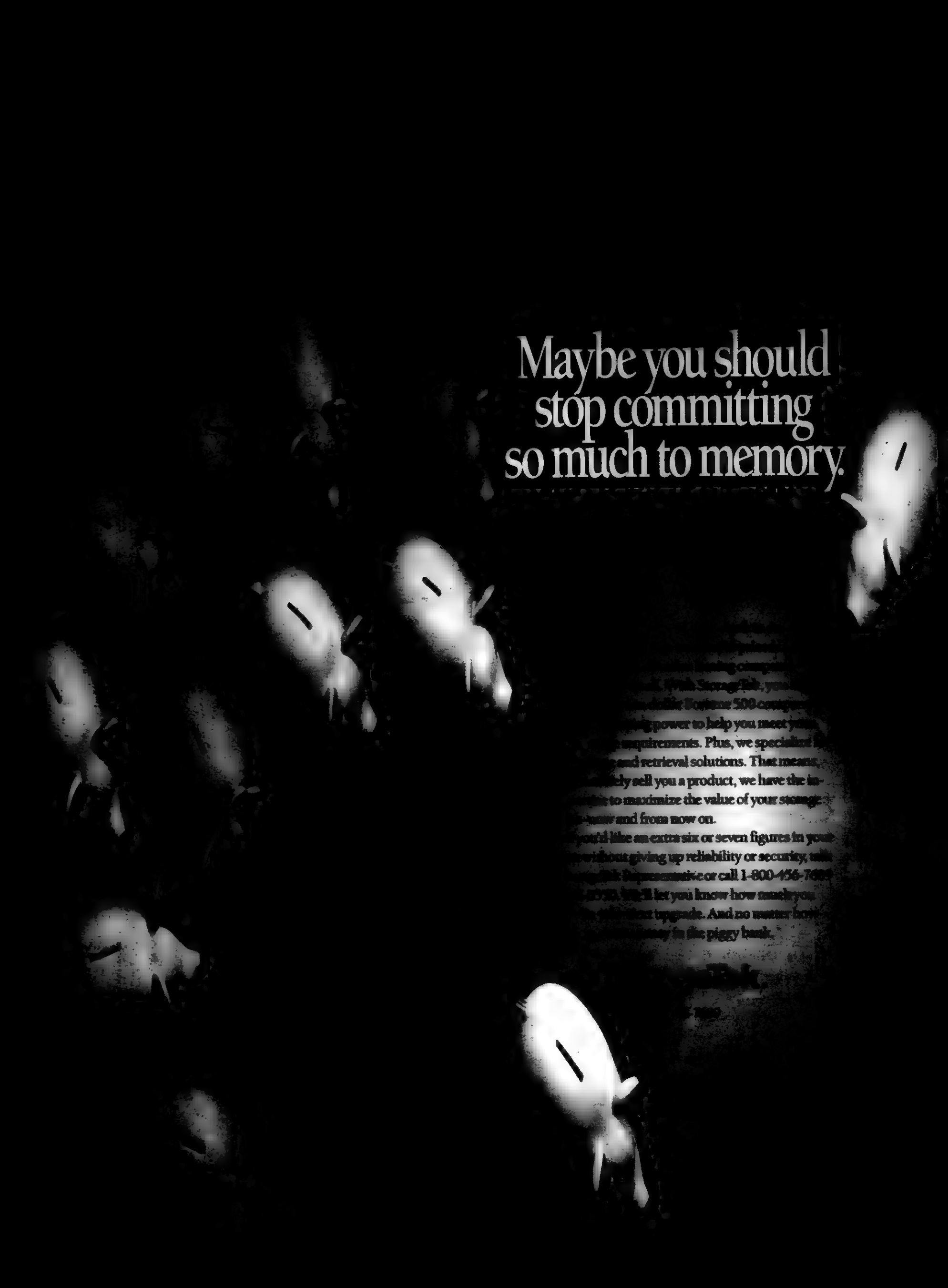
Besides providing hardware compatibility, ACE standards protect your investment in ULTRIX™ applications and will allow you to take advantage of other products as they are developed by other ACE members.

At Digital, we believe that the concept behind ACE and other open alliances is the key to the future. And with our DECsystem 5000 family, the future is now. For more information, call 1-800-622-3677.

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COMPUTERWORLD

SPECIAL REPORT: ADVANCES ON THE PC FRONT
Beginning on page 95

IS confronts chore in move to System 7.0

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. served up its next-generation operating system last week, but some users may find the demands of System 7.0 hard to digest.

Although Apple USA President Bob Puette said he expects 3 million Macintosh users to upgrade by year's end, the path to full System 7.0 integration is peppered with implementation hurdles. Added memory requirements, network tinkering and scattered software incompatibilities could delay widespread installation.

"I'm going to let others work through the rough spots before rushing right out to buy System 7.0," said James Brown, a systems specialist at Nissan Motor Corp. in Carson, Calif.

Apple executives said System 7.0 requires at least 2M bytes of

Continued on page 8

Migration pattern

A small fraction of the Apple Computer, Inc. Macintosh installed base is ready to fully support System 7.0

1990 worldwide installed base

Non-System 7.0-ready	
Mac 128K Mac 512K	814,000
Mac Plus	1.08M
Mac SE Mac SE/30	1.73M
Mac Classic Mac LC	180,000
Mac II Mac IIX Mac IICX	998,000
System 7.0-ready	
Mac IIFI Mac IICI Mac IIFX	266,000

Source: International Data Corp.

IBM spins off outsourcing unit

Subsidiary expected to blunt charges of Consent Decree violation

BY CLINTON WILDER
CW STAFF

WHITE PLAINS, N.Y. — IBM took a major step last week to remedy charges that its outsourcing business may be illegal. The company spun off a subsidiary that, unfettered and molded in the image of IBM Credit Corp., may pose even more of a threat to competitors that have been crying foul.

IBM transformed a division that sold outsourcing services into a new, wholly owned subsidiary, Integrated Systems Solutions Corp. Similar to the IBM credit leasing subsidiary, ISSC will have its own board of directors, employees, accounting and bottom-line responsibility.

ISSC will be able to offer services that the 1956 U.S. Department of Justice Consent Decree appears to prohibit IBM itself from selling, such as applications development, end-user support and such specific functions as check processing.

Until now, IBM said, its Systems Services Division was limited to providing data center operations, technical support and systems software to its outsourcing customers: Eastman Kodak Co. and four banks.

Fred L. Ciesewski, senior vice president and MIS director at outsourcing customer Bank South NA in Atlanta, said the move frees IBM to offer other services his bank may be interested in. He likened the Consent Decree to the limitations placed on the Bell operating companies after the AT&T breakup.

"When you deal with the phone company now, they sometimes say they wonder if Judge

Continued on page 141

DEC to prop up VAX 9000 investment

Plan to assure value despite move to RISC

BY MARYFRAN JOHNSON
CW STAFF

When it comes to betting his company's future on the success of Digital Equipment Corp.'s VAX 9000 mainframe, George Kerns is looking for a better deal — and DEC says he's going to get it.

"What we want are quantifiable assurances — not just talk — that this product line will never be de-emphasized," said Kerns, vice president of information management at GTE Mobile Communications in Atlanta.

DEC will move quickly to reassure Kerns and other customers that their investments in the company's mainframe technology will be protected, a DEC executive said last week.

VAX 9000 sales are not meeting projections, and DEC's announcements that it will migrate the VAX line to reduced instruction set computing technology threaten to push residual values through the floor.

Gartner Group, Inc. estimated that a VAX 9000 Model 210 will be worth only 8% of current list price by 1994, mainly

Continued on page 4

Performance tells tale of extremes

IBM SOFTWARE GIANT IN TROUBLE

Part 2 of a three-part series researched and written by Computerworld staff members Rosemary Hamilton, Johanna Ambrosio, Patricia Keefe and Kim S. Nash.

Where software is concerned, IBM is many companies.

It virtually owns some markets, its domination so complete that it seems immune to competition. In others, it has stumbled badly, appearing incapable of delivering what its customers need. In still others, it is just one of many players, holding its own but seemingly unable to break away from the pack.

What works in one market does not always work in another. For example, brand-name loyalty has tipped the mainframe database management market to IBM but has not helped it sell personal computer software.

The following are three markedly different stories of IBM's software market performances.

DB2:

Swamping the competition

The mainframe relational database management system market is getting pretty simple. There is IBM's DB2, and then there is the rest of the world.

DB2, now the IBM MVS market standard, illustrates IBM's ability to respond to a market shift and come out a winner. Although many

Continued on page 139

Price war slams PC vendors

BY RICHARD PASTORE
CW STAFF

The personal computer industry appears to be slipping into a cyclical battle for survival as price cuts and shrinking margins take their toll.

Consolidations and price wars, prevalent in earlier industry shakeouts, struck with a vengeance again last week, with retail distributor Businessland, Inc. on the brink of disaster and Compaq Computer Corp. forecasting a 15% slump in revenue for this quarter. Furthermore, reports surfaced last week that Apple Computer, Inc. is pondering layoffs (see story page 6).

Business is likely to worsen, analysts said. The PC industry, which is already being

Continued on page 6

Crash and burn

With sales dropping off, Businessland, Inc.'s prospects for stemming the red ink are getting more bleak by the quarter



Source: Businessland, Inc. CW Chart: Tom Monahan

INSIDE

Zenith on Comdex stage in bid to reclaim prominence in PC market. Page 141.

DEC PCs draw attention, but will they reclaim allegiance of customers accustomed to getting desktop machines from other suppliers? Page 4.

What, me worry? HP goes against the hardware downturn, posting a 25% profit hike and positioning itself to capitalize on an economic recovery. Page 6.

Microsoft, AT&T team up on LAN Manager for Unix. Page 12.

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6 HP rebounds into profit, closing its second quarter with double-digit gains.

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10 The similarity is there, but Cincom's AD/Advantage is no kin to IBM's AD/Cycle: It offers more facilities and runs multiple platforms.

12 OLE! Flinging wide the gates to Object Linking and Embedding, HP commits its New Wave application to support future upgrades of Microsoft's Windows.

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139 There are exceptions to the rules, but IBM continues to prove the theory that hardware vendors rarely become tough contenders in the software arena.

140 Can users overcome their concerns about the merger with AT&T long enough to give NCR's System 3600 a fair shake?

Quotable

"It used to be that you would have to chuckle when you said Digital and PC in the same breath. I don't think you should chuckle anymore."

STEVE LAIR
DATAQUEST

On DEC's latest dive into the PC market. See story page 4.

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EXECUTIVE BRIEFING

■ **The PC industry is in turmoil** as Comdex/Spring '91 opens today in Atlanta. Businessland shocks the industry and customers with a $43 million loss, while Compaq warns of a 15% plunge in sales. Declining IS budgets and the U.S. economic downturn are taking their toll, and the PC price wars continue unabated. **Page 1.** Comdex attendance may suffer as well, as corporate budgets are feeling the pinch of travel expenditure cutbacks. **Page 141.**

■ **IBM spins off its outsourcing business** into a wholly owned subsidiary. The move comes in apparent response to critics, who have charged that the outsourcing business violated the 1956 Consent Decree. Ironically, the action may make IBM an even stronger outsourcing competitor. **Page 1.**

■ **Striking the right balance between technical know-how** and business understanding is posing unprecedented challenges for IS professionals. Proper training, career paths and career choices are much more complicated than they once were. First of a two-part series. **Page 121.**

■ **IBM's report card as a software vendor** varies widely among market segments: unparalleled success with DB2, some embarrassing failures in PC software and a mixed bag in Unix. Part 2 of a three-part series. **Pages 1 and 139.**

■ **The NCR 3600 may be the first victim** of the merger with AT&T, as potential buyers adopt a wait-and-see posture on the firm's future. They worry about AT&T keeping its "hands-off" promise. **Page 140.**

■ **Minicomputer industry woes continue** as Prime announces an $84 million quarterly loss and plans to cut 800 jobs through attrition. Meanwhile, Wang loses a key veteran development executive to DG. **Pages 4 and 10.**

■ **DEC will move to assuage fears** of VAX 9000 users about the product line's future. Hardware and software enhancements and a long-term migration plan to the RISC-based Alpha VAX are in the offing. **Page 1.**

■ **University IS programs are stressing technology** use over primers. They are getting firms more involved in school curricula and encouraging IS chiefs to teach and lecture. **Page 113.**

■ **Sabbaticals for IS employees** can be an effective way to attract, motivate and get the most productivity from them. There are potential downsides, but sabbaticals are generally viewed positively. **Page 89.**

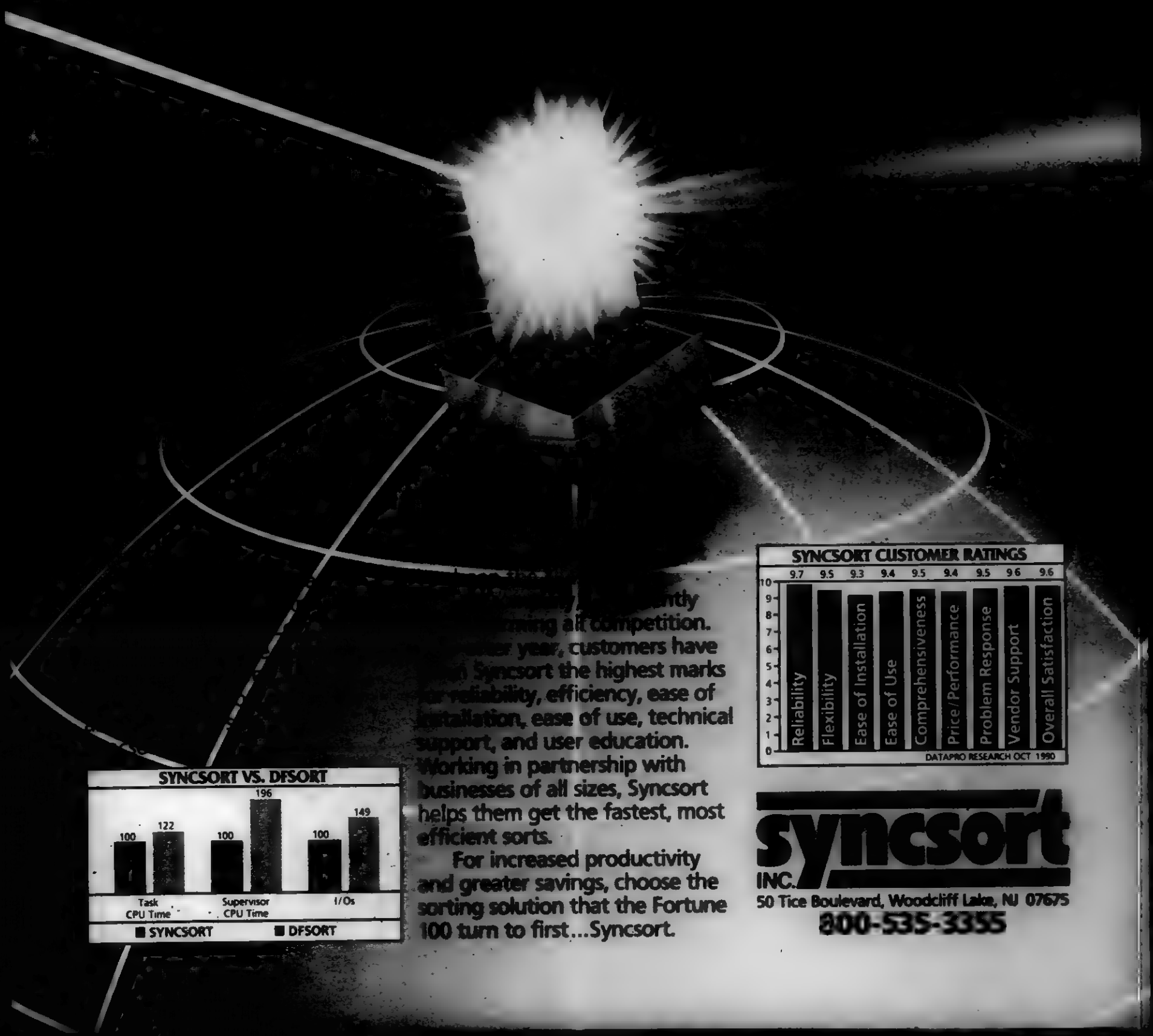
■ **Personal computers are becoming both more and less personal:** They are packing more power and functionality per inch but also gaining capabilities that make them much more of a peer player in enterprise networks. **Page 95.**

■ **Gray market goods** — new PCs, mainframes and minicomputers sold through unauthorized reseller channels — offer discounts of 40% and higher for the educated shopper. **Page 132.**

■ **Take the regulatory wraps off AT&T,** a group of 14 large enterprises urges. In a study commissioned but reportedly not controlled by AT&T, users blame federal regulation for costly and frustrating delays in signing up for Tariff 12 and other services. Competitors MCI and Sprint question the study's objectivity. **Page 8.**

■ **On-site this week:** Keegan Management in San Jose, Calif., relies on Norton-Lambert's Close-up communications software to help run its businesses — and sell them off. **Page 68.** Minicomputers still rule the roost at aluminum producer Alumax, where Prime 50 series CPUs run business, database and maintenance functions. **Page 33.** The Federal Reserve Bank in Baltimore is wrestling with standards for PC hardware, software and LANs as it attempts to migrate mainframe applications to 20 LANs. **Page 49.**

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DEC aims PCs at its own users

But in spite of industry praise, minicomputer buyers are not converted

BY RICHARD PASTORE
CW STAFF

Digital Equipment Corp.'s new line of personal computers and portables has earned the company rare respect from industry analysts. But DEC minicomputer users accustomed to looking to other vendors for PCs may need further convincing.

DEC has been hurt by its inability to sell PCs to minicomputer network customers. With the new high-end systems, it is also hoping to forestall customer defections to workstation-level boxes from rival vendors.

However, DEC must win over a customer base already set in its PC ways. "I don't see us running out and buying a bunch of them just because they're Digital," said Stephen Crusenberry, coordinator of DEC's PC systems architecture at Bechtel Corp. in Norwalk, Calif. The firm has already standardized on Compaq Computer Corp. PCs.

"We looked at DEC PCs in the past but avoided them because of their prices," said Timothy Kahn, MIS manager at Sunoco Fibre Development, Inc. in Marietta, Ga. He buys Hewlett-Packard Co. PCs and clones to run on DEC Pathworks networks.

Nevertheless, DEC's aggressive pricing and emphasis on networking and graphics are indications that the company should be taken more seriously in the PC arena, some analysts said.



Steven Burns

Ken Olsen (left) and Andrew Grove *announce PC line*

"It used to be that you would have to chuckle when you said Digital and PC in the same breath. I don't think you should chuckle anymore," said Steve Lair, chief PC analyst at Dataquest, Inc. in San Jose, Calif. The product line announced last week will pose a significant challenge to the market, he said.

Other observers were particularly impressed with the design and entry price of the new PC workstation, the DECPC 433 Workstation. It combines Intel Corp. I486 architecture with workstation-level graphics of 1,280- by 1,024-pixel resolution and is priced starting at $5,999. In comparison, the company's earlier 25-MHz 486 price ranges from $6,920 to $10,475.

Workstation hybrid

The new model, built and designed in conjunction with Intel, comes with 8M bytes of memory and can be configured with up to 1G byte of storage. It supports DEC's Pathworks network software as well as DOS, OS/2 and various Unix incarnations.

This PC/workstation hybrid makes perfect sense for DEC, which must distinguish its PC line from other clones and has workstation experience to leverage, said Paul Zagaeski, an analyst at The Yankee Group in Boston.

It may already be too late for DEC at some sites, such as Bradley University in Peoria, Ill. The university is about to replace its last VAX server with a Sun Microsystems, Inc. 470. "Based on price/performance, we chose the Sun 470," said Joel Hartman, associate provost of information technology and resources.

DEC also announced the 433T deskside system, intended for both client and server use. Also a 33-MHz, 486-based system, it incorporates the Extended Industry Standard Architecture bus, 4M to 64M bytes of memory, eight slots and 10 storage bays. Pricing for the system, designed and manufactured in partnership with Tandy Corp., starts at $11,995.

The other introductions were notebook- and laptop-size PCs made in conjunction with Ing. C. Olivetti & Co. The 33-MHz Intel 80386DX laptop weighs 11 pounds and offers a 60M-byte hard disk, an integrated mouse pad and a price of $6,450. The 6.2-pound notebook uses an Intel 20-MHz 80386SX chip and comes with a 60M-byte disk and 2M bytes of memory. It sells for $4,895. There is also a desktop expansion chassis option for the unit.

Wang exec defects to DG

LOWELL, Mass. — Gerald Paul, longtime Wang Laboratories, Inc. executive and, until recently, vice president of systems and communications development, left Wang last week to join Data General Corp., based in Westboro, Mass.

Paul will assume the title of vice president of Eclipse development June 3. He will report to Joel Schwartz, vice president and general manager of the Eclipse business unit.

Paul was at Wang for 12 years and was responsible for much of the company's proprietary VS systems development and marketing efforts. His successor has not been named.

Frank Ryan, vice president of corporate communications at Wang, said the VS computer line will not suffer, adding that the company has a strong management and development team in place.

He said Chief Executive Officer Richard Miller is "clearly building his own management team. Some people are going to be on it and some aren't." Paul was unavailable for comment.

VAX 9000

FROM PAGE 1

because of DEC's move to the RISC-based Alpha VAX and its anticipated price/performance improvements. However, a comparable Enterprise System/9000 mainframe from IBM will be worth 33% of current list price by 1994, said Peter Schay, an analyst at the Stamford, Conn.-based consulting firm.

"DEC needs to provide a lease rate or package that protects the user from this kind of depreciation," Schay said.

DEC officials are scheduled to meet with Kerns next Monday to discuss an as-yet-unannounced program address to provide that security blanket. Kerns will be hearing about DEC's three-part plan to provide "100% protection in hardware, software, peripherals and company assets," said Rich Whitman, group marketing manager for information systems business at DEC.

The plan includes enhancements for VAX 9000 hardware and software, migration to RISC-based Alpha VAX and by 1994-95 and business practices to "protect the asset investment" of large systems users.

Although Whitman would give no further details on the financial protections DEC will give certain customers, he did say one likely offering will be technology upgrade leases similar to what IBM provides. "We are going to guarantee the investment of the customer, and there will be real, hard monies tied to it," Whitman said.



Kerns *wants assurances from DEC*

An upgrade lease protects the residual value of machines as they age, Schay said.

"DEC is going to be much more sophisticated about leasing and financing strategies for its mainframe users," Schay said. "But if the VAX 9000 sales stay mired at 70 systems a quarter, DEC won't be able to afford the kind of investment it takes to stay in that business."

GTE Mobile Communications became the second-largest cellular telephone company in the nation after the mid-March merger of Contel Corp. and GTE Corp. Now a service company for GTE Mobilenet and Contel Cellular, the new firm is expecting its customer base to quadruple to 2.5 million by 1995.

Kerns stated that his plans for an extensive VAX-based client/server environment hinge on the VAX 9000 leading the technology curve. "If DEC is not going to be successful with [the VAX 9000], we want them to share our risk, whether that means paying for a conversion or buying back the equipment," he said.

CORRECTIONS

Because of a transcription error, a chart that appeared in the April 29 issue of *Computerworld* said Legent Corp. posted a loss for its second quarter, ended March 31. In fact, Legent reported a $7.5 million third-quarter profit.

.....

The chart accompanying the "TI seals James Martin deal" article [CW, April 15] incorrectly estimated the computer-aided software engineering tool market share for Texas Instruments, Inc. as 9.3%. The correct figure is 7.1%. Incorrect information was provided to *Computerworld*.

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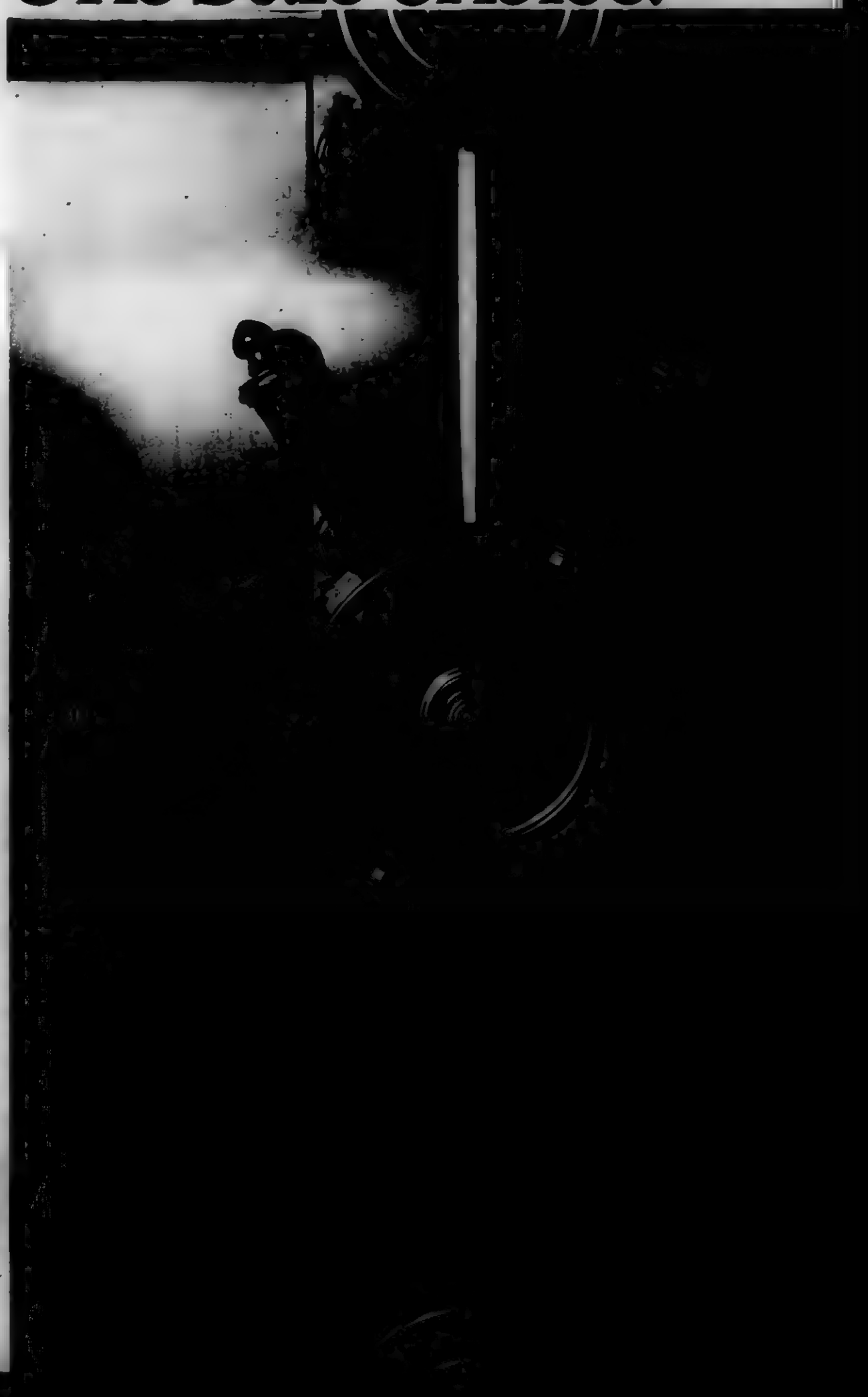
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NEWS SHORTS

Apple shows ISDN applications

Apple Computer, Inc. demonstrated new Integrated Services Digital Network (ISDN) applications last week at its Worldwide Developers Conference in San Jose, Calif. One of the applications was Grasspencil, developed by third-party software vendor Glenn-Marx Associates. The software will distribute a wide variety of medical images for viewing, annotating and reformatting data. Apple said it is working with 50 third-party developers to create ISDN applications for the Macintosh.

U.S. Robotics snares modem maker

Modem maker U.S. Robotics, Inc. last week acquired the assets of Touchbase Systems, Inc., the Northport, N.Y., manufacturer of the Worldport pocket modem. U.S. Robotics, based in Skokie, Ill., said the acquisition will give it a product for portable computer users, rounding out its desktop and data center offerings. Touchbase becomes the Portable Products Division of U.S. Robotics, two co-founders have become U.S. Robotics officers, and the unit will continue to operate from Culver City, Calif. Terms of the purchase were not disclosed.

Current price is down

IBM said it is offering, for a limited time, a $129 price on Version 1.2 of Current, its personal information manager package. Customers must order directly from IBM before Aug. 31. Current lists for $395.

Novell enhances server

Novell, Inc. announced that it is shipping its Netware Access Server Version 1.2. Access servers give as many as 16 remote users dial-up access to a Netware network. With the new version, users are, for the first time, able to move native Apple Macintosh files over the remote links, as long as Netware for Macintosh Version 3.0 is loaded on the network. It also allows remote users to connect with X.25 networks without a separate translator device. The server sells for $2,395.

CA spins off banking software

Computer Associates International, Inc. spun off its Infopoint banking software product line last week and merged it with banking outsourcing vendor The Newtrend Group for sale under the Newtrend name. According to CA Chairman and Chief Executive Officer Charles B. Wang, Infopoint software is in use at more than 700 financial institutions. Newtrend provides financial institutions with outsourcing and computer services through the use of its Miner2 software. CA will own half a share in Newtrend, with Wang becoming chairman of the group and R. R. King, chairman of Newtrend, becoming president and chief executive officer of the joint venture.

Genetic privacy bill introduced

U.S. Rep. John Conyers Jr. (D-Mich.) has introduced legislation that would regulate the collection, maintenance, use and dissemination of genetic records held in the information systems of federal agencies and contractors. Conyers, concerned about discrimination against individuals on the basis of their genetic predisposition to certain health problems, said federal privacy laws must be extended to protect genetic records from disclosure and misuse.

Sprint, AT&T win Kuwait contracts

U.S. Sprint Communications Co. and AT&T announced contracts last week to help restore domestic and international telecommunications in war-torn Kuwait. Sprint International will install a satellite earth station to connect Kuwaiti businesses with Sprint's data, electronic mail, voice and video networks, but terms of the contract were not disclosed. Sprint will also open three business centers in Kuwait, each equipped with telephones, fax machines and computer workstations. AT&T said it has delivered two digital telephone exchanges and a satellite earth station to Kuwait under a $7 million contract.

More news shorts on page 140

HP profit brightens gloomy industry

BY NELL MARGOLIS
CW STAFF

PALO ALTO, Calif. — A varied product mix, a quick takeoff for its new RISC workstations and expense control fueled Hewlett-Packard Co. to double-digit revenue and profit increases for its second fiscal quarter.

Perhaps the best news about HP's rebound, analysts said last week, is that it could have staying power.

HP said last week that for the quarter ended April 30, net income was up 25% from that in the comparable quarter in 1990 to $233 million, on revenue of $3.7 billion, a 13% increase over last year.

Overall orders rose by 9% over those logged in the firm's second quarter of fiscal 1990. U.S.-based revenue for the quarter increased by 4% year over year, while non-U.S. sales marked a 20% gain.

Expense control

HP has "done a super job of getting their expenses under control, and it has worked," said Robert Herwick, an analyst at Hambrecht & Quist, Inc.

Furthermore, "with their year-to-year orders and revenue growth being somewhat better than IBM's or DEC's, it's pretty clear that when we finally do get an economic upturn [nationwide], HP is going to be exceptionally well-positioned to participate in the growth areas of the '90s," Herwick said.

Other analysts agreed. Laura Conigliaro, who follows HP for Prudential Bache Research, Inc., noted HP's mounting strength in the German market and the stronger-than-expected initial demand for its recently introduced reduced instruction set computing (RISC)-based workstations as encouraging.

HP is not necessarily home free, however. Competition from agile, young personal computer vendors that come armed with a mastery of the dealer channel could be fierce for HP, Herwick said. "They're under attack by the Dells and ASTs of the world." Additionally, encroaching recessionary conditions in Europe are likely to knock a few points off HP's international sales growth in the third quarter, Conigliaro said.

Price war

FROM PAGE 1

hammered by recession and retail consolidation, is in an escalating price war that already involves several vendors. Dell Computer Corp., Compaq's clone arch rival, said last week that it will pare prices on desktop and portable models.

A price war in times of economic adversity benefits users in the short term. However, side effects and direct results of price wars — dealer shakeouts, consolidations and weakened vendors with less to spend on research and development — can come back to haunt users.

"I'm worried there could be a disadvantage [to the price cuts]; I'd like to see Compaq have a lot of R&D cash," said Richard Marolt, information services manager at Great Central Insurance Co. in Peoria, Ill.

Support suffers

The consolidations can be chaotic and limiting, according to Robert McLoughlin, assistant vice president of microcomputer procurement at New York Life Insurance Co. With sales dipping, merging dealers will not retain all of their staff members and sites. "There may not be as many people for support or as many convenient locations," he said.

New York Life has been buying PCs and telephone technical support solely from Businessland, which chilled the industry last week with the announcement of a $43 million loss. Only last-minute credit arrangements seem to have kept the reseller from bankruptcy.

As buyers of lower cost machines choose other sources, such as superstores and mail-order vendors, traditional dealers are hurting.

"The guy that might have gone to Businessland is now looking at a Gateway catalog or going into a Compuadd store," said Will Fastie, editor of "The Fastie Report" in Baltimore.

Less dramatic but maybe more unsettling is the swoon of high-flying Compaq. The vendor blamed its revenue trouble on dollar fluctuations overseas, its recent price cut and dealer consolidation.

Blame the economy

However, the chief culprit is the economy, which is slowing corporate purchases.

"The corporate investment for PCs is down considerably across the country," said Steve Lair, chief PC analyst at Dataquest, Inc. in San Jose, Calif. "That would impact the premium brands first because they represent a more significant investment level."

For example, Towson, Md.-based Black & Decker Corp.'s PC budget shrunk by as much as 10% compared with last year, said Greg Faries, manager of client information services.

This tightfistedness has already been felt by IBM, which blamed recent market share declines on the Gulf war and the recession. Now, Compaq is forecasting trouble.

So far, the low-priced clone vendors are continuing to do well, picking up defector business at the expense of premium brands. Whether they will continue to dodge the recession bullets depends on how far the premium brands are willing to cut and how much margin flexibility the clone makers have.

Dell added its own volley to the escalating price war last week by cutting prices $100 to $900 on nine desktop and laptop systems. This comes one month after Compaq's dramatic price cut and the more recent and limited responses from AST Research, Inc., Toshiba Corp., IBM and Leading Edge Products, Inc.

Another source of industry stress is the recent consolidations among major PC dealers.

Apple considers layoffs

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. employees may become victims of success. High sales of low-cost Macintosh personal computers have cut back profit margins and reportedly led Apple executives to consider layoffs. Published reports last week said as many as 2,000 employees, or nearly 13% of Apple's work force, could be furloughed.

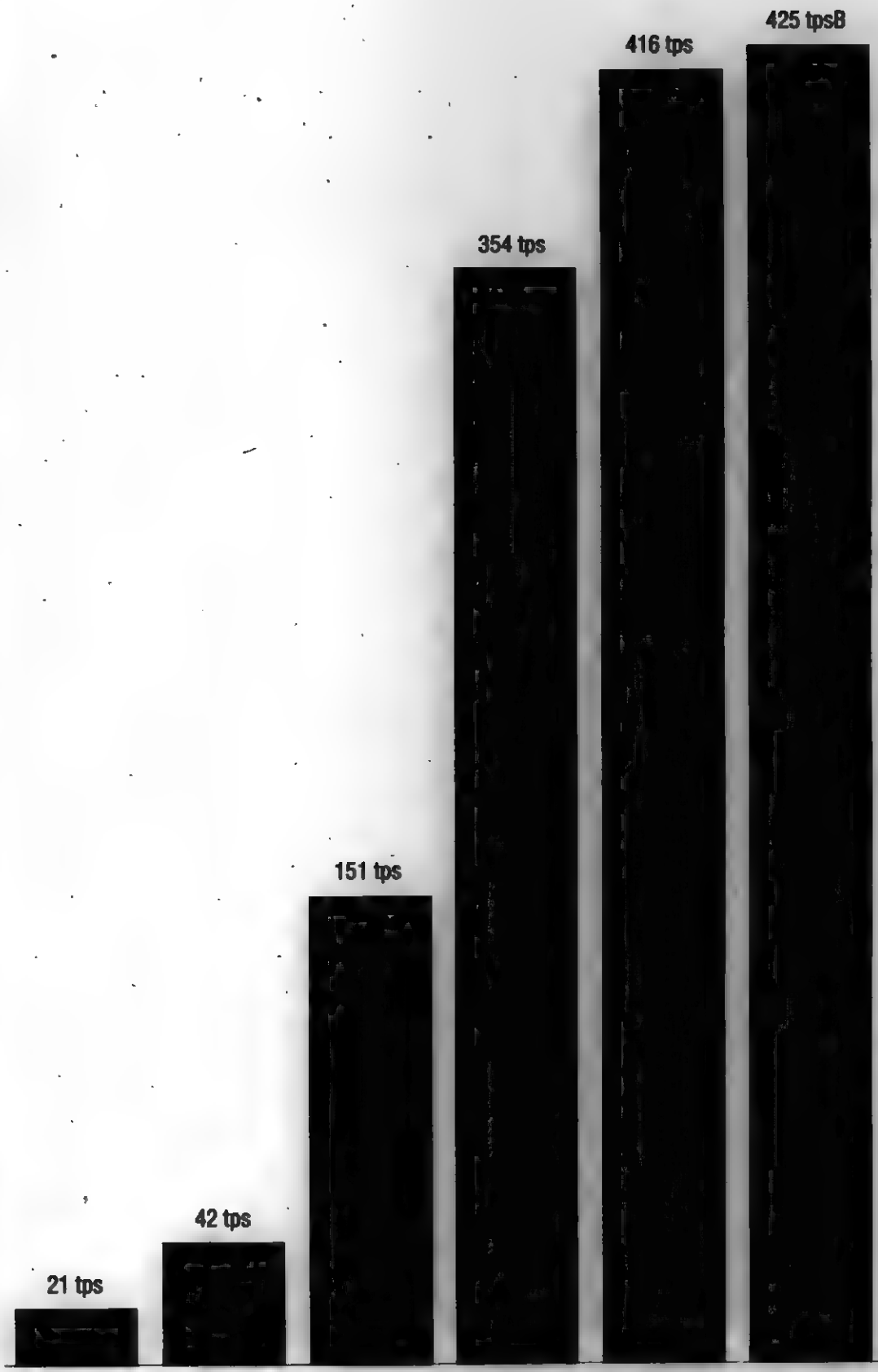
"It's no longer a question of if, but how many people will go," said James Weil, an analyst at Soundview Financial Group. Apple executives briefed securities analysts last week about plans to reduce operating costs, about which they said "they will leave no stone unturned," Weil said.

Last October, Apple unveiled the Macintosh Classic, Macintosh IILC and Macintosh IISI. The success of the machines helped unit sales for the quarter ended March 31 soar 85% over figures from one year earlier, but profit margins dipped from 54.7% to 48.8%.

Apple spokesman Christopher Escher would not speculate on layoff plans but said the $5.56 billion firm is considering several measures to reduce expenses.

A report in last week's *San Francisco Chronicle* said no final decision had been made as to how many of Apple's 15,600 employees would be let go, but estimates ranged from 600 to 2,000. A final decision on the extent of the cutbacks is expected later this week.

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System 7.0

FROM PAGE 1

random-access memory. Beta-test users noted, however, that the 2M-byte figure is artificially low, and those who want to run more than one application at a time will need at least 4M bytes.

"You can't do much with 2 mega," said Rick Christjansen, manager of administration and technical support at Manville Corp. in Denver. "Memory may only cost $40 a meg, but if you're upgrading a couple hundred 1M-byte machines, you're talking about a significant price tag and a headache to boot."

Users of older and entry-level Macintoshes may also feel short-changed, even if they are willing to pay for a RAM upgrade.

System 7.0 requires a hard drive with 3M to 5M bytes of free space, ruling out its use on floppy-based Macintoshes. System 7.0 will run on any Macintosh Plus or later model with enough RAM and disk space, but only the IISI, IICI and IIFX have the correct processor configuration to fully exploit the upgrade. Models such as the SE/30, IIX and IICX require the addition of a special coprocessor chip to use the virtual memory feature.

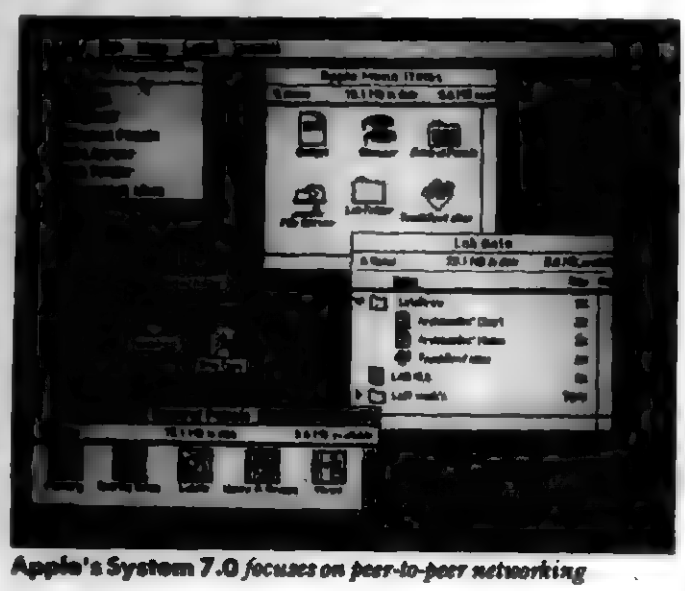
Apple officials moved toward assuaging those problems by dramatically slashing the price of both memory upgrade kits and logic board upgrades — up to 57% for memory kits and 41% for logic board upgrades.

In larger IS shops, some users objected to Apple's focus on peer-to-peer networking, which they said undermines the company's claim that System 7.0 is business-oriented. "Anyone who takes networking seriously doesn't want to do peer-to-peer networking because it lacks backup and security controls," said Rick Marolt, IS manager at Great Central Insurance Co. in Peoria, Ill. "I like to have things on the server, where they can be shared by many people."

Users also need to determine if they have the network hardware required to fully exploit System 7.0. Apple officials said drivers for third-party Ethernet cards need to support Appletalk Phase 2 at the very least. Other drivers developed without System 7.0 support will work if users turn off the virtual memory feature and there is light network traffic.

Another area of concern is application compatibility. Roger Heinen, Apple's vice president and general manager of Macintosh software architecture, said some incompatibilities have been discovered, but they affect "a small percentage of Macintosh applications and none of the top 500 packages."

Among the applications that require no tweaking to run System 7.0 are Microsoft Corp.'s Word 4.0 and Excel 3.0, Adobe Systems, Inc.'s Illustrator 3.0, Aldus Corp.'s Pagemaker 4.0 or 4.01 and the entire family of Macintosh products from Claris Corp.



Apple's System 7.0 *focuses on peer-to-peer networking*

Apple provides a program that will scan existing programs before System 7.0 is installed and flag potential incompatibilities. The $99 System 7.0 Personal Upgrade Kit also includes 90 days of free upgrade telephone support; the $349 Group Upgrade Kit offers 180 days of free phone support.

System 7.0 backers

System 7.0 was the star of the show at last week's announcement by Apple, but any movie director can tell you that it is often a crackerjack supporting cast that makes a production successful. As a result, more than 100 third-party applications offering System 7.0 support were announced along with the new operating system. Few are available immediately, but most are expected by Macworld in August.

Among the firms unveiling packages optimized for System 7.0 were the following:

- **Microsoft** unveiled an updated Excel spreadsheet, optimized for the new operating system.
- **Supermac Technology** announced an update of its Pixelpaint Professional graphics package. Pixelpaint Professional 2.0 is priced at $799 and is currently available.
- **Claris** unveiled its Claris Resolve spreadsheet. The product will sell for $399 when it becomes available this summer.
- **Ventura Software, Inc.** rolled out an updated edition of its desktop publishing software, Ventura Publisher. The package is scheduled to arrive in August.
- **Software Ventures Corp.** announced that it expects to launch its System 7.0-compatible Version 4.0 of its Microphone II telecommunications application on July 1.
- **Agfa Corp.'s Compugraphic Division** announced the availability of scalable Truetype outline font technology for System 7.0. Agfa officials said they plan to produce 200 Truetype fonts by the end of the year.
- **Sitka Corp.** introduced Mactops 3.1, a file- and printer-sharing system that allows the Macintosh to be integrated into IBM Personal Computer-, Unix- and pen-based platforms. Mactops 3.1 is expected to be available in August.
- **Symantec Corp.** officials said its Symantec Antivirus for Macintosh includes System 7.0 support.
- **T/Maker Co.** announced that its Writenow word processor application will have a System 7.0 face-lift in the third quarter.

Other leading developers whose products are compatible with System 7.0 or that have committed to incorporate its features into new products include Ashton-Tate Corp., Lotus Development Corp., Parallon Computer, Inc., Novell, Inc., Aldus and Acius, Inc.

JAMES DALY

IBM taps Borland for OS/2 applications tools

BY PATRICIA KEEFE
CW STAFF

IBM let drop last week the first key piece of a plan to deliver an OS/2 developers' workbench.

IBM announced a nonexclusive agreement under which Borland International, Inc. will develop specific object-oriented programming languages and development tools for the 32-bit OS/2 Version 2.0. That will complement an upcoming IBM enhancement to the OS/2 software developers' kit.

The developers' workbench for OS/2 will consist of tools from both IBM and third parties, according to John Soyring, director of software development and programming at IBM's Personal Systems Group.

The workbench has been kept under tight wraps and is described as "an entire development environment for applications developers."

The Borland products will be delivered early next year, said Gene Wang, vice president of the applications company.

The first product slated to ship is Borland C++ for OS/2; early release copies will be out by year's end. It will contain a "100%" ANSI C compiler, a C++ compiler that supports object-oriented programming and an object-oriented 32-bit assembler, debugger and profiler, along with a visual resource editing capability that reportedly enables developers to build user interfaces quickly.

IBM chose Borland over others for several reasons, Soyring said. For example, he surveyed third-party developers and uncovered a demand for object-oriented programming tools, preferably in C++.

Moreover, not only has Borland's technology racked up positive reviews, but its sales were also "outstanding," he said.

Users frown at federal regulation of AT&T

AT&T-sponsored study cites concerns with increasing costs, delays

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Federal regulation of AT&T harms corporate users by limiting choices, inflating prices and slowing the procurement of telecommunications services, according to 14 large U.S. enterprises profiled by the National Economic Research Associates, Inc. (NERA).

Thirteen companies and a university, some of them AT&T customers, said in the AT&T-commissioned research that the high end of the long-distance market is now intensely competitive, and they called on the Federal Communications Commission to create a level playing field for AT&T and its competitors.

Paine Webber, Inc. said regulatory delays cost the company nearly $500,000 in savings while it negotiated a Tariff 12 package of voice and data services from AT&T. "I see nothing but negative effects from regulation," said Gerard Higgins, senior vice president for communications and computer services. "I would like to deal with AT&T with no regulation, just like we deal with IBM."

Big delays

Boise-Cascade Corp. reported a 10-month, $2 million delay in getting its Tariff 12 approved, and AMR Corp. (parent company of American Airlines) said regulatory delays cost it $1 million per month in lost savings. "I am absolutely sure I would get a better deal if AT&T were more free to compete," said James Juracek, AMR systems engineering vice president at Sabre Computer Services.

The study was part of a $200,000 consulting assignment paid for by AT&T. AT&T assisted in choosing the companies to be interviewed but had no hand in editing the results, NERA said.

"Any study commissioned and paid for by AT&T is hardly worth anything," said a spokesman for MCI Communications Corp. A spokesman for U.S. Sprint Communications Co. said Sprint was considering its own customer survey on the issue. MCI and Sprint have strongly opposed FCC proposals to substantially deregulate AT&T's business offerings.

Despite the report's strong support for further deregulation, the company testimonials did not always laud AT&T.

Paul Pavloff, senior director of information services at Georgia-Pacific Corp., said, "One of the things we found in dealing with MCI and Sprint was that anytime we asked a question, the answer was, 'Can do.' Any time we asked AT&T a similar question, the answer was, 'We're not sure; we'll have to go back and see how that will play under the tariff . . .' "

As a result, Georgia-Pacific has moved most of its telecommunications business from AT&T to MCI.

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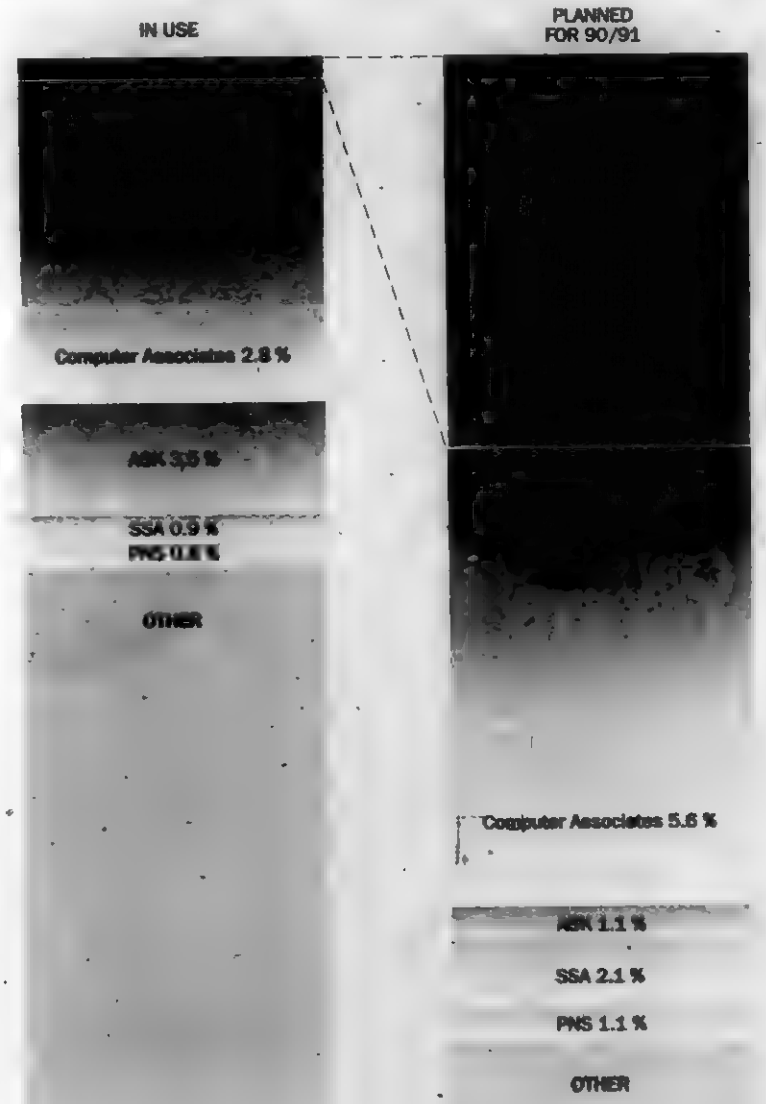
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Cincom Systems releases rival to IBM's AD/Cycle

BY ROSEMARY HAMILTON
CW STAFF

Cincom Systems, Inc. launched an alternative to IBM's AD/Cycle applications development environment last week that it said offers more facilities than IBM's and runs on multiple platforms.

Cincom's AD/Advantage has been under development for six years and has recently been marketed in the UK, according to Dennis Butler, the company's director of applications development technology.

The Cincom initiative has some similarities to AD/Cycle. It addresses the full life cycle of applications development and will rely on existing third-party front-end tools for the design and analysis phase.

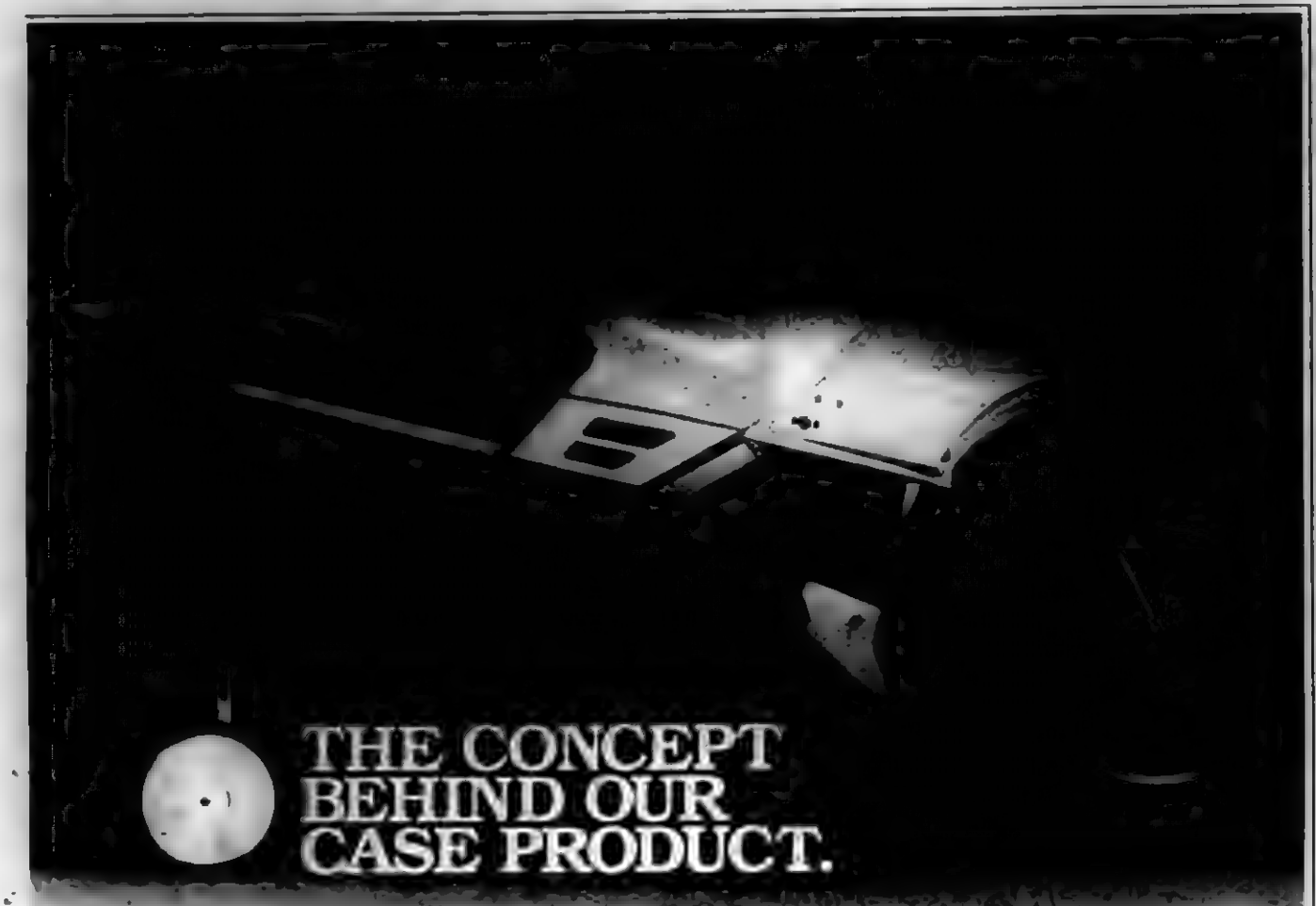
It incorporates a number of Cincom software modules, including some new facilities such as the design object generator that takes data from design tools and produces screen panels and other objects for an application.

Cincom uses a new version of its fourth-generation language, Mantis, as a core piece of AD/Advantage to develop and prototype programs.

Butler said the system will eventually support IBM's and others' repositories as they become mature.

The company will initially offer AD/Advantage for IBM MVS and VSE users, and it plans to provide a version for the IBM IMS environment later this year.

Cincom also intends to extend AD/Advantage to other platforms, including Digital Equipment Corp.'s platform.



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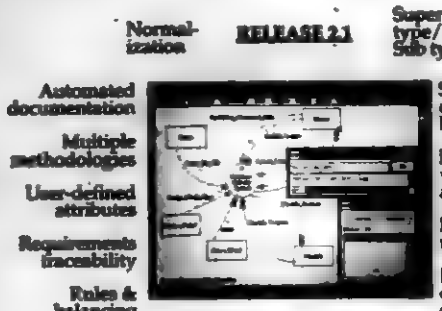
"The software's incredible ease of use belies the power hidden within." **Computer Language**

System Architect works with such methodologies as DeMarco/Yourdon, Gane & Sarson, Ward & Mellor (real-time), entity relation diagrams, decomposition diagrams, object oriented design (optional), state transition diagrams, and flow charts.

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Money woes plague Prime

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — Prime Computer, Inc. will cut 800 positions in an effort to reduce operating expenses and offset a disastrous financial report.

DR Holdings, Inc. in Delaware, which rescued the ailing Prime from a hostile takeover attempt two years ago, released its first-quarter statement last week, posting a staggering $84.4 million net loss.

Harvey Wagner, vice president of finance and chief financial officer at Prime, attributed the company's poor showing to continuing weakness in both the worldwide and U.S. economies.

Wagner confirmed that 800 jobs would be eliminated at the company, saying that this would be accomplished through normal attrition. Prime employs 8,300 people worldwide.

"Prime is facing extremely difficult competition in the minicomputer arena in the next 12 to 18 months, especially from companies like IBM and Digital Equipment Corp., who are offering price cuts and performance increases," said William Sines, director of midrange systems and server research at Technology Investment Strategies Corp. in Framingham, Mass. He estimated that 60% of Prime's business is international.

Riding out the storm

Prime's customers remain confident. "As a user group, we don't think this is any different than what many other companies are going through right now," said Cathy Van Orman, president and chairwoman of the National Prime User Group.

She said users are confident Prime will "ride out the storm" and pointed to upcoming announcements in the imaging and software arena as proof of Prime's commitment and staying power.

The immediate challenge is to keep on track and maintain focus, according to Wagner.

"We will continue to move from a totally dependent hardware manufacturing company to a software, service and solution company," he said.

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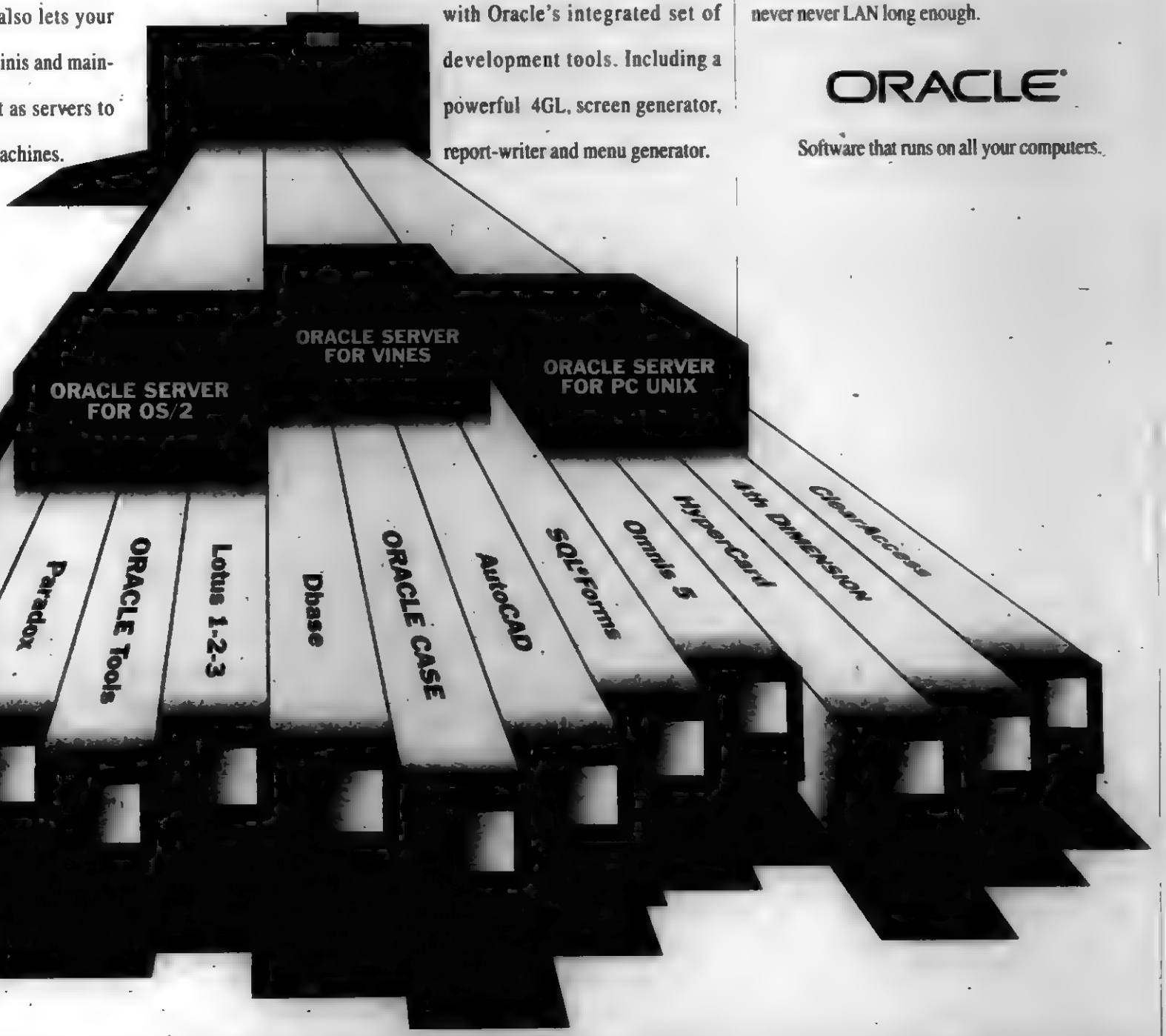
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Microsoft, AT&T only players on Unix LAN Manager team

BY JIM NASH
CW STAFF

Microsoft Corp. and AT&T Computer Systems last week became the sole developers of Microsoft's LAN Manager network operating system for Unix after Hewlett-Packard Co. bowed out of the two-pronged development effort.

Mike Murray, general manager of Microsoft's networking business unit, said in a teleconference last week that he expects Version 2.0 code for Unix to be available to OEMs in the fourth quarter of 1991. Managers juggling LAN Manager and Unix workstation networks have been stuck with Version 1.1.

Industry analysts predicted that end users would see new products in about 18 months. Murray said both Microsoft and AT&T will make certain future versions of LAN Manager will be grafted onto LAN Manager for Unix with "maybe a couple months' lag."

HP will continue to support its version of LAN Manager for Unix, but from now on, the firm will resell AT&T's version. The AT&T product is generally regarded as the more sophisticated, said Craig Burton, a principal at consultancy Clarke Burton Corp. in Salt Lake City. HP announced separately that it will offer worldwide support for Microsoft's LAN Manager, Windows, MS-DOS, OS/2 and SQL Server products.

According to Don Sherwood, a product marketing manager at HP, the company is comfortable with the role of reseller and integrator now that the product "is more stable and more of a commodity."

An AT&T spokesman said the new development agreement "requires maximum portability" to new and existing OEM versions of LAN Manager for Unix.

Network administrators said they had few qualms about the consolidation, as long as all OEM versions worked well with AT&T's. Brenda Blowers, a computer specialist and facilities manager at China Lake Naval Weapons Center in China Lake, Calif., said she is comfortable with the changes. "As long as the code is compatible," Blowers said, "I don't see where there will be an impact" on our networks.

Cost concerns

Other users agreed but expressed concern about the cost of migrating from their systems to AT&T's. No prices for future versions of LAN Manager for Unix have been released.

Harry Vanderholst, information systems manager at Dreisaen Aircraft Interior Systems, Inc. in Oceanside, Calif., said he might not migrate from the HP software he uses now, especially if the price is too high.

Microsoft comes closer to attaining its goal of a single common LAN Manager platform. In most network market share pie charts, Microsoft's portion often includes many licensed versions. Murray said the company is working to eliminate the notations to that effect.

Late last year, Microsoft was successful in regaining LAN Manager code from 3Com Corp., maker of the 3+Open network operating system. With the consolidation of LAN Manager for Unix, the only semiautonomous version of LAN Manager available will be IBM's LAN Server. Plans are under way to bring LAN Server into closer profile with LAN Manager.

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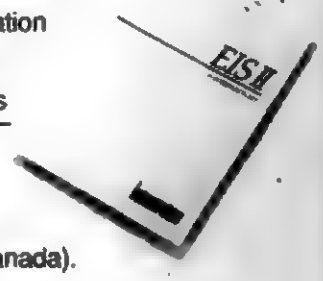
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HP will adapt to Windows OLE

BY J. A. SAVAGE
CW STAFF

In a move that could leverage hundreds of applications into Hewlett-Packard Co.'s New Wave personal computer application, HP announced that it will support future releases of Microsoft Corp.'s Windows that include Object Linking and Embedding (OLE). Currently, applications that take full advantage of New Wave have to be specifically ported to New Wave.

OLE is object-oriented code that allows two separate applications to be mixed. New Wave does much the same thing but also automatically updates changed files. In addition, it has a mechanism that automatically performs routine tasks in one file or several.

"Since Microsoft will be requiring developers to redo applications to apply to Object Linking and Embedding, then we'll do the rest," said Richard Walker, marketing development manager for New Wave.

He said that currently Windows applications can be run in New Wave without a specific port, but text and graphics from different files cannot be manipulated by "drag and drop" methods — a function analysts have said is one of the most desirable parts of New Wave.

No availability date has been set for HP's OLE support because it is dependent on Microsoft's delivery of its Windows code. "Microsoft is only now shipping preliminary beta code," Walker said.

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Harvard takes to Windows

BY CAROL HILDEBRAND
CW STAFF

MOUNTAIN VIEW, Calif. — A major upgrade of Software Publishing Corp.'s Harvard Graphics presentation software drew a reaction of "It's about time" from industry observers, but they were more skeptical of a Windows version of the package. Both were announced last week.

"The upgrade has been long overdue," said Jeffrey Tarter, editor of "Softletter," a newsletter based in Watertown, Mass.

Harvard Graphics 3.0, which is expected to be available next month, represents an effort to more tightly integrate the charting, drawing and presentation functions as well as to deepen the drawing and charing environment, said Ted Simonides, Software Publishing's product manager for 3.0.

Users singled out the revamped drawing environment. "It's much easier to integrate your drawings with your charts now," said Carol Langston, a personal computer software analyst at The Hertz Corp. The drawing capabilities are now totally built into the package, she added.

The icon-based drawing environment has also become handier for moving text around, said Bob Morley, systems analyst at MCI Communications Corp. "As far as moving the text around that you'd already put in a chart, it used to be kind of kludgy. Now, it's a lot easier to deal with."

The announced Windows version, which the firm said would be ready sometime between November 1991 and February 1992, is going to be a harder sell, since the DOS-based product's estimated base of 750,000 users will have to learn a new product once they move over to Windows-based versions.

While Langston, whose firm is moving to Windows on the low end and going to OS/2 on servers, said it will "more than likely" switch to Harvard Graphics for Windows, others were not so sure.

"Once people are switched over [to Windows] and don't have to use Harvard, it's going to come down to how good a job Harvard salespeople do convincing users to stay with Harvard," said William Coggshall, president of New Media Research, Inc., a Los Altos, Calif.-based market research firm. "As it goes, so go the fortunes of Software Publishing."

Europe LAN routing pledge

BY ELISABETH HORWITT
CW STAFF

EL SEGUNDO, Calif. — Infonet Services Corp. introduced a service last week called Infolan, which is said to provide geographically distributed local-area network users with the response time they demand without requiring that their companies set up and manage international leased-line networks.

The service is based on Cisco Systems, Inc.'s routers installed at Infonet hubs, enabling the carrier to route LAN transmissions over a shared backbone at speeds of up to 2M bit/sec.

For a set price, Infonet will provide, manage and maintain its own backbone links, the local Postal Telephone and Telegraph authorities' leased lines and Cisco routers at the user's premises, said Infonet spokesman Robert Sheikh.

Kredietbank N.V. in Brussels, for example, is installing the network to handle backup and traffic overflow for an existing private LAN-to-wide-area network that is based on Cisco routers. "We wanted more redundancy on our network, especially the Asian branches," company spokesman Peter Van Laer said. In Asia, it can take eight or more months to install a backup leased line, and it is difficult to ensure that the two lines do not run over the same facilities.

Filling the gap

Infolan fills a gap in the current European networking environment, where X.25 services are ubiquitous but too slow for many LAN users, and leased lines are not always easy to come by, according to Doug Gold, director of communications research at International Data Corp. in Framingham, Mass.

However, Infonet needs to expand the service beyond its current limitations, Gold said. The initial service, scheduled to be launched next month, will serve only nine countries, including the U.S. Infonet said it plans to add Canada, Hong Kong and Japan in the fourth quarter and Australia and Denmark early next year.

Infonet is also limiting the protocols Infolan will initially support to Token Ring and Ethernet LANs and Transmission Control Protocol/Internet Protocol and source-routing protocols. Missing are IBM's Systems Network Architecture and Novell, Inc.'s IPX, Gold said.

Infonet plans to add support for IPX as well as Digital Equipment Corp.'s Decnet to Infolan early next year, Sheikh said.

Pricing for Infolan depends on configuration. An implementation that connects LAN sites in San Francisco, Tokyo, Hong Kong, London, Paris and Brussels and supports links of up to 64K bit/sec. between the user premise and Infolan would cost $25,000 per month.

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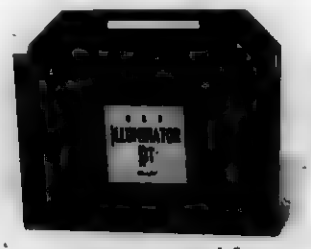
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D&B Software duo unites user groups

BY SALLY CUSACK
CW STAFF

ANAHEIM, Calif. — The normal user group talk of upcoming releases and support issues may take a back seat at this year's Interact conference.

The 4,000 customers of former Management Science America, Inc. will focus on next year's merger of its user group and the former McCormack & Dodge user group into one entity under the Dun & Bradstreet Software flag. The move mirrors last year's merger of the two vendors into D&B Software.

"There are 10,000 companies using D&B Software in the U.S., and most users will benefit from the joining of the two," said Dale Sietsema, a member of the task force assigned to the merger. Sietsema said he is not looking for any "product answers" at this year's meeting and that he is comfortable with the vendor's stance on product direction.

D&B Software is making a push toward the client/server software model, although no products have been delivered and no official migration plans have been mapped out.

"I would like to know the extent of this migration as well as the time frame," said Katharine Susman, chairwoman of the Interact government and industry special interest group. "Are we talking five years? Ten years?"

Strategy in itself

Hank Holland, president and chief operating officer at D&B Software, stressed that the future architecture is a strategy.

"We want to clearly communicate both the technical and customer sides of this strategy," Holland said, adding that D&B Software will continue to support both product lines.

Holland said he will detail company plans at Interact. "I think our biggest hurdle to overcome is educating the user in terms of client/server. A lot of mystique is associated with that particular buzzword, and we have to remove that."

U.S. maps out technology

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — By the year 2000, a single semiconductor chip will be able to hold more than 1 billion bits of information but will require a factory costing between $1.5 billion and $2 billion to make, the National Advisory Committee on Semiconductors (NACS) said last week. Only 10 superchip manufacturing lines will be needed, and fewer than five will be in the U.S.

The predictions are part of a "technological road map" by which the U.S. semiconductor industry hopes to leapfrog past foreign competition by the end of the century. It was put together by 90 experts at a workshop convened last month by NACS and the White House Office of Science and Technology Policy [CW, April 29].

Smaller chips

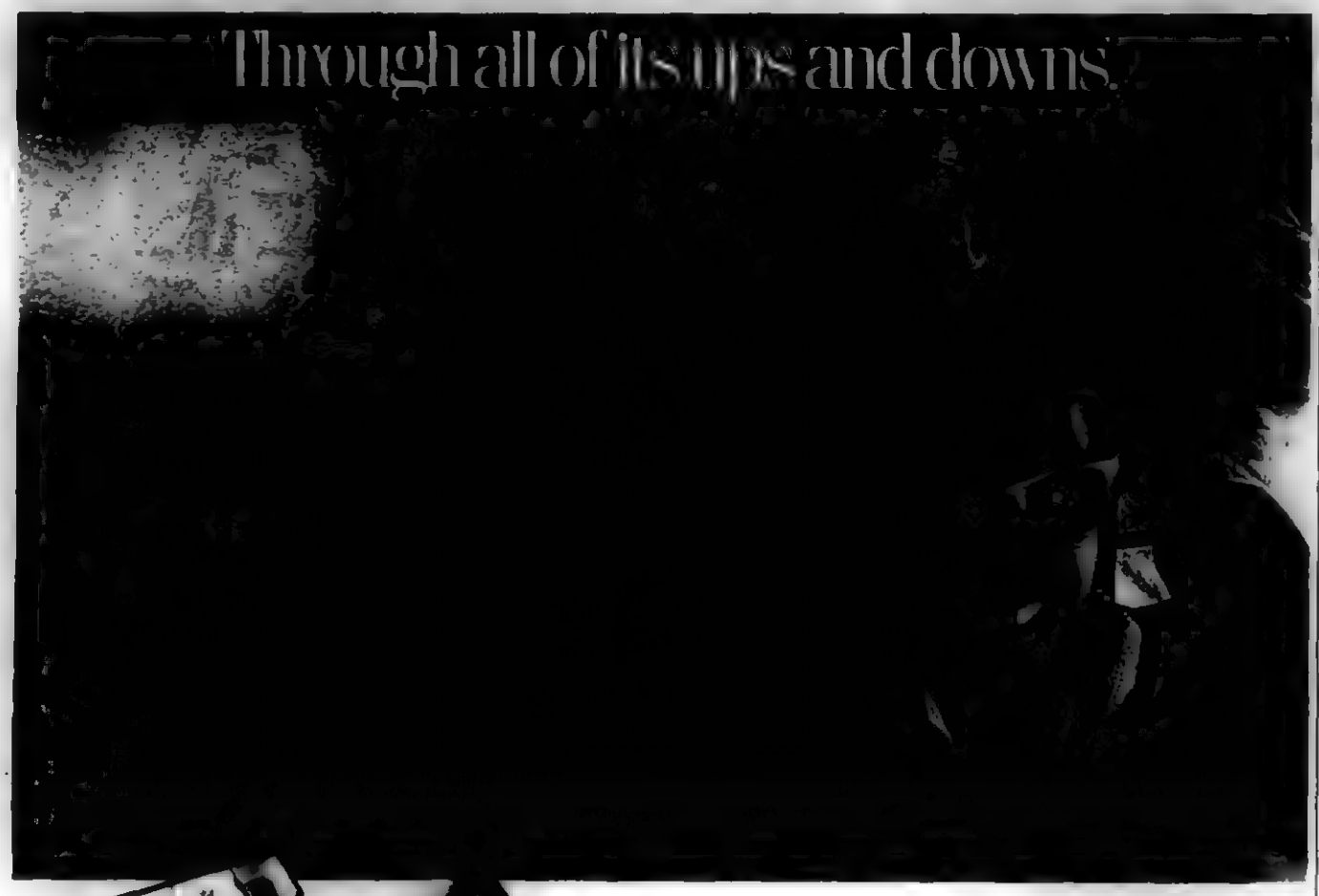
One goal of the program, called Micro Tech 2000, is to help U.S. industry develop a 1G-bit static random-access memory chip by the year 2000. That will require chips with features .15 micron wide — or five times smaller than those in today's best chips. Achieving those goals would put the U.S. about three years ahead of the Japanese, said Ian Ross, chairman of NACS and president of AT&T Bell Laboratories.

The difficulties in meeting the goals will "force a new culture of cooperation and sharing within the U.S. and the world semiconductor industry," a NACS summary of the road map said.

Robert Galvin, chairman of the executive committee at Motorola, Inc. as well as chairman of Sematech, said there is enthusiasm for such cooperation. "Companies are finding they don't have as many secrets to protect as they have common interests."



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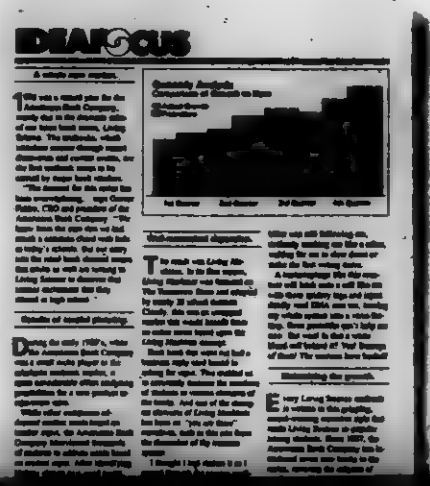
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TECH TALK

Spaced-out VAX

■ On its recent flight, the space shuttle Discovery carried into orbit a specially designed Digital Equipment Corp. VAX as part of a National Aeronautics and Space Administration test of commercial computer software. A militarized VAX 6000 successfully controlled from space a robotic system at the Goddard Space Flight Center in Greenbelt, Md. The test verified that standard VAX commercial architecture and software — VMS and Ada language — can be used in the harsh environment of space, according to DEC. The computer was modified to resist the rigors of space travel, including the stresses of rocket launch and extreme temperatures.

Light and lacy

■ A team of British researchers has discovered a way to make silicon emit light. The finding is a potentially significant step in the development of optical computers. The researchers at the UK Ministry of Defense's Royal Signals and Radar Establishment in Lavern, England, etched holes into silicon and created "porous silicon" that has unique optical properties. The lacy silicon structure may pave the way for optoelectronics based on silicon, which is inexpensive compared with gallium arsenide and other materials with light-transmitting capabilities.

Egads, a 16M-bit EPROM

■ Toshiba Corp. recently began shipping samples of its 16M-bit erasable programmable read-only memory (EPROM). It is the world's largest capacity EPROM, according to the company. The new device has an access time of 150 nsec and is expected to be used mainly in the design of telecommunications and medical equipment, laser beam printers and word processors. Data stored in the EPROM can be readily erased by exposing the device to ultraviolet light, which makes it useful in developing prototype equipment.

Audio: The wave of the future

Speech, a more natural mode of communication, will be the future's interface of choice

BY MICHAEL FITZGERALD
CW STAFF

Graphical user interfaces are all that anyone talks about these days, but audio user interfaces will be the favored technology in the future, some scientists believe.

"Human interaction through computers happens through a keyboard and monitor — both are fairly unnatural," said Joseph "Chip" Krauskopf, manager of the advanced human interface group at Intel Corp. "Everyone is comfortable communicating through speech."

Although it is not certain that Hal — the talking computer in Arthur C. Clarke's *2001: A Space Odyssey* — will have arrived when 2001 rolls around, computers that talk and listen have begun to leave the realm of science fiction during the last few years.



Amy Hamstra

Creating Hal "is really a hard one — Hal not only had speech recognition abilities, but also read lips," explained Krauskopf, who said creating a computer with the ability to process natural language remains an immense challenge. "We're just now at the beginning of doing good speech recognition, and further away still from natural language processing," Krauskopf said.

Computers with speech recognition capabilities are on the market today.

Dragon Systems, Inc., for example, markets a discrete speech recognizer with a 30,000-word vocabulary for personal computers (in discrete speech, speakers must pause between each word) and a continuous, or normal, speech recognizer with a 2,000-word vocabulary. The user "teaches" the machine to recognize his unique speech pattern by speaking.

At Rank Xerox's Europarc research center in Cambridge, England, significant pieces of an audio interface are in use today. Before meetings, the computers on the participants' desktops begin to generate the sounds typical to a meeting: Voices murmuring and papers rustling cue attendees that the meeting is about to begin. Europarc also has what it called a "Sonic" version of Apple Computer, Inc.'s Finder. With Sonic Finder, if a file is dumped in the trash can, it makes a "thunk" sound.

"It's not something people are just talking about," said Sara Bly, research scientist at Xerox Corp.'s Palo Alto Research Center, in Palo Alto, Calif. "[The audio interface] absolutely could start showing up in everyday life before the end of the decade."

Bly's own research focuses on ways to use nonspeech audio in exploratory data analysis, a statistical method used to differentiate data when it is not clear what you might want to get from it.

One possible use is to analyze patterns in the stock market. The output would be both graphical and aural: The computer could conceivably play a melody that could indicate patterns a graph alone could not.

Computers with multimedia talents, such as the Next workstation made by Next, Inc., are able to receive and deliver electronic voice messages and permit executives to attach verbal notes to reports.

This sort of verbal Post-it Note also is offered by Articulate Systems, Inc., which sells a product called Voice Navigator II for the Apple Macintosh. Interactive, Inc. in Montrose, S.D., recently introduced a similar product called Interactive Sound that it calls a voice mail software package. Interactive Sound runs under Microsoft Corp.'s Windows 3.0 when used with a Creative Labs Sound Blaster Board.

A number of practical concerns must be resolved before Hal becomes reality. A two-minute, phone-quality conversation takes up 1M byte of random-access memory, and one minute of compact disc-quality sound would consume 5.2M bytes of hard disk space unless it is compressed.

When system glitches are cosmic — seriously

BY CAROL HILDEBRAND
CW STAFF

"Cosmic rays caused the system crash." That may become the strangest excuse yet for systems programmers as a result of a study being conducted by scientists at Los Alamos National Laboratory in Los Alamos, N.M.

The study, an informal effort involving several Los Alamos scientists and computer division staffers as well as a representative from Cray Research, Inc., is examining the possibility that unexplained individual bit failures in memory among supercomputers may be the result of cosmic ray showers, a phenomenon that has been well-documented among computers aboard spacecraft but has remained unstudied for terrestrial machines.

As supercomputers grow in complexity, they are able to record individual bit failures in memory as a function of time, explained Jim Tabor, the study's administrative coordinator.

Taking aim at cosmic events

Tabor said the study is aimed at correlating the bit failure data of the Cray supercomputers with particular cosmic events, such as Supernova 1987A, which was recorded in January 1987, to see whether there was a corresponding jump in bit failures at the time of the event.

Solar activities, such as flares, emit tiny energy-carrying particles, called nutrenos, which generally pass through the earth and its atmosphere without distraction.

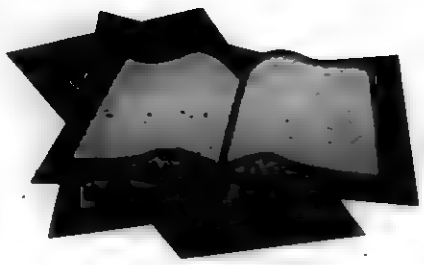
"The atmosphere serves as a shield to protect the earth from most solar cosmic ray activity," Tabor said, adding that there have been only about 50 solar events significant enough to be measurable at earth's surface during the past half century.

The increasing power of supercomputers could also make them more susceptible to cosmic activity, Tabor said. "As chips get smaller, they become more sensitive to nutrenos."

Tabor said the group is looking into collaborating with other Cray sites around the world to examine the impact of such geographical data as altitude. "We'll be looking at whether there's any regularity with the bit failures," he said. For example, "Do they happen more at nighttime? At noon?"

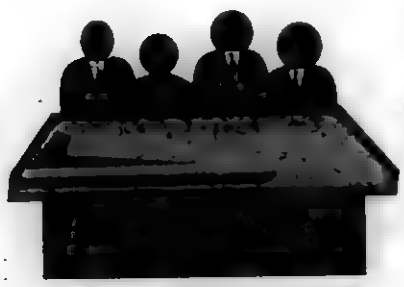
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IDC Study on UNIX OLTP

UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.



About the TPC

The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

Within the past five months, *every one* of these companies selected and used the INFORMIX-OnLine database server to demonstrate to their customers the power of their latest UNIX systems. No other UNIX database product has been this extensively benchmarked—because nothing shows performance like OnLine.

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In each case, the Transaction Processing Performance Council's rigorous TPC A and TPC B benchmarks—the new standard for comparing system and database performance—were used to highlight OLTP performance and database throughput.

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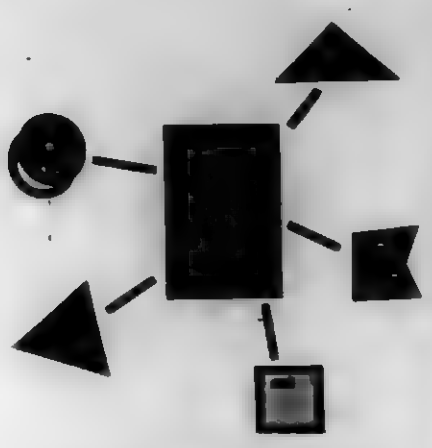
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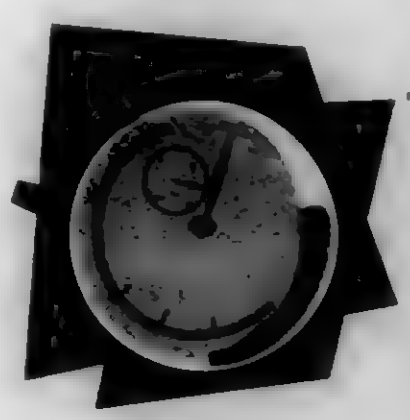
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TP1 vs. TPC Benchmarks

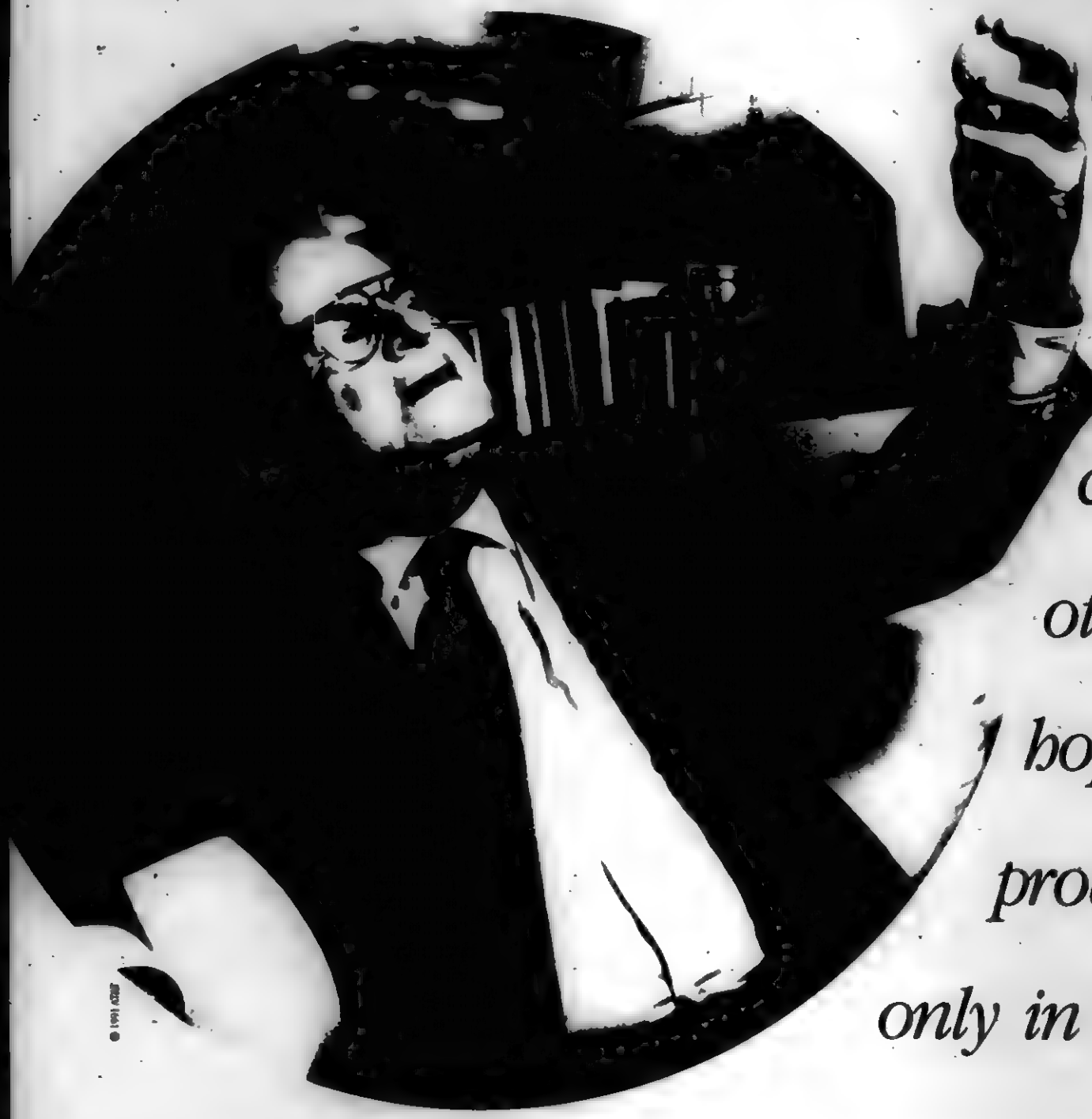
The TP1 benchmark is no longer the accepted benchmark for measuring database performance. The new TPC tests establish more complete, thorough specifications than TP1, leading to more objective, verifiable results for comparing performance between hardware systems and software products. TPC Benchmark™ A measures OLTP processing performance. TPC Benchmark™ B—similar to a batch test—focuses on database throughput.

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The world and all it encompasses divides neatly can control and the things you can't. And as my tee finds its way to the bottom of a water hazard as little doubt in my mind which group golf balls fall that I can easily control an entire phone system



but a dimpled I mean, from I get fault configuration other hand, all I hope that more products for use only in the hope that

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EDITORIAL

Research Power

Earlier this month, one of the most venerable names in assessing customer satisfaction made a lot of hay by publicizing its first foray into personal computer end-user satisfaction.

J. D. Power and Associates surveyed some 2,200 end users and produced a Top 10 vendor list that some immediately annointed as the long-awaited Holy Grail of satisfaction surveys. After all, it was done by J. D. Power, not by some trade publication or research house (which have been doing such surveys for decades).

But as a consumer of PC hardware, you must understand what this widely and wildly publicized survey is — and what it is not. Let's clear up some likely misconceptions.

The study is a consumer buyers' guide. Wrong. The study is *not* intended as a consumer buying guide, so don't use it as such. According to J. D. Power, it is for use as a "diagnostic tool" for the vendors. By the way, it is the vendors to whom the survey is being marketed for sale. One company spokesman said, "As far as I'm concerned, they're all good."

If my vendor is not among the top companies named, it fell below the industry average and was not published. Wrong again. J. D. Power surveyed users of only 16 hardware vendors. It refuses to publish those that didn't do well, but there are only six such companies. Don't assume your vendor is among them.

The survey compared apples to apples, looking at similar kinds of PC technology. Wrong again. The machines surveyed cut across a broad swath of technology from PC AT technology to Intel I486s. So it's entirely conceivable that half or more of the 100 IBM users surveyed were using vintage 1984 technology. That just might impact a user's impression of satisfaction, especially if his neighbor has a 486 on his desk.

Then there must have been a statistically valid number of responses to be able to rank vendors when there's such a variety of hardware available. The average number of responses was about 100, with some response levels in the 75 range. There are 50 million PCs in business use. Go figure.

Surely, the users surveyed have used more than one kind of machine in their work lives in order to make valid satisfaction assessments. According to the company, that question wasn't asked, so it's very possible some of those surveyed had no basis of comparison.

Like most publications, we see a lot of surveys and research cross our desks. Regarding this study, we completely concur with J. D. Power — this is not a buyers' guide. Nor can it be construed as anything approaching a statistically viable rating of PC vendors.

Oh yeah, you want to brag about winning this survey with some advertising? First, you must become a J. D. Power subscriber. Then let the company review your ad.

Ultimately, there's less to this survey than first meets the eye. There's also a lot more.



LETTERS TO THE EDITOR

IS myths

Regarding your viewpoint piece by Marc S. Sokol, "Mainframe programmers and the V-8 mentality" [CW, April 15], his comments concerning the "mentality" and other attributes of mainframe developers are particularly vexing.

He mentions our "language, style of dress and eccentric working hours." This insults not only the individuals but the organizations they work for. The professional programmers I know and work with are people who, not only in my organization but in others, bear no resemblance to the computer "geeks" of the '50s and '60s.

We wear suits or dresses, work from 8 a.m. to 4 p.m. and speak with our client community in business terms. We don't have to work the graveyard shift because our companies have recognized the value of development resources and have provided the necessary processing power.

As far as feeling that working on a PC would be demeaning is concerned, well . . . I simply cannot imagine a situation where a professional developer would turn down the opportunity to work with the most advanced tools at his disposal. That includes mainframe- as well as workstation-based packages.

Finally, he pontificates that if IS managers don't jump on his bandwagon, these "less progressive, less realistic IS shops" will suffer "relatively low productivity." These conditions have absolutely nothing to do with the platform used for application development. They are directly related to the skills and professionalism of the analysts, designers, developers and implementers of the systems as well as their management.

Eric S. Helland
Corporate Financial Systems
Woolworth Corp.
Milwaukee, Wis.

Business details

The suggestions provided by Howard Rubin in your "In Depth" column [CW, April 15] are helpful up to a point for measuring benefits from IS. There needs to be greater emphasis and more detail in the area of "business-oriented metrics."

Business managers are interested above all in return on investment: quantified business benefits compared with costs. It is the ability to properly quantify dollar benefits that produce a bottom-line measurement of IS value. Many IS investments are still being justified largely on cost savings and avoidance, while revenue- and profit-enhancing benefits are limited to guesstimates or not quantified at all.

This procedure is particularly dangerous in the case of knowledge worker technology, where the greatest benefits are on the side of sales and profitability improvements.

In addition, the "business value delivered" approach implies that IS can produce business benefits without the integral input of users and the clear endorsement of management. While the contribution of IS must be measured, delivery of business benefits requires the integrated effort of all these players.

Jo-Ann Osipow
Manager
Value Assessment Program
Business Science International, Inc.
Englewood Cliffs, N.J.

The right Pick

Perhaps *Computerworld* misses the point in "Pick market decision time" [CW, April 22]. For both established Pick vendors cozying up to Unix and Unix marketers newly embracing the Pick environment, we're actually experiencing a case of "if you can't be with the one you love, love the one you're with."

Your protectionism seems rooted in a contention that Pick infringes on some lebensraum needed by Unix. This discussion becomes intellectually interesting only when one considers the technical similarities and differences between the "Unix applications [which] appear to be the thing on which to concentrate . . ." and Pick applications. Are Unix applications really more pure [Unix] and their Pick counterparts less so? Your innuendo to that effect is unsupported.

There's nothing confusing about Pick — whether in its native state or married to Unix. Only after an enterprise is up and running is there time to address your concern about "scattering the focus of new users." And by then there's little motivation to bother.

M. Denis Hill
MIS Manager
Cornmuts, Inc.
Oakland, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Not to burst anyone's bubble . . .

But sometimes those new technologies just aren't great ideas

MICHAEL B. COHN



My next-door neighbor is an entrepreneur. He spends his time and money trying to get rich quick. I'd rather see him spend the time and money reseeding his front lawn. Last time around, he sunk 10 grand into his latest scheme — nachos for dogs. He didn't fare too well. It turned out that the vast, untapped canine Mexican food market he envisioned consisted mostly of a few Chihuahuas.

With or without jalapenos, his idea was pretty lame. But we in IS are guilty of the same sort of thing. We push all kinds of new ideas and technologies. We're in such a hurry to make things better/smarter/faster that we can't see beyond the ends of our noses. The plain truth is, people don't want most of this stuff. If you're responsible for promoting any of the following ideas at your company, remember my neighbor and all of his leftover corn chips:

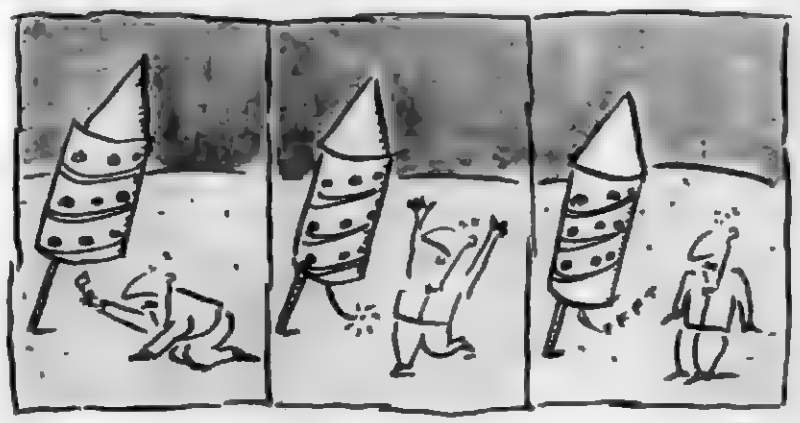
• **Image.** People are dropping big bucks on image and optical storage, and I'm telling you, the idea won't fly. Who cares if you can store and retrieve documents, insurance claims and X-rays of your tennis elbow? It won't do any good. People are too used to paper. They'll just ask for a printout, scribble all over it and then want to scan it back in and start the process all over again.

Even worse, some people will do their scribbling on those little yellow sticky things. So when the stickies get stuck in the scanner or on the floor near the scanner or at the bottom of somebody's purse, everyone will blame the computer.

Face it, we're not ready for image. It's complicated. It's expensive. People really want yellow stickies, and besides, you can get a whole mess of them for less than five bucks.

• **Voice response units.** My telephone works great, except when someone calls while I'm in the shower. Aside from that, I think we've taken the telephone as far as it should go.

Yet high technology can't leave well enough alone. Now everyone is trying automated telephone systems. Computer voices tell us to "press 1 now." They ask us to Touch-Tone in our Visa number. They demand we enter a name, last name first, until recognized or grossly misspelled or until we slam the receiver against the wall.



It won't sell. People don't want Touch-Tone technology. They don't care about quick response. They're used to waiting weeks for the next available representative.

• **Multimedia.** I was pretty comfortable with the first word processors. When someone invented spreadsheets, I figured them out. And when graphics came along, I kept on top of things.

But now we're peddling audio cards, image cards and full-motion video cards. And text and spreadsheets and pie charts and music and digital images and "Mr. Ed" reruns are all happening at once on my PC, and it's distracting as hell.

Just because something's "multi" doesn't mean it's good. I like my media one at a time. It's tough enough just watching a ball game while my wife is vacuuming.

• **Laptops.** This is another "smaller" idea that's out of control. Some say PCs emit radiation. Some say they don't. Either way, I'm not too sure I want to put one on my lap. I keep too many other important body parts near there.

• **Executive information systems.** This is the worst idea of all. Executives don't sit at workstations. They don't pull up charts and graphs. When executives want to know something, they pick up the phone or yell at someone or ask about it on the golf course.

What executives should do is create committee information systems; that's how things really get done. A committee information system would give a whole bunch of folks a whole bunch of information and then let them get in an argument, call for a vote and recommend a three-month study. Better yet, maybe someone could come up with a committee procrastination system. Then we'd really have something.

Cohn is trying to be a computer salesman in Atlanta.

Is that a customer or the FCC in disguise?

BARRY LAMBERGMAN



The old marketing adage, "Know your customer," took on a new meaning at the Comdex computer trade show in Las Vegas last fall, when a number of computer vendors were surprised to learn that the prospective customer carefully looking over their products and asking a lot of questions was actually from the Federal Communications Commission. They were even more surprised when the FCC levied approximately $200,000 in fines to vendors selling either personal computers or peripherals in violation of the FCC's marketing rules.

With the exhibit doors swinging open for another Comdex show, it is probably a good time to take a look at what the FCC's "shoppers" were using as selection criteria.

Generally speaking, violations of the FCC's marketing rules fall into two categories. The first involves violation of the rule prohibiting the sale, lease or offer for sale or lease (including by way of advertising) of any radio frequency device requiring FCC approval, prior to obtaining such approval.

The second category involves marketing equipment that is not labeled in accordance with the FCC's rules, for example, failure to display FCC identification numbers. Thus, marketing equipment, even after it has been approved, can violate the FCC's rules.

Radio frequency devices

Although computer equipment is not typically thought of as "radio frequency devices," it is nonetheless subject to FCC approval as part of that category. This is because computer equipment either intentionally generates radio frequency energy for internal processes or sends radio frequency signals by conduction to associated equipment via connecting wiring. As a result, computer equipment that is not designed and manufactured in accordance with FCC-prescribed technical standards can cause interference with other radio frequency devices.

There are several classifications of computer equipment under the FCC's rules, and those classifications determine the type of FCC equipment authorization that is required. For example, most Class B equipment (equipment marketed for use in a residential environment, such as personal computers) is subject to "certification," while Class A equipment (equipment marketed for use in a commercial, industrial or business environment) is subject to "verification," which is actually a self-authorization process.

In December 1990, the FCC issued a news release announcing that it plans to continue its efforts to improve marketing compliance at national computer industry trade shows. The FCC noted that it "is striving to improve the compliance rate so that all vendors can compete equally in the marketplace." Violators who rush uncertified products to market, the FCC noted, gain an unfair economic advantage over their more law-abiding competitors.

There are several things that equipment vendors can do to avoid running afoul of the FCC's marketing rules.

The first is to ensure that marketing activities undertaken prior to certification or verification satisfy the conditions for "early" marketing set forth in the FCC's rules. For example, with respect to personal computers the rules permit the advertising or display of such equipment at trade shows prior to FCC approval provided that certain specific disclaimer language is made a conspicuous part of the advertising or display.

Similarly, with respect to commercial computer equipment, the rules permit the actual demonstration of such equipment at trade shows prior to compliance testing, as long as a conspicuous notice is displayed indicating that the equipment has not been so tested.

In fact, even equipment that is only in the conceptual, developmental, design or preproduction stage may be offered for sale, provided that the prospective buyer is advised in writing that the equipment must comply with the FCC's rules before final delivery.

> COMPUTER VENDORS WERE surprised to learn that the customer carefully looking over their products was from the Federal Communications Commission.

In terms of establishing a timetable for bringing a product to market, a sufficient amount of time should be allowed for obtaining an FCC equipment authorization. Since it takes about 50 days for the FCC to process certification applications, every effort should be made to file a certification application at least two months prior to any trade show at which it plans to take equipment orders.

It is also crucial to determine whether marketing plans are consistent with the classification of a given product. For example, a product may be designed to meet the less stringent Class A standards, based on the target market being commercial customers. However, if there is any intention of distributing the product through retail outlets or advertising it in a publication directed at the general public, a manufacturer should seek a ruling from the FCC that Class B certification is not required. All that's necessary to obtain a ruling is to show that the price or performance of the equipment is not suitable for residential use.

Awareness of the FCC's equipment authorization and marketing rules isn't only important in terms of staying legal. It can also be helpful in terms of avoiding unnecessary expenditures of time and money to meet technical standards more stringent than actually required.

Don't wait for the next trade show to find out what the FCC expects. One way or another, you may wind up paying dearly for the delay.

Lambergman is an attorney specializing in communications law at the Washington, D.C., law firm Fletcher, Heald & Hildreth.

We all need to stop talking to ourselves

READER'S PLATFORM

CHRISTINA REBHOLZ

As Buddha said, you never know where you shall find the bodhisattva — the teacher bringing you enlightenment. I recently received some enlightenment while attending an industry conference. Two-thirds of the attendees were from other vendors and delivered approximately three-quarters of the presentations. The remaining one-third were IS staff members, and they delivered the rest of the talks.

The enlightening part of the seminar didn't occur during any of the vendor presentations. Most of the vendors were discussing open systems, connectivity and object-oriented programming techniques using the buzzwords that you read in the major trade magazines and that I, as a vendor marketing manager, help to promote.

Enlightenment occurred during the question-and-answer sessions after a number of the panel discussions. This was the point at which the vocal minority — the IS staff members — would repeatedly say, "What you've said is all wonderful theoretically, but it doesn't solve my real-world problems. You people in the computer industry have no idea what I go through in order to be successful at my job."

After hearing this message repeatedly for three days, it began to sink in, and it led me to a more important question. What is the problem with computer vendors and their relationships with their customers?

I think the answer is simple. My career is a good example for the explanation.

I graduated from an Ivy League university with a degree in electrical engineering. Upon graduation, I worked at DEC as a developer in one of its software research and development groups. Since DEC, I've worked at two software companies as a product manager and am now at a hardware company, where I have worked as a senior software product manager. I am currently working as a software strategic marketing manager.

Notice something missing? That's right. I've never worked in IS. In fact, I'd say 90% of the people I've worked with haven't. There is a certain element of elitism in working for a vendor. ("Oh dear, I can't date Harvey. He codes in Cobol. Real hackers write in C.") It is virtually unimaginable to hire someone out of IS into a department other than industry marketing or technical support (if they've actually used the vendor's product).

> ACTIVE LISTENING IS something we vendor types need to do far more regularly.

In fact, the only person I can think of that I've worked with who had a lengthy career in IS before joining a vendor was one of my former managers, Tom.

He taught me a lot about how IS worked and how to speak the language during a sales call. Most importantly, Tom also helped me listen to the underlying meaning of many of the questions I was asked during sales calls, questions I didn't think made a lot of sense.

For example, a decision maker from one of the branches of the armed forces once looked me in the eye and asked, "If there is a nuclear war, how will you provide us with technical support?" Tom taught me that the correct answer was not to choke and say, "If we have a nuclear war, this company is covering its collective derriere and heading toward the hills," but rather to look right back at him and say, "I see from our agenda that a representative from technical support will be giving you a presentation in approximately an hour. He is better qualified to answer that question."

Admittedly, this is an unusual and extreme case. But by listening to these sorts of questions, I learned that virtually every customer has exceptional needs or concerns of some sort and that product and support definitions should include the ability to handle a wide variety of potential "red flags." In the case of the armed forces, I learned how much IS departments depend on their vendors for support during times of crisis, most of which can't possibly be predicted.

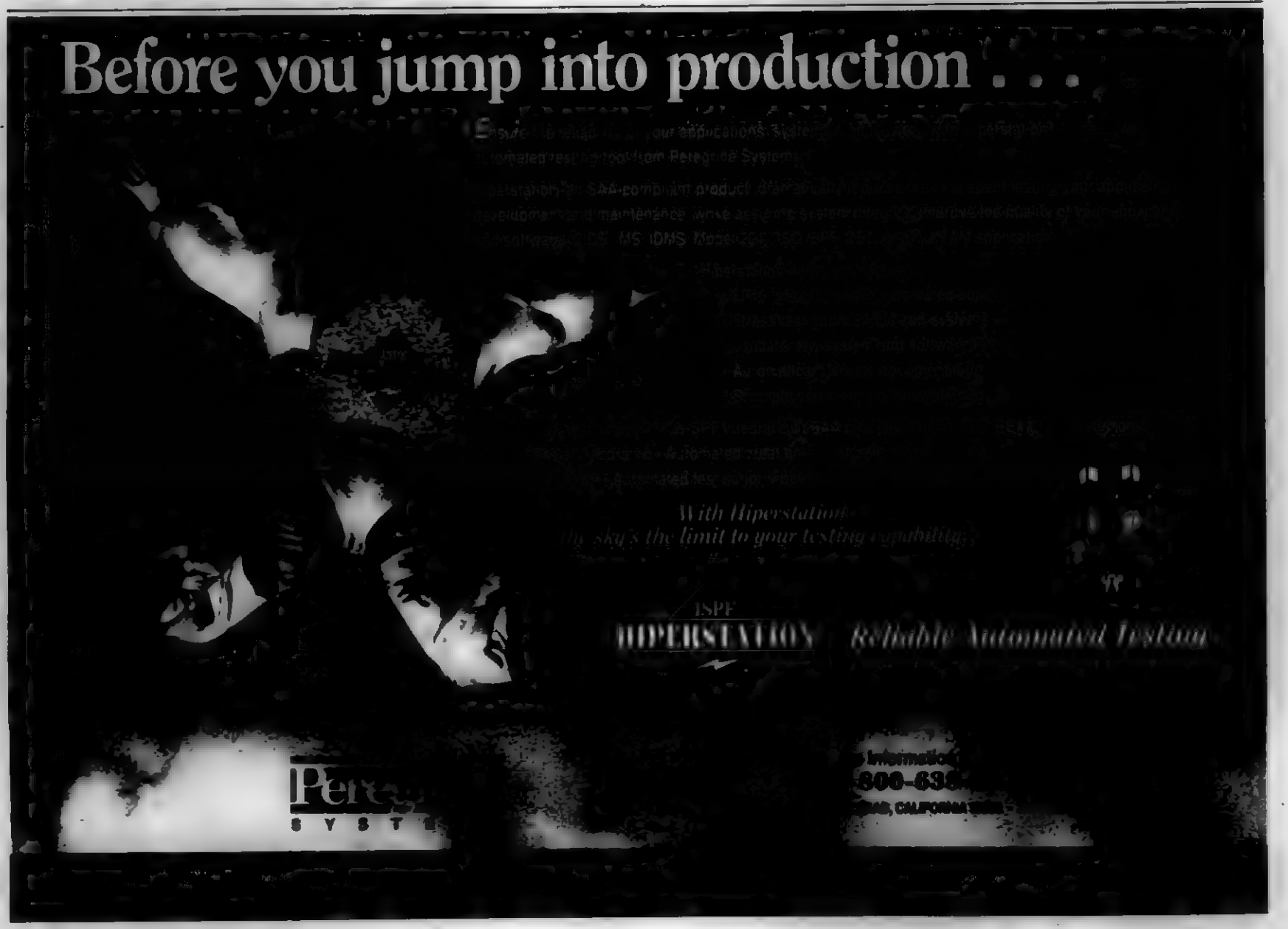
The list of other types of issues I had to learn about is long, but, in summary, Tom taught me that I can learn a lot about how IS works by listening to questions. Active listening is something we vendor types need to do far more regularly.

All right, I'll bet a number of you are thinking, "Finally! A vendor 'fesses up." Not so fast.

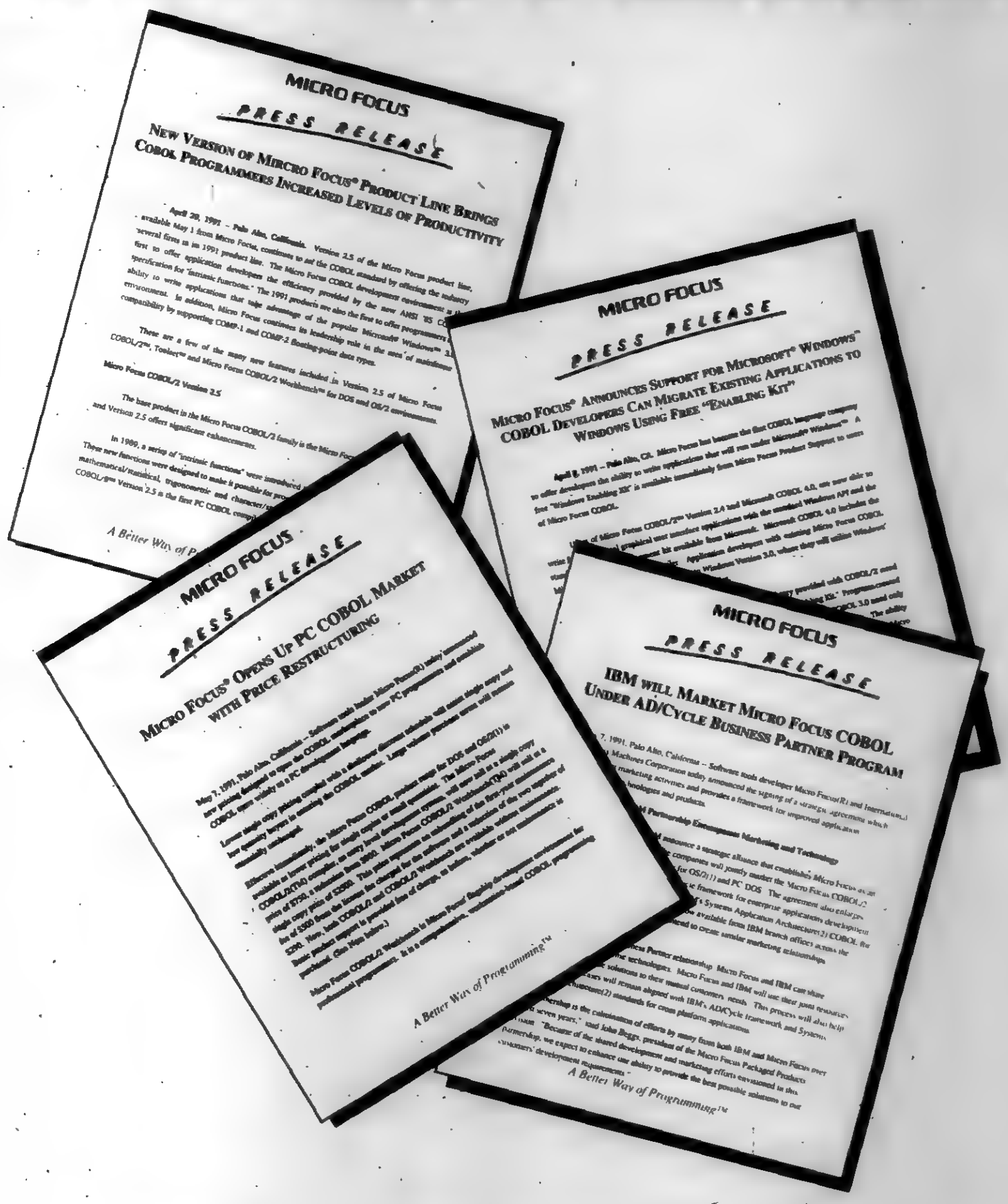
Think about your own job history. Who are you working for? If you're working for First National Bank of Fredonia, how much money did you change before you started designing the loan tracking system? If you work for Massive Manufacturer, what percentage of your lifetime salary did you draw from working on the shop floor before you put the manufacturing resource planning system into the factory? Just as importantly, are you considering the person who's interested in a career change to IS within your own company as you try to find people to fill positions? Or will you hire only college graduates with degrees in IS or computer science?

It's something all industries need to think about. Perhaps what we all — IS managers and computer vendors — need is a regular dose of the real world.

Rebholz is a software strategic marketing manager at Intel Corp. in Santa Clara, Calif.



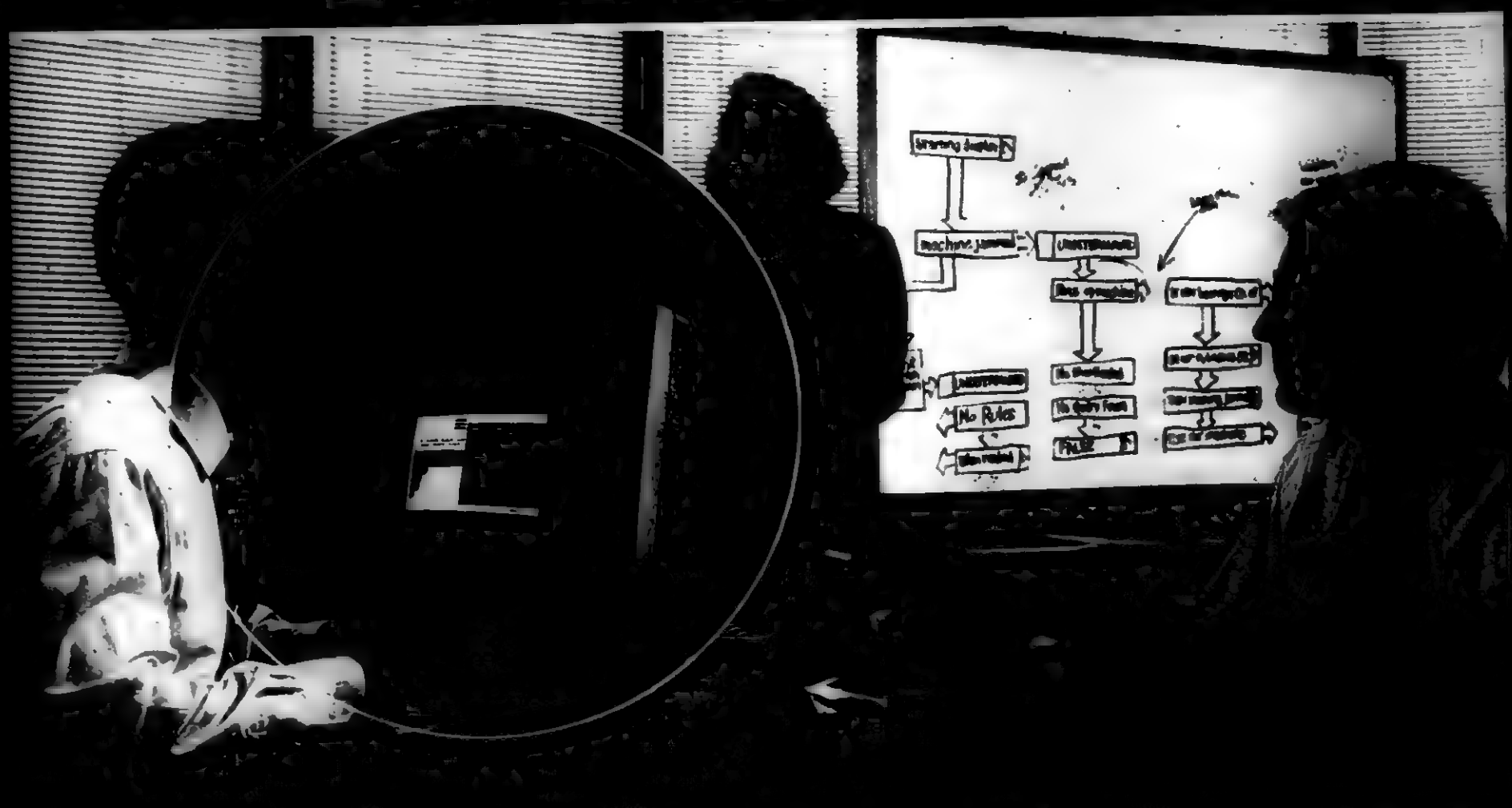
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HARD BITS

IPL adds 8mm tapes

IPL Systems, Inc. recently unveiled its new generation of 8mm cartridge tape drives for IBM's Application System/400 midrange computers, including an upgrade path for IPL's current line. Claiming to be a "generation ahead" of IBM in 8mm technology, IPL officials said their new 6600, 6700 and 6800 series of 8mm subsystems provide twice the storage capacity and transfer speed of other 8mm products.

Star Technologies, Inc. announced that the Star 910/VP Compute Server, a Scalable Processor Architecture supercomputing network server, can now operate in mixed network environments with workstations from both Sun Microsystems, Inc. and Digital Equipment Corp. The server is capable of delivering up to 160 million floating-operations per second of distributed supercomputing power to a network of both Sun and DEC users in scientific and engineering environments.

The Sterling, Va.-based company has also signed an OEM agreement with KI Research in Hanover, Md., that allows Star to distribute the firm's Kinet software products for DEC emulation and communications capabilities.

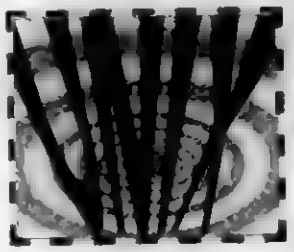
Users taste-test Unix flavors

IS groups turning to Unix question which version or versions to use

ANALYSIS

BY JOHANNA AMBROSIO
CW STAFF

Commercial information systems shops are starting to say the "Unix" word aloud. Increasing numbers of them are at least looking into, if not installing, Unix for applications such as software development.



However, users still grapple with the issue of which type of Unix to choose. Every manufacturer's version is slightly different, leading to support and integration problems. Although some users have standardized to an extent, many are running multiple Unix types.

While these IS shops are by no means tossing out their existing mission-critical systems, some consider Unix a cost-effective platform for new applications as they arise. Others look at Unix as the first step toward an open systems environment where there is mix-and-match hardware and software.

J. C. Penney Co.'s Dallas-based corporate IS shop fits into the latter category. "We're going open systems full blast," said David Evans, vice president and director of IS. The company, with Unix installed in areas including overseas operations, servers and a help desk, will be expanding the operating system into other areas over time.

"We expect to have a Unix option for every application," Evans said. Eventually, he added, he expects to see a library of commercial Unix applications large enough to rival that of any other operating system.

Helene Curtis Industries, Inc. in Chicago is piloting a Unix-based computer-aided software engineering system. Tom Gildea, vice president of business information services, said, "Open systems is the direction [in which] we're headed. There's a growing sentiment of not putting all your eggs in one basket."

Another company that is headed down the open systems road via Unix is Grand Metropolitan PLC in Minneapolis, the parent of Pillsbury Co. and other consumer brands. "We're convinced that Unix will be a key platform for us," said Carl Wilson, vice president of MIS.

Grand Metropolitan has Unix pilots in manufacturing and some corporate areas, Wilson said, although he declined to be more specific. "What we're going to

Continued on page 39

Different folks

The state of Unix implementations varies as much as Unix versions do. Users include the following:

- Grand Metropolitan PLC. A consumer products company piloting Unix in manufacturing and corporate IS areas.
- J. C. Penney Co. Expanding Unix across the board (servers and help desk applications).
- Carleton Technologies, Inc. An aerospace defense company installing its first Unix application in engineering but considering using it companywide.
- Helene Curtis Industries, Inc. Installing its first Unix application in computer-aided software engineering.

Reverse-engineering tool has repository ties

BY ROSEMARY HAMILTON
CW STAFF

PEARL RIVER, N.Y. — CGI Systems, Inc. added a reverse-engineering tool for Cobol applications to its lineup of repository-based computer-aided software engineering (CASE) tools last week.

Company officials claim Pacreverse is a step ahead of most current reverse-engineering tools because it has a multiuser implementation that ties directly to a repository. In addition, it allows users to work with entire suites of applications instead of one program at a time.

Reverse-engineering allows users to bring more current procedures and organization to older programs. In the case of CGI's product, users can include data about existing programs in the Pacbase repository. This data can then be accessed for future maintenance or reused when developing new applications.

GTE Data Services, Inc. in Tampa, Fla., tested Pacreverse in late 1990. It began implementation in January 1991. To date, the company has reverse-engineered 103 programs, and it gave Pacreverse high marks.

"We have worked through our batch programs, and we are just starting with the on-line processes," said Scott Coryea, a systems supervisor. "So I think we are well under way."

GTE signed onto the entire CGI tool set in 1990, Coryea said. The firm reviewed 19 CASE offerings before selecting CGI's. Among other reasons, it was picked because its tool set has a central repository, and the company had plans to deliver a reverse-engineering tool.

"A majority of the tools on the market today only deal with new development," Coryea said. "Pacbase does that well, but we wanted a tool to help us gain some maintenance benefits [on existing programs]. Those costs are so high, and it made sense to attack that as well."

Pacreverse is ahead of the competition, but it is not a full-blown reverse-engineering tool, said Ed Acly, director of software research at Technology Investment Strategies Corp. "Their support for data is very rich, but they need to emphasize the procedural logic," Acly said. "That should be happening within the next 12 months or so."

Coryea said Cobol applications have two views: a data view and a procedural view. The first phase of Pacreverse focuses on data, but he said he expects CGI to deliver a second phase to address the procedural side as well.

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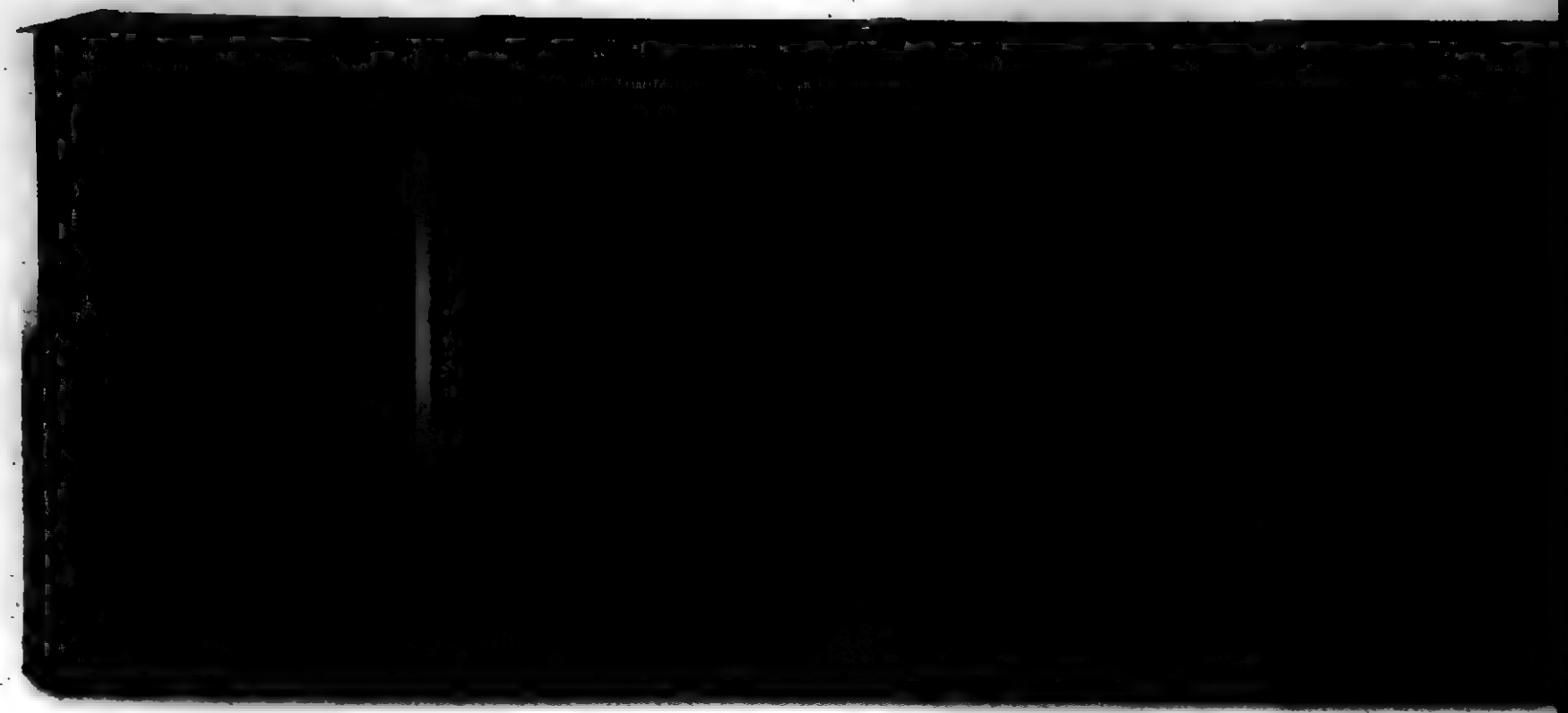
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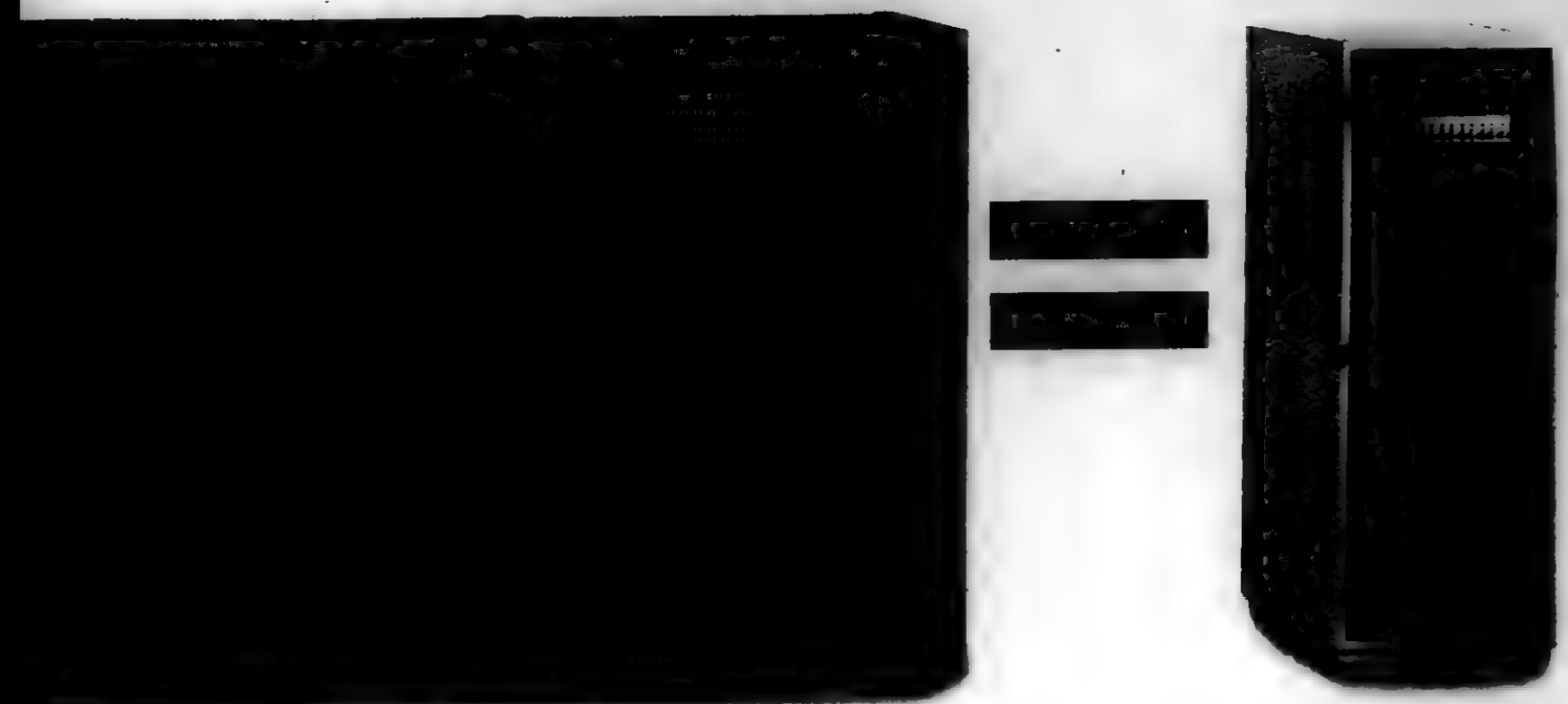
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SOFT NOTES

JYACC adds tool

JYACC, Inc. has announced that its JAM family of fourth-generation language tools is now available for **AT&T's** Starmaker system. JAM front-end software tools provide a screen editor, an integrated data dictionary and a subroutines library, and they support the division of computing functions between the database server and front-end client/server applications for computing applications.

Interbase Software Corp., an Ashton-Tate Corp. subsidiary, and **Convergent Solutions, Inc.** recently entered a joint marketing and development agreement to produce an interface between the Interbase relational database management system and Convergent's Application Development System.

Aluminum maker sticks with mini

ON SITE

BY SALLY CUSACK
CW STAFF

NORCROSS, Ga. — Alumax, Inc., the nation's third-largest producer of primary aluminum and aluminum products, is still sold on the minicomputer as the most efficient and economical platform for its applications.

Alumax has Prime Computer, Inc.'s 50 Series midrange systems installed at five primary aluminum plants for database, business and maintenance functions.

Spread out among six locations, including headquarters, across the country, the Prime machines are responsible for numerous applications. These include purchasing, production reporting, order entry, billing, human resources and payroll programs.

According to Bruce Kerns, director of MIS at Alumax, all the software systems were developed in-house using Information, a Pick-like database management system offered by Prime.

There are currently six members of the software development team at headquarters here, and each location has between three and six software developers on-site to maintain systems and applications development.

"We chose Prime back in 1984 as the best supplier of Pick database products on a system," Kerns said.

Kerns lists menuing systems, pop-up windows, electronic mail and word processing as applications currently available to users via dumb terminals.

Alumax has 10 50 Series systems currently in operation. They support approximately 1,000 monochrome terminals and an assortment of Intel Corp. 80286- and 80386-based personal computers.

The company is in the process of constructing a raw-aluminum production plant in Quebec, where a Prime 6650 will be installed for business and production-reporting applications.

"Most of our plants have taken the approach that central database information must be shared, and as the databases are very large, it makes sense to do it on a mini," Kerns said. "It's more economical."

He adds that he has not seen a client/server platform able to meet the company's needs with the same price/performance ratio as is currently delivered on the midrange systems.

There are several Prime 6350s and 6650s installed at headquarters, which is responsible for feeding all order entry, billing and marketing requirements to the five plants over 19.2K bit/sec. AT&T leased lines.



Tom Tracy

Alumax uses Prime Computer machines at its five aluminum plants

Local communications at the plants are done via fiber optics, Kerns said. He explained that producing raw aluminum requires vast amounts of electricity, which in turn can interfere with more traditional types of communications lines.

The role of fiber

Fiber helps reduce the electrical interference with the systems, he said, adding that the company generally works with local contractors when installing a fiber network and that it has used technology from Fibronics International, Inc. and Synoptics Communications, Inc.

Kerns said that Alumax will probably be looking at Unix in about five years and may try implementing it in smaller locations or for specific applications prior to that.

He thinks that PI Plus, the Unix-compatible implementation of Prime Information, is a good direction for Prime.

"We have been through some tough times with Prime. We stayed with them through the hostile takeover attempt, and we feel they are good for the long run," Kerns said. "They have a good management team and good financial results."

Sterling announces initiative to focus on development

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

WOODLAND HILLS, Calif. — After a decade of growth through acquisition, Sterling Software, Inc. is now working toward focusing its resources on common product areas.

Most recently, one of Sterling's 14 divisions, Answer Systems Division, based here, announced a Corporate Applications Management Initiative (CAMI) that will pull together Sterling's applications development tools, mapping them against IBM's AD/Cycle architecture and filling in the gaps with new products by 1992.

CAMI joins earlier Sterling product initiatives, including the Corporate Storage Management Initiative and the Corporate Data Communications Initiative, both introduced in 1990.

One of CAMI's main objectives is to array Sterling products against the AD/Cycle architecture. David Weir, president of the Answer Systems Division, said his group has the ability to bring a cohesive AD/Cycle mapping of its products to Sterling customers with strong products at each point.

In announcing CAMI, Sterling is responding to industry pressures as well. "Sterling Software and its products have been seen as a disparate collection of relatively mature products, but they are not viewed by Wall Street or the data processing community as a leading-edge software company," said Robert Williams, an investment analyst at Dallas-based The Principal, Inc.

There are gaps in the offerings, Weir conceded, and gaps must be filled by more products or by packages sold by third-party providers. For example, the bulk of Sterling's products are in the IBM marketplace, and that must be addressed with a host of new open systems products, including Unix packages.

"They really have a lot on the table to pull off CAMI," said Ed Topor, president of Lake Bluff, Ill.-based Casetek International, Inc., a software consulting firm that uses Sterling's computer-aided software engineering (CASE) products.

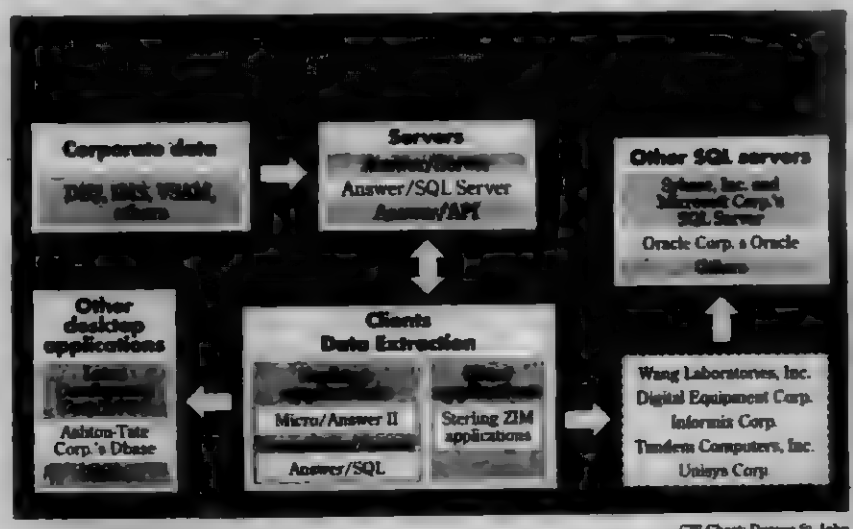
"I would expect it's going to take them one, and possibly two, years to do all the links between their CASE tools. You have to tie each of these individual product pieces to the IBM Repository, and that's going to be the driving force of the CAMI strategy," Topor added.

"They're going to link their other CASE tools to the [IBM] Repository through the Developer," Topor explained. Sterling's Developer and Integrater products, which Topor uses in his work, were acquired when Sterling purchased Montreal-based Asyst Technologies, Inc. last year. "They'll end up with an integrated CASE environment in which customers have the option of buying the entire Sterling product line or some of its components."

Because CAMI is not yet complete, users who attended the recent Sterling user group meeting in New Orleans expressed indifference to the CAMI marketing message. The purchasing pattern of many Sterling users has been to mix and match products from Sterling and other vendors, so coexistence with other vendors' products is a key concern for those users.

"CAMI really wouldn't have an impact on our shop," said Arnie Blackwell, a technical systems analyst at Canada's Royal Bank in Toronto. "Answer products have been used here for four years, but we're also using Easytrieve from Pansophic [Inc.] to download mainframe data to our [personal computers]."

At Royal Bank, Blackwell and other programmers use Answer's Microanswer query product to import mainframe data into end-user spreadsheets such as Lotus Development Corp.'s 1-2-3.



Source: Sterling Software, Inc.

CW Chart: Doreen St. John

User-critical

A few users were quite critical of Sterling's corporate marketing strategy in recent years, citing frustration with the current patchwork of products. "It's a poorly focused company," said one long-time user of Sterling's mainframe products, who asked not to be identified. "They're short-order cooks. They tell us, 'If we can't make it for you, we'll go out and buy it,'" he said. But older products, such as the Mark IV code generator, are no longer supported to that user's satisfaction.

He said he plans to "downsize" several mainframe programs for development on PC local-area networks — and to stop using the Mark IV product, now renamed Mark V, altogether.

SPEC adds benchmarks

NUMBERS ON THE two benchmarks vary widely, although they both measure multitasking tests in jobs per hour.

BY J. A. SAVAGE
CW STAFF

Two new benchmarks to rate the throughput of multiprocessing Unix systems were released last week by the Systems Performance Evaluation Cooperative (SPEC). Unlike its earlier benchmarks, from which users could get an idea of raw CPU speed for single-user workstations just by checking an average Specmark number, these benchmarks will take some involvement by prospective buyers.

"We've been fighting the tendency to look for a single measurement. The two separate benchmarks are useful to point out different measures of throughput," a SPEC spokesman said. The organization's steering committee members went on to say that these benchmarks were not easy to use.

Numbers on the two benchmarks vary widely, although they both measure multitasking tests in jobs per hour. For instance, a Sun Microsystems, Inc. Sparcstation 2 rated 140.4 scripts per hour on one and 935.91 scripts per hour on the other. SPEC members suggested that those interested in using the benchmarks do their homework and decide which is more relevant to their work loads.

"It's like purchasing an automobile based on EPA mileage," said Steve Gaede, a steering committee member. "You need to know what kind of driving you plan on doing — city or country." Additionally, a user's configuration is unlikely to match that of the benchmark configuration.

Not only are the new Specmarks more difficult to use than the earlier suite, but they are based on software development applications, not commercial applications. "If you assume that software development is in a commercial environment, then, yes, they are commercial. But in most minds, commercial denotes spreadsheets and word processing — and we're still looking at that," said Sjvaram Chelluri, SPEC's project manager for these benchmarks and the district manager for marketing/performance analysis at AT&T Data Systems in Lisle, Ill.

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Security gear sales to take off

BY SALLY CUSACK
CW STAFF

CLEVELAND — U.S. shipments of security access and deterrent equipment are projected to reach $6.2 billion by 1995, according to a recent report by The Freedonia Group, a market research firm based here.

Technology-intensive products, such as computer-driven security systems, biometric systems and smart-card access controls, are projected to advance at double-digit annual rates, the report says.

Edward D. Hester, vice president of the durable goods division at The Freedonia Group, said computer-based security systems are giving customers an improved price/performance ratio.

"Computer technology is responsible for raising the effectiveness of the systems, especially in access control," Hester said.

The report divides access control systems into three main categories: card-based systems, keypad and combination devices and biometric systems, including voice and optical technology.

Shipments of access control systems, including readers, scanners, cards, computer peripherals, dedicated systems and software, are expected to grow dramatically and reach $1.1 billion by 1995.

There are several specific advantages to computerized electronic access control systems, including easy reprogrammability to deny access (following a dismissal, for example), allowing a person access to some areas while denying access to others, limiting access to prescribed times of the day or night and keeping detailed records of all entries.

The report notes that card-based access control systems are popular among users but are vulnerable to unauthorized access by someone in possession of a stolen card. For this reason, more sophisticated systems have been developed, including those that require inputting a sequence of numbers on a keypad in addition to card access identification.

Microprocessor-based card systems have the potential to be integrated with biometric systems for maximum personal identification capability.

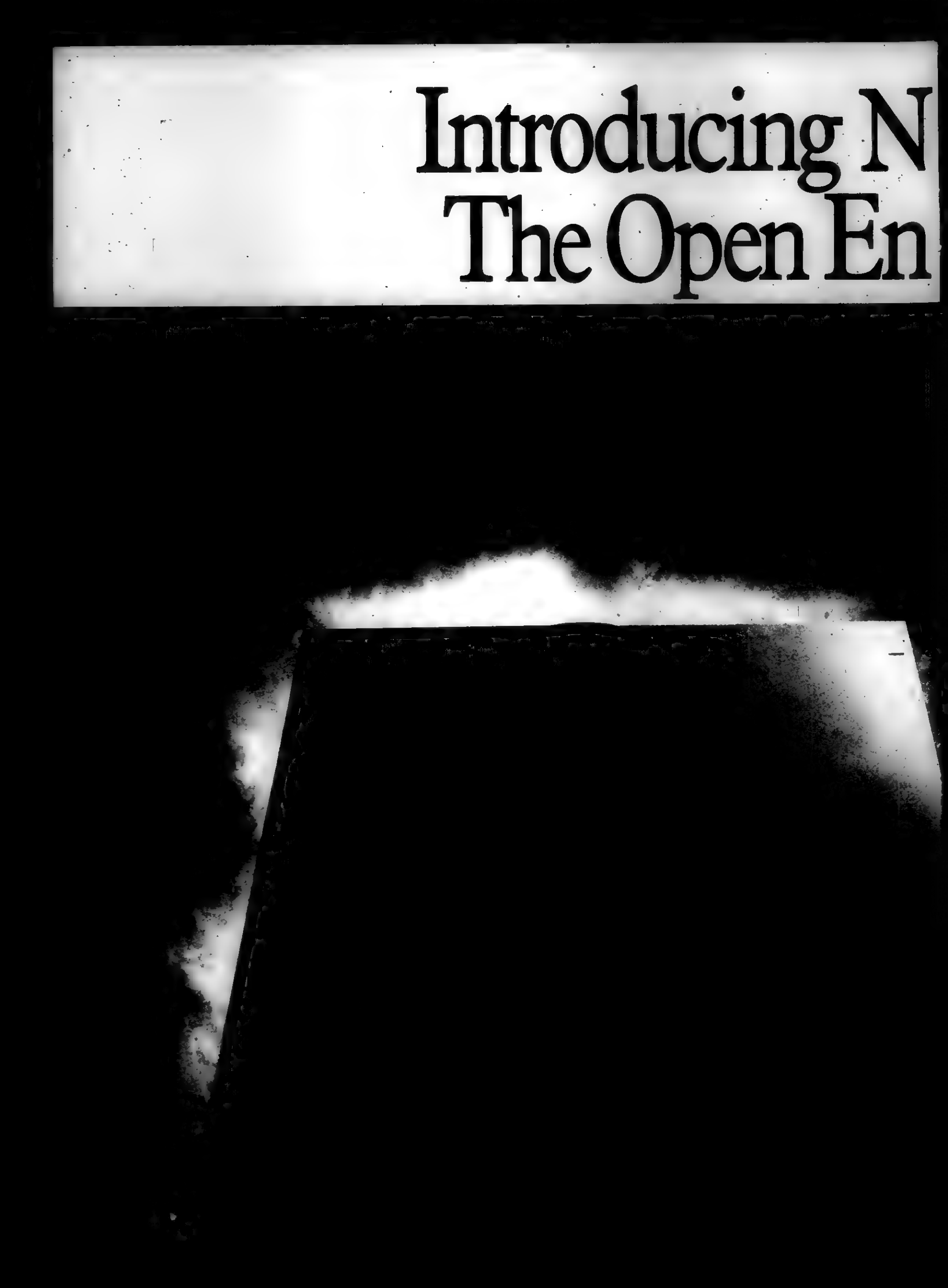
However, comprehensive biometric security systems are still relatively expensive when compared with keypad- and card-based access systems.

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IBM says AIX at top of class

BY KEITH NEWMAN
IDG NEWS SERVICE

AUCKLAND, New Zealand — The days of IBM's AIX being seen as a proprietary version of Unix are over, and the battle is on to achieve standards between competing Unix versions, said Ahmed Chibib, an IBM developer of AIX and the RISC System/6000 compiler technologies.

Chibib said in New Zealand last week that IBM's Unix operating system for the RS/6000 is now better understood. The RS/6000 was released a year ago, and there are 3,000 major applications ported, plus 6,000 sitting on top of that. In the same period, 100 RS/6000 machines have been installed in New Zealand — mainly the 320 and 520 models — and are used for commercial accounting and database functions.

"There is incredible competition in Unix. The better technology will always be adopted as standard, but you don't want standards to get in the way of advancement," Chibib said. "Four criteria define what an open system is: portability, interoperability, standards and scalability. AIX conforms to these," Chibib claimed. "Unix openness is really in X Open and Posix compliance; above that come things like de facto standards used by everyone, including Ethernet, SCSI support, X Windows or NFS from Sun. Users have made these popular, and as a result, you can't find a Unix system without them," he said.

"On top of that come OSF and Unix 5.4 extensions, which are similar in function. Then vendors add their own enhancements. This is where AIX stands above everyone else: We have implemented all the standards and added many features that make our Unix a more commercially robust system," Chibib said.

Exciting evolution

Chibib is enthusiastic about the way Unix and distributed computing are evolving. "The ability to have various computers from various vendors, possibly even running different operating systems, connected on a network and perceived as [a] single computer is exciting to me," he said.

All Unix is being enhanced, he said. The AIX plan is to incorporate advancements from the Open Software Foundation, including the distributed computing environment (DCE), data management environment, a shrink-wrapped version and greater security.

"We have filled in a lot of holes, including system management, disk management, tuning the system and adding devices which are normally lacking because users have traditionally needed a guru sitting next to them to do that," he said.

"Anyone supporting the DCE can interoperate, with each machine doing what it is best at. I believe big computers in the future will be data warehouses simply holding data so individual pieces of that distributed environment can operate on that data," he said.

Chibib said he anticipates a twentyfold improvement in the RS/6000 lineup this decade, with particular focus on enhancing graphics and CPU and I/O capability.

Benchmarks released for Oracle running on Sequent

BY JEAN S. BOZMAN
CW STAFF

BEAVERTON, Ore. — Sequent Computer Systems, Inc. and Oracle Corp. jointly released audited results of their TPC-B benchmark test of the Oracle 6.0 relational database management system as it ran on a Sequent machine recently.

Rich Wells, manager of Sequent's Oracle marketing program, said the Sequent/Oracle 319 transactions per second result compared favorably with other TPC-B results for four-processor Digital Equipment Corp. Vaxcluster complexes running DEC's RDB and Oracle 6.0 RDBMSs.

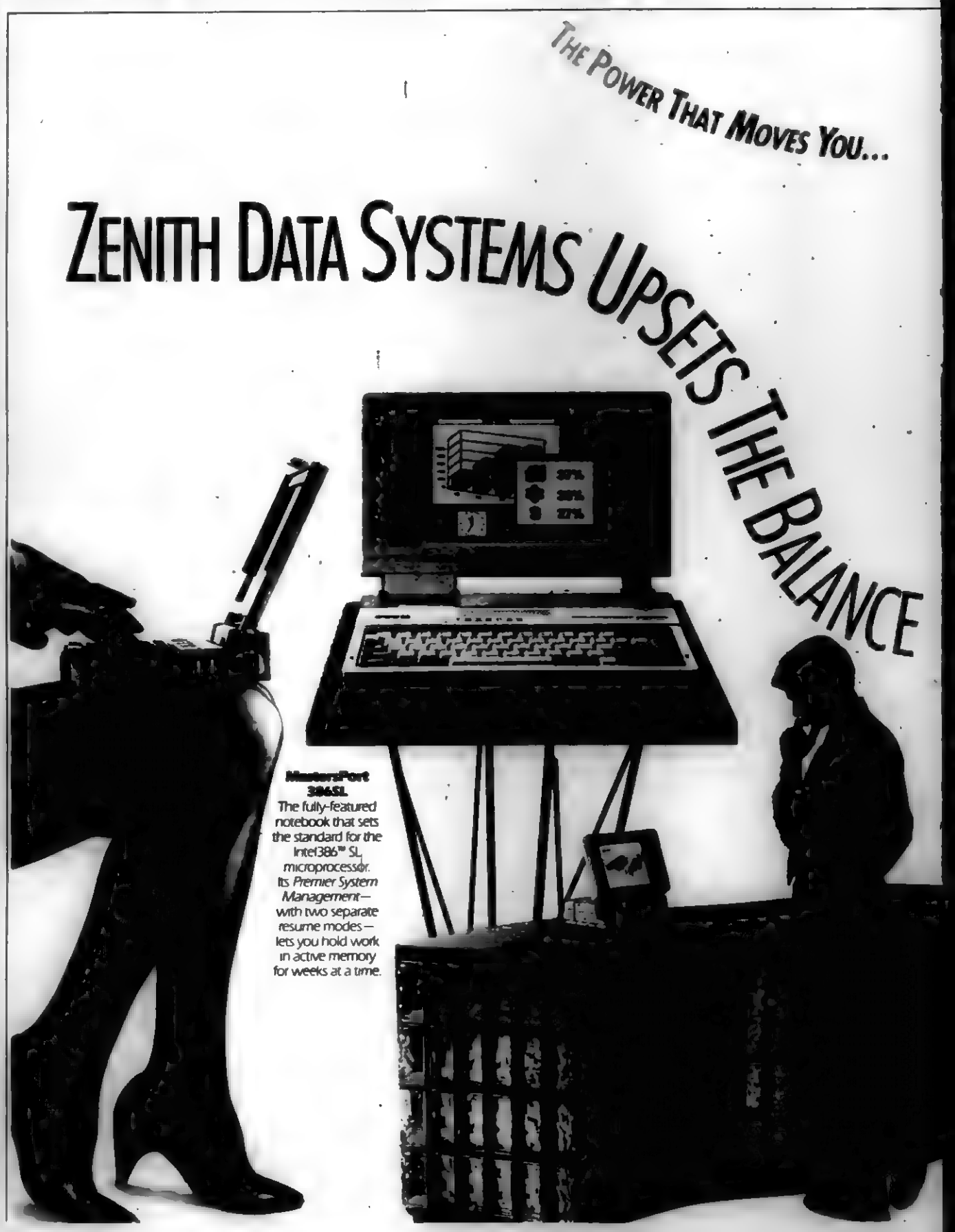
The test of a simulated banking application running against a 35 million-row database resulted in a sustained rate of 319 transactions per second.

> THE TPC-B TEST was run over a period of several days.

The TPC-B test was audited by Tom Sawyer, a consultant at Codd & Date, Inc. in San Jose, Calif.

It was run over a period of several days at Sequent's main campus here, using a Symmetry 2000/700 with 190M bytes of main memory and 35G bytes of disk. The Symmetry machine, which runs Sequent's version of the Unix operating system, is based on 16 Intel Corp. I486 processors.

During simulated eight-hour work loads, the database was stopped several times as power was shut off and disk drives were taken off-line. The database was then recovered using a "mirrored" copy of the database and an archived version, according to Sequent engineer Cormac Burke.



Storage Tek adds automation to tape library control system

BY ELLIS BOOKER
CW STAFF

LOUISVILLE, Colo. — Storage Technology Corp. recently introduced an updated software control system for its tape cartridge library system that adds several features for automated operations.

The Expert Library Manager (EXLM) software works with Storage Tek's 4400 Automated Cartridge System. EXLM Release 1.1.1 reportedly streamlines production processing as well as vaulting and cartridge-ejection activities. The popular 4400 tape subsystem contains library "modules," each of which can hold up to 6,000 18-track, ½-in. cartridges. Up to 16 libraries can be connected together, for a total storage capacity of 96,000 cartridges.

Storage Tek, which recently sold its 2,500th library, said the EXLM software further automates routine functions such as disaster recovery data backup and offsite processing.

The software can identify cartridges or groups of cartridges by volume serial number or data set name and can work in conjunction with a data center's tape management system to remove specific volumes or volumes with specific data sets. EXLM ranges in cost from $10,000 to $13,750 and is available immediately.

THE EXLM SOFTWARE further automates routine functions.

Reverse

CONTINUED FROM PAGE 29

do is expand what we have now to fully integrate our manufacturing and commercial areas," he said. "We expect this vision to be in place over the next three to four years. Right now, we're experimenting with Unix and making sure we understand it."

The movement of commercial IS shops toward Unix was noted in the 1991 Software Market Survey, recently released by Sentry Market Research in Westboro, Mass. Of the more than 360 IBM mainframe sites questioned, 29% said they are likely or very likely to install Unix within the next two years. Among the sites with Digital Equipment Corp. computers, 44% said they will move toward Unix within the same time frame.

At Carleton Technologies, Inc., an aerospace defense company in Orchard Park, N.Y., the primary motivation for Unix is the availability of less expensive hardware. The company is planning to order DEC Decstations by the end of the month, according to Kenneth Krallman, MIS manager.

The engineering workstations will run Ultrix, DEC's Unix version, and will complement Carleton's existing Vaxstations, which run DEC's proprietary VMS operating system. "Decstations with Ultrix have better price/performance than Vaxstations — three to four times the horsepower and sometimes up to 10 times, for the same money," Krallman said.

Open options

Although he is sticking with DEC initially because "they can integrate Unix into our entire environment," Krallman said he is keeping his options open for down the road. "We will go wherever we can get the best price/performance. In the future, maybe some other vendor's Unix workstations will look good."

Also, he said, Unix will be an option for applications in the rest of the company within the next two or three years.

On the issue of which Unix to pick, Wilson said, "That's one of the things we're working out, but we're banking on the Posix standard." Most of the major manufacturers and Unix consortia have either pledged to support Posix or already do.

Evans said he has a mix of Unix System Laboratories' System V Release 4, DEC's Ultrix and versions from Sun Microsystems, Inc. and Hewlett-Packard Co. He said he is also piloting IBM's AIX. "It's a little more Unix than I want," Evans said. "I'm betting that Unix V.4 will ultimately be the winner, but I've been wrong before."

If there is safety in numbers, Evans' bet may turn out to be the winner. According to the Sentry Market Research study, 46% of the IBM mainframe sites and 31% of the DEC sites said they will implement System V. The runners-up were AIX for the IBM mainframe shops, mentioned by 46% of the IBM respondents, and Ultrix for the DEC shops, with 23%.

Whatever the organization's rationale for adopting Unix — cheaper hardware, open systems or both — one thing seems clear: Unix is no longer desired by only the "techies" who have always been partial to the operating system. Unix is starting to be brought in by the IS professionals who heretofore have shunned it as just one more thing to learn and support.

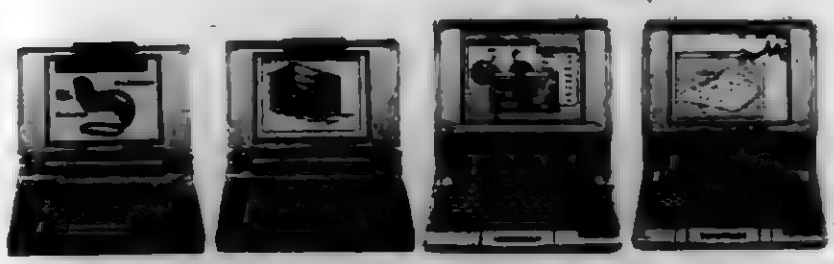


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LCD/Size	Backlit/8.85"	Backlit/8.85"	Backlit/8.85"	Edgelit/10.4"	Edgelit 10.4"
Video/Gray Scales	VGA/16	VGA/16	VGA 32	VGA/64	VGA/64
Power Management	• Suspend/Resume • Sleep mode • Low battery operation	• Suspend/Resume • Sleep mode • Low battery operation	Premier System Management™ • Standby Resume • Rest Resume • Panic save • Unattended communication	Intelligent Power Management™	Intelligent Power Management
Software	MS-DOS® included	MS-DOS included	MS-DOS pre-installed, Microsoft® Windows™ v 3.0 included	MS-DOS and Microsoft Windows v 3.0 pre-installed	MS-DOS and Microsoft Windows v 3.0 pre-installed
Weight (with battery)	6.6 lbs.	6.6 lbs.	6.8 lbs.	15 lbs.	15 lbs.

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Manufacturing IS not yet in gear, study finds

BY ELLIS BOOKER
CW STAFF

CHICAGO — As if U.S. manufacturers needed another bit of bad news, a recent survey indicated that this sector of the economy continues to have very little success when it comes to applying advanced technologies.

What's more, the study, Deloitte & Touche's "Annual Survey of North American Manufacturing Technology," which was released last month by the firm's manufacturing, distribution and services group, indicated that manufacturers are collectively attributing fewer and fewer benefits to some of the information systems technologies that many manufacturers labeled as vital to their future just a few years back.

For example, manufacturing resource planning (MRP), a class of centralized planning systems for manufacturing environments, has declined in importance, the study found.

"We believe the MRP investments of the '70s and '80s will be dismantled during the '90s," said James Schuetz, leading partner at Deloitte & Touche's manufacturing, distribution and services group, based here. Schuetz noted that during the past 25 years, MRP implementations have suffered from high capital and training costs.

The number of survey respondents who expected MRP to contribute to future business declined almost 3% compared with the survey findings of one year ago.

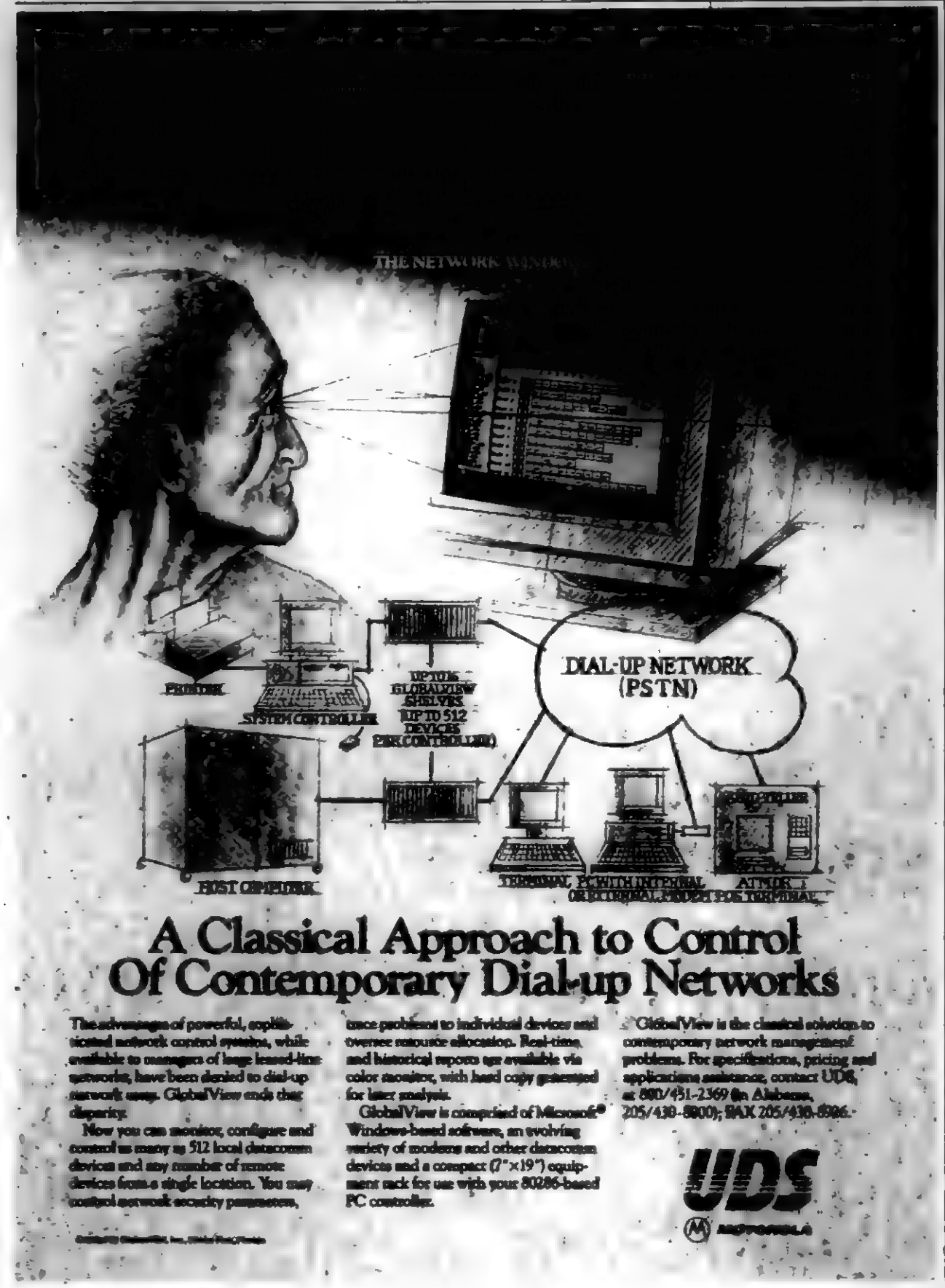
Also out of the spotlight

Other items that respondents deemed slightly less important this year than one year ago included the integration of manufacturing systems, fourth-generation languages, the international Manufacturing Automation Protocol, relational databases and electronic mail.

Leading the list of information technologies on the uptick were Ethernet networks, local-area networks, electronic data interchange and the integration of systems across business functions.

Also, not surprisingly, many of the 872 manufacturing executives who responded to the survey said they lacked confidence in the technical capabilities of their work force.

Poorly educated workers were listed by 66% of respondents as being at least a moderately significant barrier to implementing technology. Half of the respondents also cited weakness in managerial leadership and vision as a significant deterrent. But an even larger number, 73%, said justifying the costs of high-technology investments was just too difficult.



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Compuware DB2 roster enhanced

BY CAROL HILDEBRAND
CW STAFF

Compuware Corp. has supplemented its DB2 add-on roster by introducing Transrelate Workbench for DB2, a tool aimed at helping database administrators manage their IBM DB2 environment.

Transrelate Workbench automates and integrates the functions that database administrators need to analyze and maintain DB2, said Steven Scheidt, vice president of product management at the Farmington Hills, Mich.-based firm. "It allows the database administrator to select any number of objects from the catalog and perform all kinds of automation tasks," he said.

Using a windowed interface based on IBM's Common User Access, the user can use pop-up command lists, Help windows and cut-and-paste abilities for data manipulation testing and debugging, fault diagnosis and general management. All of the actions that relate to one object in the DB2 environment sit in one window.

Compuware got the seed technology for the product from Transamerica Corp., a San Francisco, Calif.-based financial services company. A group of IMS database administrators had assembled an in-house management tool, and Scheidt said his firm saw possibilities for administrators of other databases, including DB2.

"This is the first time we've gone directly to the database administrator," Scheidt said. "The trend [at user sites] is to consolidate tools vendors, which leaves the database administrator as the systems integrator."

Consumers Power Co., a utility based in Jackson, Mich., chose Transrelate Workbench when it needed help automating DB2 functions — "things like general control, reorganizations and migrating a database from test to production," said Alan Hine, a senior systems analyst at the firm.

Hine praised the tool's ability to help in migrating systems, a major task for DB2 administrators. For example, Hine said, after making changes in a database in test mode, an administrator can run a program that will compare the production version with the changed test version.

Transrelate Workbench for DB2 is priced from $40,000 to $85,000, depending on CPU size, and is slated for immediate availability.

NEW DEALS

EDS nets $40M contract with U.S. Army

Electronic Data Systems Corp. announced late last month that it had signed a $40 million contract with the **U.S. Army** to supply an optical storage system for personnel records. Plans call for the system to be installed at locations in St. Louis, Indianapolis and Alexandria, Va. The contract will run for one year and includes five one-year options.

Cray Research, Inc. announced that **Apple Computer, Inc.** had ordered its second Cray supercomputer. The system, a Cray Y-MP2E valued at $4.5 million, will reportedly be used for research and development applications. It is scheduled to be installed at Apple's main headquarters in Cupertino, Calif., this fall. Cray also announced the shipment of its 100th Cray Y-MP supercomputer. The new system, a Cray Y-MP2E, will be installed at Pfizer, Inc.'s Central Research center in Groton, Conn.

Convex Computer Corp. has reported that the **German Climate Computer Center** has ordered a C3840 supercomputer. The C3840, one of Convex's recently announced 3800 series systems, will be used for environmental research to learn more about the Earth's climate. Convex also announced that another C3840 had been requested by the **Danish Meteorological Institute** and that a C220 supercomputer had been installed at the **University of Wisconsin at Milwaukee**.

Late last month, **Unisys Corp.** announced the opening of a facility in Birmingham, Mich., that will provide information services for **Ford Motor Co.** and other customers. The Unisys Data Center was created as part of a three-year cooperative agreement between Unisys and Ford and will be used for remote processing support for several Ford divisions.

Digital Equipment Corp. recently announced that it has been awarded a contract by the **Long Island Lighting Co.** Under terms of the contract, estimated to be worth more than $7 million, DEC will provide systems and services to connect more than 20 Long Island Lighting offices and power plants during the next two years.

Stratus Computer, Inc. announced that it will be selling a Stratus XA 2000 Continuous Processing System to **Cathay Pacific Airways** in Hong Kong. The airline will reportedly use the $1.1 million fault-tolerant system to process cargo deliveries electronically.

The **U.S. Navy** recently placed two orders totaling $3.8 million with **Documon, Inc.**, according to the company. Under terms of the agreements, Documon said it will convert millions of pages of Navy documents, including technical manuals and the Military Specifications and Standards, to optical disc.

Software Architecture & Engineering, Inc. (Software A&E) has announced that **Northwest Airlines** has awarded it a contract for software development tools and services for the creation of an aircraft maintenance system. Under terms of the agreement, Northwest will use Software A&E's Strategic Networked Application Platform computer-aided software engineering tool, with Software A&E providing training and consulting services.

The 2,500th Storagetek 4400 Automated Cartridge system was delivered to the **Bell Telephone Company of Pennsylvania**, according to **Storage Technology Corp.** The system was one of four installed at Bell of Pennsylvania.

Prime adds 5370 to midrange line

NATICK, Mass. — Prime Computer, Inc. recently expanded its 50 Series line of midrange computers with the 5370 system.

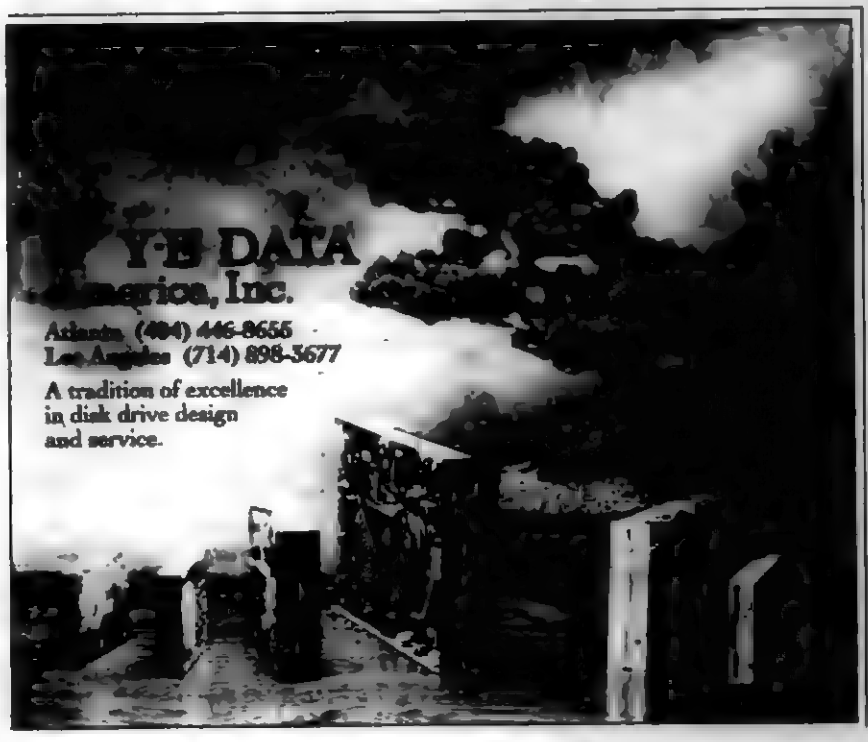
Billed as the highest performing member of 5000 Series systems introduced last September, the new offering provides symmetrical dual-processing capabilities for high-end office environments.

Memory configurations range from 64M bytes to 128M bytes. According to the vendor, customers can use the 673M-byte, 5¼-in. disk drives to configure the 5370 to provide up to 32.3G bytes of mass storage.

The CPU incorporates seven CMOS gate arrays. The central board also offers interfaces for two independent I/O buses, an extended memory bus interface, a cache, a control store and a maintenance processor.

Designed to replace the company's older 6150 system, the 5370 is priced starting at $226,000, and 5000 Series customers can upgrade from lower performance systems by swapping CPU boards, the company said.

The machines are currently shipping.



Vendors team on object plan

BY SALLY CUSACK
CW STAFF

DAYTON, Ohio — Technology makes strange bedfellows, as demonstrated last week when NCR Corp., Object Design, Inc., Hewlett-Packard Co. and Sun Microsystems, Inc. joined forces to propose an object management specification to the Object Management Group (OMG), an international organization of systems vendors and users.

Together, the companies are providing a comprehensive response to the OMG's request for Object Request Broker (ORB) technology. ORB defines an advanced method for using and sharing information on networked computers from different vendors.

This will allow third-party software vendors to use the method to lower the cost of writing portable applications with interoperability features in distributed computing environments.

The combined submission reportedly offers a consistent architecture that would provide support across different hardware, operating systems and networking platforms.

It will use an NCR Class Definition Language compiler, which will interface to NCR's Remote Method Invocation.

Also included will be the Sun/HP Distributed Object Management Facilities, which offer a runtime applications programming interface for the development of portable applications across multiple distributed computing technologies.





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NEW PRODUCTS — SOFTWARE

Systems software

Wind River Systems, Inc. has ported the Vxworks real-time operating system to Digital Equipment Corp.'s Decstation workstation platform.

Vxworks includes native networking support and an applications development environment. Currently, the system can be used to develop real-time applications for Lockheed Sanders, Inc.'s Star MVP VME board-based computers; support for other target systems is planned, the company said.

Vxworks now supports reduced instruction set computing (RISC) based on Sun Microsystems, Inc. Scalable Processor Architecture, as well as Mips Computer Systems, Inc. R3000 and Intel Corp. I960 architectures. According to the company, Vxworks is the only real-time system available supporting all three major RISC architectures.

A server license costs $19,500. Fees per target system are assessed for applications developed under Vxworks.

Wind River Systems
1010 Atlantic Ave.
Alameda, Calif. 94501
(415) 748-4100

Database management systems

The Empress relational database management system and fourth-generation language has been ported to run on Hewlett-Packard Co.'s Apollo Division workstations, Empress Software has announced.

Empress Version 4.3 runs with the standard X-11 X Window System interface, as well as Digital Equipment Corp.'s Decwindows, Apollo Domain and Open Look, under the AT&T Unix System V and the University of California at Berkeley's Unix environments. The product offers a variety of software tools with object-oriented capability and direct kernel access.

Pricing for the Empress system ranges from $1,295 to $250,000, depending on platform and number of users.

Empress Software
6401 Golden Triangle Drive
Greenbelt, Md. 20770
(301) 220-1919

Development tools

Kimberly-Clark Computer Services, Inc. has announced the release of Cross System Product/Application Development Enabler (CSP/ADE), an IBM AD/Cycle-compliant software product.

CSP/ADE provides executable templates for modeling applications as well as fourth-generation language development functions and tools. The product is intended to decrease applications generation time and reduce the CSP learning curve for developers, the company reported. CSP/ADE runs under the CSP development environment on MVS, VM and VSE platforms.

Licensing fees are approximately $30,000 for VM or VSE versions and $50,000 for an MVS version.

Kimberly-Clark Computer Services
Suite 1900
600 E. Las Colinas Blvd.
Dallas, Texas 75039
(214) 830-6800

Applications packages

Systems Union, Inc. has announced support for the Digital Equipment Corp. Ultrix operating system in Sunaccount financial software.

Sunaccount is one of two modules in the Sunsystems multicurrency accounting software package. It consolidates financial information in all currencies and generates analysis and reports. The product now supports both VMS and Ultrix environments.

Pricing for the Sunaccount module starts at $3,600, depending on the processor size, the operating system and the number of users.

Systems Union
10 Bank St.
White Plains, N.Y. 10606
(914) 948-7770

Britz Publishing, Inc. has announced the availability of the Bword 7.0 word processing software for the IBM Application System/400.

Enhanced features include a mailing list manager with a file format conversion utility, improved printing functions and a 65,000-word dictionary.

Bword costs $199.

Britz Publishing
986 Madison Ave.
Madison, Miss. 39130
(601) 853-1394

Utilities

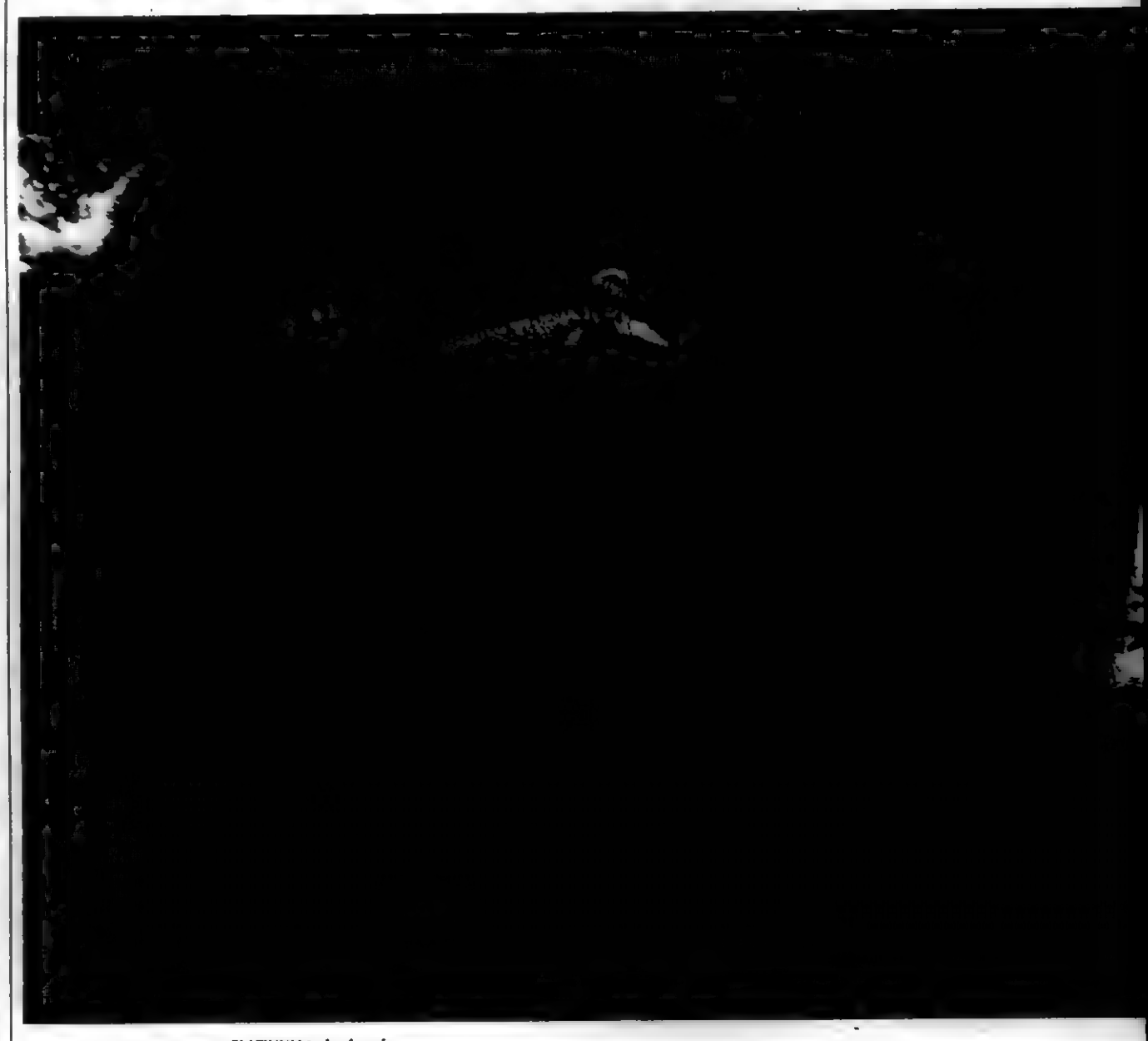
Syncsort, Inc. has announced Syncsort/Backup (Syback) 2.3, a backup software product for the VM operating system.

Release 2.3 incorporates support for IBM's VM/ESA and for shared file system data. A disaster recovery procedure has been added, and performance has also been enhanced.

Pricing is hardware independent. A three-year license, including new releases and all technical support, is priced at $11,000.

Syncsort
50 Tice Blvd.
Woodcliff Lake, N.J. 07675
(201) 930-9700

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NEW PRODUCTS — HARDWARE

Processors

Sanyo Icon has introduced the 88open series of reduced instruction set computing (RISC) systems for Unix and Pick operating systems.

The systems are based on the Motorola, Inc. 88100 RISC chip set, with additional processors controlling I/O functions and disk operations. Up to 250 users can be supported. Licenses for both Unix and Pick are included with each system.

An entry-level system with 10M bytes of main memory, tape backup, a 383M-byte disk drive and interfacing for 16 terminals costs $38,514.

Sanyo Icon
Suite 110
18401 Bon Karmen
Irvine, Calif. 92715
(714) 474-3993

Data storage

Universal Computer Systems, Inc. has introduced 8mm tape drives for IBM Application System/400 midrange computers.

The UCS-2300-XC, for AS/400 Models B30 to B70, features optional compression capability, allowing up to 7G bytes of storage per cartridge. It transfers data at a reported 600K byte/sec.

The UCS-2307, for AS/400 Models B10 to B20 and C2 to C25, includes 5G-byte compressed storage and a 400K-byte/sec. transfer rate.

Pricing ranges from $10,000 to $33,000, depending on configuration and compression options. Connections for newly introduced AS/400 models will eventually be provided, according to the company.

Universal Computer Systems
6700 Hollister
Houston, Texas 77040
(713) 939-0088

Laser Magnetic Storage International Co. has announced the Independence Tape Subsystem for IBM Application System/400 computers.

According to the company, the subsystem provides plug-and-play compatibility with IBM 2602 and 2607/2608 controller cards. The Independence offers 1.4G bytes of unattended backup capacity. Data transfer rates are 1M to 3M byte/sec.

The system costs $29,900, including a 12-month warranty.

Laser Magnetic Storage
4425 Arrowswest Drive
Colorado Springs, Colo. 80907
(719) 593-7900

Storage Concepts, Inc. has begun shipping the Concept 550, a high-performance Redundant Array of Inexpensive Disks system for small computer systems interface peripheral users.

The Concept 550 provides up to 6G bytes of storage capacity and a data transfer rate of 10M byte/sec. Host adapters for several different bus architectures may be used with the product.

The company has also introduced the Concept 510, designed for real-time applications. The 510 model transfers data at 12M byte/sec.

Pricing for the Concept 550 begins at $24,000. The 510 starts at $22,000. Both models include controller disks, power supply and cooling system.

Storage Concepts
1622 Deere Ave.
Irvine, Calif. 92715
(714) 852-8511

I/O devices

Agile has introduced the 5250 Optima, a protocol conversion/print sharing product for IBM midrange computers.

The Optima supports multiple ASCII printers through three twin-axial addresses. A parallel input port allows printer sharing with other host devices, including Digital Equipment Corp. VAXs and personal computers.

Operating software is shipped on an upgradable disk.

The 5250 Optima costs $1,895.

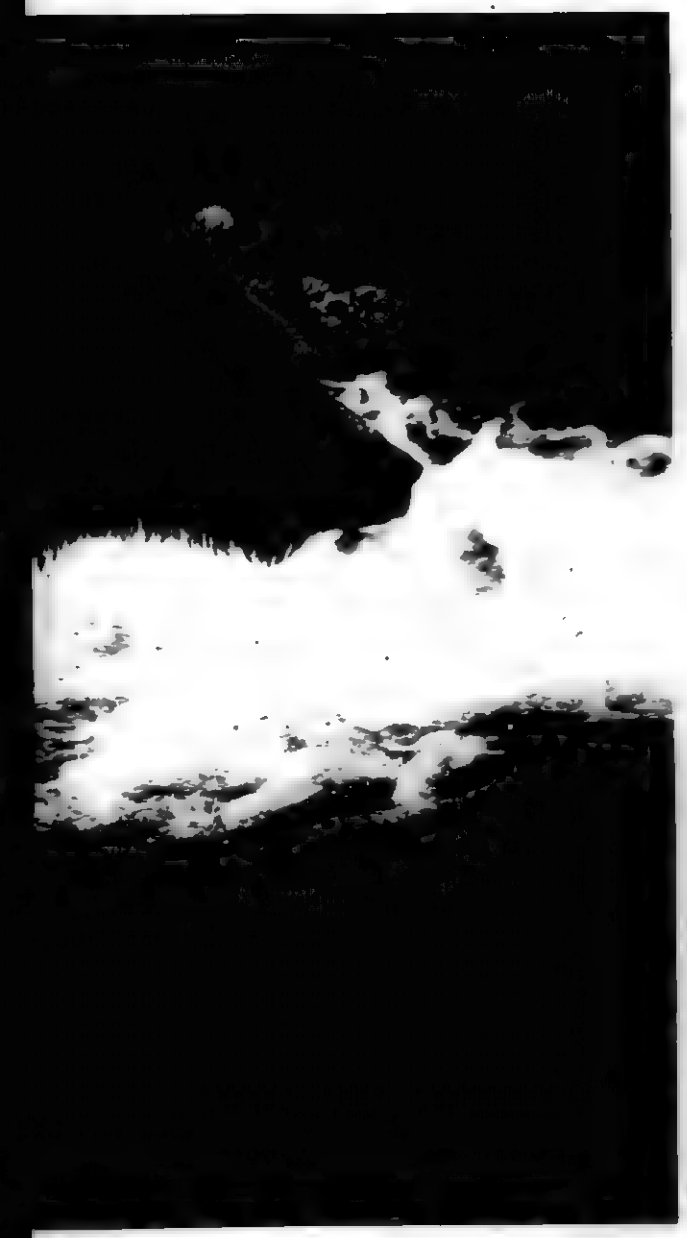
Agile
825 Alfred Nobel Drive
Hercules, Calif. 94547
(415) 724-1600

NCR Corp. has announced the NCR 6481, an 88 page/min. laser printer system.

The system supports standard printing software and can combine optical character recognition symbols, multiple font text, logos and graphics on a single page. Resolution is 240 by 240 dot/in. The system can deliver an output of 1⅓ million pages per month, according to the company.

The 6481 is priced at $172,900.

NCR
1334 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-5278



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COMMENTARY

Michael Fitzgerald

Is Elvis still alive?



If Elvis were a PC, he'd be an SX notebook. These things are sighted all over the place, but do they exist?

The Elvis Effect struck the SX notebook market the same way it hits the Chicago Cubs every summer: The spirit was willing, but the pieces were lacking, and the SX market became an apparition. The crush of vendors coming into the market simply overwhelmed the ability of component makers to meet demand; vendors announced machines last November or December, and some still dream of shipping products.

Compaq Computer's SX notebook has been showing up in the hands of users in increasing numbers after dribbling out of the factory in its early months. AST's is also shipping, although in scant quantities, and the same goes for Texas Instruments' new box. But all in all, vendors of SX notebooks have sounded rather like Samsung, which trumpeted volume shipments of its SX notebook, then admitted volume was a low-decibel 400.

Suppliers of key components such as hard drives and screens are now beginning to meet demand, and SX notebooks

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OS/2 push faces uphill battle

IBM will have to work at its goal of wooing Windows-besotted users

BY PATRICIA KEEFE
CW STAFF

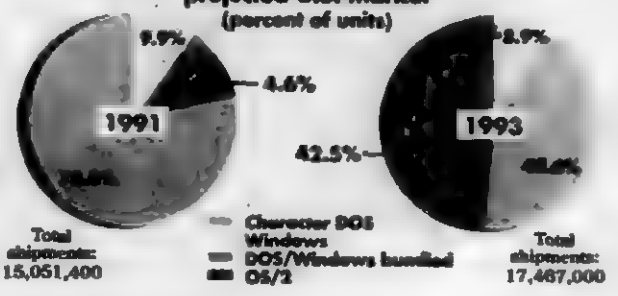
It may be that IBM has finally found the right track for OS/2. But if some recent reports are to be believed, the computer giant will more than have its work cut out for it in its quest to garner a respectable chunk of the desktop operating system market.

Gartner Group, Inc., for example, predicted that Microsoft Corp.'s Windows 3.0 operating environment will capture 41% of the desktop market by 1995. As for OS/2, the Stamford, Conn.-based research firm's report said, that product's market share will be just half of Windows', which means that IBM will not succeed in its efforts to encourage most users to migrate to OS/2 by 1995.

The rest of the market will be distributed across Macintosh (20%), Unix (6%) and DOS (by itself, surprisingly, 10%), Gartner reported.

Time has come?

Shipments of OS/2 are expected to go from being a sliver of the market to more than 42% in two years, one of several analyses said



Source: Workgroup Technologies, Inc.

CW Chart: Janell Genovese

Technology Investment Strategies Corp. (TISC) is a little more pessimistic. Originally, it predicted that OS/2 will have won over just 13.5% of the market by 1994. However, more recently, the Framingham, Mass.-based analysts postulated that 32-bit Windows will chip away at OS/2 sales in the short term, while OS/2 3.0 — also called New Technology 3.0 by Microsoft — will shave off some high-end sales in the long term.

The bottom line, according to the TISC report, is that although overall OS/2 sales will remain as predicted, the mix of IBM's OS/2 1 and 2 generation and Microsoft's OS/2 3.0 will shift in Microsoft's favor during the next five years.

As of March, TISC estimated OS/2's market share at 3% and Windows at 18.9%. DOS owned the biggest chunk, weighing in at 70%. Apple Computer, Inc.'s Macintosh operating system and

Continued on page 53

IBM PS/2 high-end models garner mixed user reviews

BY RICHARD PASTORE
CW STAFF

Six months out of the chute, IBM's Personal System/2 Models 90 and 95 have emerged as qualified successes. Most users seem happy with the reliability and upgradability of the systems, but some question their features and the value of their costly architectures.

The Intel Corp. 1486DX-based Model 95 tower and, to a lesser extent, the Model 90 desktop are IBM's first reasonably successful servers, analysts said.

"The 95 was everything the PS/2 Model 80 was supposed to be and never was," said John Dunkle, an analyst at Workgroup Technologies, Inc. in Hampton, N.H. The Intel 80386DX-based Model 80 has been a laggard in performance and features, making it one of the least successful PS/2s, according to some analysts and users.

Storeboard/Computer Intelligence in Dallas said IBM has sold a total of 3,500 Model 90s and 95s through March 31 via U.S. computer dealers — a respectable if not overwhelming number, analysts said. However, persistent supply constraints are expected to hold back sales through June or July, an IBM spokeswoman said.

Users generally give the machines high marks for durability — a key point because a large percentage of the machines are being used as network servers. Many also point to the systems' upgradable processor complex as a prime benefit.

"I like [the idea of] being able to pull out the current processor and put in the 50-MHz processor when that comes out," said Richard Bigelow, project manager at Pacific Telesis Group in San Francisco. "I don't have to scrap the box or board."

The removable processor board has made for a rapidly expandable line. Last month, IBM unveiled Intel 1486SX versions of the Models 90 and 95 only one day after the chip was unveiled. The firm also revealed plans to incorporate Intel's upcoming 50-MHz 1486 chip sometime in early summer.

Despite trimming list prices 10% to 13% last month, the Model 90's and 95's pricing — ranging from $10,845 to $16,445 — is not as

Continued on page 53

Investing in Tomorrow's Bottom Line



Jerry Barnes, Chrysler Corporation

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Moving application development to a workstation environment allowed Chrysler to use its mainframe resources more efficiently and speed up development cycles by taking advantage of productivity tools not available in the mainframe programming environment. With this solution, programmer productivity improves greatly without a large investment in additional mainframe resources: an important consideration in uncertain economic times.

"The mind-set here a few years ago was, 'why would anyone want to do anything away from the mainframe.' Now, we have over 200 trained COBOL/2 Workbench users."

With the Micro Focus COBOL/2 Workbench, programmers can develop and maintain full-scale CICS/VS and CICS DL/I applications independent of the mainframe in a fraction of the time.

"We quantified the time spent on typical software development activities. We showed how we could make a code change, compile the program, detect an error, correct the error and recompile the program again in less time than it would take someone to logon to the mainframe and submit the first compile. In many cases, the developer would make the change on the PC in two to three minutes, while it could take close to 20 minutes on the mainframe."

Jerry Barnes made his case for Micro Focus COBOL/2 Workbench based on greatly improved productivity. The Micro Focus edit-check-debug cycle, now an industry standard for PC-based programming made a big impact on throughput and costs.

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Std. output paper tray capacity	✓ 100	50
Opt. sec. input paper tray capacity	✓ 500	250
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Bright side, dark side of standards

ON SITE

BY RICHARD PASTORE
CW STAFF

BALTIMORE — Foresight in personal computer network standardization is paying off as the Federal Reserve Bank's fifth district begins augmenting and connecting its 20 local-area networks.

However, there is a downside to the standards effort. Premium hardware platform standards — IBM and Compaq Computer Corp. are the chosen vendors — have placed the budget-tight bank between a rock and a hard place. Many of the users are stuck with older generations of IBM and Compaq systems because the bank's tight budget limits its ability to upgrade to new boxes from those vendors. Cheaper clones are off-limits because they more often fail network compatibility tests.

The bank district, based in Richmond, Va., now operates districtwide applications exclusively on mainframes tied into various branches. But as plans gel this year to migrate districtwide applications off the mainframes through 1992, the LANs will have to be connected in a wide-area network. That is where standardization will have its biggest advantage.

"We established standards from the very beginning to allow us to evolve as we needed without a lot of serious problems," said Roland Costa, end-user services manager in Richmond. "It would have been much more difficult to make the connections without standards."

The standards in question are IBM and Compaq servers and nodes, IBM's Token Ring network topology and IBM's personal computer LAN operating system.

Operating switch

The operating system, however, will have to be changed to Microsoft Corp.'s LAN Manager or Novell, Inc.'s Netware, depending on which is chosen as the standard. "PC LAN was a good starter, but it doesn't have the centralized support capabilities and security we need," Costa said.

Security is the most important element of any network at the Federal Reserve, said Michael Ball, data processing coordinator at the district's Baltimore branch. The office runs sensitive cash distribution services and check reconciliation applications on its LANs for about 176 local banks.

Network standardization is already paying dividends on a more local level. The Baltimore branch recently implemented an optical disc system for much less money than might have been possible with a conglomeration of PCs and network topologies, Ball said.



The optical disc system consists of Panasonic Communications and Systems Co. 5¼-in. drives and jukebox, Intel Corp. Satisfaxion boards and Macro Soft's Macrofiche software. It runs on two separate LANs with its own dedicated servers.

The system, which replaces a microfiche document storage system, will pay for itself in three years, Ball said. It will also save considerable time and paper — where users once had to locate a report on fiche, print it on paper and fax it to a local bank customer, they can now access the report directly from optical disc and fax it to the customer bank right from a PC.

The decision to standardize on IBM and Compaq platforms stems from extensive software compatibility testing, Ball said. Second-tier clones proved to have network software and applications compatibility snags in far more cases than did systems from first-tier vendors.

Yet the relatively steep prices charged by IBM and Compaq leave some bank users stranded. Because of the high prices, the Baltimore branch has not been able to buy as many PC upgrades as it would have liked. "There are [IBM PC] XTs out there that are not meeting people's needs," said Baltimore branch Vice President William Tignanelli. As many as half of the 200 PCs are Intel Corp. 80286-based boxes or below. Servers range from soon-to-be overtaxed IBM Personal System/2 Model 70s and 80s to a single Compaq Systempro.

Part of the problem is the Federal Reserve System's conservative budget. "Incrementally, our budget doesn't grow by a large percent," Tignanelli said.

"It limits our automation growth, but we feel the growth we do manage is worth the investment," Ball added, noting that because of adherence to standards, the bank will not get stuck with a bunch of incompatible and useless PCs.

This may not suffice for long, as the Baltimore branch intends to add central purchasing and other applications to the networks and expand the server load by more than 50 nodes. Budget money will have to be allocated for upgrades or the past investment in LAN technology may be in danger, Ball said.

The budget situation may get better before it gets worse: Despite the bank's efforts to optimize its Unisys Corp. 380 mainframe, the 3-year-old check-processing system is approaching capacity and will require a costly upgrade.

GUI-related products grab attention at Demo '91 show

BY JAMES DALY
CW STAFF

PALM SPRINGS, Calif. — Representatives of nearly three dozen high-technology companies gathered in this desert oasis recently to provide a peek at trailblazing new products.

The mass unveilings — which ranged from multimedia personal computers to an unscheduled glimpse of Borland International, Inc.'s upcoming Quattro Pro for Windows — were the central focus at the birth of Demo '91, a three-day confab organized by Stewart Alsop, editor of the "PC Letter" industry newsletter.

The gathering was designed to rekindle the inventive enthusiasm that marked the early days of the PC industry, Alsop said.

"There is always talk about mergers and strategic alliances, but new products are still the fuel that drives the industry," Alsop said.

Highlights of the show included the following:

• Tandy Corp. became the first company to introduce PCs that conform to the multimedia specifications announced by Microsoft last fall.

• Borland President Philippe Kahn briefly demonstrated Quattro Pro for Windows, which offers a feature similar to the Toolbar in Microsoft Corp.'s Excel 3.0 that allows tools and functions to be easily accessed. The product also includes tabs across the bottom of the screen that can be used to integrate related files.

• Cambridge, Mass.-based On Technology, Inc. addressed the confusion that sometimes results when several people simultaneously tinker with the same document. Instant Update, an application designed for the Macintosh platform, keeps tabs on the work everyone is doing and notifies group members of changes.

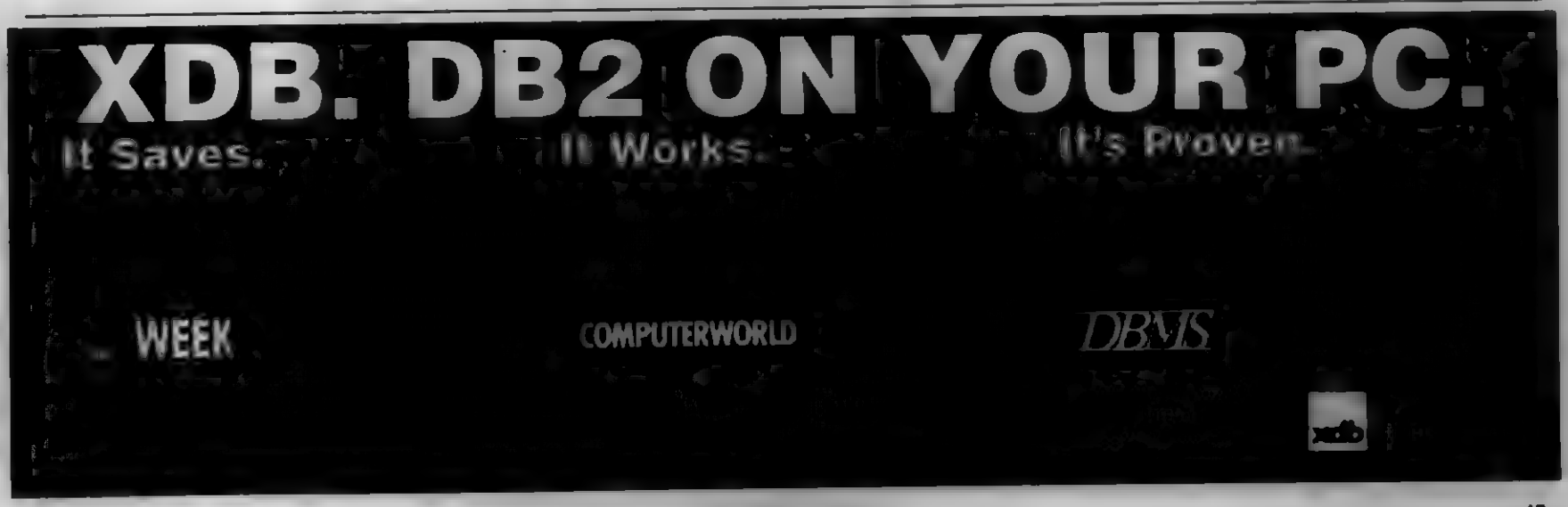
Instant Update, which will ship in June for $495 for two users and $995 for groups of five, will not be available for Windows-based machines for a while.

• Palo Alto, Calif.-based start-up Userland Software, Inc. makes it easier for Macintosh users to customize their software with Userland Frontier, a combination scripting language and object database. The package will be available in October, but no price has been set so far, officials of the firm said.

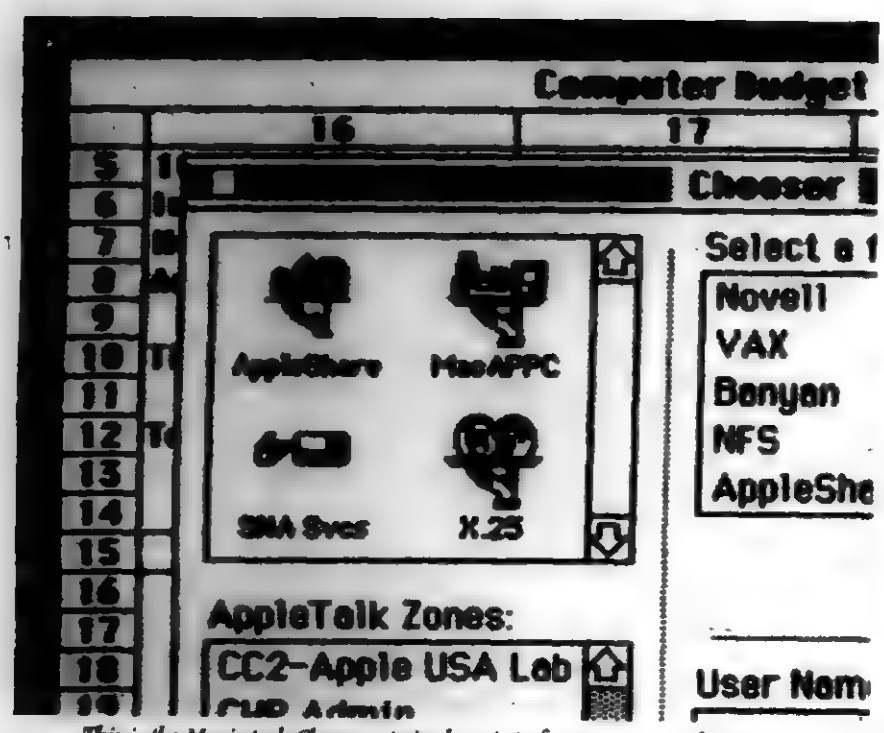
• Users tired of tapping out addresses on envelopes with a typewriter may want to get their hands on Newark, Calif.-based Tidemark Corp.'s Address Express, a specialized printer designed to produce addresses on envelopes at the touch of a button. The setup will sell for $1,195 when it becomes available in the third quarter.

• Hydra Systems, Inc. in San Jose, Calif., demonstrated Hydra One, a PC add-in board that allows Macintosh software to run on a standard DOS machine.

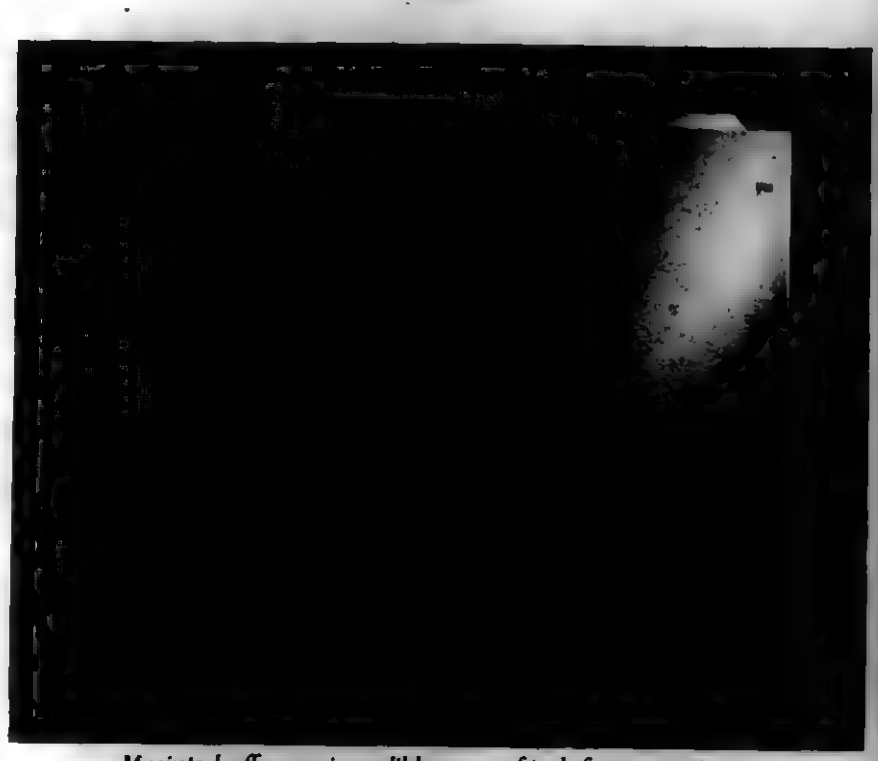
• The Pageahead database publishing package eases the communications problems often associated with the integration of database management systems and desktop publishing setups. The Windows-based application is from Pageahead Software Corp. in Seattle and is expected later this year.



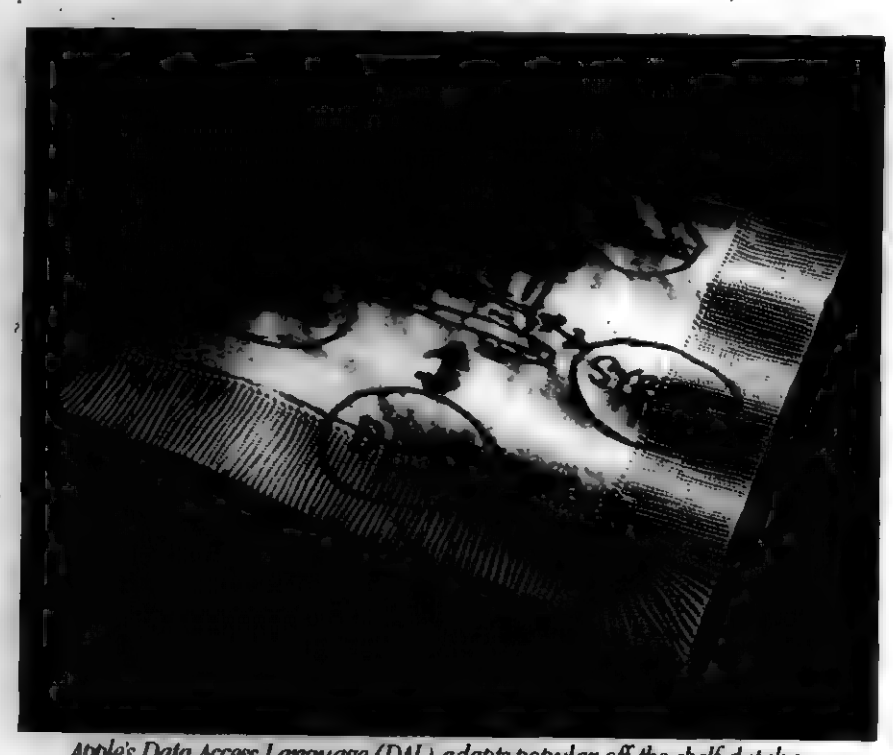
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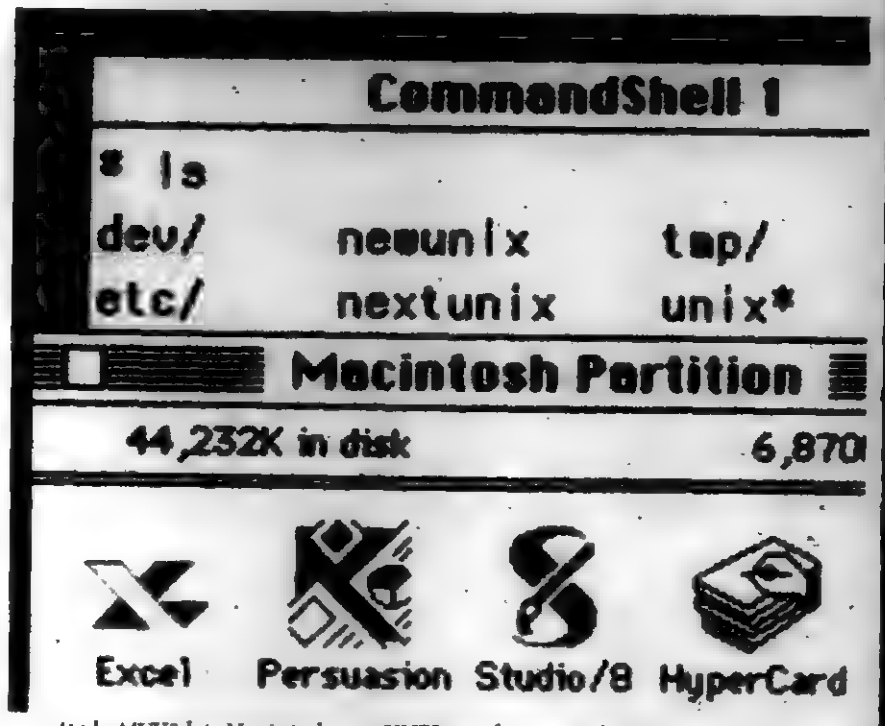
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to anything.



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Eyes on Microsoft databases

Recent programmer hiring spree raises questions on future plans

BY JEAN S. BOZMAN
[illegible]

REDMOND, Wash. — Microsoft Corp. is hiring enough database programmers to create an in-house pool of experts for its SQL Server for OS/2 local-area networks, a product that is developed by Microsoft business partner Sybase, Inc. in Emeryville, Calif., industry sources said.

The recent hiring activity has not escaped the notice of database analysts and competitors, who said Microsoft's in-house database team would be capable of creating "client" database tools that would fit hand-in-glove with Sybase's database server for OS/2 LANs.

"There is some database project going on, but it's been very hush-hush," said David McGoveran, president of database consulting firm Alternative Technologies in Santa Cruz, Calif. "Microsoft has gone out of its way to hire people for a new database group."

Microsoft executives acknowledged the buildup of database experts but firmly stated that the motive was to create database tools within Microsoft's Applications Division.

"Microsoft is in the database server business," said Dwayne Walker, group business manager of Microsoft's Server Applications Group, a part of the firm's Network Business Unit. "You can say that the one thing the Microsoft Applications Division doesn't have is database tools," Walker said.

Devoted to SQL Server

However, Walker flatly denied any possibility that Microsoft's database experts might cook up an alternative to the Microsoft/Sybase SQL Server for OS/2. The SQL Server product, which has been shipping to users for nearly two years, has sold only between 5,000 and 10,000 copies worldwide, he indicated. That volume is far below initial expectations, said industry analysts, who cited the lack of SQL Server tools and applications [CW, April 29].

Walker did acknowledge some recent strains in the Microsoft/Sybase development relationship, stemming from the need to support both 16-bit and 32-bit versions of OS/2.

"We have been pressing them pretty hard to support both flavors of OS/2," Walker said. "We do press them about the things that PC users need, and sometimes they say, 'You need to prove it to us,' but there's give-and-take in any relationship."

Sybase executives agreed with Walker on both counts: The relationship with Microsoft is solid, and Microsoft's beefed-up database expertise is probably going to be used in the database tools and personal computer LAN applications area.

"They're probably hiring database people because of demand for the product," said Stewart Schuster, marketing vice president at Sybase. "I would guess over time they would provide add-on facilities as well. They could write a utility or a front-end tool. Think of SQL Server as a database operating system so that people can add products on top of it in the future."

Microsoft also needs in-house database expertise to provide technical support to customers who buy the SQL Server from the company, Schuster said.

Even if an internal Microsoft LAN database project should take hold, it would not yield viable products for 18 months to two years, industry analysts said.

"They don't have the resources or the time to develop another SQL Server equivalent in the near future," explained Rich Finkelstein, president of Performance Computing, Inc. in Chicago. "That would take many years of development and a different marketing and sales structure than they have right now."

Microsoft had an in-house database project called Omega for several years during the late 1980s, but it failed to produce a commercial product, industry analysts said.

Slow cycle

The development cycle for the OS/2 version of Sybase's SQL Server, which runs on Digital Equipment Corp. VAXs and on many 32-bit Unix systems, is deliberately slow, Sybase said. The newest Sybase relational database management system product, Release 5.0, is due out later this year.

Microsoft is working to port Sybase Release 4.2 to the OS/2 SQL Server platform, Schuster said, while the current SQL Server for OS/2 runs Sybase Release 3.4 code. Schuster said the OS/2 product lag "thoroughly debugs products and new features before we lock them up in a box and send them out to the mass market."

> "THERE IS SOME database project going on, but it's been very hush-hush. Microsoft has gone out of its way to hire people for a new database group."
>
> DAVID MCGOVERAN
> ALTERNATIVE TECHNOLOGIES

Inside that SQL Server "box," there is likely to be a new item, sources within Microsoft indicated late last month. A new, graphically oriented development tool, Visual Basic, is scheduled to be shipped inside SQL Server packages soon, possibly by June.

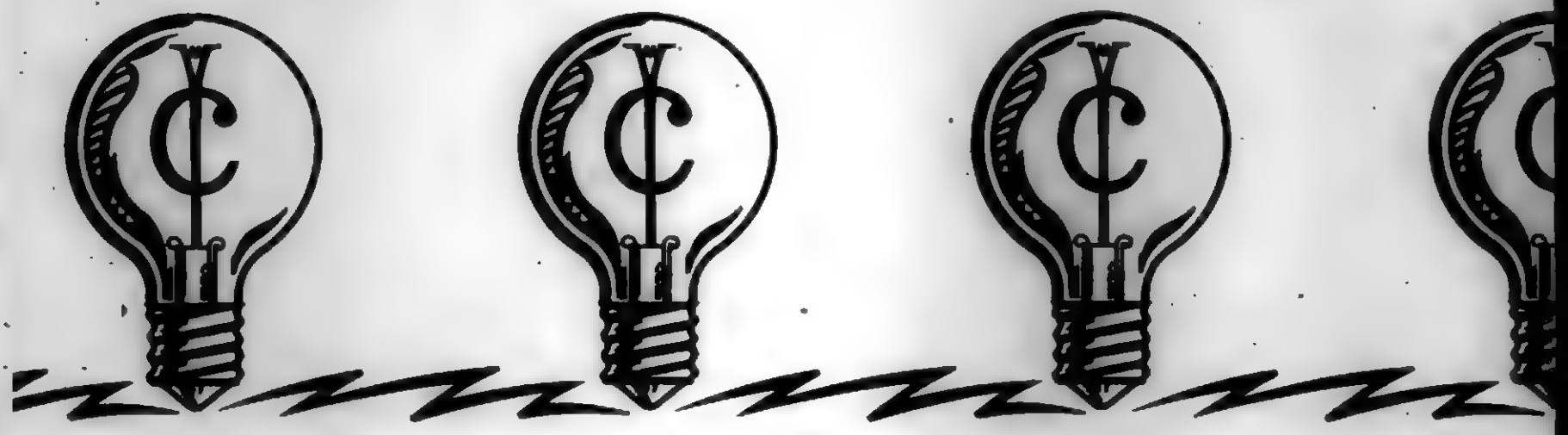
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OS/2 push

FROM PAGE 47

Unix account for the remaining 5.4% and 2.7%, respectively. Gartner Group breaks down 1990 as follows: Windows had a 12% share, OS/2 had 1%, the Macintosh had 10%, Unix had 3%, and DOS had 69%.

Exactly how market share gets divided up in the future could depend in part on whether users are given a clear message about the feature sets and positioning of the 32-bit OS/2 2.0, OS/2 3.0 and 32-bit Windows.

OS/2 2.0 gives IBM a head start in the 32-bit operating system market, but a lot will depend on whether IBM is able to exploit its time advantage with a stable, reliable product. Hampton, N.H.-based Workgroup Technologies, Inc. thinks IBM can.

In a bulletin last month, the research firm urged its clients to "try OS/2 again — for the first time." Calling Release 2.0 "revolutionary," Workgroup Technologies predicted that "1991 will be remembered as the year that the industry bought into OS/2 as a robust, viable operating system" — particularly given that IBM opened up support for other hardware platforms, cut the prices and improved or added support for DOS and Windows applications.

As a result, Workgroup Technologies has adjusted its estimates for both DOS/Windows and OS/2 shipments beginning in the fourth quarter of 1991. In severe contrast to TISC and Gartner Group, it predicted OS/2 will seize a 42.5% market share as early as 1993. DOS will retain a respectable 42.6%, but Windows is expected to wind up with a small 9% market share. Obviously, Workgroup Technologies expects interest in Windows to peak between now and 1993, by which point it will have been left in the dust by OS/2.

A number of variables will determine whether any of these firms' predictions come true, not the least of which is whether IBM delivers on its OS/2 2.0 promises. How Microsoft and IBM solve programming complaints is another variable. Microsoft has a big head start here with the soon-to-be-released Visual Basic for Windows.

Also key is whether IBM will endorse OS/2 3.0 or come out with a portable OS/2 of its own. How users would react to a choice between two portable OS/2s at a time when Unix is expected to pick up even more steam is, of course, another factor that will affect the market.

IBM PS/2

FROM PAGE 47

universally appealing as their upgradability.

"There are a lot of cheaper clones that will do basically the same job," said Steven Mosby, data processing manager at St. Peter's Community Hospital in Helena, Mont. Mosby, who installed Model 90s as servers and nodes, said that in the future, he would consider a 486 clone as a node but prefers the safety of the IBM name for servers.

The Models 90 and 95 also lack some of the desirable features that are built into rival servers. While IBM shops favor the IBM systems, users with no such allegiance are being swayed by the Compaq Computer Corp. Systempro with its disk array and nearly 20G bytes of maximum storage, according to dealers and users. The IBM systems top out at 12G bytes, and the firm does not yet offer a disk array.

The units' standard Extended Graphics Adapter (XGA) has also come under fire and is considered overkill for server implementations, users said.

"XGA doesn't make any sense on the server. You want to shut the monitor off anyway," Mosby said.

XGA would be preferable as an option, allowing customers to escape the premium XGA charge presumably built into the PS/2's pricing, said Fred Zickert, manager of microcomputer support at Eaton Corp. in Cleveland.

Tadpole jumps in with Sparc laptop

BY J. A. SAVAGE
CW STAFF

CAMBRIDGE, England — In its first foray into systems, Tadpole Technology, Inc. will introduce an 18-million-instructions-per-second notebook computer called Sparcbook, which it claims is the first based on Sun Microsystems, Inc.'s architecture.

The $6,000 reduced instruction set computing machine will bundle Ethernet, a send-only fax, a modem, a 16M-byte disk, 8M bytes of random-access memory, a floppy disk, the Unix operating system and DOS emulation, according to Robert Gilkes, chief executive officer at the company.

Packed in a magnesium case measuring 11.8 by 8½ in. and weighing seven pounds, the computer is slated to be available in July. It is initially scheduled to be available with AT&T's Unix System V Release 4.

However, it will not be a full Unix operating system but rather a subset of it, according to Laura Segervall, an analyst at San Jose, Calif.-based Dataquest, Inc. "It's a nice product and close to the right price, but [the Unix subset] will make it appealing to only a limited market."

"We're looking at the corporate market, not the individual buyer," Gilkes said. "The average individual won't spend $6,000 when he can spend $3,000 for an X86-based computer."

Gilkes suggested that the Tadpole machine will not replace desktop workstations, except in Japan, where desk space is at a premium. Instead, it is more likely to be used by a traveling executive to keep in touch with a company's executive information systems.

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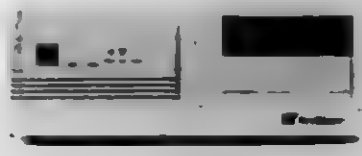
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Additionally, NetBlazer acts as a terminal server or modem pool. It can route Ethernet to Ethernet. And can even use 56K leased lines.

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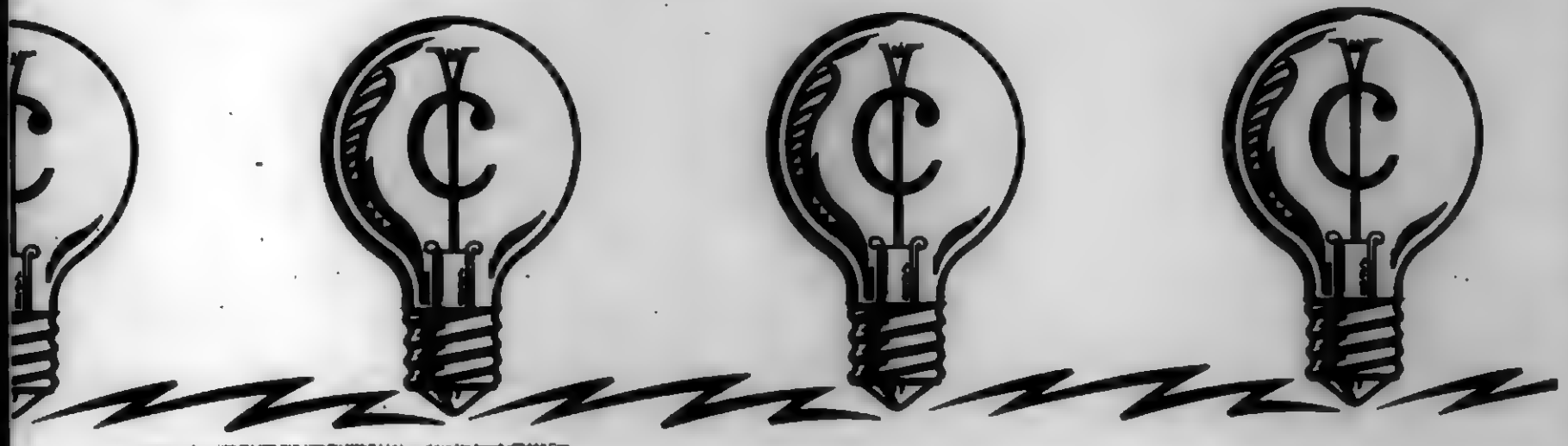
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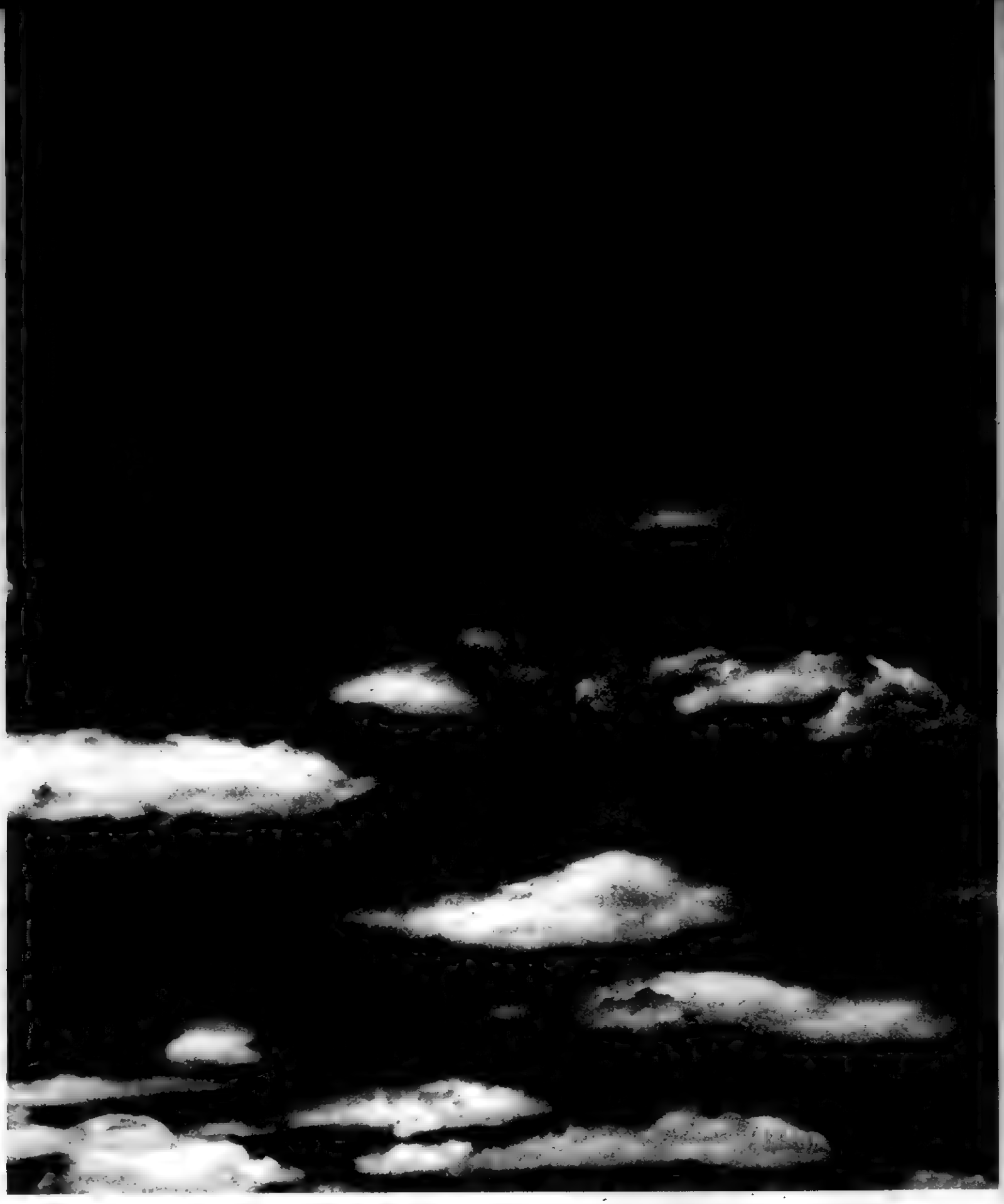


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MICRO BITS

Macintosh-using scientists, engineers unite

The first user association to focus solely on the use of the Apple Computer, Inc. Macintosh in science and engineering was recently formed in Worcester, Mass. Macscitech will draw its membership from a wide range of technical disciplines, including astronomy, chemistry, medicine and physics, according to Chairman Doug Nemura. The group's first conference is scheduled for January 1992 in San Francisco, just before Macworld Expo.

In Hewlett-Packard Co.'s biggest sale of reduced instruction set computing boxes, Mitsubishi Electric Corp. said it will buy 10,000-plus HP workstations, worth more than $100 million. In the contract, which is for less than five years, Mitsubishi will use and resell HP's newest 700 series and the expected follow-on minicomputer using the same chip.

NCR Corp. released its 7054 point-of-sale (POS) system, an Intel Corp. 80386SX-based POS system that runs Unix. The 7054 will support up to 11 workstations in a hub configuration and eight workstations in a star configuration. It can be configured for 1M to 16M bytes of random-access memory and two 16-bit IBM Personal Computer AT bus-compatible configurations. Hard disk options include 20M, 40M and 100M bytes. The system is targeted at the convenience store market. The 7054 is available immediately and will retail between $5,000 and $8,500.



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Fitzgerald

CONTINUED FROM PAGE 47

are appearing. But now come comments like this one from Andrew Seybold, portable computer analyst at Dataquest, Inc. in San Jose, Calif.: "The SX notebook market is going to be the shortest market that ever lived."

What gives here? Is he saying, "Skip the SX, it isn't worth it?"

In a sense, he is. Seybold's comment comes in part from the existence of Intel's 80386SL chip, a version of the 386 chip specially designed for the portable market. It offers better power management, slightly better performance than its 20-MHz SX cousin and the ability to build smaller, lighter weight portable computers for about the same price as the 386SX. This translates to lower costs to vendors, or so the theory goes — vendors shift uncomfortably and mention something about development costs for a redesigned notebook affecting pricing in uncertain ways.

Seybold sees things differently:

"A lot of [vendors] will try to position both the SL and SX in their market plans, but the price pressures on the SX are going to be fierce, and from the indications I have, SLs are going to be less expensive."

THE ELVIS EFFECT struck the SX notebook market the same way it hits the Chicago Cubs every summer: The spirit was willing, but the pieces were lacking.

Seybold hastens to say he thinks SX notebooks will sell and sell well. But he thinks the spotlight now shines on the SL.

The SLs are going to be here soon. Zenith Data Systems led a flurry of SL vendors with machines on display at Comdex/Spring '91, and these machines are promised to ship before Comdex/Fall '91. Of course, that's what a lot of people said about the SX notebook, too, and significant quantities of those are just now shipping. Why should users wait for a new technology when they want portables today? The SL will be a significant advance, but more evolutionary than revolutionary.

Components suppliers will be more ready to meet demand this time around, and the lighter, longer-lived SL addresses the two major annoyances of portable users: weight and dead batteries.

To at least one user, SL might stand for "start leasing." Hyundai Motor America still uses 286-based laptops, but it does not own them. The company leases its laptops "because it gives us flexibility," says Carrie T. Ulvestad, national manager of dealer communications at Hyundai. Ulvestad says portable technology was changing so rapidly that leasing made sense.

With the expected rapid ramp-up of SL models, it may turn out that some of the SX versions announced late last year have, like Elvis, left the building.

Fitzgerald is a *Computerworld* Midwest bureau correspondent.

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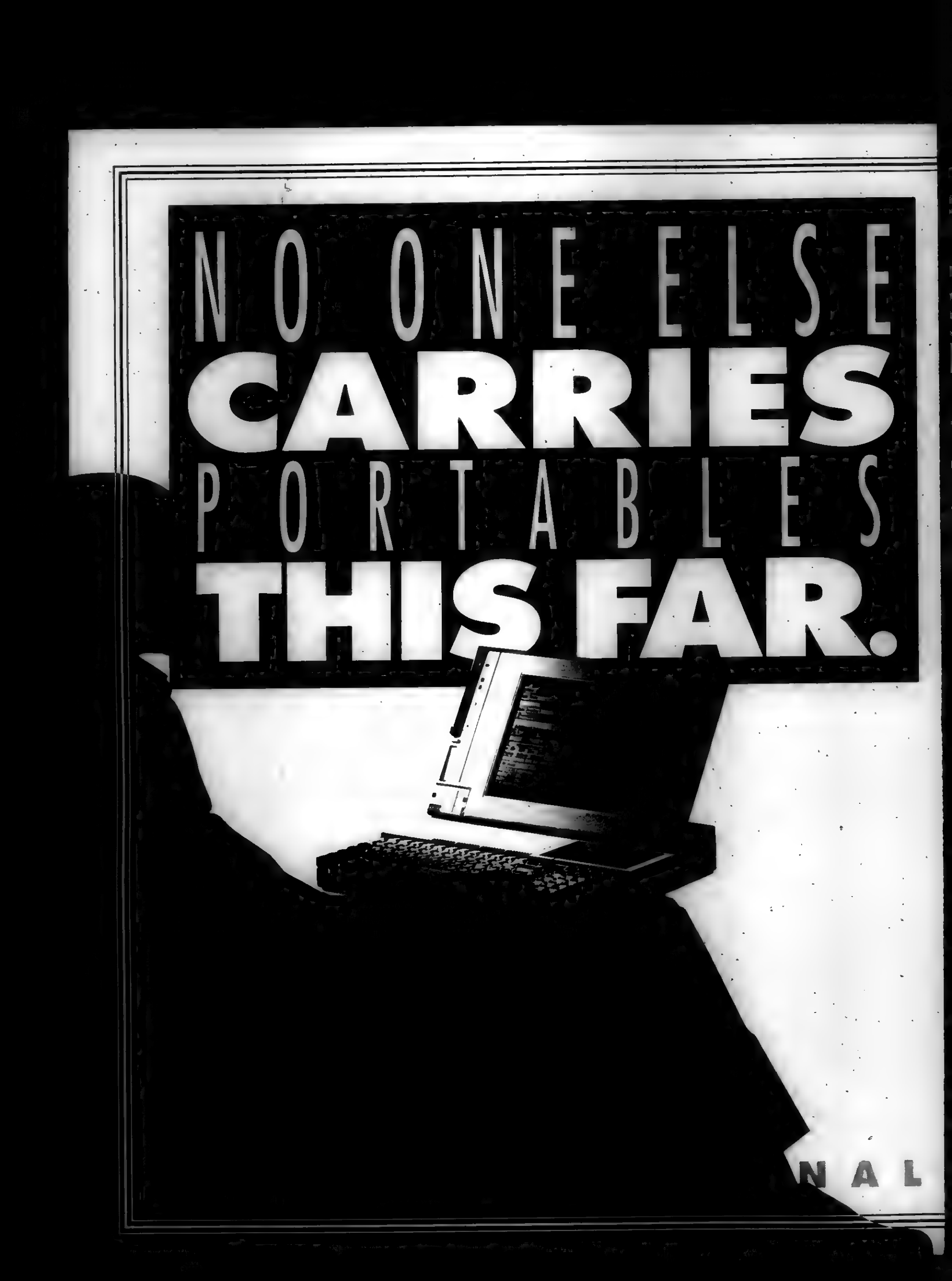
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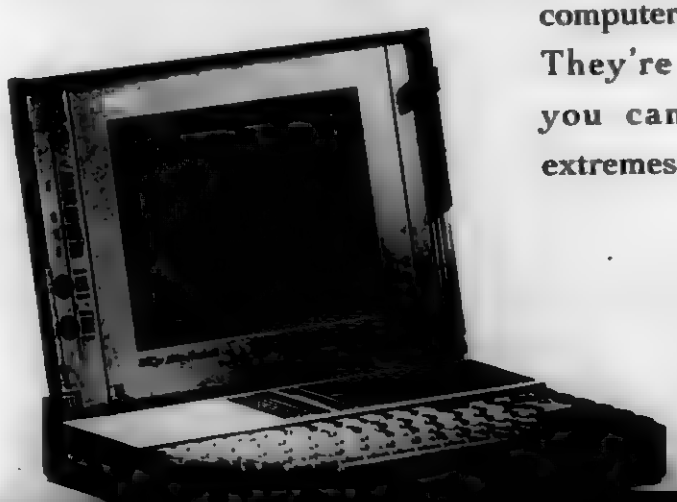
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Everex PC: Strong on design, weak on speed

Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Suzanne Weixel.

Everex Systems, Inc.'s Tempo LX 386SX notebook may not be the most powerful briefcase-size personal computer, but reviewers said it is sturdy and dependable and has a keyboard some desktop systems might envy.

Performance: Running at 16 MHz with a 20M-byte hard drive, the Tempo LX has enough speed to get the job done if you are not in a big hurry. Random-access memory is expandable from 1M to 5M bytes, but the system lacks other expansion options.

Ease of use: The backlit LCD screen can be hard on your eyes, but it refreshes quickly and has good controls. The keyboard has well-spaced keys, and there are dedicated cursor, page-up and page-down keys.

Design: The system weighs a standard 6.9 pounds and is well-designed.

Power supply: The nickel-cadmium battery lasts about three hours for basic data entry tasks but only about two hours for drive-intensive tasks.

Value: If you save your heavy-duty power applications for the office, the Tempo LX's basic features and outstanding keyboard are a good buy, reviewers said. It lists for $2,895 with 1M byte of RAM.

Everex Systems, Inc.'s Tempo LX

Reviews	Performance	Ease of use	Design	Power supply	Value	Score
PC Week 4/1/91	Satisfactory	Good	Good	Good	Satisfactory	Good value
Users						
Tom Sparks, Jettax	■	■	■	NC	▬	Versatile
Analysts						
Bill Lempesis, The Lempesis Report	▙	▬	■	■	▬	Great value

Key: ▬ Very good ▙ Good ▌ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC: No comment. **Infoworld* score based on 1 to 10 ratings

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Eric Zimits, Rauscher Pierce Refsnes	▌	■

Everex Systems, Inc. in Fremont Calif. had gross revenue of $435.6 million and income of $24.5 million in 1990. Ratings were obtained from financial analysts who follow the company

Everex responds

Dennis Jou, product manager:

Performance: For those who require more speed and storage, the Tempo LX is now available in a 20-MHz model with a 40M-byte hard drive. It costs $3,295. With a 60M-byte hard drive, it costs $3,695.

Ease of use: We are working on improving the brightness and clarity of the screen.

AST Exec: Great price/performer but a bit big

AST Research, Inc.'s Premium Exec 38620/SX

Reviews	Performance	Ease of use	Design	Power supply	Value	Score
PC Week 4/1/91	Good	Satisfactory	Good	Good	Good	Analysts' choice
Users						
Bobby Sy, Citizen Watch Co.	■	■	■	■	■	Excellent
Analysts						
George Thompson, Datapro Research	▙	▙	▙	▙	▙	Complete machine

Key: ▬ Very good ▙ Good ▌ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC: No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Rose O'Brien, Pyramid Research, Inc.	■	▙

AST Research, Inc. in Irvine, Calif., had gross revenue of $533.81 million and income of $35.1 million in 1990. Ratings were obtained from financial analysts who follow the company

AST responds

Bret Berg, product manager for portable systems:

Ease of use: We chose the 8½-in. diagonal display because its dot pitch gives crisper resolution.

Design: It is slightly thicker than other notebooks to accommodate a variety of features. The back edge is curved to fit comfortably into the palm of your hand.

AST Research, Inc. packed as much as it could into its Premium Exec 386SX/20 notebook personal computer, reviewers said, sacrificing a little in size but gaining a lot in performance.

Performance: It runs at 20 MHz and comes with a 20M-byte hard drive and 2M bytes of random-access memory, which can be expanded to 8M bytes.

Ease of use: Its IBM Video Graphics Array display can show 32 shades of gray. The keyboard is adequate, with an integrated numeric keypad and good placement of cursor control keys.

Design: You will need a large briefcase to carry the AST. It weighs a bit more than 7 pounds, and the smooth case measures 9 by 11.4 by 2½ inches.

Power supply: The nickel-cadmium battery provides three to four hours of life. Power management features abound, including a suspend feature.

Value: Reviewers said the AST Premium Exec rivals desktop systems in terms of features and performance and is priced on the low side for a notebook PC. It lists for $2,995 with a 20M-byte hard drive, $3,395 with a 40M-byte hard drive and $3,795 with a 60M-byte hard drive.

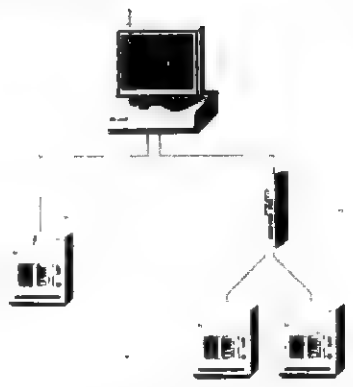
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SynOptics

The Hub Of Client/Server Computing.™

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NEW PRODUCTS

Data storage

An image compression solution for personal computers has been announced by Video and Image Compression Corp.

The Picture Packer software package ($79) offers no-loss compression ratios as high as 5-to-1, or lossy compression up to 30-to-1 rates.

A hardware accelerator board is available for an additional $595. The company claims the accelerator board cuts average image compression time to three seconds. Until April 1992, a $100 rebate will be offered on the purchase of the accelerator.

Video and Image Compression
Suite 235
21311 Hawthorne Blvd.
Torrance, Calif. 90503
(213) 792-1859

Peripherals

Emerson Computer Power, an affiliate of Emerson Electric Co., has announced the Accupower Model 35, an uninterruptible power supply for mission-critical workstations and servers.

The 600 VA, 400W unit includes noise suppression, a light and sound alarm system and 10-minute battery-powered operation. Optional Emerson kits will shut down unattended systems through the Accupower's computer interface connector.

The product costs $599.

Emerson Computer Power
Suite L
15041 Bake Pkwy.
Irvine, Calif. 92718
(714) 380-1005

Future Domain Corp. has upgraded its small computer systems interface (SCSI) peripheral controller kits, which include host adapters and software drivers.



Future Domain's ***SCSI peripheral controller upgrade kits are available on both 5¼- and 3½-in. disks***

The company offers kits for stand-alone personal computers running DOS and for multitasking PC-based networks. The company's Disk Maestro disk management software has added support for new peripherals; OS/2 and Novell Netware 386 drivers are included. Both 5¼- and 3½-in. disks are available, according to the company.

Stand-alone pricing starts at $135. Kits for networked PCs start at $216.

Future Domain
2801 McGaw Ave.
Irvine, Calif. 92714
(714) 253-0400

Extended Systems, Inc. has announced a fax-receiving add-on for the Hewlett-Packard Co. Laserjet IIIP.

The Faxconnection ESI-5010A directs incoming fax transmissions to the Laserjet for plain paper fax output. The product includes an auxiliary telephone jack, allowing fax transmission and receipt over the same line. A 256K-byte memory buffer is standard, with a 1M-byte option available.

The Faxconnection ESI-5010A is priced at $595.

Extended Sytems
6123 N. Meeker Ave.
Boise, Idaho 83704
(208) 322-7575

Systems

Commodore Business Machines, Inc. has introduced two low-end Amiga systems.

The Amiga 500 Starter, targeted toward first-time computer users, is priced at $599, including 512K bytes of random-access memory. A word processor, paint program and flight simulator are packaged with the system.

The Amiga 2000HD Professional is intended for small businesses and costs $1,999. The system comes with 1M byte of memory, a 50M-byte hard drive and several business applications including spreadsheet, word processor and database programs.

Commodore Business Machines
1200 Wilson Drive
West Chester, Pa. 19380
(215) 431-9100

Samsung Information Systems America, Inc. has introduced a line of personal computers that include bundled software.

The Sensor SP 286, a 12-MHz system, offers 1M byte of random-access memory, an IBM Video Graphics Array (VGA) monitor and Microsoft Corp.'s MS-DOS, Geoworks Ensemble, as well as several utilities programs installed on the 40M-byte hard disk.

The 16-MHz Sensor SP 386SX includes 2M bytes of memory and an enhanced VGA monitor, MS-DOS, Microsoft Windows 3.0 and advanced utilities are installed.

The SP 286 is priced at $1,399. The SP 386SX costs $1,995.

Samsung Information Systems
3655 N. First Street
San Jose, Calif. 95134
(408) 434-5400

Flytech Technology USA, Inc. has begun shipping the Carry-1 9000 series of book-size personal computers.

Intel Corp. 12-MHz and 16-MHz 80286-based systems and 16-MHz 80386SX systems are available. Nine- and 10-in. monitors are available as options on all models; the 16-MHz systems include a Super Video Graphics Array display interface. System random-access memory is expandable from 1M to 4M bytes.

The company reported that the Carry-1 9000 desktop sys-

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The best part is that you can get all of this from your existing HP LaserJet printer. To receive a sample fax, and to find the location of your nearest authorized HP dealer, call 1-800-752-0900, Ext. 2296.

tems have the smallest footprint available.

Pricing ranges from less than $400 for a 286-based system with monochrome monitor and floppy drive to $3,000 for a 386SX-based system with 4M bytes of memory and an 80M-byte hard drive.

Flytech Technology
3008 Scott Blvd.
Santa Clara, Calif. 95054
(408) 727-7373

Database management systems

Cincom Systems, Inc. has ported its Supra mainframe relational database management system to several Unix platforms.

Supra runs on IBM's AIX Unix for IBM RISC System/6000 workstations. Licensing for the product is priced from $2,750 to $90,000.

Pricing for Supra on The Santa Cruz Operation's Unix platform ranges from $1,500 to $100,000.

Cincom Systems
2300 Montana Ave.
Cincinnati, Ohio 45211
(513) 662-2300

Expressware Corp. has upgraded File Express, its flat-file database management system.

The source code for Version 5.0 has been rewritten in the C language, significantly improving performance, according to the company. Import/export capabilities are enhanced, and added features include file locking and multiple indexing.

The product costs $99; registered File Express users can upgrade for $39.

Expressware
125 Stella
Duvall, Wash. 98019
(206) 753-3453

Board-level devices

The OS/Ram32plus memory board from Capital Equipment Corp. reportedly adds 2M to 128M bytes of extended and expanded memory to any IBM Micro Channel Architecture-based microcomputer.

According to the firm, the product automatically configures itself for 16- or 32-bit operation and is compatible with all major operating systems. It uses standard in-line memory module chips.

The board costs $349 with no memory installed.

Capital Equipment
76 Blanchard Road
Burlington, Mass. 01803
(617) 273-1818

Software utilities

Stairway Software, Inc. has announced Screenextender 2.0 for Wordperfect Corp.'s Wordperfect.

The utility program eliminates the need to scroll horizontally when viewing Wordperfect documents. It supports six screen display fonts and on-screen underlining, superscripting and character strikeouts, among other options. The program runs in 40K to 50K bytes of random-access memory.

Screenextender is priced at $99.95. Upgrades are available for $30.

Stairway Software
Suite 204
700 Harris St.
Charlottesville, Va. 22901
(804) 977-7770

Data Access Corp. began shipping FlexQL, a SQL-based report-writing software package.

The product reads and writes in file formats from relational database products and spreadsheets from vendors including Lotus Development Corp., Ashton-Tate Corp. and Borland International, Inc. It also imports and exports ASCII files and exports word processor files for mail merges. FlexQL provides accurate page preview for all reports designed, the firm said.

A stand-alone version running under the DOS environment costs $295; a network version costs $595.

Data Access
14000 S.W. 119th Ave.
Miami, Fla. 33186
(305) 238-0012

Software applications packages

Imara Research Corp. has announced Imara Version 2.0, an upgrade of its document imaging software.

Imara uses a filing-cabinet analogy for storage and retrieval of documents. The OS/2-based product, installed on a server, supports client systems running Microsoft Corp.'s Windows 3.0. An optional add-in with optical character recognition capability is available.

A stand-alone version costs $2,495. The network version, for up to 19 workstations, costs $1,995 per node.

Imara Research
Suite 804
111 Peter St.
Toronto, Ontario M5V 2H1
(416) 581-1740

Titus Communications Corp. has announced TitusDOS, a graphical user interface (GUI) designed for slower personal computers.

The product, which runs in 16K of memory overhead, is intended to offer GUI ease of use without requiring hardware upgrades. Menus use public-domain icons. TitusDOS utilities include a calculator, calendar and editor for files up to 61,000 characters in size.

TitusDOS costs $49.95.

Titus Communications
1001 Ross Ave.
Dallas, Texas 75202
(214) 954-0630

Spreadware has begun shipping Spreadware Statistics Menu (Stats), a statistics package for Microsoft Corp.'s Excel spreadsheet.

Stats appears as an option on the Excel menu bar and allows users to generate analysis simply by selecting a target field and any statistical function. Versions are now available for Excel on personal computers and the Apple Computer, Inc. Macintosh, as well as for Informix Software, Inc.'s Wingz spreadsheet.

The product costs $89.

Spreadware
48284 Eisenhower Drive
Indio, Calif. 92201
(619) 347-2385

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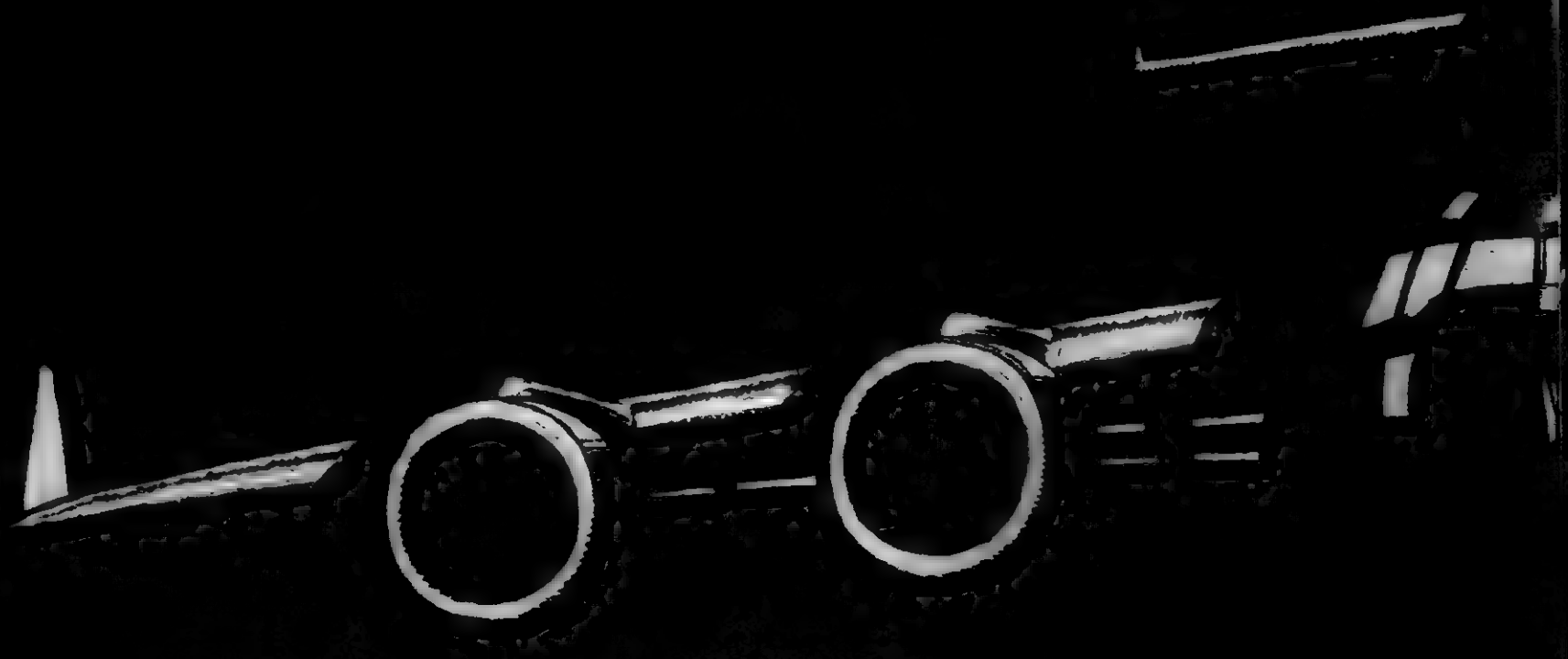
The new HP LaserJet FAX.

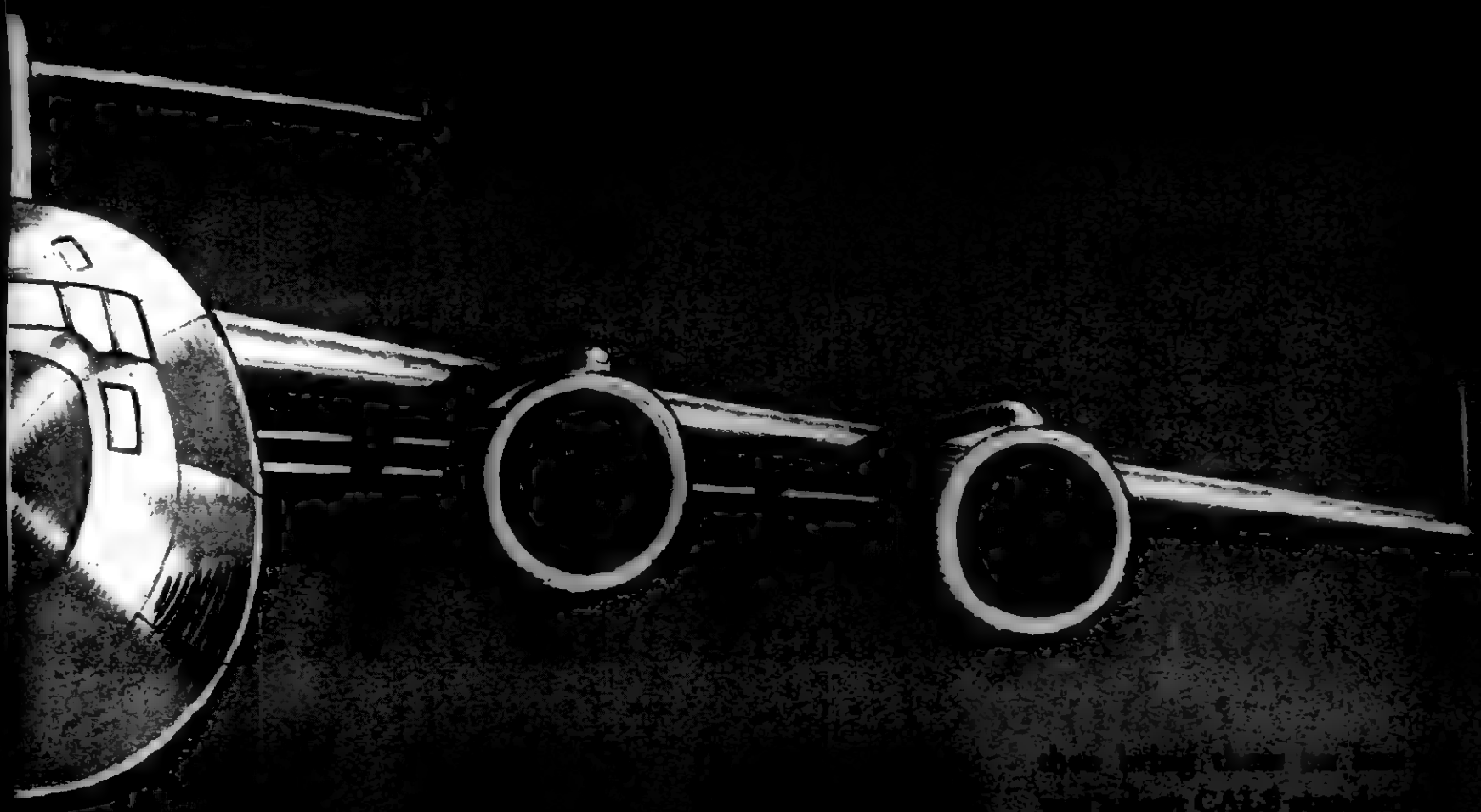
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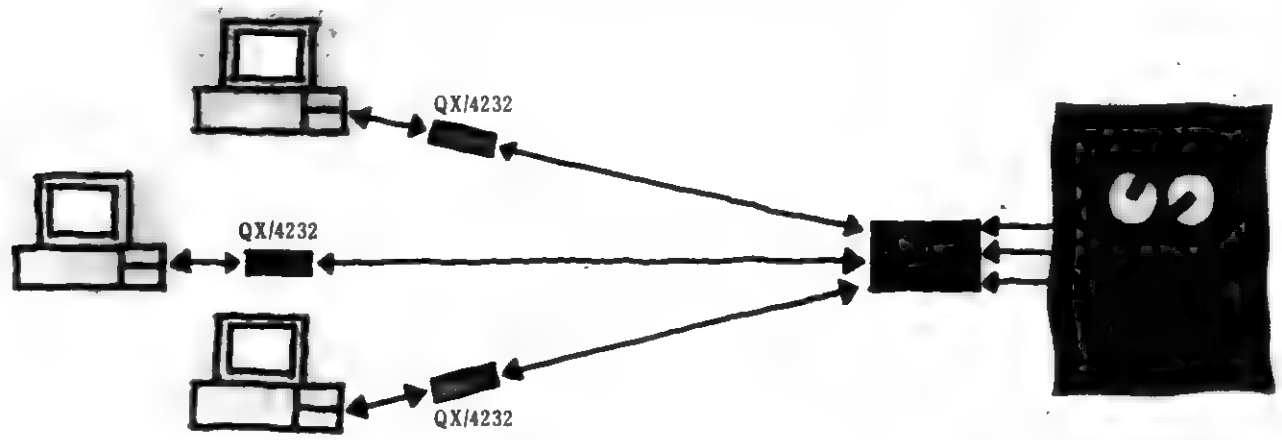




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BIT BLAST

Cabletron unveils gateway

Cabletron Systems, Inc. recently introduced a gateway between its Spectrum network management system and **AT&T**'s Accumaster Integrator system. Cabletron, which already had a gateway to IBM's Netview network management product, said the Accumaster gateway allows users to integrate Spectrum-controlled devices into environments controlled by AT&T's Unified Network Management Architecture. Accumaster is priced at $11,995.

Cabletron also announced an agreement under which it will license **Touch Communications, Inc.**'s Alliance Open Systems Interconnect network management software in a step toward supporting the Common Management Information Protocol. The Touch software will be integrated into Cabletron's Spectrum and Lanview/Windows platforms and into its line of Ethernet, Token Ring and Fiber Distributed Data Interface products.

Unable to adequately support Multinet, a Transmission Control Protocol (TCP) application for Digital Equipment Corp. VAX/VMS users, **Novell, Inc.** decided to end its OEM agreement with the software's developer **TGV, Inc.** Multinet connects VAX/VMS users to TCP networks and, until April 29, had been sold by Provo, Utah-based Novell. Santa Cruz, Calif.-based TGV said **Excelan, Inc.** had licensed the software in 1988, before it was acquired by Novell in 1989. A spokesman for TGV said supporting Multinet can be difficult because resellers have to know TCP, VAX and VMS systems very well.

Newspaper takes step into the LAN age

ON SITE

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — It was like running out of gas on the last lap of the Indianapolis 500: On election night at *The Washington Post*, the computer system used by editors and reporters to put together the morning edition went down for two hours.

Never again, said the *Post* after that 1988 debacle, and the untimely outage set in motion a sweeping overhaul of the newspaper's systems and networks.

The *Post* was lucky the failure did not last longer. The system had originally been supplied by Raytheon Co., but Raytheon had exited the business after selling just one, and the *Post*'s Tandem Computers, Inc. processor ran a modified and unsupported version of the Guardian operating system. At least there was no network to troubleshoot; reporters' and editors' dumb terminals were hard-wired into the Tandem processor.

"We asked, 'How can we get out of this situation?' We needed to keep the operating system pure, and we wanted to be on a mainstream system," said Elizabeth Loker, vice president for planning and advanced systems and the person guiding installation of the *Post*'s new system.

Meanwhile, reporters, many of whom had personal computers at home, were demanding the same capabilities at work. "They saw big, 10-year-old terminals in the newsroom, and all they could do was type a story," Loker said. With the move toward more open systems, it seemed time to also embrace networked systems.

The solution: 700 IBM Personal System/2 workstations and servers running OS/2 and LAN Manager attached to a Tandem Nonstop TXP computer via IBM Token Ring networks. To avoid any more election night disasters, each hardware component — main processor, gateway, bridge, server and the network itself — will have a twin for backup.

Sacramento, Calif.-based System Integrators, Inc. won a contract in 1990 to make it all happen. System Integrators will replace proprietary terminals with Intel Corp. 80386-based PS/2s and will provide applications software for writing, editing, messaging and related functions distributed across the Tandem host, the network servers and the individual workstations. The company is also installing the network.

The Tandem host connects to dual, 16M bit/sec. Token Ring backbones via gateways that convert Tandem's Ethernet-based communications protocols to those needed for Token Ring. The backbones will attach to 13 4M bit/sec. Token Ring sub-networks as well as to an Amdahl Corp. mainframe that holds the *Post*'s library and archive system. The subnetworks are assigned to different editorial departments, and they allow network failures to be localized and isolated.

Loker calls the subnetworks "dumbbells," with one bell holding workstations in the *Post*'s fifth-floor newsroom and the other bell holding servers and

Continued on page 74

The Washington Post

To the post

The Washington Post is launching a network that includes the following:

- 700 IBM Personal System/2 Model 70 workstations and PS/2 Model 80 servers.
- OS/2 and LAN Manager.
- Connection to a Tandem Computers, Inc. Nonstop TXP host via IBM Token Ring networks, including a 16M bit/sec. backbone.

CW Chart: Doreen St. John

LANs grow with groups

BY CHRISTOPHER LINDQUIST
CW STAFF

LA JOLLA, Calif. — Personal computer-based local-area networks are growing in size and number, with a large portion of that growth showing up in a narrow range of industries.

A study by Computer Intelligence, a market research firm based here, examined the penetration of large PC LANs within specific industry segments and found that while certain groups held significant percentages of the large PC LAN total, the actual percentage of organizations within those groups could be quite small.

This is partially explained by the tendency of some industries to be very work group-oriented, according to Dan Ness, an analyst at the firm.

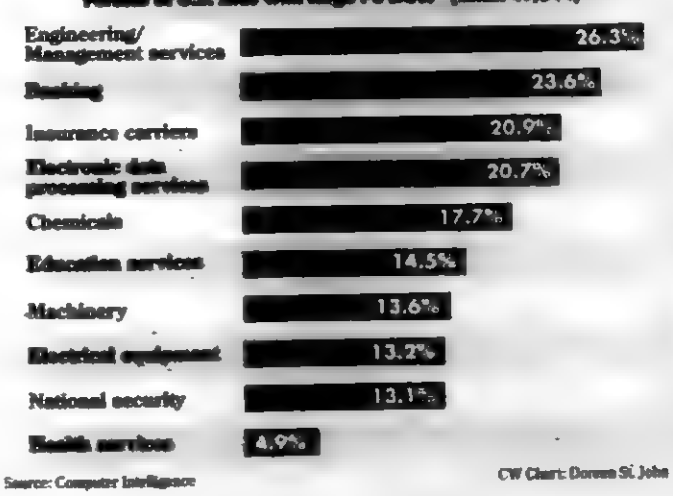
For example, while large health services organizations owned 4.3% of the large PC LANs, only 4.9% of them actually had a large LAN. Conversely, large engineering/management services, a more group-oriented sector, contained 4.9% of the total number of large PC LANs, but penetration was much deeper, with 26.3% of the firms having large LANs.

The report looked at 82 industry groups divided into three categories by size: less than 100 employees, 100 to 499 employees and 500 or more employees. Nearly half of the PC LANs with 100 or more PCs fell into 10 industry classifications in the largest group.

In poor health

The health services sector shows the lowest penetration of large PC LANs with less than 5% at a time when several industries exceed 20%

PENETRATION OF LARGE PC LANS
Percent of U.S. sites with large PC LANs (Total: 49,344)



Source: Computer Intelligence

CW Chart: Doreen St. John

European strategies unfold

Carriers move to prepare for 1992 open market

ANALYSIS

BY ELISABETH HORWITT
CW STAFF

European carriers are putting a lot more effort of late into satisfying their international customers to position themselves as hubs for the open European market of 1992.

The market for trans-European network services is growing rapidly. Businesses are expanding their European presence and setting up systems and networks to support such applications as distributed inventory and sales reporting.

A number of companies are moving to minimize the need for an information systems presence at various European sites by establishing telecommunications links between those sites and centralized applications at the home data center.

The financial company Credit Suisse, for example, already has an extremely centralized organization, with 1,200 electronic data processing people in its Zorich headquarters, and is thinking of further reducing its international technology centers, according to Oscar Gemach, a senior manager of IS at the firm.

"At least three companies I know — big ones — are concentrating their European IS into one data center," said Thomas Koehler, head of the service group of Andersen Consulting in Germany.

Long accustomed to enjoying

Continued on page 70

1979 *Built the first commercial private packet network.* 1980 *Created the first hybrid network using private and public capabilities.*

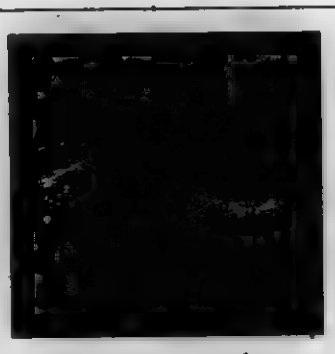
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privately-owned transatlantic fiber optic cable completed. 1990 Sprint announces first commercial video services to the Soviet Union. Sprint introduces first nationwide ISDN capabilities.

Software helps company make career change

Keegan uses Close-up software to sell Nutri/System centers and to start up accounting arm

ON SITE

BY JIM NASH
CW STAFF

SAN JOSE, Calif. — When the diet centers it owned were doing well, Keegan Management Co. used its polling software to track cash flow. When the market for fad diets went south with the economy, Keegan used the software to help sell the centers.

Next month, Keegan will use the same communications software, Norton-Lambert Corp.'s Close-up, as a key feature in its new accounting business, Matthews Accounting, Inc. Two years ago, the company owned 75 Nutri/System, Inc. weight-loss centers across the country and was valued at $30 million, according to Barry Matthews, vice president of finance at Keegan.

At that time, Keegan was at its apex, buying and managing independently owned and franchised centers. Chip Stimpson, information systems manager at Keegan, was hired to bring order to the chain's financial reporting.

"Most of the stores didn't have cash registers," Stimpson said. "They had cash boxes and deposited money in the bank by hand."

During Nutri/System's heyday, the stores were each bringing in an average of $30,000 plus per week, Matthews said.

Learning patience

Keegan, on the other hand, is nothing if not a company of vigilant certified public accountants, Matthews explained. It was frustrating for the company to wait as long as two weeks to get weekly cash flow reports from the centers.

"Our mandate was to get snapshots of the financials every day without making 75 phone calls. We looked at setting up a wide-area network but decided not to," Stimpson said.



Network systems, it was decided, were too expensive to operate for only nightly information uploads. Support appeared problematic, too, especially for centers in areas such as Iowa and Kansas, he added.

Keegan opted for an IBM Personal Computer-based system using Close-up for automatic dial-up and dumping of information on the company's IBM Personal System/2 Model 50Z. Stimpson said Quickday — point-of-sale software from FDC, Inc. in Nashville, Ky. — collects customer information and stores financial data on PS/2 Model 30s. FDC also produces a data compiler and analyzer called Qcorp on the Model 50Z.

Much has happened, however, since the 1980s, when weight-loss businesses flourished, Matthews said. Congress investigated health risks associated with unsupervised commercial diets. Nutri/System was hit with a still-pending class-action suit charging that its program damaged dieters' gallbladders. Then came the recession.

Matthews said Keegan has sold all but 12 of the centers and is preparing to unload those as well. Close-up helps the company figure out a fair price for each center being sold by allowing Keegan managers to see exactly how each store did in sales the day before. "A store can go from a star center to a dog center in a week," Stimpson said.

As the dieting business dies down, Matthews is working to prepare the debut of Matthews Accounting. The new accounting firm will target small to medium-size companies. Keegan is being transformed into a shell company.

Affordable accounting

Telecommunications may help give birth to a new line of services for accounting firms. Keegan is preparing to open an accounting subsidiary that will automatically collect monthly financial reports from small and medium-size companies over asynchronous telephone lines.

Matthews Accounting, Inc., scheduled to open next month, will use Norton-Lambert Corp.'s Close-up software package to send operational accounting reports to Matthews' IBM PS/2 Model 50Z. The information is used for basic business processes such as accounts payable, payroll and general ledger.

A finance director ordinarily does this accounting, but in smaller firms, hiring a $60,000-per-year employee to organize finances is prohibitive, said Barry Matthews, vice president of financing at Keegan. Accounting firms would have to charge anywhere from $60 to $200 per hour to do the monthly work, which also makes owners of modest businesses sweat.

Matthews, who will be president of the new accounting firm, said it is much more affordable for a company to contract out the work if the process of collection is automated and standardized. He said the monthly uploads will be examined for completeness and stored for use later in a formal audit completed by Matthews or another firm.

Matthews said he will not vouch for the information's accuracy, and companies will be responsible for providing IBM PCs or compatibles to run Close-up and Solomon III accounting software from TLB, Inc. in Findlay, Ohio.

JIM NASH

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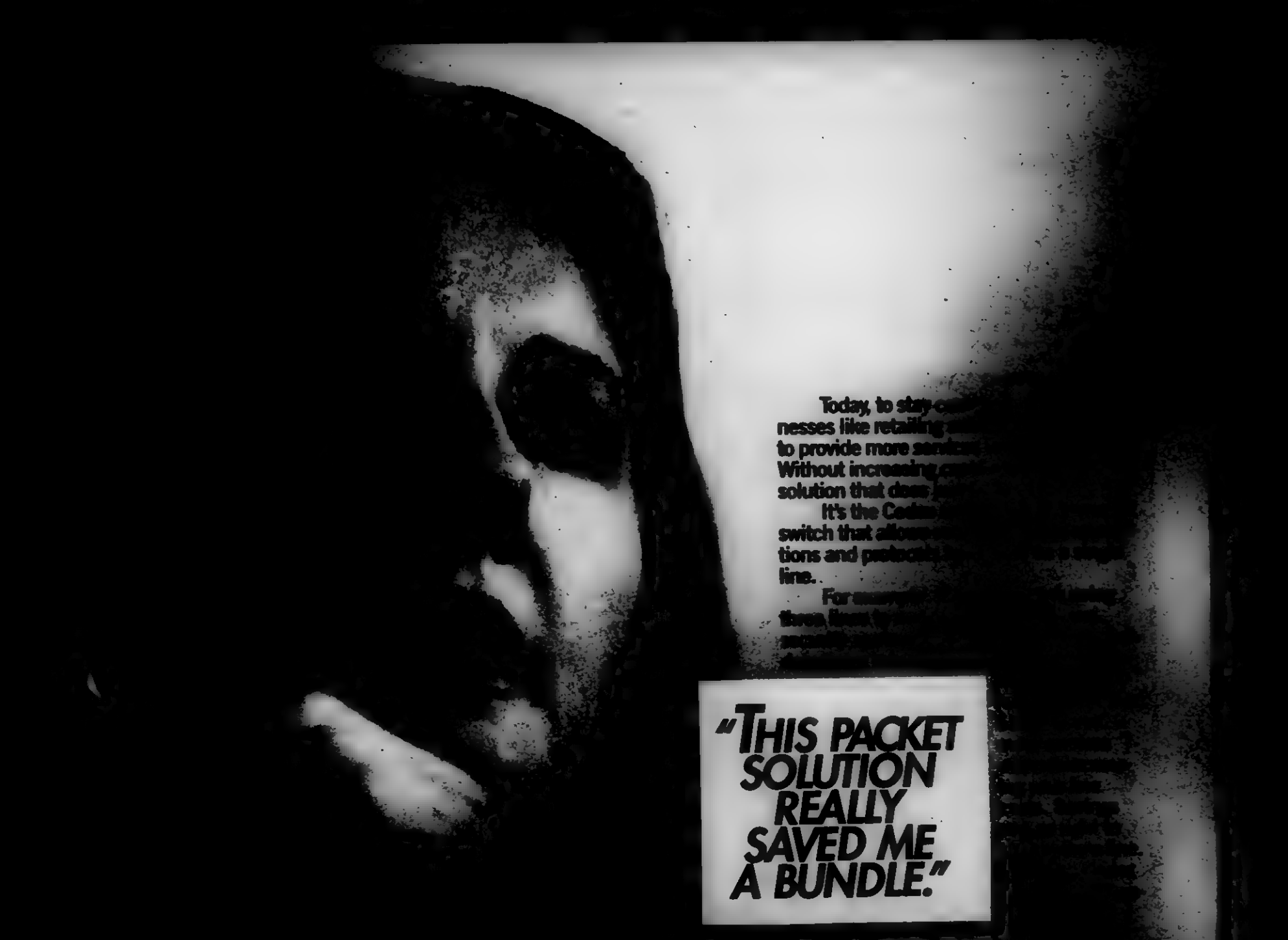
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USERS' The Codex 6525 was voted "Best Equipment" in Data Communications magazine's recent X.25 user survey.

European

FROM PAGE 65

the privileges and trouble-free existence of a monopoly, the European Postal Telephone and Telegraph authorities (PTT) are waking up to the fact that they must compete with one another to get a slice of the expanding multinational networking pie.

U.S. firms tend to pick one or two countries as communications hubs for all of their European sites. Their choice often depends on which PTT gives them the most attractive combination of services and rates. This puts PTTs such as Germany's Deutsche Bundespost, which has been slow to lower international tariffs, at a disadvantage against carriers such as British Telecom PLC and France Telecom, which have been more responsive to U.S. users' pricing demands.

Deutsche Bundespost is aware of the need to lower prices but is somewhat hampered by its responsibility to help fund the upgrade of eastern Germany's telecommunications infrastructure, according to company spokesman Lorenz Moosmuller.

Both U.S.- and Europe-based multinational companies have increasingly looked to value-added network companies with worldwide presence to put together their international networks. To many multinationals, it makes sense to have one firm deal with various foreign carriers and find the source of problems when they occur.

PTTs have reacted by setting up value-added connections and one-stop shopping agreements with major U.S.-based international carriers and value-added networks. The most aggressive moves of late have been made by Belgium's Regie des Telegraphes et Telephones (RTT). Recent initiatives include the following:

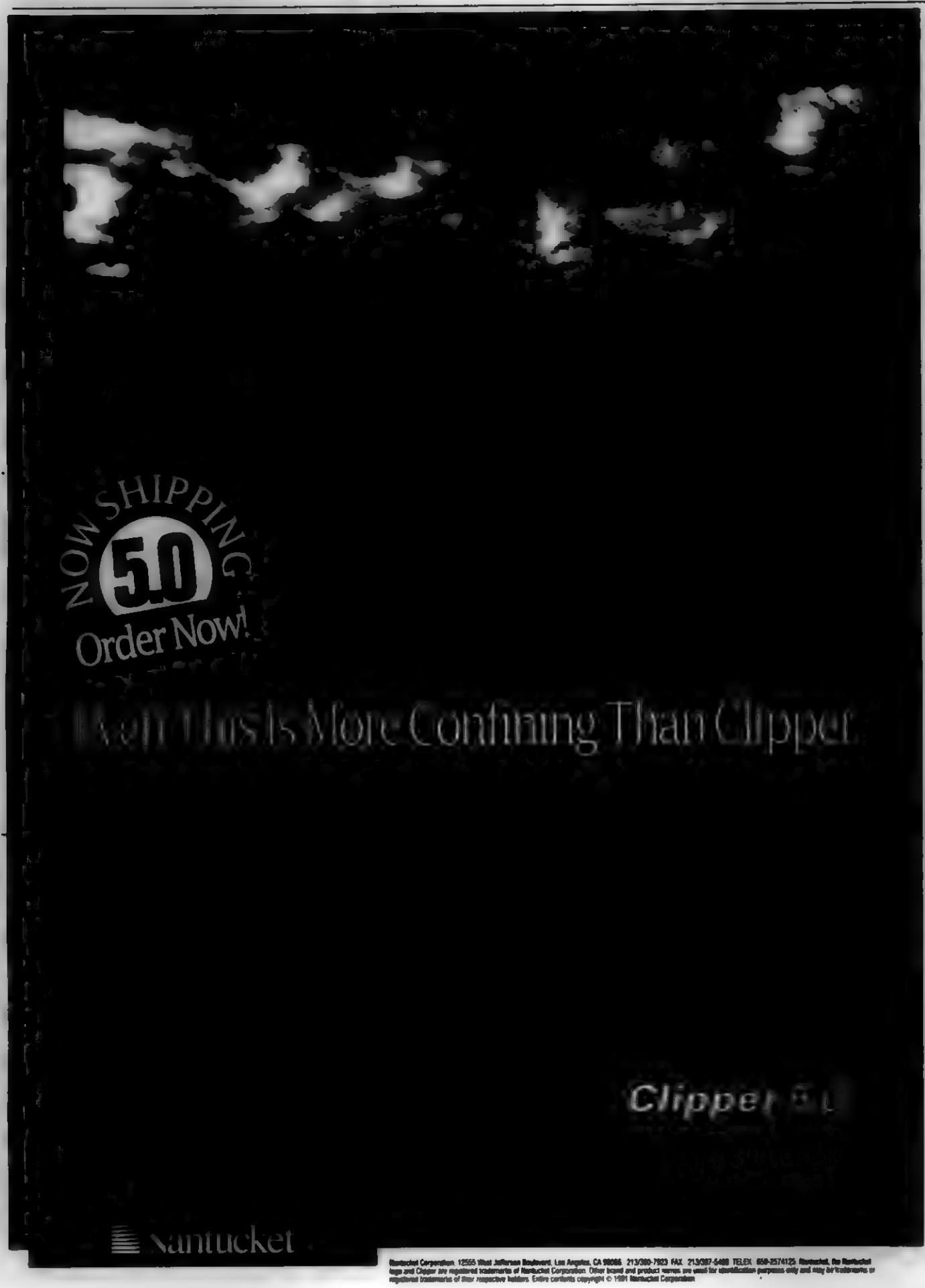
- Legislation to make the RTT a "public autonomous enterprise" with greater control over its own budget and competitive strategies. The idea is to give the Belgian carrier the flexibility to compete more effectively with private companies in the European telecommunications market. France's administration initiated a law this year that does approximately the same thing for France Telecom.
- A bilateral agreement signed with AT&T last September to provide global Software Defined Network Services, CCITT X.400-based interconnection of electronic mail services and one-stop shopping.
- A similar agreement signed with U.S. Sprint last March.
- A second international gateway to provide customers with redundant backup links.
- Investment in an undersea fiber-optic cable joining the UK with the European continent via Belgium.

Aggressive competition

Several of the less advanced PTTs have launched marketing campaigns this year to show how aggressively they are moving to revamp their networks. Swiss Telecom, for example, announced earlier this year that it would spend more than $10 billion during the next four years on projects such as the digitization of up to 90% of Switzerland's exchanges and complete installation of Integrated Services Digital Network (ISDN) by 1992.

At a gala opening in New York of its first U.S. office last month, Spain's Telefonica de Espana presented itself as the "natural hub of the world" — it is the geographic center of four continents. The carrier plans to have 82% of its trunk lines and 56% of its local lines digital by the end of next year. It is also deploying ISDN and plans to have generally available switched 56K and 64K bit/sec. offerings by July, according to Adolfo Suarez, vice president and general manager at Telefonica USA.

France Telecom, while still a monopoly, has become a leader in Europe when it comes to deploying advanced network services such as ISDN. At the turn of this year, the French Ministry of Postal, Telecommunications and Space enacted laws to further open France to communications from value-added network providers. It also cut France Telecom's economic and management ties to the ministry, leaving the carrier free to use all of its profits to enhance its own services and start new ventures.

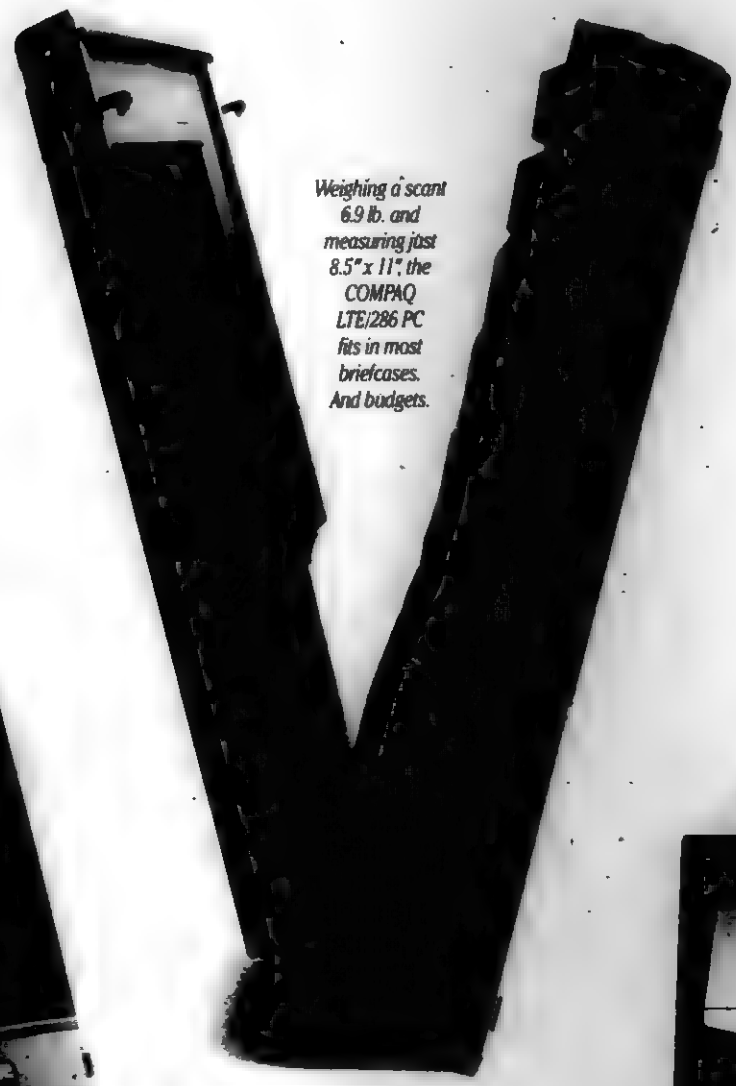


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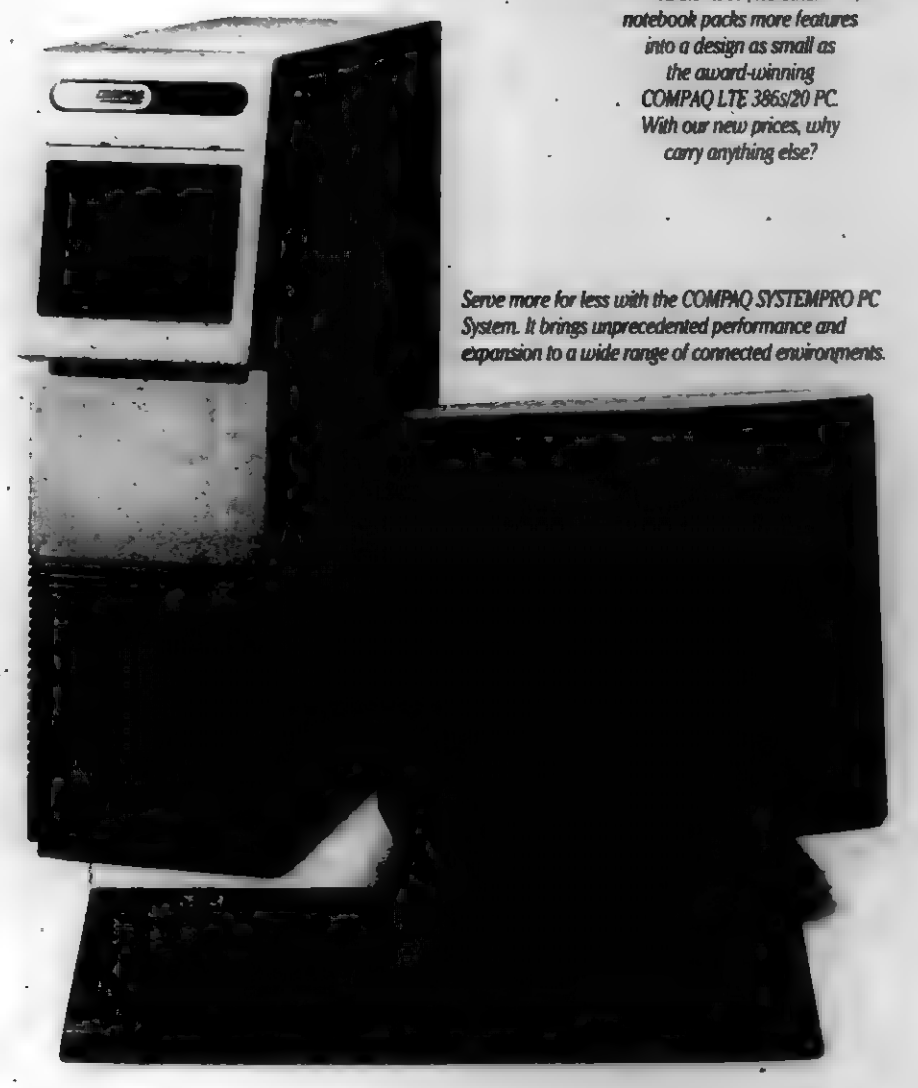


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E-mail tool operates within 1-2-3

BY JIM MARCH
CW STAFF

Electronic mail software is hooking deeper into popular desktop applications. The latest example is Beyond, Inc.'s @Mail, an E-mail program that allows end users to send and receive messages without leaving their Lotus Development Corp. spreadsheets.

Casual users of spreadsheet programs said they see marginal advantage in Boston-based Beyond's "message from home" capabilities. But an analyst briefed by the company said that with 14 million Lotus 1-2-3 users, the product is likely to find several million fans.

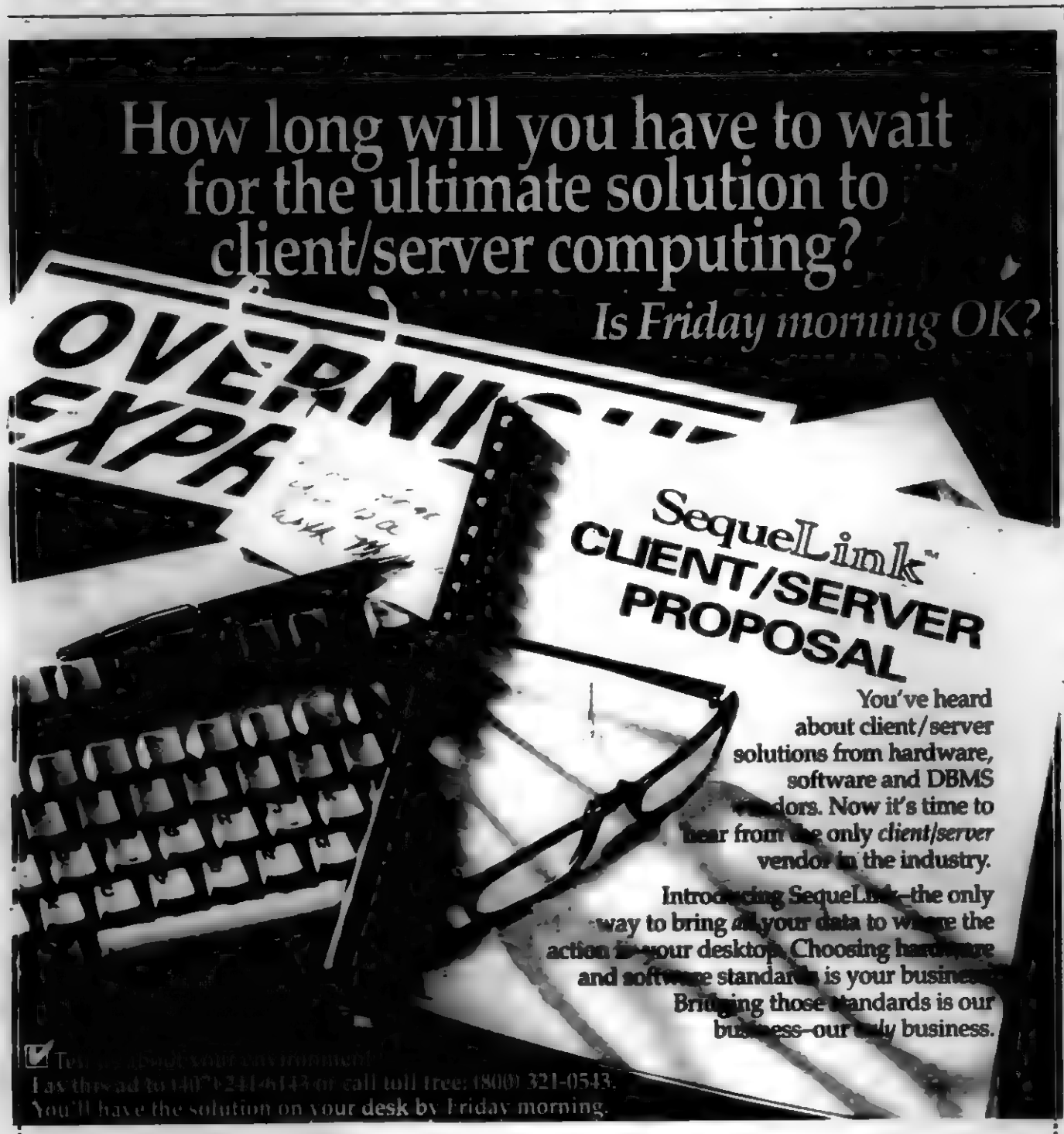
Based on Message Handling System (MHS), codeveloped by Novell, Inc. and Action Technologies, Inc., @Mail not only gives users the capability to send messages from an active spreadsheet, it also allows them to preprogram spreadsheets to be mailed when a specified value is attained on the sheet.

David Atlas, senior analyst for electronic messaging at International Data Corp. in Framingham, Mass., said he knows of no other software package offering this kind of multitasking. Atlas estimated that there are 3 million to 4 million potential users with both Lotus and MHS applications.

However, the software's benefit seems less attractive to users who "don't reside in [their] applications all day long," said Burt Lum, technical specialist at GTE Hawaiian Telephone Co.

Likewise, Jim Beck, manager of electronic messaging at Credit Union National Association in Madison, Wis., said he rarely uses spreadsheet software. Beck said he does not mind having to back out of one program to pick up his mail. Both Beck and Lum agreed, however, that tightening the bonds between E-mail and applications is necessary.

@Mail is scheduled to ship next month. It costs $129.95 for a single license and up to $395 for an eight-user license.



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Newspaper

FROM PAGE 65

bridges in the seventh-floor computer center. The subnetworks will each have 32 PS/2 Model 70 workstations and dual Model 80 servers.

Active news stories reside on the workstation, with the local servers periodically taking snapshots of stories in progress. When the Tandem goes down — about twice each year — reporters and editors will be able to continue working locally. Old and inactive stories reside on the Tandem.

Reporters can dial into commercial news and information services through a "modem pool" attached to the backbone, and they can also tap into a special server on the backbone holding commercial spreadsheet, database and graphics packages. Information and graphics from these sources can be downloaded for inclusion in stories.

Loker said *the Post* will also add a system that can scan incoming wire service stories for keywords and can route stories to reporters and editors based on interest profiles supplied earlier by those individuals.

Reporters at *the Post*'s 17 U.S. bureaus will be able to dial up and go on-line or work locally on their PCs. "We wanted to make the bureaus full citizens," Loker said.

Two *Post* departments will move to the new system on a trial basis this summer. Final implementation is scheduled for mid-1992. Loker declined to disclose what it will cost, other than to say it is "a huge number."

"Putting together a large network with off-the-shelf hardware is not easy," Loker said. But she added that it has gotten somewhat simpler since she abandoned an earlier plan to mix vendors in the network.

"We decided to go all IBM, even though that's more expensive. It's to reduce the number of variables," she said.

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Burnett's network, which was installed in just three days, spans 29 floors to link 1,200 personal computers, integrate an IBM mainframe and provide remote connectivity. In fact, its advanced capabilities earned Burnett the Excellence Award from the Enterprise Networking Institute.

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The Past, Present, and Future of Network Computing.

Interface between T1, WAN in works

BY JIM NASH
CW STAFF

With federal approval for Switched Multimegabit Data Services (SMDS) seen as one year off, five networking vendors have proposed a standard interface between T1 and wide-area network devices.

Regional telephone companies are expected to receive government approval in 1992 to offer multimegabit services linking local-area networks over T1 and T3 lines across metropolitan areas. At least one potential user, however, noted that fiber communications would have to become much more popular before the services would be practical.

The nonproprietary interface introduced last week standardizes the way participating bridges and routers transfer data to and from data service and channel service devices. Data and channel service machines act as digital modems, pushing data over T1 and T3 lines.

The vendors proposing the interface include Ungermann-Bass, Inc.; Advanced Computer Communications, Inc.; Wellfleet Communications, Inc.; Verilink Corp.; and Digital Link Corp. Some of the partners are either involved in or preparing trials with telephone companies such as Pacific Bell Telephone in San Ramon, Calif.

Gary Krall, director of marketing at Advanced Computer, said multimegabit services will offer users flexibility in using T1 lines. Users would only be billed for installation, monthly service charges and use, he said, rather than the full dedicated-line costs whether or not the line is used.

> MULTIMEGABIT SERVICES WILL offer users flexibility in using T1 lines.
>
> GARY KRALL
> ADVANCED COMPUTER

Pacific Bell's multimegabit service project manager, Frank Liu, said users should be encouraged by the proposed standard. Liu said firms will be able to use equipment from all vendors adhering to the specifications. That means more flexibility in purchases, he said, as well as a larger universe of firms that can be contacted over the service.

Only two of the 120 offices of utility Pacific Corp. in Portland, Ore., are likely to have the traffic to justify buying the service, and even they are still wired with 10M bit/sec. Ethernet.

Art King, senior operating system analyst at Pacific, said that until fiber-optic data distribution is more prevalent, the service may find only a small market.

Liu said the new interface will attract some companies with its promised management of bridging, routing, T1 and T3 devices.

John DeVries, line manager for networking products at Micom Communications Corp., a competitor for the companies in the SMDS standards effort, played down the short-term impact of the proposed standard.

DeVries said the five companies involved are aiming at Fortune 500 firms. Micom markets Marathon, a tool for connecting LANs and WANs over 9.6K and 56K bit/sec. lines. DeVries said the larger market of medium-size companies is unlikely to make the jump to T1 lines because of this agreement.

ELS Netware licensed to Anthem's Eagle Technology

Company plans few changes for Level I software

BY JIM NASH
CW STAFF

PROVO, Utah — Having consolidated all of its low-end networking products into Netware 2.2, Novell, Inc. has decided to license its most basic product, ELS Netware Level I, to a business unit of Anthem Electronics, Inc.

For an undisclosed amount, San Jose, Calif.-based Anthem will license ELS Netware Level I, reselling it through the distribution company's new manufacturing unit, Eagle Technology. The move will have little impact, according to managers of ELS networks. Level I networks typically have four users.

Eagle plans to produce copies of the software, to be called Netware Starting System (NSS), without updates of its own, said Ken Lamneck, Eagle's vice president and managing director. Ladd Timpson, product line manager for Novell's Netware 2.2, said his company plans few changes for ELS Level I as a component in Netware 2.2.

NSS is available now and is bundled with coaxial cable T-connectors and two Ethernet adapter cards, which are also licensed from Novell. NSS will work only with the licensed cards and costs $995 with Eagle's relabeled NE 1000 adapter card and $1,155 with an IBM Micro Channel Architecture-based version.

Tommy McJunkins, president of McJunkins Tire Center in Monroe, La., said the news had little impact on his networking plans. "If my dealer can continue his level of support, I don't care where [ELS] comes from," McJunkins said. "Novell has been extremely good at improving the software and keeping the dealer up to date on the product."

He said as long as support does not suffer and improvements are made, he will be satisfied with the product. "I don't expect Novell to leave us high and dry. I don't think that they can afford to."

Ch



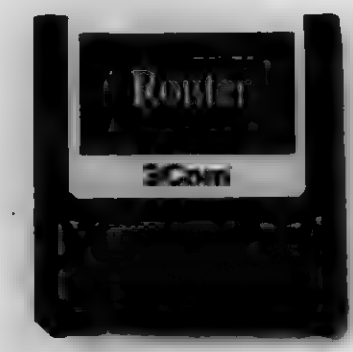
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Online NCS completes Chipcom puzzle

BY CHRISTOPHER LINDQUIST
CW STAFF

SOUTHBORO, Mass. — Chipcom Corp. recently announced what it is calling the "final piece of the puzzle" for building and managing its fault-tolerant networks.

The Simple Network Management Protocol (SNMP)-based Online Network Control System (NCS) reportedly allows users to manage and reconfigure a Chipcom network or group of networks using software rather than hardware.

For example, network managers using the product could reassign individual Ethernet or Token Ring connector modules to any of three logical networks within a Chipcom concentrator to balance traffic loads, without having to go to a wiring closet and change cables.

This is possible because Chipcom concentrators use the firm's Trichannel architecture, which allows up to three networks to be run simultaneously in a single concentrator. "Because Synoptics [Communications, Inc.] and Cabletron [Systems, Inc.] don't have multiple Ethernet buses in their hubs, they can't do this," said Michael Howard, president of Infonetics Research Institute, Inc., a computer research and consulting firm in San Jose, Calif.

The system can also be configured to run scripts to perform certain tasks, such as paging the system manager, when specific warnings are received, lessening the need for a full-time operator. Cabletron's Spectrum system was more versatile in this regard than Online NCS but cost a lot more, starting at about $50,000, Howard said. "At the pricing level that we're talking about here from Chipcom, you cannot buy that from Cabletron."

Online NCS was built under The Santa Cruz Operation's Open Desktop environment, which includes Unix System V, an Ingres Corp. relational database management system and the Open Software Foundation's Motif graphical user interface. The point-and-click interface allows network managers to click on color-coded icons within a graphical "map" of the network to zoom in on problem areas. They can also perform actions such as enabling and disabling specific ports in a concentrator graphically.

Online NCS runs on 386- and Intel Corp. I486-based computers. A license to use the system on as many as 12 Online system concentrators costs $6,500. A license for 13 or more concentrators costs $12,500. The product is expected to be available in 60 days.

Escort adapter to link sites to network

EATONTOWN, N.J. — Integrated Services Digital Network (ISDN) equipment vendor Teleos Communications, Inc. recently introduced an ISDN terminal adapter designed to provide primary rate access to high-speed data services.

Teleos is promoting the Escort adapter as a means to link small, remote sites to a corporate network via public switched digital services. Escort is intended to support remote sites dedicated to a single network application, while the earlier Teleos IAP6000 Access Server was designed for use at larger corporate locations with high-volume multimedia traffic. Potential applications for Escort include videoconferencing and private line backup.

Teleos said Escort has been tested for compliance with AT&T Accunet services and that it has an optional integrated channel service unit for direct connection to a T1 line.

Escort is slated for delivery in June for $5,900 per unit.

In another recent development, Teleos acquired Vadis, Inc.'s personal computer adapter product line. Vadis exited the ISDN PC adapter card market last June, reportedly because the market had reached only 10% to 15% of the company's expectations. Vadis' equipment is IBM Micro Channel Architecture-based and should thus complement Teleos' existing IBM Personal Computer XT/AT-compatible adapter.

Supernet aids super users

SAN DIEGO — Providing a pit stop of sorts for users of high-speed computers, a group of vendors is backing an information exchange for this elite systems community.

The vendors are joining together to take part in what they emphasize is a noncommercial forum presented through a monthly technical journal and an on-line bulletin board.

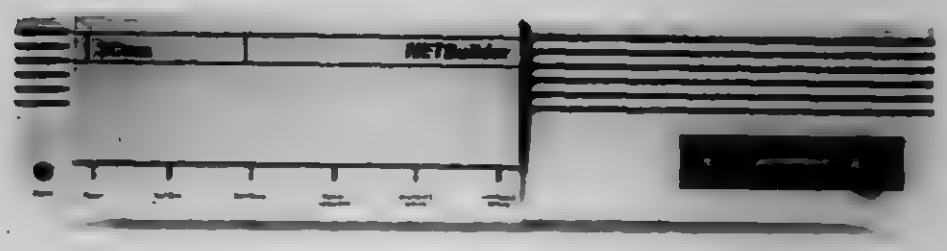
Called Supernet, the forum will first appear in *Supercomputing Review Magazine*.

Supernet will contain free information listings and services, as well as provide information on research projects, job listings, user feedback on software and hardware and listings of user-group meetings.

Sponsors are high-performance computing firms, including Alliant Computer Systems, Corp., Convex Computer Corp., Cray Research, Inc., Digital Equipment Corp., IBM and Intel Corp. Plans for Supernet call for creation of an on-line electronic mail version of the forum and an international directory of high-performance computing users.

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McData controller to sport swap-in, swap-out design

BY JOANIE M. WEXLER
CW STAFF

BROOMFIELD, Colo. — Channel-attached and remote host controllers will soon be graced with the investment-protecting modular design that is madly fueling the intelligent wiring hub market.

McData Corp. said it will announce today a controller family, slated to ship June 3, that adds Ethernet and Token Ring integration, multiple host support and peer-to-peer communications to the traditional 3270 terminal cluster controller functionality of its previous generation 4174 IBM host-compatible controller.

McData's Linkmaster 7100 Network Controller allows the customer to buy a chassis and change its character by swapping boards in and out — an investment-protection play that has until now evaded the IBM channel-attached networking environment.

McData's 7100 could usurp IBM's 3174 Establishment Controller in price and features, according to users and analysts. Jeffrey Whitlow, a telecommunications systems engineer at First Colony Life Insurance Co. in Lynchburg, Va., said he has been beta-testing the 7100 because his company's applications are driving the firm to replace its 700 stand-alone dumb terminals and personal computers with local-area networks and intelligent workstations.

The 7100, he explained, accommodates his growing variety of computing and networking environments and "is a whiz to configure. I had the 7100 on-line and in production mode in 25 minutes. By comparison, IBM's 3174 took an hour and a half."

Whitlow explained that the time differential is important to his business because users are constantly changing departments and projects.

IBM has yet to announce Ethernet connections for its controllers. The 3172 Establishment Controller, IBM's device for heterogeneous environments, supports local channel attachments only, and its local and remote 3174 still caters to IBM's proprietary Systems Network Architecture (SNA) protocols.

"McData is making a bold move in leapfrogging IBM and replacing the 3174," commented Cindy Santisario, a senior research analyst at Framingham, Mass.-based International Data Corp. She said that the 7100's pricing is "right in line" with IBM's 3174, but the 7100 lets users send SNA traffic over Ethernet, increases the number of IBM hosts supported from one to two and allows IBM 3270 terminals to access Digital Equipment Corp. VAX hosts.

"I'm getting 64 ports from McData for less than what I'd pay for 32 ports on an IBM 3174," Whitlow added.

McData's 7100 prices range from $5,635 to $29,935; all models provide a direct link to Netview, IBM's enterprise network management system. Connections to fiber-based Enterprise Systems Connection hosts are slated for 1992.



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Future belongs to wireless gear

BY CHRISTOPHER LINDQUIST
CW STAFF

PARSIPPANY, N.J. — A Golden Age of wireless for both voice and data communications equipment should be well under way by 1995.

A recent report by research firm The Insight Research Corp. predicted sales of wireless voice and data equipment, such as wireless private branch exchanges (PBX) and local-area networks, will increase rapidly over the next few years, with voice communications equipment sales growth eventually outstripping that of data equipment.

This will happen despite the current industry trend for data equipment sales growth to be greater than that of voice equipment by a wide margin — 25% compound annual growth for data vs. 7.5% for voice, according to the report.

Trend reversal

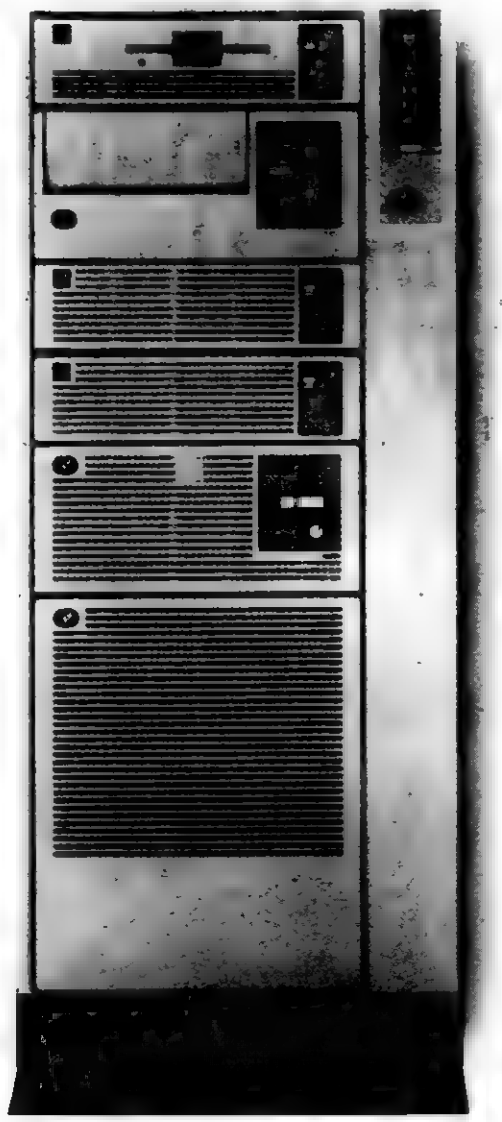
This trend reversal will be caused in part by the rapid acceptance of wireless analog telephones connected to PBXs and key systems, the study said. The trend is expected to accelerate once vendors begin to supply cordless digital telephones.

Conversely, wireless data technology will find a more difficult road ahead. Most companies planning on moving within the next five years will find their new buildings suitably prepared for standard wiring, limiting the opportunities for wireless data equipment.

Figures from the report stated that wireless LAN equipment sales will grow from $79 million in 1991 to $235 million in 1995, a compound annual growth rate of more than 31%. Similarly, sales of wireless PBXs and key telephone systems are expected to increase at a compound annual rate of 50%, from $34 million in 1991 to $171 million in 1995.

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We're introducing 11 brand-new AS/400s to give companies of all sizes just about everything they've been asking for, and in return, we're asking for less. The new AS/400s are up to 35% more affordable.

They can also be 200% bigger, 275% faster, and store 225% more information.

So thousands of existing AS/400 applications will run better, and your business will have new freedom to run advanced applications like image and telephony, to compete more successfully in today's complex markets.

You'll also be better able to communicate because the new AS/400s are more open, supporting the most popular networking standards.

Yet for all that's changed, the new models are fully compatible with their predecessors. Earlier AS/400s can run the new operating system; in fact, we're offering it to existing customers free. So their investment isn't just protected, it's improved.

An expanded range for growth.

The AS/400 has always been able to grow along with you, but now you'll be challenged to keep up with *it*.

The biggest AS/400 now gives you true mainframe capacity (for the technically minded, that's 384 megabytes of memory and 123 gigabytes of disk storage), with the power to serve over 600 users simultaneously.

If you're not quite ready for all that, the smallest AS/400 can sit beside your desk, serving as few as four people.

But no matter where you begin, you can still grow your AS/400 and keep everything you started with. Software that runs on the smallest one still runs on the biggest, and hardware upgrades are as easy as ever.

And there's greater potential for the future. The new high-end model is the first AS/400 to use an advanced parallel processor architecture. Today that means it'll do twice the work, twice as fast. Tomorrow it means even bigger AS/400s. Stay tuned.

Open to more standards for more connections.

As the AS/400 grows upwards, it's also expanding in another direction. Outwards.

Its ability to connect and to manage multivendor networks has been greatly improved so your people can work more closely, not just with each other but with customers and suppliers.

The AS/400 now supports a wide range of communications protocols such as OSI, TCP/IP, X.25, ISDN, SNA and SAA™ plus Ethernet®, Token-Ring and Novell®.

Which together spell *open*.

There's also new ability to work with non-AS/400 databases, so your different locations won't seem so different anymore.

A full family of high-function servers.

Since most AS/400s have PCs attached, the new AS/400s improve those connections, and at both ends.

As high-function servers, they now support workstations running DOS, OS/2®, Windows™ 3.0 and AIX®. So people can have AS/400 power (both data and applications) in familiar environments.

And Novell users have a new option, to access an AS/400 and their NetWare® server concurrently from the same PC.

For LAN managers, there are new tools to help you locate, solve and prevent problems more easily.

Plus there are new server applications that let AS/400s and workstations share the load, to make better use of themselves and of each other.

Advanced applications that you can afford.

Of course, the point of all this is to let you run advanced applications that will give your business a competitive edge, at a cost that even smaller companies can afford.

For example, ImagePlus/400® helps you manage paperwork by eliminating the paper. You can now store a mountain of documents in an AS/400 Optical Library (up to 280 billion bytesworth) and retrieve them instantly, at a fraction of the cost of magnetic disk storage.

Or, using CallPath/400™ you can link your database with your phone lines. When customers call, the AS/400 can automatically pull up their files so you can answer their questions and take their orders more quickly and correctly.

There are also new applications for FAX, for artificial intelligence, for windowing and more. We named it the Application System/400® for a reason.

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As you may know, IBM Rochester, Minnesota—which designs, builds and supports the AS/400—won the 1990 Malcolm Baldrige National Quality Award. But please don't think we're resting on our laurels.

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NEW PRODUCTS

Host-to-host

Emulex Corp. has announced a low-end Ethernet terminal server, the Performance 2500.

Four- and eight-port versions are available. The Performance 2500 supports Transmission Control Protocol/Internet Protocol and Digital Equipment Corp.'s Local-Area Transport protocol. Modem control is possible at all ports. Thin Ethernet and 10Base-T adapters are available as options.

The four-port Performance 2500 is priced at $1,850; the eight-port version costs $1,995.

Emulex
3545 Harbor Blvd.
Costa Mesa, Calif. 92626
(714) 662-5600

Ungermann-Bass, Inc. has introduced a software product that provides end-user connectivity to Tandem Computers, Inc. hosts via UB smart hubs.

With the product, terminals, personal computers and Apple Computer, Inc. Macintoshes can be connected over Ethernet, broadband and Fiber Distributed Data Interface networks using Transmission Control Protocol/Internet Protocol.

The Tandem connectivity product will be shipped to current UB support customers free of charge. The Access/One smart hub with five slots costs $2,095.

Ungermann-Bass
3900 Freedom Circle
Santa Clara, Calif. 95054
(408) 496-0111

Gateways, bridges, routers

Crystal Point, Inc. has announced Outside View, an OS/2-based software package that allows connectivity to hosts, networks and stand-alone personal computers using a variety of I/O channels.

Outside View supports asynchronous communications via modems, direct serial links and local- and wide-area networks under several transfer protocols. It features a macro programming language and supports Dynamic Data Exchange.

A stand-alone copy costs $349; networking versions are available.

Crystal Point
Suite 148
22122 20th Ave. SE
Bothell, Wash. 98021
(206) 487-3656

Wide-area networking hardware

Datability, Inc. has begun shipping an upgraded X.25 packet assembler/disassembler (PAD) card for the company's VCP-1000 communications platform.

The VCP-1000 interconnects Unix systems, Digital Equipment Corp. platforms and IBM hosts, X.25 networks, personal computer modems and other devices. The 16-MHz X.25 PAD card offers a 60% performance improvement over previous models, according to Datability. It provides 64 virtual circuits with transmission rates of up to 64K bit/sec.

The card costs $3,199.

Datability
11th Floor
322 Eighth Ave.
New York, N.Y. 10001
(212) 807-7800

Electronic data interchange

Prime Factors, Inc. has released Compact/EDI and Compact/PC, mainframe and personal computer software intended to reduce the cost of electronic data interchange (EDI) through data compression.

Compact/EDI yields compression rates of up to 5-to-1 for batch and real-time applications data.

It is independent of a mainframe operating system. Pricing starts at $3,000, depending on processor.

Compact/PC can be purchased as a complete application for file compression and decompression or in ANSI C language for integration into custom applications. It is compatible with the mainframe version. A license fee for both versions costs about 25% more than Compact/EDI.

Prime Factors
1470 E. 20th Ave.
Eugene, Ore. 97403
(503) 345-4334

Patrick Franz Consulting has created a low-cost electronic data interchange (EDI) software package for personal computers running DOS.

X-Caliber EDI offers standard functions including communications, reporting, data mapping and security features. It is intended to make EDI capability cost-effective for smaller businesses. X-caliber EDI costs $450. An introductory price of $250 is offered until June 30.

Patrick Franz Consulting
Suite 205
204 E. Jefferson St.
Syracuse, N.Y. 13202
(315) 478-4011

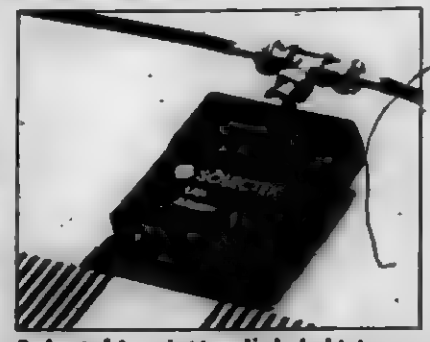
ACS/Premenos, a division of Premenos Corp., has announced a fourth-generation language for accomplishing electronic data interchange (EDI) tasks.

EDI/E generates scripts for translation, enveloping and routing for a user-specified EDI task. The scripts can be customized using the E language.

The product will initially be available for the IBM AIX and AT&T Unix System V platforms. Pricing ranges from $25,000 to $65,000.

ACS/Premenos
Suite 200
1000 Burnett Ave.
Concord, Calif. 94520
(415) 602-2000

Local-area networking hardware



Selectek's *adapters link desktop computers to Ethernet and Arcnet networks*

Selectek Corp. has created a line of adapters for linking portable and desktop computers to Ethernet and Arcnet networks.

The Model LAN-10BT ($499.95) connects to 10Base-T networks using standard RJ45 telephone jacks. The Model LAN-CX ($499.95) connects to thin Ethernet and 10Base-2 systems over coaxial wires. The Model LAN-ARC ($399.95) provides connectivity with Arcnet.

Each adapter weighs 3½ ounces and includes software drivers for Novell, Inc.'s Advanced Netware 286 and Netware 386, Transmission Control Protocol/Internet Protocol and 3Com Corp.'s 3+Share.

Selectek
Suite 109
6370 Nancy Ridge Drive
San Diego, Calif. 92121
(619) 450-1220

Cnet Technology, Inc. has announced two Ethernet adapter cards for Extended Industry Standard Architecture (EISA) bus-based servers and workstations.

The CN950E supports thick and thin coaxial and unshielded twisted-pair 10Base-T cabling and costs $599. The CN900E, a model without unshielded twisted-pair support, costs $549. Both models include software drivers and transfer data at a rate of 10M bit/sec.

Cnet Technology
2199 Zanker Road
San Jose, Calif. 95131
(408) 954-8000



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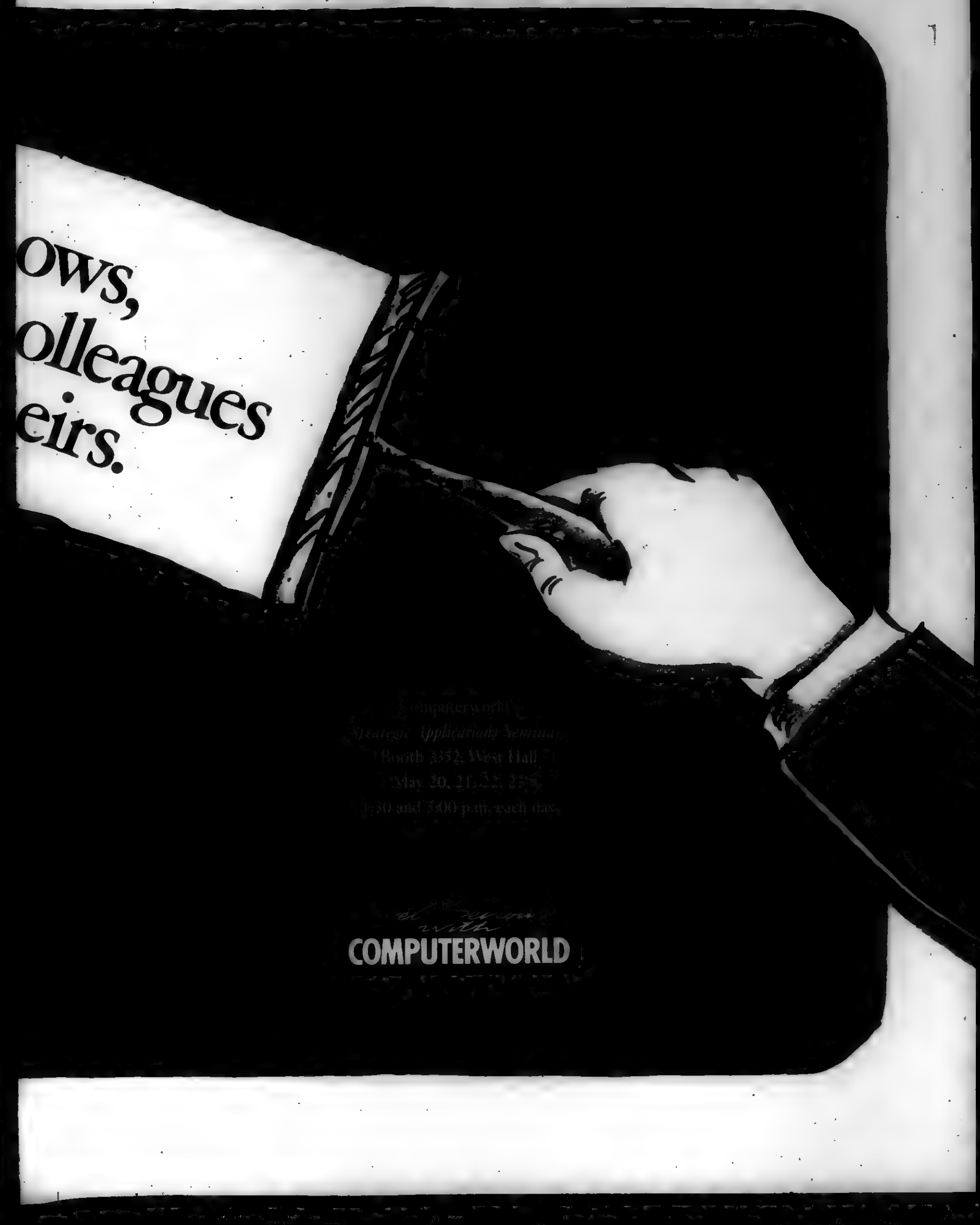
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EXECUTIVE TRACK



Clifford R. Hall has been named vice president and chief information officer of **Manville Corp.**'s Information Services Division in Denver, where he will be responsible for the overall direction and strategy of the division.

Previously, Hall had been an officer of United Telecommunications, Inc., the parent company of U.S. Sprint Communications Co., since 1989. He served as U.S. Sprint's executive vice president and chief information officer from 1987 to 1989.

Hall began his information services career in 1963 at Pacific Northwest Bell. He joined GTE Corp. as a systems analyst and spent 19 years there, becoming GTE's director of information management in 1984.

He holds a bachelor's degree in quantitative methods from the University of Washington and an MBA from the University of Chicago.

.....

Randy Dieterle has been named vice president and CIO of PRC, Inc., a McLean, Va.-based systems integrator and a subsidiary of Black & Decker Corp. in Towson, Md. Dieterle's responsibilities will include developing and implementing corporate information systems strategies for PRC, formerly known as Planning Research Corp.

Dieterle was previously executive vice president at Palo Alto, Calif.-based Neuron Data, Inc., a developer of expert systems software. Before that, he was vice president of U.S. systems and support at Oracle Corp. in Belmont, Calif.

He has an MBA from Pennsylvania State University.

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Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

An IS approach to managed care

Blue Cross' new cost-controlled health care focus is backed by integrated claims system

BY MARYFRAN JOHNSON
CW STAFF

After six years of dwindling market share and increasingly ferocious competition, the health insurance empire of Blue Cross/Blue Shield of Massachusetts is striking back with information technology.

The state's largest health insurer, with 2.25 million subscribers, Boston-based Blue Cross is shifting its business focus from traditional indemnity insurance to the cost-controlled world of "managed health care," where health maintenance organizations (HMO) and similar groups offer benefits packages tailored to hospitals, businesses or individuals.

"The overall strategy and direction of the company has been this commitment to become a managed care company," says Max Ward, vice president of production services, which manages the computer systems and networks at Blue Cross. "Our relationships with the health care providers are changing. They want more services and greater choices among those services."

Information technology is aiding and abetting this effort through the organization's move to an integrated claims processing system, which gives hospitals and health care providers increased access to Blue Cross applications such as those dealing with Medicare information.



Stella Johnson

Blue Cross' Ward, left, and May *use IS to respond to a changing relationship with health care providers*

For example, Blue Cross' provider automation department chose a novel method to keep in touch with its most important customers, the state's 140 hospitals. Rather than rolling out a network of IBM terminals so those hospitals could tap directly into the insurer's database, the department recently installed a fault-tolerant system from Stratus Computer, Inc. to serve as a kind of "come one, come all" network communications switching point for the 600,000 transactions that flow in every week.

"Blue Cross is a kind of medical intermediary, and our applications are available for the hospitals on a dial-up basis now," Ward explains. "Once they connect over the Stratus, they will have the ability to go to any application internally."

The first hospitals will start connecting this summer, and eventually the entire network will have access through the Stratus machine, adds George P. Mey, director of provider automation services. "All the hospitals with terminals will have functionality they didn't have before, such as access to our benefit management applications."

More importantly, each hospital can use its own equipment to connect with the Stratus machine, through Stratus'

Continued on page 93

Sabbaticals: Hit the road, Jack

BY JAMES DALY
CW STAFF

Information systems managers have discovered that sometimes the best thing to do for employees is to get rid of them — temporarily.

The company sabbatical, a corporate perk that prospered in the excesses of the 1980s, is still flourishing as a way to attract the best and the brightest.

"Employers are facing a shrinking talent pool, and sabbaticals often serve as a very powerful enticement tool," said Lane Ringlee, a consultant at benefits consulting firm Hewitt Associates in Lincolnshire, Ill.

Major institutions such as Xerox Corp., McDonald's Corp., IBM and Apple Computer, Inc. all offer longtime employees the chance to get away from routine workday concerns to chase a curiosity or pursue an obsession. Typical sabbaticals last anywhere from several weeks to several months.

Phyllis Jones, a systems analyst at Wells Fargo & Co. in Oakland, Calif., recently spent three months returning to the roots of her Native American heritage. She studied Navajo rug weaving on the New Mexico reservation where she grew up.

Jones awoke early each morning to gather the roots and plants used in creating vibrant dyes for the rug wool and worked closely with her mother to learn the ancient art. At the end of her leave, her achievements were three rugs and a renewed sense of personal confidence and corporate spirit.

"I surprised myself at how much I could accomplish," she said. "The company gave me a great opportunity, and it's made me even more dedicated to do the best I can for them."

While sabbaticals may refresh tired minds and bodies, benefits counselors strongly emphasize that leave takers preplan as much of their sabbatical as possible. Job seniority, travel expenses, raises, continuity of insurance benefits and vacation accrual are among the issues that should be clarified ahead of time.

There is a downside: With a key IS employee gone, for example, a department can lose momentum on a major project. Employees may also face jealous colleagues, turf battles or a crushing backlog of work when they return.

The trade-off, however, is a powerful competitive tool that can recharge the battery of a company veteran.

"It was a wonderful experience," Jones said. "The fact is, I'm looking forward to my next one."

Maguire speaks from the heart for motivation

BY JOSEPH MAGLITTA
CW STAFF

Barely one minute into his talk, Francis X. Maguire already had his audience of hundreds of information systems managers nodding in agreement. He's preaching what he practices: speaking from the heart.

"In the MIS world, there are a lot of people who need a lot of respect, and I agree," Maguire said. "No one understands you. They can't understand what you're talking about, and frankly they don't want to. They'll jump into the ladies' room to get away from you."

The audience chuckled, half nervously. Maguire, considered by many to be among the nation's top employee relations and communications consultants, continued, fist slapping into his palm.

"You've got to make other people in the organization understand that we're not supposed to be afraid of the MIS crazies!" he asserted.

Founder of the Hearth Communication Group in Germantown, Tenn., the 57-year-old Flushing, N.Y., native has consulted at more than 100 corporations and has given speeches to more than 500 professional groups.

Maguire calls himself not a motivational speaker but a validational speaker. "People don't know how great they really are," he said. "I just punch their tickets."

His is hardly a household name, but millions of Americans have been touched indirectly by Maguire's work. As an executive assistant in the Kennedy and Johnson administrations, he was a member of the original task force that planned the War on Poverty social programs. Maguire played early key executive roles at Federal Express Corp., Kentucky Fried Chicken Corp. and American Airlines. In a stint as director of program development at ABC, Maguire hired Ted Koppel and Charles Osgood, then unknown journalists.

Last month, Maguire brought his gospel of openness to about 200 IS managers at the Society for Information Management's institutional member conference in Tucson, Ariz.

Reach out to users

"You in MIS bring so much to the banquet table. Why aren't they eating?" Maguire asked the audience. Silence. Then he answered his own question. "Maybe it's time to take the Saran Wrap off," he responded to laughter and applause.

"There's a holy huddle in MIS, and you're drinking your own bath water," he continued. "The solution is to be open. Playing it close to the vest does not work. Reach out, show you care, and be committed. Let people know they are partners with you."

Maguire paused for dramatic effect. "The key to the future is not technology. Technology is available to all. No, it comes from here." He pointed to his heart.

It is a favorite image. Only six weeks earlier, Maguire had undergone open-heart surgery for a quadruple bypass. Today he jogs two miles per day and speaks with renewed conviction about the importance of good attitudes, honest talk and openness. So strong is his belief that human relations, not hardware or software, make IS and companies excel that he might be dubbed "Mr. Heartware."

Maguire quickly moved on to a favorite theme: change. "The best way to predict the future is to invent it. Take a seat at the table. The answer is not to cop out and say, 'Nobody understands us.'

"At Federal Express we had a saying: 'If you aren't lead dog, the view never changes.' You are all agents of change. We need to build bridges in our organizations and in ourselves. But change doesn't happen by issuing memos. Edicts and memos don't work. Today, it's persuasion."



Maguire *speaks with openness and honesty*

And that applies doubly to the people who work for you, Maguire believes.

"Make sure the people who work with you are for you, and the people who report to you know that you care. But don't mother them. Validate them. Unlock their potential. Then get out of the way. Don't get tangled up in your own ego.

"Look," he said. "I'm not giving you anything you don't already know. We've all read the self-help books; we all know the rules. Perfection is not what it's about. Excellence is. Perfection is the destination; excellence is the journey. It's not about quality of measurement but about quality of life." The audience nodded.

"Listen. Hear. Keep your feet on the ground. Have heart. If you aren't coming from the heart, you ain't gonna be around for long.

"MIS has a heart," he concluded. "MIS has feelings. You have a seat on the 50-yard line. Wake up! It's not information technology. It's human relations."

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POWERstation 320	8.5	29.5	24.6
DECstation 5000-200	3.7	24.2	18.5

When it comes to porting, your ship has come in. Of course, all the speed in the world wouldn't mean much without the applications you need. So the RISC System/6000 family already has more than 2,500 of the most popular technical and commercial applications up, running and running fast. And if you think you know a good thing when you see it, so do software vendors. That's why you'll also be seeing more and more applications coming on board the RISC System/6000 platform all the time. And if you like to build your own solutions, there's a full arsenal of enablers and relational data bases from leading vendors, as well as CASE tools and a host of popular programming languages.

A smorgasbord of solutions. Applications already announced include the IBM engineering design packages CADAM™, CAEDS™, CBDS™,

MFLOPS are the results of the double-precision, all FORTRAN Linpack test 100x100 array suite. The Dhrystone Version 11 test results are used to compare RISC System/6000 integer MIPS ratings where 1,757 Dhrystones/second is 1 MIPS (VAX 11/780). SPECmark is a geometric mean of ten benchmark tests. All performance data are based on published benchmark information.

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CALENDAR

The National Conference for Artificial Intelligence will be held in Anaheim, Calif., July 14-19.

Keynote speakers will be Saul Amarel, the Alan M. Turing professor of computer science at Rutgers University, and Robert Kahn, president of The Corporation for National Research Initiatives.

For more information or to register, contact The American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

JUNE 9-15

Computer Security Institute. Denver, June 10-12 — Contact: Computer Security Institute, San Francisco, Calif. (415) 267-7651.

Experts on Networks. Washington, D.C., June 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

FDDI Executive Symposium. Sunnyvale, Calif., June 11-12 — Contact: Jean Marie McArdle, Events Management International, Westfield, Mass. (817) 684-4701.

EDIs Steps for Success. Atlanta, June 11-13 — Contact: Sharon Scott, Informa, Atlanta, Ga. (404) 220-2002.

Strategic Planning for Information and Systems. Chicago, June 12-14 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Windows 3.0 Developers Conference. Tyngsboro, Mass., June 12-14 — Contact: Andree Fontaine, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

The Synoptic User Group. Orlando, Fla., June 13-14 — Contact: Christine Seale, Bytex Corp., Southboro, Mass. (508) 480-0840.

JUNE 16-22

Office Automation Society International Educational Conference. Alexandria, Va., June 16-19 — Contact: OASI, McLean, Va. (703) 821-8650.

National Educational Computing Conference. Phoenix, June 16-20 — Contact: Southwest Events, Scottsdale, Ariz. (602) 991-5131.

Cincom's 1991 International User Conference. Cincinnati, June 16-20 — Contact: Cincom Systems, Inc., Cincinnati, Ohio (513) 662-2300.

MIT Center for Information Systems Research Summer Session. Cambridge, Mass., June 17-20 — Contact: CISR, Cambridge, Mass. (617) 253-6657.

Testing Computer Software. Washington, D.C., June 17-20 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

Engineering Systems Design and Analysis Conference. Istanbul, Turkey, June 17-20 — Contact: The American Society of Mechanical Engineers, Dallas, Texas (214) 746-4901.

Imaging at Work '91. Tyngsboro, Mass., June 17-20 — Contact: Andree Fontaine, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

International Trade Computerization Conference. Washington, D.C., June 18-19 — Contact: NCITD, New York, N.Y. (212) 433-1400.

Videotex Industry Association Conference and Exposition. Washington, D.C., June 18-21 — Contact: Debbie Tribe, Videotex Industry Association, Silver Spring, Md. (301) 495-4955.

Downsizing in the Computer Industry: Making the Migration from Reliance on Mainframes to Distributed Processing in the Mini, PC and LAN Environment. New York, June 19-20 — Contact: Institute for International Research, New York, N.Y. (212) 826-1200.

Interlevent '91. Hong Kong, June 19-20 — Contact: International Telemet, McLean, Va. (703) 556-7778.

MLT Working Group Meeting. Malvern, Pa., June 19-21 — Contact: Sue West, SMS, Malvern, Pa. (215) 251-3164.

Supercomputing 1991 USA/Pacific. Santa Clara, Calif., June 19-21 — Contact: John Derryberry, Augus & Rudin, Inc., Redwood City, Calif. (415) 363-0882.

Mac Week '91. Ann Arbor, Mich., June 19-22 — Contact: Conference Management Expotech, Inc., Grosse Pointe Park, Mich. (313) 882-1824.

Document Image Processing Symposium. Toronto, June 20-21 — Contact: C. J. Howse, Price Waterhouse, Toronto, Ontario (416) 863-1133.

JUNE 23-29

Structuring Business Partnerships for Competitive Advantage. Laguna Niguel, Calif., June 23-25 — Contact: AMR International, Inc., Greenwich, Conn. (203) 661-0161.

Conference on Communications. Denver, June 23-26 — Contact: IEEE, Northglenn, Colo. (303) 452-6111.

International Communications Association Summer Program. Boulder, Colo., June 23-28 — Contact: ICA, Dallas, Texas (214) 233-4001.

Scoop Boot Conference. East Rutherford, N.J., June 24-27 — Contact: Bob Daniels, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Test Engineering Conference. Atlanta, June 24-27 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

International Windows 3.0 Developers Conference. Santa Clara, Calif., June 24-28 — Contact: Andree Fontaine, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Taking Control of the Future: The Role of Information Management in Business Reengineering. Nashville, June 25 — Contact: Lisa Gibson, Computer Corporation of America, Cambridge, Mass. (617) 492-8860.

Micro '91: Auditability, Security and Productivity of Micro-based Systems. Boston, June 25-27 — Contact: Pamela Bassett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Multimedia '91. London, June 25-27 — Contact: Arielle Maniquet, NGA, London, England (011-44) 081-742-2828.

PC Expo. New York, June 25-27 — Contact: Mark A. Haviland, Bruno Blenheim, Inc., Englewood Cliffs, N.J. (201) 569-8542.

Hammer Forum and Clinic '91. Boston, June 26-28 — Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

Independent Computer Consultants Association National Conference. Seattle, June 27-29 — Contact: Carolyn Kandiz, Independent Computer Consultants Association, St. Louis, Mo. (314) 997-4633.

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SIM award goes local

BY CLINTON WILDER
CW STAFF

MADISON, N.J. — The New Jersey chapter of the Society for Information Management (SIM) has brought the concept of "Think globally, act locally" to the world of information systems awards.

Earlier this month, the chapter presented the first New Jersey SIM Partners in Leadership Award to two executives from Newark, N.J.-based Mutual Benefit Life Insurance Co. It is the first local SIM chapter to develop its own version of the prestigious international SIM award, given each fall to two pairs of IS and business partners for innovation and leadership in applying IS to business.

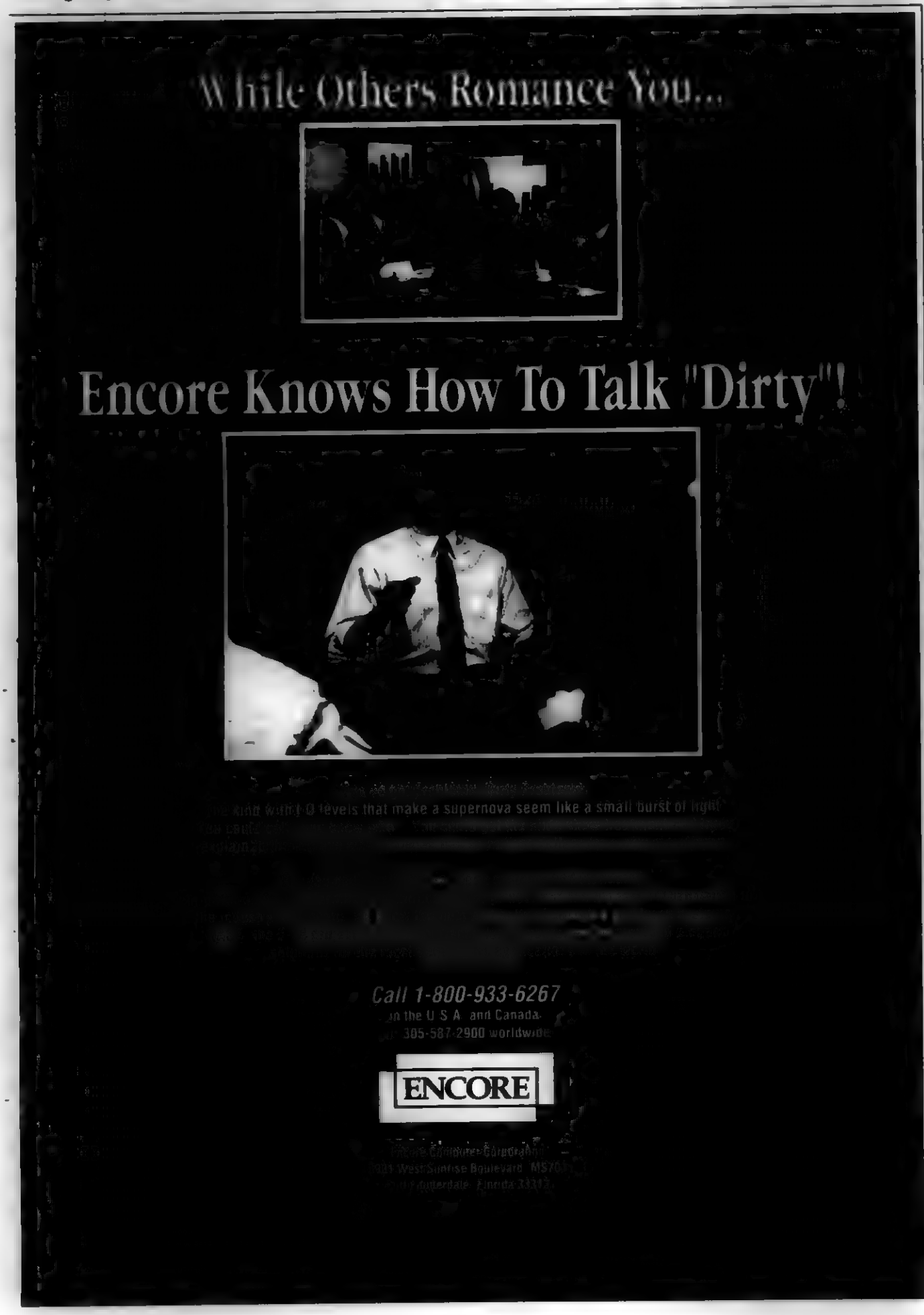
The New Jersey winners were Mutual Benefit Life's Keith T. Glover, senior vice president of individual insurance administration, and June Marrero Drewry, senior vice president of IS. The two executives led the re-engineering of writing and processing new insurance policies at the $13 billion firm.

Glover and Drewry have also been nominated for the international SIM award. Winners will be honored at SIM's annual conference in Chicago in October.

"The New Jersey chapter is pretty active and subscribes strongly to the business/IS partnership concept," said Paul Berger, a founder of the chapter and a member of the award selection committee. "We felt that there are a lot of strong companies in New Jersey and wanted to spread the concept, so we decided to have our own local version."

Berger, president of Paul Berger Consulting in Lawrenceville, N.J., noted that the chapter's award nomination process and selection criteria are identical to those for the international award. The selection committee consists of IS and business executives, consultants and academics.

Glover and Drewry received the award at the chapter's regular monthly meeting May 9. John Owens, president-elect of SIM, attended the meeting. Owens, now chief information officer at Carrier Corp. in Farmington, Conn., was a co-winner of the inaugural SIM Partners in Leadership award in 1987, when he was the top IS executive at Sara Lee Corp.'s Hosiery Division in Winston-Salem, N.C.



MANAGEMENT BRIEFS

Ford begins outsourcing

Ford Motor Co. has begun outsourced processing at a new data center in Birmingham, Mich., constructed and operated by Unisys Corp. The data center opened last month and will provide remote processing support to several Ford divisions representing 4,500 users in six countries, including an IBM Systems Network Architecture link to Ford headquarters in Dearborn, Mich. The data center will support future Unisys outsourcing customers as well as Ford. Processors include Unisys A16 and A15 mainframes and a dual-processor 2200/422 system.

United Way of America has received a grant from IBM for $1.5 million worth of Personal System/2 hardware and software to be used in United Way facilities and volunteer centers nationwide.

The program, called Involving More People Through Automation and Computer Technology (IMPACT), was piloted by United Way of Metropolitan Atlanta and funded through an earlier $120,000 IBM grant in December 1989.

Blue Cross

CONTINUED FROM PAGE 89

Network Express communications software. The move enables Blue Cross to ease out of the terminal maintenance business while satisfying the hospitals' preference for using their own hardware and networks.

"When our provider network was installed back in the 1970s, a lot of hospitals had little or no automation. Our terminals might be the only technology they had," Mey says. "But even though we had a lock on providing the equipment, we were not giving as good a level of service as they needed."

The choice of the crash-proof Stratus system had a twofold impact: It saved money over maintaining an extensive IBM terminal network, and it provided greater openness for health care providers and better service for customers.

"The need for immediate verification of claims is there and growing," Mey says. "The health care business is heading for a point-of-sale environment where if your terminals are down, your business is down, too. There is no reason why activity in the health care industry can't follow what is happening in the Visa or Mastercard world.

"We look at things differently now," says Mey, who focuses on research and development of new technologies at Blue Cross. "Two years ago, we would have replicated everything with IBM terminals."

> "THERE IS NO reason why activity in the health care industry can't follow what is happening in the Visa or Mastercard world."
>
> GEORGE F. MEY
> BLUE CROSS

IBM is still the vendor of choice for the insurer, however.

During the 1980s, Blue Cross began moving off old Honeywell, Inc. systems onto IBM platforms. Today, the main data center uses a 3090 Model 600S for claims processing, a 3090 Model 170S for Medicare claims and a soon-to-be-replaced Bull HN Information Systems, Inc. DPS 90. The IS division, with about 250 employees, also manages a handful of minicomputers from several vendors and up to 30 local-area networks of personal computers.

When it comes to its computer systems, Blue Cross has fielded its share of criticism in recent years. In 1990, the commonwealth of Massachusetts released an audit faulting the insurer for a lack of strategic business planning in a $200 million overhaul of its information systems.

Today, the computer systems upgrade is forging ahead with the implementation of the integrated claims systems, which Blue Cross officials say they expect to be completed by mid-1992. The next big project will be an overhaul of the enrollment and billing systems.

"Having the one claims system is important, but what is key is having the IS functionality to provide what the market wants," says Steven Tringale, a corporate spokesman at Blue Cross. "It has been a very positive reorientation to have the market issues really drive the IS effort."

The mainframes handle four major claims systems for doctors, pharmacies, hospitals and subscribers. The hospital network makes 4,000 requests for data every day, and the number of claims filed daily amount to 25,000, excluding pharmacy claims.

Where there was once relatively little overlap among the different claims groups, there is now such complex intertwining that integrating the claims systems became an obvious necessity.

"We needed a way to tie the components of the health care system together before we pay a claim," Ward says. "Managed care is all about managing the claims up front. We need to control the cost so we don't overpay and then have to regroup those dollars."

While Blue Cross will continue to offer its traditional Master Health and Master Medical plans, the growth end of the business is expected to be in products "that rely on building networks to the provider community," Tringale says.

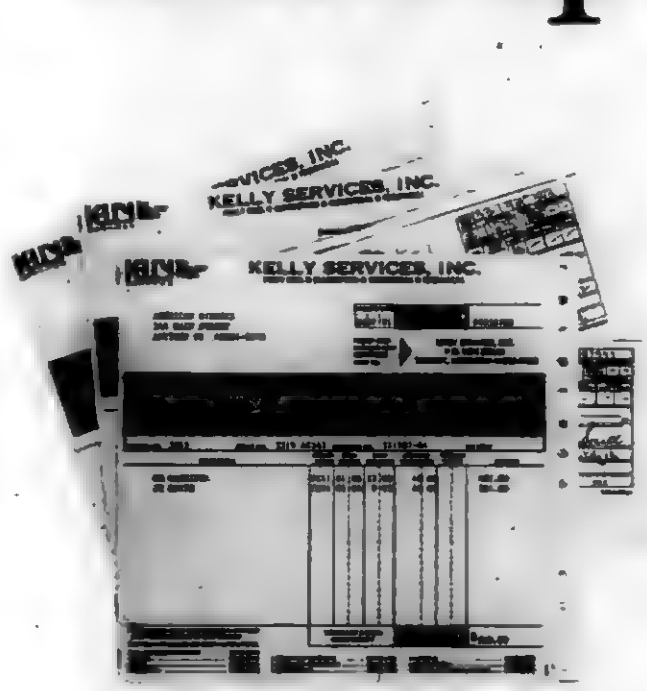
One prime example is a "point-of-service" plan that Blue Cross recently sold to AT&T. The plan offers AT&T employees the core benefit of an HMO network of providers but gives them the option of using physicians or hospitals outside that network — for an additional fee, of course.

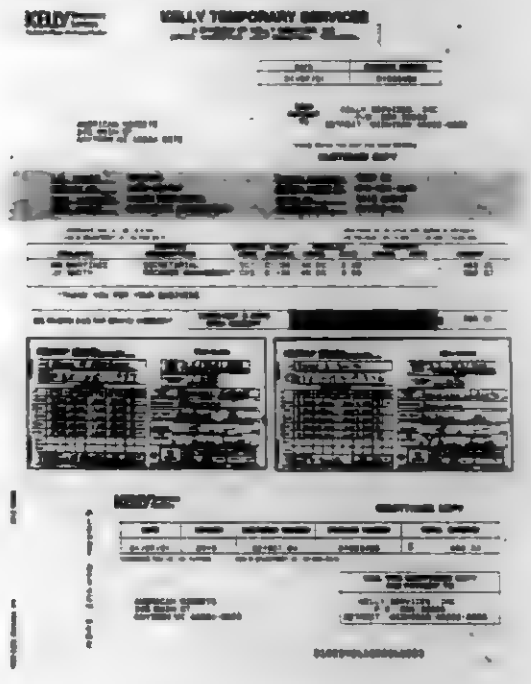
"This kind of benefit requires the kind of claims systems that can recognize in-network from out-of-network claims and tell the provider what sort of eligibility is there," Tringale says. "We want our systems not only to pay claims as efficiently as possible, but to support this new product portfolio."

By the end of this year, Blue Cross will have integrated the six HMOs it now owns in Massachusetts, making it the state's third largest HMO provider behind Harvard Community Health Plan and Bay State Health Care.

"We are expanding into every area of the state," Tringale says. "We will be the only statewide, integrated managed care company, with something to offer for every niche."

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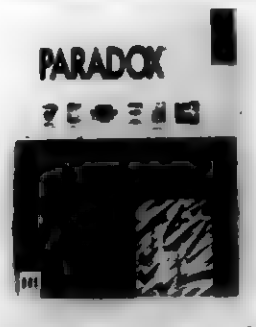
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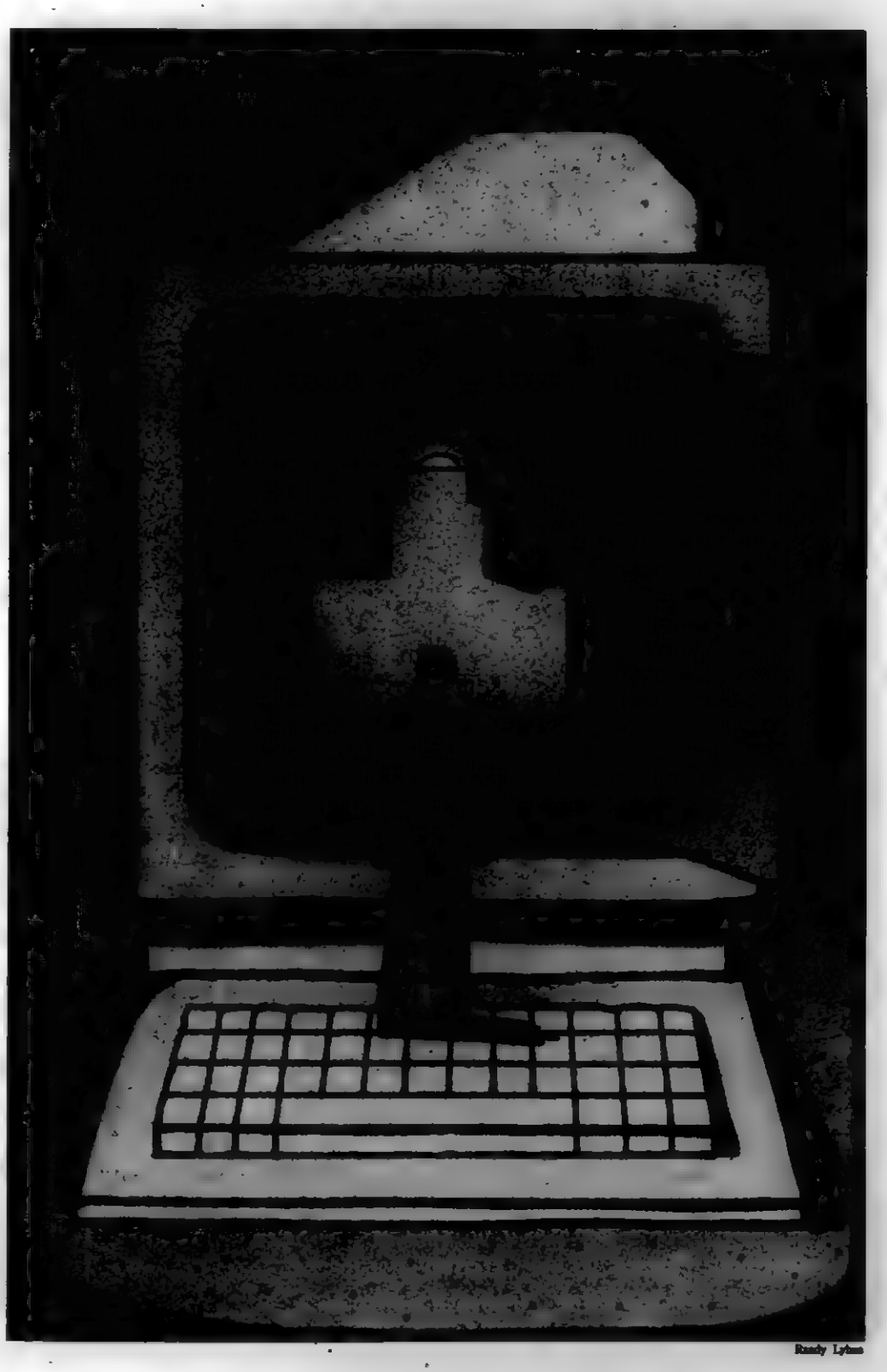
Software Craftsmanship

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Opening the way for new uses

Gutsier hardware, more capable software, improved communications . . . Is it any wonder companies are starting to rethink the role of PCs?



Randy Lyhus

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Beyond the beginners' slope

Recent developments have convinced many corporate users that personal computers can handle more advanced and business-critical assignments

BY RICHARD PASTORE



Robert de Michiell

Technology breakthroughs and evolutionary enhancements may be fewer and farther between in some segments of the computer industry. But in the personal computer environment, developments in hardware and peripherals, operating systems, software applications, communications and connectivity continue to open doors for new kinds of PC uses and users.

In PC hardware, increased power in tinier packages has finally made it practical for users who require portability and high functionality to make do with just one computer (see story next page).



This long-anticipated breakthrough came late last year with the arrival of the first notebook-size PCs with high-powered processors and large storage capacities. Expansion chassis made by Compaq Computer Corp., Tandon Corp. and others provide extra storage, hard disk drives and slots, augmenting the portables' built-in capabilities.

Additional power and functionality have also appeared in larger PC systems, making it possible for PC network servers to do the work of minicomputers or even mainframes.

"A year or two ago, you couldn't bring down a 10G-byte database" from a larger to a smaller system, says Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn. Now, "superservers" — with as much as 20G bytes of disk storage and eight microprocessors — allow users to develop and run major mainframe-scale applications speedily and cheaply on the PC local-area network. Multiprocessor systems of this type are available from Compaq, Netframe Systems, Inc., Advanced Logic Research, Inc. and a number of other vendors.



For some users, the ability to develop and run applications on PCs makes all the difference. "We'd been thinking of doing decision-support applications on the mainframe, but the cost was prohibitive," says Stephen Anderson, an information systems architect for the state of Washington's Department of Social and Health Services. Now, a Netframe PC superserver is saving the department thousands of dollars in mainframe costs.

The main developments in PC peripherals have been price reductions achieved through component redesigns and manufacturing processes.

Laser printer prices have dropped about 22% in the last two years, according to BIS Strategic Decisions in Norwell, Mass. And recently, prices of desktop scanners have also moved down, making document image processing affordable for more organizations.

In the operating systems area, changes have been cosmetic but hardly superficial. Graphical user interfaces — most notably, Microsoft Corp.'s Windows 3.0, introduced last year — have simplified PC interaction and brought microcomputer technology to a new class of users.



Network operating systems have also matured significantly. Some now provide enhanced security features and node capacities that allow networks to accommodate more users and higher level applications (see story next page).

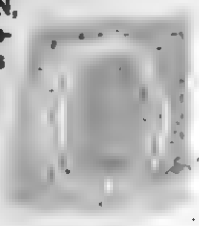
One of the most interesting new developments in the software applications arena is work-flow management software. New packages such as Lotus Development Corp.'s Notes and AT&T's Rhapsody Business Orchestration Solution automate the many manual steps involved in an office procedure such as logging and delegating customer complaints. Office workers who once had to pick their way manually through the myriad steps of a particular task can now be cued by the software (see story next page).

Capabilities such as hyperlinks, active documents and object linking and embedding, which are starting to appear in some PC applications, also free users from the need to perform some manual processes. These capabilities let users build intelligence into their documents so they can, for example, automatically access another document or form for the user to reference.

At Canadian nuclear utility Ontario Hydro, Interleaf, Inc.'s document management software allows staffers filling out on-line government forms to reference a government regulation manual without exiting the form on which they are working.

In the area of communications and connectivity, arguably no technology has changed the way businesses work with PCs more than electronic mail. Today, a key enhancement making E-mail more functional is the ability to send messages between dissimilar LANs.

"A couple of years ago, you could send mail to somebody in the office next to you on the same LAN, but you couldn't send it upstairs to the next LAN," says Mark Leary, an analyst at International Data Corp. That changed with packages such as Consumers Software, Inc.'s Network Courier and Soft-Switch, Inc.'s Softswitch Central, which connect LAN users to corporatewide E-mail systems without the need for major in-house bridge building. Increases in transmission rates and throughput speed now also make it possible to send more types of data across E-mail channels — images and even voice, Leary says. There's even some help for the harried with E-mail filters that permit automatic screening and routing of incoming messages.



Client/server connectivity has also become a practical reality as software has been designed to link PCs with mainframe and minicomputer servers in transparent-access modes. PC users can now grab data from host systems without moving to a dumb terminal or bothering with mainframe access and query languages. This has enabled more computer novices to interact with on-line data and has increased the speed with which data on multiple hosts can be downloaded to a PC (see story next page).

Electronic data interchange (EDI) has really settled in on the PC. Today, users working with PC-based financial tools can pull EDI data from suppliers or customers off their PC networks, instead of having to download it from the mainframe.

Even the up-front savings is substantial: Mainframe EDI systems can cost hundreds of thousands of dollars; PC-based packages cost thousands. ●

Pasture is a *Computerworld* senior writer.

Lightweight KOs desktop unit

Alice Goldberg threw away her checklists this March when she acquired a single personal computer for office, home and on-the-road work.

Goldberg, a senior consultant at pharmaceutical firm Ciba-Geigy Corp. in Ardsley, N.Y., had been searching for an all-purpose computer for some time, but something always seemed to be missing. Machines that were powerful enough and offered enough storage capacity to support front-end processing for an IBM 3090 mainframe as well as typical word processing and spreadsheet duties weighed considerably more than what Goldberg was willing to lug around. And the lightweights she looked at were just that when it came to power.

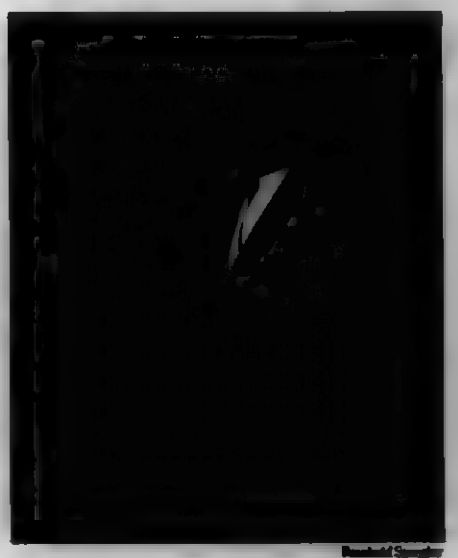
Instead, she made do with two computers — an IBM Personal System/2 Model 80 for the office and a Compaq Computer Corp. LTE 286 for everywhere else — and lots of time-consuming file transfers.

What liberated Goldberg from this backup and update drudgery was the Compaq LTE 386S/20. Introduced last October, the machine was the first of what is now a small band of full-function notebook PCs capable of handling desktop computing chores. Compaq's expansion chassis, which houses the LTE when it is operating in office mode, contains two expansion slots and room for two 80M- or 120M-byte hard disk drives, floppy disk drives or tape drives.

"I don't think I could have used it as my sole machine without that expandability," she says. The PS/2 she gave up contained a 190M-byte hard disk.

Also crucial is the fact that the expansion chassis hooks directly into the firm's network and its IBM 3090. The improvements have a price, though. The notebook, chassis and full-size keyboard and color monitor cost $15,000, compared with about $10,000 for the PS/2 and LTE 286 combo she used before.

Only time and use will show whether the extra expense is worth it, Goldberg says. If she takes the machine outside the office three times a week, she figures she will get her money's worth. So far, the 386S/20 has been making that quota.



Goldberg: *a one-computer woman*

Software to do the grunt work

Personal computer-based work-flow management will become a reality this month at TRW, Inc.'s Electronic Systems Group when the company's procurement department turns over management of a tedious, lengthy purchase order process to AT&T's Rhapsody Business Orchestration Solution with the goal of shaving months off of lead time.

When a government requisition for satellite or spacecraft electronics comes into the Redondo Beach, Calif., contractor, up to 116 procedural steps are required to convert it into a purchase order — a process that can take from 96 to 116 days.

In the past, TRW buyers manually compiled purchase order notebooks filled with up to 98 sections. The "notebooks" will now be compiled electronically using Rhapsody software residing on 80 networked AT&T PCs and servers.

The software takes control by determining in advance which forms are required for a product requisition, then walking the buyer through each procedure, says Fred C. Leland Jr., the group's procurement manager.

The PCs, linked to two AT&T Starlan servers and TRW's various hosts via Ethernet, also eliminate the need for buyers to chase down data on dispersed, stand-alone systems.

The Electronic Systems Group tried to implement a similar system three years ago but found the mainframe/PC-based solutions too expensive and limited because they didn't offer transparent, simple sharing of common data such as purchase order templates. The turnkey Rhapsody system, which began shipping in October 1990, met more of the firm's requirements than systems from any of the 23 other vendors considered, Leland says.

Rhapsody and similar newly released products have brought work-flow management to the PC-level platform for the first time.

Leland says his conservative estimate is that the efficiencies of automated work flow will cut lead time to 50 days. That should free 16 of the 100 buyers for redeployment.

Permit to build without big iron

Advances in network operating systems have lifted limitations and brought new levels of functionality to personal computer-based networks, particularly in the area of applications development and the types of applications that can be run on PC networks.

At Rhone Poulenc Rorer, Inc., new functionality in Novell, Inc.'s Netware 386 operating system has turned the firm's PC local-area network into a powerful applications platform.

The Fort Washington, Pa.-based pharmaceutical firm has been networking PCs since 1986. But it is only since last year's adoption of Netware 386 that Rhone has been able to design and implement mainframe-scale applications on the network, saving the relatively higher expenses and longer lead times commonly associated with mainframe development, says Marc Kustoff, director of microcomputing.

The operating system, released by Novell in mid-1989, supports 250 users per server, a key improvement over its predecessor's support limitation of 100 users per server.

The company now has 1,000 PCs on eight networks, all interconnected and running Netware 386.

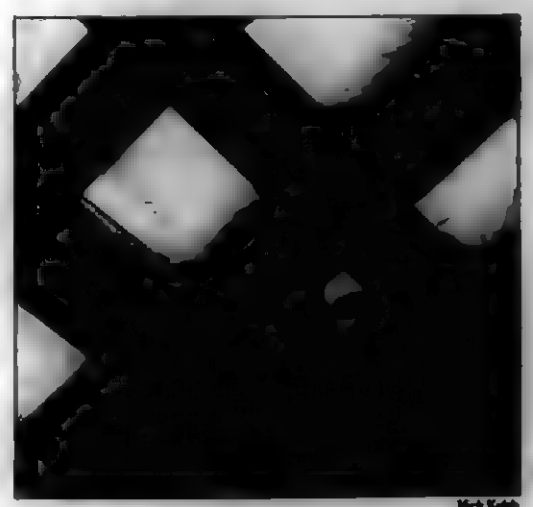
More importantly, the operating system provides new facilities that allow Kustoff to better segregate users into specific access categories. This enhances internal security and in turn allows more sensitive data to reside on the network servers.

In the past, sensitive data — and the applications that drew upon it — had to be mainframe-resident to ensure protection from unauthorized user access.

Rhone recently developed a finance application on the PC LAN. Before Netware, according to Kustoff, "we would have had to develop on the [IBM 3090] mainframe because 50 people needed access to it."

Mainframe development would have been less desirable not only because of the extra expense and time but also because the financial data was originally microcomputer-based.

Mainframe development would also have been less popular with users. "Users really wanted a micro-based tool because that's really where the data is coming from," Kustoff says.



Kustoff: *Moves development closer to data source*

Big picture on small systems

Until last fall, metallurgists and technologists at steel fabricator Armco Advanced Materials Corp. had to cull research data piece by piece from a variety of hosts dispersed around the company's Butler, Pa., facility and rekey it into their personal computers. That's changing, though, because the company has adopted a client/server architecture that offers transparent host access from Apple Computer, Inc. Macintoshes.

"Now we can look at anything that's going on anywhere in the business," says Thomas Lutz, chief information officer.

For example, a metallurgist investigating a product defect may require data from the plant's hot mill and its melt shop. Before, he would have had to access computers in both areas sequentially from a dumb terminal, using different utility query programs. Now, he simply selects the database he wants from a Macintosh menu, points and clicks. Digital Equipment Corp.'s Pathworks and Fairfield Software, Inc.'s Clear Access do the rest. The client/server programs create a utility query program in the background and deliver the data to the Macintosh transparently.

Client/server connectivity has also given many staff members their first opportunity to access VAX-based data. "We've probably doubled or quadrupled the number of users," says Thomas Morrison, information automation manager.

Some of those new users are operating-department engineers and supervisors who do not have much computer background. Now they can access host-based production data to analyze the effects of certain temperatures and galvanising speeds on steel qualities.

Stories on this page written by Computerworld *senior writer Richard Pastore.*

No thanks, I can do it by myself

New tools and utilities are helping to turn passive end users into PC adventurers

BY KATHLEEN A. GOW

Many personal computer users who could barely walk through a software program a few short seasons ago are now starting to build their own applications. Once-computerphobic executives are now scheduling their work, filtering their messages and tapping external databases. This developmental surge is happening largely because developers of PC software are starting to create products with nontechnical users in mind.

"One of the biggest things enabling users is when software companies sneak a programming language into a product," says Marshall Moseley, a software analyst at Dataquest, Inc. in San Jose, Calif. "There are people who use complex macro languages — in spreadsheets, for instance — who don't know they're programming because it happens in the background."

Forms-based products — some of which act as front ends to databases — also allow users to create reports in a visual mode and without obvious programming. Numerous products of this type have debuted during the past 12 months.

Easy to learn

Don Chase, microcomputer manager for the Washington Department of Wildlife in Olympia, Wash., has been working with Borland International, Inc.'s Objectvision since February, and he says the forms-based programming tool for Microsoft Corp.'s Windows 3.0 graphical user interface environment is something that even the department's computer-averse field biologists can learn to use.

Jim Crain, division chief at the city of Los Angeles' Client Services Department, agrees. "Objectvision — as a simple front end to Paradox — is a natural first tool," he says. It's easy to use the decision trees as the logic behind forms, and users graphically construct logic by manipulating icons and connecting them with lines.

Asked by two of its clients to suggest a flexible and easy-to-use database product, Computer Ease of Milwaukee, Inc., a Novell, Inc. value-added reseller, picked Ventura Software, Inc.'s Formbase. Neither client site had in-house programmers or a particularly high level of computer literacy, says James Jaeger, vice president of sales at Computer Ease, but the forms orientation, the point-and-click interface and the good Help screens and sample programs meant that clients could easily make changes to applications developed by the reseller.

"They didn't want to have to hire a programmer for every little change," Jaeger says.

Apple Computer, Inc.'s Hypercard and similar products also "reduce the entry-level barriers for users," says Rich Bader, a contributing editor to Stewart Alsop's *PC Letter*, because they use the metaphor of the card, with information organized like stacks of cards.

Although often slow and difficult to learn and use, these products reward persistent users by allowing them to work in nonlinear ways.

Dean Cooper, a senior attorney in the environmental law section at Dow Chemical Co. in Midland, Mich., is using Hyperpad from Brightbill Roberts to develop an environmental law program that will serve as both a training tool for lawyers and engineers and a reference tool for on-site inspections.

Hyperpad does require some understanding of programming concepts, Cooper says: "It's not for novices." Version 2.2 of Hyperpad, due to ship early this month, may lower the threshold somewhat. The prepared tools and idea pads allow selection of buttons and ideas to build on. There's a shortcut version to writing scripts, and buttons can be linked to another card.



Chase plans *to let Department of Wildlife scientists handle their own forms creation*

Groupware arrives

One area seen as having a lot of promise as a user enabler is the category of organizational productivity tools sometimes called "groupware." Products in this amorphous category are designed to empower users by linking them to the expertise of other users and to multiple sources of data.

Lotus Development Corp.'s Notes, introduced in December 1989, helped to popularize the emerging — and as yet largely undefined — groupware category, according to Dan Ness, a microcomputer industry analyst at La Jolla, Calif.-based Computer Intelligence.

Brad Jackson, a project leader in the information technology department at Texaco, Inc., says Notes allows users with little technical background to easily create interactive discussion databases and even attach scanned-in images to files.

Notes 2.0, unveiled in February, added support for applications integration with Dynamic Data Exchange and Object Linking and Embedding.

David Marshak, a senior consultant at Patricia Seybold's Office Computing Group in Boston, says that in terms of difficulty, Notes occupies roughly the same level as databases with simplified front ends and products such as Lightship from Cambridge, Mass.-based Pilot Executive Software or Q+E from Raleigh, N.C.-based Pioneer Software Systems, Inc.

Lightship is an executive information system-building tool designed specifically for nonprogrammers. Q+E is a package that allows users to query and edit Dbase-compatible databases and to access external ones from Microsoft's Excel spreadsheet.

According to Marshak, all of these products provide enough in the way of programming models, or templates, that users can manage to build simple applications on their own, but they require a sophisticated user or a systems professional to build strategic, robust applications.

Control benefits

A different kind of software that is giving users more control over information and their own time is work-flow automation software. A specific category of software carries this title and actually allows users to automate routine parts of work procedures (see story page 96). There are also a number of other products that assist work flow by filtering, prioritizing and managing information.

Beyondmail from Cambridge, Mass.-based Beyond, Inc. handles those sorts of chores for electronic mail users.

Previewed at Networld in February and expected to ship sometime this summer, the expanded E-mail application can do such things as analyze the contents of an incoming E-mail message and, for example, reroute it to a manager's secretary because it came from accounting and contains the word *resubmit* in a header field or in the body text.

Another critical measure of freedom comes from the ability to use on-line, context-sensitive Help facilities to maneuver through access procedures and new applications created elsewhere.

Analysts agree that on-line Help desks have become a necessity, with context-sensitive Help and the ability



Cooper built *an environmental law program with Hyperpad*

to search on key words and phrases seen as the dividing features between good and simply fair Help programs.

Seybold's Marshak sees Help desks of the future moving to just-in-time training and learning, where, for instance, if a user is having trouble doing a mail merge, the application will sense the problem and present a video or animated instruction program. The Help facilities available today are not quite that intuitive. A user seeking help usually has to click on an icon to pull up a screen of clarifying Help text.

New categories of Help tools are emerging all the time.

Bader says Hewlett-Packard Co.'s New Wave, which runs on top of Windows, is an example of an emerging genre. "It has the ability to routinize or proceduralize steps on a machine," he says. It also allows the cooperation of multiple applications packages with capabilities defined in terms of users. Users have to understand some basic concepts of programming to use New Wave, Bader says, but they don't need a programming background.

There is clearly still some distance to be covered in this field. A number of products aimed at increasing end-user independence are still too complicated for many users.

But analysts say that within a software generation or two, a significant number of products will provide truly intuitive operations for end users. In the meantime, there's enough around for the more adventurous to start testing their wings. ●

Gow is a free-lance writer based in Medford, Mass.

New hope for tired systems

You don't have to settle for sluggish performance if you use old PCs

BY DEREK SLATER

It's possible not only to buy more powerful ready-made engines these days but also to crank the performance of existing machines to new highs using add-in boosters. Name an area of weakness, and there's a fix-it device to get your machine pumping data almost as if it belonged to the next chip generation. Consider these examples:

BLOCKAGE: Hard drive bottlenecks. Booster option 1: Software caches. Traffic jams on the hard drive can slow a personal computer faster than almost anything else. Memory caching software is one fix. Caches reserve an amount of random-access memory on which to record data from the hard drive for quicker access.

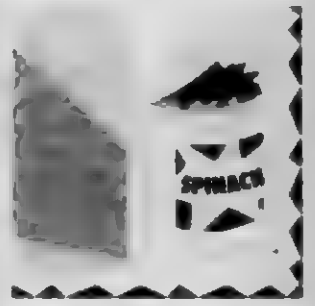
Standard utilities packages — such as Cupertino, Calif.-based Symantec Corp.'s Norton Utilities and Beaverton, Ore.-based Central Point Software, Inc.'s PC Tools Deluxe — include disk caching programs. However, today's RAM-hungry applications may leave little extra system memory to set aside.

One product that acknowledges this dilemma is Super PC-Kwik Power Pack, an integrated set of system-accelerating software utilities from Multisoft Corp. in Beaverton, Ore. Multisoft recently added a function that returns memory from the cache to the system when a big program such as Microsoft Corp.'s Windows 3.0 is running.

Booster option 2: Caching disk controllers. Add-in caching hard disk controllers come with a higher price tag but also offer a higher level of performance; users report that the results can be dramatic.

The Fisher Associates, Inc., a Torrance, Calif.-based risk analysis firm, bought a Hyperstor-1600 from Perceptive Solutions, Inc. in Dallas to cut database access times on an Intel Corp. 80386-based server. Company President Fred Fisher says the company is processing three times as many invoices in one-seventh the time. Caching controllers cost anywhere from $400 to $1,800, depending on the amount of memory on the board and the drive compatibilities included. The Hyperstor — which costs about $1,200 — supports mixed-drive environments. Several vendors are introducing lower-end boards compatible with single drive types.

Booster option 3: Hard drive replacements. Taking the caching controller concept a step further, some users choose to eliminate the hard drive entirely and replace it with a RAM board. The memory available on these boards is gradually increasing; one of the highest capacity boards available now is the BRC-Ramd-48 Ramdisk, a single in-line memory module board from Costa Mesa, Calif.-based Bristol Research Corp. The cost is $6,995 for the full 48M-byte version of the product, which was introduced in March.



BLOCKAGE: RAM cram. Booster option: Memory management software. For some, memory is as much a sticking point as speed. This is particularly true for users of laptop and notebook computers, which have little space for extra memory chips or high-capacity hard drives.

One helper is memory management software such as Santa Monica, Calif.-based Quarterdeck Office Systems' QEMM. Memory managers help users alleviate RAM crunch by making better use of existing memory. QEMM controls the 386's virtual 8086 and 32-bit protected modes, transforming the PC's memory into expanded and extended memory.

BLOCKAGE: Storage squeeze. Booster option 1: Removable hard drives. Disk space is another issue. A number of vendors are offering removable drives, and older versions are being tuned up to keep the pace, in some cases adding support for OS/2, Unix and popular networking software.

Booster option 2: High-density floppies. Higher capacity floppy disks may eventually become a common augmentation or replacement for hard drives, according to analyst George Thompson at Datapro Research Corp. in Delran, N.J.

Very High Density Floppy (VHDF) disk systems, with more than 20M bytes of storage space on a 3½-in. disk, are currently manufactured by San Jose, Calif.-based Brier Technology.

VHDF disk systems can be inserted into internal drive bays or used as stand-alone peripherals. ●

Slater is *Computerworld*'s new products writer.

Getting the platforms to mesh

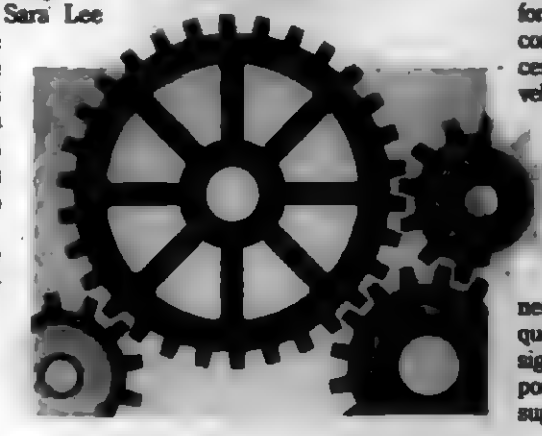
BY JOHN WEBSTER

The ability to support diversity within personal computer local-area networks — and to have multiplatform connectivity across them — has become a burning issue as companies strive to share data more effectively across work groups and functions.

Vendors have been responding to these new realities.

"Before, you were forced to build separate network architectures," explains Paul Bandrowski, manager of advanced technology at Sara Lee Corp. in Chicago. Now, he says, it is becoming more feasible to "combine tasks from separate networks into one network across one data link. The cost is reduced, and it's easier to maintain."

Routers in general have become more adept at moving multiple packet types over Transmission Control Protocol/Internet Protocol (TCP/IP), Systems Network Architecture and Appletalk.



However, incorporating various protocols onto the same network for seamless support of data transfer among two or more LANs requires a bridge router, or brouter. Indicative of the kinds of changes going on in this product category are recent enhancements made by Wellfleet Communications, Inc., which include support for 4M-bit and 16M-bit Token Ring networks, source routing transparent support and synchronous pass-through.

With increased interest in reduced instruction set computing-based machines, better LAN accommodations for Unix have also become a major concern. The most talked-about recent development in this area is Novell, Inc.'s Netware v3.11, which was announced in February and is just now beginning to ship in volume.

One key ingredient of Netware v3.11 is its support of communications protocols other than its proprietary Internetwork Packet Exchange/Sequenced Packet Exchange. The most significant protocol stack now supported is the TCP/IP. The TCP/IP support allows Netware servers to communicate with Unix hosts, which tend to "speak" TCP/IP.

This means "users can integrate DOS workstations with Unix servers and integrate DOS servers with TCP/IP," says Kenneth Zoline, a Chicago-based specialist in mixed-platform LANs.

Netware's new Macintosh Netware Loadable Module also provides true Appletalk Filing Protocol support for Apple Computer, Inc. Macintosh-to-PC connections, reducing the necessity for board-level modifications.

While Novell is garnering a large share of the limelight, it isn't the only networking software vendor offering enhanced portability.

Banyan Systems, Inc. has also made significant strides toward eliminating cross-platform communications snags, says Art Beckman, a Banyan user and manager of information technical services at Pacific Gas & Electric Co. in San Francisco.

"Banyan has a strategic plan to support at least nine front ends and is working on including the Mac by the end of the year," he says.

In the DEC world, both Pathworks 4.0 and DEC's Personal Computer System Architecture 4.0 have expanded to encompass TCP/IP and Network Device Interface Standard, thus improving Ethernet interface support. ●

Webster is a free-lance writer based in San Francisco.

Unix jumps into the breach

Corporate users, disappointed with OS/2, begin to look at Unix on PCs as a realistic alternative

BY PATRICIA KEEFE

After many years of trying, Unix has finally begun to pique the interest of corporate users. Typically, these are firms that are chafing against the limitations of DOS and eager to exploit a true 32-bit client/server environment, where Unix has a considerable head start on its nearest competitor, OS/2. Almost 3½ years after it first shipped,

OS/2 still falls short, users say. As a result, Unix's superiority in the areas of multiuser operation, multitasking and connectivity has led a number of companies, among them DHL Systems, Inc., Wal-Mart Stores, Inc., K Mart Corp. and a host of Wall Street firms, to build key business and mission-critical applications around Unix.

This is no stampede, and the conversions are by and large more incremental than revolutionary. With Unix holding less than one-tenth of the overall business market, widespread, hard-core implementations are still years away.

The small number of commercial, Unix-based desktops can be divided into several groups: Those running Unix on personal computers vs. those running Unix on workstations; those who consciously choose Unix vs. those who more or less stumble into the environment, led by a vertical application; and those running Unix on the client desktop vs. those running it either on a server tied to DOS PCs or as a bona fide multiuser box serving a mix of emulating PCs and dumb or X terminals.

In each of these cases, the latter overshadows the former. One reason is that much of the software that runs under Unix — vertical applications as well as office automation packages — tends to run on dumb terminals or Unix workstations, negating the need for intelligent desktops.

Many popular shrink-wrapped DOS applications are slowly being ported to Unix (see chart). But so far, these packages have not exerted much influence on corporate purchasers.

Do-it-yourselfers

Applications are often written in-house. This was the case at The Toronto Stock Exchange (TSE). In mid-1990, TSE became the first major exchange to automate the chaotic "order book," a record of orders before they trade, which traditionally are screamed out across the floor. It did this by running The Santa Cruz Operation's SCO Unix over IBM and Philips Telecommunications N.V. Intel Corp. 80386-based PCs and a single Compaq Computer Corp. Intel 1486 box tied to a Tandem Computers, Inc. VLX.

"Multiuser/multitasking was a key issue for both remote diagnostics and the ability to run multiple applications in a trading environment," says Loren Hicks, TSE's director of floor and product systems. "This is truly a distributed system, and there is really no other way to architect this than through Unix."

Hicks has over 100 keyboardless PCs anchored on the exchange floor and running four or five concurrent applications under Unix and Motif. Traders use a unique touch screen-based application to epter orders; they never see Unix.

It is typical for users to be shielded from any contact with Unix, either through the use of a graphical user interface such as Motif or through a menu shell built into the application.

At San Antonio, Texas-based La Quinta Motor Inns, Inc., interaction with Unix is even more of an arm's length affair. Approximately 205 networked La Quinta Motor Inns are running an SCO Xenix-based package over Intel 386-based Vectras from Hewlett-Packard Co. The DOS-based corporate desktops are tied to a Unix database, server and mail system.

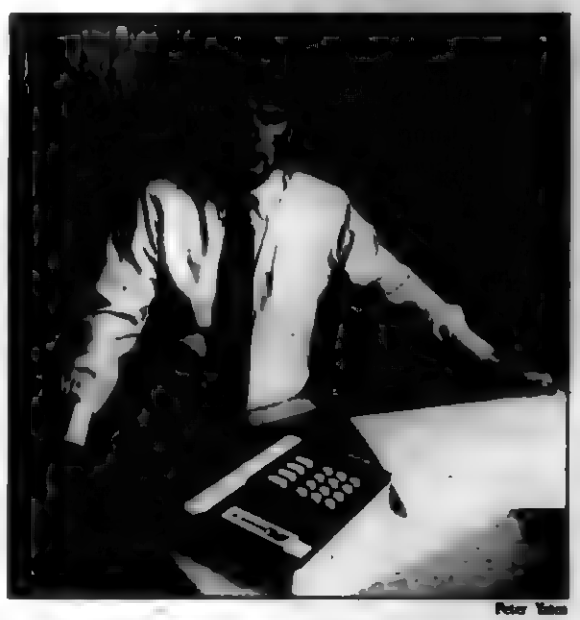
La Quinta Motor Inns chose Unix because it provides the opportunity to become "a one operating system shop," says Charles Hamlett, vice president of information systems.

However, the firm probably won't be rushing to discard DOS anytime soon, says Sam Peace, La Quinta's director of IS operations. "Unless there are some major price changes, the cost of Unix on a client basis is a little bit of a luxury," he says.

Cost is a concern — Unix applications packages still fetch high prices. Even when users opt to run the operating system on PCs, some expensive extras are usually necessary. Firms that choose Intel 386 or I486 PCs find they must bulk up the machines with additional storage and memory.

Money, money, money

But Unix *can* save money. When K Mart elected, in 1987, to build a Unix-based in-store architecture around the Intel platform, the decision was based as much on a desire to protect technology investments as on Unix's multiuser capabilities, according to David Carlson, senior vice president of IS.



Peter Yates

Carlson: *Unix is the obvious choice for multiuser mode*

For Central Fidelity Bank in Lynchburg, Va., switching to Unix has meant being able to run one, rather than three, data lines into each branch to serve three networks. After automating several branch activities, the bank found its DOS server "was not cutting it," says Charlie McVeigh, automation manager for the bank's 200 statewide branches. Switching to Unix increased the number of communications tasks the network could handle without adding software. These include distribution of software upgrades, remote systems administration, host connectivity and peer-to-peer communications via support for LU6.2.

Better than alternatives

Current users laud Unix for network and database integration, better server and remote administration and overall greater freedom of movement across platforms and gateways. "A lot of people criticize Unix, but my question is, what out there is better for multitasking/multiuser?" Carlson asks.

A lot more users may be singing Carlson's tune if IBM falls short with OS/2 Version 2.0, slated for release at year's end, and if Microsoft Corp. fails to deliver on its New Technology OS/2 promises. Both appear to be on a collision course with Unix Easy, a modular next generation of Unix System V Release 4 that is also known as "Unix Lite." It is said that Unix Easy is more modular across the three hardware tiers, sports a better interface and consumes less memory.

User impatience with IBM and Microsoft could combine with a more palatable Unix and more powerful PCs to spur increasing numbers of DOS developers and users to cross over. ●

Keefe is *Computerworld*'s senior editor, PCs and workstations.

Move it on over

Many of the leading DOS desktop applications have either been ported to Unix or are in the process

WORD PROCESSING SYSTEMS

- **Borland International, Inc.** — Sprint
- **Wordperfect Corp.** — Wordperfect 4.2
- **Samna Corp.** — Samna Plus IV
- **Microsoft Corp.** — Word
- **Software Publishing Corp.** — Officewriter*
- **Xyquest Corp.** — Xywrite
- **Ashton-Tate Corp.** — Multimate

SPREADSHEETS

- **Borland International** — Quattro Pro
- **Lotus Development Corp.** — 1-2-3
- **Microsoft** — Multiplan*
- **Olympus Software, Inc.** — Ultracalc

DATABASE MANAGEMENT SYSTEMS

- **Ashton-Tate** — Dbase IV
- **Datacase Corp.** — Datacase
- **Oracle Corp.** — Oracle
- **Fox Software, Inc.** — Foxbase+
- **Informix Software, Inc.** — Wingz & Smartware
- **Ingres Corp.** — Ingres
- **Data Access Corp.** — Dataflex

MISCELLANEOUS

- **Autodesk, Inc.** — Autocad (Computer-aided design)
- **Microsoft** — Works*
- **Wordtech Systems, Inc.** — Quicksilver (Dbase compiler)
- **Norton Computing, Inc.** — Norton Utilities

*Move in progress

Source: Computer Technology Research Corp

CW Chart: Doreen St. John

Even the clones are restive

BY RICHARD PASTORE

After several generations of strict conformity, personal computer clones have begun to mutate. It's a matter of Darwinian necessity. In the days when PC demand outstripped supply, it was enough to copy IBM and slap a lower price on the box. But survival in the commodity world of the IBM work-alike now demands differentiation and innovation.

"We need to make sure our products are differentiated not just in price but in performance," says David Kirkey, vice president of marketing at Advanced Logic Research, Inc. (ALR) in Irvine, Calif.

Time to market is one area in which the clone companies have begun to push the envelope. For example, many first-tier firms moved into fast-forward on production of an Intel Corp. I486-based PC, but AST Research, Inc, was first out of the gate with a native 486 box.

In an even more stunning turnabout at the end of last year, both IBM and premier compatible vendor Compaq Computer Corp. wound up following the clone makers' example, introducing upgradable PCs designed from the ground up.

AST paved the way in early 1989, offering a chance for users to swap the PCs' original processors for more powerful successors. A user could buy a machine with an Intel 80386SX chip and upgrade it to a 486. ALR and Everex Systems, Inc, quickly followed AST's lead, producing their own upgradable designs. ALR took it a step further and pushed the upgradable CPU range down to the Intel 80286 level. "Two years later, IBM and Compaq are saying they're going to be in that marketplace, so tell me: Who's copying whom?" Kirkey asks.

Clone makers' attempts to differentiate themselves have not gone unnoticed by corporate buyers, who are increasingly looking toward the clones. Computer Intelligence in La Jolla, Calif., reports that in recent surveys, 41% of U.S. firms with 500 or more employees say they plan to buy clone alternatives to IBM, Apple Computer, Inc. and Compaq boxes. And there's some evidence that good prices aren't the only draw.

Stephen Anderson, an information systems architect for the state of Washington, says he has noticed the changes, adding that clone makers' market responsiveness and willingness to innovate are "serious considerations that you have to take into account when you're buying."

Not every attempt at innovation by a clone maker has been successful. However, the near future promises more technological innovation.

AST is working on a multiprocessor-based computer that, rather than following in the footsteps of Compaq's Systempro, will be adding its own twists to a differing specification. It will debut by year's end, analysts say. (IBM has yet to unveil a multiprocessor-based PC.)

Several clone vendors, including NEC Technologies, Inc. and Acer America Corp., are developing 1992 hardware designs around the Mips Computer Systems, Inc. reduced instruction set computing architecture.

Many clone vendors will no longer let others call the shots. Innovative ideas from the small players will benefit users and keep the larger competition on its toes. "I don't think IBM is in any more of a position to set standards today than any other hardware company," says Michael Krieger, senior manager of advanced systems at AST. ●



M. E. Cohen

Dealers' losses, your gains

Jostling in the distribution channels works to the buyer's advantage

BY CHRISTOPHER LINDQUIST

Change is rampant in the personal computer dealer channel, and purchasers are reaping the benefits in the form of cost savings, convenience and customized service.

Mail-order marketers are offering products and an increasing range of services at prices so low, traditional retailers cannot compete. Superstores give buyers good prices and the simplicity of one-stop shopping. Traditional dealers, when they aren't rushing to compete on price, are joining the ranks of value-added resellers (VAR) to swell the choices for buyers in search of systems building assistance.

Several factors are contributing to the reshufflings. At the top of the list are rising levels of technical confidence and cost-consciousness among purchasers. Next is the fact that mail-order companies, sensing an opening, have pushed hard and fast to capture more market share.

Gone are the days when purchasing a mail-order system meant trading a good price for poor support and worse service. Today, extended warranties, free telephone support, overnight delivery of replacement parts and even on-site service are becoming common.

Andy Rifkin, director of research and development at *Time* magazine, says *Time* purchased PCs through local dealerships but shifted to mail order six months ago when it tried to upgrade 200 of its Intel Corp. 80286-based units with plug-in 80386 cards and found the upgrade would cost more than a whole new machine purchased through a mail-order supplier.

Price was a major factor, according to Rifkin, who researched roughly 60 PC brands before settling on PCs from Gateway 2000, Inc. in North Sioux City, S.D. However, in addition to price, performance and quality of telephone technical support were also important.

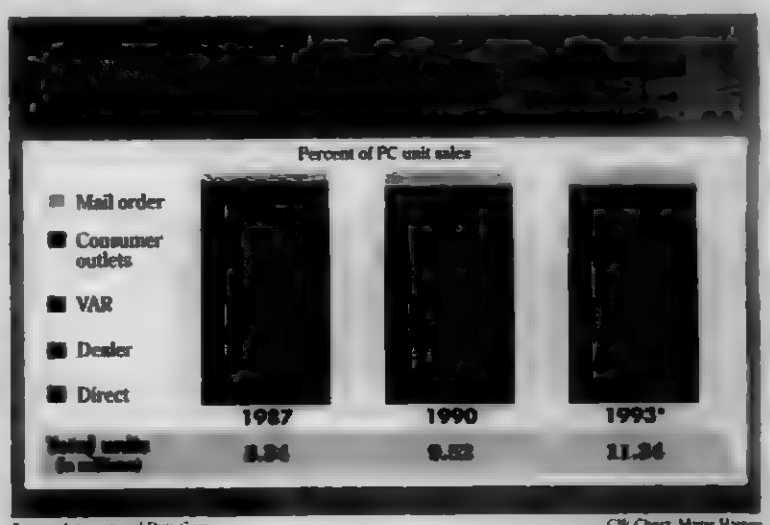
Superstores are increasingly service-conscious. Nathan Morton, chief executive officer at computer superstore chain CompUSA, Inc., says purchasers can get as much as they want — from drop-off repair to 24-hour-per-day on-site support.

For some purchasers, however, price is not the issue, and after-the-fact service is not enough. Choices for this group, which wants soup-to-nuts systems assistance, are expanding as conventional dealers develop specialties and transform themselves into high-end VARs.

Businessland, Inc. is one dealer that is trying to cover both ends of the spectrum. Having eliminated its retail business, it is using catalog mailings and a National Order Center in San Jose, Calif., for direct sales to price-conscious buyers. Businessland is also moving aggressively into VAR mode, offering not only consulting but also facilities management.

Intelligent Electronics, Inc. in Exton, Pa., offers other dealers another escape from competitive pressures and possible plummets into what industry observer Seymour Merrin refers to as "the bankruptcy gap." The company takes established local dealerships and adds them to its nationwide network.

The result for customers? Familiar faces are offering better prices and big-league support. ●



Source: International Data Corp. CW Chart: Marie Hanes

Lindquist is a *Computerworld* staff writer.

Despite his wealth, Phinnias Pritchard lived in a small hovel within the bowels of London's East End. To call him miserly would be entirely too generous. Consider this illuminating example:

Rather than spend a half penny for new candles like everyone else, Phinnias would make the rounds of local establishments, scrape the tallow drippings from old candleholders into a sack, and later melt the contents to make new candles. On one particularly productive evening he collected six scrapings from a pub, four from a butcher's shop, twelve from a church abbey, eight from a neighborhood inn, ten from a local

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cockfighting hangar and nine from a cobbler's shop. Query: If it takes the remains of seven candles to make one new candle, and if one candle lasts an entire night, how many full nights of light was he able to create from this trip?

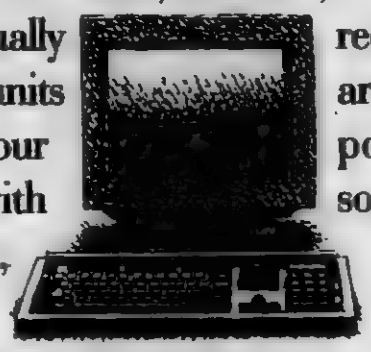
Certainly it's hard to quarrel with Mr. Pritchard's motives. Especially in this era of revered recycling. But, one could legitimately question whether he was receiving an adequate return for all the effort he expended. (Though it did yield in excess of seven candles.)

One could also question what all of this has to do with Wyse.

Believe it or not, quite a bit.

Because—in the interest of ergonomic reform—we are conducting a sort of recycling effort of our own. From May through August we are paying $50 for any antiquated terminal traded in on a new Wyse WY-150, WY-160, WY-185 or WY-370.

Obviously, we don't actually recycle the parts into our new terminals. But we will see that the old units are properly dismantled and disposed of, then recycle $50 into your pocket. A nice return for very little effort. So if you are still cursed with some ergonomically archaic terminals, here's your chance. After all, having shipped over three million terminals worldwide in the past decade, we know a little about how to build new ones. Which helps explain why we are able to offer such a broad line of industry-standard terminals with a combination of features and ergonomics unsurpassed by competitive terminals. User-comforting ideas like our unique detachable keyboards with light-touch keys and high tactile feedback. Tilt & swivel monitor bases and higher refresh rates plus overscan video for flicker-free images. All at price/performance ratios that are controller-comforting.



THE WYSE-ERCONOMIC REFORM ACT: $50 REBATE on any old terminal when purchasing new Wyse WY-150, WY-160, WY-185 or WY-370 Terminals. With advanced ergonomics, highest refresh rates, legendary reliability.

Besides being the largest independent terminal company in the world, today Wyse is also recognized for its broad line of PCs as well as its multiprocessing advanced systems. Probably because we provide the same kind of ergonomics, performance and aggressive pricing that has made us so strong in terminals.

For more information about Wyse terminals, call your local distributor or call us at 1-800-GET WYSE. We'll send you our new Ergonomics Handbook and a poster of more mind-stretching Cerebral Aerobics. Just to help keep your brain flicker-free.

By now the attentive reader has learned two things: Mr. Pritchard's recycling program netted him more than seven candles and Wyse's recycling program can net purchasers several hundred dollars towards the industry's finest terminals.

Don't stop now.

WYSE

The answer to terminal replacement problems can be found in our unique $50 trade-in offer.
The answer to Pritchard problem can be found on page 120.

More punch per dollar spent

During the past year, high performance and lower prices met head-on

BY JEREMIAH CARON

Change is a constant when it comes to affordability of personal computer systems. From year to year, prices continue on a downward slide, while both performance and purchaser expectations push upward. Some years see bigger shifts than usual, however. This past year has been a special one — not because of any cataclysmic breakthroughs but

because of the coincidence of particularly heavy price competition on the highest plateaus of the technology.

When the first Intel Corp. I486-based PCs came to market in late 1989 and early 1990, most were priced so high that the existing 80386 PC pricing structure did not seem threatened. Before long, however, a number of vendors, including AST Research, Inc., Advanced Logic Research, Inc. and a horde of mail-order firms, challenged the notion that I486-based PCs were just for high-end engineering and local-area network file server applications. These companies priced their desktop 486s low enough to attract corporate power users looking for maximum performance in single-user applications, and they built up their service and support capabilities to a point where many users say they rival or surpass those of the more expensive vendors.

These moves forced major PC players to rethink their pricing strategies, with the result that I486-based systems, which sold for $13,000 to $14,000 when first introduced, now cost $5,000 to $10,000.

Predictably, as prices of the I486 machines fell, so did those of the 386s. Compaq Computer Corp., for example, has announced significant and broad-based price cuts twice in the past eight months, bringing its suggested retail to within reasonable striking range of the asking prices of vendors such as Dell Computer Corp. and Northgate Computer Systems, Inc. A Compaq Deskpro 386/25E with a 60M-byte hard disk can now be purchased for $4,499 or less, for example.

The increase in affordability of powerful microcomputers has not been limited to Intel CPUs. Apple Computer, Inc.'s October 1990 introduction of the Macintosh Classic, LC and IISI models has made corporate purchasers rethink their assumption that the Macintosh was a powerful but more costly alternative to DOS-based computing. In the meantime, Unix users were treated to high-powered reduced instruction set computing-based workstations for less than $5,000 from a number of vendors.

Price/performance plus

There have also been significant improvements in the price/performance of peripherals. Pricing structures on printer products (particularly laser printers), IBM Video Graphics Array adapters, monitors, add-on memory and communications products were quietly but permanently rearranged over the past year as new technologies emerged and existing ones became less expensive.

The entry-level price of high-quality output was significantly lowered in the past year by the emergence of "personal" laser printers, most notably the Hewlett-Packard Co. Laserjet IIP, Apple Personal Laserwriter LS and IBM Laserprinter E models.

These products — which sell for less than $1,500 — make laser printing more affordable, although supplies, such as toner cartridges, are still fairly expensive.

Affordable at last

Memory can now also be termed "affordable." Both IBM and Compaq dropped prices on their 32-bit memory expansion boards in late 1990, and most users can inexpensively increase system random-access memory to the levels required by many of today's advanced software products, including Microsoft Corp.'s Windows and Lotus Development Corp.'s 1-2-3 Release 3.1.

Software is one area where prices generally vary little from year to year. For the most part, this means continuously improving value because new features and functions are often added to new versions without major alterations in selling price.

Of course, software developments do tend to increase costs for purchasers in terms of the need to reconfigure or replace hardware or to purchase additional software to take full advantage of new capabilities. The $149 Windows package is a case in point. Many of the estimated 3 million units sold have forced their users to upgrade their existing PCs with more RAM, more powerful processors and new graphics adapters or to buy completely new systems based on the 80386SX or 80386 CPU.

The bottom line, however, is that this has been a good year for PC purchasers. The current generation of "affordable" PCs, both the DOS/Intel CPU and most of the Macintosh line, are based on 32-bit microprocessor platforms. This is a key corner to turn because it means that before very long, even low-end PCs will be able to multitask applications, access large amounts of memory and support a whole generation of advanced applications and environments. ●

Caron is senior editor of "Faulkner Reports on Microcomputers and Software" and "Microcomputer Communications," published by Faulkner Technical Reports in Pennsauken, N.J.

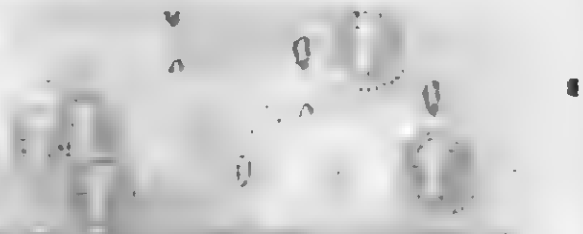
See how they've dropped

A for-instance look at recent price trends

Prices represent averages based on long-term tracking of roughly 30 vendors

	1/90	6/90	1/91	5/91
LOW-END				
16-MHz 386SX PC with 1M-byte RAM, Video Graphics Array (VGA) graphics and 40M-byte hard disk	$4,000	$3,600	$3,200	$2,800
MIDRANGE				
25-MHz 386 PC with 2M-byte RAM, VGA graphics and 100M-byte hard disk	$7,500	$7,000	$6,000	$5,000
HIGH-END				
25-MHz 486 PC with 4M-byte RAM, VGA graphics and 300M-byte hard disk	$15,000	$13,500	$11,250	$9,500

CW Chart: Doreen St. John



Low-priced? Affordable?

Changes in the PC industry during the past year came thick and fast — and largely benefited the consumer

Compaq Computer Corp. Deskpro 386 price cuts	Positive	Positive	Result of pressure on Deskpro 386 sales from low-cost vendors. Caused further overall 386 price drops, even from IBM. Helped bring 32-bit computing well into affordability range.
Apple Computer, Inc. Macintosh Classic, LC and IISI introduction	Positive	Positive	Effectively reduced entry price point to Macintosh environment. New low-cost systems will support System 7.0. Success encouraged Apple to lower high-end Macintosh prices.
Major vendors offer low-cost laser printers	Positive	Even	Laser printing capabilities now available to individual and small-business users. May tempt users to purchase low-cost laser printers even though they are still much more expensive than dot-matrix models and exact a higher consumable cost.
Microsoft Corp.'s Windows 3.0 introduction	Even	Negative	Many new Windows users require hardware upgrades, new applications and additional training, which can significantly reduce overall affordability of a Windows-based environment.
Advanced Micro Devices, Inc. AM386 clones introduction	Even	Positive	Prices of systems based on faster AM386 chips may not be noticeably different than for slower Intel Corp. 80386-based products. Effect on affordability should be positive, however, as Intel answers clones with 486SX chip, further pressuring overall 386 pricing.

CW Chart: Marie Hanes

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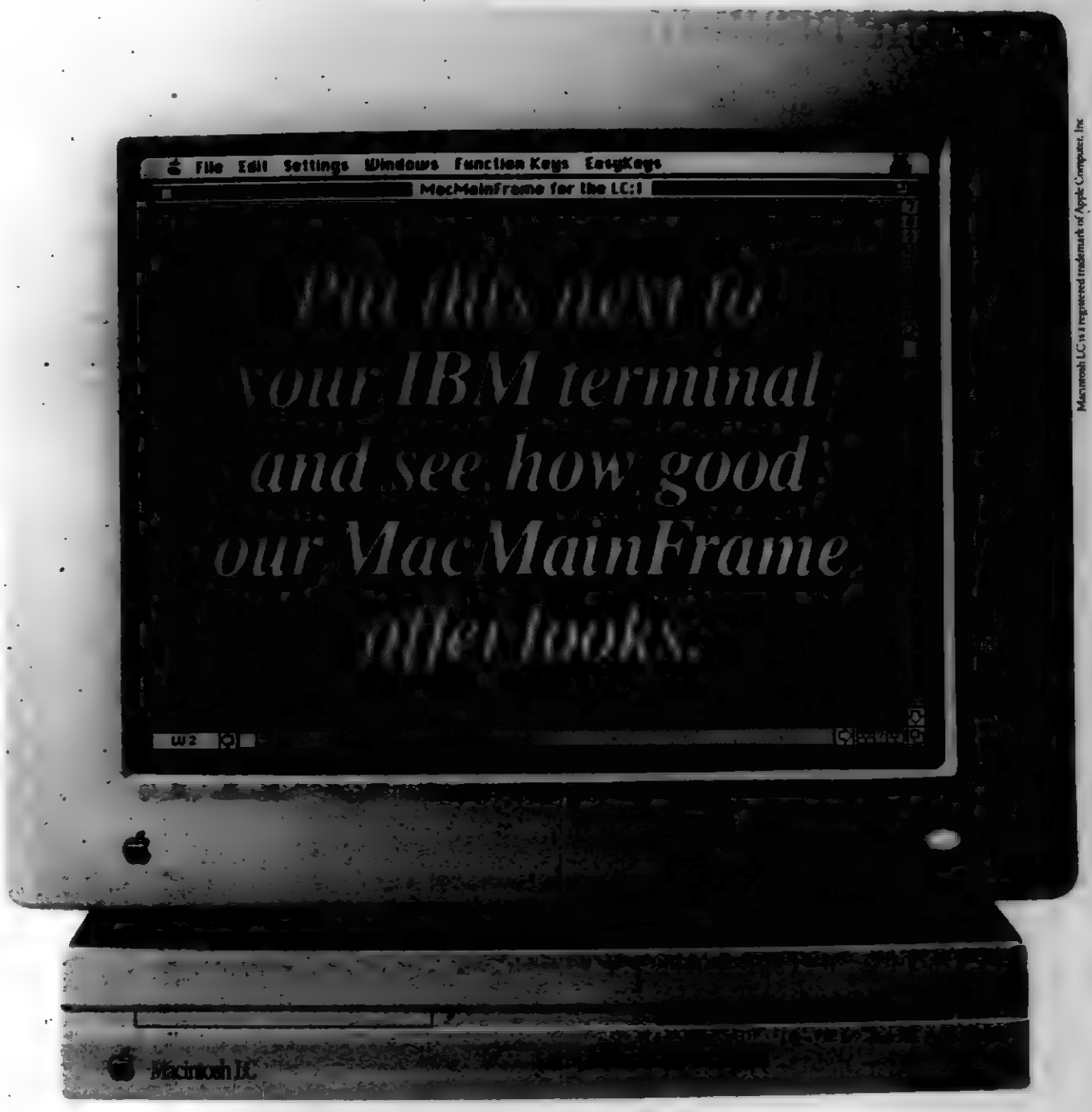
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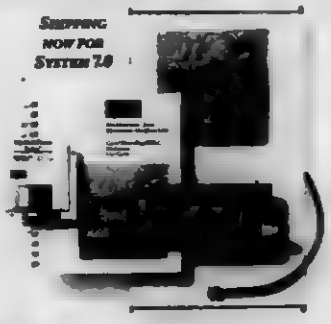
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MCW2



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MCW2

Improving the brain-to-RAM transfer

BY MARK FRITZ

First there was the keyboard. Then came the mouse. Now there's the Super Mouse, the Beetle Mouse, the Mouseman and the Unmouse — a virtual rodent's nest of input devices. Unlike their furry namesakes, however, these mice — and a host of other user input devices, including trackballs and touch screens — are welcome additions to the desktop computer.

The proliferation of input devices is, at least in part, a result of graphical user interfaces (GUI) such as Apple Computer, Inc.'s Macintosh interface and Microsoft Corp.'s Windows. GUIs, which make computer use easier, are not only changing the way people interact with their computers, but they are also raising expectations for input devices. For many GUI users, neither straight keyboarding nor old-fashioned mice live up to those new expectations.

Some of the new mice offer little more than ergonomic design and decorator colors. Infrared- and radio-controlled mice, such as those from by Logitech, Inc. in Fremont, Calif., and Z-Nix Co. in Pomona, Calif., liberate users from tangled wires.



Jamil Genovese

Apple users have traditionally used one-button mice, and IBM Personal Computer and compatible users have become accustomed to Microsoft's two-button mouse. There are also three-button mice out there, although few applications are designed to utilize them.

Motivated users can take advantage of multiple-button mice by using mouse-handling software such as Whiskers, a $25 program from Numbers & Co. in Oroville, Wash. Whiskers allows users to program the second and third buttons to emulate any key (i.e., ENTER, HOME, SHIFT and DELETE). Whiskers, which runs under Windows, can also transfer copy, cut and paste commands to mouse control and can assign hot keys.

Trackballs, which are essentially mice turned upside down, are the preferred pointers of some computer users because they occupy less desk space than a mouse pad and are less likely to cause wrist strain. That is an attribute some vendors are seeking to strengthen. For example, Emac, a division of Everex Systems, Inc., recently announced its Silhouette trackball, which has a special ergonomically designed chassis contour.

One of the problems for users of laptop computers has been how to use Windows or some other GUI without a mouse. One solution is Microsoft's new Ballpoint Mouse, a miniature trackball device that clips onto the side of any laptop and allows the user all the functionality of a traditional mouse. Sometimes, a separate device such as a mouse or a trackball is more of a hindrance than a help. With applications that require a lot of keyboarding, it can be distracting and counterproductive to have to take one's hands off the keyboard.

Fingertip alternatives

One fix is being offered by Home Row, Inc. in Clackamas, Ore. Home Row technology embeds a pressure-sensitive pointing device in the J key on the home row of the keyboard. By applying pressure on the keycap as if to bend it left, right, up or down, it controls the cursor much like a trackball would. Command clicks are done with the F and D keys. Home Row is not an end-user product; the technology is available for licensing to keyboard manufacturers. Company President and inventor Dave Straayer acknowledges that it takes "some engineering" to install this technology in a keyboard but claims his licensees report volume costs well below the cost of installing a trackball with each computer.

Of course, the ultimate human pointing device is the finger, and if you cover your monitor with a touch-sensitive panel of transparent glass or plastic known as a touch screen, you will get almost direct contact with a graphical application on your screen.

Touch screens are usually used for very simple computerized tasks that involve nontypists and people who are not very technically inclined. They are popular

Fritz is a free-lance writer based in Dedham, Mass.

dFacts Are In.

DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
EASE OF USE			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications *without programming*	Yes	Yes	No
Modern pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
PRODUCTIVITY			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
POWER, FLEXIBILITY			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	5	3
MARKET PENETRATION			
#1 Selling, #1 Rated multiuser database; over 3 million users (1)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	No
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Macintosh
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 50% of PC database systems sold (2) source: economic consultant's report by the position research firm Ausbin Inc. Surveys Oct. 1990 (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX, and SunOS. Macintosh and other UNIX versions are announced.

Based on what our customers tell us, we made a list of some of the most important features to look for in data management software.

Then we compared the new dBASE IV® version 1.1 with two other database products.

As you can see, dBASE IV offers exclusive advantages in many categories.

For instance, only dBASE IV lets you access all its functions from a single screen. Called the Control Center, this screen lets you manage existing data, and create new tables, queries, reports, forms and labels totally without programming.

When all the facts are on the table, it's easy to see which database software is best.

Of course we aren't the only ones who have come to this particular conclusion.

Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

Trademark/owner: dBASE IV: Ashton-Tate, Ashton-Tate logo/Ashton-Tate Corp. Other company or product names mentioned may be

on factory floors, where the computerized control of complex machinery can be reduced to pointing. The touch screen gives an industrialist added value by virtually negating the need for worker training — no one needs to be taught how to use his finger.

Another market pursued by touch-screen vendors is the executive suites of corporations, where nontechnical users need access to corporate information.

Stretching the appeal

Recently, several manufacturers have come out with touch-screen software that emulates a mouse, a development that may serve to broaden the appeal of this technology.

Monitormouse from Elographics, Inc. in Oak Ridge, Tenn., the largest maker of touch screens, allows a touch screen to replace a mouse or to work in conjunction with one. When used in the Windows environment, Monitormouse can be used to resize windows, pull down menus or activate commands. When the finger is held still, the program switches into the drag mode so you can drag objects across the screen with your finger the way you can with a mouse.

Touch-screen prices, which were once prohibitively high at approximately $1,000, have dropped gradually during the last two years. You can now buy an Elographics touch screen for as little as $265 — but add at least $99 to that for Monitormouse or other software.

Even though touch screens have been around for a long time and are widely used — Elographics has 100,000 in the field — these devices are not totally trouble-free.

Many users report difficulty with registration in the setup of the screens, which means it is hard to align the coordinate systems of the touch screen with that of the graphic display. Interactive video producer Edgar Shriver at Kinton, Inc. in Falls Church, Va., reports registration problems in the setup of the screens are "a lot of bother."

Ergonomics can also be something of an issue. Some users complain about tired arms and sore fingers. "Banging your finger against a screen all day hurts," Shriver observes, noting that he's seen some users who initially demanded touch-screens convert to mice for that reason.

Touch technology is also starting to show up in nonscreen contexts. Microtouch Systems, Inc. in Wilmington, Mass., has transferred touch direction to a desktop tablet similar to the digitizing tablets used by engineers, draftsmen and designers to produce with a hybrid input device called the Unmouse.

The Unmouse is a miniature (3-in. by 4½-in.) touch-sensitive tablet with a resolution of 1,000 by 1,000 touch points, or points the computer will recognize through the touch of a finger, a pen or the supplied stylus.

As with full-size tablets, the Unmouse can be used for drawing, tracing or entering signatures into computer documents. By sliding templates under the glass, it becomes a programmable keypad. If the user prefers, the tablet can be switched into mouse or trackball mode. It costs $235.

Developing forms of expression

With the advent of pen-based operating systems from Microsoft and Go Corp., some observers say that in the near future, users will see some sort of digitizing tablet on almost every desktop. The pen-based systems that will emerge from Go and Microsoft technology will be sophisticated enough to recognize complex written "gestures," which is how they recognize handwriting. For instance, the curve of a U would be considered a gesture.

GRAPHICAL USER INTERFACES, which make computer use easier, are not only changing the way people interact with their computers, but they are also raising expectations for input devices.

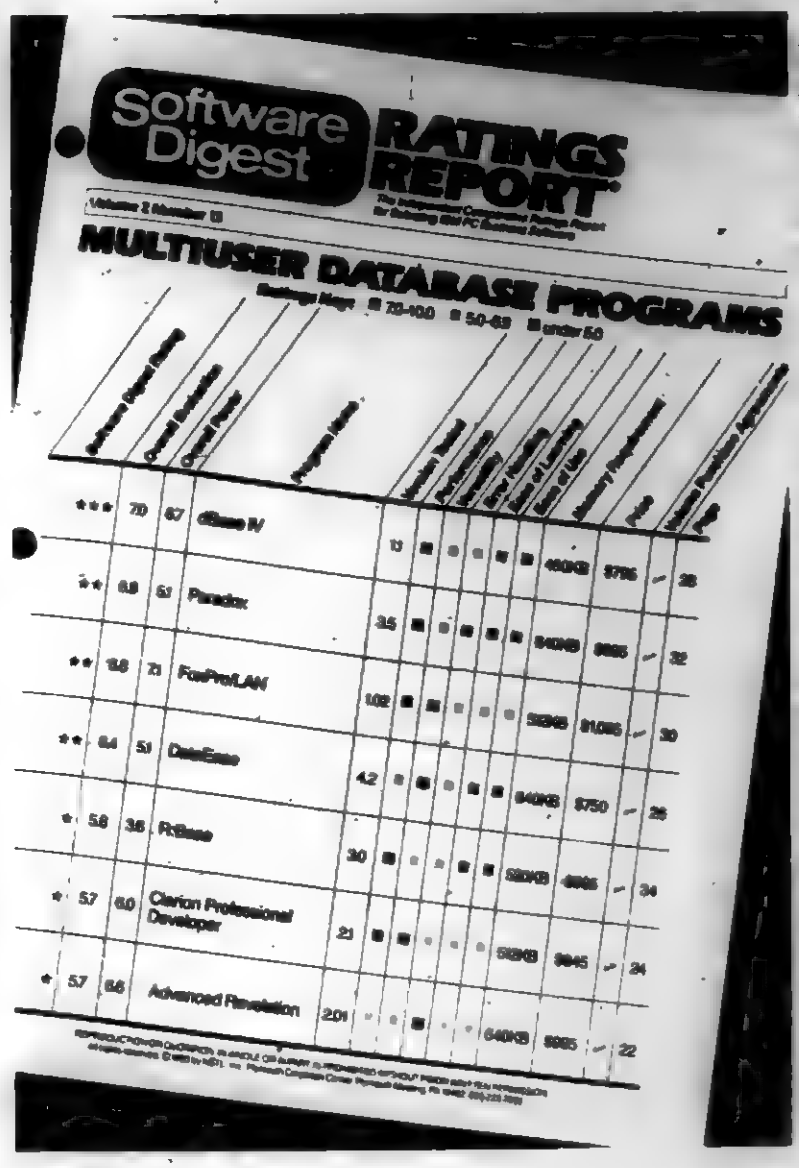
Of course, the ultimate way to communicate with a computer would simply be to talk to it. Although today's PCs are not smart enough to understand what people say, they can be "trained" to recognize a limited vocabulary of commands much like a parrot can learn to repeat words without understanding the meaning of them.

Perhaps the best known speech-recognition product is Voice Navigator from Articulate Systems, Inc. in Cambridge, Mass. With Voice Navigator, Macintosh users can enter common commands such as OPEN, COPY, CUT, PASTE AND PRINT simply by speaking into a microphone. It's faster than using a mouse and leaves hands free for other tasks.

Voice recognition products similar to the Voice Navigator are also available to the IBM PC world at reasonable prices. The Voice Master Key system from Covox, Inc. in Eugene, Ore., for example, sells for $149.

The inconvenience of voice recognition systems is that they have to be trained or programmed to recognize each command, and some systems are speaker-dependent, which means they recognize only the voice of the person who trained them. Also, voice-recognition systems are often thrown off by background noise and are not recommended for open office environments, where many people may be speaking at once. ●

dTruth Comes Out.



Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

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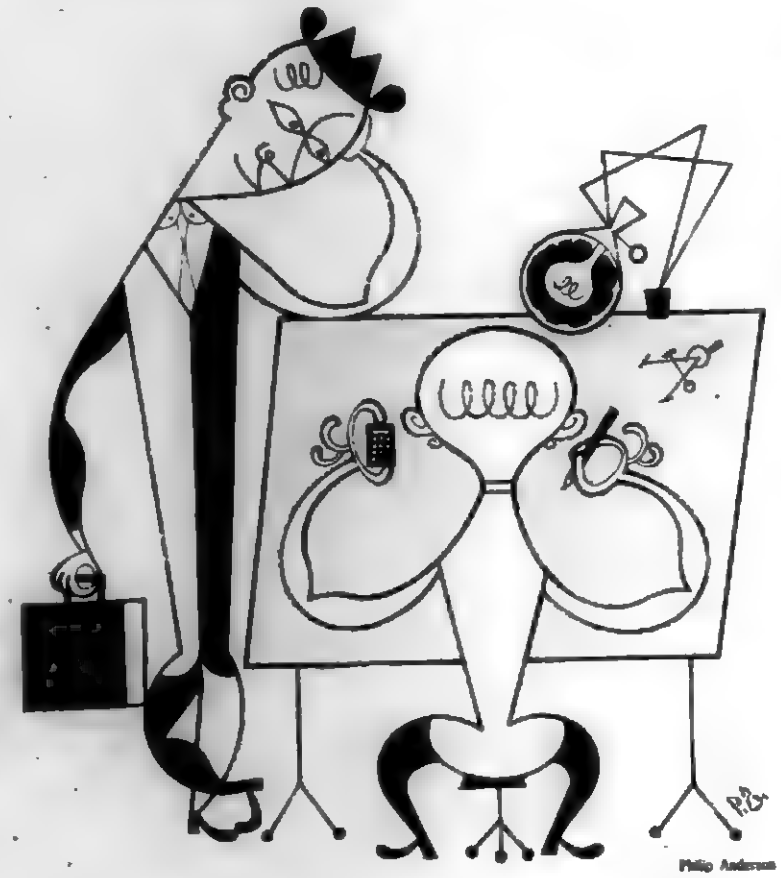
The truth is, no other database can do so much to improve productivity.

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Do 10,000 minnows = a whale?

No new blockbuster applications on the horizon but lots of fresh twists and technology extensions



Philip Anderson

BY ALAN J. RYAN

If there is a 1990s equivalent of Visicalc on the short-term horizon, its outline isn't apparent yet. That's a disappointment to many who say it is time for another great leap in personal computing, another breakthrough application that will set off a sustained buying boom.

In the meantime, however, there are significant — albeit less resounding — strides being made in a number of key areas, and these incremental developments may ultimately provide more substantive roles for PCs than any single gee-whiz application. Here are a number of areas to watch:

• **Transportable models.** Notebooks and laptops are being turned from bare minimum travel conveniences into all-purpose machines. "We are graduating into the next generation of products based on the 80386SL chip from Intel Corp.," says Bruce Stephen, director of PC hardware research at International Data Corp. in Framingham, Mass. Without question, he says, "we will see a lot more power management features in the notebooks, so users will be able to run the machines longer."

They'll also be able to run them harder for a lot less, says Mark Minasi, a partner at consulting firm Moulton, Minasi & Co. in Columbia, Md. "For $2,000, you'll be able to buy an 80386SX-based notebook [this year] that will include 4M bytes of random-access memory, a 60M-byte hard disk and a coprocessor socket." At those prices, Minasi says, it is likely that companies will begin looking at the tiny computing units as replacements for full-size desktop models.

Also in the cards for laptops are higher capacity, 2½-in. hard drives. The norm will increase from 60M to 80M bytes, Stephen says, and there is even talk of vendors going beyond 80M bytes within the next year.

• **Pen-based systems.** The release of high-function pen-based systems will open even more doors for an increasingly mobile work force.

High-function stylus-based computers based on Go Corp.'s Penpoint operating system, expected late this year or in the first quarter of 1992, will be as exciting as the early Apple Computer, Inc. Macintosh, says Paul Saffo, a research fellow at the Institute for the Future in Menlo Park, Calif.

Microsoft Corp. is also working on a high-function, stylus-based operating system called Pen Windows and has already distributed more than 200 developers kits. The company says 21 OEMs have announced support for Pen Windows, and products may start to ship in early 1992.

While companies such as Grid Systems Corp. in Fremont, Calif., already offer stylus-based units for applications such as insurance damage reports or retail inventory control, those products only scratch the surface of pen-based possibilities. When the Go technology is incorporated into laptop units (the company is working with several vendors), it will work with a wider range of applications, such as word processing and spreadsheets, a Grid Systems spokesman says.

Saffo, however, says what will really bring the promise of pen-based operating systems to fruition will be the eventual combination of that technology with advances in wireless communications. "It is the combination of the two that is exciting — a slate-like device in your briefcase with a built-in cellular modem," so users can send and receive faxes or upload or download anything that is available in your office, he says.

• **Expanded storage.** Users can also expect to see many more desktop and portable devices that use compact disc/read-only memory (CD-ROM) technology now that prices on CD technology are dropping, says Kurt Mueller, founder and president of Dataware Technologies, Inc., which makes authoring systems for publishers creating CD-ROM applications.

The really exciting developments will be in the area of low-cost, write-once CDs, Mueller says. "Write-once technology is available today in the $30,000 class, and that is expected to drop to the $2,000 to $3,000 range this year or early next year."

If that happens, he says, write-once technology could become a practical and affordable tool at the departmental or even individual user level for applications such as electronic publishing, work-group computing, improved archival applications and transaction processing.

• **Windows and OS/2.** Charles Foundyller, president of Daratech, Inc., a consulting firm in Cambridge, Mass., says he expects to see Version 3.1 of Windows arrive in the third quarter. The upgrade to Windows 3.0, he says, will eliminate some of the bugs in Windows and will include more utilities.

He adds that Microsoft may deliver Version 2.0 of OS/2 this year, which is expected to have direct execution of Windows applications programming interface calls. That feature would allow users to take Windows programs and run them in standard mode under OS/2.

• **Combination specials.** A number of technological strains are beginning to converge, producing products that challenge old ideas about the PC's place.

One product of this type that is expected to hit the market this year is Red, from Reddy Information Systems in Berkeley, Calif., and New York. Red, which might be best described as a personal, portable multimedia information system, also features a portable CD-ROM drive and a proprietary display processor.

The unit, initially targeted at jobs such as aircraft maintenance, where the user's hands must remain free to perform work, essentially projects an image onto the user's retina so that the image — in this case, a maintenance manual page — appears to be floating in space in front of the user. The unit clips onto the user's belt and has an external battery pack that lasts four hours.

Fax technology is also making its way into an assortment of other technologies. Announcements of superfax machines that have copying capabilities, laser printing capabilities and the like have already begun and will continue throughout this year and into the next. •

Rising mobility

During the next few years, portables and laptops will make the greatest gain in desktop sales

Percent of worldwide unit shipments of microcomputer systems



*486-based PCs and low-end workstations used in nontechnical settings

Source: Electronic Trend Publications

Ryan is a *Computerworld* senior writer, features.

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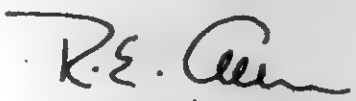
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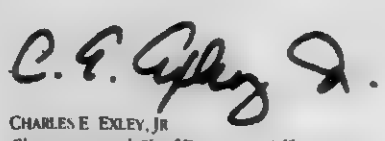
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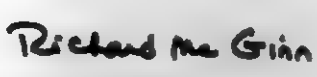
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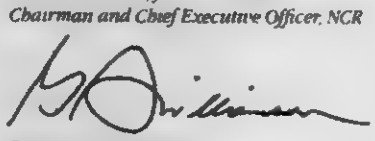
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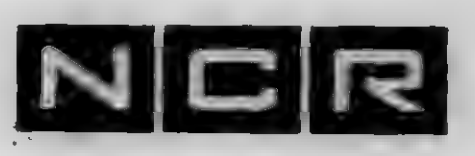


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The whole world in your hand?

Pundits see a day when computer users will be able to do almost everything, almost everywhere

BY ALAN J. RYAN

If computer industry visionaries are correct, the not-so-distant future of personal computing will bring a truly global and mobile information marketplace where users can access and share information from nearly anywhere using a cellular phone and a personal computing "appliance."

As more companies look for ways to reduce overhead, and as technologies such as compact disc/read-only memory (CD-ROM) and cellular communications continue to improve in price and performance, the idea of a mobile work force requiring little office space is expected to become a reality.

It is not unlikely that within the decade, users carrying one powerful handheld computing appliance — featuring fax, photocopy, telephone and CD-ROM capabilities — will have access to all of the information they need simply by plugging into "landing sites" or "information turrets."

The users' telephone numbers will be their mobile work and leisure address, at which they will be able to be reached 24 hours per day via electronic mail. In the long run, says Paul Saffo, a research fellow at the Institute for the Future in Menlo Park, Calif., "the workstation is going to become like a telephone, where the essential value is derived from what it is connected to."

Some of the developments expected during the next several years that will help to bring about this altered reality include the following:

• **Cheaper optical:** Low-cost read/write optical is just three years away, says Mark Minasi of Moulton, Minasi & Co. in Columbia, Md. "With storage technologies, we're seeing some breakthroughs. For instance, Tandy Corp. recently announced a list price of $399 for its CD-ROM. Once CD-ROMs bust the $200 range, I think it becomes reasonable," he says.

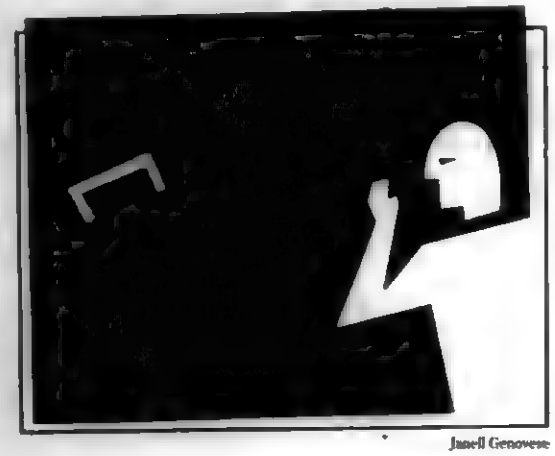
However, one of the surprises for the remainder of the decade will be that the cost and performance of magnetic and optical storage will stay pretty much even, Saffo says. "We won't scrap our magnetic drives wholesale for optical. Each has a complementary role to play," he says.

• **Portable office resources:** The function of the desk is going to change, says Lee Felsenstein, vice president for research and development at Reddy Information Systems, which has offices in New York and Berkeley, Calif.

Felsenstein, who designed the portable Osborne 1 computer, says users will be able to carry with them large portions of what they used to keep in their desks and on their bookshelves. "That makes possible modes of interaction between the information system of the organization and the actual functioning, productive parts of the organization," he says.

• **Expanding documents:** Information will be relayed in the most practical way, whether it be a folded piece of paper in a person's pocket or a screen full of text on a wall, says Bob Spinrad, director of corporate technology at Xerox Corp. and a veteran industry observer.

Users will become more indifferent to the media employed and more concerned with the information contained therein, Spinrad says. Combined imagery that may include handwritten notes, sound files, still photos and more will all be included in the documents, he says. Some of the linking of video, sound and text is already here today through multimedia, he adds.



Janell Genovese

• **Holographic storage:** The Microelectronic and Computing Technology Corp. (MCC) in Austin, Texas, is a cooperative research and development enterprise whose mission is to strengthen and sustain the competitiveness of member companies in information technology. MCC is home to many leading-edge developments. Among them is a brand-new project to develop holographic storage. The way this will work, explains Jerry Willenbring, program manager of the optics in computing program at MCC, is that images of pages will be captured onto tiny crystallites of photorefractive material and stacked in an array of pages. To reconstruct a captured page, an electronic beam would be aimed at the stack at the proper angle to capture the correct page and retrieve the data electronically.

Initially, Willenbring says, the technology would be very expensive and would likely make its earliest inroads in high performance applications such as multimedia, transaction processing, military/aerospace industries and supercomputing. However, once the technology gains acceptance and prices drop, it has the potential to reach right down to PC markets. Willenbring says prototypes may be ready in three to four years.

• **Intelligent conference rooms:** Conference room decor will become truly high-tech, according to Samuel Bleecker, a technology consultant at Bleecker & Associates in Boca Raton, Fla. "The conference room is now going to become an information war room" where participants will share information through flat screens built into the table.

Attendees will come to the meeting and plug in their CD-ROMs so they can look through their information databases to respond to questions. They will also be able pull up studies, charts or full-motion videos and display them on all of the screens in the room. For conference calls, the user will be able to point and click at the faces of the people he wants to include in the meeting, Bleecker says.

• **Resource sharing:** Another MCC project with big potential implications for PC users is called the Experimental Systems Project (ESP).

Don Bynum, director of business development at the experimental systems lab at MCC and project manager of ESP, explains that the project revolves around the notion that a few hundred commodity microprocessors can do a bulk of the work that currently requires a supercomputer.

"We don't believe there is any functional difference between processors packaged as workstations on a LAN and a closely coupled parallel computer," he says. The trick is figuring out how to harness PC power to perform the same kinds of complex tasks.

As a point of comparison, Bynum says, one Texas university is planning the purchase of a $16 million supercomputer. "For $16 million," he says, "you can buy about 8,000 386-based PC workstations with 1M byte of memory, a 40M-byte hard disk and a VGA monitor."

Furthermore, he says, if you compare this amount of PC power with a supercomputer, you find that with that many PCs, you have 180% of the MIPS (millions of instructions per second) that a supercomputer would theoretically offer, nearly 100% of the millions of floating-point operations per second, two orders of magnitude more disk space, three orders of magnitude more aggregate bandwidth and one order of magnitude more random-access memory.

Today, Bynum says, an average of 5% of all PC MIPS available are actually being used. ESP is studying ways to harness the unused compute power of PCs and to share the excess MIPS throughout an organization.



Felsenstein: *The work space will be wherever you are*

ESP, which already has a working prototype, is expected to produce results before 1993, Bynum says.

• **Integration:** Phase 1 in the sociology of the computer industry was implementing new technology along old lines, Felsenstein says; now, it should become possible to interlink those technologies in new ways.

Integration won't make individual computing units any bigger, he says. The emphasis will be on modularization so users will be able to employ ever-smaller purpose-built units that can link into larger systems as necessary.

One large-scale integration effort already underway is the Carnot project at MCC, whose objective is to allow existing mainframe-based data resources — large databases — to interoperate with open systems, including PCs.

According to Ron Riedesel, director of business development for the project, the goal is to take corporate data accumulated across global corporate operations on various incompatible systems and build a bridge between the closed centralized systems companies have invested in and the open, distributed systems of tomorrow.

Some prototypes of Carnot technology are expected this quarter, but more complete systems will be released during the next three years. •

The personal stuff is great, but . . .

We're missing the connections, says the man who thought up much of what makes PCs useful

You may not recognize the name Douglas Engelbart, but if you have ever used a word processor, a database, split screens, windows or a mouse, you know a little about how his mind works: Engelbart is the person who thought up all these "modern" conveniences. Of course, he thought of many of them 40 years ago, about the time he conceived the idea of a desktop computer.

But all of those things are only bits and pieces of Engelbart's real work. He continues to receive honors for them — most recently the 1991 Coors American Ingenuity Award — but so far, few people have grasped the big picture he keeps trying to draw. Since 1951, Engelbart has been chasing a vision of a structure and a set of tools that will allow organizations to become self-powered engines for ongoing knowledge creation.

It's a pretty complicated idea, one in which the personal computer fits as the individual workbench in what Engelbart calls the "knowledge workshop." The gist is an environment where information in multiple forms can be shared, combined and augmented across all kinds of organizational boundaries.

Knowledge augmentation is a primary theme, which is why an early prototype system Engelbart created back in the 1950s was named Augment. That system took shape when Engelbart was working at the Stanford Research Institute (now SRI International). He and Augment have moved around quite a bit since then. The system was sold to Tymshare, Inc. and then acquired, along with Tymshare, by McDonnell Douglas Corp., where Engelbart also worked. Now McDonnell Douglas has agreed to license the system to The Bootstrap Institute, an entity Engelbart created to explore his ideas about how organizations can use distributed online environments to perform collaborative knowledge development.

When Engelbart looks at the PC world, he views it not in isolation but as part of that larger concept. *Computerworld*'s features editor, Joanne Kelleher, asked him to share that view with us.

Although he sees great progress in microcomputer technology, Engelbart says there is a long way to go in using it to best advantage:

"I'm always struck by how much catapulting development is going on in microcomputers and microcomputer software, with more power and more variety in the utilities being offered and the little auxiliary hardware things. The real problem, though, is going to be in figuring out how all that stuff can be integrated coherently into what you could call the organizationwide or enterprisewide knowledge workshop. That's the sort of prejudice or special eye with which I look at all this.

"Trends like the movement toward standards in windows systems and the growing interest in groupware are encouraging. But I don't find a sort of comprehensive picture yet out there . . . the kind I'd like to see."

The dynamics of the market will have to change to accommodate enterprisewide information sharing and collaborative work, Engelbart says:

"It is going to be a very different marketplace for both the vendors and the buyers of hardware, software and netware. I say that because of the rate of change that is going to be required in organizations to really learn how to harness the technology, as well as the expense and amount of internal adjustment required.

"Right now, the way the market works is that vendors bring out products, people try them, and they start learning. Then vendors start trying to improve their products and to follow the successful things that other vendors are doing. But you can't retrain everybody to go from one global software product to another, radically different one without a lot of expensive internal changes.

"Operating this way is a tremendous new frontier in terms of new kinds of roles, relationships, working modes and conventions for knowledge distribution. It is going to be expensive to design and implement all that, and if you knew a lot more about what you were going to do, it would be one thing, but all that is just unexplored territory right now. In that kind of environment, vendors can't just come out and lay something out on the table and say, 'That's our new product.' The large user organizations will have to become more proactive."

Ease of use is fine, he says, but don't penalize the whole organization by making everyone work at the most primary level:

"I don't have anything against making it easy to learn, per se. What I say is, if you are really going to look for really peak performance in your organization, you have to be very careful not to limit everybody to the sort of system that is easy for the uninitiated to learn or easy for the more casual or occasional user to use.

"It is important to provide accessibility for those people, but if that's what dominates your approach to your whole system, then everybody is going to go around talking Pidgin English. For large organizations, it is important to think in terms of dichotomy — a shared vocabulary, with variety in the styles of interface."



Robert Isaacs

Engelbart says the next task is to integrate PCs into an organizationwide environment for knowledge creation

PCs haven't lived up to expectations in terms of productivity because they aren't being used collaboratively:

"One big part that's missing is the working methodologies and conventions that would enable PC users to come effectively into the larger work group. The personal computer came in to help people do their isolated stand-alone stuff, but the interoperability between them is in very bad shape. Having things on floppy disks or whatever kinds of disks is just no way to collaborate.

"Network file servers, where you can make part of your work available to other people, will help. But you have to give a chance to the really new style of work . . . new roles, new modes of organization, new modes of management, modes of reporting, sharing and integrating specialists into the work force more effectively."

Our definitions of information sharing are expanding:

"As network capacity grows and storage capacity grows, more and more use is going to be made of the whole spectrum of media, including real-time color video and photo quality stills and digitally recorded speech.

"Right now, we only have the word *document* available to talk about this kind of purposeful sort of knowledge hunk, but the documents involved in the kind of hyperinterconnections that you are going to need to be interoperable effectively will be very different. For example, E-mail will only be one part of the generalized hyperdocument."

Visualizing new ways of applying technology has always been difficult, and the farther out you look, the fuzzier the frame of reference can become:

"Inertia or lag is a very general characteristic. Your mind can only really be analytical about how everything works in a limited domain, or else there are just too many gears and wheels spinning in your mind. So some parts of the world you just sort of take as is and go charging along.

"If there are things changing over there that haven't been part of your perception of the candidates for change, then it is just hard to take them in until some experience lifts you out of your old rut.

"I would make verbal descriptions of desktop publishing or [computer-aided design] systems back in the '60s, and people would say, 'Gee, that's exciting — that's great.' But it would not sink in as being real to their world. It never does until there comes a time at which they can experience it somehow. Then it starts to be real.

"Part of the problem, too, is that if you are talking about downstream possibilities, no matter how accurate your vision might be, you don't have the vocabulary in today's lexicon to describe it. So it takes several paragraphs to set the stage for one term you are going use.

"Do that for a couple of terms, and there you are, two pages later, and people aren't used to being dealt with that way. They are used to using terms they already know. This is a very basic problem, and somehow we have to find ways to deal with that if we are going to get our organizations to start being able to evolve with enough timeliness to take maximum advantage of technology.

"The kind of change rate that is coming about is so much larger than our organizations have ever had to deal with." ●

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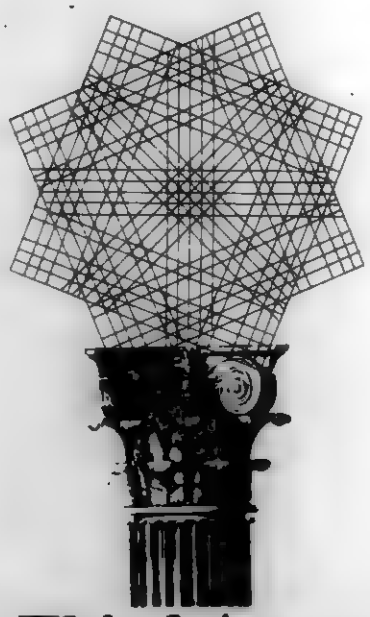
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Course of action: Readying IS students for the real world

Schools tie what they teach to what companies say IS grads need to know

BY LUCIE JUNEAU

In an industry in which some product life cycles are measured in months rather than years, it's tough for companies to keep up with the latest changes. That effort is just as difficult for technical and business schools producing the next generation of information systems professionals and managers. These schools are reaching from their ivory towers into the real world to give their undergraduate and graduate students what they need to make it in IS. But it hasn't been easy.

Gordon Davis, chaired professor at the University of Minnesota's Carlson School of Management, says he sometimes feels as if he's riding "a speeding train."

Keeping academia up to date with what's happening in business requires some fact-finding effort. Schools that hope to provide students with state-of-the-art technology and applications provide opportunities for formal and informal faculty contact with the business industry. This contact also helps them match their curricula and degree requirements to changing business needs. Seminar and lecture series featuring industry speakers are popular, as are corporate affiliate programs that support research.

The best faculty members stay up to speed — or pull ahead of the crowd — by taking advantage of many of these departmental activities. They work as consultants and conduct their own research, interact with professional and academic colleagues through professional societies, maintain an extensive network of professional and academic contacts and keep up with IS journals and relevant periodicals.

Staying up to date

To keep students up to date with changes in industry, faculty members revise course materials frequently and invite executives into their classrooms as guest lecturers.

Inviting representatives of the business community into the classroom as lecturers is a popular way of keeping students in touch with real-world issues.

Juneau is a free-lance writer based in Salem, Mass.

Students are eager to hear what practitioners have to say, IS professors report. Although it's important that students learn about the latest information technology, it's even more valuable for them to hear how the technology is being used in the business environment, the professors say.

Addressing the systems and design class at the University of Texas, Walter Viali, director of Texaco, Inc.'s IS enabling center, was able to give students an overview of the top computer-aided software engineering (CASE) products on the market. Texaco's enabling center is responsible for acquiring CASE software for Texaco, says Eleanor Jordan, associate chairwoman of the management sciences and IS department at the University of Texas.

Of even greater benefit were Viali's remarks about resistance to the new technology, Jordan says. Some students, she adds, were surprised to hear that "you don't say, 'Here's this wonderful tool,' and everybody says, 'Great, give it to us.' "

Build a bond

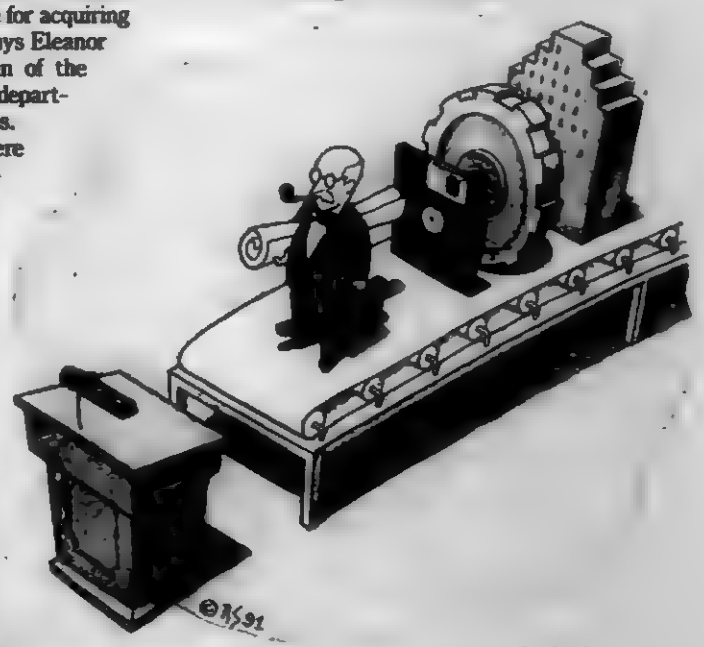
Finding good speakers doesn't have to be difficult, says Sirkka Jarvenpaa, director and adviser of the IS Ph.D. program at the University of Texas. "Getting good speakers is a matter of relationship building," Jarvenpaa explains. Her research has put her in contact with people in the IS community, many of whom have agreed to speak to students. For the relationship to work, Jarvenpaa makes sure those involved feel the information exchange is going to be worthwhile.

She usually arranges a luncheon in which the speaker, faculty members and students can interact and swap ideas, and "sometimes I even pass student resumes on to the visiting person," Jarvenpaa says.

However, there are occasions when some speakers miss the point. "Oftentimes, [speakers] try to take the role of the professor and have a highly structured lecture extracted from literature rather than presenting something from their own experience," Jarvenpaa says.

Some universities lure industry leaders to their campuses by offering special academic programs designed for executives.

At MIT's department of information technology, executives spend a semester or a year as visiting scholars. Robert Goldberg, one of the founders and a former vice president of marketing at software firm BGS Systems, Inc., is currently at MIT serving as an adviser to faculty and students, says Stuart Madnick, the John Norris Maguire professor of information technology. "Bob Goldberg brings a strong sense of what's going on in industry and what education should have," Madnick says.



Rob Saunders

Just up the road from MIT, Harvard Business School runs an annual two-week program for chief information officers from major firms called "Managing the Information Services Resource." Teaching this

Continued on page 114

- **Business community input on curricula**
- **Hands-on research, consulting a must**
- **Do IS chiefs think grads are better prepared?**

Continued from page 113

program keeps faculty members sharp, says Professor Warren F. McFarlan, director of research at the school. "If you're off-base on what's happening in industry, you'll get instantaneous feedback," he says.

Harvard also runs an 11-week executive program for 160 senior executives, McFarlan says. This advanced management program forces faculty members to confront the newest applications, he says.

Curricula considerations

The interactions faculty members have with their corporate peers help shape the academic curricula.

"At UCLA, we used the corporate members of our associates group as a sounding board to develop a syllabus for a course on office automation. We were breaking new ground at the time seven years ago and wanted to know what to emphasize. Their input largely shaped the course we taught," says Georgia State's Ephraim R. McLean, formerly a member of the faculty at UCLA.

However, McLean warns, there can be problems with accepting industry input. For example, practitioners don't always agree on what skills should be taught. "Some say give them more technical skills. Others say they need more management training," he says.

New York University (NYU) revamped its IS curriculum two years ago to keep pace with the industry, says Jack Baroudi, director of undergraduate studies at NYU's Stern School of Business. Based on yearly meetings with 15 affiliate firms, undergraduate offerings include courses in advanced software, Unix and expert systems, he says.

"We de-emphasized the programming aspects of our course and made Cobol, C and Unix available but not required. The only language they must take now is Pascal," he says. These changes were implemented because many companies are now using packaged software or fourth-generation languages, Baroudi says.

On the graduate level, the school has developed a special course called "Emerging Technologies" to help students learn about cutting-edge developments in IS, says Edward A. Stohr, chairman of the IS department at the Stern School of Business. "We invite people who are experts in the technology into the classroom for one or two lectures, and people who've gone through the process of applying the technology in the organization come in to teach another one or two classes," he says.

The idea behind these glimpses of real life is that students will be better able to understand the technology and its business applications, Stohr says. Current topics in the course include electronic data interchange and neural networks as well as imaging and other electronic paper-replacing systems.

Harvard Business School updates the business case studies used in its MBA program on a regular basis, McFarlan says. "In one required information technology course, 'Information Organization and Control,' we use 12 to 13 new cases a year," he says.

Keeping up with Professor Jones

Most universities encourage faculty members to work on their own research. "There's an unwritten allowance that 20% of a faculty member's time may be dedicated to professional activities. That's a euphemism for one day a week to do consulting," McLean says.

In addition, because most faculty members have nine-month appointments, they have at least three full months to do research on campus or in the field, he says.

Research and consulting are often the same thing, Davis says. "I look for consulting projects that have a research application," he says. "The ideal type of consultation is one where business gets a practical result, and the faculty member keeps an eye on a business problem they ought to be looking at," he says.

Students as well as professors find value in getting right into the business setting. At the University of Michigan, students participate in executive projects that combine research and consulting.

"Students get to see real problems in the real world; companies get hard-working MBA students to bring fresh insights. Sometimes the emperor doesn't have clothing, and it takes someone from the outside to state the facts or ask 'dumb questions,' " says Dennis G. Severance, professor of computers and IS.

Consulting brings faculty members and students up to the state of the art, while research brings them ahead of the state of the art, Madnick says.

Universities are eager to give their students hands-on experience with state-of-the-art technologies. "We're always looking to bring the latest software into the classroom," says Jay Nunamaker, head of the department of management IS at the University of Arizona.

"We get students using software developed on research projects, so in that regard, they're even out in front of industry," Nunamaker says. "We also bring in CASE tools like Accelerator and expert systems shells," he adds.

Learning is fundamental

However, providing students with this week's hot product isn't critical. "What's more important is that the students have enough exposure to different products so that they learn quickly and easily because of prior experience with learning. Their ability to learn is the most important thing today," Jordan says.

Some faculty members bring newspapers and periodicals into the classroom to cover current IS issues. This tactic is a must when covering international IS developments, says Seymour E. Goodman, head of The Mosaic Group, an IS group with an international focus at the University of Arizona's department of MIS.

Timely access to information relating to foreign research and development technology is difficult to come by, Goodman says. "We push *The Financial Times*, *The Economist* and the *Wall Street Journal*," he says. A new journal, *International Information Systems*, for which Goodman is an editor, is trying to fill the information gap, he says.

Active IS faculty members are always looking for new avenues for university/industry interaction and welcome any opportunities the business world can offer.

"I would encourage companies to be proactive," McLean says. He suggests schools sponsor IS faculty members to work as interns. "The accounting profession has done this for years to let faculty members know what the big issues are in the accounting world," he says. •

Are grads better prepared for business?

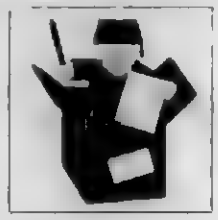
Business and technical schools are working to keep academia in tune with what's happening in business. Do IS managers think the caliber of students coming into the IS workplace has been affected by that emphasis?

Kent Stapleton
Manager, IS development
Hershey Foods Corp.
Hershey, Pa.
Most graduates we see are technically well-qualified and have exposure to business issues through MBAs or other means. They understand when you talk about accounts payable or receivable and sales force automation.

I attribute the fact that they're more business-qualified to the fact that colleges and universities recognize there is a difference between information systems and computer science.

Because I have had the opportunity to work with an advisory committee at Pennsylvania State University, I know schools are getting IS managers' input and tailoring their curricula to address what we're looking for. Students we hire from Penn State work on a senior development application. What they've got to do is identify a business need and develop a business solution using a computer for assistance.

Baird White
Worldwide director of MIS
Spaulding Sports Worldwide
Chicopee, Mass.
I find that it's still tough to get the most out of graduates coming directly from a school environment. We've still got to put them through fairly extensive training in the way we do things here — in hardware and software and our own way of analysis. Getting someone used to our culture is key. That has nothing to do with the technical tools they bring on board.



We put a lot of emphasis on hands-on experiences such as research projects and case study work. If you sat in a computer science class and built a compiler, that's terrific. However, if you've worked on actual projects, that's even better. But for some reason, I'm seeing less practical experience. As a matter of fact, I used to get two or three calls per semester from schools wanting to send a class down and talk to me about what we're doing. Now I don't get any.

Sid Diamond
Vice president, worldwide information services
Black & Decker Corp.
Towson, Md.
I think students are better prepared to go into business today than they were five to 10 years ago because the colleges have changed the curricula in the computer science area to broaden them more from a technical base — operating systems, advanced programming languages — to a more business-oriented approach.

As a result, students coming into a business environment are more aware of the things that occur in manufacturing or marketing or sales.

I think students are getting summer jobs and doing research projects at corporations so they have a better knowledge and insight into business.

How students can ace IS test

How do schools ensure that their undergraduate and graduate students will make the grade in IS? Through a combination of the following:

- Enlist guest lecturers from the business community to relate their IS experiences.
- Get input from corporate IS managers to help shape the school curriculum. This enables curriculum and degree requirements to match changing business needs.
- Recruit IS managers to teach courses on applied technology.
- Offer courses on emerging technologies such as imaging, electronic data interchange, neural networks and so on.
- Encourage faculty members to consult and do research for businesses.
- Encourage or require IS students to do research on companies.

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AAAI-91

NATIONAL BRIEFS

They might be consultants

▶ **NCR Corp.** is not only about to be part of AT&T — it's about to be a consultancy, too. NCR's **ACR — Advisory Consultant Relations** — group will actually serve as consultants to consultants; according to a company spokeswoman, the group will develop and implement cooperative marketing programs for consultants, particularly those based in the U.S. and serving Fortune 500 firms. Under the direction of Michael Ruffolo, NCR's director of systems integrator alliances, the ACR group will afford users' advisers with a single point of contact in NCR's U.S. marketing organization and will enhance the company's already stated strategy of partnering with leading consultants.

Buy, buy

▶ El Segundo, Calif.-based systems integrator **Computer Sciences Corp.** (CSC) is poised to pay approximately $22 million to acquire London-based information technology management consulting firm **Butler Cox.** The buy will significantly expand CSC's already substantial European presence, according to the firm. **Software Publishing Corp.** is also on a British shopping spree; the Mountain View, Calif.-based firm is about to buy Surrey, England-based database software maker **Precision Software Ltd.** for approximately $25 million in cash and securities.

More briefs on page 118

Finding a place in the Rising Sun

BY CLINTON WILDER
CW STAFF

TOKYO — At the center of the storm known as U.S.-Japan trade relations is a soft-spoken man who for the past 11 years has helped prove that U.S. high-tech firms can succeed in Japan.

Edmund J. Reilly is president of Digital Equipment Corp. Japan, and this year he is also serving as head of the American Chamber of Commerce in Japan (ACCJ). Founded just three years after Japan's surrender at the end of World War II, the ACCJ is a networking and advocacy group for U.S. companies in all industries doing business in Japan.

Reilly's thoughts on the current trade climate and prospects for U.S. computer firms in Japan include the following:

On the current competitive imbalance:
"I don't see the problem getting any better. There's a tendency to look at the trade issue as the overriding issue — Japan waited much too long to open their

Continued on page 116



John Crowley/Business Tokyo

Reilly hopes DEC Japan can be a model for others

Lotus files for summary judgment

Borland has one week to respond in copyright infringement case

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Why wait? Lotus Development Corp. was supposed to meet in June with U.S. District Judge Robert Keeton and Borland International, Inc. attorneys to set a trial date for Lotus' copyright infringement suit against Borland. However, an impatient and confident Lotus jumped the gun two weeks ago by filing a motion with Keeton for a summary judgment in the case [CW, May 13].

Borland has another week to respond. The request for summary judgment does not address the issue of damages.

In March, Keeton rejected Lotus' request that discovery — the period during which evidence is gathered — be cut off and an early trial date be set. "We were looking to expedite the process," a Lotus spokesman said.

Borland claims that in March, Lotus asked the judge to decide the case "at an early date." Lotus based its request on the argument that the Borland case's outcome was controlled by the June 1990 decision handed down in Lotus' similar case against Paperback Software International, Inc. — a decision favorable to Lotus. "All Lotus [did two weeks ago] is to reduce the same argument to writing," a Borland spokesman said. He said Lotus is really just trying to short-circuit the discovery process to "stop us from getting the information we need."

Lotus reluctant

Lotus general counsel Thomas Lemburg took issue with that interpretation. "In March, the judge was not asked to state his views on the merits of the case," he said. "We believe there are no factual disputes about whether Borland infringes on [our] 1-2-3 copyright," a Lotus spokesman said. There are two primary issues in a copyright case, according to Lemburg.

The first is whether the material that Borland allegedly copied is copyrightable to begin with, which Lotus believes was established in the Paperback case.

The second is whether Borland copied those copyrightable elements. "They call it the 1-2-3 menu option," Lemberg noted.

Lemberg further claimed that confidential parts of the Borland documents available only to Lotus' external legal team provide a strong case against Borland on intentional copying. "The judge will see from their own mouths, essentially, an admission of guilt," he said.

Conversely, Borland said it stands by its assertion that Quattro Pro is a unique product and does not infringe on 1-2-3's copyrights.

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Rising Sun

CONTINUED FROM PAGE 116

market and is still very slow to recognize problem areas.

"But even if the market were to open completely, there would still be a trade imbalance that's frightening. The Japanese companies have spent a tremendous amount of time and money to develop their products. The American companies have a tendency to give up too quickly."

On barriers to U.S. computer firms setting up operations in Japan:
"No matter how you look at it, it costs a lot of money to set up an office here. In Tokyo, the cost can easily be $2 million, which is very difficult for a $30 million or $40 million software company.

"The ACCJ has been working with the Japanese government to address [the problem] and provide incentives [for firms to make the move]. Teradyne Corp. recently opened an operation on the island of Kyushu. The Japanese government wants to decentralize and encourage business outside of Tokyo, so we hope it's a win-win situation. Software developers used to have to be close to the customers, but now we find development and design groups are much more able to be out in the countryside."

On market challenges in the computer industry in Japan:
"On the product side, in modifying a product for the Japanese market — a lot of companies still don't do a good job in that area. The Japanese also have a very different concept of support [from that prevalent in the U.S.].

"Even in a completely open environment, many Japanese would be reluctant to buy American because they are used to different levels of support. They expect more in systems integration and total solutions. At DEC, customers want us to do a lot more than we did in the past. Japanese customers really demand that — but I think it's a business opportunity for U.S. companies."

On the Japanese high-technology labor market:
"It's very difficult to hire people, especially in software. Some estimates range as high as a shortage of 500,000 software developers in the mid-1990s. The ACCJ has put together some programs for recruiting Japanese university students to work for American companies."

On pitching U.S. firms as good employers:
"It has been hard in the past because the image of a U.S. company was that it would close after two years if it wasn't making money here. We've been using statistics to show that U.S. companies actually have a very good track record in employment. There have been very few layoffs, and it presents an opportunity [for Japanese employees] to travel and learn another language. At DEC, we send many of the people we hire here back to the U.S. or to Europe.

"American companies do have the reputation of promoting people faster than Japanese companies and offer more incentives for fast-track employees. That can be attractive to ambitious people."

On recent changes in the Japanese labor market:
"A few years ago, very few people would consider ever leaving their company. Now, you do find more people willing to leave, about 7% a year.

"At the same time, it was difficult, if not impossible, [for American firms] to hire college graduates 10 to 15 years ago. As that has changed, it becomes a built-in feedback network from those employees back to undergraduates. We have also worked closely with some university professors — they play a strong role in influencing career choices."

On selling U.S. computer products to the Japanese government:
"The U.S. computer industry's share of the Japanese market in the private sector is about 25% and in the government sector is about 8% to 10%, which indicates there's a problem there. The market has only been open since 1985. At DEC, we've had less success in the government sector here than in any other country."

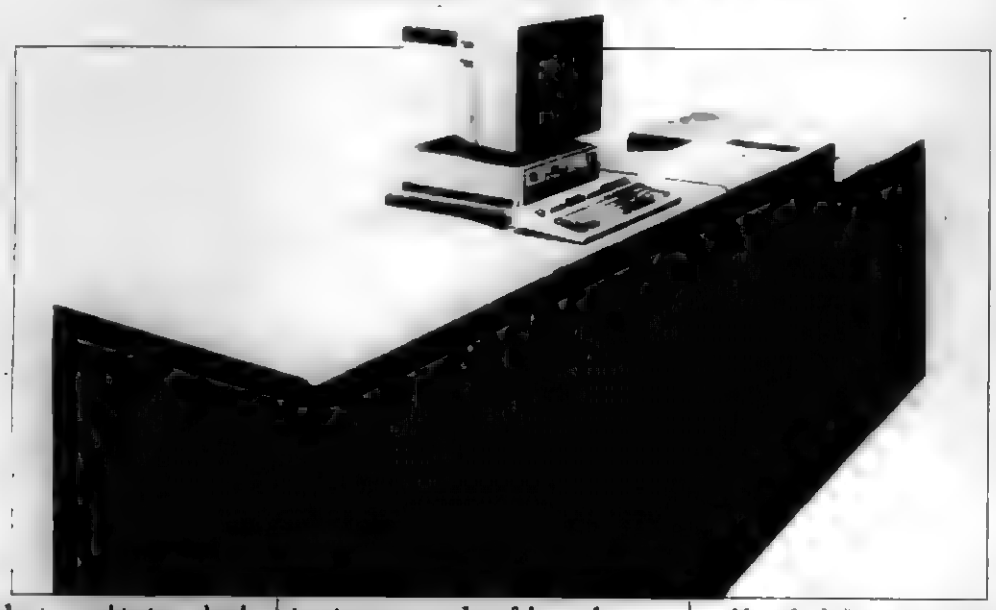
On Japanese investments in the U.S.:
"We're trying to bring down barriers here. The last thing we want is to put up barriers to investment in the U.S. We all should be encouraging investment in the U.S."

On the overall trade climate:
"In many respects, the market here has opened up. We had big trade barriers back in the 1970s with quota systems in place. Most of those official trade barriers have gone. There is nothing to prevent U.S. companies from doing R&D here or joint ventures.

"But there still are the unofficial trade barriers — the entrenched relationships of the *keiretsu* ["family of companies" concept], the more closed distribution systems, the financial barriers to set up here. By comparison with Japanese companies setting up in the U.S., it is much more difficult to come here. It will take a long time for them to change that."

Reilly, 49, has headed DEC Japan since 1980. He hopes DEC's experience can be a model for other U.S. companies. Although last year was a tough one for DEC overall, DEC Japan accounted for $34 million of DEC's $74.4 million of profits worldwide.

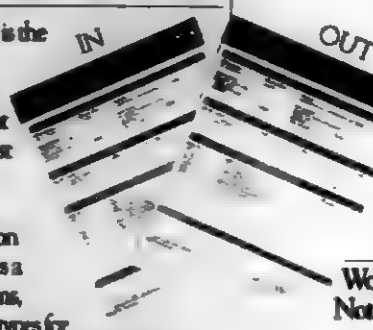
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EXECUTIVE CORNER

Northern Telecom hires Speakes

Northern Telecom Ltd.'s executive roster now includes former White House spokesman **Larry M. Speakes**, who early this month joined the Ontario-based telecommunications player as communications vice president. Fresh from a stint as a communications consultant, Speakes served as assistant press secretary to presidents Nixon and Ford and was chief spokesman for President Reagan from 1981 until 1987.

As of last week, the president, chief executive officer and chairman he will report to is Northern Telecom's **Paul G. Stern.**

Maxtor Corp.'s search for a CEO came to an end last week with the selection of **Laurence R. Hootnick** to head the San Jose, Calif.-based disk-drive vendor. Hootnick, an 18-year **Intel Corp.** veteran, most recently served as president of that company's embedded controller and memory group.

His experience at Intel also included service as chief financial officer and as corporate senior vice president of sales and marketing. Maxtor founder **James McCoy**, who stepped in as interim CEO with the departure of **George Scalise**, will remain as chairman of the board.

Regis McKenna, founder and chairman of the international high-technology marketing consulting company **Regis McKenna, Inc.**, has joined the board of directors at **Oracle Corp.** McKenna's hiring, according to Oracle's CEO, **Lawrence Ellison**, is one step in the company's effort to become a multibillion-dollar firm.

Peter S. Anderson has left **New Valley Corp.** (formerly Western Union Corp.) to take up the position of president and chief operating officer at Tustin, Calif.-based **MAI Systems Corp.** (formerly known as MAI Basic Four). Anderson succeeds a coincidental namesake, **Fred D. Anderson Jr.**

Peter Anderson, who started his career at IBM, most recently served as president of the Western Union Priority Services unit and senior vice president of the parent company.

R. Stephen Cheheyl, a two-decade computer industry veteran with finance and operational experience in companies ranging from start-ups to giants at home and abroad, recently became senior vice president of finance and administration and CFO at **Wellfleet Communications, Inc.**

Cheheyl comes to Wellfleet from a stint in consulting. Prior to that, he held an executive finance and administration post at **Alliant Computer Systems Corp.** and was involved in taking the company public.

HP, IBM refute dumping charges

BY CAROLINE GREEN
IDG NEWS SERVICE

LONDON — IBM and Hewlett-Packard Co. have lashed out at the makers of a UK documentary called *Fragile Earth*, which implies that the two firms dump hazardous waste in Taiwan.

The companies, which both claim to have a green philosophy, strongly denied the broadcast's implication that they bypass strict U.S. dumping laws and profit on waste disposed of in Taiwan.



Taiwan has extremely lax environmental laws, with consequent levels of pollution so high that a government report has predicted the country will be uninhabitable by the year 2000 if immediate action is not taken.

"A large part of this waste is computer scrap — crushed computers from companies like IBM and Hewlett-Packard," the documentary's narrator said on the program.

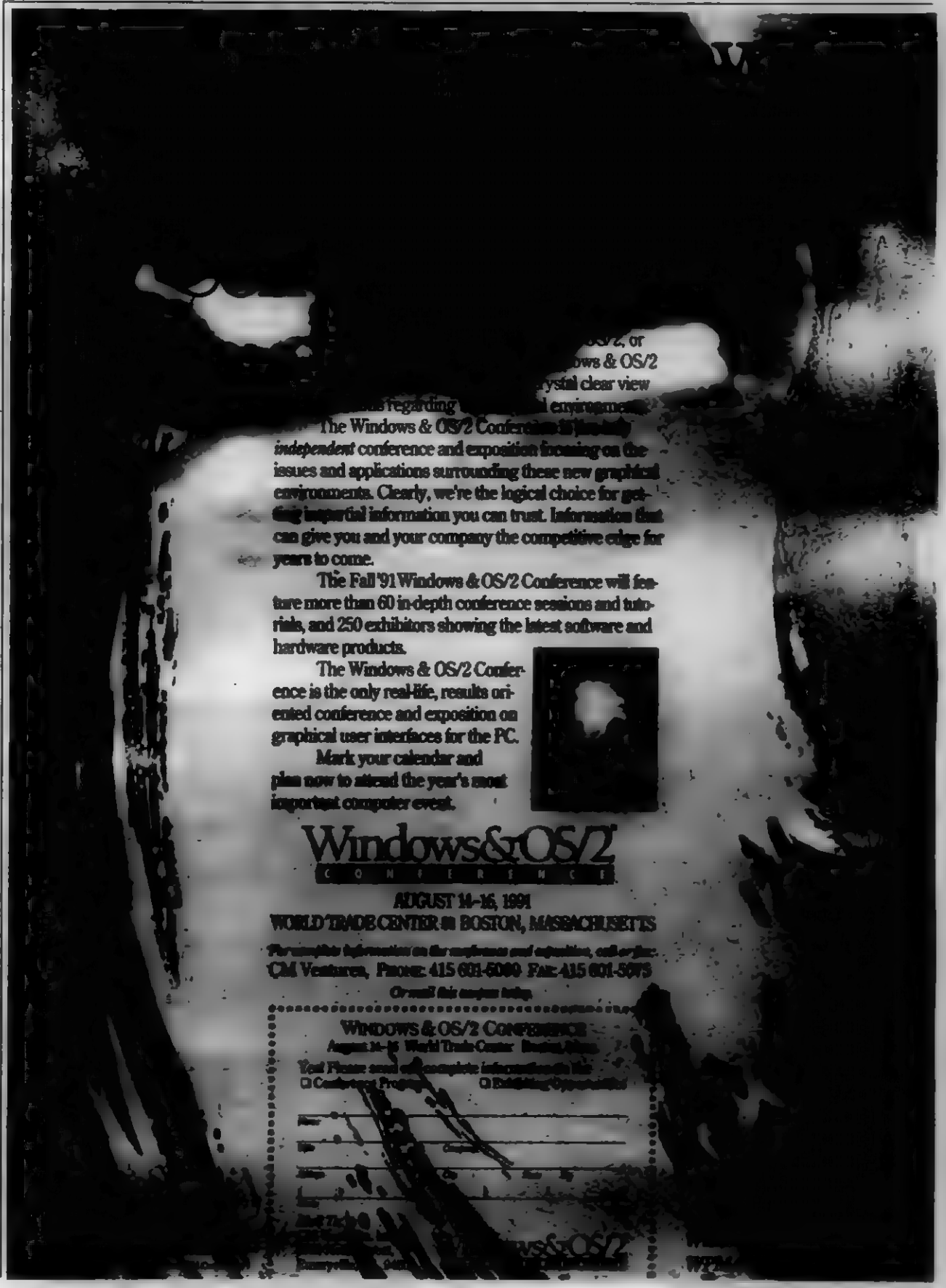
An IBM spokesman in the U.S. said the company was "really distressed" by the implications and added, "We have had words with the makers of that program. The implications are false."

The spokesman said the program's producers have avoided legal action because of the careful phrasing of the allegation and the use of the word *like* in the relevant sentence.

HP has issued an official response that states: "No hazardous waste from HP manufacturing sites is shipped overseas, neither directly nor through waste-disposal contractors. While HP does ship some scrap metal overseas, such shipments are the end result of an extensive recycling and disassembly program to reclaim old computers."

A spokesman for the television station said, "The material was checked through by our lawyers, and we stand by the program. Obviously [IBM and HP] can issue a complaint through the Broadcasting Complaints Authority if they feel they have been unfairly treated."

Green writes for PC Business World, *an IDG Communications British publication.*



NATIONAL

BRIEFS

One bad Apple?

▶ The trend is more predictable than the weather these days. If disappointing quarterly earnings come, can stockholder suits be far behind? Not for Apple Computer, Inc., which early this month became yet another in a lengthening string of computer industry firms to be sued by shareholders claiming that the company issued misleading statements regarding its prospects. Apple immediately fired off a statement that it believes the lawsuit to be wholly without merit. The company said it will contend the suit.

From Tokyo with info

▶ The Tokyo-based **Japan Management Association Research Institute, Inc. (JMAR)**, which claims to be the largest information research firm in Japan, is now open for business in San Diego — a first for JMAR, which has spent its 20-plus years offering its services on home turf. JMAR USA will provide information on Japanese markets, industries, firms, technologies and trends.

Amdahl takes a look at pricing to increase sales

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — In the wake of first-quarter earnings depressed by the U.S. economic downturn and even more immediately by a European sales slump, Amdahl Corp. is exploring new pricing strategies for its customers, according to President and Chief Operating Officer Joseph Zemke.

"We're obviously not satisfied with the financial results of the first quarter," Zemke told industry analysts at a briefing earlier this month. His $2.1 billion firm earned $11.4 million in the quarter ended March 31, down from $29.9 million in the corresponding quarter one year ago. Revenue for the quarter was $442.6 million, down from $506.7 million.

A certain amount of creative financing — including extended payment plans, upgrade plans and bundled products — is helping Amdahl expand its customer base during the downturn, Zemke said. "There are fewer fish in the pond," he said, referring to customers for multimillion-dollar IBM-compatible mainframes, "and they're being fished more heavily."

In the first quarter alone, Amdahl attracted 25 additional corporate clients representing 50 mainframe sites, Zemke said. The firm said it has an installed base of nearly 1,900 mainframe sites worldwide.

Amdahl Chief Financial Officer Edward Thompson said the firm is also controlling expenditures for the duration. Still, it has hired 300 people so far this year — somewhat fewer than planned — and is considering hiring 300 to 400 more by year's end.

The firm also spent 17% of revenue on research and development during the first quarter — high for any industry player — and used $100 million in cash to build product inventories and finance machines for its leasing customers. In addition, it retooled its factories here and in Dublin.

"We'll be net users of cash in the second and third quarters," Thompson said, "but we'll start generating cash again late in the fourth quarter." That is when Amdahl plans to ship a new entry aimed at competing with the high-end IBM Enterprise System/9000 models. The firm also plans to ship its new high-end Amdahl 6390 disk-drive machines in the third quarter.



Amdahl's Zemke *is looking to rectify a poor first quarter*

Industry analysts quizzed the Amdahl executives about plans for future Unix-based file servers based on Scalable Processor Architecture (Sparc) reduced instruction set computing technology, but no details of any future machine were given.

"We know how to build big machines, whether they're based on emitter-coupled logic chips or whether we're using building blocks like the Sparc architecture," Zemke said. "Our view of Sparc is that it will provide a new level of price/performance in the open systems market."

While no mention of this was made at the analysts' briefing, Amdahl plans to gain increased software revenue through its new Huron Operations group. Huron, a mainframe-based software development system, was introduced March 26. It was promptly criticized by analysts as being too proprietary to play into any open-systems strategy. But Phil LeMay, vice president of Huron operations, noted that Huron is just as proprietary as IBM's AD/Cycle architecture — and produces applications that are completely IBM-compatible.

"It can become a very large business for us in a relatively short time," predicted John Pritchett, director of Amdahl's advanced market development group. Huron has been used by Amdahl's internal IS group for a year and is being installed at early support sites in seven U.S. cities. All Amdahl machines run IBM systems software, but Amdahl has been selling its own version of mainframe Unix, called UTS, for 10 years.



Computer companies stricken

European Community ponders treatment for ailing computer industry

BY BRYAN CRUMP
IDG NEWS SERVICE

LONDON — The European computer industry is sick. UK-based International Computers Ltd. may be with us today, but it could be Japan's Fujitsu Ltd. tomorrow. France's Groupe Bull needs bailing out, Netherlands-based NV Philips is restructuring, and Italy-based Ing. C. Olivetti & Co. S.p.A.'s directors must be wondering if they will ever see a black bank statement again.

The flagging fortunes of Europe's information technology standard bearers are clearly worrying European Community (EC) industry ministers. Earlier this month, they called on the EC to investigate why the sector is doing so badly. But not everyone is angst-ridden over the future of Europe's box makers.

"So what?" was one industry analyst's reaction to the proposed EC probe. "Should PCs be made in Europe? Not necessarily. There's more money in software. Maybe hardware manufacturers should be in the Far East, while Europe concentrates on software," the analyst proposed.

Deals in demand

Ask many users whether European suppliers should be subsidized or protected with import controls — the current tariff for bringing semiconductors into the EC is 14.9% — and you are likely to find parochialism giving way to the consumer desire to score a good deal.

The views of one information technology manager working for a major money brokerage, who requested anonymity, are typical. "From the end-user point of view, I want the best deal kit at the best price. If you have protectionism, it's inevitable [that] prices are going to go up. Once you start putting up tariffs to protect companies, they are not going to have incentives to cut costs, and that's fatal in a fast-moving industry," he said.

Some industry observers share his doubts. Michael Skok, managing director of European Software Publishing, said, "Only efficient businesses should be able to survive. That's what happens in the U.S., and that's why it has been so successful in creating things like Silicon Valley and the [Massachusetts Route 128 technology] corridor."

No entrepreneurs?

According to Skok, Europe's information technology woes revolve around its inability to create an environment in which entrepreneurial flair is encouraged. "In Germany, it's hard to attract people to start-up companies. In the UK, if someone's company fails, it's looked upon as a major stigma. In the U.S., having had a failed company is OK," he said.



Skok's views are not shared by Terry Pruce, managing director at Leicester, UK-based computer components firm Flint Distribution. Pruce said he still gets depressed when he has to buy products from Far Eastern rather than European manufacturers.

For Pruce, tariffs are merely a way of getting the balance right. Because Asian companies do not have to pay their employees as much as their European rivals do and because they get the benefit of Western technology without all the hard research and development work, Pruce said he believes that the EC has the right to charge tariffs. Otherwise, he warned, EC companies may fall victim to that dreaded trade weapon, the dump.

The EC is currently investigating allegations of floppy disk dumping by Chinese, Taiwanese and Japanese manufacturers (see story page 117). But the problem is that definitions of dumping and fair competition vary widely.

Barriers, pro and con

Nevertheless, Pruce may still have a point in saying countries such as South Korea have an unfair advantage in the trade stakes. "If we want to export to South Korea, I have to pay a tariff, which amounts to a 50% surcharge on the cost of the product," he said.

That is still no justification for import barriers, according to Skok. "Do you fight protectionism with protectionism? In my view, you don't. What we need is a world economy where there are no national boundaries for trade," he said.

Rob Briggs, chairman of Computer Users of Europe, disagreed. He said he believes the EC's role should be to foster the right environment for information technology industry growth. Right now, he said, it is failing miserably.

It is a question not so much of tariffs or subsidies but of making sure European companies stand on an equal footing with their U.S. and Asian rivals. "The EC seems prepared to produce within Europe a more vigorous legislative regime for [information technology] companies than anywhere else," Briggs said.

Even when the EC does move, Briggs said, it is tediously slow. If a perceived dumping threat crops up in the U.S. or Japan, the governments move quickly to deal with it, he said. Not so with the EC: It sets up a [illegible].

Crump writes for PC Business World, *an IDG Communications British publication.*

IBM mainframes, AS/400s and DEC VAXs are giving bridges, fortresses all over the world with the IDEA Concert controller. The Concert controller lets users tie all these systems, bridging them with a familiar [illegible]
matter where it resides.
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Finally, as a [illegible] Concert [illegible] acquisition, leave or move. Systems [illegible] connecting up to 32 [illegible] devices.
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Noncompete may be on way out

CHICAGO — A California trial court ruling that gave a green light to the entrepreneurial offspring of a Big Six accounting firm could also further a shift in the legal climate of the information systems services industry, observers said.

As part of an ongoing round of litigation set off by the departure of 11 employees to form Technology Solutions Co. (TSC) in 1988, Arthur Young Co. (now Ernst & Young) tried to enjoin TSC from doing IS consulting for a client its founders had served while at Arthur Young. The TSC crew, their former firm said, were bound by noncompete clauses in their employment contracts.

The California Superior Court, however, found the noncompete clauses void. To the extent that they prohibited TSC from working for any former Arthur Young client, the court said, the contracts violated California business law and "a strong California public policy."



The ruling may be appealed and overturned. Even if upheld at the highest state court level, it will not bind courts outside of California. Nevertheless, noted Alan Borlack, a partner at the Chicago-based law firm of Gordon & Glickson, P.C., the Golden State has traditionally served as a caldron for emerging law. "People take a good, hard look at anything that comes out of California," he said.

In addition, the TSC decision plays into a growing move away from traditional noncompete clauses for service professionals, he noted. Illinois' new Code of Professional Responsibility, for instance, bars lawyers from entering into so-called "covenants not to compete" with their firms.

Moreover, Borlack said, there is a good chance that courts will read into the TSC opinion an implication that IS consultants owe a fiduciary duty to their clients — an issue that is just beginning to be litigated.

Inaccurate information, incomplete information, information that doesn't arrive the moment you need it can hurt. Obviously, it hurts people in business. But, unfortunately, there are times when the people that it hurts are children. And no group is working harder to prevent that than child protection workers throughout the country. But look at what they face. Caseworkers are overloaded. And the number of child abuse cases is on the rise. Compounding the problem is the mounting burden of legal and administrative tasks. And the fact that paperwork is still by and large handled manually. And when you consider that the key to helping children is to make informed decisions and to make them fast, even the most Herculean effort often isn't enough. That was the problem. And to Berrien County, Michigan, it was understandably the toughest problem in the world. In a joint effort with caseworkers, we developed the Bull Child Protection System. Which gives caseworkers instant access to critical information so decisions can be made in minutes. And by reducing clerical tasks, it lets workers focus on what matters most: the children. As important as it is, however, it's just one example of how we work closely with customers to solve tough problems. Today the systems and applications Bull has developed for law enforcement, social services and the courts are used by state and local governments in 43 states. Call 1-800-233-BULL, ext. 2300, for a free demonstration of the Bull Child Protection System. In Canada 1-800-268-4144. It isn't one of the biggest systems we've ever developed. But to us it is undoubtedly one of the most important.

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INTERNATIONAL BRIEFS

Bottoms up

▶ Walldorf, Germany-based business application software vendor **SAP AG** had some welcome news to announce at its annual international user meeting, which was held early this month: Revenue increased 36% to $340 million, and profits were up 20% to $54.7 million for the firm's fiscal year 1990. SAP, which realized 47% of the past year's sales growth from markets beyond the German borders, expects its upward bottom line trend to continue, bolstered by continued expansion around the globe and a new line of open systems-based applications set to debut in 1991.

We are the world

▶ Or at least we are trying to be. With international sales contributing some 34% of its fiscal 1991 bottom line, **Dell Computer Corp.** is stepping up its already aggressive international expansion. The Austin, Texas-based IBM-compatible personal computer direct marketer is now open for business in the Benelux countries. Dell is operating a new subsidiary based in Amsterdam, and it has also planted its flag in Scandinavia with a newly opened subsidiary in Helsinki, Finland. In addition, the company announced the opening of a European customer support center based in the Netherlands.

But who will tell Baskin-Robbins?

▶ "Facilities management is the flavor of the year," Mike Anthony, chief executive officer of **Gatton Synthesis Ltd.**, told the British business press. The CEO was explaining why his firm, which has offices in England, France and Germany as well as plans for expansion into Scandinavia, is launching a pan-European service to take computer maintenance and documentation tasks off the hands of in-house information systems departments. According to Anthony, ranking firms such as Andersen Consulting, Cap Gemini Sogeti and SD-Scicon have already signed on.

Answer To
WYSE
Cerebral Aerobics
Program
No5

True. Phineas Finished made Ebenezer Scrooge seem like a high roller. In making his rounds, Phineas collected the scrapings from 49 candles. You probably figured that out yourself. And that be would then have enough for seven nights' light. But did you keep at it long enough to realize he would also accumulate the scrapings from these seven candles to make an eighth candle?

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IS business demands complicate job choices

BY ALICE LAPLANTE
SPECIAL TO CW

Part I of a two-part series.

Information systems professionals have always faced tough choices when it comes to career paths. If they chose a technical specialty, they risked losing the chance to move into management. If they chose to focus on managerial issues, they could rapidly fall behind the state-of-the-art technology.

This dilemma is complicated even more by increased demands that an IS employee become proficient in business concepts and practices to effectively perform even basic systems jobs.

Yet despite volumes of well-intended advice from recruiters and career counselors, it is not always necessary for an IS professional to possess the perfect combination of technical wizardry, business acumen and political sagacity to have a productive career, IS managers say.

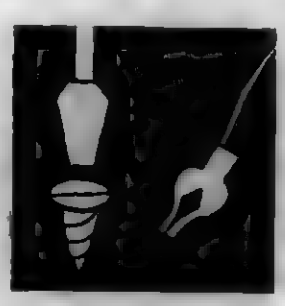
What is essential is that every professional possess a deeper understanding of the problems and issues facing the people who use the systems designed and maintained by the IS staff.

IS professionals themselves believe they should attempt to navigate a technically solid middle course with slight biases to suit their interests — as long as this is tempered with a dose of awareness of the competitive realities faced by their organization and the people who work for it.

Truth behind cliches

At Key Services Corp. in Albany, N.Y., the truth behind the cliche that IS professionals must "get close to the business" was learned the hard way.

Robert Tucker, corporate manager of operations, and his staff put together a corporatewide electronic mail system based on what Tucker realized later were very preliminary interviews with too small a sampling of end users. The IS staff members involved in the project were more concerned with technical specifications than with how E-mail would fit into day-to-day operations. As a result, few employees used it.



The challenge is twofold, says Raymond Caron, president of Cigna Systems, the systems arm of Philadelphia-based Cigna Corp. First, he says, IS employees face enormous pressure from above to find ways of applying technology that will gain competitive advantage for their firm. But this is complicated by the dizzying pace of technological development. As a result, IS staff members tend to focus on the technical problems of any given project, ignoring end users and business issues.

When this happens, the company suffers, Caron says. What is necessary is finding a balance that serves the corporation but doesn't burden IS employees with unrealistic expectations.

For employees fresh out of college, striking this balance is less of a problem. Most current IS programs emphasize technical skills as well as accounting, finance and other business concepts that give them a firmer footing than their predecessors. For longer term employees, however, it's a trickier issue because they have historically maintained or modified systems put in place by others, says Bob Holmes, manager of systems evaluation at California Gas and Electric Co. in Los Angeles. "Most of us never had to ask questions about how an end user did his work."

Formal business education helps, but it isn't enough, IS managers say. IS workers also need to gain knowledge of individual end-user departments: Understanding how the personnel department functions is different from comprehending the challenges faced by employees in the word processing pool. "This kind of knowledge can be achieved only through working in the trenches," Holmes says.

Getting the right balance

There is also the question of balance: It is possible to get too immersed in business, IS managers say. Because technology changes so quickly, an employee who spends months or years in an end-user department could end up virtually locked out of the more interesting IS jobs.

But the reverse is more likely to be true: Someone with his nose to the technical grindstone and blinders to business realities is likely to find himself on the endangered species list, Tucker says.

Tucker says his firm's E-mail disaster made it clear to him that he had to build a staff centered around business know-how. "I can buy the technical skills through an outsourcing firm," he says. "I don't necessarily need them on staff."

Different strokes

However, most IS managers agree there is room for all kinds.

"What I used to think of as the Renaissance man is simply not practical," says John Ineson, director of corporate information systems at Union Camp Corp. in Wayne, N.J. He says he believes that running a successful systems operation increasingly needs a "team approach," with different members of the team bringing different areas of expertise to the field.

Other managers say that expecting to find someone with both in-depth business knowledge and highly technical hands-on skills simply isn't realistic.

"You will have a substantial percentage of your systems and programming staff who are unable to make the transition to user-oriented computing or who don't want to," says Brian Ellis, director of MIS at Brunswick Bowling and Billiards in Muskegan, Mich. Most firms will always have room for a "backbone" of technicians, he adds.

> SOMEONE WITH HIS nose to the technical grindstone and blinders to business realities is likely to find himself on the endangered species list.
>
> ROBERT TUCKER
> KEY SERVICES

Still, he admits, opportunities for IS employees who work well with end users will dominate purely technical jobs.

Part II will explore how technical employees can gain a business edge.

LaPlante is a free-lance writer based in Palo Alto, Calif.

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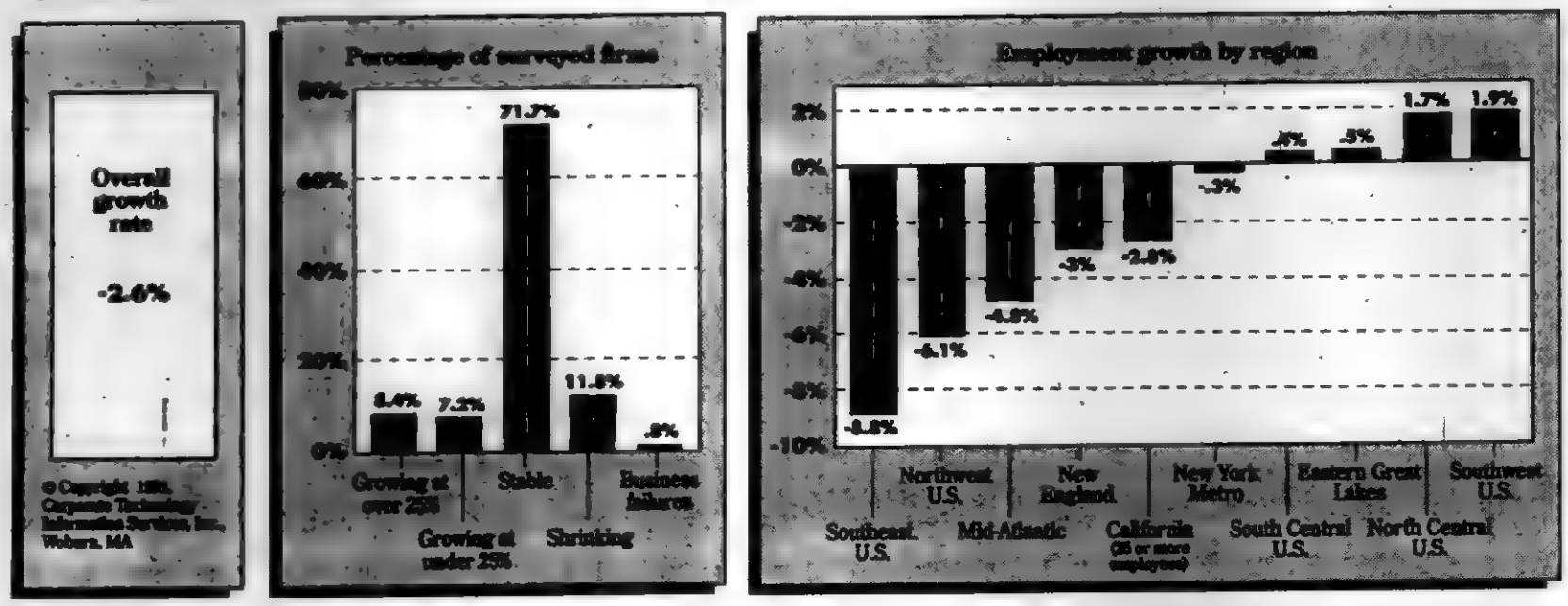
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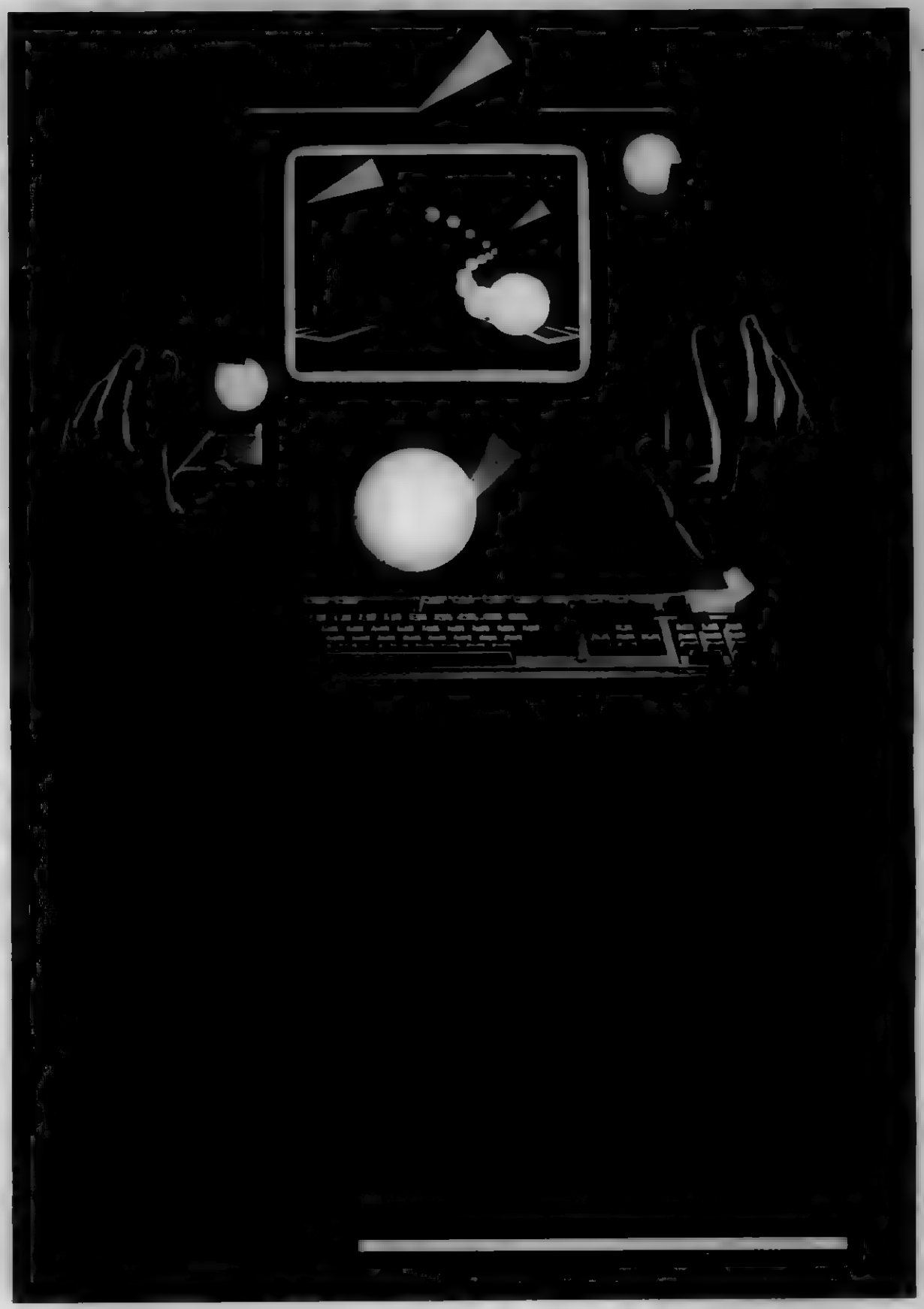
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The U of AK Computer Network supports an 8,000 mile communications network linking 13 campuses statewide with 5 computer systems. We have an opening for an experienced Data Base Specialist working with IDMS and DMS/OS in an MVS/XA environment and a Senior Analyst Programmer in support of Administrative Computing. Following are the particulars.

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(SALARY D.O.E. PLUS EXCELLENT FRINGE BENEFITS, annual salary range begins at $40,435). Full-Time Permanent.

JOB SUMMARY: Perform application software analysis, design, and programming at the highest level of technical complexity, scope, and risk.

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MINIMUM QUALIFICATIONS: Bachelor's degree or equivalent relevant experience and a minimum of 5 yrs. of related experience including lead analyst, project leader, and/or managerial experience. Demonstrated proficiency in designing, coding, testing, implementing and documenting complex computer systems and software. Applications analysis and programming; its theory and application. Demonstrated proficiency in record/file design including logical and physical database design, and work with an interactive data dictionary. Technically understand the technical and non-technical written and oral communications skills. Understanding of software engineering and systems development methodology. Skill at coordinating of technical resources in a multi-vendor environment.

DATA BASE SPECIALIST

(SALARY is D.O.E. PLUS EXCELLENT FRINGE BENEFITS, annual salary range begins at $36,771) Full-Time Permanent.

JOB SUMMARY: Develop and maintain the disk storage management plan for the U of AK. Provide analysis of data set placement, user projections, develop recommendations. Develop and maintain the data base environment, including installation, definition, access strategies, and dictionary maintenance. Develop and implement procedures to protect the data base and relevant data against unauthorized access, modification, or destruction. Develop and deliver information and training relating to the concepts and usage of the data base. Monitor and maintain data base usage and performance. Assist the Data Base Quality Assurance function in various activities.

MINIMUM QUALIFICATIONS: The successful candidate must have a min. of 2 yrs. data base management systems experience on a system equivalent to the U of AK, one of which must be in data base application analysis and design. In addition they must have 3 yrs. experience in computer programming and/or systems analysis. A bachelor's degree in a related discipline is desirable. Experience in MVS/XA, DMS/OS, IDMS, and related products is a plus.

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CLOSING DATE: Applications must be received or post-marked by 5:00 p.m. on 6-14-91

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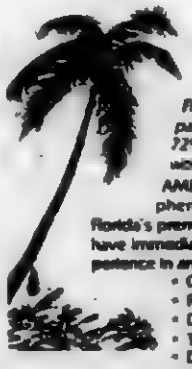
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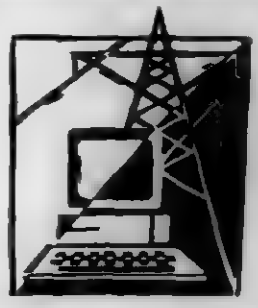
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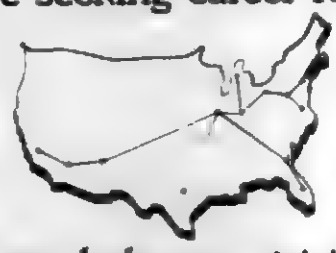


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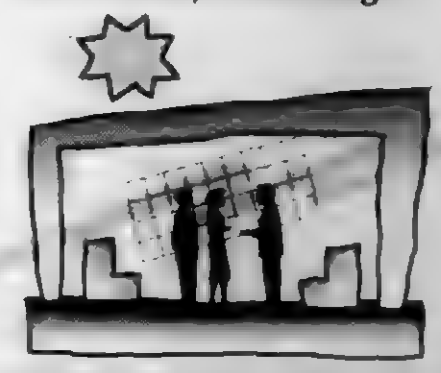
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Exploring the uncharted gray market

BY KIMBERLY PATCH
SPECIAL TO CW

Gray market merchandise — new personal computers, mainframes and minicomputers sold through unauthorized reseller channels — holds enticing discounts of 40% and more for buyers intent on ferreting out low prices.

However, buyers should brace themselves for potential pitfalls. Obtaining proper product maintenance can be difficult and expensive, and inexperienced buyers risk acquiring used equipment despite promises of new products. Consequently, buyers should weigh three basic factors prior to navigating the gray market: dealer reputation, maintenance agreements and warranty and licensing papers.

Buying a computer on the gray market is not illegal, and neither the buyer nor the seller can be sued unless there is proof the equipment was stolen.

Dabbling in the gray market is really a buyer's beware, says John Dunkle, vice president of Workgroup Technologies, Inc., a market research firm in Hampton, N.H. "While the price may look very attractive initially, you're exposed if the system goes down," he says.

The first thing to do before buying is establish who will fix the computer if it breaks, Dunkle says. The buyer should also find out where he can have the machine serviced. Outlets that sell gray market PCs often do not service them, but some minicomputer and mainframe dealers do service machines and may even offer their own warranties.

Another factor is timing. Gray market dealers often receive large amounts of inventory that they want to unload quickly. If a buyer has to cut through all the red tape in getting a purchase order from his company, the machines may no longer be available when he's ready to buy.

Most gray market equipment comes from value-added resellers (VAR). When VARs sell less than projected, their suppliers usually don't take back the merchandise. To recoup their investments, VARs sell merchandise at a reduced cost to unauthorized dealers, who in turn sell the equipment to users.

Buyers can find gray market PCs at large retail outlets, mail-order houses and warehouse sales.

Although PC makers discourage market leaks, they tend to ignore gray market activity. For example, Fry Superstores in Sunnyvale, Calif., carries unauthorized PCs made by IBM, Apple Computer, Inc. and Toshiba America, Inc., but the vendors do not acknowledge the superstore as a channel, Dunkle says.

Buying by mail

Mail-order companies also sell gray market PCs. Damark International, Inc., a mail-order firm in Minneapolis, sells mostly 1-year-old models and seconds. "But there have been instances where we have purchased [new equipment] from a VAR" that was not authorized by the manufacturer to sell that equipment, says Mark Platt, a vice president at Damark.



One-day computer flea markets, or warehouse sales, often contain gray market goods and savings. For example, Show Promotion, Inc. sponsors a one-day sale several times per year in the Boston area that includes authorized and unauthorized computers and peripherals.

Marvin Getman, president of Show Promotion, bought a Hewlett-Packard Co. Series II laser printer for $1,100 at a recent show. "I know that it goes for more than that, so I thought it was a good deal and bought it," he says. "The purchase came warrantied, so I know I'm dealing with legitimate people."

Gray market parts also leak into the marketplace and let users buy merchandise cheaply.

Gerald Krefetz, a financial consultant in New York, says he bought an Intel Corp. 80386-based PC clone with a 40M-byte hard drive, 1M byte of memory and two floppy drives for $1,000. "I got a machine [worth] somewhere between $1,700 and $2,500," he says.

Krefetz says he bought the machine from a repairman who works for a major computer company and does a little business on the side assembling PCs from components — some of which are probably gray market parts from the company he works for. "Major service companies throw out more parts than you can shake a stick at. I would not be surprised if service personnel help themselves to parts rejected for minor reasons," Krefetz says.

Gray market mainframes and minicomputers, on the other hand, are chiefly sold through used-equipment dealers.

Makers of larger machines tend to take a harder stance concerning the gray market than do PC dealers. Several large dealers, including Digital Equipment Corp., have active programs to stamp out the activity.

Because midrange and mainframe dealers usually discourage customers from dealing in the gray market, buyers who purchase larger machines there tend to keep a low profile concerning those purchases.

One West Coast executive who is a Grid Systems Corp. and NEC Corp. VAR says his company recently bought a VAX 6210 from the gray market. "DEC wanted $165,000 for it. We bought it through a large-system reseller for $120,000. [The reseller] probably bought it for $100,000. It came brand-new, directly from the factory."

Despite the overall tension on the part of vendors and uneasiness on the part of buyers, the gray market is not likely to disappear anytime soon, according to Dunkle and gray market users. It is simply a matter of economics.

According to numbers from Workgroup Technologies, the gray market makes up roughly 4% of all DEC VAX revenue and between 8% and 9% of IBM System/36 revenue. Gray market PC sales are "at least double" the gray market percentages for larger machines, Dunkle says.

Patch is a free-lance writer based in Boston.

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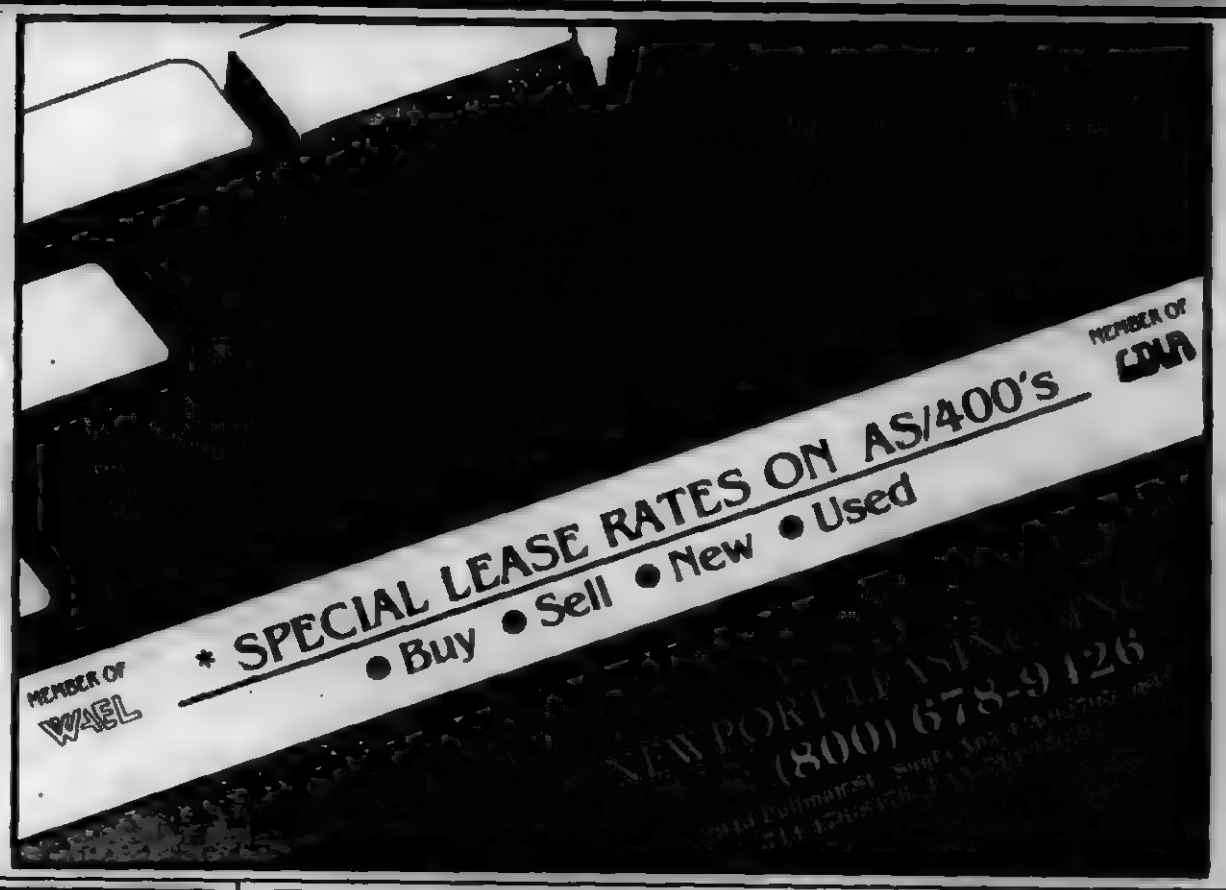
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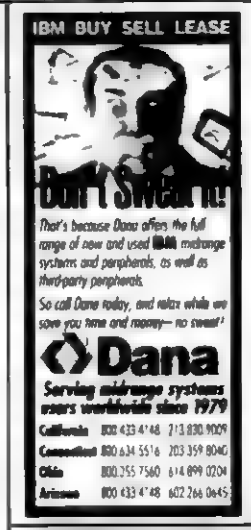
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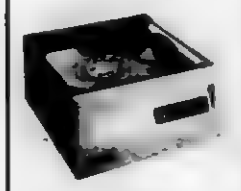
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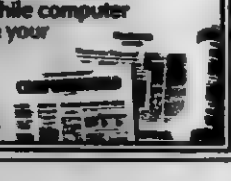
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Adding the missing piece in training

BY BYRON GLICK
SPECIAL TO CW

Many members of corporate America seem to view training as a kind of one-stop shopping experience: Pick up a quick set of skills and head out the door. But adhering to four objectives — standardizing vocabulary, sharing expertise, reducing problems and increasing user satisfaction — can keep users browsing in the aisles and ending up with a cartload of benefits.

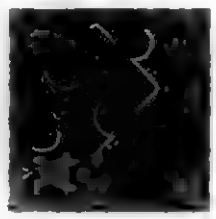
Objective No. 1: Standardizing vocabulary. Technical training is particularly susceptible to the Tower of Babel syndrome in which each person or group develops a private vocabulary that is not shared with others. Beginners invent terms that sound right but are not commonly understood; and experienced users dabble with jargon that is not intuitively obvious.

Trainers should break down the inherent barriers created by diverse vocabularies. Training builds a shared vocabulary that enhances interuser communication, streamlines problem resolution and reduces user learning curves.

Any experienced trainer will recognize that it is wildly optimistic to expect a completely homogeneous vocabulary in a given system.

Still, training can be effective in the area of shared vocabulary by helping trainees identify diverse words, phrases and acronyms that designate similar objects or processes (and, worse yet, similar labels for diverse objects).

All training should be examined for its support of a common vocabulary or, in the absence of that, the identification of differences between vocabularies.



Objective No. 2: Sharing expertise. Despite the increasing presence of user groups, newsletters and network facilities such as electronic mail and bulletin boards, every company develops pockets of expertise that are not available to other users in its system.

In-house training is an opportunity to bring experienced users into contact with newer users. While the more seasoned users may not be able to commit the time and resources to become trainers, they might be able to contribute case studies or other examples of specific application uses in a given work setting.

Additionally, if training is brought into the company, the experienced users can form a review board to examine course descriptions and training vendors. This review process will certainly help ensure better training selection and serve as a forum for discussing user needs and requirements.

Objective No. 3: Reducing problems. A more educated user base will report fewer trivial problems. Especially with the novice, nuisance errors can consume a great deal of time and energy on the part of the user and those who support the user. Many files have been lost because a user misunderstood default file storage locations. Since such errors are based mainly on a user's lack of familiarity with a system or software package, proper training can reduce the number of problems reported and free up support resources by preventing problems in the first place.

In addition, if objectives 1 and 2 are realized, even significant problems will be easier to solve. A standardized vocabulary will yield clearer definitions of problems, and a wider base of expertise will provide a broader pool from which to draw solutions.

Objective No. 4: Increasing user satisfaction. User satisfaction is an often used and rarely defined term that lends itself to many methods of measurement.

One metric is user complaints. Every information systems trainer has encountered at least one frustrated user who is sure the system or application is broken when, in fact, some easily correctable user error is at fault. If this occurs frequently enough, the failure will almost always be blamed on the system and those who support it, not on those who use or misuse it. Training can familiarize users with the look and feel of an application and, consequently, make them more successful and satisfied with that application or system.

A second index of user satisfaction is how a system meets previously unfulfilled needs. Training can raise this index by alerting the user to new functions and applying those functions to the tasks the user already does.

PROPER TRAINING can reduce the number of problems caused by users' lack of familiarity with a system or software package, freeing support resources by preventing problems in the first place.

New applications are most frequently used to perform the same function as the old application, only faster and easier. Good training will not only help the user apply new software to old tasks but will also highlight additional tasks to which the system might be applied.

Glick is an office systems coordinator in the systems administration division at the University of Wisconsin.

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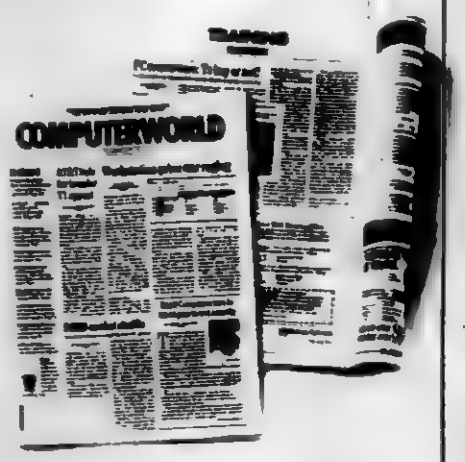
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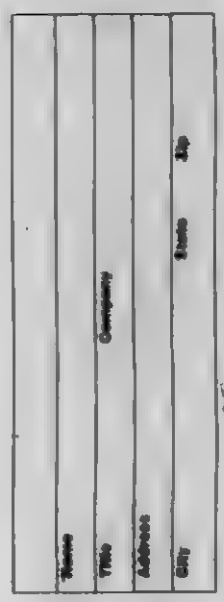
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

DOWNGRADED FROM HOLD TO SELL: Apple Computer, Inc. (Bear Stearns & Co.). Reason: New product sales in question after some dealers and vendors indicated that supply is catching up with buyer demand. Budget constraints, especially among school systems where Apple machines are popular, make Apple a dicey stock.

DOWNGRADED FROM BUY TO HOLD: Conner Peripherals, Inc. (Bear Stearns). Reason: Slower sales predicted for Apple and other OEMs with contracts for Conner disk drives may offset the firm's momentum in the market for notebook computer drives.

DOWNGRADED FROM AVOID TO SELL: Sequent Computer Systems, Inc. (Bear Stearns). Reason: Weak economy and seasonal order fluctuation are intensifying Sequent's troubles, which include a rocky transition from Intel Corp.-based 80386 machines to i486 products.

DOWNGRADED FROM BUY TO HOLD: Silicon Graphics, Inc. (Bear Stearns). Reason: IBM's recent price cuts on its RISC System/6000 workstation line will pressure workstation makers to respond; Silicon Graphics stock is vulnerable to such short-term events.

UPGRADED FROM BUY TO STRONG BUY: IBM (Bear Stearns). Reason: Despite its weak first-quarter earnings, IBM has not lost much market share. Most major mainframe companies showed similar results, and growth among the personal computer firms was also less than expected. Sales look good for the host of new products recently introduced.

UPGRADED FROM NEUTRAL TO ATTRACTIVE: Sun Microsystems, Inc. (Paine Webber, Inc.) Reason: Investor concern over new consortium led by Compaq Computer Corp. helped push Sun stock down recently. However, Sun can deliver products now, while the consortium will not deliver for at least one or two years.

GUEST SPEAKER

Marty Resinger, technology analyst, Duff & Phelps Investment Research Co., Chicago:

"By rating IBM a long-term hold, we're trying to signal investors to think of IBM differently.

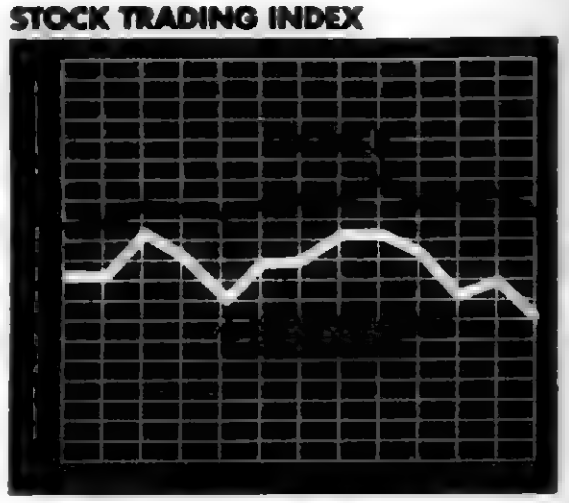
"No longer can you buy IBM and put it away as a core holding. It can't be unthinkingly counted on for long-term appreciation [because] it certainly hasn't grown all that much in terms of earnings per share since 1984.

"The strong currents in the industry toward smaller and more standard computer systems have impacted IBM's earnings — and we're not even halfway there in terms of seeing a final outcome of these trends.

"IBM may not be doing itself a favor over the long haul by being in the software business. Its large presence can discourage people from developing software for IBM platforms if they know they have to sell against IBM or IBM-backed developers. The success of IBM hardware depends on there being software available for it. If IBM competes with smaller software developers and knocks them right out of the business, [IBM] won't, ultimately, build its business."

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- After saying second-quarter profits will take an 80% swan dive, Compaq Computer Corp. fell 15¼ points last week, losing nearly 30% to close Thursday at 35¼.
- Other large technology stocks were also battered. IBM fell 1¾ points to 104⅛, Digital Equipment Corp. dropped 2 points to 64¼, and Hewlett-Packard Co. slipped 1 point to 48.
- Among networking firms, Cisco Systems, Inc. lost 2¾ points to 29 after reporting revenue and profit increases for the current quarter. Cabletron Systems, Inc. also tumbled, losing 5⅛ points to close at 33½.
- Some software makers lost big, including Borland International, Inc., which suffered a 9½-point fall to 44½, and Microsoft Corp., which declined 6⅜ points to 99⅜.
- As NCR Corp. and AT&T started working to become one, investors pushed both stocks back half a point last week. NCR closed at 102⅜ while AT&T ended Thursday at 36⅛.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, MAY 17, 1991

TOP PERCENT GAINERS	
Aytel Communication Corp.	31.43
Advanced Micro Devices	15.15
Gandalf Technologies Inc.	11.54
Mentor Corp.	9.88
Computer Task Group	8.86

TOP PERCENT LOSERS	
Compaq Computer Corp.	-31.09
Businessland Inc.	-30.00
Phoenix Technologies	-17.24
Televideo Systems	-16.53
Cabletron Systems	-16.40

TOP DOLLAR GAINERS	
Advanced Micro Devices	1.88
Bell Atlantic Corp.	1.63
US West Inc.	1.13
Motorola Inc.	1.13
BBS Systems Inc.	1.00

TOP DOLLAR LOSERS	
Compaq Computer Corp.	-16.75
Cabletron Systems	-6.38
Adobe Systems Inc.	-5.25
Auto Data Processing	-5.13
Intel Corp.	-4.50

Exch	52-Week High	52-Week Low		May 17 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Off 0.86%
OTC	19.00	5.38	3 COM Corp.	7.38	-1.00	-11.94
NYS	69.75	52.50	American Info Techs Corp.	58.38	-0.75	-1.27
NYS	44.13	29.00	AT&T	36.25	0.25	0.69
OTC	9.63	0.88	Ameri Communication Corp.	2.13	0.38	21.43
NYS	58.25	39.50	Bell Atlantic Corp.	47.13	1.63	3.57
NYS	57.25	47.50	Bellsouth Corp.	48.63	0.75	1.57
NYS	44.00	13.13	Cabletron Systems	32.50	-6.38	-16.40
OTC	25.88	8.25	Compression Labs Inc.	16.13	-1.88	-8.38
NYS	41.25	23.38	Contel Corp.	41.00	0.00	0.00
OTC	5.13	2.75	Data Switch Corp.	4.00	-0.25	-5.88
NYS	38.75	8.88	Digital Comm. Assoc.	16.50	-2.00	-10.81
OTC	25.25	12.25	Dynatech Corp.	20.75	0.50	2.47
OTC	12.88	5.50	Fibronix Int'l Inc.	9.13	-0.13	-1.35
OTC	4.00	1.75	Gandalf Technologies Inc.	3.63	0.38	11.54
NYS	4.50	1.63	General Datacomm Inds.	3.00	0.00	0.00
NYS	33.88	23.50	GTE Corp.	29.63	0.25	0.86
NYS	80.88	40.25	ITT Corp.	57.88	-0.38	-0.64
OTC	44.13	17.88	MCI Communications Corp.	28.88	0.00	0.00
OTC	21.00	2.75	Microcom Inc.	8.50	0.25	4.00
NYS	11.13	4.00	Network Equipment Tech.	8.75	-0.13	-1.41
OTC	14.63	4.00	Network General	8.00	-0.13	-1.54
OTC	16.50	8.13	Network Systems Corp.	11.88	-0.75	-6.12
NYS	37.13	22.13	Northern Telecom Ltd.	30.25	-0.25	-0.88
OTC	68.50	17.25	Novell Inc.	52.50	-1.88	-3.45
NYS	69.50	57.00	Rynex Corp.	68.63	-2.00	-0.72
NYS	47.50	36.25	Pacific Telesis Group	40.13	0.38	2.23
ASE	15.38	4.75	Parrot Corp.	14.50	0.00	0.00
NYS	29.13	8.88	Scientific Atlanta Inc.	13.88	-0.50	-3.48
NYS	58.88	47.25	Southwestern Bell Corp.	50.13	0.25	0.50
NYS	48.38	20.63	United Telecom	27.25	-0.75	-2.68
NYS	40.75	32.38	US West Inc.	36.13	1.13	3.21
Computer Systems						Off 5.01%
OTC	8.75	0.56	Allant Computer Sys.	1.00	0.00	0.00
ASE	18.88	10.00	Amdahl Corp.	16.13	-0.63	-3.73
OTC	73.25	24.25	Apple Computer Inc.	47.00	-4.25	-8.29
OTC	13.88	4.25	Archive Corp.	8.75	-0.63	-6.67
OTC	32.75	7.50	AST Research Inc.	21.50	-2.25	-9.47
NYS	7.38	4.00	Bolt, Beranek & Newman	5.63	-0.75	-11.76
NYS	21.63	4.50	Commodore Int'l	15.38	0.13	0.82
NYS	74.25	35.00	Compaq Computer Corp.	35.00	-15.75	-31.03
OTC	2.13	0.13	Computer Automation Inc.	1.50	-0.25	-14.29
NYS	21.13	6.75	Control Data Corp.	11.00	-0.50	-4.35
NYS	20.88	8.38	Convex Computer	16.13	-1.25	-7.19
NYS	51.25	30.00	Cray Research Inc.	33.75	0.00	0.00
NYS	16.13	3.50	Data General Corp.	15.13	-0.50	-3.20
NYS	3.25	0.75	Datapoint Corp.	1.38	0.00	0.00
OTC	30.63	8.25	Dell Computer Corp.	22.38	-0.50	-2.19
NYS	95.13	45.50	Digital Equipment Corp.	63.00	-2.88	-4.38
NYS	36.13	13.75	Harris Corp.	25.50	0.13	0.49
NYS	55.13	24.88	Hewlett Packard Co.	48.13	-0.13	-0.26
NYS	139.75	96.25	IBM	103.75	0.50	0.48
OTC	14.00	7.75	Information Int'l	8.25	0.25	3.13
OTC	31.50	10.50	Intergraph	27.25	-2.38	-8.02
NYS	2.75	0.50	MAI Systems Corp.	0.69	0.00	0.00
NYS	149.75	114.00	Matsushita Electronics	119.25	-3.50	-2.85
OTC	28.00	9.00	Mentor Graphics Corp.	16.13	-10.13	-0.82
NYS	104.25	44.50	NCR Corp.	102.63	-0.58	-0.48
OTC	35.50	11.88	Pyramid Technology	22.75	-1.88	-7.61
OTC	34.00	9.75	Sequent Computer Sys.	13.00	-0.25	-1.89
NYS	47.25	18.00	Silicon Graphics	32.63	-3.38	-9.38
NYS	37.25	14.63	Stratus Computer Inc.	30.13	-2.88	-8.71
OTC	38.63	15.00	Sun Microsystems Inc.	34.50	-2.00	-5.48
NYS	28.88	6.88	Tandem Computers Inc.	14.50	-0.63	-4.13
NYS	39.50	23.50	Tandy Corp.	30.50	-1.38	-4.31
OTC	32.00	6.75	Teradata	15.25	-1.75	-10.29
NYS	7.88	1.38	Ultimate Corp.	4.75	-0.50	-9.52
NYS	15.88	1.75	Unisys Corp.	3.88	-0.13	-3.13
ASE	5.75	2.00	Wang Labs Inc. (b)	3.00	0.00	0.00
Software & DP Services						Off 5.36%
OTC	83.00	17.00	Adobe Systems Inc.	47.25	-5.25	-10.00
OTC	59.88	20.25	Atlas Corp.	45.00	-4.13	-8.40
OTC	28.50	12.00	American Mgmt. Systems	26.75	-0.50	-1.83
OTC	18.25	7.50	American Software Inc.	11.00	0.13	1.15
NYS	4.63	1.38	Anacomp Inc.	3.50	-0.13	-3.45
OTC	23.50	10.00	Analysts Int'l	15.25	-0.25	-1.61
OTC	13.25	4.88	Ashton Tate	8.50	-0.38	-4.23
OTC	10.38	4.50	ASK Computer Sys.	7.75	-0.25	-3.13
NYS	37.00	22.63	Auto Data Processing	31.38	-5.13	-14.04
OTC	83.25	32.00	Autodesk Inc.	64.75	-1.50	-2.67
OTC	31.50	18.50	BGS Systems Inc.	27.00	1.00	3.85
OTC	43.88	17.75	BMC Software Inc.	35.75	-3.00	-7.74
OTC	21.50	11.00	Boole & Babbage Inc.	12.75	-0.50	-3.77
OTC	84.25	14.50	Borland Int'l	46.75	-4.38	-8.56
NYS	9.75	0.44	Businessland Inc.	0.88	-0.25	-30.00
OTC	20.88	5.13	Cognos Inc.	16.63	-0.38	-2.21
NYS	16.88	4.38	Computer Associates	7.75	-0.13	-1.59
OTC	17.75	10.25	Computer Horizons	10.25	-1.50	-12.77
NYS	73.25	35.75	Computer Sciences	63.25	-4.25	-6.29
NYS	11.75	6.63	Computer Task Group	9.75	0.63	6.86
OTC	25.25	13.00	Comshare Inc.	17.50	-0.13	-0.71
OTC	16.00	3.75	Corporate Software	10.38	-0.38	-3.49
NYS	49.00	27.88	General Motors E (EDS)	47.50	0.13	0.26
OTC	16.75	7.25	Goal Systems Int'l	13.63	0.38	2.83
OTC	7.00	1.88	Hogan Systems Inc.	6.25	-0.25	-3.85
OTC	22.50	7.75	Information Resources	19.75	-1.25	-5.95
OTC	17.50	2.63	Informix Corp.	5.63	-0.25	-4.26
OTC	7.88	1.38	Intellicorp Inc.	1.88	-0.19	-10.88
OTC	8.25	2.50	Interleaf Inc.	6.38	-0.50	-7.27
OTC	16.13	6.88	Intersolv	9.00	-1.50	-14.29
OTC	43.25	10.00	Knowledgeware Inc.	31.25	-2.00	-6.02
OTC	45.00	16.75	Legent Corp.	28.00	-1.50	-5.08
OTC	39.25	12.50	Lotus Development	32.88	0.50	1.54
OTC	32.00	13.63	Microgrph.	16.00	-3.00	-15.79
OTC	117.50	50.75	Microsoft Corp.	99.25	-3.50	-3.41
NYS	10.50	4.00	On Line Software Int'l	6.38	0.25	3.08
OTC	24.00	4.88	Oracle Systems	8.00	-1.00	-11.11
NYS	14.63	7.00	Parasophic Systems	11.75	-0.13	-1.05
OTC	8.25	1.25	Phoenix Technologies	6.00	-1.25	-17.24
NYS	52.00	33.38	Policy Management Sys.	46.00	-2.25	-4.66
NYS	23.63	11.50	Reynolds & Reynolds	20.63	0.50	2.48
OTC	25.50	14.75	SEI Corp.	25.25	0.25	1.00
OTC	21.75	12.38	Shared Medical Systems	21.38	0.50	2.40
OTC	35.25	12.00	Software Publishing Corp.	19.25	-3.63	-15.85
NYS	14.63	5.50	Sterling Software	12.75	-0.63	-4.67
OTC	28.00	9.50	Sungard Data Sys.	16.00	-0.75	-4.48
OTC	56.88	17.75	Symantec Corp.	43.75	-1.88	-3.31
NYS	34.50	4.50	System Center Inc.	8.25	-0.75	-8.33
OTC	37.25	12.75	System Software Assoc.	14.25	-2.50	-14.93
OTC	37.38	4.75	Wang	12.13	-1.38	-10.19
Semiconductors						Off 4.35%
NYS	14.25	3.63	Advanced Micro Devices	14.25	1.88	15.15
NYS	12.50	5.50	Analog Devices Inc.	10.75	-0.50	-4.44
OTC	21.75	5.25	Chips & Technologies	9.38	0.13	1.35
OTC	55.25	28.00	Intel Corp.	48.50	-4.50	-8.49
NYS	13.00	5.13	LSI Logic Corp.	9.88	-0.75	-7.06
NYS	19.13	6.75	Micron Technology	14.00	-1.00	-6.67
OTC	21.50	7.25	MIPS Computer Systems	15.38	-2.00	-11.51
NYS	88.38	45.75	Motorola Inc.	64.88	1.13	1.78
NYS	8.63	3.00	National Semiconductor	7.00	-0.63	-8.20
NYS	47.63	22.50	Texas Instruments	38.13	-2.00	-4.98
OTC	12.25	3.00	VLSI Technology	8.00	-1.50	-14.29
ASE	14.88	4.00	Western Digital Corp.	4.88	-0.25	-4.88
Peripherals & Subsystems						Off 4.45%
OTC	2.75	0.88	Aperture Technologies	2.19	-0.25	-10.25
OTC	24.00	7.50	Banctec Inc.	13.00	-0.50	-3.70
OTC	17.50	4.25	Cambex Corp.	11.75	-0.75	-6.00
ASE	11.75	4.13	Cognitronics Corp.	8.63	0.00	0.00
NYS	31.25	14.63	Conner Peripherals	19.25	-3.13	-13.97
ASE	22.00	7.00	Datarem Corp.	9.88	-0.38	-3.66
NYS	13.00	4.25	EMC Corp.	11.13	-0.75	-6.32
NYS	47.25	33.75	Eastman Kodak Co.	41.13	-0.25	-0.60
OTC	11.25	4.75	Emulex Corp.	8.88	-0.13	-1.39
OTC	33.25	14.00	Evans & Sutherland	19.63	-0.13	-0.63
OTC	9.50	3.88	Iomega Corp.	6.38	-0.19	-3.25
OTC	33.25	8.75	IPL Systems Inc.	22.50	-1.50	-6.25
OTC	1.63	0.13	Maxstor Systems	0.81	0.03	4.10
OTC	17.00	2.63	Mentor Corp.	4.25	0.38	9.68
OTC	18.00	4.38	Micropolis Corp.	13.50	-1.25	-8.47
NYS	93.75	73.63	3M Corp.	88.00	-0.38	-0.42
OTC	14.50	6.00	Prinbrade Inc.	7.00	-1.00	-12.50
NYS	24.75	9.50	QMS Inc.	20.50	-2.63	-11.38
OTC	19.25	8.25	Quantum Corp.	11.50	-1.63	-12.38
NYS	7.63	4.38	Recognition Equipment	7.25	0.25	3.57
OTC	11.50	4.00	Reson Inc.	9.13	-0.75	-7.59
OTC	19.88	5.63	Seagate Technology	11.63	-0.50	-3.13
NYS	47.00	11.00	Storage Technology	41.38	-1.63	-3.79
OTC	4.75	1.25	Tandon Corp.	2.56	0.06	1.60
NYS	38.38	11.63	Tektronix Inc.	30.75	-2.13	-6.48
OTC	0.63	0.16	Televideo Systems	0.31	-0.06	-16.53
NYS	60.13	29.00	Xerox Corp.	54.75	-1.38	-2.33
Leasing Companies						Off 0.81%
OTC	16.25	6.88	Amplicon Inc.	15.50	0.25	1.64
NYS	28.38	14.63	Comdisco Inc.	24.63	-1.25	-4.83
OTC	16.25	8.25	LDI Corporation	14.75	-0.13	-0.84
OTC	5.75	2.25	Sunstrand Inc.	3.75	0.00	0.00

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PC SOFTWARE:

Giant in a bit player role

For a company that set the standard for corporate personal computing, IBM's limited PC software experience is littered with embarrassing failures, below-par products and conspicuous absences.

"IBM has squandered a lot of credibility over the last 10 years [in the PC software market], and they are now in the position of having to prove themselves," said Stewart Alsop, editor of "The P.C. Letter" newsletter.

IBM's initial foray into desktop software was through resale agreements with third parties such as Software Arts, Microsoft Corp. and Software Publishing Corp. The intent in the early days of the PC was simply to ensure that IBM Personal Computer users had software, according to Ashton-Tate Corp. President William Lyons, who was IBM's vice president of PC software marketing in 1988.

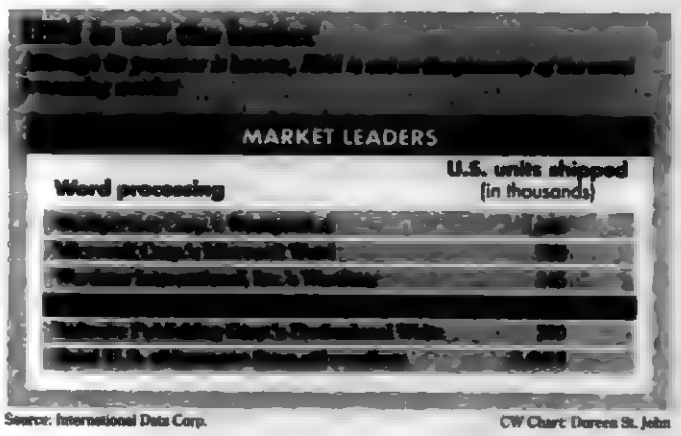
IBM's Entry Systems Division also floated a short-lived project that solicited internally written software for sale to customers. But the programs were widely considered to be weak and badly documented.

"It was an object lesson for IBM that they have to invest something or the customer won't respond," Alsop said.

Perhaps the best-known IBM PC software failure was Topview, a character-based graphical environment the company announced in 1984. At the time, company executives declared the product "strategic" but then compromised the design and spent two years trying to win industry support before finally abandoning it.

Although observers now say Topview was ahead of its time, IBM "misunderstood that product so badly, they don't like to talk about it," Alsop said.

Similar problems today plague the OS/2 operating system. With OS/2, IBM got the basic concept right but tripped up with specifications that are tied to IBM systems. Once again, the industry withheld support. OS/2's slow start has contributed to the poor acceptance of Officevision, which has a significant PC component.



Source: International Data Corp. CW Chart: Doreen St. John

Two theories

There are two theories about why IBM failed to establish a position in a market that recorded total sales of $4.6 billion in 1990, according to the Software Publisher's Association.

First, the software market has not been hospitable to hardware vendors in general because the ingredients for success are so different.

Second, IBM never seriously tried to become a PC applications powerhouse.

"You have to move fast, and that's IBM's biggest disadvantage," said Esther Dyson, editor of "Release 1.0." IBM also had little background in retail sales, selling to end users and promoting "sexy" features such as ease-of-use instead of mainframe stalwarts like security.

IBM also tends to focus on compatibility at the expense of innovation, analysts and former executives said. "Displaywrite was a beautiful piece of work, yet today it is considered a dog because they haven't kept up," one former IBM executive said.

It recently announced plans to stop enhancing Displaywrite, its only successful PC application, and instead sell a word processor created by Xyquest, Inc.

Two years ago, it launched the Desktop Software Group. The unit is charged with getting IBM market share in selected areas as soon as possible, leaving it to rely on licensing deals with third parties.

"Developing products from scratch is not a priority," said Dave Cassano, director of product management at Desktop Software. "We want competitive products in the market now," he said.

DB2

FROM PAGE 1

observers perceived the product as merely adequate technically, it came with the security that large shops count on IBM for.

DB2 hit the mainframe database scene in the mid-1980s, when relational technology was emerging as an alternative or additional database to the traditional hierarchical database management system environments. At the time, IBM's hierarchical IMS had healthy competition from a host of competitors, including Cullinet Software, Inc.'s IDMS and Applied Data Research, Inc.'s Datacom/DB.

However, many of them stumbled in response to DB2, choosing either to challenge relational technology or to incorporate relational features into existing products. IBM was seen as ahead of or superior to these strategies.

Today, DB2 is the center of a third-party industry of DB2 add-on products. The handful of mainframe database competitors that remain typically position their products as compatible with the DB2 strategy.

Former competitors Cullinet and Applied Data are now part of Computer Associates International, Inc., which still directly challenges DB2 in its marketing campaign. Most other competitors, such as Cincom Systems, Inc. and Software AG of North America, Inc., position themselves as being complementary to DB2.

Many observers agreed DB2 did not succeed on its technical merits but rather because of a combination of [illegible] in the late 1980s.

Large shops were ready to make the move to relational technology, and they wanted to do it with a highly reliable vendor. IBM positioned DB2 as "strategic" and marketed it aggressively.

Today, there are approximately 6,000 DB2 licenses installed, according to Norris van den Berg, manager of strategy and marketing planning at IBM's Santa Teresa Laboratory, where DB2 was developed.

DB2 was an obvious choice for Engelhard Corp. when it decided to move from a nondatabase environment to a relational DBMS five years ago, said Steven Polk, director of information services at the Iselin, N.J.-based manufacturer.

"We reviewed the others, but we felt that DB2 would be the mainstream," he said.

While IBM acknowledged that its logo may have helped DB2 sales, it also suggested that DB2 has done well because it meets pressing concerns for reliability and data integrity.

"Big customers were interested in relational, but that's not the first thing they asked about," van den Berg said. "[They] asked about recovery, performance, user authorization. I think this was ingrained in us, and maybe some of the others didn't have that."

Star quality

DB2 continues to gain ground in the database management system arena



CW Chart: Doreen St. John
Source: Computer Intelligence

OPEN SYSTEMS SOFTWARE:

Promise, pitfalls aplenty

Open systems software presents a huge opportunity for IBM, but it is far from certain that the company can achieve the dominance it enjoys in many other markets.

If revenue and market share are the yardsticks, IBM has already done quite well in the Unix market. However, critics are skeptical that IBM is really serious about open systems and that it can become a major player in the Unix software market.

IBM's challenge is mostly one of perception. Critics charge that the company is involved in open systems only grudgingly, that it remains devoted to proprietary architectures, that it has a lot to learn about being one of many players in a market and that, in the words of one user, "they're approaching you with a cookie, but they have a huge net in the background."

"I'll start thinking of IBM as an open systems vendor when IBM salesmen's first approach is to sell me an OSI [standards]-based network, and when I don't want that, then it pitches SNA," said Bruce Gengler, project manager at Deere Technical Services in Moline, Ill.

Impressive figures

IBM managed to rack up an impressive $1.15 billion in Unix revenue in 1990, more than double its 1989 figure, according to International Data Corp. IBM's worldwide market share of Unix systems in dollars went from 4% in 1989 to 7% last year.

IBM's open systems movement has its supporters. "They've actually made more strides than they're given credit for," said Rick A. Barron, a business interface specialist at McDonnell Douglas Aerospace Information Services Co. in St. Louis. He cited the RISC System/6000 family and IBM's pledge to tie its Unix systems into its proprietary ones as evidence that the company is at least trying.

IBM says it is in open systems to stay. "It troubles me when people say we're not open," said Donna Van Fleet, director of the Austin, Texas, laboratory that oversees AIX and OS/2 development. "I will not rest until everyone is converted."

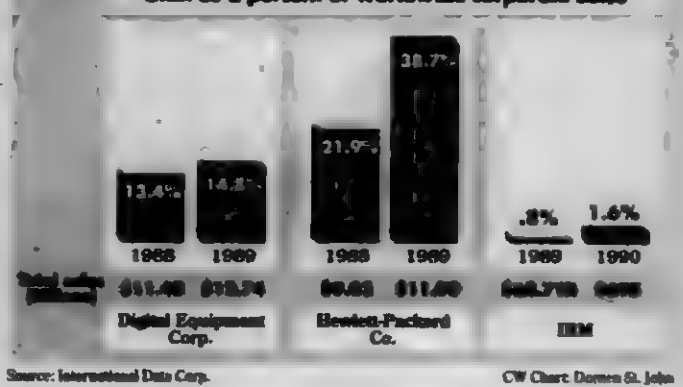
Van Fleet said her laboratory, with some 2,000 developers evenly divided between AIX and OS/2, is as large as the laboratory that develops the DB2 database management system and the MVS operating system, two of IBM's premier proprietary products. Furthermore, she said, IBM has already achieved some of its open systems goals, including the following:

- Participation in standards organizations such as the Open Software Foundation (OSF), the National Institute of Science and Technology and X/Open.
- Demonstration of the OSF/1 operating system on three different IBM platforms, including the 3090 mainframe.
- Compliance with other standards, including being among the first to win the X/Open brand of approval.
- AIX support for the vast majority of the commands found in other Unix variants.

Unix not ubiquitous

IBM is growing in Unix business more slowly than major competitors

Unix as a percent of worldwide corporate sales



Source: International Data Corp. CW Chart: Doreen St. John

NEWS SHORTS

Federal IS costs to hit $27 billion

The National Aeronautics and Space Administration and the U.S. Departments of Treasury and Transportation will overtake the Army, Navy and Air Force as the three largest spenders for information systems by 1996, the Electronic Industries Association (EIA) said in its third annual five-year forecast of federal IS expenditures. All total, Uncle Sam will spend $27 billion for IS in 1996. The EIA predicted a 3% annual real decline in defense IS spending and an increase at civilian agencies.

DG wins contract defense

The U.S. Supreme Court let stand a Federal Appeals Court ruling in favor of a $127 million contract awarded to Data General Corp. by the U.S. Department of the Interior. The contract had been contested by SMS Data Product Group, Inc. in Reston, Va., on the basis that the award had been biased in DG's favor by Washington, D.C., insiders.

3Com OSI software ships

3Com Corp. announced shipment last week of its personal computer-based Open Systems Interconnect (OSI) software ahead of schedule. The Santa Clara, Calif.-based company had said it would ship OSI/ES next month with demand-protocol architecture and OSI/ES Internetbios. 3Com said the software is the first to support OSI's Virtual Terminal Protocol and File Transfer Access Management on DOS PCs.

Link settles lawsuit

Fremont, Calif.-based terminal vendor Link Technologies, Inc. has reached an out-of-court settlement of its yearlong legal dispute with neighbor and competitor Inkel Technology, Inc. Last summer, acting on the belief that Inkel's then newly announced Sherwood terminal line had been developed using Link technology supplied by four recently departed Link executives, Link filed suit against Inkel and its parent, Inkel (USA) Corp. Last week, both parties apparently decided to get out of court and back to business. Neither party alleged that the other side's claim lacked merit. Neither conceded fault. Both agreed to forego further litigation in favor of a settlement agreement.

Software AG adds tool kit

Software AG of North America, Inc. last week unveiled a software development tool kit that combines existing products with services. The Rapid Application Development program tools run on IBM mainframes and consist of Natural, a fourth-generation language; Predict, a repository; Natural Architect, which specifies requirements; and Predict Gateway, a migration tool to gather information from other vendors' computer-aided software engineering tools. The total package costs between $45,000 and $400,000, depending on the processor. Some training is included. Customization is priced separately.

Intel recasts organization

Intel Corp. announced several organizational changes recently, including the creation of three new groups that will report to Intel's executive office. The groups — Architecture and Applications, headed by Senior Vice President David House; Software Technology, led by Vice President Ron Whittier; and Multimedia and Supercomputing Components, headed by Vice President Ken Fine — are intended to "address major market opportunities for Intel," said President and Chief Executive Officer Andrew S. Grove. With the creation of the new groups, Intel's Microcomputer Components Group will be dissolved.

Lynch takes new Unisys post

Unisys Corp. last week appointed Hugh T. Lynch president of its Computer Systems Product Group. Lynch, a former NCR Corp. executive who came to Unisys six months ago, fills the slot vacated by Cyril Yansouni, who left the $10 billion computer and defense company late last year. Lynch will be responsible for Unisys product development, engineering and manufacturing operations worldwide.

Stardent unveils desktop gear

BY SALLY CUSACK
CW STAFF

CONCORD, Mass. — Stardent Computer, Inc. broke new ground last week by introducing a family of desktop visualization systems that are based on a 40-MHz Intel Corp. I860 processor and are aimed at the scientific and research communities.

Dubbed the Vistra 800 series, the reduced instruction set computing (RISC)-based product line runs under the AT&T Unix V Release 4 operating system.

Stardent will still actively market and support its Titan line of Mips Computer Systems, Inc. R6000-based workstations for advanced graphics applications.

Seeing the niche

The visualization industry targets a niche market of leading-edge scientists who require a platform for computational chemistry and similarly compute-intensive applications, said Charles T. Casale, president of Aberdeen Group, a Cambridge, Mass.-based consulting firm.

The Vistra 800 series offers three models with differing rendering levels of graphics performance. They range from 33,000 polygons and 260,000 three-dimensional vectors per second at the low end to 90,000 polygons and 500,000 3-D vectors per second in 24-bit color at the high end.

> THE VISTRA 800 series is a family of visualization systems aimed at the scientific and research communities.

All models support Stardent's AVS visualization software and provide Virtual Pixel Map support. This allows the user to implement double buffering and enhanced pixel attributes without purchasing additional pixel memory.

The platforms integrate a 3½-in., 1.44M-byte floppy disk and a 3½-in. disk drive capable of storing either 200M or 400M bytes of data. A small computer systems interface is also provided, and the systems can be configured with 16M to 64M bytes of single in-line memory module memory.

Casale indicated that the IBM RISC System/6000, the Silicon Graphics, Inc. workstation and the recently announced 700 series from Hewlett-Packard Co. will still dominate the general-purpose advanced workstation market.

Pricing for the 800 series ranges from $20,995 to $59,015, and volume shipments are slated to begin next month.

Doubt lingers on NCR 3600

Acquisition effects cited as reason for concern

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — The technology may be impressive, but potential users have their doubts about buying into NCR Corp.'s new System 3600 because of the possible side effects of NCR's acquisition by AT&T.

NCR rolled out the System 3600 parallel processing system last week in a presentation to 120 potential buyers, including representatives of American Express Co., Citibank/Citicorp and the Federal Reserve System.

> "WE'RE GOING TO adopt a wait-and-see attitude; the question in our minds is, will AT&T be hands-off or not?"
>
> SALVATORE F. CHIARAMONTE
> CITIBANK

Some users said they were favorably impressed, although most expressed concern about the merger. The newness of NCR's strategy of placing microprocessors in a massively parallel architecture to generate up to 10 million instructions per second (CW, May 13) was also a concern for users.

"We're very interested in its price/performance," said Skip Peterson, vice president of telecommunications/LAN support at Citibank.

"I think they have a very good strategy," said Salvatore F. Chiaramonte, Citibank's vice president of International Standards Organization administration. "We're going to adopt a wait-and-see attitude; the question in our minds is, will AT&T be hands-off or not?"

Charles E. Exley Jr., NCR's chairman and chief executive officer, said NCR believes the 3600 will find a solid market. Analysts said companies with huge databases would be best for 3600-type mainframes.

The System 3600, a member of NCR's System 3000 family, was designed to run up to 288 loosely coupled Intel Corp. I486 chips. It runs AT&T Unix System V Release 4, so it supports software such as Oracle Corp.'s Oracle and Informix, Inc.'s Informix relational database management systems, NCR said.

David Card, an analyst at International Data Corp., suggested several uses for the machine. "Take a credit-card processing company that wanted to do direct mailing to [a specific market]. That's what this thing is incredibly good at doing. Or in a retail environment, if you want to compare in near real time data gathered from all your stores."

NCR will begin beta testing the 3600 in September and is slated to start shipping in the fourth quarter. Prices range from $855,000 to $8 million.

Exley said NCR expects to ship 10 or 12 of the machines by year's end.

DEC files licensing lawsuit

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. filed a lawsuit last week against Clearpoint Research Corp. over the disk and tape storage subsystems Clearpoint began selling in 1990 for DEC's VAX-6000 and 8000 computers.

At issue is Clearpoint's refusal to pay licensing fees to DEC for Clearpoint's DCMS-DSB disk and DCMS-TSB tape storage controllers, which attach directly to the VAXBI bus on high-end VAXs.

DEC maintains that the third-party vendor is infringing on five of its patents on the VAXBI bus and one patent on the Mass Storage Control Protocol. Both products are openly licensed now to about 25 of Clearpoint's competitors.

"We spent $1.5 million developing this alternative technology back before DEC was licensing the VAXBI bus," said Vince Bono, founder and president of Clearpoint. "We genuinely believe we don't need a license."

Bono emphasized that the lawsuit will remain "transparent" to his 2,500 customers worldwide. The disk and tape lines have so far sold approximately 1,000 units, he added.

If DEC prevails, Clearpoint will have to pay $1,400 in licensing fees per subsystem.

IBM

FROM PAGE 1

[Harold] Greene will let them do certain things," Cisewski said. "It's a lot better when you don't have to worry about those constraints."

Former IBM market research analyst John Torres, who left IBM last year to become vice president at research firm Ledgeway/Dataquest in Lexington, Mass., said the move should make IBM's outsourcing business more flexible and entrepreneurial.

"There were many times [at IBM] when we wanted to do something to make us more competitive, but we didn't because of the Consent Decree," Torres said.

The 35-year-old Consent Decree is murky when applied to today's outsourcing business. It prohibited IBM from competing directly in what was then known as the service bureau business, which the agreement defined as "the preparation of information and reports for others on a fee basis."

One competitor, Dallas-based Affiliated Computer Services, Inc., has complained loudly in recent weeks that IBM's contracts with Kodak and other customers violated the decree.

Integrated Systems Solutions Corp.

- **Headquarters:** Tarrytown, N.Y.
- **Employees:** 5,000
- **1990 revenues:** $800 million*
- **Current contracts:** 1,300 (five outsourcing "megacontracts"; all others for disaster recovery, data center relocations and various other services)
- **President and chief executive officer:** Dennie M. Welsh, former head of IBM Systems Services Division
- **Chairman:** Bernard Puckett, general manager of applications solutions

*Estimate from The Yankee Group

CW Chart: Doreen St. John

Although the Justice Department had taken no action, the software and services industry trade group Adapso formed a committee to investigate the allegations.

That committee was scheduled to meet late last week to determine whether to disband.

"It's not as relevant as it was two weeks ago," Adapso Vice President Bill Warner said. Arlington, Va.-based Adapso issued a press release applauding IBM's move.

'Washing its hands'

Affiliated Computer Services Chairman Darwin Deason, however, remained adamant, charging that IBM merely "washed its hands" of the alleged violations.

"I'm outraged," Deason said. "What about the fact that they built this whole revenue stream illegally? It's like breaking into my house and stealing my possessions, then moving them into another house and saying you'll pay the taxes on them. That doesn't make it right."

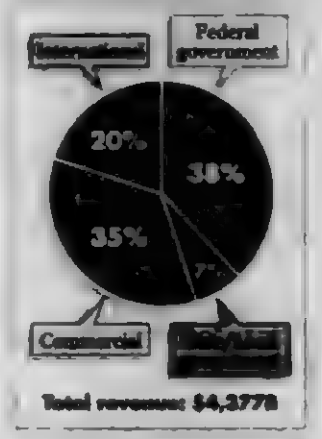
A spokesman for Electronic Data Systems Corp. — IBM's largest competitor in outsourcing — declined to comment on IBM's action.

ISSC will also provide IS support for all of IBM's internal field organization in the U.S. The combined outsourcing and internal business could total $1 billion this year, according to The Yankee Group.

Out and about

Outsourcing was estimated as a $4.4 billion market in 1990, with a projected annual growth rate of 15%

Percent of 1990 worldwide revenue of U.S.-based vendors



Source: International Data Corp.
CW Chart: Marie Haines

Budget cuts, slow news keep some from Comdex

BY CW STAFF

Economic restrictions and the belief that trade shows just do not deliver much news anymore will keep a number of microcomputer managers away from Comdex/Spring '91, according to several managers interviewed last week.

However, the addition of Windows World, which will run in conjunction with Comdex/Spring '91 and falls on the first anniversary of Microsoft Corp.'s Windows 3.0, has succeeded in bringing back some some key vendors, such as Lotus Development Corp. It may also be behind a 20% jump in preregistrations over last year, with Interface Group, the sponsor, predicting a turnout of 60,000.

Arthur Beckman, manager of information technology services at Pacific Gas & Electric Co. in San Francisco, for example, is making a "massive" move to Windows.

Having settled on his core products, Beckman is sending two people to scout out new packages at Windows World. However, several of those interviewed were resolute in saving their travel budget for PC Expo, which has moved to late June.

"I think PC Expo is starting to take [interest] away from Spring/Comdex," said Jacqueline Bynadorp, a personal computer coordinator at Jockey International, Inc. in Kenosha, Wis. She is going to Comdex/Spring, but she said it may be for the last time.

"If I were to go to a show at this time of year, I would go to PC Expo," said Bob Holmes, a systems consultant at Southern California Gas & Electric Co. in Los Angeles. "There are notable absences at Comdex, IBM being one, that will be at PC Expo."

Other users, such as Black & Decker Corp.'s Greg Faries, manager of client information services in the firm's Towson, Md., office, and Carl W. Baron, technical support manager at Millstone Coffee, Inc. in Everett, Wash., said economic conditions have curtailed travel.

"The first thing companies cut are people, salaries and travel. I'm not sure management views some of these shows to be as beneficial [for] the cost," said Faries, noting that his company will not send anyone to the show.

Baron echoed a couple of users when he said he has attended Comdex/Spring in past years with a set agenda, but he does not have anything to look for this time. "We probably aren't going."

No one in Dreisaen Aircraft Interior Systems, Inc. in Oceanside, Calif., is going, according to MIS manager Harry Vanderhoist, who said it is not worth flying out to Atlanta just to battle the throngs.

Those who are going appear to be predominantly interested in Windows applications and development tools and front ends for Microsoft's SQL Server. The latter is particularly compelling.

Ron Adinolfi, a vice president at Swiss Bank Corp., said he needs a development package that will allow him to create a front end to SQL Server and IBM's Database Manager as well as generate a finished product for either OS/2 or Windows. No such tool surfaced at last month's Microsoft Tools Conference, and Adinolfi said he is not willing to build it himself. "[To do so] is probably more work than the benefit you'd get out of it." Meanwhile, his database project is stalled.

One of the expected highlights at the show is a wave of high-end notebook and laptop introductions.

Sheldon Laube, national director of information and technology at Price Waterhouse, is looking at multimedia. "It's a breakthrough product because it will open computers up to people who've never used them before," he said.

Will Zenith's PC line put it back on the map?

BY MICHAEL FITZGERALD
CW STAFF

ATLANTA — Zenith Data Systems will announce a suite of personal computer products at Comdex this week, including a notebook computer based on Intel Corp.'s 80386SL power management chip. Analysts were divided last week on whether the new products would be enough to remedy what they called Zenith Data's lack of presence in the market.

The SL notebook may be the key to the Groupe Bull subsidiary climbing back into the PC hierarchy. The $4,999 Mastersport 386SL weighs 6.8 pounds, has a full-size keyboard, a 60M-byte hard drive, 2M bytes of random-access memory (expandable to 8M bytes) and sophisticated power management features that give it up to an eight-hour battery life.

Zenith Data will also introduce notebooks based on Intel's 80286 and 80386SX notebooks, two battery-powered portables based on the 1486 and 1486SX and two desktop file servers centered on Intel's two 1486 chips.

"This is absolutely a bet-the-company announcement," said William Ablondi, an analyst at BIS Strategic Decisions. Ablondi added he thought Zenith Data would win its gamble. However, Gib Hoxie, head of Boos, Allen & Hamilton, Inc.'s Information Industry Practice in San Francisco, disagreed. "It's too little, too late," he said. "I would certainly expect there to be a couple of SL machines a couple of pounds lighter than that by the end of the third quarter, and I think the price is a bit stiff also."

Initial user reactions concurred with Hoxie, with some respect for Zenith Data's technological offerings.

Current Zenith Data laptop user Barry Larson, director of systems and data processing at Wisconsin's Department of Transportation, is interested in purchasing as many as 200 386-based laptops this year. Larson likes the power management capabilities of the SL but may opt for the cheaper SX notebook.

"For those kind of price differentials [$1,000 less for the SX], you have to have some very specific reasons for going with that kind of model, and I'm not sure what applications warrant that sort of thing," he said.

Zenith Data is in the process of a significant reorganization, away from its traditional direct marketing focus. Two weeks ago, it replaced Arthur Lambert, its longtime vice president of worldwide sales and marketing, with Businessland, Inc. executive Michael J. Poehner.

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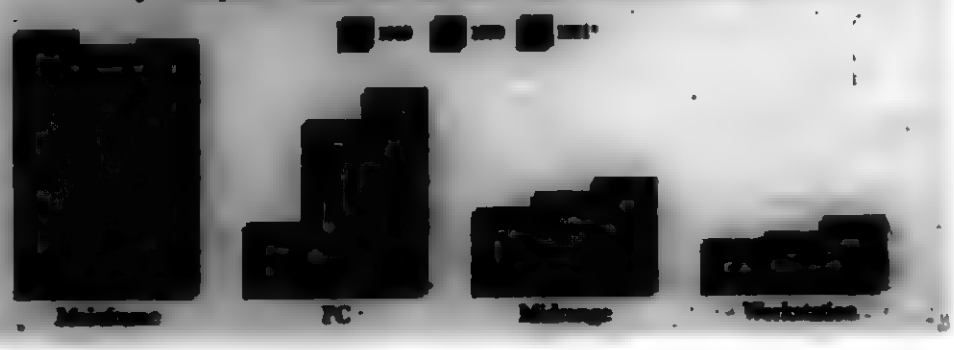
TRENDS

1991 SOFTWARE OUTLOOK

Software expenditures show software for mainframe systems getting less of the budget each year as more emphasis is placed on distributed environments

Average spending per company
(in thousands)
Base: 1,343 companies

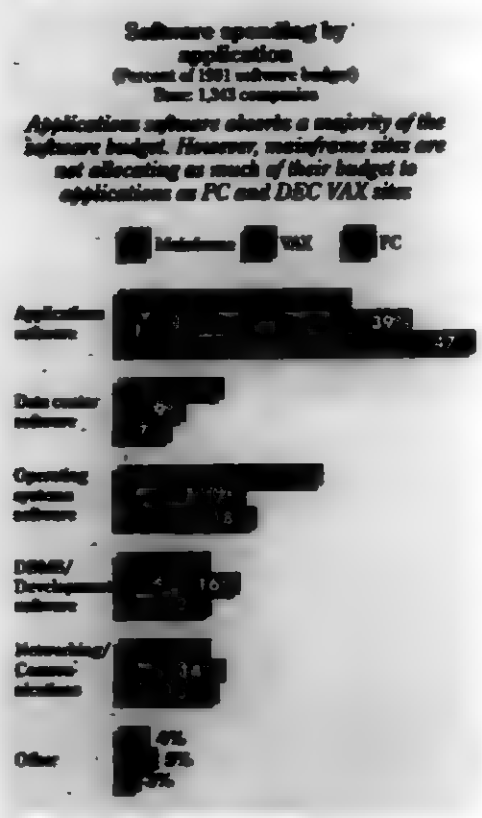
Although mainframe groups spend the most money on software, spending has become stagnant. PC software expenditures, on the other hand, have almost tripled since 1989



*Projected

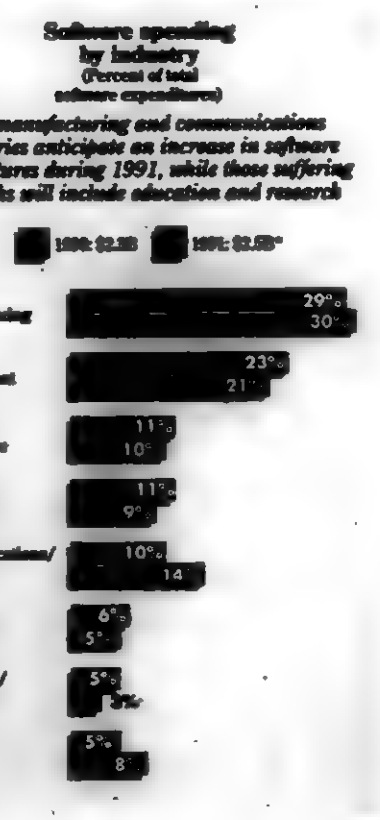
Software spending by application
(Percent of 1991 software budget)
Base: 1,343 companies

Applications software absorbs a majority of the software budget. However, mainframe sites are not allocating as much of their budget to applications as PC and DEC VAX sites



Software spending by industry
(Percent of total software expenditures)

The manufacturing and communications industries anticipate an increase in software expenditures during 1991, while those suffering cutbacks will include education and research



Source: Sentry Market Research, Westboro, Mass.

*Projected

CW Chart: Tom Monahan

NEXT WEEK

The CEO View takes a hard look at outsourcing through the eyes of **Derek Kaufman**, president of Diesel Technology in Wyoming, Mich. Kaufman discusses his 1988 decision to hand over the firm's information systems to EDS, as well as his thoughts on information technology at a Rust Belt manufacturer, in this week's Manager's Journal.



Peter Yates

If the struggle to manage interconnected LANs is a familiar one to you, don't miss next week's Product Spotlight. We can't offer a one-stop solution for integrated network management (nobody can), but we can brief you on how people are coming as close to it as they can, whether through standards or by paying close attention to vendor alliances.

INSIDE LINES

One name stands out

▶ First Boston Corp. will outsource its data center and voice and data communications to IBM — if it decides to outsource at all, Chief Information Officer Charles Mayer said recently. The investment firm has been in negotiations with several outsourcing vendors but will go with IBM if Mayer can be convinced that outsourcing won't cost First Boston the chance to capitalize on the price/performance gains of more decentralized processing on departmental servers. The firm runs three IBM 3090 Model 500Js in its data center near Princeton, N.J.

Windows on Dbase

▶ Our brethren in London report that Borland International Chairman Philippe Kahn recently confirmed that his company will deliver a Dbase compiler for Microsoft's Windows that works with Borland's Paradox Engine. But the product should not be expected for another year. The compiler — dubbed Turbo Xbase for Windows — forms part of the company's strategy for giving large corporate users access to different data sources. Paradox Engine is intended to act as the central component for data access in large companies, letting firms integrate their desktop PCs with other servers, such as Oracle and Microsoft's SQL Server.

Drawn to Windows, grumpily

▶ A crowd of Fox Software's Foxpro DBMS users was recently wowed by a demonstration of Foxpro Version 2.0 at a Boston Computer Society meeting. When asked about an Apple Macintosh version of the product, Fox President David Fulton responded that a beta-test release of the product should be available in about 90 days, adding, "I want this more than you do." As for a Microsoft Windows version? "The Windows product will have all the same features as [Version 2.0], plus chiclet buttons and all that [baloney] — and it will run slower, unless we can help it," Fulton replied.

Perfect words for Windows, some day

▶ Orem, Utah-based Wordperfect now says that its Wordperfect for Windows, originally slated for release in June, won't make an appearance until "late summer," although it declined to say why. There aren't even any beta-test users out there, the firm said.

Why should Unix go unscathed?

▶ So you thought maybe Netview/PC is finally headed for the dustbin, now that IBM has direct LU6.2 links plus an AIX-based platform to link third-party equipment to Netview? Wrong, IBM Network Management Director Bill Warner says: You can expect an AIX version of Netview/PC, too, "to add to the range of choices."

Your humble subject could use this

▶ Apple's research and development labs are busy working on a technology for PC users that recognizes repetitive computational tasks and writes a miniprogram to streamline their execution. The technology, code-named "Eager," was demonstrated by Apple Vice President of Advanced Technology Dave Nagel at Demo '91 recently in Palm Springs, Calif.

First the pizza box, now the fridge

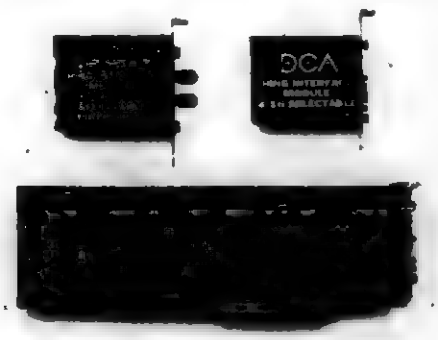
▶ Rumor has it that the engineers at Data General have been busy gearing up for the next big product announcement, scheduled for late next month. DG watchers predict that the company will unveil a successor to its high-end MV 40000 proprietary computing platform. There has also been speculation that the company will be throwing in some advanced disk storage products for good measure.

Microsoft's been flooding the mails with a nifty little magazine titled Focus on Windows ***that promotes the Windows Resource Kit. One user told us his firm received three such mailings with three different prices: $29.95, $14.50 and zip. We've told the way to get the best price is to call the toll-free number and tell Microsoft that your code on the mailing label is AAZ. We've tried, but the darn number is always busy. You can always get through to News Editor Pete Bartolik, though. Call (800) 343-6474, zap him a fax at (508) 875-8931 or zip a line to him on Compuserve ID, 76537,2413.***



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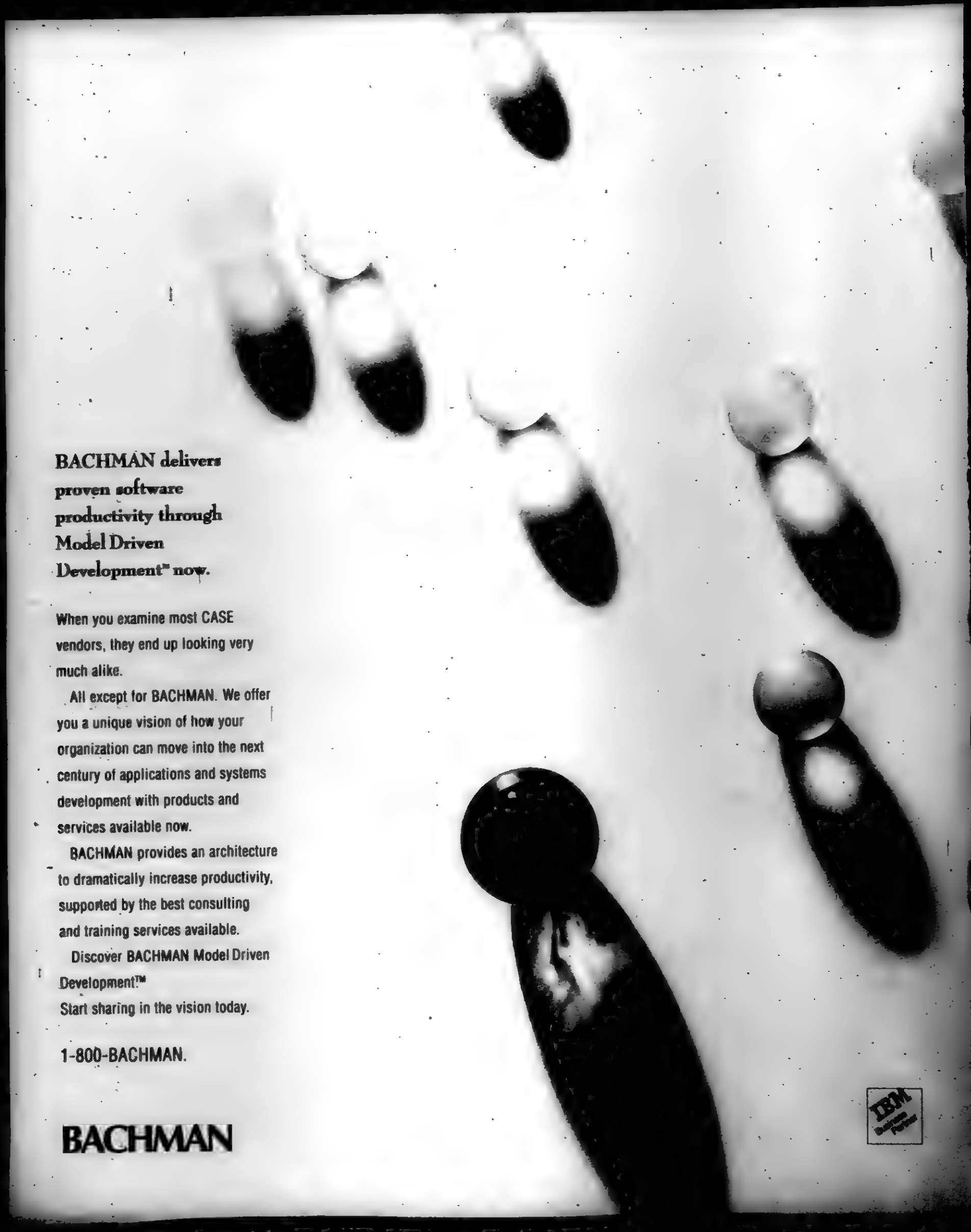
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COMPUTERWORLD

Red Cross IS prepped for transfusion

BY JEAN S. BOZMAN
CW STAFF

SAN DIEGO — The American Red Cross will shut down its blood centers on a staggered basis to replace computer systems that have contributed to safety problems in processing the nation's blood supply.

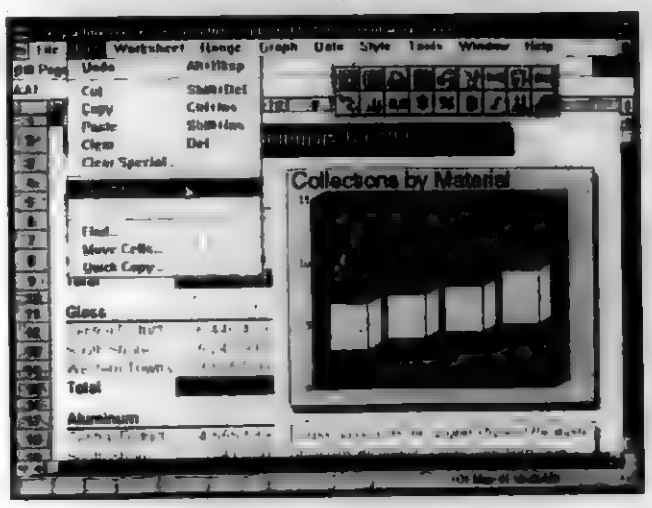
A move toward standard systems and centralized data reporting is intended to counter incompatibilities among the computer systems now in use at 53 centers around the nation.

"These diverse computer systems were responsible for fully 25% of the citations made by the FDA in the last year," according to a Red Cross statement on the computer overhaul plan issued last week.

The Food and Drug Administration has found many safety flaws in local centers — citations

Continued on page 4

It's here . . . well, almost



Comdex/Spring '91 attendees *were queuing up to view Lotus Development Corp. demonstrations of 1-2-3 for Windows, which will not be formally introduced until sometime during the summer. Coverage of Lotus' Windows strategy and other Comdex developments is on pages 106-108*

IBM plans stronger 386 upgrade push

Exec says users request credit for old systems

BY PATRICIA KEEFE
CW STAFF

ATLANTA — IBM is mulling over a trade-up program for Intel Corp. 80286-based computers that could include bundled OS/2 — or, if users demand it, Windows 3.0 — as a way to jump-start sluggish sales.

The idea takes a page from IBM midrange and mainframe marketing by working with IBM Credit Corp. to assist users with "inventory planning," IBM Vice President Joseph Guglielmi said in an interview last week.

He said several large accounts, which he declined to identify, with thousands of 286s each, have specifically asked for a trade-in program. As a result, IBM will probably pilot some type of trade-in program this summer with selected accounts on "specific bids," Guglielmi added.

Among the "full suite of options" IBM is either considering or has already committed to are the following:

- Shipping "OS/2-ready" Intel 80386s complete with 4M bytes or more of memory by the end of the year.
- Bundling OS/2 with every 386 it ships, either directly or through the dealer channel.
- "Inventory planning," or the 286 swap-out program targeting accounts with 1,500 or more such units.
- Additional pricing and service incentives for large accounts.
- An OS/2 "starter set" for retail walk-in trade that would provide a "better DOS than DOS." Users would be able to run DOS applications faster under a preinstalled OS/2.

So far, users seem wary. Most, like Rodger Bender,

Continued on page 107

Betting the future on grand plans

Last in a three-part series researched and written by Computerworld *staff members Rosemary Hamilton, Johanna Ambrosio, Patricia Keefe and Kim S. Nash.*

IBM SOFTWARE GIANT IN TRANSITION

IBM's future as a software provider holds both promise and doubt. The promise is that the company has made software a priority and is working feverishly to deliver on its grand architectural strategies and other key areas. But given IBM's prior spotty software performance and a host of other factors, observers are wondering whether it can deliver.

It is essential for IBM to do so. As hardware margins continue to fall, IBM must derive more of its revenue from software and services. To help meet this goal, IBM executives said, they are counting on initiatives such as Repository Manager and AD/Cycle, as well as the firm's relationships with third-party vendors and an increasingly important services business.

"IBM is changing from having high-priced hardware and giving the software away to charging high prices for software and giving the hardware away," said Bob Djurdjevic, president of Annex Research in Phoenix. "We're now midway through a transition in the way that the company does business."

Although IBM's huge installed base buys it some time, it risks losing market share in key areas. Some of IBM's major mainframe customers, including J. C. Penney Co. and Aetna Life and Casualty Co., have already adopted non-IBM applications development software — essentially

Continued on page 8

Multivendor LAN managers

COMPUTERWORLD BUYER'S SCORECARD

Users of Sun Microsystems, Inc.'s Sunnet Manager LAN network management software give it the highest score (56 out of a possible 76) in ability to manage other vendors' equipment

See Buyers' Scorecard page 76

Product	Score*
Response base: 79	
Sun's Sunnet Manager	SCORE 56
Hewlett-Packard Co.'s Openview Network Node Manager	SCORE 53
IBM's Netview Network Manager 6000	39

*Scores are based on product ratings from each user group, combined with the importance ratings users assigned to the criteria.

CW Chart: Doreen St. John

May I say who's calling?

BY ELISABETH HORWITT
CW STAFF

Armed with corporate success stories and converts picked up during the past year, call identification services seem to be on the verge of fulfilling their early promise as the magic application that will finally put Integrated Services Digital Network on the user map.

With the help of U.S. Sprint Communications Co.'s automatic number identification offering, or ANI, Florist Transworld Delivery Association started a service that pulled in $1 million in revenue in the first six months of operation. Called "Flowers After hours," the service handles after-hours calls for florists throughout the country. When a customer calls a member florist after hours, the call is routed to an FTD call center.

At the same time, the florist's trunk telephone number is sent to the center via ANI and matched with a database containing the florist's location, specials and prices. "Customers get the impression they are dealing with a 24-hour local florist," said Michael Lindquist, FTD's network operations manager.

Some 500 florists have signed up for the new service so far, generating more than $1 million in additional profits to date, Lindquist said.

While some 4,000 to 5,000 businesses now use ANI, the market will grow only 10% to 11% per year for the next two or three years or until the

Continued on page 14

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INSIDE



Peter Yates

Outsourcing is a way of life at Diesel Technology Corp. President Derek Kaufman explains why in The CEO View in Manager's Journal. Page 61.

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6 Now available: Covia is putting some of its internally developed technology platforms and services on the open market.

7 A federal judge is expected to consider Apple's motion to include Microsoft's best-selling Windows 3.0 interface in a broadened version of a 3-year-old copyright lawsuit against Microsoft and HP.

8 Software buyers and makers were alarmed when IBM unveiled its Application Systems Division in July 1987, but four years later, analysts say, competitors are no longer alarmed.

10 IBM denies that the Displaywriting is on the wall for its word processing package, vowing continued support and enhancements.

14 Observers predict the Public Utility Commission will approve the use of call ID with the proviso that local carriers give users the option of blocking the information from being sent.

107 Slashing and burning continue on the PC front, with IBM announcing PS/2 price reductions in response to recent Compaq cuts.

109 Apple's proposed paring could yield juicier technology and timelier results for users.

Quotable

"Many of our clients want to shelve their 286s, but the CFO is telling them no, because they haven't been depreciated yet."

FRANK DZUBECK
COMMUNICATIONS NETWORK ARCHITECTS

On IBM upgrade plans. See story page 1.

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81 A point-of-sale system helps Denny's manage its cash accountability, labor costs, inventory and productivity. By Charlotte A. Krause.

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The 5th Wave



"OH, SURE, $1.8 MILLION SEEMS LIKE A LOT RIGHT NOW, BUT WHAT ABOUT RANDY? WHAT ABOUT HIS FUTURE? THINK WHAT A COMPUTER LIKE THIS WILL DO FOR HIS SAT SCORE SOMEDAY."

EXECUTIVE BRIEFING

■ **Automatic number identification is gaining momentum** as a business application, potentially spurring ISDN growth. FTD florists, for example, create the impression of a 24-hour local florist by matching after-hours calls with a database of member florists. However, deep concerns remain over privacy issues, which courts and regulators will continue to debate. **Page 1.**

■ **One CEO's view of outsourcing** is very positive. Diesel Technology President Derek Kaufman decided three years ago to contract with EDS instead of setting up an internal IS shop at the Grand Rapids, Mich.-based manufacturer. Kaufman gives the strategy high marks, preferring a one-stop IS shop to "hardware vendors who just drop off manuals" and IS professionals who have "developed their own language." **Page 61.**

■ **Covia is going commercial,** selling internally developed software on the market in an effort to shore up profits of its airline members debilitated by the effects of the Persian Gulf war. New CEO Allan Loren named former CIO Mark Teflian to head the new unit, called Covia Technologies. **Page 6.**

■ **IBM wants your 80286-based PCs.** The firm is mulling a trade-in program that may bundle OS/2 or Windows 3.0 if users request it. The program, expected to begin selectively this summer, is an effort to jump-start sluggish sales of 386-based machines to corporate buyers. **Page 1.**

■ **Point-of-sale systems at Denny's restaurants** have increased revenue and saved restaurant managers in each store about 14 hours per week in paperwork. The chain is in the midst of a four-year POS rollout that will eventually encompass 1,000 stores in 46 states. **Page 81.**

■ ***Computerworld* names a new publisher:** Gary Beach, formerly publisher at *Network World,* takes over the reins from Fritz Landmann. **Page 4.**

■ **The Red Cross' migration to new computers** will necessitate a staggered shutdown of its 53 blood centers nationwide, beginning this summer. HP 3000s and IBM AS/400s will likely replace the current systems, which suffer from a lack of standards and networking. **Page 1**

■ **IBM slashes PC prices 6% to 24%** as the PC price war rages on. Suffering dealers are ecstatic, but users say the cuts will not automatically lure them away from cheaper clones. **Page 107.**

■ **Less expensive FDDI availability** could result from a consortium of five vendors promoting a shielded twisted-pair alternative to fiber. Analysts say high-end users could see cheaper offerings within six months, although most users still do not need the 100M bit/sec. bandwidth of FDDI. **Page 4.**

■ **IBM's future as a software vendor** will follow one of two scenarios: Either IBM will deliver on its enterprisewide software promises and be a leading systems integrator, or users will turn their backs on strategies such as AD/Cycle and IBM will become "just another big company." Last of a three-part series. **Pages 1 and 8.**

■ **There will never be a one-stop solution** to integrated network management, experts say. You can put some pieces together as vendors adhere to emerging standards and form alliances with one another, but you're still likely to end up in a tangle of systems. **Page 71.**

■ **On-site this week:** Burger King didn't exactly need a whopper of a system, but its Consumer Response Line processing requirements quickly outgrew a PC LAN, so it now uses an AS/400 to support the successful customer service initiative. **Page 27.** American Airlines sales reps promote something special in the air with a laptop-based SMARTS application that uses Borland's Paradox database. **Page 41.**

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Vendors agree to FDDI alternative

BY JOANIE M. WEXLER
CW STAFF

LITTLETON, Mass. — Five networking vendors took strides last week to spur lower Fiber Distributed Data Interface (FDDI) prices when they shook hands on a cheaper, shielded twisted-pair alternative to fiber's current 100M bit/sec. monopoly.

The agreement to support a standard, interoperable specification for 100M bit/sec. data rates over shielded twisted-pair wiring was made by Digital Equipment Corp., Chipcom Corp., Synoptics Communications, Inc., Advanced Micro Devices, Inc. and Motorola, Inc. at the DEC offices here. The copper alternative is intended for backbone-to-desktop data transfers.

In addition to providing healthy competition to fiber, the fact that the same chip set is used for both shielded twisted-pair and fiber should boost chip set volume and drive costs down, according to Michael Howard, president of Infonetics Research Institute, Inc. in San Jose, Calif. The chip set accounts for 20% to 30% of an FDDI connection cost, Howard said.

The move could provide a cost-effective way for users to get 100M bit/sec. rates to the desktop within six months as actual products start shipping, said Janet L. Hyland, director of network strategy research at Forrester Research, Inc., a consulting firm in Cambridge, Mass. Most users, however, will not need that kind of bandwidth on the desktop for at least two years, other analysts said.

IBM's role

IBM was not a part of the announcement, although most firms wired with shielded twisted-pair today are IBM sites. IBM is pursuing its own 100M bit/sec. over shielded twisted-pair technology and recently told *Computerworld* that it will begin rolling out 100M bit/sec. over copper products at the end of the year.

The consortium members would say only that their technology is similar to IBM's and that they will all end up supporting the official standard at some point. In the interim, however, there is no guarantee of interoperability among IBM products and products that members of the consortium might introduce.

Cabletron Systems, Inc., which competes with DEC, Synoptics and Chipcom in the smart-hub arena, said it will skip the shielded twisted-pair step and hold out for the more widely demanded specification for 100M bit/sec. data rates over unshielded twisted-pair wiring.

"Within 18 months, the standards committee will have a specification for unshielded twisted-pair, which is what the world wants," said Chris Oliver, Cabletron's director of manufacturing and engineering. Oliver said that in 1990, Cabletron shipped 300,000 Ethernet nodes, only 1% of which run over shielded twisted-pair wiring.

The single specification now sanctioned by the five firms is available to any other firm free of charge. Internetworking vendor Cisco Systems, Inc. has already stated that it will support the consortium's standard.

From a standing start

The ability to provide 100M bit/sec. connections to desktops over shielded twisted-pair wiring could overshadow fiber-based FDDI in the desktop

Number of PC nodes installed running at 100M bit/sec.

	Fiber (FDDI)	Shielded twisted-pair
1990	3,200	
1991*	13,000	4,000
1992*	22,000	49,000
1993*	43,000	151,000

* Projected

Source: In-Stat, Inc. CW Chart: Janell Genovese

Red Cross

FROM PAGE 1

that led to the shutdown of Red Cross centers in Albany, N.Y., and Washington, D.C., last year.

American Red Cross President Elizabeth Dole, speaking at the annual Red Cross convention here last week, outlined a program to overhaul Red Cross operations at a cost of $120 million, one-third of which is to be spent on hardware and software.

Beginning this summer and continuing until 1994, the program calls for temporary shutdowns of all local Red Cross blood centers, allowing several months for staffers to be trained in the use of more standardized systems. Other sites will pick up the data processing responsibilities of the closed centers.

"Between three and six blood centers could go down at a time," explained Red Cross spokeswoman Elizabeth Hall. "They'll stop collecting blood and recruiting donors — they'll stop everything except distributing blood. Then they'll go through eight weeks of transformation, during which they'll be equipped with compatible links to the new computer systems."

Test consolidation

Testing of blood will be moved from the 53 local centers to eight regional testing laboratories, and a common blood-testing software application will be used by all testing centers.

The Red Cross would not comment on the types of computer systems being considered for the new standard software platforms; some Red Cross sources said final decisions had not been made. The $120 million budget will include $80 million for personnel, training and downtime costs at the closed centers and $40 million for new hardware and software systems.

"Each center is using one of 10 different software applications systems, but there's no telecommunication between them," said Arne de Beaufort, general manager of administration at the Red Cross' Blood Services Division. "We'll end up with eight central labs, and they will be connected to each other on a network."

Probable platforms

The most likely hardware platforms will be Hewlett-Packard Co. HP 3000 minicomputers, which are widely used at the testing centers, and IBM Application System/400 midrange computers, de Beaufort said. The installed HP 3000s and AS/400s currently have no standard communications or database structures, hampering blood-donor identification and tracking procedures.

The Red Cross will also revamp its centralized Donor Deferral Registry (DDR) in Washington, D.C. "There are national DDR standards, and there are also local ones. We are going to streamline the whole process with a consistent definition of deferral codes.

"We need to have a standardized way of keeping track of [donor] deferrals on the database," de Beaufort said.

Beach named publisher of *Computerworld*

FRAMINGHAM, Mass. — Gary Beach, formerly publisher of *Network World*, took over last week as publisher of *Computerworld*.

Beach replaces Fritz Landmann, who was promoted to senior vice president at Boston-based International Data Group, parent company of *Computerworld*. Landmann will also serve as director of IDG's global resource development.



Beach: *"IS is not swimming upstream anymore."*

Beach, 40, led *Network World* to a leadership position among data and voice communications publications since being named president and publisher in 1987. Before that, he was advertising sales manager at *Data Communications*, a McGraw-Hill, Inc. magazine.

"I'm really excited," Beach said. "I don't think there has been a better time to join an operation like *Computerworld*. The sense that our readers in IS can have a positive impact on their enterprises has never been higher.

"Corporations have seen the power and positive impact of technology on their employees and their operations, and more technically proficient managers are moving into corner offices," he said. "IS is not swimming upstream anymore."

Beach holds a degree in urban affairs from Manhattan College in New York.

CORRECTIONS

Users of Cupertino, Calif.-based Apple Computer, Inc.'s Macintosh Models SE/30, IIX and IICX can take advantage of the virtual memory feature of System 7.0 — but only in limited amounts [CW, May 20]. The three Macintoshes have the coprocessor necessary to use the feature, but they are built with 24-bit read-only memory (ROM) rather than the 32-bit ROM needed for full virtual memory use. Misstatements by Apple officials led *Computerworld* to report otherwise.

In the April 22 Marketplace article, Zero Surge, Inc.'s location was incorrectly listed as Princeton, N.J. The company is located in Bernardsville, N.J.

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NEWS SHORTS

Slow growth for CA

Computer Associates International, Inc. announced single-digit revenue and net income growth last week for its 1991 fiscal year ended March 31. Revenue for the year was $1.348 billion, an increase of 4% compared with the previous year. Net income for fiscal 1991 was $159.295 million — 86 cents per share — vs. the year-earlier figure of $157.751 million, or 85 cents per share. Meanwhile, Novell, Inc. continued its skyward financial movement during its second fiscal quarter with a 25% jump in net revenue and an 87% increase in net income. Net revenue hit $150.2 million, compared with $120 million for the second quarter last year. Profits rose from $20.5 million last year to $38 million.

Setback for electronic shopping

Prodigy Services Co. said it would shelve its electronic grocery shopping service. The White Plains, N.Y., company, a joint venture of IBM and Sears, Roebuck and Co., recently cited insufficient customer demand in deciding to cancel the 3-year-old service, which allowed Prodigy users to order goods through participating local supermarket chains.

Federal PC buy goes to Sysorex

The U.S. Department of the Treasury awarded a contract worth up to $400 million to Sysorex Information Systems, Inc. in Falls Church, Va., for as many as 65,000 desktop and laptop computers, peripherals, 5,000 local-area networks, applications software and support services. The contract, called Departmental Microcomputer Acquisition Contract, provides a common procurement mechanism for the department.

Sony offers $699 multimedia set

Sony Corporation of America hit the consumer market last week with a personal computer-based multimedia package priced at just $699. The system, aimed at the home and school markets, includes a Sony compact disc/read-only memory optical disc player and six information, learning and entertainment programs. The Laser Library is designed to run on IBM Personal Computer XTs, ATs and compatibles.

Air isn't free — but it is cheaper

To fuel the fledgling wireless LAN market, Motorola, Inc.'s Radio-Telephone Systems Group last week dropped the price of its Altair wireless LAN module from $3,495 to $995.

On-Line updates Ramis

On-Line Software, Inc. of Fort Lee, N.J., has announced the immediate availability of Ramis Information Release 7.2, the company's end-user information management system. The latest version reportedly includes a SQL Window, enhancements to the MVS/CICS and File Expert interface and enhanced MVS/XA/ESA support. The product is priced from $25,000 to $170,000 depending on operating environment and CPU size.

Export rules eased

The U.S. and its allies relaxed controls on the export of computers and telecommunications equipment to the Soviet Union and Eastern Europe, but trade industry officials expressed disappointment that the relaxation did not go further. Intel Corp. 1486/33-MHz computers, Digital Equipment Corp. VAX 6410 minis and similar machines may go without an export license. Fiber-optic telecommunications equipment was not approved for export to the Soviet Union as it had requested.

Lowe moves on

William Lowe, a key player in IBM's successful effort to dominate the PC hardware market, has left Xerox Corp. to become president and chief operating officer of Gulfstream Aerospace Corp. in Savannah, Ga. He left IBM in 1988 to join Xerox as an executive vice president of manufacturing and development.

Covia unit spreads its wings

Newly formed subsidiary taking in-house technology onto open market

BY ELISABETH HORWITT
CW STAFF

ENGLEWOOD, Colo. — Covia Corp. is putting some of its internally developed technology platforms and services on the open market through a recently formed subsidiary, Covia Technologies.

Mark Teflian, formerly chief information officer at the parent company, is president of the new unit. Teflian said the strategic move to commercialize Covia's technology was established by Allan Loren soon after Loren became Covia's chief executive officer last January.

"We were starting to leverage value in Covia but not focusing on the underpinnings needed to be successful in the market," Teflian said.

Covia's co-owners are UAL Corp., USAir and Air Canada in North America; and Swissair, British Airways, Alitalia Airlines and KLM Royal Dutch Airlines in Europe.

A few quick sales by Covia Technologies would provide the firm's co-owners with a much-needed infusion of cash, according to Paul Nisbet, a senior airlines analyst at Prudential Securities, Inc. Airlines worldwide are still recovering from the effects of the Persian Gulf war, but this is a time when they face "all sorts of opportunities to expand and to take over route structures" from their failed competitors, Nisbet said.



Teflian said *Covia wasn't focusing on the underpinnings' needed for market success*

Covia Technologies' flagship product is a software platform called Communications Integrator, which was originally developed for United Airlines. The platform is said to facilitate the development of distributed applications across disparate systems without the need to rewrite a program for each new operating system or communications environment. The platform was designed to support on-line transaction processing environments such as airline reservation systems, Teflian said.

Signed, sealed, delivered

The subsidiary signed its first contract on May 1, selling the Communications Integrator to European airline reservations and information systems subsidiary Galileo International Ltd.

The subsidiary also plans to leverage Covia Corp.'s artificial intelligence expertise and applications, which include expert systems to manage airport gate assignments and flight rescheduling and seating changes, Teflian said.

High on Teflian's priority list right now is establishing partnerships with companies that can expand his company's distribution channels. Last April, Tandem Computers, Inc. and Stratus Computer, Inc. agreed to port the system to their platforms.

Ingres users confident of Ask support overall

BY JEAN S. BOZMAN
CW STAFF

SAN JOSE, Calif. — An air of confidence surrounded longtime users of the Ingres database management system when they gathered for their first national meeting since Ask Computer Systems, Inc. acquired Ingres Corp. last year.

The longtime Ingres users seemed pleased with what they heard as Ask executives outlined their plans for the product line. "This is a very optimistic group [of executives]," said North American Ingres Users Association (NAIUA) President Rick Angelini. "The last set of managers was very defensive. It seemed like they were always on the run from competitors like Oracle [Corp.]."

Angelini said Ingres Corp., founded in 1980 as Relational Technology, Inc. by University of California at Berkeley professors, was known in recent years for leading-edge technology and trailing-edge marketing.

"The business tenor is much more upbeat," said Becky Stokes, a Salt Lake City systems analyst who was NAIUA's president last year. "I have a great sense of confidence in this new group of executives and their ability to market the Ingres products."

A few concerns about Ingres product direction did surface, however. Some were sparked by Eric Carlson, Ask's executive vice president, who said several yet-to-be-named products would be terminated through a "sunset" program.

Good news

However, users applauded Carlson when he promised to extend the life of Ingres Release 5.0 by "maintaining it into the indefinite future," noting that many Ingres users have not yet converted to the Ingres 6.3 relational database management system.

Carlson said the Ingres Windows/4GL graphically oriented applications generator would soon support both the Microsoft Corp. Windows 3.0 and the Apple Computer, Inc. Macintosh user interfaces. The next-generation Ingres 6.4 RDBMS — which will embed business rules and triggers inside the database engine — will go into a beta-test program this summer, he said, followed by shipments some time in early 1992.

> "I HAVE A great sense of confidence in this new group of executives and their ability to market the Ingres products."
>
> BECKY STOKES
> FORMER NAIUA PRESIDENT

The presentations by Ask officials were remarkably free of references to Ask products — except for the keynote speech by Ask Chief Executive Officer Sandra Kurtzig.

Kurtzig firmly denied what she called "rumors" that Ask's traditional emphasis on manufacturing would stunt the development of other types of Ingres applications programs. A set of financial systems, the first of the Advance generation of Ask products to be built on top of the Ingres database and the Unix operating system, is set to debut in 1992. Kurtzig noted that 60% of Ingres users are not in the manufacturing sector.

Gladiator enters the ring

Unisys clusters 2200-series CPUs for transaction processing

BY SALLY CUSACK
CW STAFF

BLUE BELL, Pa. — Positioning itself to meet the future needs of a high-end user base, Unisys Corp. last week introduced a fault-tolerant mainframe clustering technology for transaction processing-intensive applications.

The preintegrated, multihost-based Gladiator series systems are based on multiple 2200/400 and 2200/600ES mainframe systems and offer performance of approximately 3,000 transactions per second, the company said.

Currently, the 2200 series can couple up to six processors on its 2200/400 model and up to four processors on the 2200/600ES system. At present, the company's other mainframe line, the A series, does not have the ability to cluster two separate processors.

Gladiator will be delivered in phases and will accommodate as many as 24 processors housed in up to four interconnected mainframe hosts.

These will synchronize multiprocessor and multihost access to individual records maintained in central databases, the company said. The product line also offers database recovery and sophisticated fault-tolerant performance capabilities.

David M. Card, director of systems research at International Data Corp., a Framingham, Mass.-based research firm, likened Gladiator to IBM's Sysplex, a computing strategy announced last September.

Card noted that while Gladiator's feature set is similar to that of Sysplex, overall the Unisys offering seemed "less complicated" than the IBM.

"It is good, solid technology," Card said, "but Unisys has to convince both the customer base and the sales forces they are competitive at the high end. They need a big hit."

Unisys is hoping to appeal to customers with high-volume, mission-critical online transaction processing applications such as airline reservations systems and financial institutions.

Current Unisys customers are realizing a built-up demand for fault-tolerant computing, said Thomas R. Murphy, president of Uae, Inc., a 650-plus-member Unisys user group. Murphy added that while users may not rush out to buy into Gladiator tomorrow, they do realize it is a technology they will need in the not-too-distant future.

"We are not talking any more than a couple hundred target customers for this product," said Jim Cassel, vice president of large computer strategies and services at Gartner Group, Inc. "It is good news for the 2200 customer, as the company has prepackaged all the coupling software for the user. This will make installation relatively easy."

According to Max Feuer, program manager for the product, the systems will operate with existing customer systems software including fourth-generation languages such as Unisys Link and Mapper. The product also offers the Unisys Record Lock Processor technology and a specially packaged version of the current OS1100 multihost operating system.

Unisys Gladiator series Release 1, which will be available in the fourth quarter, consists of five 2200/400-based systems and ranges in price from $2.95 million for a two-host configuration to $11.09 million for a four-host configuration.

The Gladiator series Release 2 is scheduled for delivery in the first quarter of 1992 and will consist of four 2200/600ES systems ranging in price from $9.59 million to $50.71 million.

Judge to rule on Windows 3.0 tiff

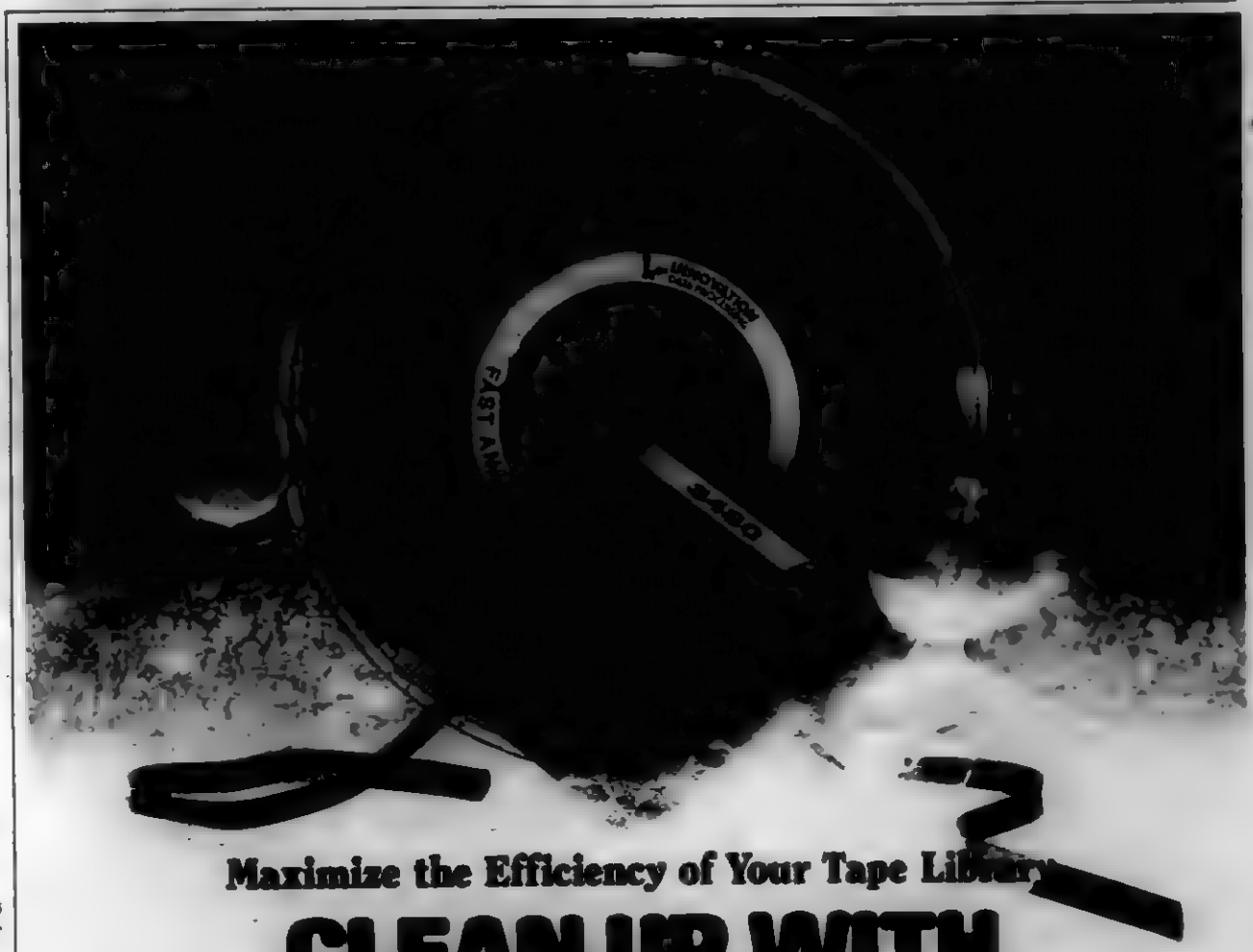
SAN FRANCISCO — A federal judge is expected to rule next month on whether Apple Computer, Inc. can expand the scope of its copyright lawsuit against Microsoft Corp. and Hewlett-Packard Co.

At a status hearing last week, U.S. District Judge Vaughan Walker scheduled a hearing for June 14, at which he is expected to consider Apple's motion to include Microsoft's best-selling Windows 3.0 interface in a broadened version of the suit.

Apple sued Microsoft and HP in March 1988, charging that the overlapping windows and icon manipulation screen features in Windows 2.03 and HP's New Wave violate Apple copyrights. Apple's original charges have since been winnowed to include just 10 of nearly 200 points of alleged infringement.

Attorneys from Microsoft and HP said Apple's proposed addendum is an attempt to restyle rather than amend the charges. "It's as if we were on the five-yard line heading for the goal, and now Apple wants to play lacrosse instead of football," Microsoft attorney David McDonald said.

Apple maintained that Windows 3.0 is fair game. "The lawsuit was brought against Windows 2.03 and all derivative works, and we've always believed that Windows 3.0 was a derivative work," Apple spokesman Christopher Escher said.



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Future

FROM PAGE 1

turning their backs on AD/Cycle.

Given these and other issues, two scenarios for IBM's future are emerging. One says IBM will deliver on its grand architectural strategies (see chart at right), continue working with third parties and standards bodies to build consensus and transition to a role of systems integrator.

A bleaker picture shows IBM losing market share and becoming just another big company.

To keep that from happening, IBM is focusing on three areas:

- Delivering Systems Application Architecture (SAA), AD/Cycle, Systemview and other pieces of its architectures.
- Partnering with third-party vendors to offer software and services IBM does not provide.
- Beefing up its high-margin integration and services component.

IBM broke with tradition last month when it hired an outsider — Bob Howe from Booz, Allen & Hamilton, Inc. — to head up its Consulting Practices and Operations Group.

IBM's overall software strategy is "focusing on delivering solutions — things that are complete in their framework and their building blocks," and which are provided by both IBM and third parties, said Steve Mills, assistant general manager of finance and strategy in IBM's Programming Systems line of business.

For the immediate future, analysts said, IBM's primary objective is to continue its strategy of controlling accounts by selling grand plans such as Officevision and Systemview and integrating third-party software.

There are several challenges there. Grand plans are difficult to execute in a fast-changing industry, and IBM has had to scramble to adapt to such changes as the rise of open systems.

Also, customers are not necessarily buying into the strategies. Some, like Terry Louder, vice president of technology research at Banc One Services Corp., will consider only software that is compliant with IBM's Common User Access interface. "We have SAA on our list of requirements," Louder said.

However, David Evans, vice president and director of information systems at J. C. Penney in Dallas, said, "We're not doing anything with AD/Cycle, and I don't need to. They've been talking about it for years, but they've been long on talk and short on delivery." J. C. Penney bypassed AD/Cycle for Texas Instruments, Inc.'s Information Engineering Facility.

Nor is everyone convinced that IBM can pull off these grand strategies. "I certainly applaud their efforts in the whole SAA and AD/Cycle arena," said Jim Stuber, a vice president at Mellon Bank Corp. in Pittsburgh. But "I think they still don't understand what software development is all about, so I am concerned about the delivery."

Misleading beliefs

IBMers said the perception that the company has failed to deliver what it promised is unfair. "If you track all the way back to the interfaces announced in 1987, those have been met," Earl Wheeler, IBM's general manager for Programming Systems, said in an interview in February. But he said the standard has changed and expanded since then.

Wheeler said IBM will deliver products within two to three years after architectures are announced.

At the same time, IBM is increasingly leaning on third parties to fill in product gaps (see chart this page).

Equity investments in some of the independents directly benefit IBM financially and encourage third parties to port software to IBM platforms.

No automatic advantage

Customers said they welcome the partnerships but noted that they do not necessarily give IBM business partners an advantage.

"A relationship with IBM certainly helps a software vendor get in the door," said Lawrence Bacon, senior vice president at Travelers Insurance Cos. "But in no way do we exclude vendors that are not IBM partners."

There are other challenges for the company to overcome: IBM must do a better job of providing software for the desktop, particularly that which links to the mainframe (see story page 12). This is "a critical strategic thrust that we're on, and we believe we're making progress," Mills said. It must also change its culture to reflect a software orientation.

Within reach

IBM should be able to meet its goal of growing software and services revenue at the same rate as the industry in general, according to most analysts.

Although IBM refuses to disclose specific revenue goals, Clifford Friedman, an analyst at Bear Stearns & Co. in New York, said the firm has set its sights on having software and services account for 45% of total revenue by the mid-'90s. "They can do it," Friedman said. In 1990, software and services made up 31% of IBM's total revenue.

Computerworld estimated that some 80% of the 1990 total was derived from systems software on all platforms.

Rick Martin, an analyst at Prudential Securities, Inc. in New York, said IBM should be able to continue to increase its software business at least 15% per year, despite its low profile in the personal computer market.

IBM raises high-end software prices 7% or 8% per year, he said, and the rest will come from the mainframe software market's general expansion.

Grand plans

IBM has recently hatched several major strategies to bring varied products under a common umbrella

Systems Application Architecture (SAA)

Introduced in 1987 as a way to unite IBM's many product lines, it is now the basic structure on which all other strategic initiatives are built.

AD/Cycle

The IBM applications development initiative released in 1989. The first to tightly tie in third-party products, it provides management, tools and procedures for creating software

Systemview

Announced in 1990, it uses the same framework approach as AD/Cycle but addresses systems management issues ranging from network management to capacity planning

Officevision

This troubled office automation plan was positioned as the first big SAA application at its 1988 announcement but has been plagued by delays. Analysts think Officevision will undergo a transformation and become more of a framework, like its big brother, AD/Cycle

Data Warehouse

The unofficial name for a soon-to-be-announced architecture that will address corporatewide data access

CW Chart: Janell Genovese

Stake, well done

Since 1988, IBM has invested about $600 million in 42 software companies worldwide, backing firms that fill IBM product gaps

SELECTED EQUITY INVESTMENTS

Company	Product or service	Original investment
American Management Systems, Inc.	Industry-specific services and applications	$18M
Bachman Information Systems, Inc.	CASE, re-engineering	Not available
Computer Task Group, Inc.	Software and services	$21M
Easel Corp.	CASE, graphical user interfaces	$15M
Hogan Systems, Inc.	Banking applications	5% of company's stock
I/NET, Inc.	Imaging systems	$4M
Image Business Systems Corp.	Imaging systems	$6M
Index Technology Corp.	CASE	$2.5M
Metaphor Computer Systems, Inc.	Decision support systems	$10M
Policy Management Systems Corp.	Insurance applications	$116.5M

Source: Broadview Associates

CW Chart: Doreen St. John

From systems to solutions

Software buyers and makers were alarmed when IBM unveiled its Application Systems Division (ASD) in July 1987. Smaller firms feared stiff competition from a new group devoted to creating and selling homegrown and third-party applications. Users envisioned shrunken options as IBM took over the applications software market.

Four years later, the division has not justified the initial uproar, according to Marty Ressinger, technology analyst at Duff & Phelps Investment Research Co. in Chicago.

Renamed Applications Solutions Division in 1990, Milford, Conn.-based ASD today looks like a new animal. Although ASD was out front with Systems Application Architecture (SAA) marketing responsibility, that was later moved to another division.

Five months ago, ASD lost Officevision, IBM's office systems environment and first user-oriented SAA-compatible product. ASD head Anne-Lee Verville declined to comment on the shift, but analysts said IBM made the switch to spur Officevision development, which has been late from the start.

ASD now develops internally and installs at customer sites cross-industry technologies, including scientific and technical computing, imaging and electronic data interchange. Verville would not name a figure but said "some of {these} applications are major contributors" to IBM's bottom line.

Analysts are not so sure. The division is probably less important to IBM right now than it might be down the road, Ressinger said, because it handles technologies that are not yet entrenched in mainstream computing.

Even as ASD has slimmed down and rearranged itself, however, a parent organization with other software responsibilities has grown up around it. Formed in 1988 when ASD changed its name, the Applications Solutions line of business oversees two of IBM's most strategic areas: industry-specific software and professional services.

Increasingly, according to Steve Mills, assistant general manager of finance and planning in Programming Systems, IBM will combine basic software building blocks such as AD/Cycle and Officevision with professional services and industry-specific software.

But this task will not be easy. "[Applications Solutions unit head Bernard] Puckett's got the toughest job in IBM," said analyst Bob Djurdjevic, president of Annex Research in Phoenix. "He's got to reposition the company from a stovepipe mentality of products to one that crosses industry and geographic boundaries." The Applications Solutions unit, with about 30,000 employees worldwide, including those in ASD, is responsible for much of IBM's nonsystems software, including personal computer software.

Applications Solutions' industry groups develop and acquire niche software in vertical market sectors. Its transportation group, for example, teamed up with US Air to develop the Airline Application Development System.

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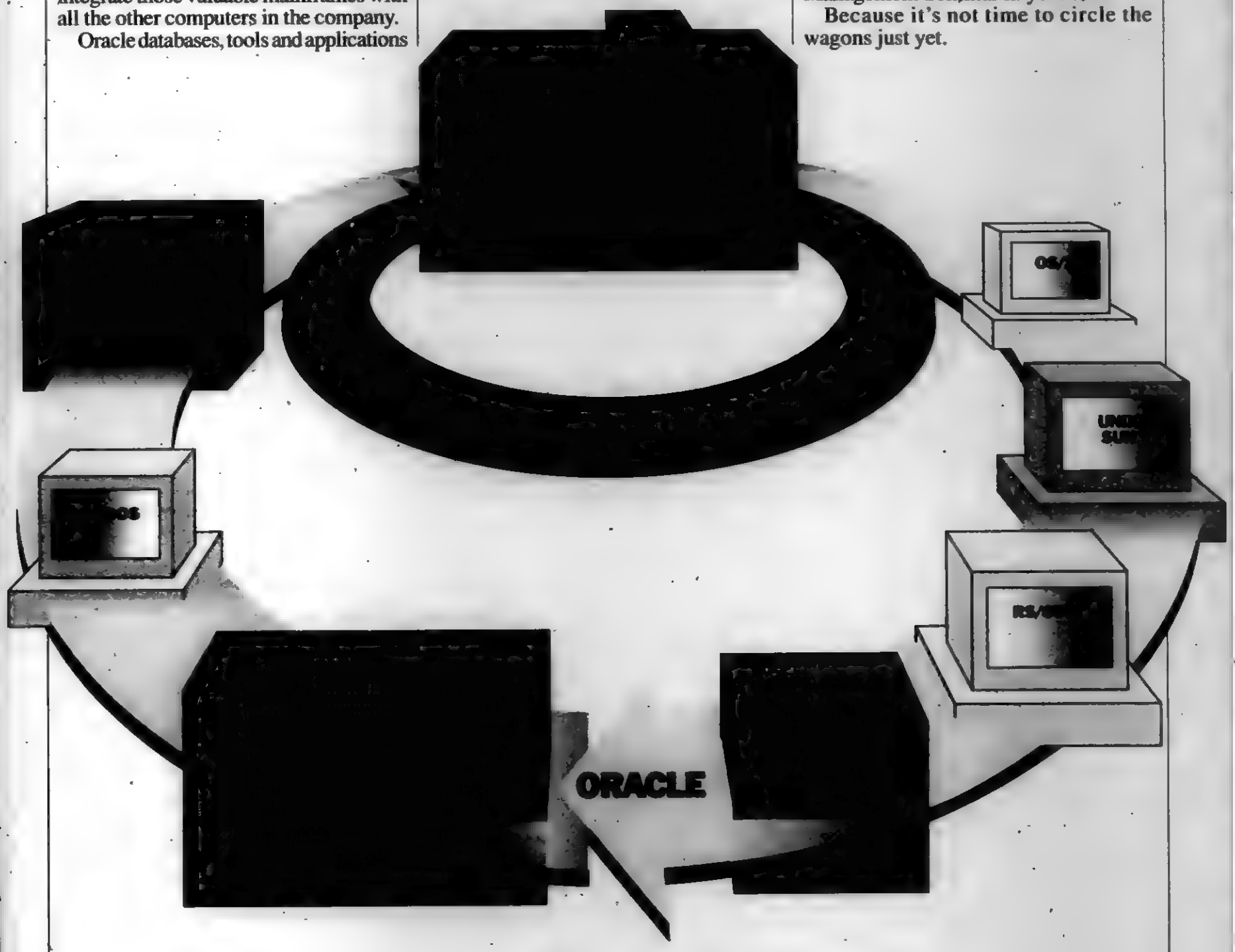
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IBM vows commitment to Displaywrite

BY CAROL HILDEBRAND
CW STAFF

WHITE PLAINS, N.Y. — With the announcement of enhancements to Displaywrite, IBM reiterated last week that its workhorse word processing package has a long way to go before it heads for the glue factory.

Reports that the package was going to be replaced by Signature, a graphical word processing family that is being developed by IBM and Xyquest, Inc. [CW, March 11], "aren't really true," said Frank Patrini, development manager for Displaywrite. "Signature is going to be concurrent to Displaywrite. We have many Displaywrite customers out there, and we are going to support them," he added.

Displaywrite 5 Modification 3 features several functions that are aimed at increasing ease of use, such as enhanced printer and laptop support, as well as a reduction in the amount of random-access memory necessary to install the package, Patrini said.

"Obviously, the focus at IBM is off of Displaywrite," said Mary Conti Loffredo, an analyst at Framingham, Mass.-based research firm International Data Corp. "But they are remaining true to their promise that they will not abandon their Displaywrite people."

Best migration path

Tom Fornoff, manager of editor marketing at IBM's Desktop Software business unit, said when Signature is fully developed, it will be the best migration path to graphical word processing. "We think that when the product comes out, a lot of them will [migrate]."

Analysts agreed that Displaywrite will not be given an unceremonious dumping. "Signature is clearly the desktop direction, but I believe that they'll incent the users into moving" rather than withdrawing support for Displaywrite, said Mike Anderson, an analyst at Gartner Group, Inc. in Stamford, Conn.

Still, some users are not waiting around for Signature to arrive.

Todd Sherman, data processing manager at Laerdal Medical Corp. in Armonk, N.Y., said he is currently looking at other packages, notably Ami Professional, which was developed by Samna Corp. and is now marketed by Lotus Development Corp.

"Signature? I don't know. I'm contemplating other standards right now, so I don't know where I'll be by the time they announce all that," Sherman said.

Realia COBOL tops the Computerworld Buyers' Scorecard for just a few reasons:

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Michael L. Sullivan-Trainor, Senior Editor, Computerworld, in the March 25, 1991 issue

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Prime unveils image product

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — Prime Computer, Inc. last week dipped its toe into the image processing market, announcing an imaging product for customers using Prime 50 series minicomputers for commercial business applications.

Called Image Way, the software is integrated with Prime Information, Prime's Pick-like database software system.

A typical configuration is a Prime 50 series computer, a Prime EXL Unix-based system for server functions, an Intel Corp. 80386-based personal computer, a scanner, write-once read-many (WORM) optical storage technology, an optical character recognition station and a fax machine.

Daisy-chained jukeboxes

According to Peter DiToro, senior product marketing manager, the 12-in. WORM technology will offer 6.5G bytes per platter, with a maximum of 50 platters per jukebox. As many as seven jukeboxes may be daisy chained together on the system.

"This allows Prime to leverage their existing applications while automating new ones," said Scott McCready, director of the image management technology program at IDC/Avante Technology, Inc., a Framingham, Mass.-based research and consulting firm.

McCready noted that the vendor was prudent in not trying to be "everything to everyone" in the imaging arena.

The installed base of Prime Information users is estimated at 6,000 worldwide, and Image Way is targeting the top two-thirds of that number.

The software was developed under an OEM agreement with Plexus Software, Inc.

The system has been installed at the U.S. Department of State and the state of Colorado, and it will go into production mode at the University of Southern California at Los Angeles on June 1.

Pricing for an entry-level system begins at $170,000. A complete system configuration can range in price from $600,000 to $1 million, depending on storage options and number of seats.

Image Way is slated to be available for general shipment within six weeks.

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DB2 not making PC leap

BY ROSEMARY HAMILTON
CW STAFF

SAN FRANCISCO — Distributed database may have been the theme of this year's International DB2 User Group (IDUG) conference held here last week, but users are still taking the slow road to IBM's version of this environment.

IBM is mapping out an enterprisewide strategy using its Distributed Relational Database Architecture, and some distributed features have been available for the mainframe relational database system since late 1989. Yet many users are still in the planning stage for distributed DB2, and several users seem more interested in connecting DB2 to the desktop. Because IBM has not yet announced this function, users are making do with basic downloading techniques to bring DB2 data to the low-end systems.

In general, users seem satisfied with IBM's delivery of mainframe distributed functions, which have trickled out since the late 1980s. However, some users also said they would like to finally be given a shipment date for the OS/2 Extended Edition link to DB2.

This would provide direct access to DB2 from the Database Manager under OS/2.

"I'm really disappointed about OS/2," said Kenneth Paris, a consultant at Forecross Corp. here and president-elect of IDUG. "That would start to solve problems, like users not having to keep retrieving data from the mainframe."

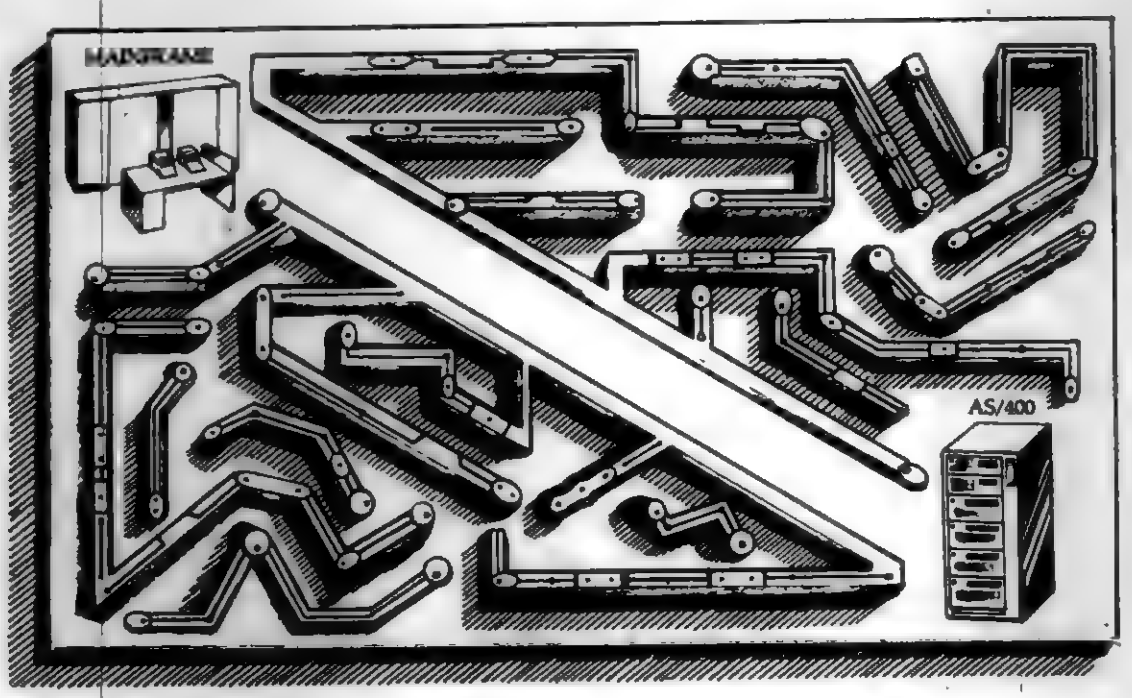
In response, an IBM spokesman last week confirmed the company is still on schedule to make an OS/2-to-DB2 announcement by year's end.

In the meantime, some users are looking for other solutions or are simply downloading information to use DB2 data on the desktop.

Paul Dufford, a database administrator at Baldor Electric Co. in Fort Smith, Ark., said the company's accounting department has been downloading DB2 data to a network of Personal System/2s. "They use just OS/2, DB2 and [IBM's] Query Management Facility," he said.

Ronald Schinker, a database administrator at Kimberly-Clark Corp. in Neenah, Wis., said his department is currently looking for a tool to help download point-of-sale data from DB2 to perform what-if analysis on PS/2s.

Since the late 1980s, IBM has provided distributed functions for SQL/DS and DB2 databases to communicate in a like-to-like environment. Late last year, IBM said it would announce an availability date for a DB2-to-SQL/DS link in late 1991. At that time, it indicated it would make an OS/2-to-DB2 announcement in that time frame as well.



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IBM sketches future plans

IBM last week provided a peek into DB2's future to approximately 1,600 International DB2 User Group attendees by sketching out key investment areas and plans for the next five years.

In a keynote address, Don Haderle, an IBM fellow and DB2 architect, said IBM will invest most of its DB2 development dollars into the five areas that users have indicated are high priorities. Haderle offered the following breakdown of investment dollars: performance, 25% to 30%; availability, 25%; distribution, 10% to 12%; application functions, 10% to 12%; and systems integration, 8%.

A key area of performance is DB2's transactions-per-second-rate, which the company has beefed up with each release. While DB2 was measured at 30 trans./sec. in 1984, Haderle said IBM is projecting that DB2 will run at 570 trans./sec. on a top-of-the-line Enterprise System/9000 Model 900 in 1991.

For improved data availability, from a data and applications view as well as a systems view, IBM is "committed to record-level locking," Haderle said. "We are doing that with OS/2 Extended Edition, and we are hoping to roll this into DB2."

Just in case . . .

For planned outages, IBM is focusing on partitioning technology that would allow users to take down portions of the database for maintenance while the remaining portion remains on-line. For unplanned outages, IBM has a project under way that would allow users to maintain a current, or "hot," version of the database off-site.

Haderle said users can expect the overall cost of running DB2 to fall as IBM moves to more of a processor complex environment. However, Haderle suggested that the complex will be made up of microprocessor-based systems.

"In order to get a different price/performance platform, we have to get on microprocessor technology," he said. "The energy will be on getting us to a different platform, a 370 instruction set, which is lower in price," Haderle continued. "It will reduce the cost by moving to a different configuration of the 370 architecture. If we look to the mid-1990s, there is the capacity for 600 MIPS to 6,000 MIPS under one cover."

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Calling

FROM PAGE 1

resolution of certain regulatory and technical obstacles to widespread deployment of local call identification services, according to Steve Sazegari, an analyst at Dataquest, Inc.

Once this happens, ANI installations will grow at a rate of 30% to 40% per year, the San Jose, Calif., research firm predicted.



The ANI services offered today by long-distance carriers deliver the general business number of each incoming call. A growing roster of corporations reported that they have realized significant boosts in service agent productivity and customer satisfaction by matching that number with a customer's account file and delivering key information to the agent's desk.

American Express Travel Related Services, one of the earliest users of AT&T's Info 2 ANI service, reported a 16% decrease in the average length of customer service calls in a pilot test. Bausch & Lomb has boosted customer satisfaction by recording the telephone number of customers who hang up before they reach an operator, so they can be called later.

However, not all individuals welcome the idea that a simple complaint or information call can put their telephone number in the hands of a business — particularly because those numbers can then be used in future telemarketing efforts.

Long-distance ANI services have avoided regulatory challenges partly because they do not fall under one Public Utility Commission's (PUC) jurisdiction and partly because they are offered in conjunction with 800 numbers — business services offered free to the caller.

However, the majority of recent local carriers' tariff proposals for caller ID — the local carriers' version of ANI — have run up against PUCs' caller privacy concerns (see story at right), discouraging potential users.

Mellon Bank Corp., for example, is still waiting for Pennsylvania courts to decide whether call ID is unconstitutional. The bank recently tried to implement AT&T's Info 2 ANI service, only to be told by Bell of Pennsylvania that the carrier was "legally prohibited" from delivering such a service, said Wayne Clifton, Mellon's telecommunications vice president.

"ANI is typically outside of PUCs' jurisdiction if AT&T passes it directly to your [private branch exchange] switch, but AT&T has to pass ANI through Bell of Pennsylvania's switch to our Centrex service," Clifton said.

Mellon also wants both local and long-distance call ID services, Clifton said. "Doing half a system seemed awkward." Therefore, the bank is holding off on call ID plans and is watching legal developments.

More requirements

Even with regulatory approval, many local carriers still have not deployed the ISDN and Signaling System 7 technology they need to provide business-oriented call ID services. Local carriers need Signaling System 7 to pass call ID information among their own central offices and to long-distance carriers.

While ISDN is not a prerequisite for call ID services, carrier spokesmen agreed that large call centers with a lot of incoming traffic can suffer from a slowdown in handling calls without ISDN's out-of-band signaling to carry the call ID data. For companies that are using call ID to improve customer service, this is obviously unacceptable.

Making the call on call ID

Caller identification debates are being initiated by a growing number of state PUCs. Proposals for local call ID services in Florida, Oregon and New York, among other states, have been put on hold at least temporarily while the commissions and local carriers debate how such services will be provided.

The most likely outcome for most of these debates is that the PUC will permit caller ID, with the proviso that local carriers provide users with the option of blocking the information from being sent, according to Henry Levine, a partner at the Washington D.C., law firm Morrison & Foerster.

Blocking potentially limits the number of incoming calls that have the ID information.

"It could kill the whole thing," said Thomas Calabrese, assistant director at The Travelers Corp.'s telecommunications division. "Too many states turning this thing off would hold back a good technology that would help us and our clients."

However, the likelihood that some percentage of calls will be blocked should not worry businesses unduly, Levine said. "You can cost-justify the service as soon as you get a reasonable yield" of call IDs coming through, he added.

Call ID advocates are hoping that regulatory bodies will keep their hands off business services on the grounds that mutual identification is an assumed basis for business dealings. So far, no one has challenged the right of long-distance carriers to offer ANI over business 800 numbers.

ELISABETH HORWITT

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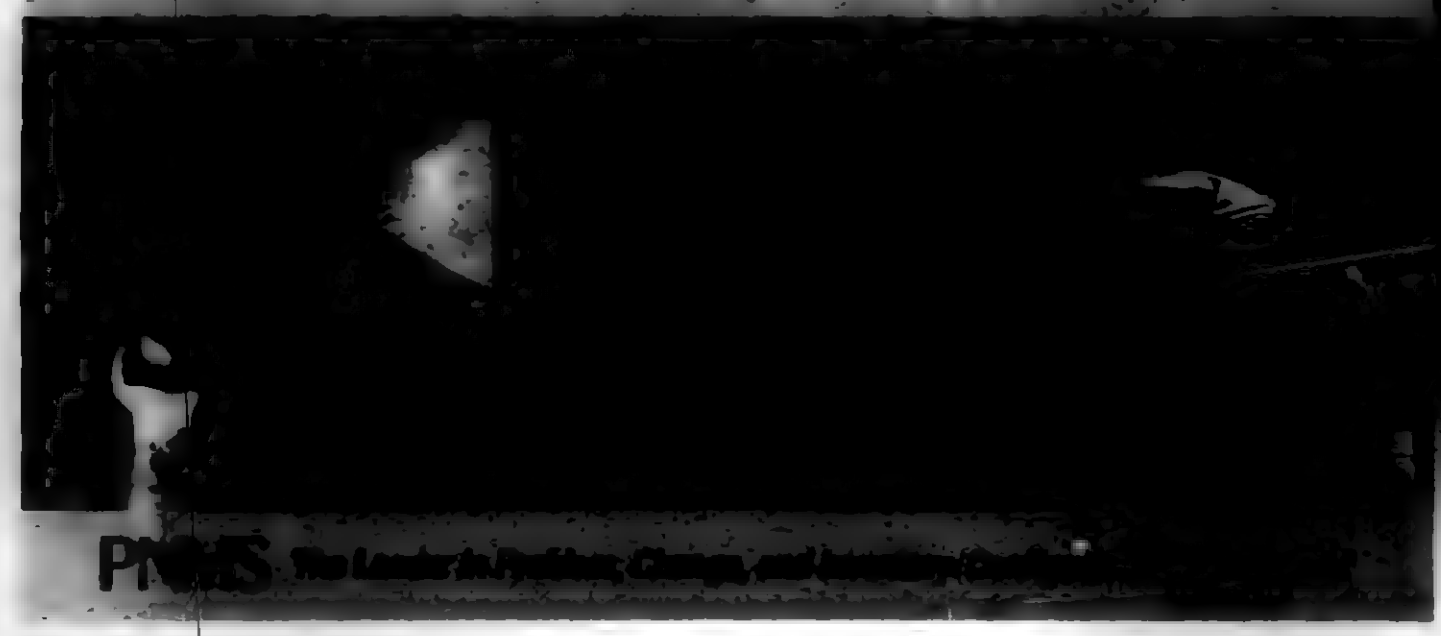
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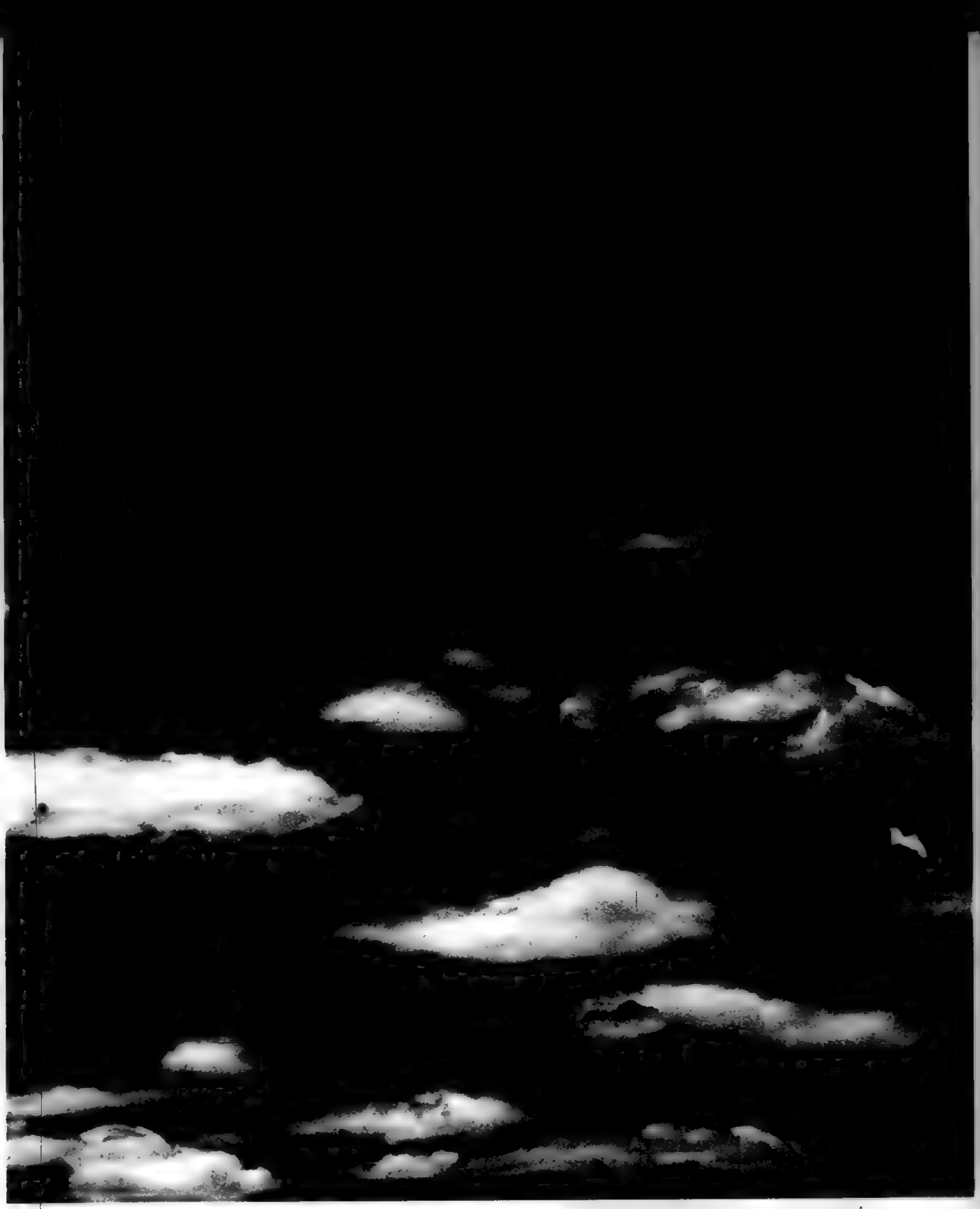
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TECH TALK

Cashing in on crystals

■ A new experimental technique devised by scientists at Bell Communications Research, Inc. has resulted in a practical way to monitor and control the growth of compound semiconductor crystal alloys and structures. The finding has allowed Bellcore researchers to produce aluminum gallium arsenide crystals that are compositionally 10 times more precise than any yet reported. Controlled crystal growth significantly increases a manufacturer's ability to mass-produce compound semiconductor devices at lower cost.

Multimaterial microchip

■ Researchers at Texas Instruments, Inc. have developed and demonstrated an optoelectronic integrated circuit that is reportedly the most advanced multimaterial chip of its type. TI's device is the first to combine silicon complementary metal oxide semiconductor logic circuitry with an array of eight gallium arsenide infrared light-emitting diodes. The device has potential use in optical computing devices, in which light and glass fibers replace the electrons and copper wire that now interconnect chips. One optical interconnect could replace as many as 32 of the pins that conventional chips use to transmit and receive information.

Sorting barrier broken

■ Two computer theory scientists have developed an algorithm that debunks conventional wisdom that there is a limit to how fast a computer can sort. The algorithm, devised by Michael Fredman of the University of California at San Diego and Dan Willard of the State University of New York at Albany, could allow surprisingly fast sorting of huge databases. The scientists use a new method of organizing data that allows a computer to compare one number against many others during a single computational step. Conventional methods can compare only two numbers at a time.

Graphical face on supercomputing

Cornell's Theory Center builds icon-oriented environment for scientific computing

BY JAMES DALY
CW STAFF

Imagine maneuvering through the dense information thicket of a supercomputer with the ease of calling up applications on Apple Computer, Inc.'s Macintosh personal computer. Then consider the cheer that would arise if the supercomputer's arcane Unix commands were replaced with screen icons as easy to use as those found on Microsoft Corp.'s Windows 3.0 graphical interface.

Sound farfetched? The folks at Cornell University's Theory Center don't think so.

In the next few weeks, the center will begin shipping beta versions of the Scientist's Workbench, a graphical environment for scientific computing that swaps complex Unix command strings with the icon-laden screen appearance of many PCs.

By clearing away the chore of programming complex scientific problems, the Workbench promises to up productivity and enlarge the range of problems that can be attacked by the supercomputer. "We spend more time programming than anything else, and that's expected to get worse in the next few years as we get into more advanced architectures," said Charlie Bender, director of the Ohio Supercomputer Center in Columbus. "Anything that could cut these programming tasks would be very desirable."

Research scientist Tom Rounds began designing the Workbench in 1988 when he noticed that the center's scientists spent more time struggling with the operating system than they did on research. Writing the code to simulate complex scientific problems is one of the most challenging and time-consuming aspects of supercomputer research.



Christoph Adelmann

Rounds wanted a way to eliminate repetitive programming and allow his fellow scientists to concentrate on solving problems. The Workbench runs on a Unix system that supports the X Window System Transmission Control Protocol/Internet Protocol and the Open Software Foundation's Motif style guide, said senior manager Donna Bergmark, who is now in charge of Workbench development. At Cornell, the Workbench serves as an interface to a pair of IBM 3090s and several Hypercubes from Intel Corp.

Because researchers are often highly individualistic, the Workbench can be graphically customized to suit independent preferences, and it allows for both graphics and text-driven commands. The environment also incorporates support for distributed processing, allowing researchers to divide their computing problems into components that can be executed simultaneously.

The Workbench also clears away desk clutter. "In the past when you were accessing a wide variety of machines like supercomputers and workstations, you had to have several terminals on your desk," Bergmark said. "It's convenient to have a unified interface that connects them all."

Programming for the Workbench is simplified through a variety of support tools. To parallel the flow of ideas, the Workbench divides support tools into five categories: programming, applications, documentation, communications and utilities. Each of these categories appears as a submenu in the Workbench organizer, and each can contain whatever options and applications the user chooses.

GAO calls for 'smart highway' research

BY MITCH BETTS
CW STAFF

The professional skeptics at the U.S. General Accounting Office (GAO), the congressional watchdog agency known for its scathing attacks on wasteful federal spending, have discovered a technology program that needs more money, not less.

After a thorough study, the GAO recently called for an aggressive research and testing program on Intelligent Vehicle and Highway Systems (IVHS), popularly known as "smart highways." They use road sensors, traffic-management computers and in-car terminals to guide drivers around traffic snarls and keep the traffic flowing (CW, March 5, 1990).

What impressed the GAO auditors was preliminary evidence that computerized traffic management can sharply reduce traffic congestion, accidents, fuel consumption and pollution. For example, a modest system of computer-controlled traffic signals used in Los Angeles during the 1984 Olympics cut travel time by 13% and reduced vehicle stops by 35%.

Even more dramatic benefits are possible, in theory, from fully automated freeways that use computers to actually control dense packs of cars — maybe electric cars — at high speeds.

But the ever-cautious GAO stressed that a major research and testing program is needed through 1996 to reduce the uncertainties and verify the grand claims for IVHS, before launching a full-scale deployment that may cost $34 billion during the next 20 years.

That heavy-duty price tag and the need for technical compatibility standards for the system components are the major barriers to implementation of IVHS, the study concluded. There are also nagging questions about whether drivers will be distracted by in-vehicle devices and who is liable for any accidents on an automated highway.

Nevertheless, the generally positive GAO report is being used by Sen. Frank R. Lautenberg (D-N.J.), chairman of the subcommittee that handles transportation appropriations, in his campaign to increase funding for IVHS programs at the U.S. Department of Transportation.

Lautenberg's IVHS proposal would authorize $250 million per year for the next five years. Among the technologies the measure would fund are the following:

- Development of in-car terminals that could provide electronic maps and guidance to drivers.
- Real-time messages that alert drivers to tie-ups and provide alternate routes.
- Computer-synchronized traffic signals.
- Electronic toll collection to eliminate stopping at toll booths.

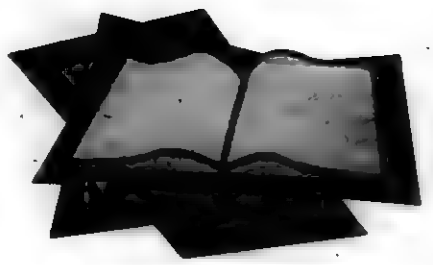
"IVHS technologies will help break up traffic jams, keep cars moving and reduce auto emissions. We need to make it an integral part of our transportation programs," Lautenberg said.

The White House Office of Science and Technology Policy, too, has endorsed IVHS as one of 22 critical technologies for U.S. economic competitiveness.

UNIX DATABASE

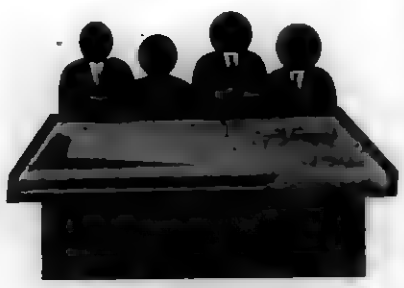
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IDC Study on UNIX OLTP

UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.



About the TPC

The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

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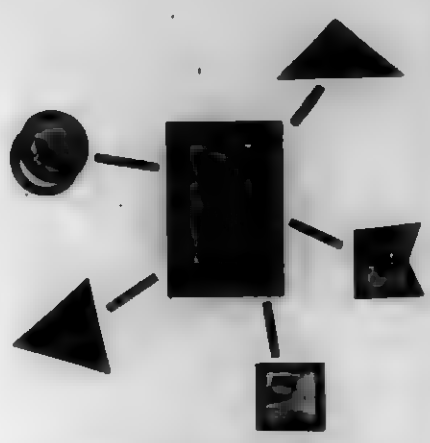
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TP1 vs. TPC Benchmarks

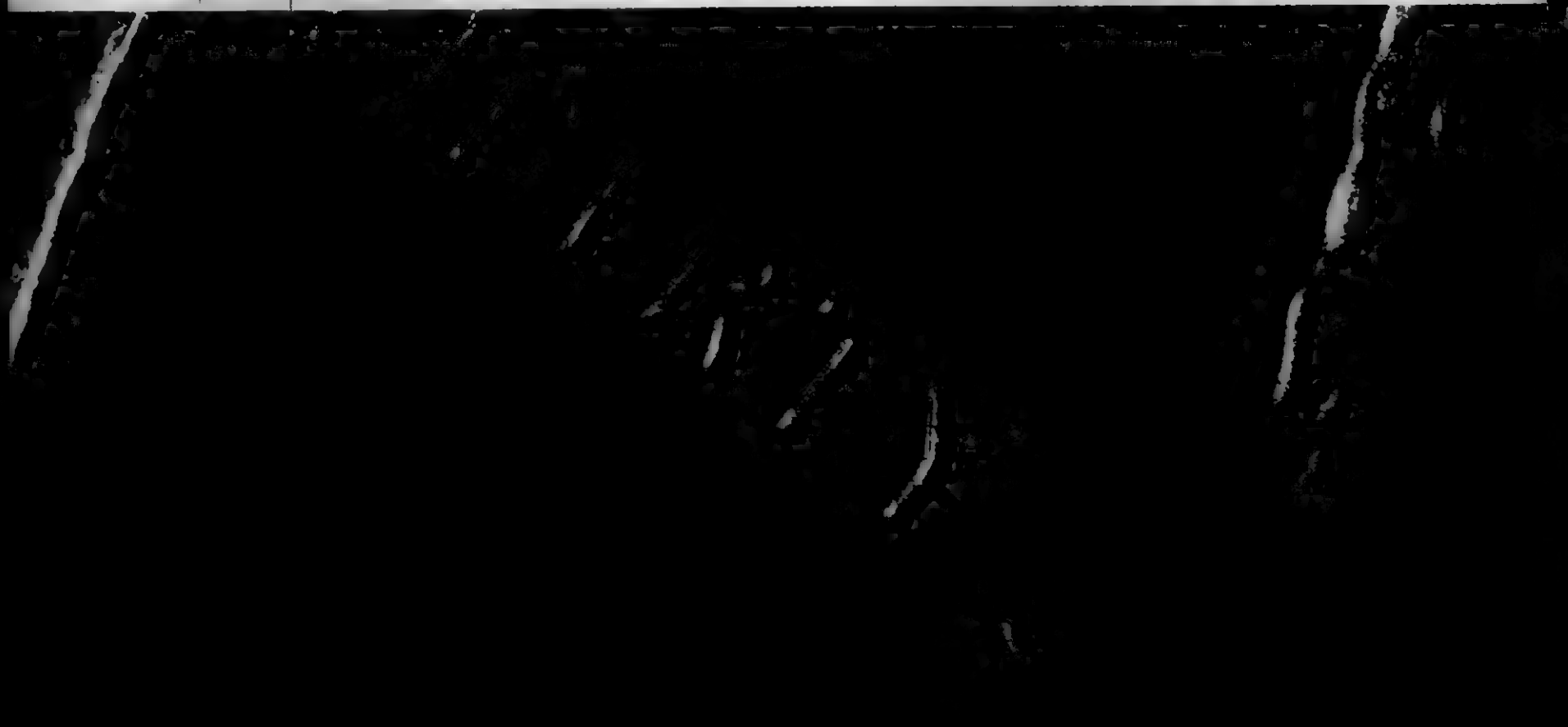
The TP1 benchmark is no longer the accepted benchmark for measuring database performance. The new TPC tests establish more complete, thorough specifications than TP1, leading to more objective, verifiable results for comparing performance between hardware systems and software products. TPC Benchmark™ A measures OLTP processing performance. TPC Benchmark™ B—similar to a batch test—focuses on database throughput.

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The cost crunch.



Budgets get cut. Deman

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EDITORIAL

IBM's test of time

It was an overflow crowd at Comdex last week that listened to the IS director of Borg-Warner tell his company's tale of switching from an IBM mainframe to a Microsoft Windows-based PC network.

According to Vincent Chrisman, his initial investment for the PC network was $72,000. That, he said, compared very favorably to the $300,000 his shop spent annually on its mainframe, most of that in software maintenance and support.

If there is a crux to IBM's software dilemma, this example pretty much states it. IBM derives about 70% of its software dollars from systems software revenue, most of that from large-systems licenses. With IS sites around the world trying to stem the growth of mainframes while porting applications to cheaper platforms and with the general trend toward a consolidation of data centers (meaning fewer software licenses), IBM's software cash cow just isn't producing like it once did.

That is the conclusion reached at the end of our three-part series in today's issue: While IBM's software future is unclear and few observers feel IBM's software strategy is in long-term jeopardy, time is not on IBM's side.

This analysis must be kept in perspective. With more than $10 billion in software revenue annually, IBM rakes in nearly six times the software dollars of the largest independent software maker, Microsoft. But that $10 billion represents only about 20% of IBM's total revenue, and that's nowhere near the revenue mix IBM had hoped to reach by the mid-1990s.

A linchpin in the company's software strategy should have been a carefully crafted articulation of the components of Systems Application Architecture and how strategies like AD/Cycle would unfold in the 1990s. But as the series points out, some big users formerly locked into IBM's account control mechanisms have pried themselves loose — partly because of impatience with the evolution of the strategy and partly because they didn't like what they saw.

Ultimately, too much of IBM's software strategy remains entwined in a world of proprietary hardware, which is not the direction the computing world is heading. Its movement into Unix and open systems in general, notwithstanding its recent workstation success, is proof of this.

There was a time one generation ago when IBM's standard was the de facto computing standard, as was the case with Systems Network Architecture.

Today's reality was best expressed by an IS director in the first installment of our series: "Five years ago when IBM did something, it froze a lot of people. Not anymore . . . they don't call the shots."

IBM will succeed in software in the 1990s only if the corporate culture can truly give up the ghost of casting itself primarily as a proprietary hardware company, around which everything else revolves. That's the biggest "if" for today's biggest software firm.



LETTERS TO THE EDITOR

The Pick search

Ms. Savage got a few of her facts right but inexplicably directed her summation to a conclusion that I find both mystifying and incorrect in "Pick market decision time" [CW, April 22].

How in the world can she conclude that there is "not much of a future market on which vendors can hang their profits and not much of a future applications growth path for users"? Unix applications are few and far between. Unix itself suffers from a serious lack of standards. Pick in itself is a standard.

Over the last few years, Pick Systems and most of the Pick licensees have ported their code to run co-residently with Unix. This gives users the best of both worlds. In Pick, you get an outstanding database management system along with a robust array of application packages. In Unix, you get a robust environment capable of supporting every bell and whistle users could want.

The bottom line is that these two apparently disparate environments complement each other nicely. Both systems tend to accommodate each other's inadequacies.

Having Pick means that your investment is protected. You can start with Pick on a little PC and move it to giant mainframes such as a Sequoia with virtually no modification to the code. Meanwhile, the 2.5 million daily users keep plugging on their Pick-based applications, chuckling under their breath at the ease with which [the programs] can be maintained while the rest of the world continues to search for the "standard."

Jonathan E. Sisk
JES+ Associates, Inc.
Irvine, Calif.

Solutions are key

The commentary on Pick [CW, April 22] displays a one-dimensional, narrow-minded view that is sadly prevalent in the computer industry. She seems incredulous that anyone would be silly enough to opt for business solutions that do not fit the mold of mainstream data processing — DOS, Unix, OS/2, MVS — even though they may be the best solutions available. Ms. Savage should reread her own column to find the answer to why users and vendors continue to turn to Pick for solutions. The key word is applications.

Ms. Savage is correct in asserting that not many college graduates are leaving with Pick experience. This is an even stronger testimonial to the abilities of the Pick DBMS to provide business solutions. While colleges are churning out Unix-trained computer scientists and engineers, it is Pick developers who are delivering proven solutions to the marketplace.

Systems vendors such as Data General, Hewlett-Packard, Prime, Sequent and others are recognizing that the wide array of Pick business solutions will attract new users to Unix. Unix, as the operating system, will run your computers. Pick, as the DBMS, will help you run your business.

Bill Leonard
Ridgewood, N.J.

Intangibles count

Melvin Niska's article, "Knowing too much but too little" [CW, April 22], points out some major problems in the information systems career field. As Mr. Niska illustrated, most companies want ready-trained employees whose resumes read like the prospective employer's software inventory, but little if any credit is given for motivation, intelligence, aptitude and desire.

I frequently see position vacancies languish six to 12 months waiting for the perfect candidate, who, when finally offered the job, either turns it down because they've done it before or accepts and then quits after a brief stay, only because things weren't going their way.

The real tragedy of all this is that Mr. Niska and many like him played ball by the rules during their careers and were rewarded with promotions, only to find that no one believes that they can perform technical duties again. So their ultimate reward becomes extended unemployment and pressure to leave a career field to which they have devoted much of their lives.

Employee loyalty can be built up even in these uncertain times if top management would accept the inherent intelligence of people like Mr. Niska and retrain them; I have seen it happen.

The "more mature" players, like Mr. Niska, will become more attractive, and they will either price themselves accordingly or move on to self-employment.

Edward J. Pospesil Jr.
Buxbaum/Pospesil, Inc.
Woodbridge, Conn.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

If you like pointless exercises . . .

You'll love the Commerce Department's proposed 'super' definition

GORDON BELL



The U.S. Department of Commerce's Bureau of Export Administration might want to rename itself either the Bureau of Export Assistance or the Bureau of Export Aggravation, just to let everyone know where it stands.

In November 1990, the bureau was asked by President Bush "to initiate international negotiations by Jan. 1, 1991, to establish a new supercomputer supplier regime." For some reason, the bureau has taken this request as a mandate to attempt a brand-new definition of "supercomputer," which potentially includes many more computers, such as workstations.

What the bureau is worried about is getting a new, single-value metric to measure supercomputer performance.

The current metric, processor data rate (PDR), is actually OK, if one is fixed on getting just *one* number that signifies the ability to do 64-bit arithmetic computation. A footnote is needed, however, that says that a machine actually has to be capable of delivering the PDR on a test program that the formula gives. On the other hand, the proposed new metric, composite theoretical performance (CTP), is a bureaucrat's delight and was probably cooked up by a former high-level Internal Revenue Service form and instruction designer who wanted to harass the computer industry.

In no instance could a machine ever deliver the measure that CTP implies, because it has no physical significance and concerns itself with theoretical or "thing" operations per second, a "thing" being an architecture constructed of computing elements designed by unidentified bureaucrats.

I won't go into the proposed CTP, except to say that logical, integer and floating-point operations per second (FLOPS) rates, word length and some random constants and I/O data rates all contribute a theoretical or "thing" operation to CTP. Since CTP bears no relationship to a computer or its performance on any program or work load, a real computer is rated pessimistically or optimistically at random.



Winston Amin

At least the old metric, PDR, almost equated to the manufacturers' peak or advertised speed. It also had the advantage of being able to be verified experimentally.

Adopting the CTP metric might assure full employment in Washington, D.C., but it would inevitably decrease trade competitiveness and industry productivity (unless we start measuring productivity by the fractional CTPs that a company can calculate and government servants can check each year). More time will be lost at even more firms that should be working on computers.

The bureau is concerned about computers in the 200 to 1,500 millions of "thing" operations per second (MTOPS) range, which is near that of powerful workstations and microprocessors. Further, using its method of computing, a "composite theoretical thing" that performs logical operations rapidly on 16-bit data can have the same power as a computer that does 64-bit floating-point arithmetic. What this means is that the bureau can draw more firms into its web.

This brings up yet another problem with trying to inhibit the export of traditional supercomputers — the harder we try, the more our economic and military competitors are encouraged to build their own supercomputers or supercomputer substitutes. This is easier for them to do now, since it is becoming increasingly true that "FLOPS is FLOPS" no matter if you buy them as a supercomputer with a few GFLOPS or as boxes of 50 to 100 MFLOPS parts, which fall below the CTP control line.

A new single-value metric just doesn't feel right to characterize all the situations one could envision a bureaucrat might want to control.

What would I do?

Computer and chip manufacturers know performance metrics such as Linpacks, Livermore's Kernels and Specmarks. The bureau should use one or two of these as control thresholds, depending on what it is trying to control (e.g., weapons calculation, real time control, decryption). I would also ask the suppliers to propose a time-varying metric, given some stated objectives from the government of what it is trying to control.

These actions would free industry to build and sell competitive machines. The process might also teach the Commerce Department and the industry to work together, while a U.S. supercomputing industry still exists.

Bell is chief scientist at Stardent Computer, Inc. and co-author of *High-Tech Ventures: The Guide to Entrepreneurial Success*.

Product quality is only half the real battle

JEFFREY M. KAPLAN



Product quality and customer satisfaction have become the battle cries of companies large and small throughout the U.S. Improving our competitive position in the world through better products and services has been a major issue since the latter part of the 1980s and has gained even greater prominence since the establishment of the Malcolm Baldrige National Quality Award.

Few industries have experienced as dramatic a shift toward customer-driven marketing as the information technology industry. Yet it remains a question whether all of this attention will translate into tangible benefits for customers who are grappling with the growing complexities of how to effectively use their information technology.

There is little doubt that product reliability in the industry is constantly increasing, but that has not necessarily led to greater customer satisfaction. Many customers continue to be frustrated by their inability to fully use available technology.

While it is hard to complain about vendors' sincere efforts to improve, too often they concentrate their efforts on products and ignore the need for service improvement.

It is easy to understand how this can happen. Product refinements or production modifications can produce measurable improvements in product quality. On the other hand, even the administrators of the Baldrige Award admit they have a difficult time measuring quality improvements in services. Yet, this is "where the rubber meets the road." Customers need professional value-added services such as systems planning and design, project management, systems integration and operations management to help them better deploy the technology at their disposal.

More vendors are venturing down this path and attempting to compete on the strength of their services. Yet many are still only giving lip service to this area. Therefore, separating those vendors with quality support from those who are unlikely to fulfill their promises is an important challenge for customers.

Measuring the quality of services is always a difficult task, and this is particularly true of professional services. The typical metrics of response and resolution time do not apply, and vendors must be prepared to meet or exceed more subjective expectations.

Despite the problems that exist in measuring the quality of support services, customers have an opportunity to take advantage of the competition that the Baldrige Award has created. Let the vendors who proclaim they are competing for that award be the first to tell you in detail how they will assure you that you'll be happy with their products *and* their services.

Kaplan is the director of service industry research programs at Ledgeway/Dataquest in Lexington, Mass.

No bones about it: We need software archaeologists

READER'S PLATFORM

RICHARD FLEMING

The other day I found myself tracing through the files of my predecessors, searching for the source code for a module everyone assured me was "critical." My sense of dread deepened as I slowly scanned old README files that referred to data sets archived nine years ago on a system that left our site in 1987.

Rummaging through an abandoned office, I hit pay dirt — the old blue book. Somehow it had survived the countless housecleanings. Stuck in the back was a list of source tapes. I was on cloud nine. I sat down at my desk and issued a retrieval request from our bomb-proof, 600-ft.-deep data storage vault.

The tapes arrived a few days later, and I reverently carried them to our library and loaded them onto a drive, hoping that the bits would still retain their magnetism, that the drive would be the right type, that the computer hadn't been an RCA Spectra machine, that the . . . Yahoo! I was in luck. The tape jerked, spun and unloaded. Holding my breath, I edited the file and looked at . . . what was that stuff anyway? Obviously, a computer language, but which one?

I printed the file and went around plaintively asking my coworkers, "Seen anything like this anywhere?" All I got for my efforts were bemused stares and a few guesses. "Looks like SAS to me." "No, I think it's Easytrieve." "Could it be RAMIS?" Dejected, I gave up the idea of an easy fix and spent the next few weeks recoding the program into C.

Yes, I know, this would never happen in your well-run shop, and I'm the Queen of Sheba!

What I propose is a new specialty for our profession. We need people trained in the obscure dialects of ancient computer languages. I can see the ad now: "Wanted — Software archaeologist able to read/write Honeywell Autocoder and understand Easytrieve. Familiar with 6502 Assembler. Able to maintain JES3 1.31 in a non-SMP environment. Excellent pay, stable working conditions. Call (800) EAT-DUST."

The need for training in software archaeology will increase as languages and operating systems change. It is a profession certainly not limited to IBM's world. Any bets on finding someone able to recode an AWK program 10 years from now?

Oh, by the way, I finally found a textbook showing a sample of the language my module was written in — Snobol. I should have known.

Fleming is an IS professional from Point Pleasant Beach, N.J.



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SOFT NOTES

Putnam honored

The Putnam Companies, an investment services firm in Quincy, Mass., was recently awarded The Second Annual IBS Strategic Decisions' Imaging Excellence Award. Presented at the 1991 Association for Information and Image Management conference and exposition in Washington, D.C., the award recognized Putnam's strategic use of imaging in check/item processing, mortgage loan origination, claims processing, engineering drawing management and customer service applications. Finalists included Blue Shield of California, the U.S. Department of State, and Northwest Airlines.

Andersen Consulting of Chicago and Boston-based **Multitrak Software Development Corp.** have signed an OEM pact to market distributed, information systemswide project control and resource management solutions. Products from both companies will be bridged to deliver an integrated set of computer-aided software engineering, methodology and management control software tools.

Open systems finds a place in users' hearts

BY TIM GRANTHAM
SPECIAL TO CW

TORONTO — In a 1989 study, 70% of the users surveyed could not articulate the benefits of open systems and almost none could quantify the value of such benefits.

Despite those findings by the Boston-based DMR Group, Inc., however, "more money has been invested in Unix-based research and development than in any other operating environment" since 1989, said George Shaffner, chief operating officer at X/Open Consortium Ltd.

The X/Open Consortium, a not-for-profit open systems market development organization in the UK, has developed the X/Open Portability Guide (XPG) for systems software. Support for XPG has been announced for virtually every Unix-based system and for proprietary operating systems offered by Digital Equipment Corp. and International Computers Ltd.

In his recent keynote speech at the Open Systems '91 conference in Toronto, Shaffner painted a bleak picture of the future of the industry if vendors cannot supply the right open systems products. "CIOs and the committees on which they serve are far more conservative," he said, because of high conversion costs, high software maintenance costs and tighter budgets.

These chief information officers want the products they do buy to be based on standards and

Continued on page 34

FEATURE: MOVING TO THE AS/400

Dumping conversion headaches on the other guy

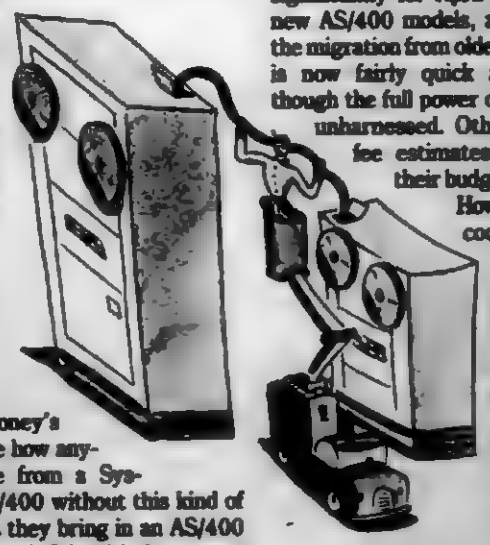
BY JOHN WEBSTER
SPECIAL TO CW

Buyers of IBM's Application System/400 generally get what they pay for when it comes to increases in speed, power and versatility. However, they also get the mixed blessing of a new operating system, which leads to some all-too-familiar choices. Should they dispose of all that useful software from the old machine? Or make it compatible somehow with the new architecture?

Although the ideal solution, many information systems managers say, is converting RPG-II or batch Cobol code to native AS/400 code, the task is usually monumental because of age-old code residing on the older systems, replete with patches and idiosyncrasies left by programmers over the life of an application.

Some firms elect to tackle the conversion in-house; others opt to farm the work out to an outside company specializing in such conversions, hoping to save time and trouble and retain current staff members in the process.

Companies providing conversion services generally have three common goals: providing AS/400 expertise that many of their customers lack because the platform is relatively new; enabling customers to retain their programming staff without needing to "clean house" for AS/400 specialists; and allowing customers to retain their extensive time and monetary investments in custom applications. For the user, the primary goal is saving time, problems and, in the end, money.



Robert Gentile, director of IS at Parade Publications, Inc. in New York, says his company is "getting [its] money's worth. I can't see how anyone can migrate from a System/36 to an AS/400 without this kind of assistance unless they bring in an AS/400 staff, but then what do I do with the current staff members who know the inner workings of the company? We didn't want to throw out System/36 people and get AS/400 people."

Not everyone has chosen to unload their conversion problems on an outside firm. IBM's conversion utilities were beefed up significantly for April's announcement of new AS/400 models, and some users say the migration from older midrange systems is now fairly quick and painless, even though the full power of the AS/400 is left unharnessed. Others cite conversion fee estimates that were out of their budget range.

However, the maze of code typically supporting aged mainframe and midrange systems is enough to cause even the most ambitious programmer to seek help. It was exactly that scenario that led Richard Canter, a senior systems analyst at Teachers'

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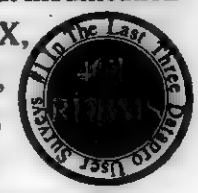
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PROGRESS

The Usual Limits Don't Apply.

BK customers have it their way

ON SITE

BY MARYFRAN JOHNSON
CW STAFF

MIAMI — One million phone calls ago, Burger King Corp. still had a lot to learn about its customers — like how annoyed they got about that second trip to the counter for catsup. Or how much they resented a screwed-up order at the drive-up window.

The toll-free Burger King Consumer Response Line filled those information gaps.

Promoted with "Your comments count" slogans on tray liners, posters and carryout bags at all 5,600 Burger King restaurants nationwide, the project swiftly outgrew a personal computer and local-area network. Today, it runs on an IBM Application System/400 midrange system with 26 operators fielding calls 24 hours per day.

Whether it is a beef with the burgers or a complaint about the ketchup, Burger King wants to hear about it.



The giant fast-food retailer's experience reaches beyond the use of information technology to automate or increase productivity, however. It demonstrates how computers can be the catalyst for change.

"The Consumer Response Line has become an amazing communications tool for us," said Bonnie Tracy, Burger King's manager of consumer relations at its headquarters here. "We now have a much clearer indication of the areas to look for in spotting problems before they become serious or widespread."

The speed of the system "has enabled us to enhance customer service in ways previously not possible," Tracy added. Among the changes is employees now repeat each order back to the customer to catch any mistakes.

Unlike the time-consuming chore of answering a questionnaire or telephone interview, the response line, (800) YES-1800, has an immediacy about it that prompts an average of 4,000 customers per day to pick up the telephone and call.

When customers had to mail in their complaints, the average response time from Burger King was 68 weeks, Tracy said.

"Since we instituted the Consumer Response Line, the number of positive calls we receive has increased by more than 50%," she added. "Without the 800 number, it's unlikely that so many people would pick up the phone to congratulate us."

Each call is answered by operators who access the AS/400 from their display terminals, where they enter the caller's name and address along with any comments. Supporting the customized customer response software is IBM's Officevision/400 office automation package and the AS/400's built-in database.

An operator receiving a call about a Burger King in Detroit, for example, simply enters the letter D and every city beginning with that letter appears on the screen. A few keystrokes later, all the Burger Kings in Detroit are listed, and the operator can target the exact location where the customer complaint — or praise — originated.

The idea behind the Consumer Response Line was first tested in 1988 at 200 company restaurants, and the single-PC operation gradually grew by adding a few more machines and LANs. "It worked beautifully, and senior management was so impressed with the need and results of the 800 number, they decided to go with a full-scale, nationwide operation," Tracy said.

Shift in CASE use reported

BY SALLY CUSACK
CW STAFF

If your company is currently using computer-aided software engineering (CASE) technology, chances are good that it is making other moves, such as shifting from the traditional big-iron world of mainframe computers and dumb terminals.

A recent study conducted by International Data Corp. (IDC), a Framingham, Mass.-based market research firm, revealed that companies using CASE are moving off the mainframe and onto platforms at a measurably quicker rate than those working in non-CASE environments.

Currently, 40% of CASE users work in a mainframe terminal environment, while 59% of non-CASE users rely on mainframe-to-terminal computing.

By 1994, only 25% of CASE users will be working in a traditional mainframe/terminal environment, while 47% of non-CASE users will still be actively supporting the mainframe/terminal architecture, said Anthony C. Picardi, director of application development tools at IDC.

According to Picardi, in 1994, 35% of CASE users will function in a local-area network client/server environment; and 15% will have moved to a cooperative processing platform. The remaining percentage will most likely have opted for some type of stand-alone solution, he said.

By contrast, in three years, 20% of non-CASE users will have migrated to LAN-based client/server platforms, while 10% will have moved to cooperative processing technology.

"Clearly, CASE users are moving more quickly off the mainframe environment," said Picardi, adding that CASE users are more likely to take advantage of additional technologies.

There are several strategic factors affecting a CASE purchase, but surprisingly, software cost is not the primary motivator. According to the IDC study, the single highest priority for users is that CASE applications are compiled — not interpretive.

Easily optimized code and the ability to integrate and generate fourth-generation languages (4GL) ranked second and third, respectively.

The study was based on a survey of 225 sites divided equally between IBM mainframe and Digital Equipment Corp. VMS customers using the platforms as primary systems.

Whatever the CASE

According to the user survey conducted by IDC, the strategic factors affecting a CASE purchase are the following:

- CASE applications are compiled, not interpreted, and compiled code is easy to optimize.
- CASE applications support 4GL integration and generation.
- Tools are provided for support and development of methodology.
- Multiple database access for CASE applications.
- CASE tools can be implemented on multiple hardware platforms.
- Cost of software.

Verity's 3-year-old Topic goes distributed

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — Verity, Inc. has just extended its 3-year-old Topic text-retrieval system to distributed data networks, allowing users to combine multiple local-area network searches into a single network-wide search for documents. The latest release, Topic 3.0, which begins shipping June 1, is capable of merging queries across wide-area networks, the firm said last week.

In the current Topic 2.0 release, users must conduct individual Topic queries against multiple relational databases. Now such queries can be combined into single queries that go against multiple data sources through a new Topic Partition Server, said Bob Williams, Verity's vice president of marketing. "The Topic architecture has been extended to support an integrated LAN/WAN solution," he said. "That gives us concurrent processing on the LAN and queries that are redirected to other servers in the network."

Other new features include a Topic query language called Topiql, a SQL-gateway bridge that will fetch data directly from networked databases, support for major graphical user interfaces including Microsoft Corp.'s Windows 3.0 — and three levels of access to match interfaces with a user's programming skills.

Topic 3.0 server software is priced from $15,600 to $150,000, depending on the number of users and the number of supported databases. Topic desktop client software, available for IBM Personal Computers, Apple Computer, Inc. Macintoshes and Unix workstations, is priced at $795.

Verity has pursued an open systems strategy that allows users to run the text-retrieval system on more than 20 hardware platforms, industry analysts said. Many of Verity's competitors based systems on IBM mainframes. As a result, Verity is trying to capitalise on the current user movement toward downsizing mainframe applications — and toward open systems such as Unix.

"They're moving toward a full-fledged information-retrieval product," said Ann Palermo, director of office systems research at International Data Corp. in Framingham, Mass. "They're developing closer links to RDBMSs," she said, "and that means the numbers stored in a database can be brought together with the documents that are stored in Topic."

Cray Research flowers with May sales

BY ELLIS BOOKER
CW STAFF

EAGAN, Minn. — It has been a busy May for Cray Research, Inc., which announced sales of five of its supercomputers this month.

Cray Research computers range from $500,000 to $23 million in price, according to a company spokeswoman.

Three of the five sales were of Cray Research's Y-MP2E, an air- or liquid-cooled system the firm introduced last May. The Y-MP2E model costs between $2.2 million and $5.7 million.

Cray Research Chairman and Chief Executive Officer John Rollwagen emphasized the importance of the Y-MP2E earlier this year, telling stockholders he expected half of the systems delivered by Cray Research in 1991 to be the new model.

According to Gary Smaby, president of Minneapolis-based Smaby Group, Inc., Cray Research is "moving down its average system selling price." He said this was to be expected as Cray Research intensifies its defense against the likes of Convex Computer Corp.

Cray Research's May customers include the following:

- The Regional Computer Center at the University of Stuttgart in Germany, which installed its Y-MP2E — the first Y-MP2E in Europe — last month. The system will be used as a file server, sitting between high-performance workstations and large scientific visualization files generated on the university's existing Cray-2 supercomputer.
- Apple Computer, Inc. and the California Institute of Technology (Caltech), both of which replaced their older Cray Research X-MPs with Y-MP2Es. Apple will put its $4.6 million system on its Cupertino, Calif., campus in the fall; Caltech will use its system at the Jet Propulsion Laboratory in Pasadena, Calif.
- Pfizer, Inc. will install its Y-MP2E this month at its research laboratory in Groton, Conn. This is the first supercomputer for the pharmaceutical company and Cray Research's 100th customer installation of a Y-MP system.

Conversion

CONTINUED FROM PAGE 25

Insurance and Annuity Association/College Retirement Equity Foundation (TIAA/CREF), based in New York City, to look for help outside the company for an IBM 3090 mainframe-to-AS/400 migration. The company intends to move all of its applications from a mainframe architecture to an AS/400-Personal System/2.

The company's custom rate analysis application, written in batch mainframe Cobol, sets insurance rates for group life insurance and annuities. "It was homegrown 20 to 25 years ago, so there's a lot of spaghetti code — very fragile code. The thing had cobwebs on it. Rather than deal with intracorporate chargebacks, we picked and chose where to build new applications. In this case, we found that it needs re-engineering because it's not efficient code," Canter explains.

The combination of limited in-house resources and the work involved with the companywide migration drove TIAA/CREF to look to Conversion Services International, Inc. in Lyndhurst, N.J. The move proved to be a good one, Canter says: "They were very good at living up to their estimates and things that needed to be done."

Systems analysts at Sealand Service, Inc., an Elizabeth, N.J., shipping firm, experienced similar shorthandedness in its migration from System/36s to AS/400s. In the case of Sealand, not only was the System/36 RPG-II code old and unwieldy, but Sealand also lacked the AS/400 experience to convert it.

"The AS/400 is a fairly new machine, so there are not too many 400 experts on the market. We didn't have the expertise in-house, and the [conversion firm] could do it fast," says Paul Vanya, lead systems analyst at Sealand. Vanya looked to Financial Technologies, Inc. in Cedarhurst, N.Y., to convert Sealand's Inland Transportation System, which includes among its modules accounts payable, scheduling, transportation route planning, maintenance scheduling and barge and rail tracking. The program was originally written in RPG-II.

Why not use IBM's own conversion utilities, shipped with the AS/400? IBM does provide a set of utilities allowing a System/36 application to run on an AS/400, but the solution is not satisfactory to most users because it runs in System/36 emulation mode, which prevents the application from taking full advantage of the AS/400's speed and power. By converting to native code rather than running the old application in emulation mode, users realize the full performance advantage of the AS/400 over the System/36.

Officials at Georgia-Pacific Corp. in Atlanta wanted to boost the performance of an employee stock purchase application when the company began a migration to AS/400s. "We didn't want to take the application to the 400 in 36 mode because we didn't like the performance," says Ted Gardner, director of corporate applications services at the company.

To fully convert the application, which was originally written for the System/36, to AS/400 native code, Gardner enlisted the help of Computer Resources and Technology, Inc. in Waukesha, Wis. The software, written in RPG-II, keeps track of employees' shares purchased and payroll deductions and creates stock activity files for brokers.

Tap the power

Users emphasize tapping the full power of the AS/400. "We definitely have a much better piece of equipment with the AS/400," Gentile says. "We do a test where we run the converted program on a System/36, time it, run the same exact program on the AS/400, and in one case, it took two minutes and 15 seconds on the 36, only 50 seconds on the 400."

Parade hired Management Dynamics, Inc., also in Lyndhurst, N.J., to convert custom-developed applications, portions of which dated back to a System/34. Most of the conversion dealt with "extensive modification in the sloppiness of original RPG-II code," Gentile says.

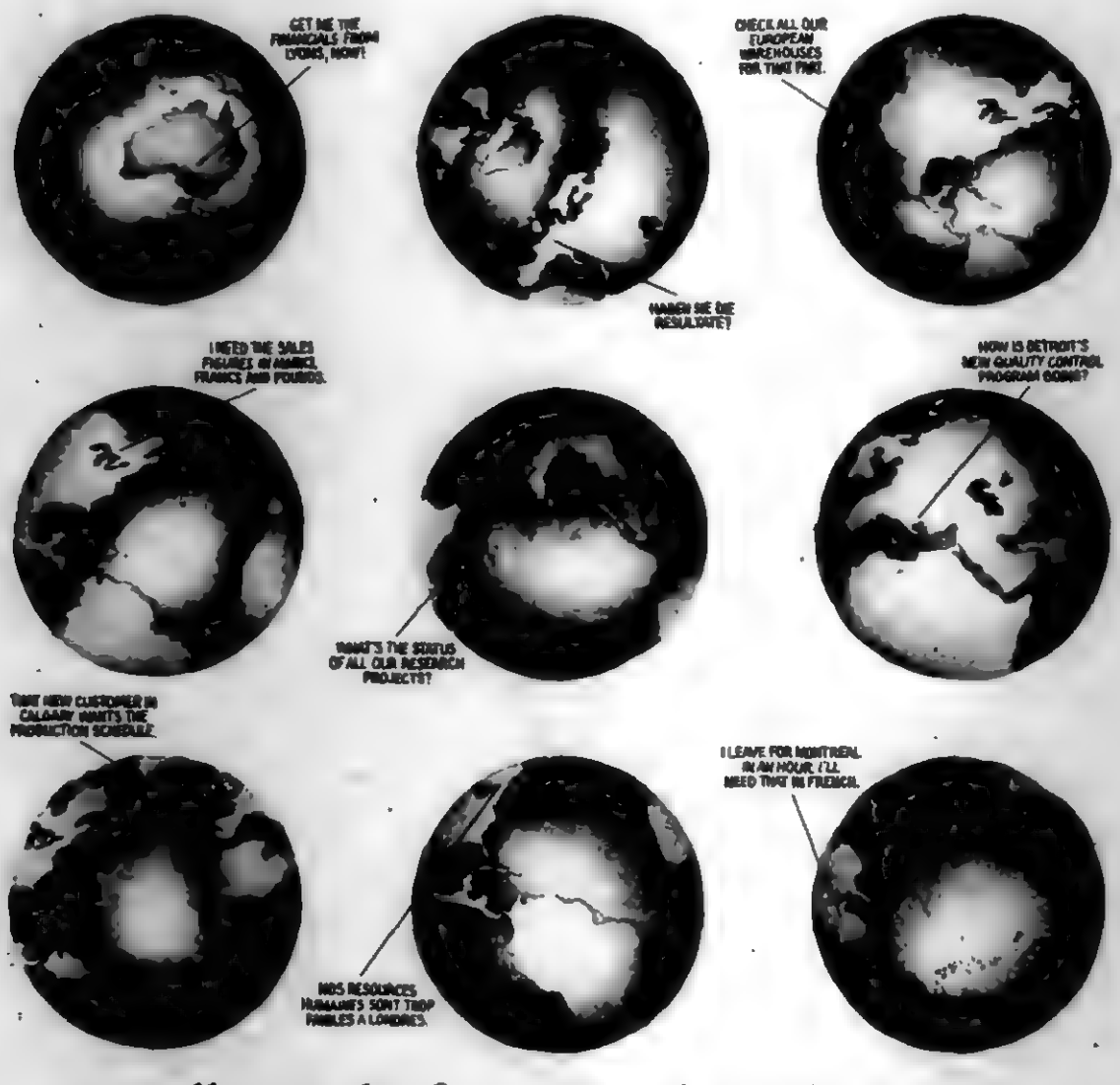
Parade worked with Management Dynamics at a flat rate of $95 per hour to convert an advertisement tracking program that targets ad copy for specific editions of the magazine, which is carried by 336 newspapers nationwide. Gentile says it is not uncommon for Parade to produce as many as 136 versions of the magazine according to advertiser guidelines.

Vanya says that although Financial Technologies charged a hefty price of approximately $65,000 for its services, it did "a very good job, very professionally." Vanya says prices are dependent on the complexity of the system, with a flat rate of $25 affixed to any "unit," which could be one program, one procedure, one file [redacted].

The entire project took about five weeks: one week to clean up the old RPG file, two weeks to convert the file and two weeks to test the AS/400 native code. Vanya stresses the importance of the testing procedures, which Financial Technologies handled "with a lot of best possible quality test cases to let us implement the conversion faster. A lot of people don't supply enough test cases. FTI stays on and even helps with nonrelated problems."

At a cost of $6,000 over about 30 days for Computer Resources and Technologies' work, Gardner is a satisfied customer. "It cost considerably less than we thought it would, and we're pretty satisfied with the RPG conversion," he says.

Webster is a free-lance writer based in San Francisco.



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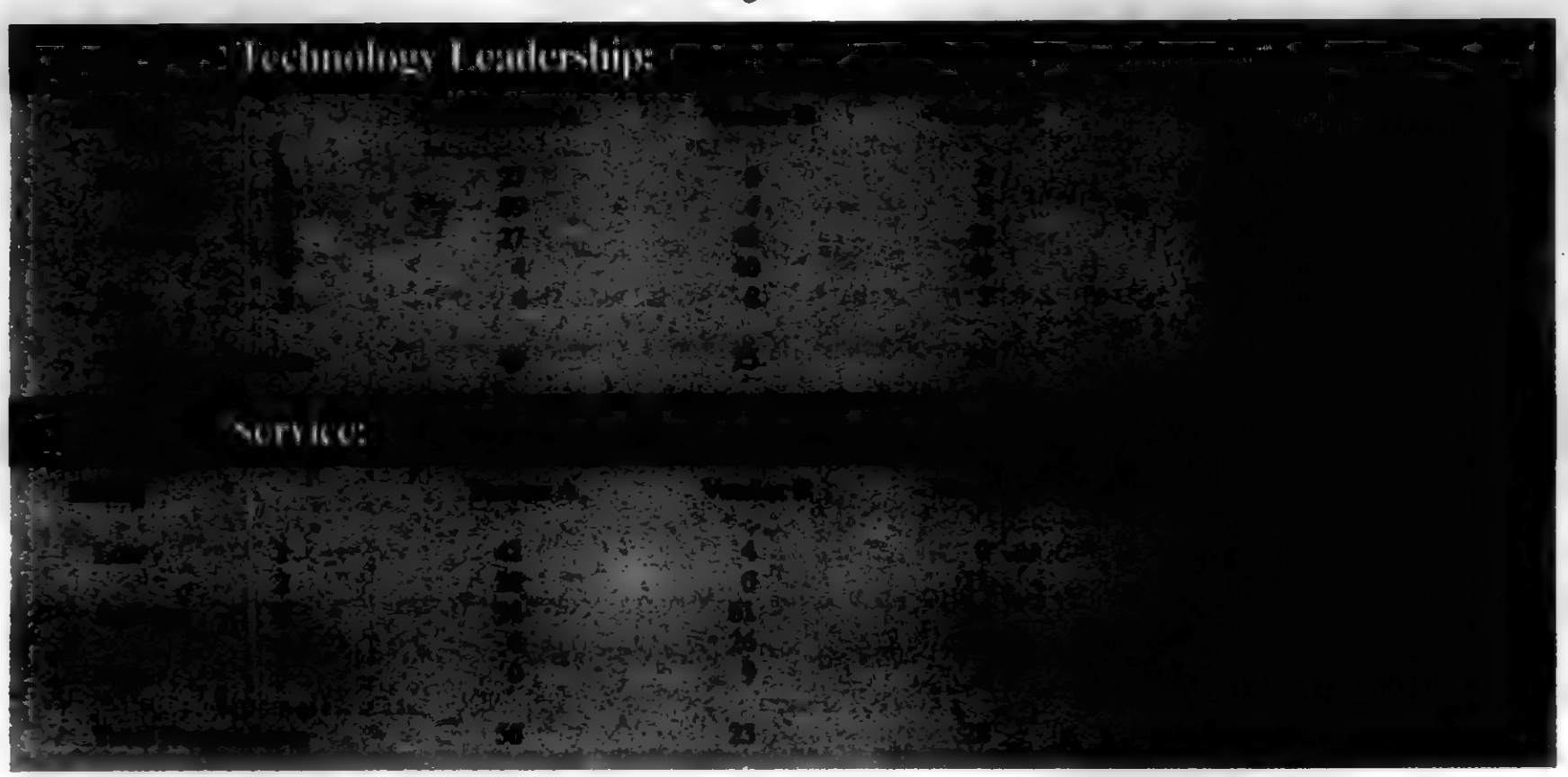
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PRODUCT REVIEW

Pacbase: Professional but slow

CGI Systems, Inc.

This is the tenth in a series of performance benchmarks that focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions.

In this issue, we look at Pacbase from CGI Systems, Inc.

•

The benchmark was carried out at CGI's U.S. headquarters in Pearl River, N.Y., by a three-member team. Mainframe computer resources, however, were located at CGI's St. Marc, France, data center. An incorrect development environment definition at its central computer site prevented the completion of the benchmark work (both the complex report and the interface) during the three-day test. We received the complex report solution the next working day. The batch interface solution was not completed because team members had other commitments. In addition, Pacbase does not provide a query language for DB2, and therefore the inquiry section was left out.

However, what was completed by the team was well-presented and robust. In addition, it complied with IBM's Common User Access. For these reasons, the level of completion had to be rated "fair," a result which was marred by poor support.

•

The team spent 57 hours planning the benchmark details and selecting the implementation strategy. Following their development plan, the team made slow but steady progress and completed their solution in just under 32 hours. At no stage, however, were solutions rushed. We marked the speed of development as "fair."

•

The speed of maintenance was "good." The solution of a 60 function point modification was produced in three hours, but it lacked the report and inquiry functions.

•

The documentation was detailed and understandable. The design graphics were well-presented with program logic shown in structured form. User documentation could be produced from the central repository. Selecting specific documentation, however, can be a tedious and lengthy process. We rated the level of documentation as "very good."

•

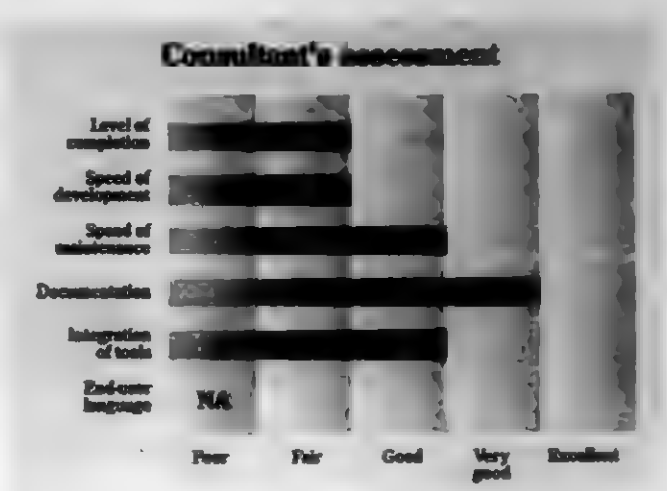
The central Pacbase repository ensured a high level of integration between the design in the Pacdesign workstations and the generated mainframe code. The only flaws we detected were that error messages were not automatically integrated into the code. Integration, however, stops at Cobol source generation. Final system integration has to be done manually, which requires substantial job control language coding. All things considered, the level of integration was "good."

•

The query language Pacquery does not support the DB2 files that were used in the benchmark. Without any alternative query language of its own (and without knowledge of any other DB2 query language), the team provided no end-user language solution.

•

In summary, with considerable effort Pacbase provided a sound solution but did not deliver in the reporting and inquiry sections. While interfacing to a wide range of target environments, Pacbase does not assist in the final integration. As experienced in the batch system foul-up, a lot of work at a target computer system is still required.



The Pacbase tool kit

- Pacdesign – CASE tool
- Pacbench – Development platform
- Cobol – IBM Cobol compiler
- DB2 – IBM database

Development and maintenance report card

ANALYSIS AND DESIGN: B
Considerable planning was done, which included the definition of target computer-naming conventions. The Yourdon methodology was used to define the data model and the data flow diagrams.
Strength: It has a central repository.
Weakness: The necessary physical implementation conventions are not supported.

DATABASE SETUP: A
This was a swift and automatic operation, which was driven by the data design that is held in the central repository. In addition to the user data, any work areas had to be defined as permanent entities in the repository database.
Strength: It has high-speed generation for a range of target environments.
Weakness: Work areas must be part of the repository.

FILE MAINTENANCE TRANSACTIONS: C
With a completion period of almost 24 hours, this was one of the slowest development times in the series so far. A lot of time was required to implement the solution in the target environment. The results were almost always correct the first time around. The results were also very robust with a pleasing presentation.
Strength: There were few mistakes.
Weakness: It is a lengthy process.

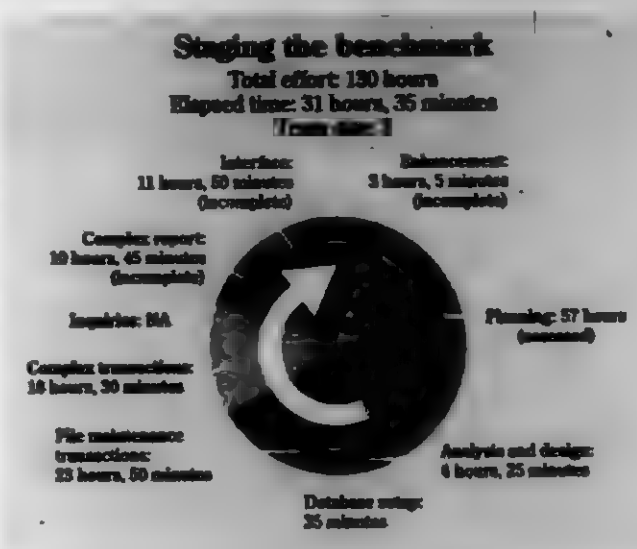
COMPLEX TRANSACTION: C
By taking more than 18 hours to complete, it was the slowest development in this series to date. A lot of processing logic, such as time arithmetic, had to be done cumberasomely at a detailed level. But once delivered, it had a good result.
Strength: There were few mistakes with an excellent operations result.
Weakness: It is a tedious process.

INQUIRES: NA
The CGI product Pacquery does not support DB2 files.
Strength: NA.
Weakness: NA.

COMPLEX REPORT: C
This part also took a lot of time and had to be completed after the initial three-day period because of an incorrect development environment. This was overcome at the end, and the results delivered the requirements of this section.
Strength: Report layouts can be painted.
Weakness: Batch work is handled separately.

INTERFACE: D
The Ashton-Tate Corp. Dbase data was transferred to the main computer. A sophisticated batch-edit program was developed but could not be tested because of the fault in the development environment.
Strength: Error conditions are professionally handled.
Weakness: There was an incomplete solution.

ENHANCEMENT: D
This was a rushed job because time was running out. The reporting and inquiry parts were not included in the solution. Changes were done at the Pacbase code level, without the Pacdesign level being consulted or updated during the enhancement stage.
Strength: It includes a central repository.
Weakness: There was an incomplete solution.



The solution was initially designed on a 4M-byte IBM Personal System/2 workstation under DOS Windows 3.0 sharing the mainframe Pacbase repository. The application was done on a remote IBM 9121-260 mainframe running under MVS, CICS and TSO.

Details of the product are available from CGI Systems, Inc., P.O. Box 1645, One Blue Hill Plaza, Pearl River, N.Y. 10965. (914) 735-5030.

Open systems

FROM PAGE 25

to be available from multiple vendors, he added.

To increase market penetration in the '90s, multivendor product availability and standards adherence must move to the front of the development cycle, Shaffner said. To accomplish this, vendors must cooperate on research and product and market development, he said.

Vendors also need to 'standardize' proprietary products, as DEC proposes to do by providing X/Open branding for its VMS operating system, and they must make their proprietary products available for distribution to other vendors, Shaffner added.

"We must have continued rapid growth of open systems because there is no economic alternative to what the market is asking for," he said.

> "WE'RE MOVING TO architectures that are owned by the customer."
>
> DON TAPSCOTT
> DMR GROUP

Shaffner's comments echoed those of Don Tapscott, director of emerging technologies at DMR, who said there has been a profound power shift in the industry from vendors to users.

"We're moving to architectures that are owned by the customer," Tapscott said. "These are based on industry standards, and the vendors are required to be compliant."

Both Tapscott and Shaffner expressed concerns about the rise of such nonvendor-aligned user groups as the User Alliance for Open Systems.

"By X/Open's count, there are now more than 20 of these groups," Shaffner said. "There is a serious danger that these groups could refragment the industry with proprietary user specifications when we're just getting rid of proprietary vendor specifications."

With the increase in multivendor environments and loosening of one-vendor account control, "we need a vendor-independent user requirements process," Tapscott said.

He said a single process is critical at this juncture and seems to be coming from X/Open.

"The fact that there are vendors funding X/Open is desirable — the user requirements development process should be a collaborative, interactive process," Tapscott said.

Grantham is a free-lance writer based in Toronto.

DEC adds memory, cuts prices

MAYNARD, Mass. — Digital Equipment Corp. recently enhanced its VAX 4000 line by introducing a 64M-byte memory board for the VAX 4000 Model 300 and announcing quantity prices for its Digital Systems Storage Interconnect disks as well as a 6% price reduction on packaged, dual-host Model 300 systems.

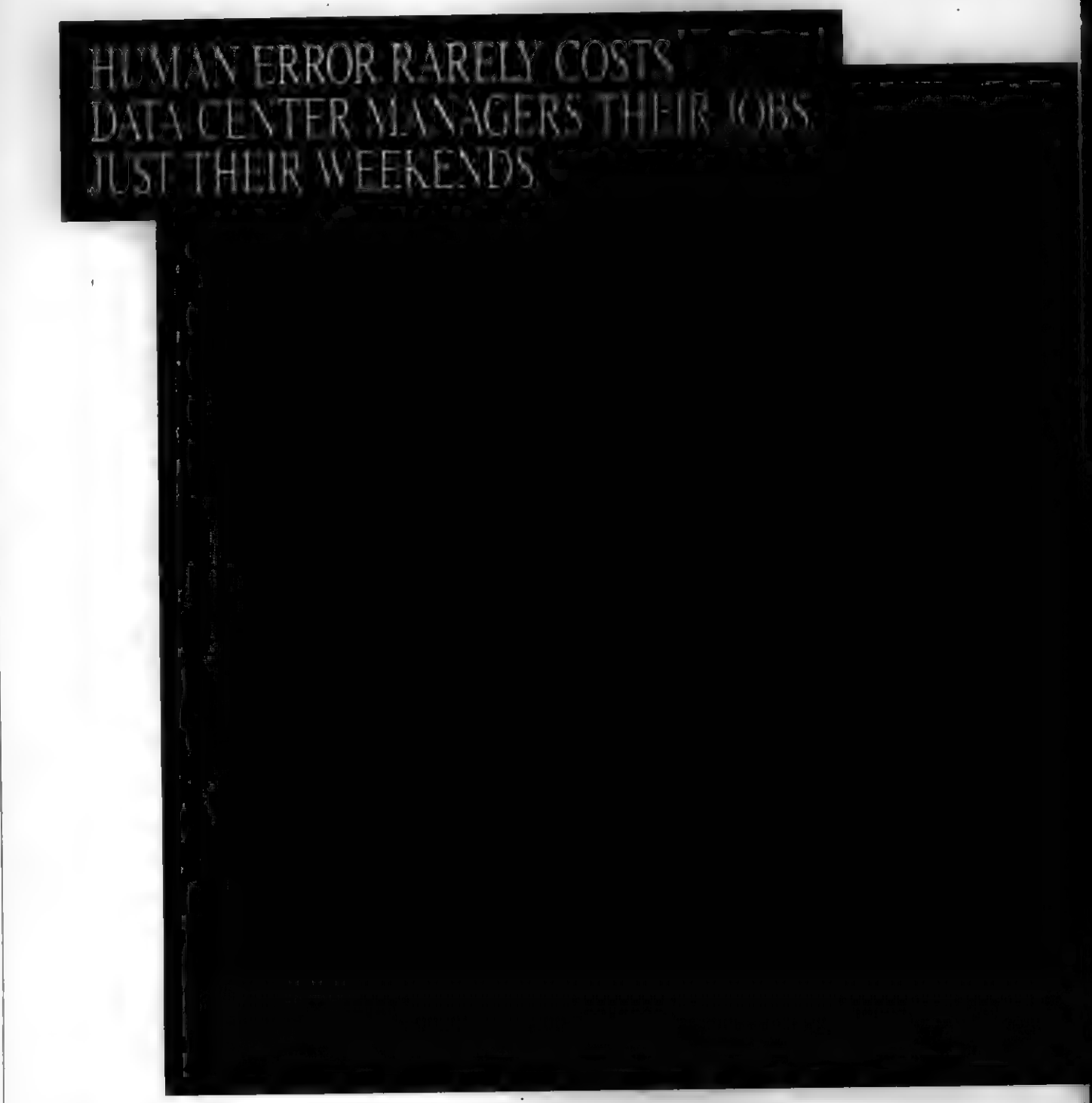
With the 64M-byte boards, which are priced at $50,400, customers can enhance their application performance by doubling the memory capacity of their Model 300s from 128M to 256M bytes. Previously, the largest memory upgrade was a 32M-byte board.

Customers who buy disks in quantity will save 18% to 22% with the new disk packages, which range in price from $30,200 to $108,400.

The packaged pricing for dual-host VAX 4000 systems also provides cost savings to volume buyers, according to DEC officials.

The 64M-byte VAX 4000 systems range in price from $83,710 for a Vaxserver Model 300 to $264,330 for a dual-host time-sharing model.

MARYFRAN JOHNSON



NEW PRODUCTS — SOFTWARE

Development tools

Acucobol, Inc. has begun shipping Acucobol-85, a Cobol compiler for the Hewlett-Packard Co. 9000 Series 700 workstation platform.

Acucobol features built-in source-code debugging, pop-up windowing and color and line drawing. It is available on more than 450 hardware platforms.

Pricing ranges from $1,313 to $2,100, depending on workstation model.

Acucobol
Suite 201
7950 Silverton Ave.
San Diego, Calif. 92126
(619) 689-7220

Applications packages

Lawson, Inc. has ported its financial, human resources and distribution software product lines to the IBM AIX operating system.

The company also announced its report writer and computer-aided software engineering tools for AIX platforms. The tools allow users to customize reports and screen formats for the business software modules and to modify standard applications at the systems level. Lawson's products are targeted at midsize corporations.

The company also announced the availability of the Lawson Accounting System software for Digital Equipment Corp.'s Ultrix operating system.

Pricing for the products starts at $20,000, depending on platform and number of users.

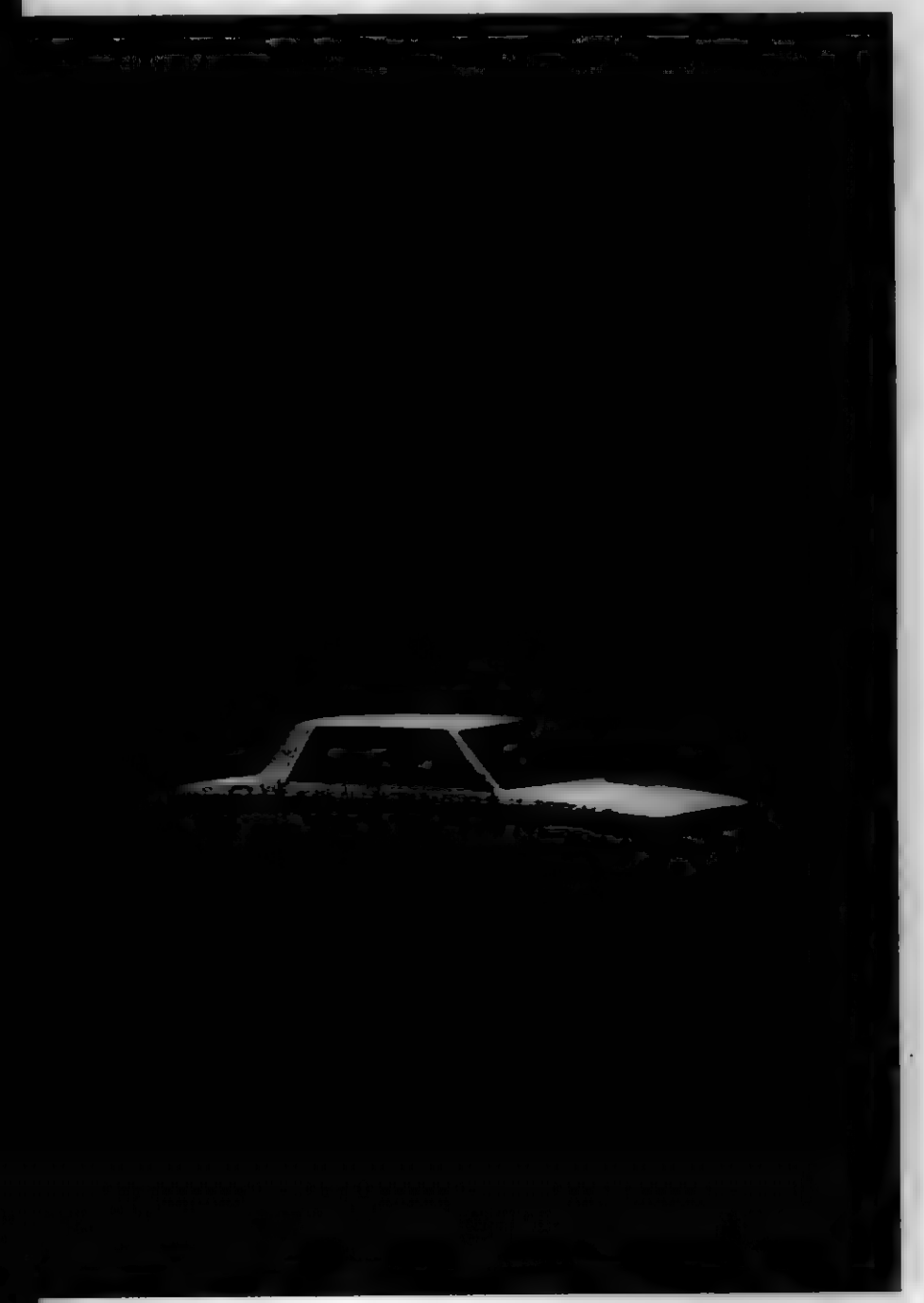
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Minneapolis, Minn. 55413
(612) 379-0258

DSD Corp. has announced availability of its C-PLAN Project Management System on Digital Equipment Corp. systems under DEC Ultrix as well as VAX/VMS environments.

Version 2.0 of C-PLAN includes import/export options for sharing data among related applications, report customization and information screens for review of project and resource data.

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HARDWARE

I/O devices

QMS, Inc. has announced support for Printronix, Inc. lineprinter commands on the QMS Magnum CF 2215 continuous form laser printer.

The Magnum CF 2215 handles text, industrial graphics and automatic number identification application tasks typically done on impact printers, according to QMS.

The laser printer has an output of 22 page/min. with resolution of 240 dot/in. and offers a 110,000 page per month duty cycle.

The controller is based on the QMS Code V Version II programming language.

The printer is priced at $59,995.

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Data storage

Andromeda Systems, Inc. has introduced the SCDC, a small computer systems interface (SCSI) caching disk controller for Digital Equipment Corp. Q-bus-based systems.

The product offers asynchronous and synchronous data transfer speeds of up to 5M byte/sec. It supports Winchester, floppy, tape and optical SCSI drives and includes 2M bytes of random-access memory cache. Future upgrades will be available by modem.

The cost is $1,495 for an entry-level system.

Andromeda Systems
9000 Eton Ave.
Canoga Park, Calif. 91304
(818) 709-7600

Sometimes sharing will slow you down.



Now there's a new LaserJet fast enough and smart enough to keep the whole group happy. The LaserJet IIISi printer. A 17ppm powerhouse designed for high volume. And multiple users.

With the LaserJet IIISi, your users are up to speed the moment they give the "print" command. HP's RISC-based formatter and the PCL5 printer language, with vector graphics and on-the-fly typeface scaling, yield fast results. Even on the most complex documents.

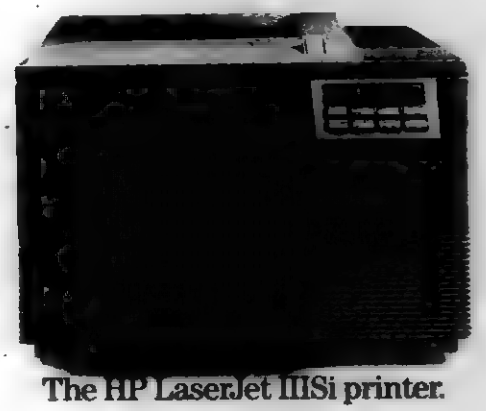
The LaserJet IIISi meets the demands of your shared work groups with two 500-sheet input trays, an output capacity of 500 sheets, and a monthly duty cycle of 50,000 pages. HP includes a job offset feature, a tray-full sensor, and software-selectable language switching between PCL5 and optional Adobe® PostScript.® For added versatility, you can choose an envelope feeder and two-sided printing.

HP sets a new standard for I/O performance with optional Ethernet or Token Ring Interface cards that support Novell or



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And sometimes it'll get you there faster. Introducing the 17ppm LaserJet printer.



The HP LaserJet IIISi printer.

3COM 3+OPEN. The LaserJet IIISi comes with standard parallel and serial I/Os.

For all its capabilities, the fastest LaserJet printer is priced at just $5,495.* An exceptional value considering your users will also be getting the sharpest 300 dpi print quality yet. In fact, HP's revolutionary combination of Resolution Enhancement technology and new microfine toner challenges the print quality of many 600 dpi printers.

If you're ready to hook your users up without slowing them down, call **1-800-752-0900, Ext. 2134** for more information on the LaserJet IIISi and the name of your nearest authorized HP dealer.

HP Peripherals
When it's important to you.

HEWLETT PACKARD

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I can get it for you WHOLESALE!
MANUFACTURER
HUGE RENT
Very Important Patient Agency

COMMENTARY

James Daly

Crossing OS cultures



Sociologists call it "acculturation." It's a clunky word used when one cultural group grafts the ideas and behaviors of another societal sector onto its own. The resultant gumbo is a fresh composite culture in which new features emerge while others are combined or gradually lose importance.

The computer industry got a large taste of acculturation recently during the release of Apple's System 7.0, its next-generation operating system. Another mouthful arrives June 11 when Microsoft announces its update to DOS, the darling of the corporate world. Instead of butting heads and highlighting their differences, Apple and Microsoft must face the fact that their respective desktop operating systems have swapped roles and turned into something they'd never thought they would be: similar.

System 7.0 will be the most effective weapon in Apple's arsenal when it goes for big corporate accounts. The firm that was once laughed out of the boardroom has produced a meaty update that will delight users who desire advanced features such as interprocess communication,

Continued on page 44

Notebook PCs ride portable power wave

The future of I486-based notebook computers looks lightweight and bursting with power

BY MICHAEL FITZGERALD
CW STAFF

ATLANTA — The next wave of notebook computers based primarily on Intel Corp.'s I486 chips were much in evidence at Comdex/Spring '91 last week. These offerings gave a glimpse of the future for personal computing: portable and powerful.

Zenith Data Systems exemplified both trends. It unveiled a file server based on Intel's I486 chip, and two battery-powered portables based on its 486 and 486SX chips. The file server, the Z-486/33ET, runs at 33 MHz, has 10 Extended Industry Standard Architecture (EISA) slots, eight half-height drive bays, a 395W power supply and can accommodate up to 64M bytes of random-access memory.

The basic model will offer 8M bytes of RAM, a 338M-byte hard drive, an EISA small computer systems interface (SCSI) adapter and IBM Video Graphics Array (VGA) for $14,999. A stripped-down model with 4M

COMDEX

bytes of RAM and no hard disk or controller costs $11,799.

Zenith Data's Supersport 486 and Supersport 486SX are among the world's first battery-powered 486-based portables. The machines each weigh 15 pounds and offer some three hours of battery life. Standard configurations come with 4M bytes of RAM, expandable to 16M bytes. The VGA screen offers 64 shades of gray, and the 486 will support color when it becomes feasible. The portables will not ship until the third quarter of 1991.

Ergo Computing, Inc., the Peabody, Mass.-based maker of the Brick, also brought out a high-powered portable called Moby Brick. Moby Brick is an 8- by 11½-in. box based on a 33-MHz I486 chip that features 32M bytes of RAM, a 120M-byte hard drive and 1,024- by 768-pixel VGA graphics in an 8.7-pound box. As with the smaller Brick, keyboard and monitor are supported but not included. The cost is $3,995.

National Business Computers & Communications offered Dockit, a portable docking system that is scheduled for release in July. It offers up to a 400M-byte hard disk and digital audio tape backup options, accepts two AT expansion cards and weighs 12 pounds.

The company also displayed an Intel I860 reduced instruction set computing workstation that comes with a 209M-byte SCSI hard drive, 8M bytes of RAM expandable to 64M bytes and 4M bytes of RAM for graphics display.

Micronics Computers, Inc. has announced a 33-MHz, 80386DX-based portable computer. Its Mport 333 weighs 14.8 pounds, is AC-powered, has 4M bytes of RAM and a 40M- or 120M-byte hard drive. It is priced at $4,995 or $5,495.

Windows applications pour it on at Comdex

BY PATRICIA KEEFE
CW STAFF

ATLANTA — Attendees at a mostly low-key Comdex/Spring '91 were showered with a flood of applications announcements touting new support for Microsoft Corp.'s Windows 3.0 environment.

Leading the charge were Lotus Development Corp. and Wordperfect Corp., which continued to tantalize users with demonstrations of the still-unshipped Windows version of their market-leading packages — 1-2-3 and Wordperfect, respectively. Lotus also demonstrated Freelance graphics for Windows (see story page 45).

Among those jumping on the Windows 3.0 bandwagon were R+R Associates, Inc. in Mount Vernon, N.Y., First Byte in Santa Ana, Calif., and Merasoft Corp. in Orem, Utah.

R+R announced Shoebox for Windows, a port of its time and facilities manager that is said to have an installed base of 200,000 DOS users. Totally rewritten for Windows, the package now includes the ability to see more than one appointment schedule on the screen at a time. On a network, it also allows users to schedule group appointments and send messages with requests for acknowledgment. A visual alert lets users know when messages have been received.

Text retrieval

R+R also introduced Notequest 1.0, a text retrieval utility that lets users build a database of all the words in their documents. The user selects keywords to instantly locate, cut and paste as well as print citations from wherever the citations may be.

First Byte unwrapped Monologue for Windows, synthesizing text and data running under MS-DOS into speech. It runs in the Windows multimedia environment and is able to request and exchange data with other applications through Windows' Dynamic Data Exchange message protocol. It operates as a memory-resident terminate-and-stay-resident utility.

Formerly known as Powerware, Merasoft introduced E'vent Manager, agent software said to give users control over the Windows environment by

Continued on page 45

Investing in Tomorrow's Bottom Line



Jerry Barnes, Chrysler Corporation

MICRO FOCUS
A Better Way of Programming™

Micro Focus Workbench Provides Chrysler Corporation with a Competitive Edge

In the fiercely competitive auto industry, programmers at Chrysler Corporation are using Micro Focus PC-based productivity tools to cut program development time and help move products from the drawing board to the showroom floor faster.

"The bottom line is that our business needs change quickly and we want to streamline the software development process as much as possible so Information Systems can be responsive to all of our operating units," said Jerry Barnes, Chrysler's Manager of Systems Engineering Technology.

Moving application development to a workstation environment allowed Chrysler to use its mainframe resources more efficiently and speed up development cycles by taking advantage of productivity tools not available in the mainframe programming environment. With this solution, programmer productivity improves greatly without a large investment in additional mainframe resources; an important consideration in uncertain economic times.

"The mind-set here a few years ago was, 'why would anyone want to do anything away from the mainframe.' Now, we have over 200 trained COBOL/2 Workbench users."

With the Micro Focus COBOL/2 Workbench, programmers can develop and maintain full-scale CICS/VS and CICS DL/I applications independent of the mainframe in a fraction of the time.

"We quantified the time spent on typical software development activities. We showed how we could make a code change, compile the program, detect an error, correct the error and recompile the program again in less time than it would take someone to logon to the mainframe and submit the first compile. In many cases, the developer would make the change on the PC in two to three minutes, while it could take close to 20 minutes on the mainframe."

Jerry Barnes made his case for Micro Focus COBOL/2 Workbench based on greatly improved productivity. The Micro Focus edit-check-debug cycle, now an industry standard for PC-based programming made a big impact on throughput and costs.

Make the case for Micro Focus COBOL/2 Workbench in your company. Call to get your "Makecase" kit today: 800-872-6265.

Sure It's Wireless But It's Not LXE



LXE Offers Full TCP/IP Connectivity...and We're Not Just Blowing Smoke.

Just because it's wireless, that doesn't mean an RF terminal can talk to your host computer.

In fact, LXE is the only RFDC system that can talk to your computer on an Ethernet 802.3 network. That means instant connectivity, with no special programming.

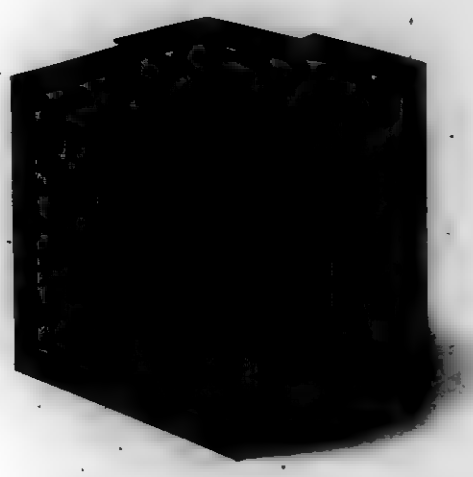
LXE has the only wireless system that offers ANSI terminal compatibility, so your operators can hot key from one computer application to another. And let's face it, that's exactly what they need to do their job.

And yes, LXE features IBM 3270 and 5250 connectivity, too.

No other company offers as many RF solutions and comprehensive customer support as LXE. You get more terminal options, more connectivity and more industrial experience. LXE *is* industrial strength wireless data communications. To learn more about our TCP/IP connectivity solutions, call an LXE Project Coordinator today at (404)447-4224.



LXE



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more efficient
8mm storage.



The IPL 6865 Subsystem.

The next generation of 8mm storage.

It's here.

Twice the speed with double the storage capacity. The IPL 6865 subsystem gives you both to revolutionize high-density 8mm storage for IBM midrange systems. Utilizing advanced helical scan technology, the IPL 6865 stores the equivalent of 24 reel-to-reel tapes on a single 8mm cartridge and is ideal for unattended back-up operations. The 6865 can also be mixed and matched with different tape media via our universal controller for maximum



flexibility. Most importantly, each 6865 subsystem comes from IPL, the company that introduced 8mm storage for the IBM midrange market in 1988 and pioneered the development of this new technology. With 18 years of IBM plug-compatible experience and thousands of installations worldwide, we provide service and support you can rely on. Open up to the IPL 6865 8mm subsystem today. For more information call IPL toll-free at 1 800 338-8475, in Massachusetts call 617 890-6620. Or, in Europe call our Belgium office at 011-32-2725.40.87.



ipl
SYSTEMS

Specifications

The IPL Advantage

The 6865 operates with IPL's universal controller which allows you to mix different tape media on one controller for flexibility. As a result, the 6865 can be used alone or combined with the following IPL products: IPL's 9 track reel-to-reel tape subsystem, IPL's ½" cartridge 3480/3490-compatible tape subsystem, and IPL's other 8mm cartridge tape subsystems in a single rack-mounted subsystem. Each 6865 unit can easily be mounted into any existing 6800 configuration.

IPL Single-Drive Option

For applications requiring single-drive capacity, the IPL 6655 8mm table-top subsystem is an economical alternative. Compatible with IBM AS/400 9404 and, for specific applications, 9406 systems, the IPL 6655 utilizes advanced helical scan technology and Exabyte's 8500 drives to store up to 5.0GB of data on a single 8mm cartridge—all at a transfer rate of 500 KB per second. The 6655 is ideal for performing unattended backup and features a full LED readout showing current drive operation, position on tape, and diagnostic codes programmable in five languages.

Quality Service

As the innovator in 8mm storage technology to the IBM midrange market, no manufacturer understands this area better than IPL. With 18 years of IBM plug-compatible experience, IPL backs its technology with a commitment to quality service and rapid response. Maintenance and technical support are available 24 hours a day, seven days a week, from service locations throughout the world.

More than 4,000 installations benefit from our high quality support and technology. Throughout the world, no one knows IBM storage better than IPL.

For More Information

To learn more about the 6865 and 6655 cartridge subsystems, or any other IPL product, contact us at 1 800 338-8475 (in MA call 617 890-6620), ext. 2135. In Europe contact us at the IPL Systems International Office, Imperiastraat 10, 1930 Zaventem, Brussels, Belgium, 011-32-2725.40.87 (FAX 32-2-725.40.29).

Models

6865-A01	Single Drive with External Controller
6865-A02	Dual Drives with External Controller
6865-A11	Single Drive with Internal Controller
6865-A12	Dual Drives with Internal Controller
6865-B01	Single Drive Add-On Drawer
6865-B02	Dual Drive Add-On Drawer
6865-C01	Add-In Drive Upgrade for 6865-XXX
6865-C11	Add-In Drive and Controller Upgrade for 6860-XXX
6655-A01	Standalone Single-Drive and Controller
6655-C11	Upgrade Kit for 6650 to 6655

System Compatibility	AS/400 9404 AS/400 9406 models B30–70, System/38
Attachment Feature	
6865 AS/400	2604
6865 System/38	7970
6655 AS/400/9406	2601
6655 AS/400/9404	SCSI
Capacity	5GB
Media	Data certified 8mm
Data Buffer Size	1MB
Transfer Rate	500KB/second
Search Speed	37.5MB/second
Read Back Check	Read after right with perfect data
Number of Tape Drives per Model	
A01/A11/B01	1
A02/A12/B02	2
Maximum Channel Attachments	
6865 A01/A02	2
6865 A11/A12	1
6655 A01	1
Tape Speed	
inches/second	0.429
mm/second	10.89
Number of Tracks per Inch	1638
Data Density	74 million bits/sq. inch
Data Compression	Yes, as part of the attachment feature 2604/7972

Physical	6655 A01	6865 A01/A02	6865 A11/A12/B01/B02
Rack Mountable	No	Yes	Yes
Width (inches)	9.3	19	19
(cm)	24.0	48	48
Depth (inches)	12.5	24	24
(cm)	31.8	60	60
Height (inches)	5.8	12	5
(cm)	14.8	30	12
Weight (pounds)	15.0	71	40
(Kg)	6.8	32	18
Voltage (A.C.)	100–120 200–240	100–120 200–240	100–120 200–240

Operating	
Cartridge Load Time	35 seconds
Rewind Time	75 times nominal tape speed

Environment	
Operating Range	60°–90°F 15°–40°C
Relative Humidity (non-condensing)	20–80%
Heat Output (BTU/hour)	760 maximum

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CDLA Computer Dealers & Leasers Association

Application lets airline use its SMARTS

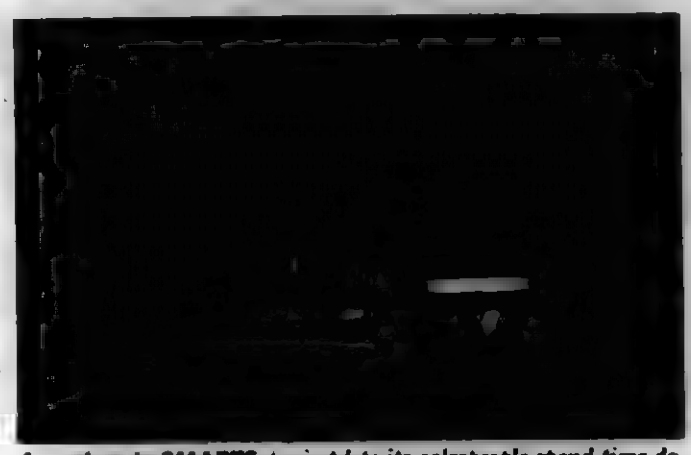
ON SITE

BY MICHAEL FITZGERALD
CW STAFF

DALLAS — American Airlines has long given its frequent flyers "Aadvantages," but it was just last year that it gave its salespeople smarts.

Street smarts. Computer smarts. Sales smarts. That intelligence came in the form of laptop computers and an application called the Sales Management And Report Tracking System (SMARTS). The latter was designed by American's Sabre Computer Services Division in conjunction with consultancy Shepherd Systems, Inc.

Shepherd designed applications using Borland International, Inc.'s Paradox database, while American's information systems group developed bulletin board functions and telecommunications relay scripts for data compression using Microcom, Inc.'s Relay Gold communications package.



American's SMARTS *project lets its salespeople spend time doing what they do best: influencing travel agents to book American*

SMARTS was just an idea in early 1989 when American decided to look into ways to strengthen its sales efforts. The airline has 365 employees who visit travel agents to increase the number of passengers they book on American's airplanes.

American's salespeople had been using dumb terminals attached to mainframes, but they did not have access to information American deemed valuable, such as the Sabre reservations system. The SMARTS project gives the salespeople the ability to turn data from the mainframes into charts and graphs and to do automated expense reporting and contracts.

"Our salespeople were getting inundated with paper in a paper world," said Kathie Stokes, SMARTS project manager. "All the sales data was coming to them in reams and reams of computer paper. They were spending a lot of time going through this paper world."

Brad Harslem, vice president of Sabre Computer Services, said American would send each salesperson six to eight inches' worth of computer reports each month, giving them detailed sales data that now is shipped in a variety of formats to their portables.

Although IS recognized the need to eliminate some of this paper, it could not react quickly enough in its Cobol environment to meet the needs of its users, Harslem explained. Paradox allowed such a move.

With SMARTS, American set out to create a user-friendly environment that would run on laptops and provide salespeople with data from remote locations.

To do this, Sabre combed its corporate databases for select sales and territorial information and created a mainframe-resident database for the laptop users. For year-to-year comparison purposes, American included 13 months of sales data.

Laptop users tie into this data via Relay Gold, which gives them access to American's Aanet.

Yearlong rollout

The development of SMARTS took one year. American selected Grid Systems Corp.'s 1550 laptop, which is an Intel Corp. 80386SX-based machine with 120M-byte hard drives.

In September, American installed Microsoft Corp.'s Windows 3.0 with its Excel for Windows spreadsheet, Paradox and Relay Gold, choosing those packages because they fit in with corporate standards.

SMARTS comes with several analytical features and built-in data manipulation tools that allow salespeople to build their own information queries.

While American refused to disclose precise numbers, it cited benefits such as time savings and the ability of salespeople to make more visits.

"We have seen a return on investment in the product, with significant productivity gains," Stokes said.

"We are the only airline with this capability today, and we think that's created a significant competitive advantage for our corporation," Harslem added.

HP adds low-end box

BY J. A. SAVAGE
CW STAFF

Hewlett-Packard Co.'s introduction of an entry-level Unix workstation last week was seen by observers as a stopgap measure, as it is not part of HP's speedy reduced instruction set computing (RISC) line. The workstation is based on Motorola, Inc.'s 25-MHz 68040 processor running at 22.1 million instructions per second (MIPS).

The introduction included a basic workstation, the 425E, for $5,490 and two graphics workstations, the 425T GRX (grayscale) and 425 CRX (color) for entry prices of $8,990 and $10,990, respectively.

Can't beat RISC

Michael Goulde, an analyst at Open Systems Advisors, Inc., said the workstations are unlikely to attract new customers to HP. "How could [they] compete with what HP already has out there in price/performance? It's not so much RISC vs. [complex instruction set computing]; the price/performance just happens to be on RISC."

Scott Underwood, a systems administrator at David Kelley Designs, said that while extending the life of his software is positive, the "numbers are impressive on RISC." He would rather make the change in operating system, networking and server hardware to get the performance of HP's RISC computers.

Karl Freund, marketing manager for workstations at HP's Fort Collins, Colo., site, said current users could expect the 400 line to get up to 40 MIPS in performance by 1993. "But being honest, at some point, users will want to move to RISC."

Chip boosts Windows

BY JAMES DALY
CW STAFF

SUNNYVALE, Calif. — A controller chip that its inventors claim can dramatically increase the speed of applications running on Microsoft Corp.'s Windows graphical user interface has been announced by Weitek Corp.

Weitek President Art Collmeyer said recently that typical Windows-based word processing, spreadsheet and drawing programs spend up to 80% of their CPU time on bit block transfer and line drawing.

The single-chip controller, the W5086, intercepts bit block transfer and line drawing functions from Windows' graphical device interface and processes them with specialised hardware, Collmeyer said. The 70-MHz W5086 increases bit block transfer speeds up to 26 times while increasing the speed of line drawing functions, he added.

The chip is suitable for a 16- or 32-bit system and is expected to be available by the fourth quarter in add-in boards costing approximately $150. Although initially incorporated through plug-in boards, it will eventually be incorporated into the motherboards of new systems.

Weitek officials also indicated that the chip could eventually be used to accelerate graphical user interface functions on Apple Computer, Inc.'s Macintosh line.

WANTED: MVS and COBOL Programmers to test an ISPF/PDF-style text editor for OS/2

We want you! If you are familiar with ISPF/PDF on IBM mainframes and are working on OS/2, we want you to put SPF/2 to the test in your workplace. See for yourself how SPF/2 provides all the editing power of the mainframe program, and more.

SPF/2 offers you the same familiar environment, command structure and editing capabilities on your PC. You already know how to use it—no training required.

SPF/2 takes advantage of OS/2's powerful features. It uses virtual memory to handle very large files. In addition, HPFS (High Performance File System) long file names are supported. And SPF/2 uses OS/2's REXX for its macro language—75 mainframe-compatible ISREDIT edit sub-commands provide the interface.

SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 even displays the same status indicators.

SPF/2 has features not available on the mainframe. For example, SPF/2 supports 48 PF keys, automatically adapts to the various OS/2 video modes (full-screen or text-window), and scrolls the file as you move the cursor. In addition, SPF/2 has virtually instantaneous response time, 100% system availability, and no connect-time charges.

If you have a departmental or company-wide need for SPF/2, a special cost-effective Multi-User License is available directly from CTC. For information, call our Sales Department at (800) 336-3320.

Test SPF/2 for yourself with a free real-working-code demo disk—it contains a production-level version of SPF/2 except it will not save your editing changes to disk. Call our toll-free, Demo Request Hotline at (800) 648-6700 and ask for SPF/2 Demonstration Disk #173.

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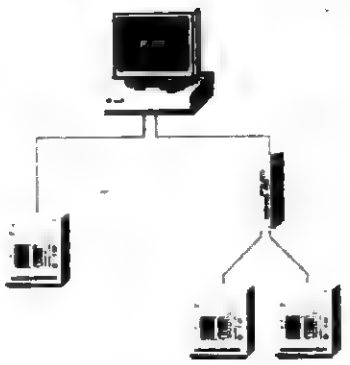
Think about your own LAN for a moment. A complex mix of clients and servers. Hosts and terminals. Bridges and routers. Ethernet and Token Ring.

If you had a shutdown, how long would it take to find the problem? And how much would that downtime cost your company?

With the SynOptics distributed management approach, you can isolate problems in just seconds.

The reason is simple. Visibility. The SynOptics intelligent hub architecture gives you the ability to see exactly what's going on within your LAN—port by port, node by node, in real time.

Our unique auto topology feature will draw a map of your LAN automatically, right down to the port level. So you won't have to worry about your network operator



The SynOptics Approach to Managing Networks Hubs gather, analyze and reduce LAN information at the source. In larger networks, Network Control Engines offer even greater control capabilities

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disconnecting the wrong device. And you can zoom in and inspect LAN activity as events happen.

All this information is presented through an innovative graphical user interface—crystal clear and actionable.

All this works because our network management system was designed from the ground up to provide a systematic way to manage change in your LAN. Add in our innovative technology, and there is simply no better way to build LANs.

And because your LANs don't stand alone, SynOptics implements industry-standard protocols such as SNMP, and integrates them into your host management environments—including IBM NetView.™

To get a free informational video, call 1-800-544-1340. We suggest you do it soon. You don't have a minute to waste.

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Daly

FROM PAGE 39

virtual memory and 32-bit addressing as well as applications developers who hope to exploit the power of the additions. Microsoft, meanwhile, has seen the advantages of Apple's approach and outfitted the once-stodgy DOS with a rewritten graphical shell as well as added memory and utilities.

What's going on? Apple and Microsoft have been known as leaders, not followers. Now they're following the most important leader of all: the user.

Apple has seen its market share slip dramatically in the past few years, and many insiders see System 7.0 as a business necessity. By providing users and developers with a more muscular system, the new software could lift sales of Apple's more expensive machines just as sales of those machines have begun to lag. The company even hopes the advances will be compelling enough to persuade DOS users to switch to the Macintosh. Apple will advertise System 7.0 in magazines directed at users of IBM-type PCs.

To be sure, Apple isn't abandoning operational simplicity for dull corporate muscle. The Macintosh interface is still superior to Windows, but Apple is being forced to innovate at a faster pace than before. With System 7.0, developers can direct high-level services using only a handful of system calls, instead of the dozens required in the past. Users can thus expect to see communications capabilities in any application where it makes sense, simply because it is easier for developers to include them. The net effect is that Macintosh applications will tend to be more powerful and still easier to use.

While System 7.0 is laying the groundwork for new types of computing, DOS 5.0 makes no such claims. "We're no longer trying to grow the application base for DOS," said Microsoft's vice president of applications, Mike Maples.

Instead, the new system was created to make the life of the end user a lot simpler — not a feature DOS was known for. DOS 5.0 is in many ways rectification for the nightmare of DOS 4.0, which was filled with scores of software incompatibilities. Many of the bugs were weeded out when Microsoft reworked the code into DOS 4.01, but many stayed with the DOS 3.1 and 3.3 releases, and the prestige of DOS took a hit.

DOS 5.0 subsequently addresses many long-standing user requests, including expanded memory features and a revamped graphical shell. Along the way it should remove the bitter taste of DOS 4.0.

The next few weeks will see Apple and Microsoft exchange hats in a fundamental fashion. The winner, of course, is the Macintosh and DOS user looking to secure the best of both worlds. The two computer giants may have pooh-poohed each other's approach to desktop systems in the past, but a more demanding user base has proved that it's never too late to teach old dogs new tricks.

Daly is a *Computerworld* West Coast senior correspondent.



DEC opens ACA to DDE

MAYNARD, Mass. — Digital Equipment Corp. said it has extended its Application Control Architecture (ACA) to integrate with Microsoft Corp.'s Windows V3 Dynamic Data Exchange (DDE) and Object Linking and Embedding (OLE) mechanisms.

This will allow users of DDE-compliant Windows 3.0 applications to invoke and interact with applications transparently on DEC's Unix and VMS systems, the vendor said.

First announced in December 1990, ACA is an object-oriented software technology said to facilitate dynamic linking of independently developed applications across the network.

According to DEC, the integration of DDE/OLE and ACA means users will not have to modify Windows applications to link to the DEC systems.

Lotus delivers tool kit for Improv

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. has shipped the Application Programming Interfaces (API) Toolkit for Lotus Improv, a version of its 1-2-3 spreadsheet for Next, Inc.'s namesake computer.

The tool kit is said to provide developers with the programming tools to automate Improv tasks, navigate through Improv models, connect to external data sources and access Improv from independent applications.

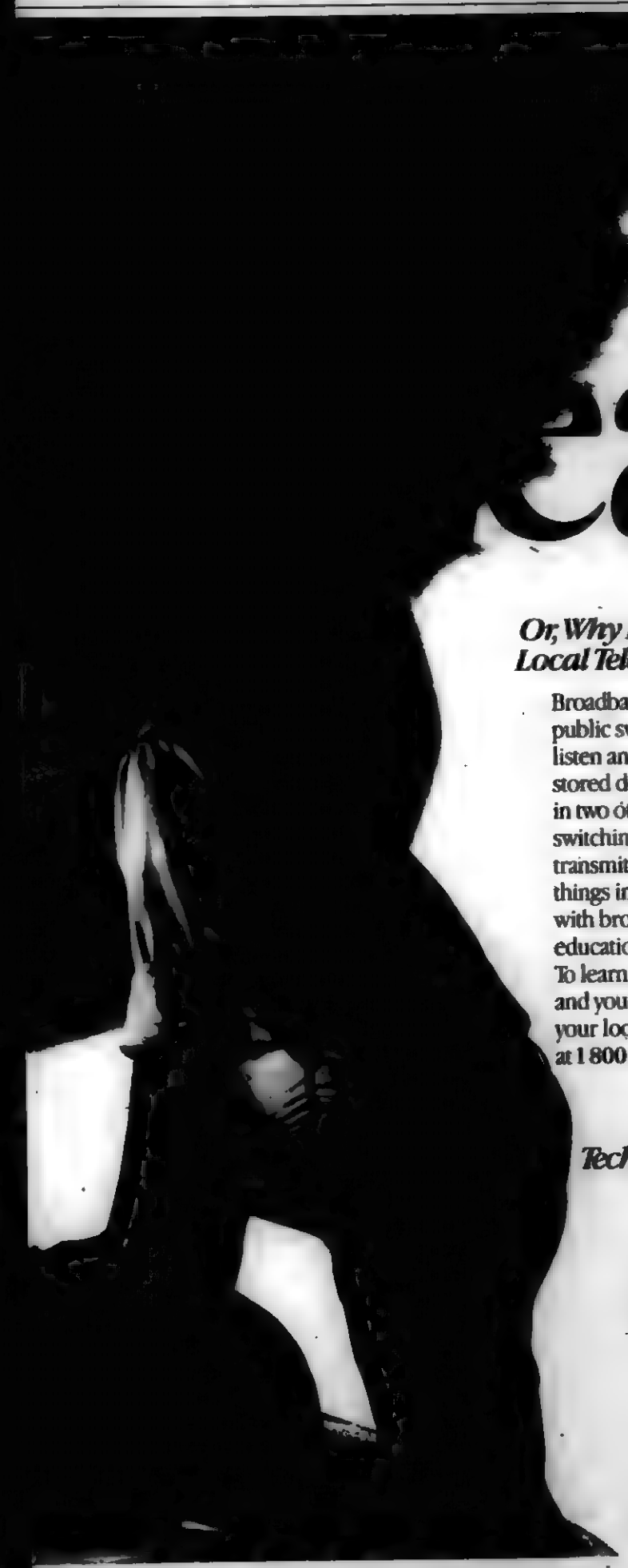
Jeffrey E. Anderholm, Improv marketing manager, said the API Toolkit will open the door to customized applications and the potential for add-on products.

Objective Technologies, Inc. (OTI) in New York is the first developer to create third-party software for Improv using the Improv Toolkit. OTProvide is a database link and query manager that allows users to import data from relational databases directly into Improv.

OTI President Alex Cone said he created a working version of OTProvide in one month, thanks to the tool kit and the Next development environment.

The API Toolkit features two implementations of the API: one for use with independent applications and another for use with the code that is dynamically linked to Improv.

Other tool kit specifics include internal Improv function calls, utility routines with associated source code, examples that show how to use the API cells, a simple back solver and an API link tester. The API Toolkit is available free of charge to Improv users and Next developers.



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Freelance goes Windows

CAMBRIDGE, Mass. — Lotus Development Corp. recently began demonstrating Freelance Graphics for Windows to the press and analysts.

One highlight of the package is Smartmaster, which Lotus said will make the package easy to master, from the initial learning curve through presentation creation. Instead of starting off with a blank "page," Smartmaster takes a fill-in-the-blanks approach by providing users with sets of predesigned pages.

A 30-minute on-line tutorial called Quickstart guides users through the creation of their first presentation. Other new functions are global editing capabilities, more than 500 clip art images, predesigned color palettes, powerful charting capabilities and a wide range of editing tools such as polygons, circles, ellipses, Bezier curves, arrows and points editing. Also supported is Microsoft Corp.'s Object Linking and Embedding, Dynamic Data Exchange and the Windows Clipboard.

Windows

FROM PAGE 39

giving the computer time and system awareness vs. radically adjusting the Windows interface.

According to the developer, the package works with the user to decide what commands to execute and when to execute them — even if the user is not there. All other applications on the computer become satellite programs, working together in any way the user determines.

Multimedia was another Comdex theme buttressed by related product announcements.

Expert-Ease Systems, Inc. demonstrated Intelligent Tutor, a multimedia training tool developed using its Guild user interface development tool. Intelligent Tutor combines graphics with audio and video media running under Windows 3.0.

Online Products, Inc. showed digital sound adapter cards that let developers incorporate randomly accessible audio sound bites into Windows-based multimedia presentations.

28½ V



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vs. 76



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NEW PRODUCTS

Systems

Samsung Information Systems America, Inc. has introduced a line of personal computers that include bundled software.

The Sensor SP 286, a 12-MHz system, offers 1M byte of random-access memory, an IBM Video Graphics Array (VGA) monitor, Microsoft Corp.'s MS-DOS, Geoworks' Ensemble and several utilities programs installed on the 40M-byte hard disk.

The 16-MHz Sensor SP 386SX includes 2M bytes of memory and an Extended VGA monitor. MS-DOS, Microsoft Windows 3.0 and advanced utilities are installed.

The SP 286 costs $1,399. The SP 386SX costs $1,995.

Samsung Information Systems
3655 N. First St.
San Jose, Calif. 95134
(408) 434-5400

Cumulus Corp. has announced small-footprint 25-MHz and 33-MHz Intel Corp. 80386-based versions of its GLC personal computers.

Models configured for stand-alone and network use are available. The company reported processor performance of 8.1 million instructions per second by the 33-MHz version.

All models include an IBM Video Graphics Array monitor, 1M byte of memory, a mouse and Microsoft Corp.'s Windows 3.0. Pricing starts at $1,695 for a 25-MHz system.

Cumulus
23500 Mercantile Road
Cleveland, Ohio 44122
(216) 464-2211

St. Croix Computers, Inc. has announced a tower system based on the 40-MHz Advanced Micro Devices, Inc. 386 processor.

A configuration with 4M bytes of random-access memory, 64K bytes of cache memory, a 125M-byte hard drive and a Super VGA monitor is priced at $2,988.

The company also unveiled an Intel Corp. 16-MHz 80386SX-based notebook computer weighing 6.2 pounds.

With a 20M-byte hard drive included, the system costs $2,328.

St. Croix Computers
4661 Stillwater Blvd.
Stillwater, Minn. 55082
(612) 943-8618

Development tools

Custom Micro Concepts, Inc. has announced an upgrade of Cuaccess for Clipper, a tool kit for developing IBM Common User Access-compliant application front ends.

Cuaccess creates adjustable windows, mouse support, push buttons and scrollable lists under Nantucket Corp.'s Clipper Summer '87 development environment. Support for Clipper 5.0 will be added.

The product costs $295.

Custom Micro Concepts
Suite 957
Bowling Green Station
New York, N.Y. 10274
(212) 988-5050

Asymetrix Corp. has released Toolbook 1.5, an upgrade of its development tool kit for Microsoft Corp. Windows 3.0 applications.

According to Asymetrix, performance has been dramatically increased in Version 1.5. New features include the ability to import graphics and handle larger files. Dynamic Link Library and Dynamic Data Exchange support have been enhanced as well.

Toolbook 1.5 is priced at $395.

Asymetrix
Suite 717
110 110th Ave. N.E.
Bellevue, Wash. 98004
(206) 462-0501

Solution Systems, a division of Software Developer's Co., has updated Brief, its personal computer-based text editing tool for programmers.

Version 3.1 adds mouse support, dialog box support and Expanded Memory Specification caching. Other features of the program are keyboard reconfiguration, a macro language and template editing.

The program costs $258; upgrades cost $89.

Solution Systems
372 Washington St.
Wellesley, Mass. 02181
(617) 431-2313

Software utilities

The Sword 1.0, a shorthand typing application, cuts keyboard typing time by up to 25%, according to The Sword Co.

The program includes one- and two-stroke abbreviations for common words and standard suffixes and comes with automatic spacing and capitalization features. It also allows users to input customized abbreviations.

The Sword 1.0 runs in 33K bytes of random-access memory and can be toggled on and off.

The Sword 1.0 costs $69. A tutorial and money-back guarantee are included.

The Sword Co.
Suite 5
4850 Orchard Ave.
San Diego, Calif. 92107
(619) 224-0139



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Compaq's LTE: A desktop-level performer

Technology Analysis — A roundup of expert opinions about new products. Summaries written by New Products Writer Derek Slater.

The 7.8-pound Compaq Computer Corp. LTE 386S/20 is a winning combination: It smoked the competition in a number of speed tests, and reviewers said the system boasts an excellent display and good battery life. A quirky keyboard layout and the above-average price were the only real complaints.

Performance: The LTE scored well in every area tested by personal computer publications, including processor, disk and video speed.

Ease of use: The system's edgelit IBM Video Graphics Array display is crisp and readable, but the 81-element keyboard was not popular. Function keys are small, paging keys are operated using a shift key, and cursor arrow keys are in an L shape.

Design: The LTE weighs slightly less than eight pounds and has true notebook dimensions: 8½ by 11 by 2.2 inches.

Battery life: Battery life averaged close to three hours.

Value: Compaq recently chopped the retail price from $6,499 to $4,399 for an LTE with a 30M-byte hard drive. If the price cut reaches end users, there is little fault left to find in the system.

Compaq Computer Corp.'s LTE 386S/20

Reviews	Performance	Ease of use	Design	Battery life	Value	Score
[illegible] 3/4/91	[illegible]	Very good	Very good	Good	Good	7.7*
PC Week 3/3/90	Good	Satisfactory	Satisfactory	Satisfactory	NC	Desktop features
PC [illegible] 3/12/91	[illegible]	[illegible]	NC	NC	Premium price	[illegible] choice
Users						
[illegible], [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NC
Don Pennacchio, Pitney Bowes, Inc.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NC
[illegible], [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NC
Analysts						
[illegible], [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Priced too high
George Thompson, Datapro Research Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Complete machine
[illegible], [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Best performer

Key: Very good, Good, Fair, Poor. Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC: No comment. *InfoWorld score based on 1 to 10 ratings.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
[illegible], [illegible]	[illegible]	[illegible]
Eric Zimits, Rauscher Pierce Refsnes	[illegible]	[illegible]

Compaq Computer Corp. in Houston reported second-quarter profit of $22.6 million compared with $104.3 million in first-quarter 1990. Revenue was down 15% to $733 million compared with $862 million in 1990

Compaq responds

John Sweney, spokesman:

Ease of use: Users said the L-shaped cursor key layout was a reasonable trade-off to keep the form factor and the full-size keys.

Value: There is a price to pay for extraordinary performance, compatibility and ruggedness. It is not a commodity market. But the street prices have dropped dramatically for these systems.

TI's Travelmate: Small size without sacrifice

Texas Instruments, Inc.'s Travelmate 3000

Reviews	Performance	Ease of use	Design	Battery life	Value	Score
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PC Week 1/28/91	Didn't "wow" lab	Good keyboard	NC	NC	NC	Winning features
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Users						
[illegible], [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Good [illegible]
Sheldon Laube, Price Waterhouse	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NC
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Analysts						
[illegible], [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Priced [illegible]
JoeAnn Stahel, Storeboard/Computer Intelligence	[illegible]	[illegible]	[illegible]	NC	[illegible]	Pricey
[illegible], [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Key: Very good, Good, Fair, Poor. Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC: No comment. *InfoWorld score based on 1 to 10 ratings.

Vendor financial ratings

Analysts	Long-term stability	Short-term [illegible]
[illegible], [illegible]	[illegible]	[illegible]
Vince Gliński, Labe Simpson & Co.	[illegible]	[illegible]

Texas Instruments Inc. in Dallas had a net loss of $54 million for the first quarter of 1991. In 1990, the company had a profit of $13 million. Revenue for the quarter increased 7% from $1.54 billion to $1.65 billion.

Texas Instruments responds

Vaughn Watts, engineering manager, and Nasir Ahmed, marketing manager:

Ease of use: The magazine that said the keyboard is "mushy" said that the exact same keyboard was great in a review of a different model.

Battery life: You can set video parameters and use built-in utilities to extend battery life.

Not everything is bigger in Texas: The Travelmate 3000 from Texas Instruments, Inc. weighs a scant 5.8 pounds and stands less than two inches tall. Reviewers found that the Travelmate makes remarkably few sacrifices to stay slim.

Performance: The notebook, powered by a 20-MHz Intel Corp. 80386SX chip, registered good scores in speed tests, although it did not lead the pack. Drive access times are very good, reviewers said.

Ease of use: The Travelmate's edgelit screen won praise for overall clarity. However, the keyboard earned a "poor" rating from *PC World* for small function keys and a "mushy" feel.

Design: At 5.8 pounds, the Travelmate weighs less than most of its 386SX competitors, even with an optional modem included. The system measures 8.6 by 11 by just under 2 inches.

Battery life: The Travelmate cuts clock speed back to 10 MHz to save power when running on the battery. At either 10 or 20 MHz, however, battery life tested at less than two hours.

Value: While it is not the fastest or most rugged portable, TI's notebook, priced at $3,199 with a 20M-byte hard drive, is a strong competitor because of its excellent portability and respectable speed, reviewers said.

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BIT BLAST

AT&T gear to Kuwait

AT&T has reportedly delivered to Kuwait $7 million worth of communications equipment that the country's Ministry of Communications ordered less than 60 days ago to help the war-torn country restore telephone service. AT&T said it will also install and maintain the two 5ESS central-office telephone switches and the earth station shipped to the ministry.

Spurring ease of development for Novell, Inc. Netware networks, Austin, Texas-based **Syscorp International** is currently selling its personal computer-based Netware applications generator, Microstep Version 1.5, for $2,495 rather than its usual $7,500 to Netware customers and Novell resellers. Version 1.5 allows users to build Netware 286, 386 and Btrieve applications graphically without writing any code.

West Coast companies looking for backup networks will have more choices by virtue of an interconnect agreement between alternative local telecommunications carrier **Teleport Communications Group** and **Pacific Bell**. The Teleport San Francisco subsidiary's local fiber-optic network will link to a Pacific Bell central office in downtown San Francisco.

3Com users see unclear future

Company's 3+ Open deal with Microsoft changes the rules on customers

BY JIM NASH
CW STAFF

Six months after 3Com Corp. handed its LAN Manager-based network operating system, 3+Open, back to Microsoft Corp., 3Com user groups are still wondering what the switch means for them.

The mood among 3Com user groups could best be described as uncertain. Some thought regional user organizations would become stronger as vendor support for existing 3+Open systems eventually ebbs. Others said members will merely concentrate on 3Com's new strategic direction: internetworking.

More, however, have spent their meetings complaining about how the 3+Open deal came down. A few contemplated disbanding because most members will either move up to LAN Manager or switch to competing systems from Novell, Inc. and Banyan Systems, Inc.

"Our group is not disbanding," said Willy Pan, leader of the Houston 3Com Users Group, a subset of the 10,000-member Houston Area PC Users' Group. In fact, Pan said, "there's a 50-50 chance that the 3Com group will strike out on its own" this year.

3Com, based in Santa Clara, Calif., decided late last year to staunch the losses it said it was incurring by licensing its own brand of LAN Manager. It was generally known, group leaders agreed, that 3+Open sales were flagging. But Pan said he and his group were shocked that Microsoft would completely absorb 3+Open.

Similar questions

Bill Riess, supervising engineer at Commonwealth Edison Co. in Chicago, said the local user group there reacted similarly. While Pan's group was independently formed, the Chicago chapter was organized and is run by local 3Com sales staff, according to Riess.

He explained that before the change, the group was focused purely on 3+Open and the features 3Com was designing for it. Since then, members have used the meetings largely to reach an understanding of practical issues such as how support would be handled and who would supply what features.

Riess acknowledged that many of the members are still confused about these issues. Members of the Albuquerque, N.M., group are also scratching their heads, said Glenn Perical, vice president and co-owner of reseller High-Tech Associates. Perical, who is the de facto leader of the loose organization, said members still do not understand even who they should buy LAN Manager from.

As understanding increases, Riess said, group discussions

Continued on page 58

Study predicts future growth in data services

BY ELISABETH HORWITT
CW STAFF

PARSIPPANY, N.J. — Carriers' efforts to snag a major portion of the burgeoning enterprisewide data communications market will be largely successful over the next few years, according to a recent report by Insight Research Corp., based here.

The data communications market is expected to grow at a rate of 25% per year for the next few years, while carrier-based switched data services will increase their revenue by 45% per year, according to the research firm.

However, emerging switched digital services such as Integrated Services Digital Network (ISDN) and frame relay will account for a comparatively small percentage of those market gains, leaving a huge portion of revenue to be accounted for by the old switched analog services, Insight said.

"An awful lot of data is still being sent via modem over the analog network and over voice-oriented services like Megacom and WATS," Insight President Robert Rosenberg said.

Indeed, the switched analog data services market will account for about 78% of the total switched data services market this year and will still make up 56% of switched services revenue in 1996, Insight predicted.

PCs play large role

The driving force for analog switched services is the huge number of personal computers now equipped with modems as well as the large number of terminals, such as automated teller machines and credit-card verification terminals, that currently use the regular telephone network, the report said.

Public packet-switched services based on the CCITT X.25 standard make up the next biggest growth factor in the switched data services market, Insight said. Such services will bring in revenue of $932 million this year and $3.2 billion in 1996, according to the report.

While packet-switched services do not go back as far as analog switched offerings, they have had more than one decade for the technology to mature and establish a firm, broad user base.

In contrast, switched data digital services were virtually

Continued on page 54

Not to be forgotten

A large portion of the growing switched data services market will continue to be analog transmissions



Source: Insight Research Corp.

CW Chart: Doreen St. John

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FM radio waves take on data role

BY JOANIE M. WEXLER
CW STAFF

If the resource is there, why not use it?

That is the philosophy of several firms improving their communications turnaround time by piggybacking data onto FM radio airwaves via service and equipment from Salt Lake City-based Mainstream Data, Inc.

Mainstream operates a 19.2K bit/sec. nationwide data broadcasting network that allows its customers to disseminate time-sensitive information — such as financial data and news — from a single source to printers at multiple sites. Mainstream sublets leftover FM bandwidth from 13 nationwide radio stations and resells it in 300 to 2,400 bit/sec. chunks for about $50 per month per site, including receiver hardware. Receiving satellite dishes at the radio stations link to a satellite backbone.

While about 80% of Mainstream's customers are in the financial services industry — Dow Jones & Co., Telerate Systems, Inc. and Knight-Ridder Financial-Americas — innovative applications have emerged in other firms needing a quick, inexpensive way of shipping a message to many sites simultaneously.

For example, Breakdown Services Ltd. in Los Angeles is broadcasting synopses of television commercial scripts and talent requests to casting agents in 120 sites. The demand for actors is usually only one day, requiring quick communications with many sources at once, explained Peter Weiss, executive vice president at Breakdown.

Weiss said Breakdown's previous modem-based system — still used as a backup — required a telephone call to each site, while the Mainstream approach involves just one call to many locations. With the modem-based system, Breakdown not only had to pay for each call, but "at our peak times between 10 a.m. and 2 p.m., the system could back up," Weiss explained. "Now, our volume is up because everyone gets the message at the same time. We can do more business."

Helping various industries

Allied Information Networks in Kelseyville, Calif., is reselling the FM service for $100 to $500 per month. The firm operates separate networks catering to farm, truck and construction equipment dealers.

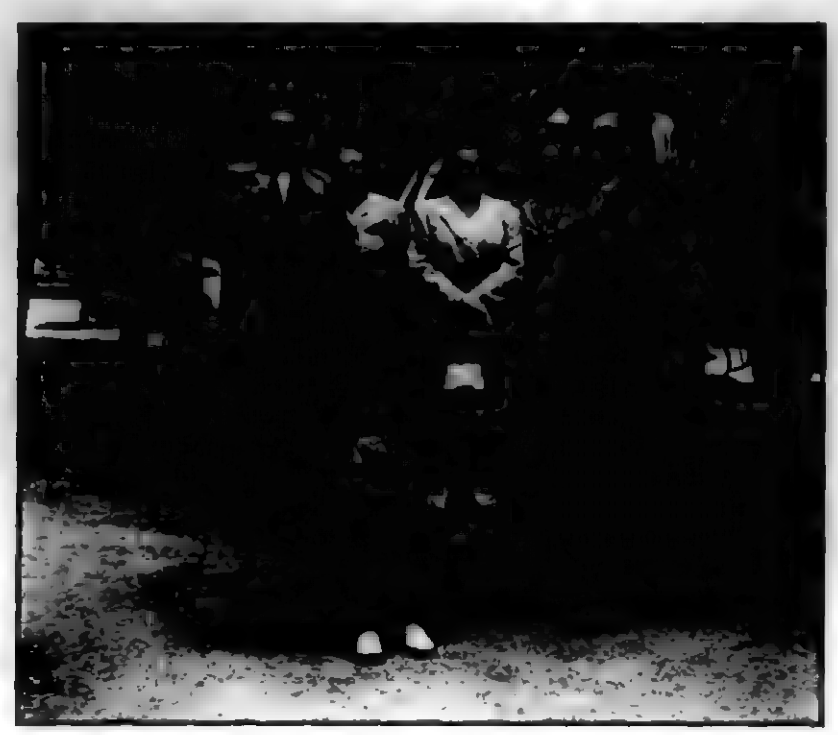
"If a dealer doesn't have a part, he can type in a message to be received by all parties who might have it, or he can send one message directly to another dealer, say, with a confidential price quote," explained Eric Shaul, vice president of sales and marketing.

The Mainstream approach has replaced an overnight 800 dial-up service that required the company to manually compile a list of needed parts during the day and a personal computer to dial up each customer with the requested information at night, Shaul said.

"The bottom line is that now we're providing a more valuable service so we can charge a lot more for it," Shaul said.

He and Weiss both emphasized the expandability inherent in Mainstream receivers, because it allows "nearly unlimited addressing options," Shaul said. "This means we can continue to grow our business."

Mainstream installs a receiving satellite dish at each FM radio station. Data is processed through a computer, formatted for the FM signal, then injected into the FM broadcast stream.

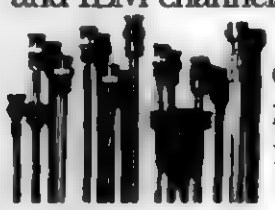


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Data services

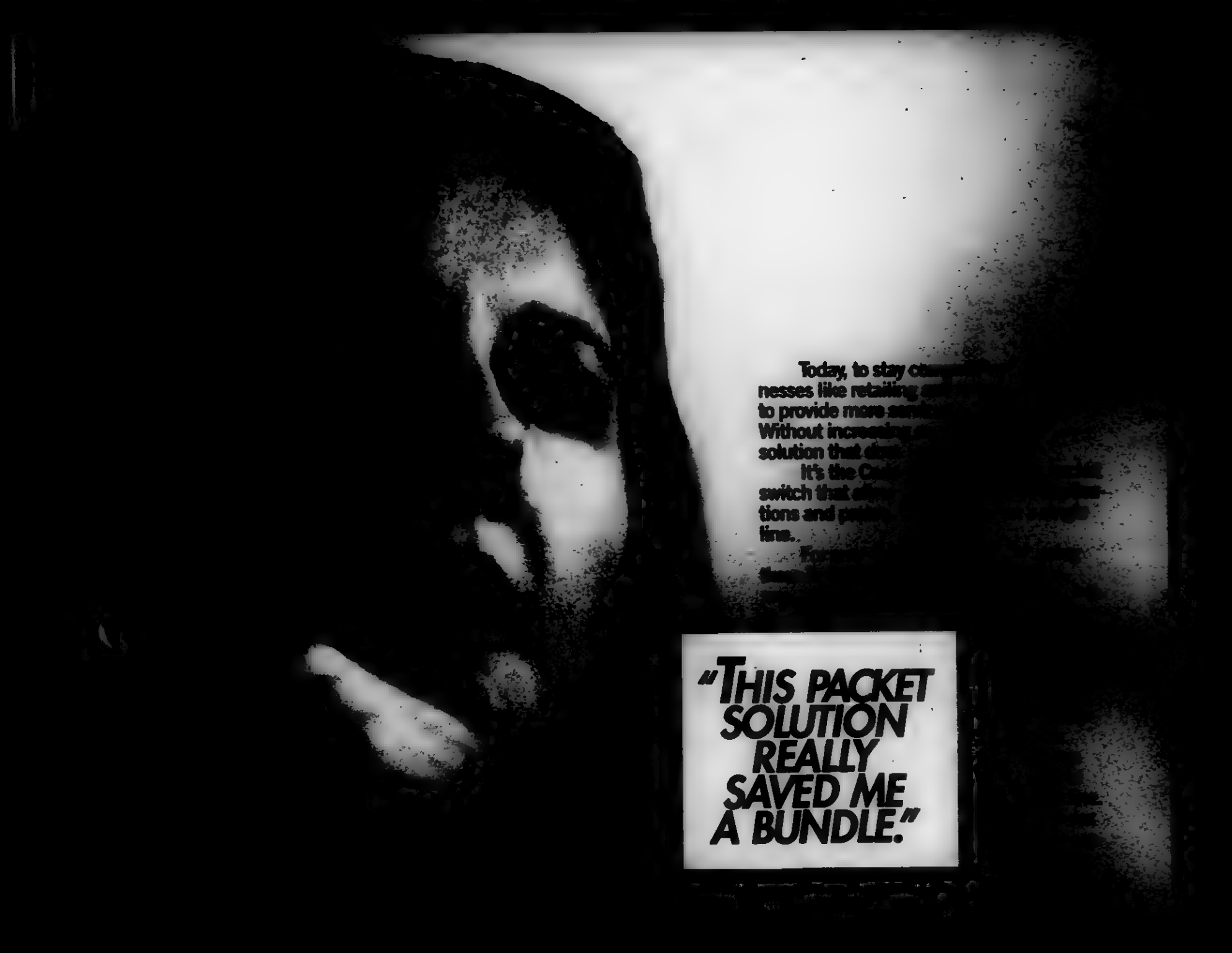
CONTINUED FROM PAGE 51

nonexistent in 1989 and will only reach $2.7 billion in revenue in 1996. This makes up less than 10% of the total 1996 switched data market, Insight said.

The above market is composed of ISDN and non-ISDN services. ISDN, the emerging standard for digital transmission of voice, data and video, will account for $59 million of the switched data digital market this year and for $1.5 billion in 1996, Insight predicted. The market will begin to take off around 1993, when local carriers are expected to begin offering the technology throughout their networks and user base.

Led by AT&T, the three leading interexchange carriers began introducing non-ISDN high-speed switched digital services about one year ago. Current offerings support speeds of 56K, 64K and 384K bit/sec., with 1.5M and 45M bit/sec. links expected by year's end, Insight said.

Frame-relay services, yet another emerging high-speed switched digital offering to emerge in the past couple of years, is expected to bring in $1.4 billion in 1996. One factor that clouds the future of frame relay is the lack of firm commitment on the part of carriers such as AT&T to introduce such services, Rosenberg said. The local carriers in particular have come out much more strongly for Switched Multimegabit Data Service, which uses the carrier's central-office switch as a hub for interconnecting multiple user sites at high speeds.


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2.

3Com

FROM PAGE 51

are again turning back to 3Com's agenda, and this time they are centered on internetworking products. The consensus in the group is to stick with 3+Open and LAN Manager and to hold the group together.

Pan explained that most of his 40 or so active members "pretty much intend to migrate to LAN Manager." Pan is a software specialist at Honeywell, Inc.'s Industrial Automation Control Division.

A New Orleans user group has apparently dissolved. The leader of that group no longer works at Ochsner Medical Institutions, and his replacement, network manager Eric Castillo, said he is unaware of any such organization in the area.

What is more, Castillo said he is unlikely to create such a forum. Ochsner had been ready to upgrade from 3+Share to 3+Open when 3Com's announcement was made. Upgrade discussions came to a halt, Castillo said, and talk of jumping to Novell Netware surfaced.

"There is a close look at the offerings in the works," he said, "and it is not positive" for 3Com. Riess said 3+Open's primary attraction was that companies could pick up LAN Manager with 3Com additions for basically the same price as Microsoft's vanilla LAN Manager.

Migration questioned

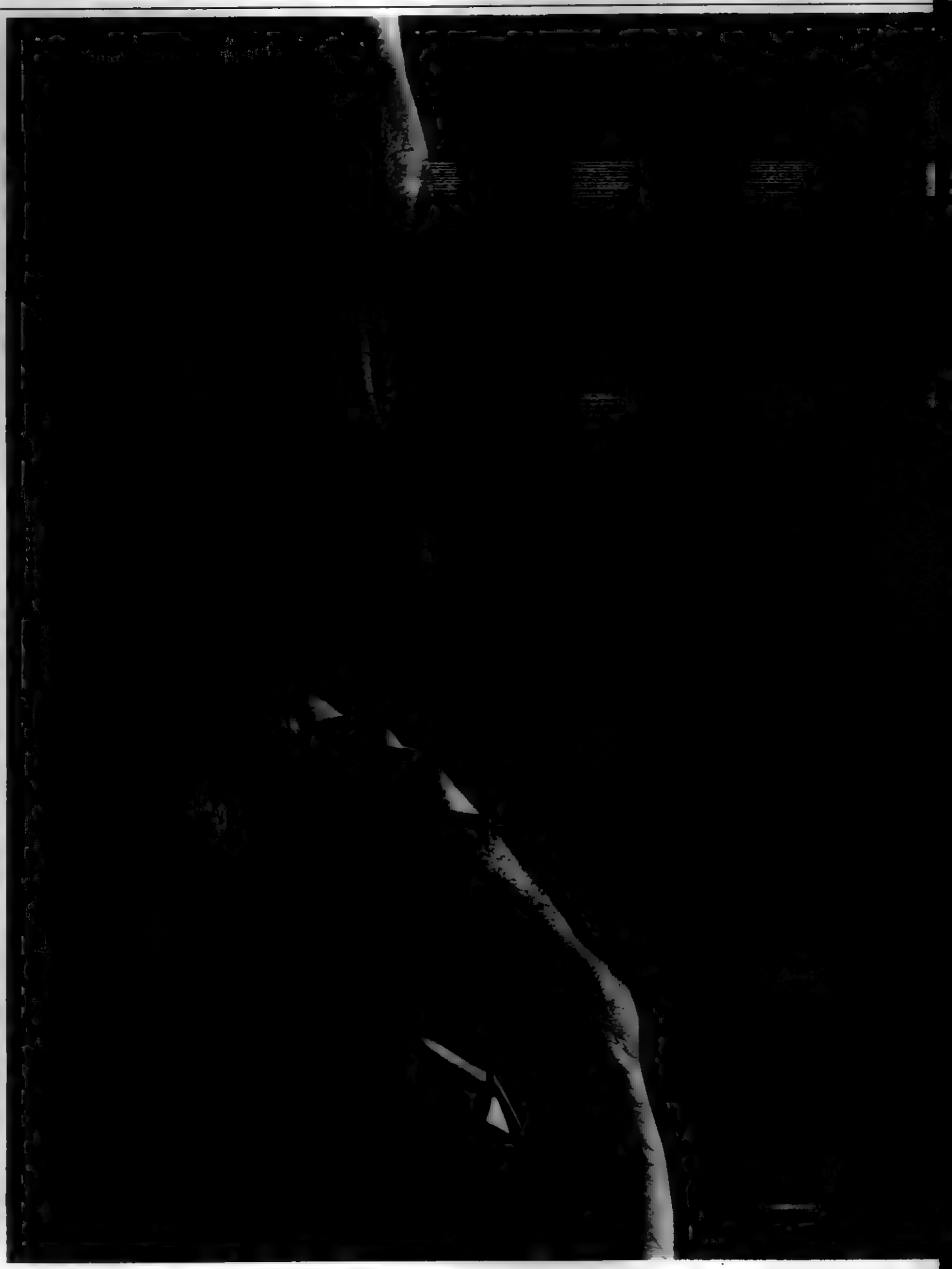
Price and options are not the only considerations, Castillo said. "No one has convinced me that migrating to LAN Manager 2.0 is going to be painless." He said he has 500 users on a network that operates 24 hours per day every day. If migrating will disrupt things at all, why not make the jump to Netware altogether, Castillo said, describing managers' discussions so far.

Perkal said members of the Albuquerque group may disband. They are unhappy with 3Com for not being able to sell 3+Open, and they are mistrustful of Microsoft's promises. Redmond, Wash.-based Microsoft has said it will provide a migration path for 3Com users.

"Microsoft hasn't delivered on some promises in the past," Perkal said, citing the company's controversial about-face on co-development of OS/2 with IBM. "If they can't deliver on that for IBM, are they going to be able to deliver on 3+Open?"

3Com has closed "two or three U.S. offices," said Bob Finocchio, executive vice president of 3Com's field operations, but he said he has no plans to close any more. The closures are not a retreat by 3Com, he said, and have "had no impact on customers."

Finocchio said two of the offices closed were sales offices without support functions.



TCP/IP via Spectrum

ATLANTA — Spectrum Concepts, Inc. has found yet another way to extend the reach of its IBM LU6.2 file-transfer software, this time to the Transmission Control Protocol/Internet Protocol (TCP/IP) environment.

The New York-based software company and Carrollton, Texas-based Openconnect Systems, Inc. announced last week at the Comdex/Spring '91 show here that they have achieved compatibility between Spectrum's Xcom6.2 software and Openconnect's Openconnect/APPC.

Openconnect's software is said to allow a system running TCP/IP networking protocols to communicate with LU6.2 systems over a TCP/IP network.

Openconnect/APPC achieves this by implementing a library of Advanced Program-to-Program Communications (APPC) calls on a TCP/IP system and then encapsulating the calls in TCP/IP protocols so they can travel over the TCP/IP network, according to an Openconnect spokeswoman.

The agreement with Spectrum further extends that communications environment because Spectrum's Xcom6.2 file-transfer software runs on a variety of non-IBM systems.

ELISABETH HORWITT

Software may bring PCs PBX function

BY JOANIE M. WEXLER
CW STAFF

BILLERICA, Mass. — The sluggish ISDN market may soon receive a shot of adrenaline if software announced recently by start-up firm Unifi Communications Corp. technically matches its marketing claims.

Although still in the pilot stage, the Phoneserver platform and accompanying Distributed Call Center application software are ambitious in their aim to replace expensive proprietary call routing and management hardware, such as automatic call distributors and private branch exchanges (PBX). The software could eventually end Integrated Services Digital Networks' (ISDN) decade-long search for a major application, analysts said.

Unifi's software runs on Unix-based Intel Corp. 80386- and 1486-based personal computers and uses ISDN's intelligent signaling channel to route and manage calls anywhere in a public-switched telephone network supporting Basic Rate Interface — 144K bit/sec. — ISDN. Basic rate ISDN is available today in 20% to 25% of regional Bell operating company central offices, according to Stamford, Conn.-based Gartner Group, Inc.

The Phoneserver platform is a convenient and cost-effective alternative to traditional switching equipment that "binds call-processing functions to the geographic location of a switch," said Bill Flood, director of customer services integration engineering at Illinois Bell Telephone Co., where the software is being tested. So far, Flood said, "the technology is being proven. It works fine with the [AT&T] 5ESS switch," and the carrier plans to begin compatibility testing in the near future with the Northern Telecom, Inc. DMS-100 central office switch.

Illinois Bell — a pioneer in ISDN service — said it plans to use the software for internal telecommuting applications and as a drawing card for would-be customers of its ISDN service. "The software allows us to free our service and repair representatives from their physical locations because calls can be switched anywhere in the network," Flood said.

Unifi's president, Robert L. Pokress, explained that the software "gives users what they've been asking for all along: the ability to control telecommunications applications through the public network without having to own any switching equipment."

Trading hardware for software, said Joseph Baylock, program director of enterprise network strategies at Gartner Group, is a current trend that affords savings in floor space and power and provides added flexibility and investment protection.

In addition, according to Pokress, "any user who can point and click" can program customized call routing applications.

The idea behind Phoneserver — and applications such as Distributed Call Center that sit on top of it — is similar to that of IBM's Callpath, which links IBM host-resident databases with PBXs. The Phoneserver approach, however, turns the public network into the switching resource, letting the application link to multiple dispersed databases across a wide area.

A quick look

The particulars of Unifi Communications Corp.'s Phoneserver include the following:

PRICE

$65K for Distributed Call Center with bundled Phoneserver; $50K plus royalties based on deployment size for Phoneserver and basic development package

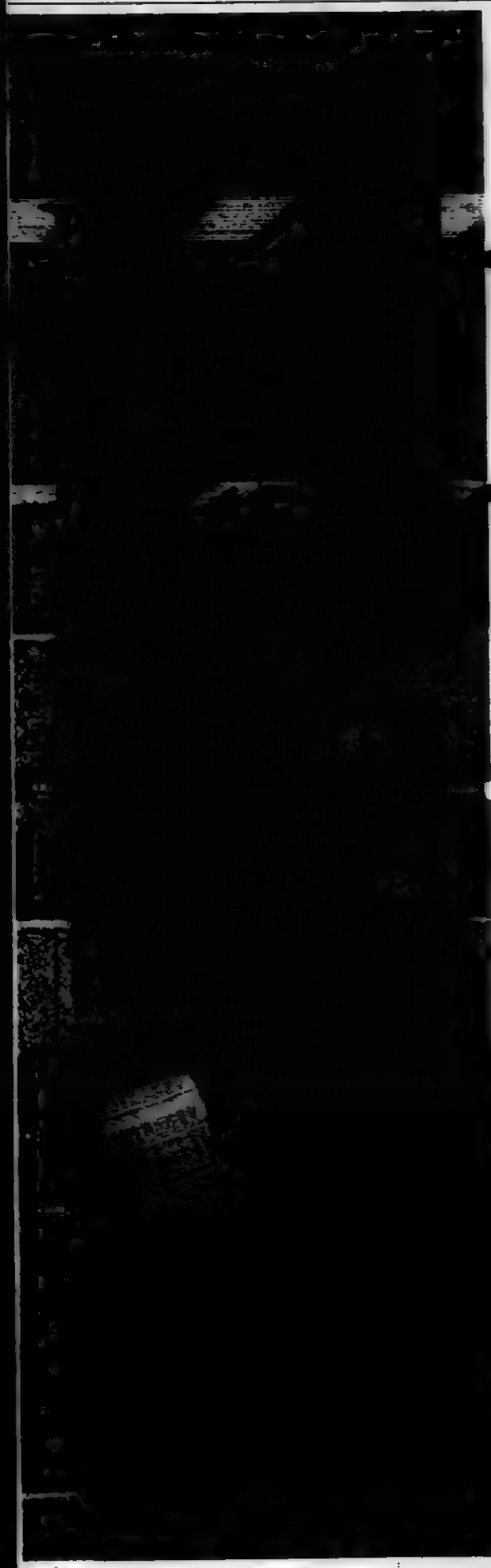
REQUIREMENTS

ISDN basic rate service from local telephone company; Basic Rate Interface card on all integrated PCs; 2M bytes of RAM on desktop; SCO Unix 386 and above PCs

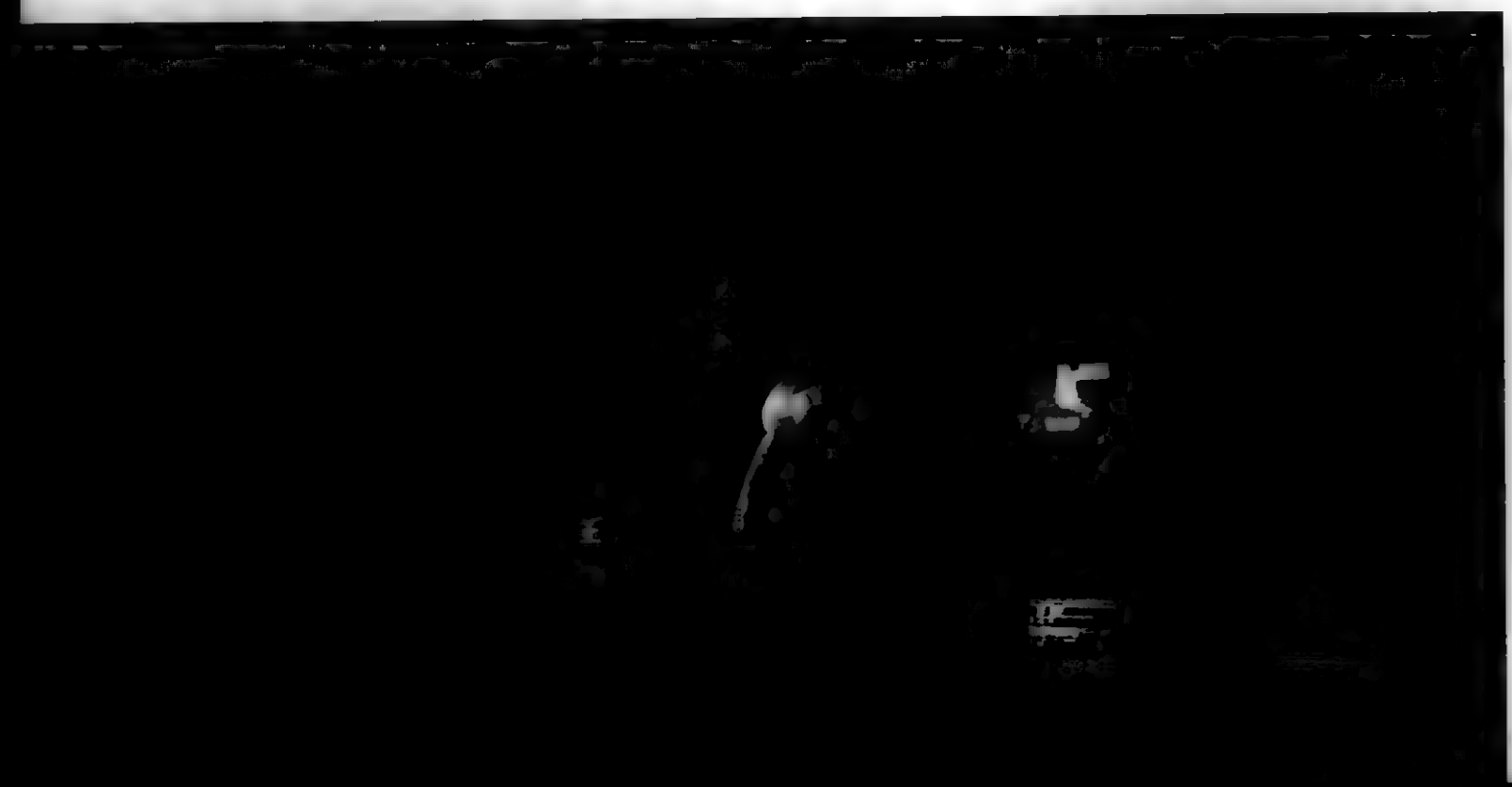
SHIP DATES

Early ship program second half 1991; general availability 1992

CW Chart: Doreen St. John



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THE CEO VIEW

Outsourcing is it at Diesel Technology

CEO Derek Kaufman has strong opinions about information systems and business

BY NELL MARGOLIS
CW STAFF

For Diesel Technology Corp., outsourcing is more than just the optimal way to run information systems — it's the only way the company has ever known.

When the manufacturer of electronic and mechanical fuel injectors hired young Derek Kaufman as president in 1988, it was at a crossroads in several respects. Formed when Penske Transportation bought the diesel fuel injection business of General Motors Corp.'s AC Rochester, Mich., Division, Diesel Technology was suddenly an independent $48 million business. At the same time, customer demands on the fledgling Grand Rapids, Mich.-based firm were changing and intensifying.

Diesel Technology needed a sophisticated manufacturing, resources and business planning system to replace its mainframe time-sharing arrangement with its former divisional owner at an annual cost of about 3% of Diesel's revenue. Kaufman considered setting up an internal IS operation but instead signed a long-term outsourcing agreement with Electronic Data Systems Corp.

The 39-year-old Kaufman has strong opinions on outsourcing and on some of the ways in which IS and the computer industry have failed to meet business expectations in the past:

On what sparked his awareness of IS as a key element of the company's business strategy:

"Analyzing our cost structure made us aware of IS. We're a 95% vertically integrated company. This has real pros from the quality control standpoint, but there's a downside, too. Inventory, overhead and flow control problems can get — I think the word I'm looking for is *horrendous*.

"We're looking to expand into new economies and countries. So the question becomes, what do we do to build a launchpad for this kind of company? We can improve the quality of the product, and we can create a cost structure that will promote expansion and growth. Information systems like the MRP II can help with the first. The second points to systems integration."

On the outsourcing decision:

"We asked, what do we do best around here? What do we do not so well that someone else does very well? The answer that kept coming back to us was, 'We're very good at making fuel system componentry. We ought to maximize the focus of every single person here on that.'

"Our first thought was to form a giant, internal IS department. Well, I knew we could do that — at [a former post], we formed almost a company within a company. I knew enough about the computer world to make me dangerous.

"We started down that path — we contracted hardware and software suppliers, and they started coming in the door. But we needed CAD and workstations and a full range of software, and I began to notice that each of the vendors was coming in with consultants in every one of the other specialties. Well, we've only got a few conference rooms here.

"With a systems integrator, we get a well-defined expense item on our ledger in return for buying power that a company this size ordinarily wouldn't have."

On traditional barriers between IS and business:

"When EDS approached us with their proposal to run our [IS] crew, one of the advantages I saw was that we could eliminate the "gray zone" of an IS department without throwing away the benefits of the technology. I think you can get whipsawed by all that information locked up in that one department of a company.

"The IS world has worked well to develop its own language, and what you see is eyes glazing over when the IS folks are talking. What excites me is, as software becomes more sophisticated, we're almost back to English! That's really where you want to be. You don't want sophistication to become a barrier.

"I have a sense that, improperly used, control of information within a company can overshadow the interpersonal relationships that are what really keep a company going. I've seen places where that has happened."

On the role of systems integrators compared to systems vendors:

"The whole implementation of a system is — or should be — based around people. And here, the people were what I'd call 'system averse.' They didn't want *any* system. Efforts to get around having one ran pretty high. Old system, new system, any system, the reaction was: 'I don't like it.'

"Meanwhile, from the hardware vendors, the idea we're getting is that a box is going to be dropped off with a stack of software and two manuals and a rep who will be around for a day or two; after that, good luck, you're on your own.

On the CEO's role in IS:

"The chief executive officer has an absolute ability to kill the implementation of change by simply being not interested. It's easy to do; I have 900 things on my plate at any given time that I could put ahead of IS. What is important to realize, though, is that the guy who wants to talk to me about it also has 900 things to do. [Penske Transportation CEO] Roger Penske has a $2.5 billion company to run — and yet, I know that I have instant access to him. If he has the interest and involvement, who am I to have less?"



Peter Yates

DIESEL TECHNOLOGY

The CEO: Derek Kaufman, 39; Bachelor's degree in mechanical engineering, General Motors Institute; married, five children

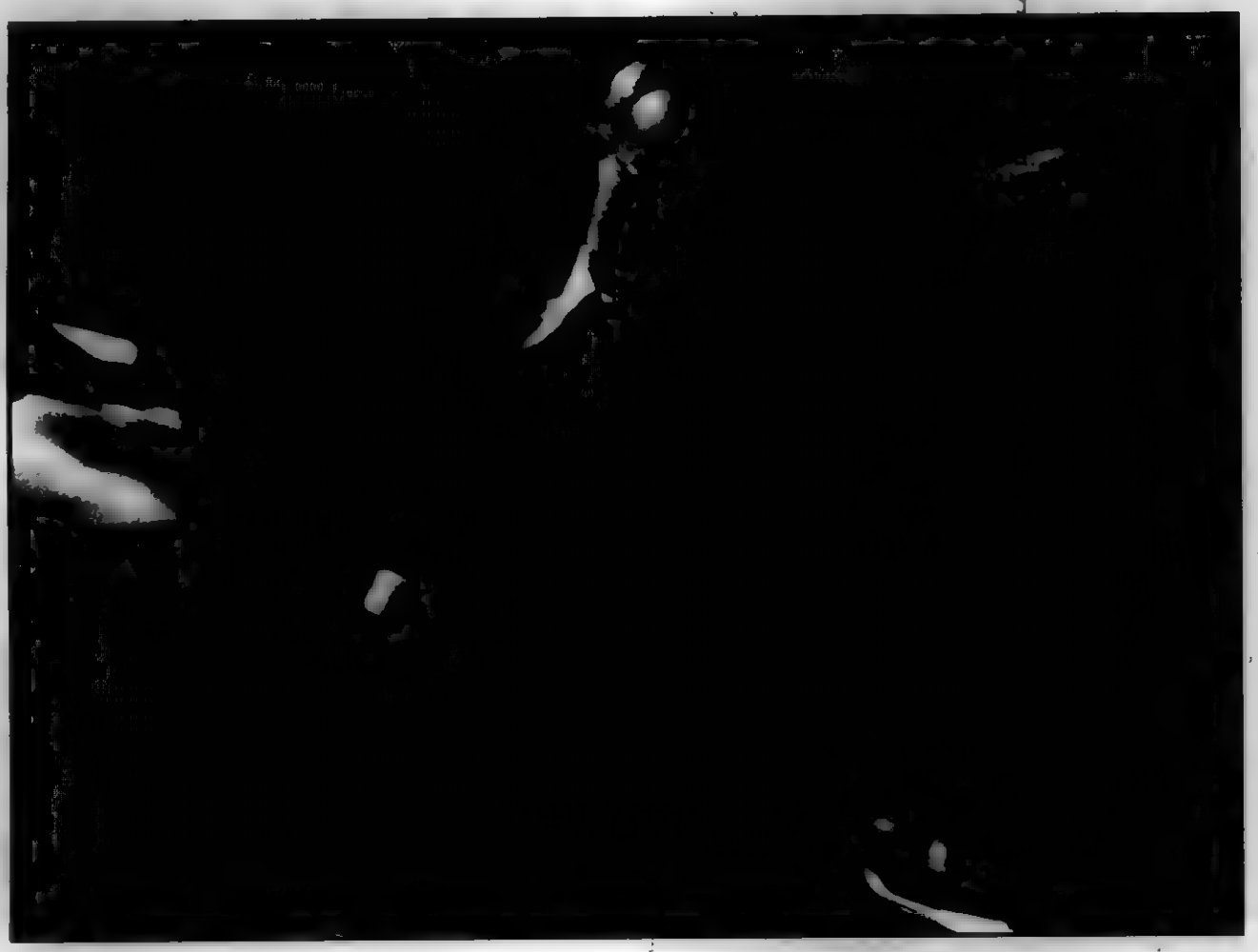
The career: President of Diesel Technology Corp., 1988-present; vice president of marketing, Freightliner Corp., 1984-1988; vice president of product support, director of marketing and other positions at Euclid, Inc. (subsidiary of Daimler-Benz AG), 1978-1984

Accomplishments: Increased Diesel Technology revenue from $48 million to $70 million in two years; led implementation of MRP II and workstation-based computer-aided design systems; increased inventory accuracy from 40% to 90%; quadrupled inventory turnover

INSIDE

▶ Merrill Lynch's DuWayne Peterson speaks on "implementing a vision" at a recent UCLA-sponsored symposium. Page 64.

▶ Book review: Gerard H. Gaynor's *Achieving the Competitive Edge Through Technology Management*. Page 66.



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TAKE ADVANTAGE OF CHANGE℠

IS executives must put their vision to work, speakers urge

BY GLENN RIFKIN
SPECIAL TO CW

LOS ANGELES — Top business executives are scrutinizing the information systems function now more than ever — and in many cases, IS is not bearing up well.

This trend has become an added impediment to the IS executive's ability to foster and follow a strategic vision, retiring Merrill Lynch & Co. Executive Vice President DuWayne Peterson told an audience of 200 Southern California IS professionals at a symposium earlier this month.

"You can't just talk about vision," Peterson said at the symposium, which was sponsored by the Information Associates program at the University of California at Los Angeles' Anderson Graduate School of Management. "You have to be able to implement it. That's what we're getting paid for."

Peterson, echoing an oft-heard sentiment at the symposium, added that chief information officers cannot be expected to bear the brunt of the technology vision alone. "Chief executive officers have to get off their butts" and get involved in computers, Peterson said. It is not enough for a CEO to deliver canned speeches about the importance of technology, he noted.



Merrill Lynch's *Peterson: CEOs must push technology*

"The key to partnering with business units is fostering a mutual respect [between IS and the users]," he said. "And that starts with the CEO."

IS executives who want to foster a technology vision for their firms must occupy a strong and visible position within top management, and there is no formula for establishing such visibility, Peterson said. "It's just plain hard work showing people that you know what you are doing, building relationships," he said.

The symposium included a keynote speech by Max Hopper, senior vice president of IS at American Airlines Co. In addition to Peterson and Hopper, CIOs at other Los Angeles-area corporations, including MCA, Inc.'s George Brenner, Southern California Edison's John Fielder and Bergen Brunswig Corp.'s Anthony Vallario, offered advice on forming an IS vision for the 1990s.

Hopper said creating a vision simply means solving a business problem. He described the work of Robert Noyce, co-inventor of the integrated circuit.

"He changed the world, but he was only trying to solve a business problem," Hopper said. "There are no magic wands we can wave to create a vision. It results from looking in all the likely and unlikely places for solutions."

Hopper suggested that leaders often become visionaries after the fact. In heading the development of American's Sabre reservations system, "I wasn't trying to be a visionary; I was trying to solve our business problems and the travel agents' business problems," he said.

Lunchtime ideas

Hopper recalled that American's Aadvantage program, the first-ever frequent-flyer program, was born "on a buffet line in the cafeteria of our flight attendants' training center." He and AMR Corp. Chairman Robert Crandall were standing in line for lunch and discussing ways to take better care of American's business customers. Another IS executive suggested combining two just-completed electronic tracking systems into a program to track customers' mileage.

"We diagrammed it on a napkin, set up a task force and six months later sprung it on the industry," Hopper said. "No one was able to match us."

Peterson, drawing from his 30 years in the IS field (he is due to retire on June 18), laid out a blueprint for both technical and organizational success in what he called a difficult time for IS. "How do you give better service and drive down costs at the same time?" he asked.

He described how he has cut Merrill Lynch's IS budget from $1.5 billion to $1.2 billion since 1987 while rolling out 17,000 personal computers to 500 locations within the firm. "It was painful," Peterson stated, "but it's paying big dividends now." The vision, he said, was based on making Merrill Lynch "the easiest financial services company to do business with."

Technical issues are buffeted by organizational issues as well, Peterson added. An organization must be open and fair and must allow people to fail. "The worst thing is a culture where people who fail are killed and thrown out the door," he said. "You have to be able to learn from the failure."

Rifkin is a free-lance writer and a former Computerworld features editor.

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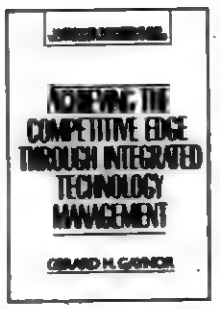
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BOOK REVIEWS

A pep talk for technology managers

Achieving the Competitive Edge Through Integrated Technology Management
By Gerard H. Gaynor
McGraw-Hill, Inc., $46.50

Business professionals are faced with decisions every day: Company A introduces a new technology, while Company B upgrades a model your company is currently using. Company A claims its new machine can serve you better. How do you decide?



Hypothetical dilemmas are sprinkled throughout Gaynor's book. The 294-page book is a guide to how workers at all levels can avoid the trap of losing money while implementing new technologies.

The book addresses basic problems of technology management, beginning with a definition of *technology*. The word itself conjures up images of complex issues, but managers must learn that technology can include any simple idea that helps accomplish a certain task.

Another problem, the author says, is that there is a love-hate relationship with new technology. While many managers may want to improve their operations, fear of the unknown creates a degree of tension when it comes time to make a decision.

The book concentrates on what the author calls "priority issues" for wise technology management. Before deciding on a new technology, many simple areas need to be reviewed, including planning, strategy and market study. Such obvious things are often forgotten, he says.

Most important, the author stresses, is not to ignore any particular area in a business. At some corporations, an effective plan can be wasted if managers and workers are not properly trained to execute a plan. By the same token, an effective staff can be wasted by poor planning.

The book closes by raising issues related to actually making the transition to a new technology once it has been decided upon. Although there is no sure way to make a smooth transition, Gaynor devotes three chapters to basic principles that can be applied in most business environments.

Gaynor's presentation of priority issues is clear, but practical examples that could make the book more enjoyable are missing. With his 35 years of experience in the technology management field, Gaynor could have reinforced his theories with some real-life situations. Basic graphs do help the reader along in some areas, but they are used sparingly. Gaynor's ideas are insightful, yet those looking for more visual aids will find the reading a bit monotonous and tiring at times.

STEVEN J. CONDON

Build Your Own 80486 PC and Save a Bundle
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Do-it-yourselfers, gather round! Aubrey Pilgrim tells how, with a small amount of elbow grease, you can build a personal computer using the very latest Intel Corp. chip set — and at a small fraction of the cost of even the "no-name" brands advertised in the back of PC magazines.

Pilgrim's writing and descriptions are concise and come with estimates of what the PC builder can expect to pay and where to get various pieces of system hardware. Actually, the nuts-and-bolts descriptions of the assembly, which takes less than an hour if you have all the parts on the table, and the accompanying black-and-white photographs occupy only a few chapters.

The timid may not follow this pilgrim, but those who do could save $2,000 to $5,000.

ELLIS BOOKER

The Next Century
By David Halberstam
William Morrow & Co., Inc., $16.95

"The Cold War is over. The Japanese won."

That quote sets the tone early on for Halberstam's latest effort, a tightly-written, 126-page book that provides ample food for thought. The book examines the post-World War II legacies of the U.S., Japan, the Soviet Union and Eastern Europe and urges Americans to wake up to the economic and social realities of their nation in decline.

Halberstam is better known for 800-page tomes such as *The Best and the Brightest* and *The Reckoning*, but *The Next Century* offers eloquent observation and insight into the forces that have shaped our current precarious position in the global economy. He argues that U.S. political dialogue and policy must shed its Cold War clothing and address the real threats to our world leadership: our deteriorating education system and economic focus on financial manipulation rather than core industry.

CLINTON WILDER

Condon is a *Computerworld* copy editor, Booker is Midwest bureau chief, and Wilder is senior editor.

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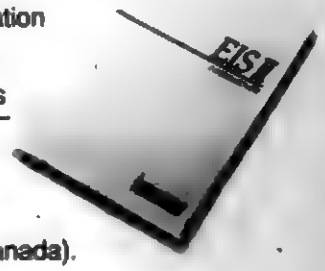
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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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For information or to register, contact IDG Management Group, Framingham, Mass. (508) 879-6700.

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National Educational Computing Conference. Phoenix, June 16-20 — Contact: Southwest Events, Seattle, [illegible]

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Interlevent '91. Hong Kong, June 19-20 — Contact: International Televent, McLean, Va. (703) 556-7778.

Supercomputing 1991 USA/Pacific. Santa Clara, Calif., June 19-21 — Contact: John Derryberry, Argus & Rudin, Inc., Redwood City, Calif. (415) 363-0982.

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Taking Control of the Future: The Role of Information Management in Business Reengineering. Nashville, June 25 — Contact: Lisa Gibson, Computer Corporation of America, Cambridge, Mass. (617) 492-8860.

Micro '91: Auditability, Security and Productivity of Micro-based Systems. Boston, June 25-27 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Multimedia '91. London, June 25-27 — Contact: Arielle Maniquet, NGA, London, England (011-44) 981-742-1818.

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JULY 7-13

Datapoint Users Group Meeting. Orlando, Fla., July 7-10 — Contact: Datapoint Corp., San Antonio, Texas (512) 593-7910.

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Sony Government Technology Exposition. Washington, D.C., July 10-11 — Contact: Sony Business and Professional Group, Montvale, N.J. (800) 877-7669.

APICS 1991 Total Manufacturing Performance Seminar. San Diego, July 10-12 — Contact: APICS Meeting Registration, Falls Church, Va. (703) 237-8344.

JULY 14-20

Guide 80. Boston, July 14-19 — Contact: Guide Headquarters, Chicago, Ill. (312) 644-6610.

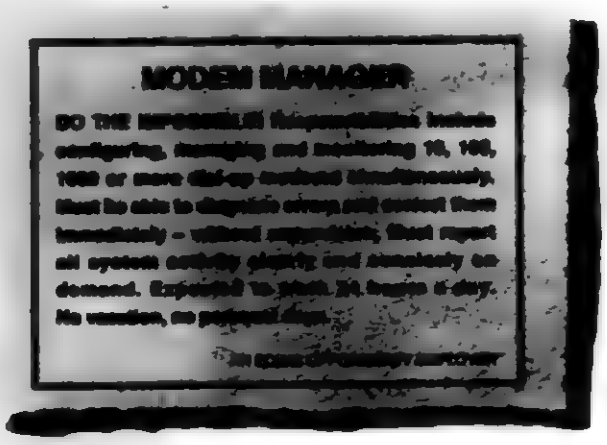
American Association for Artificial Intelligence National Conference on Artificial Intelligence. Anaheim, Calif., July 14-19 — Contact: AAAI-91, Menlo Park, Calif. (415) 328-3123.

TQM '91 Conference. Washington, D.C., July 15-17 — Contact: Paula Harrington, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-0777.

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Computer Technology and Military Planning Symposium and Exhibition. Arlington, Va., July 16-18 — Contact: Automated Missions Planning Society, Palmyra, N.J. (609) 829-7823.

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Still up in the air

Interconnected LANs make integrated network management even less possible, but standards and vendor alliances bring some pieces together

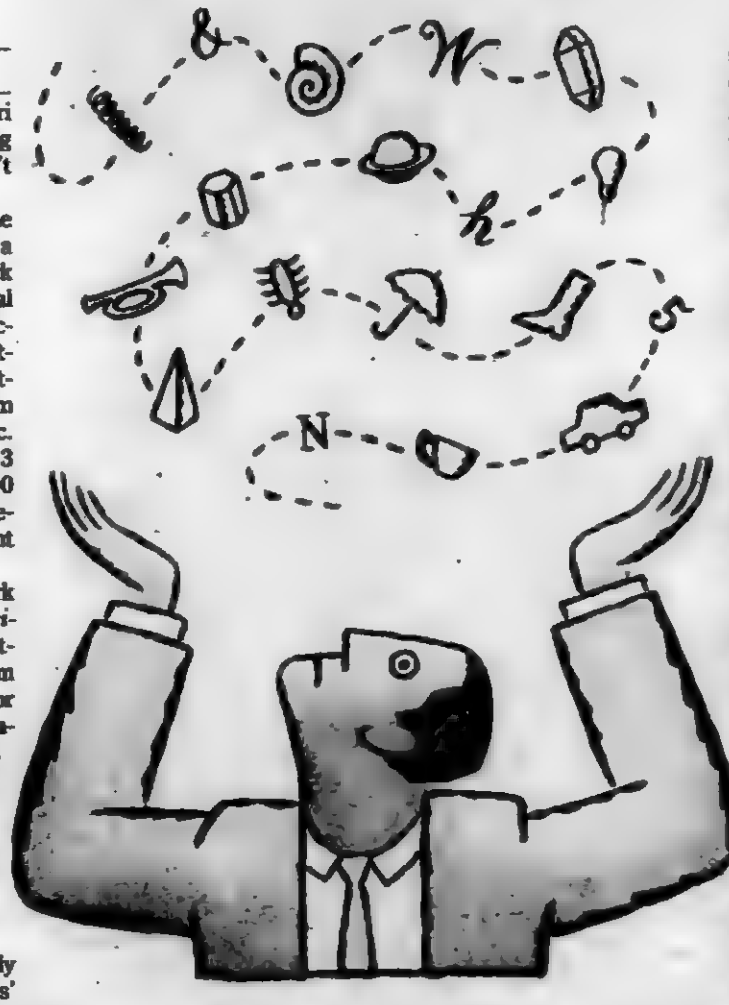
BY JULIA KING

You can't blame Lori Steinmetz for wanting something he can't have.

What he wants is one system to manage a complex internetwork of Ethernet, Digital Equipment Corp. Decnet and Apple Computer, Inc. Appletalk local-area networks, linked by bridges from DEC, Cabletron Systems, Inc. and 3Com Corp., for a total of 13 segments, with well over 500 nodes. What he wants is an integrated network management system.

To Steinmetz, data network manager at *The Christian Science Monitor*, an integrated network management system would be a central repository for all network data, including statistics, status reports, alarms and historical data. Optimally, he would access this information via a single console, while network operators stationed at consoles in several different areas would also have simultaneous access.

That kind of system is simply not available. Despite vendors' claims to the contrary, integrated network management does not exist today. No single system can manage the entire sprawl of interconnected, multivendor, multitechnology LANs many companies are contending with.



James Steinberg

Piecing it together

That's not to say vendors aren't trying. They are, especially through alliances with each other (see story page 74) and compliance with emerging standards. "What we have is a mishmash of disparate tools looking at separate pieces of the LAN puzzle," says Jill Huntington-Lee, an editor and analyst at Datapro Research Group in Delran, N.J. "The good news is there are a few emerging trends that indicate some glimmer of consolidation."

Right now, the brightest glimmer emanates primarily from the continual refinement — and growing industry acceptance — of the Simple Network Management Protocol (SNMP).

SNMP — defined by the Internet Engineering Task Force for managing Transmission Control Protocol/Internet Protocol networks — provides a common format for network devices such as bridges, routers, concentrators and modems to communicate management data via an "agent" to the management station, or "host."

The management host can be either a Unix-based workstation or a Microsoft Corp. MS-DOS-based personal computer.

Currently, about 200 organizations are actively developing SNMP products, with about 70 vendors actually shipping or ready to ship products, Huntington-Lee says.

Most of these companies are offering "element management systems," which manage vendor-specific network devices. A growing group of SNMP management station vendors (see chart page 78), however, monitor any device equipped with SNMP agents on the network.

Despite the fact that SNMP has become a de facto standard in the industry, it is debatable whether the protocol will stand the test of time.

SNMP is viewed by some as a stopgap measure until the International Standards Organization/Open Systems Interconnect (ISO/OSI) network management protocol, called the Common Management Information Protocol (CMIP), is ratified.

CMIP adds a key function to network management that SNMP doesn't currently support: It allows communications among disparate network management systems. It is also more reliable than SNMP and addresses security concerns that the current protocol does not.

Stymied by the ISO's cumbersome approval process, however, CMIP has yet to be fully defined or embraced by either users or vendors, which have to date offered few CMIP tools. Both IBM and DEC have pledged allegiance to CMIP, however — something that can't be said for SNMP.

Support, not commitment

AT&T, DEC and IBM have shown some support for SNMP, but the standard still hasn't received complete endorsement from all the major vendors, particularly IBM.

IBM offers a handful of SNMP products, including a Unix package that monitors SNMP devices, but the company probably won't make a strong long-term commitment to SNMP, says Ray Williams, senior technical staff member at IBM.

What has grown out of IBM's dissatisfaction with SNMP is another proposed set of specifications that it jointly developed with 3Com. Called CMOL, or CMIP over logical link control, the protocol is intended to

Continued on page 72

King is a free-lance technology writer based in Ridley Park, Pa.

INSIDE

Buyers' Scorecard
HP, Sun tie as users rate multivendor LAN managers. Page 76.

Product Guide
A listing of SNMP management stations. Page 78.

Outsourcing Alternative
Tips and guidelines to finding the right provider. Page 80.

Key questions

Consider the following questions before purchasing an SNMP management station:

- What kinds of proprietary management information base extensions are included in the product? Are they public information?
- Can the SNMP management station access and interpret management information bases from different vendors?
- Can it handle set commands and reconfigure networks, as well as monitor them? This depends largely on whether management information base extensions are available in read-only or read/write form.
- What kinds of alliances does the vendor have? What provisions are in place for interoperability with multivendor hardware and software?
- How much in-house effort is required to write access modules for equipment that doesn't support SNMP?
- How active is the vendor in the Internet Engineering Task Force's SNMP activities?
- Is the software reconfigurable to accommodate the CMIP standard and other standards as they evolve?

Continued from page 71

manage heterogeneous Ethernet and Token Ring LANS.

According to Huntington-Lee, however, it is unlikely that the CMOL specification will ever go head-to-head with either SNMP or the final ISO CMIP standard.

"Because CMOL runs over the logical-layer, it can't see through routers as SNMP can," she notes. "So it's limited in terms of managing internetworks."

In the absence of another full-fledged standard, then, SNMP has gained a major market presence, and users and vendors alike work around its limitations.

SNMP variations

The main stumbling block to SNMP interoperability is that not all SNMP-based equipment is created equal. Many vendors of the element management systems place proprietary data in the management information base, which serves as the storage center for management data about the network device. Consequently, host software from another vendor may not be able to read or even display that network device's data.

Further complicating matters is the fact that most vendors don't make this proprietary data public.

As a result, companies with SNMP devices from a large number of vendors need to choose a management station that either supports proprietary management information bases or offers tool kits to write applications that can.

At *The Christian Science Monitor*, Steinmetz uses Lance, an SNMP management station from Micro Technology, Inc., to gather information from the firm's 3Com and Cabletron bridges and routers. Lance puts a "tap" on each network segment to be monitored.

"The bridges automatically send messages to the Lance system, so I get an immediate alert when a line is down," Steinmetz says. "We can be ahead of users instead of looking dumb when there is a problem."

What Steinmetz cannot do with Lance is monitor Decnet traffic. The same is true at Texas A&M University in College Station, Texas. Network planner Walt Magnussen has been beta-testing Spectrum Advanced Management System, a Unix-based platform from Cabletron.

Some consolidation

Spectrum receives data from various network segments via Cabletron's line of smart hubs, to which the segments are attached.

With Spectrum, Magnussen has been able to consolidate network data not only from the Cabletron concentrators on campus but also from a variety of other attached devices, such as bridges and routers from Cisco Systems, Inc. and 3Com.

However, he still has to contend with a large installed base of non-SNMP devices from DEC. For those devices, the university has installed a separate system — DEC's Decmcc Director — to monitor and control Decnet traffic and other equipment, such as LAN Bridge 100s.

This lack of support for non-SNMP devices is the second biggest problem with SNMP management products. It is possible to kludge together SNMP and non-SNMP equipment in the same management system using third-party software sets called proxies, says Bill Livingston, vice president of strategic systems at Network Management, Inc., a Fairfax, Va.-based systems integrator.

"But it's not an off-the-shelf solution," he says, adding that implementing a complicated system of proxies for incompatible network devices requires software engineering expertise that most managers don't have in-house.

A new class of management systems is emerging to tackle that problem. These systems are essentially development platforms with well-documented application programming interfaces that let users or third-party vendors write applications for a variety of management functions, including monitoring of both SNMP and non-SNMP devices (see Buyers' Scorecard, page 76).

The most mature products in this category are Openview from Hewlett-Packard Co. and Sunnet Manager from Sun Microsystems, Inc. IBM, DEC and AT&T also offer such products.

HP's Openview includes an open applications development environment, Openview Network Management Server, which is available in both DOS- and Unix-based versions. HP has pledged support for CMIP when it is fully defined.

Sun's Sunnet Manager consolidates management data at the user interface, which furnishes a consistent format for network information regardless of the type of network or device being managed or the protocols it uses, according to Brian Biles, the company's product manager for network management.

What may come as a disappointment to many users is the better-than-average chance that no single integrated system will ever emerge. For instance, even with an integrated monitoring capability, users still need a protocol analyzer to pinpoint which device using the proprietary protocol is causing a problem (see story page 75).

"Users won't solve their network management problems by just writing a check," says James Herman, a principal at Northeast Consulting Resources, Inc. What is necessary is to keep abreast of vendor alliances and establish a timetable for bringing in emerging technologies. •

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The complete system

The following elements are necessary to build a comprehensive network management system, according to a 1990 report on network management hardware, software and services markets from International Resource Development, Inc., a market research firm based in New Canaan, Conn.:

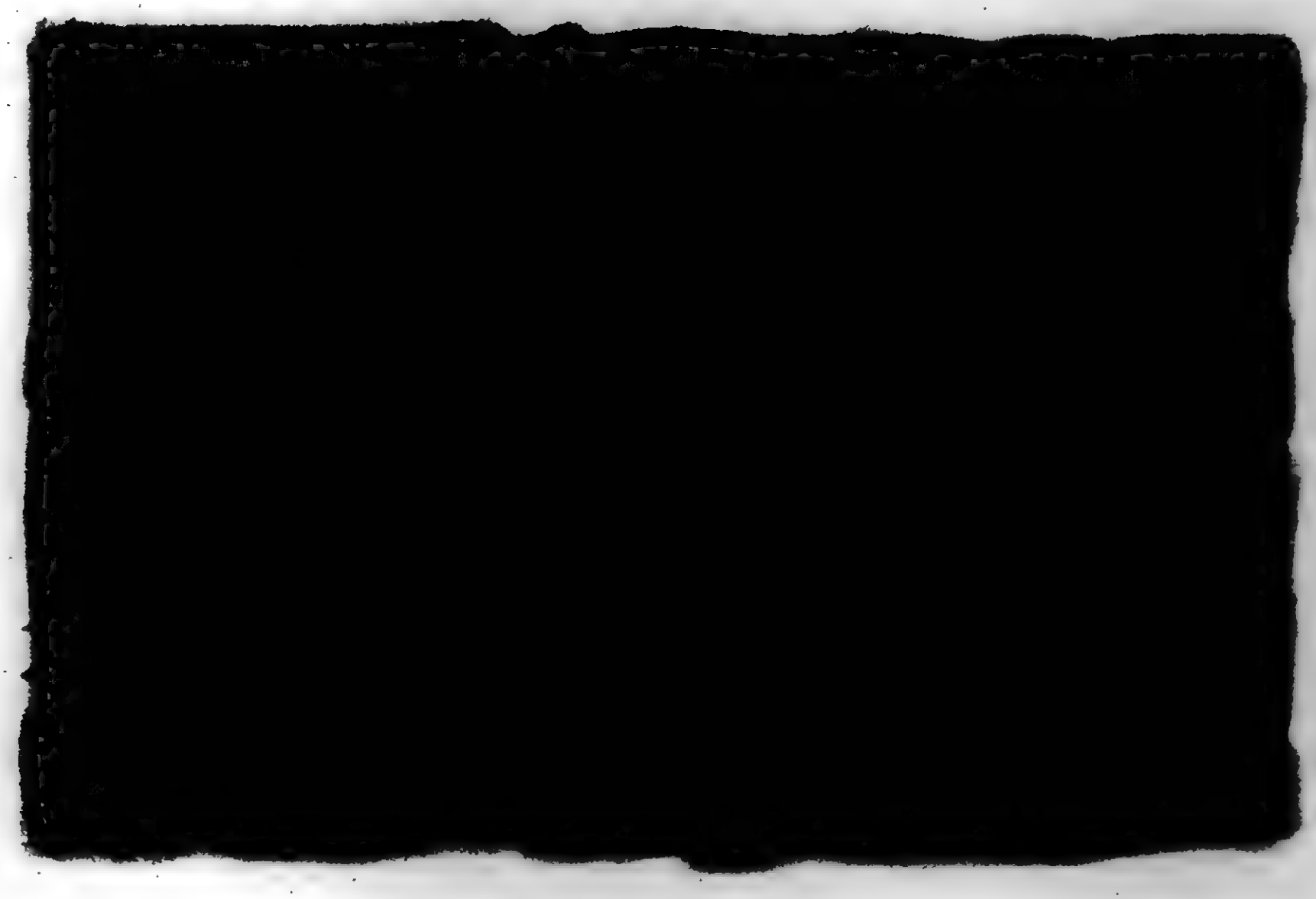
- **A repository, or management information base:** A database of all pertinent information relating to managed network objects and their attributes. Unified repositories are key to providing truly integrated network management systems, but current repositories are largely proprietary.
- **Management elements:** Network management systems that exercise control over other systems and nodes on the network. Management elements monitor network performance and then collect network management data, process it and report on it.

They can also take action, for example, by bypassing a network node deemed to be faulty. Management elements that sit at the top of network management system hierarchies are often referred to as "top managers."

- **Managed objects:** Network elements controlled by management elements.
- **User interface:** A system made up of software-generated menu trees, commands, network maps, color-coded alarms, test result formats and links among different, integrated network management systems applications.
- **Protocol suites:** Every system uses protocols, such as SNMP or CMIP, CMOT and CMOL, to initiate communications between management elements and managed objects.
- **Data structures:** Vendors use unique semantics and rules of syntax for their network management systems data and message formats. This is a primary barrier to interoperability among different network management systems.

The OSI is standardizing abstract rules of syntax and semantics, which should lead to new levels of interoperability.

- **Diagnostic capabilities:** Every network management system must be able to provide loopback tests, report on analog signal attenuation, count digital line errors and more.



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Blueprints for enterprisewide network management systems

BY JULIA KING

At Millipore Corp. in Bedford, Mass., Joe McGrath is ready to up the ante in his demands for integrated network management.

McGrath, manager of corporate telecommunications, says a fully integrated network management system should be able to monitor and manage not only the interconnected local-area and wide-area networks but also the systems applications software tied into the network.

This ideal system, sometimes referred to as enterprise management, would pinpoint all potential sources of problems that manifest themselves on the network, whether or not they are directly related to the network itself.

McGrath is looking pretty far ahead, however: Most users are still focusing on connecting the LAN management systems they already have, according to James Herman, a principal at Boston-based Northeast Consulting Resources, Inc.

Even if users were ready for such enterprisewide network management, vendors aren't. IBM, Digital Equipment Corp. and AT&T have each proposed blueprints for enterprisewide network management systems, but for the time being, the systems remain in the "visionary" stage.

These systems propose to tie together all management systems, but so far, nobody is delivering products that can fully carry out these plans.

"Right now, we're still down in the plumbing of network management," Herman notes. "It will be 1993 before any set of comprehensive, robust solutions is available."

Pulling together

One way in which the vendors are moving toward fulfillment of their enterprise plans is by forming alliances with one another as well as with LAN vendors. What follows is a look at some of the key providers of enterprisewide network management equipment and their alliances:

.....

AT&T: To date, more than 50 vendors of network equipment have committed to providing interfaces to AT&T's Accumaster Integrator.

Some of these vendors include Banyan Systems, Inc. (Network Management System), Cabletron Systems, Inc. (Spectrum), Codex Corp. (9800 series Network Management System), General Datacomm Corp. (Megaview, Netcon and Megamux TMS), Infotron Systems Corp. (Integrated Network Manager), Network Computing, Inc. (Lanalert), Timeplex, Inc. (Time/View 2000 and 2500 systems and HUB communications software) and Verilink Corp. (Verinet system).

AT&T also published specifications earlier this year describing how vendors of SNMP-based equipment can convert SNMP messages to the Accumaster Integrator alarm interface specification. Automated Network Management, Inc., Kaptronix, Netlabs, Inc. and Network Computing have all agreed to implement this specification.

However, while AT&T's Accumaster Integrator product and Unified Network Management Architecture connect a number of elemental management systems that will manage AT&T equipment, "there is no connection with IBM's SNA," says Mike Howard, president of Infonetics Research Institute in San Jose, Calif.

IBM and AT&T have struck an agreement to exchange information between IBM's Netview — which manages its Systems Network Architecture (SNA) networks — and AT&T's Accumaster Integrator.

The SNA/Accumaster link will alternatively be provided through an agreement with Systems Center, Inc.

Systems Center and AT&T are also developing software to allow Systems Center's Net/Master, a Netview competitor, to exchange information with Accumaster.

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Digital Equipment Corp.: Approximately 22 vendors have announced their intention to support DEC's Enterprise Management Architecture (EMA), including 3Com Corp. and Vitalink Communications Corp.

Network management systems from these companies will be able to report to DEC's enterprise system. DEC's EMA also supports SNMP and will eventually support CMIP.

DEC suffers from the same SNA connectivity problem as AT&T. Like AT&T, DEC has a joint agreement with Systems Center that will link Decmcc Director, a portion of EMA, to SNA management via Net/Master.

Decmcc Director also offers windowing capability to IBM's Netview, allowing users to toggle between the systems from a single workstation.

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IBM: Approximately 60 vendors now support or have agreed to support Netview via the Netview/PC interface or via a direct link. Among these vendors are Banyan, 3Com, Synoptics Communications,

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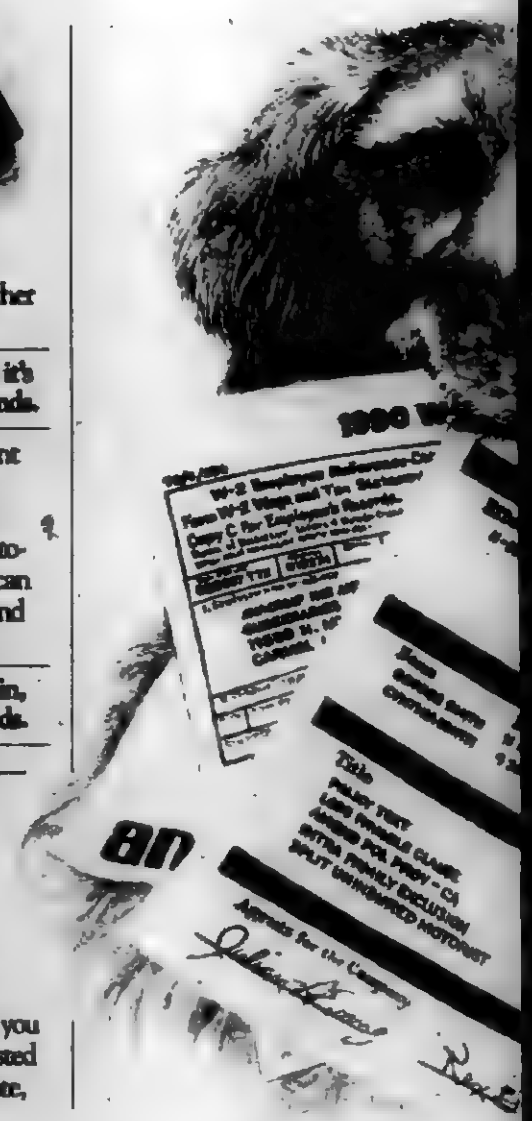
Tell Anatrieve to go fetch, and it's off and back, often within seconds.

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Inc., Ungermann-Bass, Inc. and Novell, Inc., as well as a wide range of telecommunications equipment vendors.

Companies such as TSB International, Inc. and, more recently, International Telemanagement Corp. have provided boxes that link other vendors' network devices to Netview.

IBM has also announced support for CMIP. Additionally, IBM and 3Com are working on a set of specifications based in part on CMIP for managing mixed Token Ring and Ethernet networks.

.....

Hewlett-Packard Co.: HP's Openview is a network management product line that now includes a Unix-based server for managing both HP and Transmission Control Protocol/Internet Protocol networks. Support of CMIP is in the works.

A growing number of network vendors have implemented HP's graphics-based user interface as the basis for their own management systems.

Recently, HP licensed portions of its Openview network management system for implementation on IBM's AIX-based RISC System/6000 network management platform.

The platform will initially manage both IBM's and HP's Unix-based workstations, giving IBM a network management presence in the growing number of installations with IBM hosts and distributed Unix-based systems.

The implication of the announcement is that systems from HP and IBM will be able to exchange management information, according to an HP spokesman.

.....

Cabletron: Cabletron is a relative newcomer to the enterprisewide management arena. Under an agreement signed earlier this month, the company will incorporate Touch Communications, Inc.'s Alliance Open Software Interconnect software into its Spectrum product line, giving Spectrum the ability to support the CMIP management protocol.

Cabletron also has agreements with several companies to tie into its smart hub. In effect, this will extend Cabletron's Spectrum system, which manages the hub. Cayman Systems, Inc. will integrate its Ethernet-to-Appletalk gateway technology into Cabletron's hub products, according to the company. •

This job calls for two

When you're managing a labyrinth of interconnected LANs, knowing that there is a problem and knowing what's causing the problem are two different things.

While future products will integrate those functions, right now you still need two separate tools. SNMP management stations take care of the first part, while protocol analyzers are the primary problem-deciphering tools.

"One product isolates the problem, and the other troubleshoots it," says Walt Magnussen, network planner at Texas A&M University in College Station, Texas.

Protocol analyzers allow a user to dig deeper into a reported problem by capturing data packets and decoding protocols to pinpoint the exact source of the error.

Vendors of these tools include Network General Corp., Spider Systems, Inc., Vance Systems, Inc., Protools, Inc. and Novell, Inc.

Protocol analyzers have historically worked under a segment-by-segment testing method. Today, however, vendors are working to integrate analyzers into the larger network management picture in two ways: by forging links to SNMP management stations and by allowing their products to remotely analyze multiple LANs simultaneously, analyzing those segments at a central console.

Two vendors, Network General and Spider, have tackled the latter method.

This ability to continuously monitor and distribute network data isn't cheap, however. Network General's Sniffer servers range from $4,995 to $10,995, depending on the applications and configurations. The Sniffmaster Console is priced at $7,995.

The Spider Monitor board kit sells for $8,600, and the remote software is $950.

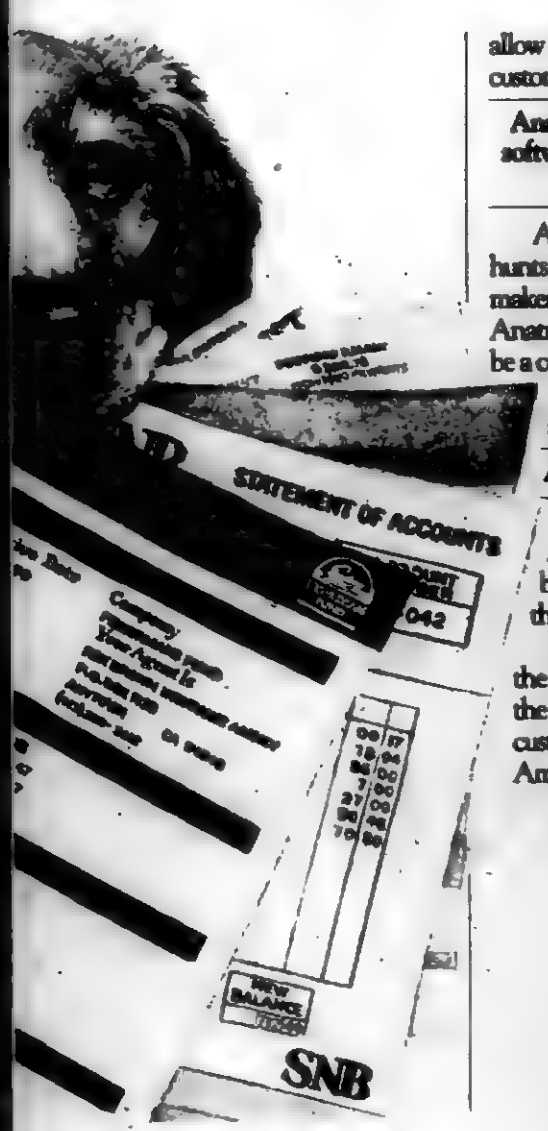
Only a couple of protocol analyzers so far are able to send reports to a centralized SNMP management station. In addition, only alarms can be sent. The actual analysis still has to be done with the protocol analyzer at the individual LAN segment.

Network General and Novell currently offer such products, but users will soon see more, according to Jill Huntington-Lee, an editor and analyst at Datapro Research Group in Delran, N.J.

Even more important, she says, will be products from both the protocol analyzer vendors and management station vendors that will let managers perform protocol analysis from their management consoles. Such products should be available within a couple of months, according to Huntington-Lee.

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BUYERS' SCORECARD

HP, Sun LAN management products in dead heat

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Carrying their workstation rivalry to the local-area network front, Hewlett-Packard Co. and Sun Microsystems, Inc. have established leadership positions in the popular multivendor LAN management market.

Their products, along with an element of IBM's Netview, represent the three major software platforms for Simple Network Management Protocol (SNMP) LAN management in terms of installed base.

According to users of these three products surveyed for Buyers' Scorecard, HP's Openview Network Node Manager and Sun's Sunnet Manager are well-matched contenders.

Both received overall scores of 52 points out of a possible 74 from their respective user samples. Users of IBM's Netview Network Manager 6000 were much more critical, giving that product an overall score of 44.

Each user group rated only its own product. The ratings were based on the average ratings each group gave its product across seventeen categories, multiplied by an average user importance factor that all users assigned to each category.

The scores are the averages of all categories combining both the user and importance ratings. Response base for the survey was 30 respondents for HP and IBM and 19 respondents for Sun (see methodology next page).

Although the HP and Sun ratings resulted in a tie, each user group registered higher levels of satisfaction in different categories.

For example, HP users rated Network Node Manager highest in the four categories respondents ranked as most important: vendor service responsiveness, fault isolation and troubleshooting, quality of technical support and overall ease of use.

Meanwhile, Sun's Sunnet Manager users gave their product the highest ratings in the other two key categories: value for the dollar (Sunnet's rating of 8.4 here was the highest in the survey) and ability to manage other vendors' equipment.

IBM's Network Manager 6000 achieved the second highest rating behind HP for vendor service, but otherwise, users rated it last in key ratings areas. Especially noteworthy were low ratings of 5.7 for ease of use and 5.1 for ability to manage other vendors' equipment.

Sun dominated leadership positions in the 11 closer-look categories, while HP users rated their product highest in only three areas.

IBM users scored their product third, sometimes by a wide margin, in all but two categories: training time required to use the product and ability to manage a large network.

Sunnet Manager's top scores included such basic network management features as performance measurement and planning, security and providing accounting information.

It also rated higher than its rivals for multivendor LAN management features, including managing traffic across bridges and routers, support for other vendors' SNMP extensions and ability to manage a large network. Because Sun sells its product primarily through third parties that add their own features, the strength of its rating also reflects the performance of the other vendors involved.

Users of Sunnet Manager indicated less satisfaction with the amount of training time required: They gave it the lowest rating (5.7) of the three user groups surveyed.

HP users gave their product the highest ratings in primary areas such as configuration management, training time required and mapping ability.

The product placed second by a nose in graphical user interface capability.

Based on user responses, Network Node Manager's areas of greatest weakness appear to be ability to manage large networks and ability to provide accounting information. •

COMPUTERWORLD BUYERS' SCORECARD

LAN multivendor network managers

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: Network Node Manager: 30; Sunnet Manager: 19; Network Manager 6000: 30

Product	Highest ratings	Lowest ratings
Hewlett-Packard Co.'s Openview Network Node Manager SCORE 52	Quality of technical support Overall ease of use Graphical user interface	Providing accounting information Performance management/capacity planning Managing traffic on modems and multiplexers
Sun Microsystems, Inc.'s Sunnet Manager SCORE 52	Value for the dollar Managing traffic across bridges and routers Graphical user interface	Training time required Managing traffic on modems and multiplexers Fault isolation and troubleshooting
IBM's Netview Network Manager 6000 SCORE 44	Responsiveness of vendor service Quality of technical support Managing large network	Managing other vendors' equipment Mapping ability Support for other vendors' SNMP extensions

KEY RATINGS

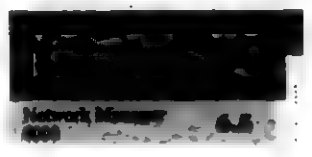
Hewlett-Packard Co.'s Openview Network Node Manager achieves the highest ratings in categories most important to users — fault identification, service, support and ease of use — while Sun Microsystems Inc.'s Sunnet Manager scores the highest ratings for value and the ability to manage other vendors' equipment. IBM's Netview Network Manager 6000 scores the second highest rating for service but places last in the the other key categories

User importance rating:

8.4 **Responsiveness of vendor service**



8.4 **Fault isolation and troubleshooting**



8.4 **Quality of technical support**



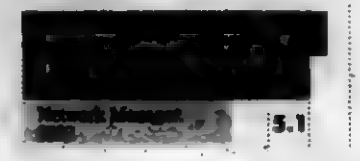
8.0 **Overall ease of use**



7.9 **Value for the dollar**



7.6 **Ability to manage other vendors' equipment**

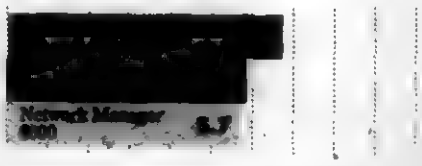


A CLOSER LOOK

Network Node Manager achieves the highest ratings in three categories, but Sunnet Manager users rated their product highest in the other eight areas. Network Manager 6000 attains second highest ratings in two categories — managing large networks and providing accounting information — but again finishes last in the remaining areas.

User importance rating:

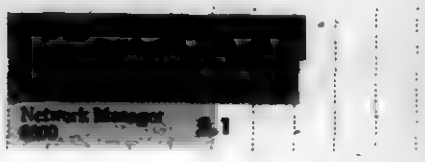
7.5 Performance management and capacity planning



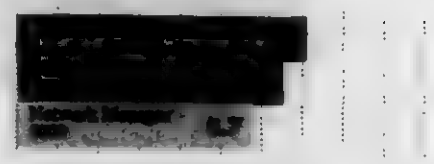
7.3 Graphical user interface capability



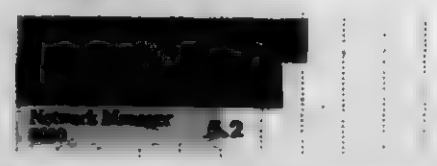
6.9 Mapping ability



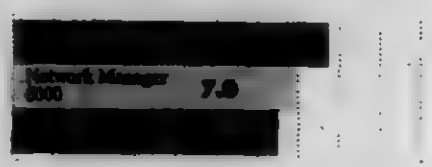
7.5 Configuration management



7.5 Support for other vendors' SNMP extensions



7.3 Ability to manage a large network



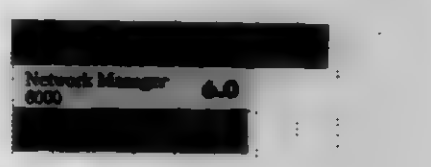
6.3 Ability to manage traffic on modems and multiplexers



7.5 Ability to manage traffic across bridges and routers



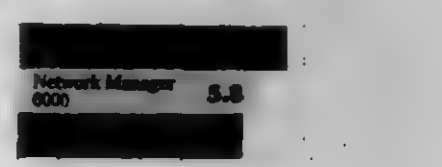
7.4 Training time required to use product



7.0 Security management



5.6 Providing accounting information



Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answers)

Network Manager 6000

Likes
Works well with our equipment
Good vendor support
Multiproduct support

Dislikes
Slow system
Steep learning curve
Not flexible enough

Network Manager 6000

Likes
Speed of the system
Multiproduct support
Good price for the product

Dislikes
Not flexible enough
Doesn't run on other platforms
Vague documentation

Network Manager 6000

Likes
Speed of the system
Gives networkwide view
Fault isolation

Dislikes
Difficult to use
Nonstandard interface
Slow

Loyalties

How likely would you be to purchase this product again if you were making the decision today?
(Reasons based on most frequently stated responses)

Network Manager 6000

Response base: 30

Number of respondents: 30

Likely
The reason:
Good support

Unlikely
0 respondents

Network Manager 6000

Response base: 19

Number of respondents: 19

Likely
The reason:
Reasonably priced

Unlikely
0 respondents

Network Manager 6000

Response base: 30

Number of respondents: 27 likely, 2 unlikely, 1 don't know

Likely
The reason:
Meets our needs

Unlikely
The reason:
Better products are on the market

Don't know: 1

Vital statistics

Total number of respondents: 79

What is your responsibility for LAN multivendor network management products?
(Multiple responses allowed)

Evaluate or recommend vendor	73
Determine need	63
Set standards for company	63
Select vendors	61
Approve or authorize purchase	38
Establish purchase agreements	37
Buy for user departments	31

What percentage of your LAN equipment is managed through this product?

91-100%	21
51-90%	23
21-50%	12
10-20%	11
Less than 10%	12

How many network nodes are managed by this product?

More than 500	16
201-500	8
51-200	18
1-50	37

How many years have you been involved with LAN management?

Five or more	23
Three to four	25
One to two	21
Less than one	10

METHODOLOGY

To qualify for *Computerworld*'s Buyers' Scorecard on multivendor local-area network management, a product had to have more than 200 installed sites. All three products rated are Unix-based and conform to the Simple Network Management Protocol (SNMP).

The minimum number of 30 respondents was waived for Sun Microsystems, Inc.'s Sunnet Manager because it has the smallest installed base — an estimated 300 units. The sample from Hewlett-Packard Co. was drawn from 2,200 Openview sites, and the IBM sample was drawn from 6,600 Netview sites. Actual response base was 30 users each for the HP and IBM products and 19 for the Sun product.

The survey was conducted and tabulated by Austin, Texas-based First Market Research, an independent research firm. Random lists of users were surveyed.

The total weighted scores were computed by multiplying the mean scores users assigned all criteria by the mean scores each user group gave its own product. Ratings are presented in order of importance based on these mean importance ratings.

WISH LIST

Respondents said they would like to see the following features added to their products:

- HP's Network Node Manager: support for more diverse networks and vendors, better analysis, more user friendliness, better mapping and multiple user interface features.
- Sun's Sunnet Manager: more graphics capabilities, better mapping, better analysis and multiple programming interfaces.
- IBM's Network Manager 6000: more graphics capabilities, better analysis and support for more diverse networks and vendors.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and companies for their assistance in preparing this Buyers' Scorecard: Computer Intelligence; Jeff Case, SNMP Research, Inc.; Tom Dolan, Westcon, Inc.; Jill Huntington-Lee, Datapro Research Group; David Passmore, Ernst & Young Center for Information Technology and Strategy; and Interop, Inc.

SNMP management stations[1]

VENDOR	PRODUCT	HARDWARE REQUIRED	DEVICES MONITORED	SNMP IMPLEMENTATION ON WHICH VENDOR'S SNMP IS BASED	MANAGES OTHER VENDOR DEVICES	TOOL KIT FOR VENDOR-SPECIFIC MIBS	USER INTERFACE PROVIDED	SECURITY FEATURES	MANAGEMENT CAPABILITIES	TYPE/NAME OF DATABASE INCLUDED	PRIVATE MIB EXTENSIONS SUPPORTED	TYPES OF REPORT WRITING CAPABILITIES	PRICE FOR SOFTWARE
AT&T Computer Systems (800) 247-1212	AT&T System Manager	AT&T Intel 80386- and 1486-based PC	Hubs, routers, servers	Multiple	Yes	Yes	X Window	User authentication, standard SNMP features	Isolates faults, detects unauthorized users, includes standardized APIs[2], supports sets	Flatfile/Proprietary	ACC, AT&T, Bay, Cisco, Hughes, Novell, Racon, Rural Interior, Synoptics, Ungo, Wellfleet, Wellington, Xyplex	None	$10,500
Advanced Computer Communications (805) 963-9431 (800) 444-7854	ACS 4800 Network Management System	Sun 3, 4, Sparcstation	Any	Carnegie Mellon, MIT	Yes	Yes	Proprietary GUI	Encryption, user authorization	Automates entry of devices on network map, isolates faults, detects unauthorized users, includes standardized APIs, supports sets	Relational/Informix	Cabletron, Cisco, David Systems, CMC Rockwell, Micro Technology, Novell, Ungermann-Bass	Real-time and historical performance statistics, configuration and event reporting	$12,500
Cabletron Systems, Inc. (603) 332-9400 (800) 638-8370	Spectrum Advanced Management System	Sun 4, Sparcstation	Any	AIP	Yes	Yes	X Window, Motif	User authentication	Automates entry of devices on network map, isolates faults, detects unauthorized users, includes standardized APIs	Object-oriented/ Proprietary	Chipcom, David Systems, Novell, Synoptics, others	Configuration reporting, trend analysis	$55,000
	Remote Lanview/Windows	Intel 80386- and 80486-based PCs	Bridges, hubs, Cabletron LAN cards	SNMP Research	Yes	No	Microsoft Windows	Password, user authentication	Isolates faults, detects unauthorized users, supports sets	Flatfile/DB Vista	Cisco, Synoptics, Xyplex	Statistical data logging	$4,595
Chipcom Corp. (508) 460-8900 (800) 228-8930	Online Network Control System	Intel 80386- and 1486-based PCs	Hubs	SNMP Research	No	No	X Window	Encryption, user authentication	Isolates faults, detects unauthorized users, includes standardized APIs, supports sets	Relational/Ingres	Chipcom	Configuration, performance and security reporting, software version tracking, SNMP logs	$6,500+
Cisco Systems, Inc. (415) 326-1941 (800) 553-6387	Netcentral Station	Sun 3, Sparcstation	Any, but intended for routers	Proprietary	Yes	Yes	X Window	Standard SNMP features	Isolates faults, supports sets	Relational/Sybase	Any	Configuration and threshold reporting, trend analysis, software version tracking	$14,000
Codex Corp. (508) 261-4000	9800/SNMP	Intel 80386-based PCs	Bridges, hubs, routers	MIT	Yes	Yes	Command line, proprietary windows	Password	Isolates faults, contains trouble ticket application[3], includes standardized APIs	Relational/Faircom	Cisco, Proteon	Alarm and trap reporting	$11,250
David Systems, Inc. (408) 720-8687 (800) 762-7848	Expressview LS	Intel 80386 and 1486-based PCs, IBM PS/2	Any, but intended for hubs	Epilogue Technology	Yes	No	Microsoft Windows	Encryption, user authentication	Automates entry of devices on network map, isolates faults	Relational/Fulcrum-Tute	David Systems	Configuration and event reporting, alarm logs	$1,495
Digital Analysis Corp. (703) 476-8000	Eye Node Network Management System	DG Aviion, Sun Sparcstation, Solbourne, IBM PS/2, Intel 80386-based PCs	Any	SNMP Research	Yes	Yes	Microsoft Windows	User authentication	Isolates faults, contains trouble ticket application, includes standardized APIs, supports sets	Relational/Ingres	Any	Configuration reporting, trends analysis, software version tracking	$14,995
Digital Equipment Corp. (508) 493-7161 (800) 344-4825	Decmcc Management Station for Ultrix	Decstation, Vaxstation, VAX, RISC-based machines	Routers, host machines	Performance Systems International, SNMP Research	Yes	Yes	X Window	User authentication	Automates entry of devices on network map, isolates faults, supports sets	Relational/Ingres	Several that are published	Configuration reporting, trend analysis	$7,070
FTP Software, Inc. (617) 246-0900	PC/SNMP Tools	IBM PCs and compatibles	Any	Proprietary SNMP Research, Performance Systems International, Carnegie Mellon, MIT	Yes	Yes	Command line	Encryption, user authentication	Supports sets	None/NA	Any	None	$300
Fibermux Corp. (818) 709-6000	Lightwatch	Sun Sparcstation	Hubs	SNMP Research	No	No	X Window, Open Look	User authentication	Automates entry of devices on network map, isolates faults, detects unauthorized users, supports sets	Flatfile/Proprietary	Fibermux	Alarm log	$4,500
Hewlett-Packard Co. (408) 973-1919 (800) 752-0900	HP Open View Network Node Manager	HP/Apollo 9000, Sun Sparcstation 1, 1+, 2, IPC	Any	Carnegie Mellon, MIT	Yes	Yes	X.11 Motif	User authentication	Automates entry of devices on network map, isolates faults, detects unauthorized users, includes standardized APIs, supports sets	Flatfile/Proprietary	Any	Configuration and event reporting, software version tracking, trend analysis	$15,000
Hughes LAN Systems, Inc. (415) 966-7300 (800) 388-5387	9100 Network Management Center	Sun Sparcstation 1, 2, Sun 4	Any	Epilogue Technology	Yes	Yes	Sun View, X Window	Password, user authentication	Isolates faults, supports sets	Relational/Unify	ACC, Cisco, David Systems, Novell, Proteon, Synoptics, Wellfleet, others available on Internet in AMH format	Configuration reporting, software version tracking, inventory and alarm logs, network map printouts	$14,950
IBM Contact local IBM branch (800) 426-3468	Netview with TCP/IP Version 2.0 for VM, MVS	IBM System/370	Any	NP	Yes	Yes	Command line, panel routines	Features standard in SNMP	Detects unauthorized users, includes standardized APIs, supports sets	Flatfile/Proprietary	Any	None	NP
	AIX Network Management/6000	IBM RS/6000	Any	NP	Yes	No	Comand line, X.11 Windows	Standard Unix features	Partially automates entry of devices on network map, isolates faults, detects unauthorized users, includes standardized APIs, supports sets	Flatfile/Proprietary	None	None	$1,500 - $6,000
Interlan Systems Corp. (703) 704-0600	Watchtower	Apple Macintosh	Bridges, routers, host machines	FTP Software, SNMP Research, Performance Systems International, Carnegie Mellon, MIT	Yes	Yes	Microsoft Windows	User authentication	Automates entry of devices on network map, isolates faults, detects unauthorized users, contains trouble ticket application	Flatfile/Proprietary	Cayman, Cisco, FTP, Shiva	Configuration reporting, trend analysis, software version tracking	$2,695

[1]Simple Network Management Protocol (SNMP) management stations, as defined by Jill Huntington-Lee, consultant at Datapro Research Group in Delran, N.J., are monitor and control network devices that use SNMP commands to read or change values stored in the device's management information base. This survey focuses on turnkey SNMP management stations, which provide a graphical user interface and applications supporting management activities. [2]API stands for application programming interface. [3]"All" SNMP implementations includes those by Carnegie Mellon University, Epilogue Technology Corp., FTP Software, Inc., MIT, Netlabs, Inc., Performance Systems International, Inc. (formerly Nysernet, Inc.) and SNMP Research, Inc. [4]Trouble ticket application is a knowledge-based capability that offers suggested corrective actions based on past network behavior.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	HARDWARE REQUIRED	DEVICES MONITORED	SNMP IMPLEMENTATION ON WHICH VENDOR'S SNMP IS BASED	MANAGES OTHER VENDOR DEVICES	TOOL KIT FOR VENDOR-SPECIFIC MIBS	USER INTERFACE PROVIDED	SECURITY FEATURES	MANAGEMENT CAPABILITIES	TYPE/NAME OF DATABASE INCLUDED	PRIVATE MIB EXTENSIONS SUPPORTED	TYPES OF REPORT WRITING CAPABILITIES	PRICE FOR SOFTWARE
Micro Technology, Inc. (714) 970-0300 (800) 368-6804	Lanss Network Management System	Sun Sparcstation IPC, Decstation 3100	Any	All	Yes	Yes	X Window	User authentication	Automates entry of devices on network map, isolates faults, detects unauthorized users, includes standardized APIs, supports sets	Relational/Sagent	ACC, Apple, Cabletron, Cisco, David Systems, Fibermux, Kinetics, Novell, Synoptics, Unisys, Wellfleet, Xylogics, Xyplex, others	Trend analysis	$10,500
Microcom, Inc. (617) 551-1000 (800) 822-8224	Microcom Management System	Intel 80386SX-based IBM PC AT	Bridges	SNMP Research	No	No	Proprietary Windows	User authentication	Automates entry of devices on network map, isolates faults	Flatfile/Proprietary	Microcom	Configuration reporting	$3,300
NCR Corp. (803) 796-0700	NCR Net Manager	NCR System 3000, Tower	Any	Wollongong	Yes	Yes	Microsoft Windows	Standard Unix features	Automates entry of devices on network map, isolates faults, detects unauthorized users, contains trouble ticket application, supports sets	Flatfile/Proprietary	Any	None	$1,000
Netlabs, Inc. (415) 961-9500	Dual Manager	Sun Sparcstation, Mips, Compaq, IBM RS/6000, NCR	Any	Proprietary	Yes	Yes	X Window, Motif, Open Look	User authentication	Automates entry of devices on network map, isolates faults, includes standardized APIs, supports sets	Flatfile/Proprietary	3Com, Cisco, Proteon, Synoptics, Wellfleet	Configuration reporting, trend analysis	$12,500
Network Application Technology, Inc. (408) 370-4300 (800) 543-6827	NMS/100	Intel 80386-based PCs	Bridges, proprietary Ethernet monitor	All	No	No	Microsoft Windows	User authentication	Automates entry of devices on network map, isolates faults, supports sets	Flatfile/Proprietary	Network application technology	None	$2,995
Network Systems Corp. (612) 424-4888	SNMP NMS	Sun Sparcstation	Bridges, hubs, routers, IPX, WAN interfaces	FTP Software, SNMP Research, Carnegie Mellon, MIT	Yes	Yes	X Window	Password	Isolates faults	Flatfile/Proprietary	Any that are published	Configuration reporting	$15,000
Newbridge Networks, Inc. (703) 834-3600 (800) 333-1080	4602 IntraSpan Net-workstation/5638 SNMP Manager	Sun 4, Sparcstation	Bridges, multiplexers, routers	SNMP Research	Yes	Yes	Sun View	User authentication	Isolates faults, detects unauthorized users, contains trouble ticket application, supports sets	Relational/Unify	ACC, Cabletron, Synoptics, Wellfleet	Configuration reporting, trend analysis, software version tracking	$15,000
	8001 LAN Manager	IBM PCs and compatibles	Bridges, routers	FTP Software	Yes	No	Proprietary windows	User authentication	Isolates faults, detects unauthorized users, supports sets	Flatfile/Proprietary	Newbridge	None	$1,000
Novell, Inc. (408) 473-8333 (800) 243-8526	Lanteyn Services Manager	Intel 80386-based PCs	Bridges, hubs, multiplexers, routers, Novell Lanterns	Proprietary	No	No	Microsoft Windows	User authentication	Automates entry of devices on network map, isolates faults	Relational/Novell	Novell	Configuration reporting, trend analysis, software version tracking	$4,995
Proteon, Inc. (508) 898-2800	Overview	Proteon turnkey systems	Proteon	MIT	Yes	Yes	Command line, proprietary windows	None	Automates entry of devices on network map	Flatfile/Proprietary	Any	Configuration reporting, alarm log	$6,995 for software and turnkey system; software not sold separately
Racal Interlan (508) 263-9929 (800) 526-8255	Roll Call	Intel 80386-based PCs	LAN hards	Carnegie Mellon	Yes	No	Microsoft Windows	User authentication	Automates entry of devices on network map, isolates faults	Flatfile/Proprietary	Any in ANSI format	None	$995
	LAN Central Express	Sun Sparcstation IPC	Bridges, hubs, routers, terminal servers	Carnegie Mellon	Yes	Yes	X Window	User authentication	Automates entry of devices on network map, isolates faults, detects unauthorized users, includes standardized APIs, supports sets	Flatfile/Proprietary	Any in ANSI format	None	$6,495
Retix (213) 399-2200 (800) 255-2333	5085 Network Management Center	Sun Sparcstation	Bridges, routers	Epilogue Technology	Yes	Yes	X Window	Password, user authentication	Automates entry of devices on network map, isolates faults, detects unauthorized users, contains trouble ticket applications, includes standardized APIs, supports sets	Flatfile/Proprietary	Retix	Trend analysis	$12,000
SNMP Research, Inc. (615) 573-1434	Xnetmon	Sun 3, 4, Sparcstation, IBM RS/6000, Decstation, Vaxstation, Silicon Graphics, DG Aviion	Any	SNMP Research	Yes	Yes	X Window, command line	Standard SNMP features	Automates entry of devices on network map, isolates faults, contains trouble ticket application, includes standardized APIs, supports sets	Flatfile/Proprietary	Any, including Network Systems, Novell, SNMP Research, Wellfleet, Xylogics	None	$4,995
Sun Microsystems, Inc. (415) 960-1300 (800) 821-4643	Sunnet Manager	Sun Sparcstation	Any	SNMP Research	Yes	Yes	Open Look	User authentication, secure RPC, standard Unix features	Automates entry of devices on network map, isolates faults, includes standardized APIs, supports sets	Flatfile, Netinfo/ Proprietary	Any that are published or available on Internet	None	$3,000
Synernetics, Inc. (508) 670-9009	Viewplex	Sun Sparcstation, Sun 3/80	Hubs	SNMP Research	Yes	Yes	Open Look	Encrypted password	Automates entry of devices on network map, isolates faults, supports sets	Flatfile/Sun	Synernetics	None	$19,900
Synoptics Communications, Inc. (408) 988-2400 (800) 776-6895	Lattisnet Basic Network Management for Ethernet, Token Ring	Intel 80386-based IBM PCs and compatibles	Bridges, hubs, routers	Epilogue Technology	Yes	Yes	Microsoft Windows, HP Open View	Read/write communications strings, user authentication	Isolates faults, detects unauthorized users, supports sets	Flatfile/Proprietary	Cabletron, Cisco, Retix, Xyplex	Configuration reporting, trend analysis, software version tracking	$2,395
	Lattisnet Advanced Network Management for Ethernet, Token Ring	Intel 80386-based IBM PCs and compatibles	Bridges, hubs, routers	Epilogue Technology	Yes	Yes	Microsoft Windows, HP Open View	Read/write communications strings, user authentication	Isolates faults, detects unauthorized users, supports sets	Flatfile/Proprietary	Any that are published	Configuration reporting, trend analysis, software version tracking	$6,500
	Lattisnet Network Management for Unix	Sun Sparcstation	Bridges, hubs, routers	Epilogue Technology	Yes	No	Open Look	Read/write communications strings, user authentication	Automates entry of devices on network map, isolates faults, detects unauthorized users, includes standardized APIs, supports sets	Flatfile/Sun	Any that are published	Configuration and event reporting, trend analysis, software version tracking	$2,995
The Wollongong Group, Inc. (415) 962-7100 (800) 872-8649	Management Station, Release 2.0	Sun 3, 4, Sparcstation, Decstation, Decsystem, Motorola Delta 8000 MPC, Intel 80386- or 1486-based PCs	Any	Performance Systems International	Yes	Yes	X Window	Standard SNMP features	Automates entry of devices on network map, isolates faults, includes APIs, supports sets	Flatfile/Proprietary	Cisco, David Systems, Network Application Technology, Network Computing Devices, Novell, Sitara, Synoptics, any from RFC-compliant SNMP agents	Configuration reporting, network statistics	$10,000

VENDOR	PRODUCT	HARDWARE SUPPORTED	DEVICES MONITORED	SNMP IMPLEMENTATION ON WHICH VENDOR'S SNMP IS BASED	MANAGES OTHER VENDOR DEVICES	TOOL KIT FOR VENDOR-SPECIFIC MIBS	USER INTERFACE PROVIDED	SECURITY FEATURES	MANAGEMENT CAPABILITIES	TYPE/NAME OF DATABASE INCLUDED	PRIVATE MIB EXTENSIONS SUPPORTED	TYPES OF REPORT WRITING CAPABILITIES	PRICE FOR SOFTWARE
Hampton, Inc. (603) 926-3331 (800) 778-2677	TrendLAN 100 Network Management System	Sun Sparcstation 2, PC	Bridges, hubs, routers	Proprietary	Yes	Yes	Sun View	User authentication	Isolates faults, includes standardized APIs, supports mib	Relational/Informix	Any that are published	Configuration reporting, trend analysis	$30,000 - $50,000
Ungermann-Bass, Inc. (408) 496-0111	NetDirector	Compaq Intel 80386-based PCs, IBM PS/2 Models 70, 80	Bridges, hubs, modems, routers, adapters, servers	Epilogue Technology	Yes	No	Presentation Manager	Password	Automates entry of devices, isolates faults, detects unauthorized users, standardized APIs, supports mib	Relational/Sybase	Ungermann-Bass	Configuration reporting, trend and fault-performance analysis	$7,500 - $16,000
Network Communications Corp. (612) 796-1300 (800) 937-0255	NetManager	Variations, Decstation 2100, 3100	Bridges, routers	SNMP Research	Yes	No	X Window	Password	Automates entry of devices, isolates faults, detects unauthorized users, supports mib	Relational/Informix	Ryder	Configuration reporting, fault collection, traffic monitoring	First copy $10,000; second copy $6,000
NetStar Communications, Inc. (617) 275-2400	SNMP-NMS	Sun 3, Sparcstation	Bridges, routers	SNMP Research	Yes	Yes	X Window, Sun View	User authentication	Isolates faults	Flatfile/Proprietary	ACC, Cisco, Novell, Proteon, Shiva, Synoptics, Tylogics	None	$15,000

Many people will take LAN outsource track

BY TODD DAGRES

When the size, complexity and expense of local-area network management get to be too big a job, many companies will begin to consider outsourcing.

Turning network management functions over to an outside contractor is by no means common practice at this point; in a study of Fortune 1,000 companies, most information systems and telecommunications professionals said they would not trust an outsourcer to manage such a strategic resource.

However, 75% of these same IS and telecom professionals agreed that certain LAN functions, such as moves, adds and changes, could effectively be outsourced. As providers of LAN outsourcing improve their capabilities, the LAN service market will grow in popularity; in fact, it is expected to reach $4 billion by 1993.

Of the five categories of LAN outsourcing services — planning, design, implementation, operation/management and remedial maintenance — it is the fourth category, LAN operation and management, that is most needed by firms today.

Providers of this service are a diverse group (see story at right). Some, such as Digital Equipment Corp., Unisys Corp. and Hewlett-Packard Co., have introduced formal LAN operation and management services packages, while others, such as Electronic Data Systems Corp. (EDS), IBM, Andersen Consulting and Network Management, Inc., are currently less structured in what they provide.

Their offerings usually include monitoring the network, identifying faults, opening trouble tickets and correcting faults.

No comprehensive plan

No one, however, has yet to introduce a suite of services covering all aspects of LAN operation management — including performance, configuration, security and accounting management. Any of the larger outsourcers will provide "total" LAN outsourcing to select customers. This may entail transferring all LAN responsibility to the outsourcer and, in some cases, people and capital equipment as well. Not many customers are ready for such a service.

The custom nature of LAN outsourcing makes discussions of price difficult. Vendors charge users per event, hour or year for certain service elements. However, the rule for LAN outsourcing service packaging and pricing will be the custom bid.

There are a few words of caution for companies evaluating LAN outsourcing alternatives and vendors. Compared with more traditional outsourcing environments such as data centers and corporate networks, the LAN environment is less mature, less disciplined, more dynamic and more decentralized. LAN operation management control and responsibility is spread across multiple divisions and sites of the organization. Finally, there are many hidden activities associated with LAN operations and management. •

Dagres is director of data communications research and consulting at The Yankee Group, a market research and consulting firm in Boston.

Are you an outsourcing candidate?

- Are you having difficulty maintaining expertise internally?
- Are your networks growing faster than your ability to manage them?
- Would you like to give up routine tasks and focus on more strategic functions?
- Are your LAN management costs way out of hand?
- Are you moving from a mainframe to a LAN environment? You might consider bringing in an outsourcer on a temporary basis.

The right stuff

Once you've found an outsourcer that covers the specific needs of your environment, consider the following requirements:

- A demonstrated commitment to your company.
- A sufficient organizational and support infrastructure.
- A demonstrated ability to manage an environment similar to your industry and applications, local-area and wide-area networks and geographic area.
- Guaranteed service levels.
- An ability and commitment to change management as LANs evolve.
- No hidden costs.
- An ability and willingness to absorb LAN management staff and capital if necessary.

Roundup of major vendors

Following are the major categories of LAN outsourcers:

• **Computer companies** with substantial service businesses, such as IBM, DEC, HP and Unisys. DEC and HP were among the earliest to roll out actual packages. IBM has been hesitant to promote its services because of its relationships with value-added resellers (VAR) and distributors; however, it is expected to begin promoting them more aggressively.

Strengths: Service and support infrastructure, knowledge of technology and installed base.

Weaknesses: Orientation toward their own products, skills limited to certain technologies or platforms and a perceived "box mentality."

• **Telecommunications companies**, including interexchange carriers, regional Bell operating companies (RBOC) and value-added network vendors.

AT&T has the service infrastructure to become a major LAN outsourcer but needs to combine the support infrastructure of its telecommunications and computer divisions.

U.S. Sprint Communications Co. and MCI Communications Corp. have developed LAN connectivity and integration services, but they have limited operation and management capability.

The RBOCs have strong regional service organizations but limited data communications and applications experience. Value-added network providers' strongest suit may be their ability to manage an internetwork of LANs as part of a public packet network service.

Strengths: Large service and support infrastructure, significant experience in physical cabling and communications, network integration experience, remote management capability, investment capital, acquisitions and alliances.

Weaknesses: Interexchange carriers: lack of experience in data applications. RBOCs: regional limitations, regulations and a "telephone company" reputation. Value-added network providers: light on service infrastructure and staff.

• **Systems integrators and facilities managers**, such as EDS, Andersen Consulting, McDonnell Douglas Computer Systems Co. and Martin Marietta, are approaching LAN outsourcing from the timesharing, data center and mainframe environments.

Strengths: Service, experience in data applications, familiarity with multivendor environments and professional service delivery infrastructure.

Weaknesses: Light on international capabilities.

• **LAN specialists**, including Network Management, Inc. and Evernet. Their challenge is to develop a national service capability that includes integration services in addition to LAN operations and management.

Novell, Inc. is also trying to build user support capabilities. Its offering is limited to help desk support but includes a multivendor support capability.

• **"The LAN 100,"** a collection of LAN VARs, distributors and integrators expanding their service offerings to complement their presales design, implementation and maintenance services.

Strengths: Focus on LANs, low-end integration capabilities, knowledge of LAN environment.

Weaknesses: No nationwide technical service infrastructure, limited to certain products and technology, inability to provide large-scale 24-hour and on-site service.

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Denny's POS effort

Food service firm's IS chief reveals how point-of-sale system puts store managers where they belong — out front helping customers

BY CHARLOTTE A. KRAUSE

The climate was not particularly favorable in 1988 at Denny's, Inc. for a major point-of-sale (POS) system rollout. We had just been acquired by TW Services, which left the company highly leveraged, and a previously unsuccessful stab at a companywide POS system had left restaurant managers skeptical about the technology.

Nevertheless, delay was not an option. Denny's needed a system to improve its cash accountability, labor costs, inventory and productivity, and it needed it as soon as possible. The intense competition in the mature food service market demanded it.

What Denny's had in place before 1988 was a manual, paper-based system in which restaurant managers used handheld data entry devices to gather weekly payroll hours. Calculation mistakes were common, and corrections bogged managers down in hours worth of paperwork.

Sales reporting was done with a pencil, which turned the restaurant managers into bookkeepers. They balanced sales totals from previous cash register readings and conducted manual guest check audits. Not only were the checks sometimes illegible, but the store managers also didn't have enough time to verify that every entree was priced correctly or that the sales tax and totals were correct.

Automation at fingertips

When it is complete in 1992, our Intel Corp. 80286-based IBM Personal Computer system — dubbed Restaurant Automation for Denny's Success, or RADS — will put automation at the fingertips of every employee at our 1,000 company-owned restaurants in 46 states. We are putting in systems at the rate of one per day.

RADS gives us a way to measure our business in more detail within each restaurant, allowing us to manage each one more efficiently and make a greater impact on Denny's bottom line.

RADS has three goals:

- To capture more sales data, especially that not previously recorded, such as food produced but not paid for, check calculation errors and so on.
- To increase control of labor dollars via a new automated time-keeping system.
- To reduce paperwork for managers so that they can spend more time on the floor providing service to customers.

Each setup basically consists of three to five terminals, another terminal that acts as a cash register, plus a PC in the back office and a remote printer in the kitchen. Servers enter their orders at a convenient terminal. Information from each store is summarized once each day, then automatically sent to Denny's headquarters mainframe in Irvine, Calif., where the data is summarized for financial reporting.



Marie Haines

Denny's formally launched RADS in June 1988 at a senior operations managers' review, followed one month later by two stores going live in Orlando, Fla. Fresh on the company's mind was a previous POS rollout during the early 1980s that had had little impact and a negative image. That project died an early death, primarily because of an unclear return on investment, limited senior management support and the high cost of the hardware — in excess of $40,000 per restaurant.

We were determined not to let that happen again. We would make sure that the support was there from all areas of the company and that the project was well-understood. We did this by holding an orientation with every level of management, starting at the top, and with all groups in the regional offices as well. We took a cross-functional team approach to the effort based on the manufacturing concept of quality control circles. Instead of design, engineering, procurement and shop floor quality control, the team included human resources, training and accounts payable (see story page 84).

Executive support

By early 1989, we had several factors going for us that we didn't have with our first POS attempt. First, we had the support of our senior executives, who pushed for the project. Second, we had been through 18 pilot programs in the Orlando area and could use them as a guide.

Our executives were behind the project because they knew time and revenue gains were possible. Information systems people shared this vision. Ensuring continued executive buy-in and support for RADS meant not letting technology dominate the decision process, so we chose a POS software solution based on a generic PC platform.

Because there was no commitment to a predetermined technology, people could concentrate on the business opportunity.

Another advantage of a generic hardware platform is an investment in the future. Now, an application can be ported across generations of PCs, ensuring a much longer, useful life for the software investment.

Our pilot program validated the use

Continued on page 84

Krause is director of information services at Denny's, Inc. in Irvine, Calif.

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- **Company has netted 1% increase in revenue**
- **Rollout to 1,000 stores by '92**

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Continued from page 81

of the software and hardware by letting us match systems performance with our project objectives and expectations.

However, things were not all rosy. We were aware that the pilot program did not go completely smoothly. There was a three-page list of software enhancements needed, including the ability to void an entire check and increase the number of modifiers for Denny's extensive food preparation options.

Furthermore, while the senior executives were behind the project, there were skeptics in the operations group: the line managers whose buy-in support was critical. They openly expressed their intention to let the 18 restaurants in Orlando try the pilot system first before they would test it.

We got around their skepticism by making the line managers part of our initial orientation and keeping them in the loop.

As the rollout and orientation proceeded, everything started to go as planned. This good news traveled fast, cementing restaurant management support.

Key issue: Nationwide training

With orientation at the executive level came hands-on training at the store level. Because RADS training isn't cheap — the first one-hour orientation costs $200 to $250 (44 employees multiplied by an average of $4.50 per hour plus trainers' wages, travel time and expenses) — the trainers make sure the meeting is rich in content and worthwhile. We recruited store general managers with good training skills to train others.

RADS training is considered a good assignment because it allows the general managers to learn the new computer system and be exposed to many management styles, problems and issues.

Only nine teams of three trainers each were required to train staff members at 320 restaurants last year. With an average of 44 employees per store, the nine teams converted more than 14,000 employees to RADS users in 1990. Using a limited number of teams was effective and enabled us to keep rollout costs down.

Project milestones

- **July '88** Started two pilot stores in Orlando, Fla.
- **October '88** Expanded pilot to one district (eight stores)
- **1Q '89** Expanded to second and third districts (18 stores)
  Tested support functions
  Produced installation documentation
  Initiated training procedures and help desk
- **2Q '89** Prepared for rollout at 30 stores per month
  Developed additional support functions (marketing, administrative and more documentation)
- **June '89** Project launch
- **December '89** 67 restaurants in Florida and California
- **December '90** 387 restaurants
- **December '92** Estimated rollout completion date

Source: Denny's, Inc.

At the home office, only two people are required to coordinate the ongoing rollout. One supervisor handles the trainers, and an administrative assistant handles logistics such as ordering equipment, paying invoices, reserving training facilities, scheduling training equipment delivery, pickup and storage, scheduling equipment installation and resolving postinstallation difficulties.

Measurable benefits

With training well under way, the project's momentum was building. Then the benefits began to accumulate.

We based our return-on-investment analysis on an increase in revenue attributable to our ability to report all sales for the first time. For example, the POS system could now capture sales previously not reported, such as single cups of coffee served without charge, food given away to friends, miscalculations and so on.

Because we can capture all food sales, we're already realizing a revenue increase in excess of 1% at our first 400 or so sites, which translates to $10,000 per year improvement per store.

No less important are the time savings in administrative activities. We identified those functions that provide time savings either because the computer did the number crunching or because the data quality improved, needing less error checking and follow-up by the home office.

For example, in our former system, the employees filled in time cards. The manager then calculated the hours worked by each employee, totaled the labor costs for the restaurant, keyed the hours into the handheld terminal and telephoned in the labor cost information.

Now, the employee uses the computer as a time clock. All the manager does is review the hours, then release them for polling to the home office. Managers need to call only their district leaders with labor costs they had automatically calculated on the PC.

Time savings are assessed at about 14 hours per week per store. When the rollout is complete, those time savings will translate into about $25 million. Time has been redirected to customer service, with managers expediting orders in the kitchen if the cooks get backed up, clearing tables to seat customers quicker and greeting customers.

Added benefits

The POS system also affects new hire procedures. Previously, it was common to manually process a new hire application form three or four times because information was missing. The manager now enters new hire information on the back office PC. RADS won't accept that application without every field being addressed.

RADS also helps us identify staffing and other problems that hinder a consistent operation.

For example, Denny's popular "10-minute guarantee" offers customers a free meal if their breakfast or lunch doesn't arrive within 10 minutes. With POS, there are special tendering categories for these free meals that we can track along with store location, time of day and server. This allows us to give management the information they need to focus on better execution and better service.

In summary, when implementing information technology in a nationwide network, it's imperative to secure senior management buy-in and support, to establish and manage expectations and to reach out to many disciplines.

Now that we have a way to measure our business in more detail within each restaurant with RADS, we can manage it more efficiently and make a greater impact on Denny's bottom line.

Denny's is committed to its major investment in POS. Even though the food service industry is feeling the impact of the recession, Denny's reported solid increases in earnings this year. ●

Interdisciplinary team

Key to ideal project team is drafting non-IS players

At Denny's, the RADS project team spans many disciplines — IS, training, human resources and finance. The key here is that the team includes employees not normally in the IS department. This provides a fresh perspective that blends business and technology strengths.

- IS. Denny's central IS department in Irvine, Calif., oversees the installation's technical aspects and ensures that it is proceeding smoothly.

It also manages the help desk, which acts as the department's eyes and ears to follow the implementation of remote technology. These folks are a vital part of the IS team and should be held in as much esteem as programmers.

It is important for the desk to receive calls from both beta-test and fully functioning sites. Doing so helps them anticipate problems before the project goes out to the full user base. Lots of telephone calls may signal a decrease in customer satisfaction — trainers and development teams need to hear the feedback.

- Training. At Denny's, the training departments created more than 30 different kinds of training materials, including videos, self-help guides, job aids and procedure manuals.
- Human resources. The human resources department helped with initial job descriptions and now aids in continual recruitment of trainers as we move into new areas of the country.
- Finance. The finance department measures our progress: Is the revenue increasing as we had projected compared with the rest of the chain? Finance also issues the monthly reports on our capital budgets: Are we completing the conversions on schedule and on budget?

For Denny's, the answer to both questions is yes, but more importantly, our progress is being measured by the same people who measure other financial objectives of the company.

The internal auditors are a key part of the financial department. They are the impartial evaluators and can really focus on controls and cross-checks, which are important for a business in many remote locations.

CHARLOTTE A. KRAUSE

Learn by their experience

You can't afford to learn about rollouts by starting from scratch and experimenting. You need to leverage the experience of others.

Your vendors are among your best resources because rollouts are quite likely a familiar activity to them.

Look at your vendors as partners: When you solve problems together, you gain the benefit of their expertise, and you both win if the problem is solved successfully.

Here's how our vendors helped us:

- Our installation vendor, Datatec Industries in Fairfield, N.J., specializes in implementing POS rollouts and controls everything from one central point.

This lets us avoid negotiating with dozens of local contractors around the U.S., each of which might have its own interpretation of our wiring requirements and understanding of POS networks. It also simplifies billing and other coordination details and lessens the probability of miscommunication.

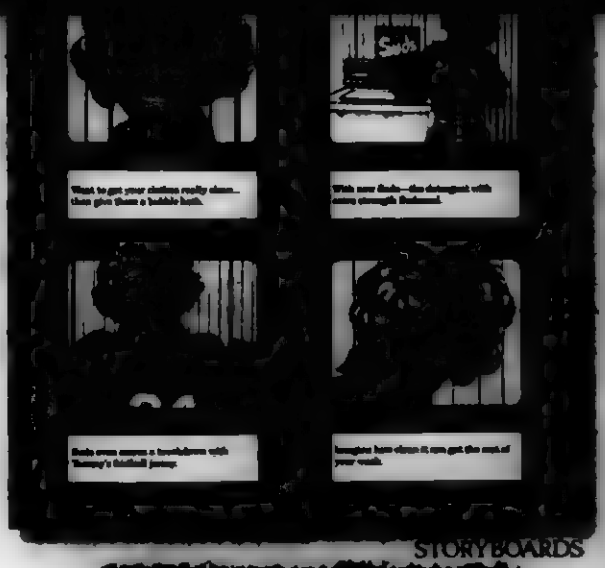
A complex multisite rollout such as Denny's requires constant centralized communication, nationwide project management skills and specialization in POS environments.

Using a single provider of POS installation services allowed us to streamline our chainwide POS implementation and avoid large increases in personnel necessary to manage the rollout.

- Our information delivery software vendor — Xcellenet, Inc. in Atlanta — brought its telecommunications knowledge to bear when we needed to resolve modem problems at our remote sites.
- Our software vendor — Fisher Restaurant Systems, Inc. in Marietta, Ga. — implemented the software enhancements we identified during our 18 pilots, customizing the software for Denny's.
- We even found a partner in our moving company, which now stores and ships our training systems between training sites.

Your vendors should go out of their way to fix your problems, whether real or perceived.

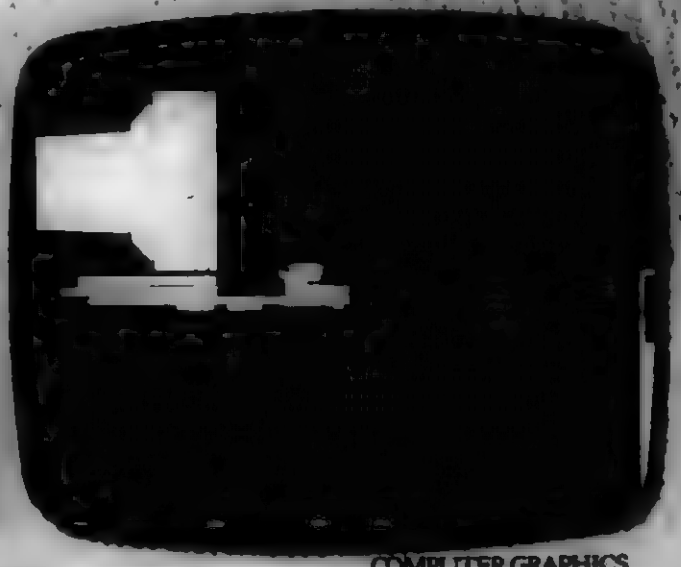
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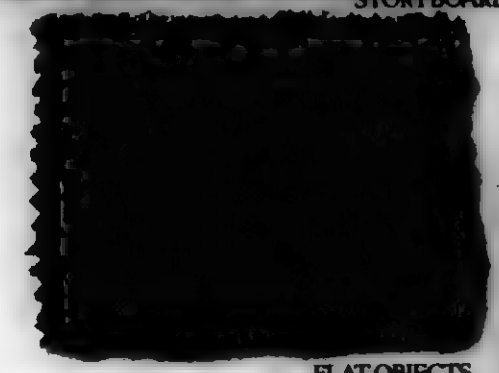
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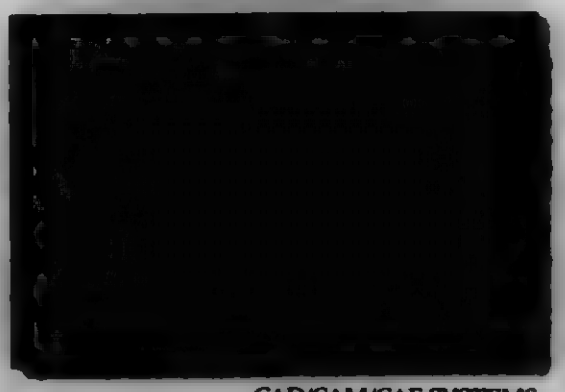
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COMPUTER GRAPHICS



FLAT OBJECTS



CAD/CAM/CAE SYSTEMS



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ART



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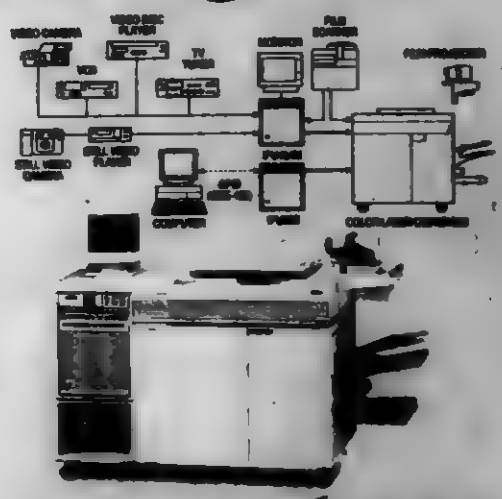


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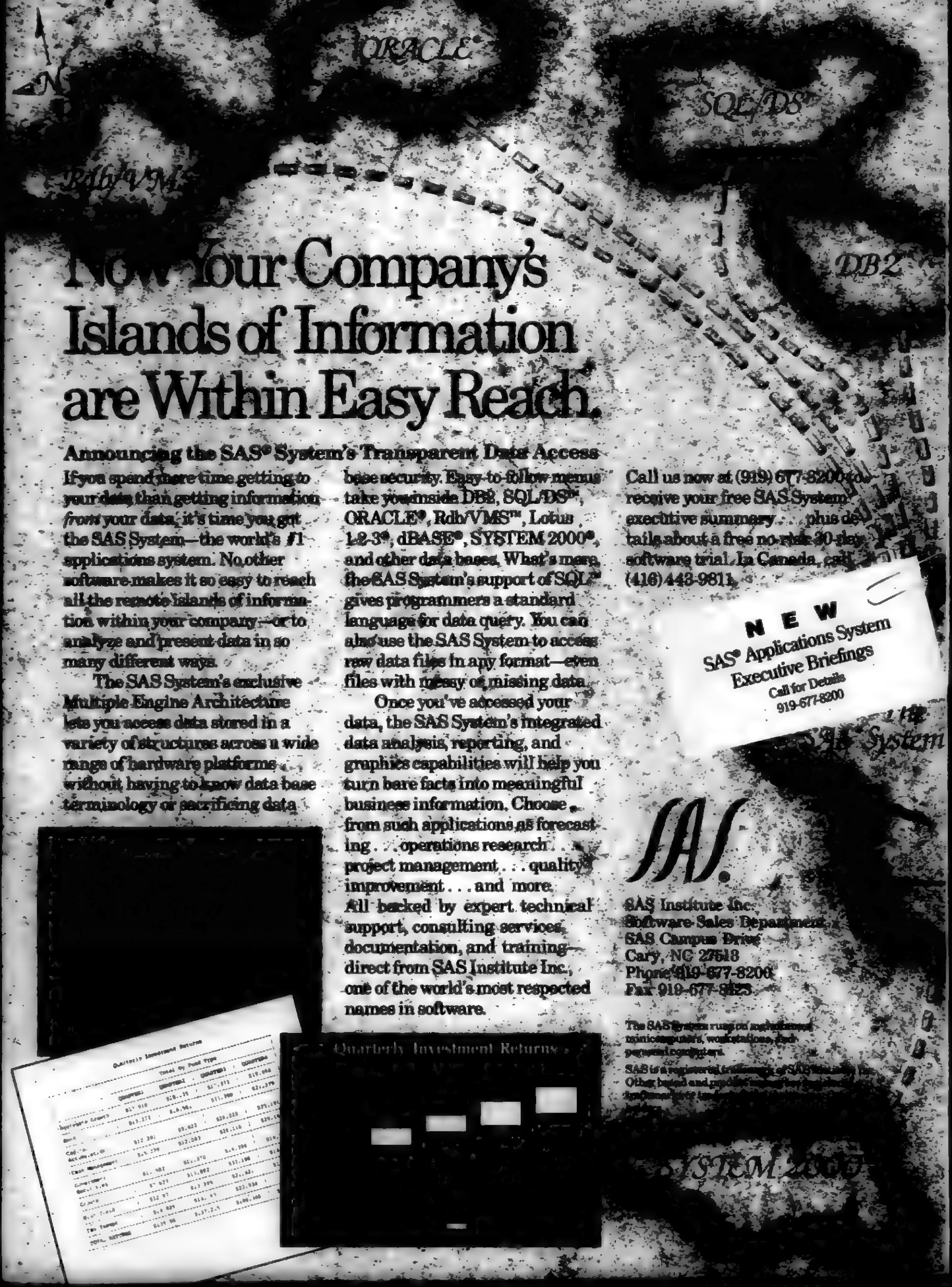
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SYSTEM 2000

NATIONAL BRIEFS

Coming out

▶ **Concurrent Computer Corp.** is out from under an involuntary bankruptcy petition filed against it in late December by a group of three large institutional bondholders. A debt-restructuring agreement reached in March by Concurrent, its bank group and the bondholders led to the withdrawal of the petition, Chief Executive Officer **Denis Brown** said.

Just in case

▶ Beaverton, Ore.-based **Cadre Technologies, Inc.** recently announced its acquisition of DB Software Corp. in San Francisco. The latter company makes a database design product called DB RE/generator, which produces SQL code that runs on IBM mainframes and other platforms. The acquisition will help Cadre fill out its general-purpose computer-aided software engineering product line.

S.O.P.

▶ An industry/government **task force** has been formed to help coordinate the development of product data exchange standards (PDES) used in computer-integrated manufacturing and concurrent engineering. Task force members come from **McDonnell Douglas Corp., Digital Equipment Corp., IBM, General Motors Corp.**, the **National Aeronautics and Space Administration**, the **U.S. Departments of Defense, Commerce and Energy, PDES, Inc.** and the **IGES/PDES Organization.** The group hopes to have a comprehensive product data exchange implementation plan in place by November.

The Sun also recycles

▶ In two separate but complementary efforts, **Sun Microsystems, Inc.** is saving some trees — and no small amount of money to boot. An initiative to document software on compact discs instead of on volumes of paper documents along with a headquarterswide recycling effort begun at Sun this month will minimize the use of paper, recycle paper that is still in use and additionally recycle wet garbage such as food and everything else from junk mail to Styrofoam to cans and bottles. Sun estimates that the effort will save the firm some $100,000 per year.

Japan's Unix market beckons

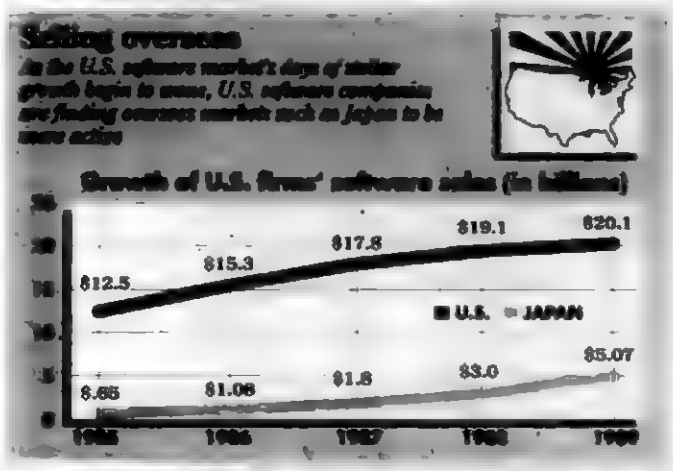
U.S. software firms lay groundwork for reaping Japanese Unix bounty

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — A determined and patient group of U.S. software companies is poised to jump into a market just opening up in Japan: packaged Unix software. Encouraged by Japanese information systems managers' newfound interest in downsizing mainframe applications, these firms are forging partnerships with well-established Japanese firms to distribute their wares.

The move means potential benefits on both sides of the Pacific: for Japanese users, quick satisfaction of a growing need, and for U.S.-based users, a promising source of the profits their suppliers need to keep the products and services coming.

Informix Software, Inc., Oracle Corp., Hewlett-Packard Co. and Information Builders, Inc. (IBI), among others, have already done their homework: They have had their Unix software translated into Japanese Kanji characters. They have also done some legwork and linked forces with Japan-based firms to provide local distribution and support of the software they sell. And they have shown patience — not always the earmark of U.S.-based firms. IBI, for example, has spent the last 10 years establishing 200 sites in Japan.



Source: Packagesoft/Sentry Market Research — CW Chart: Doreen St. John

Driving this U.S. move into the Japanese market is the promise of a foothold in a packaged software market that was barely $1 billion in 1987 but could reach several times that by 1993, according to market analysts.

The emerging packaged software market in Japan significantly coincides with slowing software sales elsewhere in the world. It also coincides with a move to hardware and software standards in the Unix world, underlined by Japanese membership in the Open Software Foundation, Unix International and X/Open Consortium Ltd.

"After you've gotten your share of the market in the U.S. and Europe, you'll go after your market share in Japan," explained Kate McGee, manager of international affairs at Oracle in Washington, D.C. Oracle is participating in a U.S. Department of Commerce trade mission to Japan, as well as building up its fledgling Japanese subsidiary to become part of a world sales division that brings in half of Oracle's revenue (see story page 90).

"In Japan, they've been using [proprietary] software for so long that they've painted themselves into a corner," said John Korondy, manager of worldwide strategic applications at Palo Alto, Calif.-based HP. "They've put themselves at a relative disadvantage by not being able to use off-the-shelf software."

However, the widespread acceptance of packaged applications for MS-DOS personal computers used in Japanese offices is easing the Japanese transition to packaged Unix software, U.S. software executives said. Bob Macdonald, vice president of corporate marketing at Menlo Park, Calif.-based Informix, sees a turnabout by Japanese IS directors frustrated by long development times for mainframe applications. "They're looking for the same price/performance and flexibility that their counterparts in Europe and the U.S. have had in their operations," Macdonald said.

Even partnership

In preparation for an intensified Japanese sales effort, in 1989 Informix made a 5% equity investment in Tokyo-based Ascii Corp., which publishes software and manufactures computer chips for the Japanese domestic market.

To ensure an even-handed partnership, Ascii acquired 5% of Informix's stock in December 1990; it also holds an option on an additional 5%. The partnership, Macdonald said, gives Informix the benefit of Ascii's market savvy and lets the Japanese firm share Informix's Unix expertise.

Similarly, HP is relying on Canon Ltd. to get its New Wave PC-based software distributed in Japan and may rely on Hitachi Ltd. to resell some of its Unix software in Japan. HP and Hitachi recently reached an agreement by which Hitachi would license software for HP's PA-RISC workstations, while HP would license expert-systems technology developed by Hitachi. Until recently, HP sold all products directly through its Japanese subsidiary.

Increasing demand for Unix may come in part from the rapid buildup of Unix-based workstations in Japanese companies,

Continued on page 90

Study highlights industrial automation

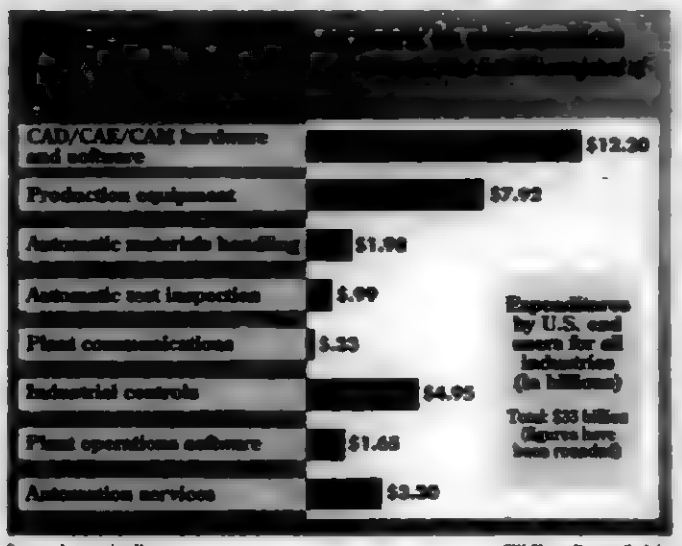
BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The U.S. computer and office equipment industry is more than just a supplier of industrial automation technology. It is a major user of that same technology, accounting for $1.7 billion of the market.

In 1989, U.S. manufacturers invested $33 billion in industrial automation hardware, software and associated services, according to a study just released by the Automation Forum.

The Automation Forum is sponsored by nine trade associations including the National Electrical Manufacturers Association, the Computer and Business Equipment Manufacturers Association and the National Computer Graphics Association. The forum said the study is the first to reliably measure the U.S. industrial automation market.

The report is a snapshot of current spending, a baseline on which future studies will be built, according to the Automation Forum. It does not attempt to identify trends or make projections.



Source: Automation Forum — CW Chart: Doreen St. John

No service economy

Speaking at an industry seminar at which the study was unveiled, Rep. Don Ritter (R-Pa.) said notions that the U.S. could prosper with an economy dominated by services have now been thoroughly discredited, and he called on the federal government to realign its research and development priorities in favor of manufacturing technologies.

"The 1990s will be the decade of manufacturing, the decade of 'Made in America,'" he said.

In addition, Ritter called for reinstatement of the investment tax credit, "a tax credit of up to 20% for the purchase of productivity-enhancement equipment." He also called for a permanent cut in the capital gains tax rate as a measure to stimulate investment.

Cap Gemini moving to facilities management

BY MARC BENITAH, FREDERIC PELLOUD and LINDA LEWIS
SPECIAL TO CW

PARIS — Europe's leading computer services house, Cap Gemini Sogeti, offers activities ranging from management consulting and professional services to systems integration. However, the company had little involvement in facilities management until earlier this month, when it announced that the field would become one of its major areas of development.

The decision is not surprising given Cap Gemini's July 1990 acquisition of 69.7% of the UK-based facilities management specialist company Hoskyns.

"Compared with our previous majority shareholders — Plessey, followed by General Electric Co. and Germany's Siemens AG — we now have a partner that understands our business," said Geoff Unwin, president of Hoskyns.

In 1990, Hoskyns reported $188 million in facilities management revenue — 48% of the company's total revenue of $391 million. Thus far, Hoskyns' activities have been focused on the UK market, which represented 87% of group revenue last year. However, Cap Gemini is expected to smooth Hoskyns' penetration of foreign markets.

For example, Hoskyns recently signed a major facilities management contract with food products maker Heinz in the UK. "We signed an umbrella agreement with Heinz. [This means] the first country to have been signed is the UK, but in due course, other European countries could well join in," Unwin said.

The Heinz contract, worth several million dollars, has triggered expansion of Cap Gemini's facilities management activities in Europe.

In France, Hoskyns and French software house Cap Sesa are creating a joint venture, Cap Sesa-Hoskyns, 60% of which is owned by Hoskyns and 40% by Cap Sesa. The initial capitalization amount was not disclosed.

According to Unwin, Cap Sesa and Hoskyns have already worked together on the Eurotunnel project and on a telecommunications contract in the UK, where a personal communications network is currently being developed.

Yet another attempt

This is not the first time Cap Gemini has attempted to enter the facilities management arena.

"In 1972 to '74, [Cap Gemini] had a subsidiary in this sector. At the time, we thought that this market would develop significantly, but it obviously wasn't mature," General Secretary Michel Berty said last month.

According to French market researcher Pierre Audoin Conseil, the French facilities management market grew 20% in 1990 to a value of $525 million. UK-based market research group Romtec PLC revealed that the UK market soared 40% last year, a 66% growth over previous years' figures.

Last year, Hoskyns reported $30 million in profit before taxes, despite the fact that it lost a $21 million contract. "[The customer] wanted to take [information systems] in-house," Unwin explained. "Its decision had nothing to do with [Cap Gemini]," he added. On the other hand, Cap Gemini's strength on an international basis now opens up Hoskyns to new opportunities.

Benitah, Pelloud and Lewis write for Le Monde Informatique, *an IDG Communications publication in France.*



EXECUTIVE CORNER

USL names board roster

Unix Systems Laboratories, Inc. (USL) recently named eight members to serve as its board of directors. The roster includes President Lawrence Dooling; four AT&T ers including Robert M. Kavner, group executive of data and federal systems; and representatives of three other companies that have invested in USL: Fujitsu Ltd., Novell, Inc. and Ing. C. Olivetti & Co.

3Com Corp. recently named Alan Kessler general manager of its Network Systems Division. Kessler, already vice president of the company, will head up the newly created division, which makes and markets terminal services, structured wiring hubs, protocol software and internetworking products. Kessler formerly held a similar position within 3Com's Distributed Systems Division.

Generic Software, a wholly owned subsidiary of Autodesk, Inc., early this month appointed Peter O'Dell its new president. O'Dell, who comes to the post after four years at Autodesk, replaces Generic Software's acting president, Malcolm Davies, who is Autodesk's senior vice president of marketing and sales.

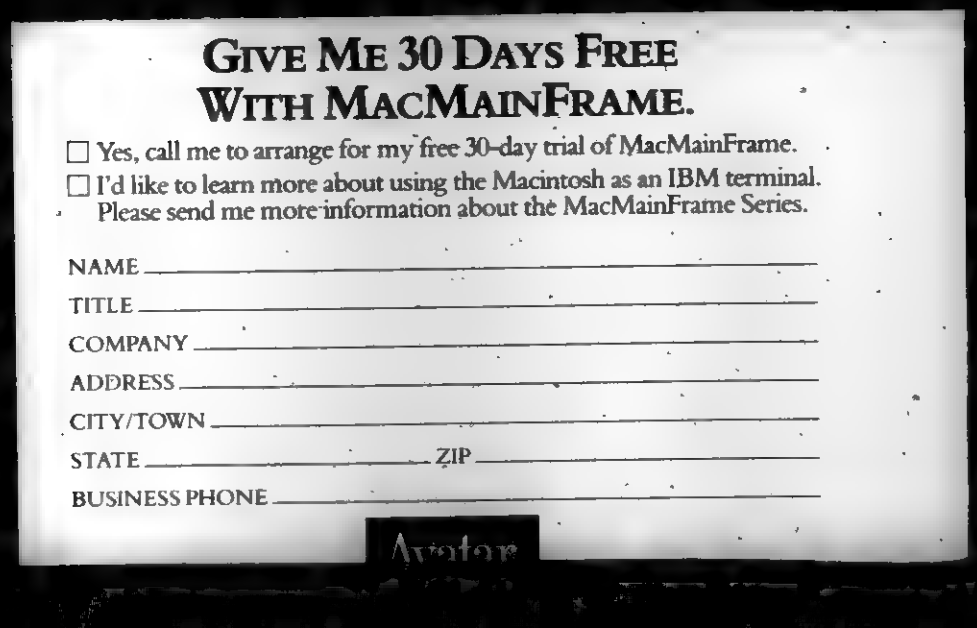
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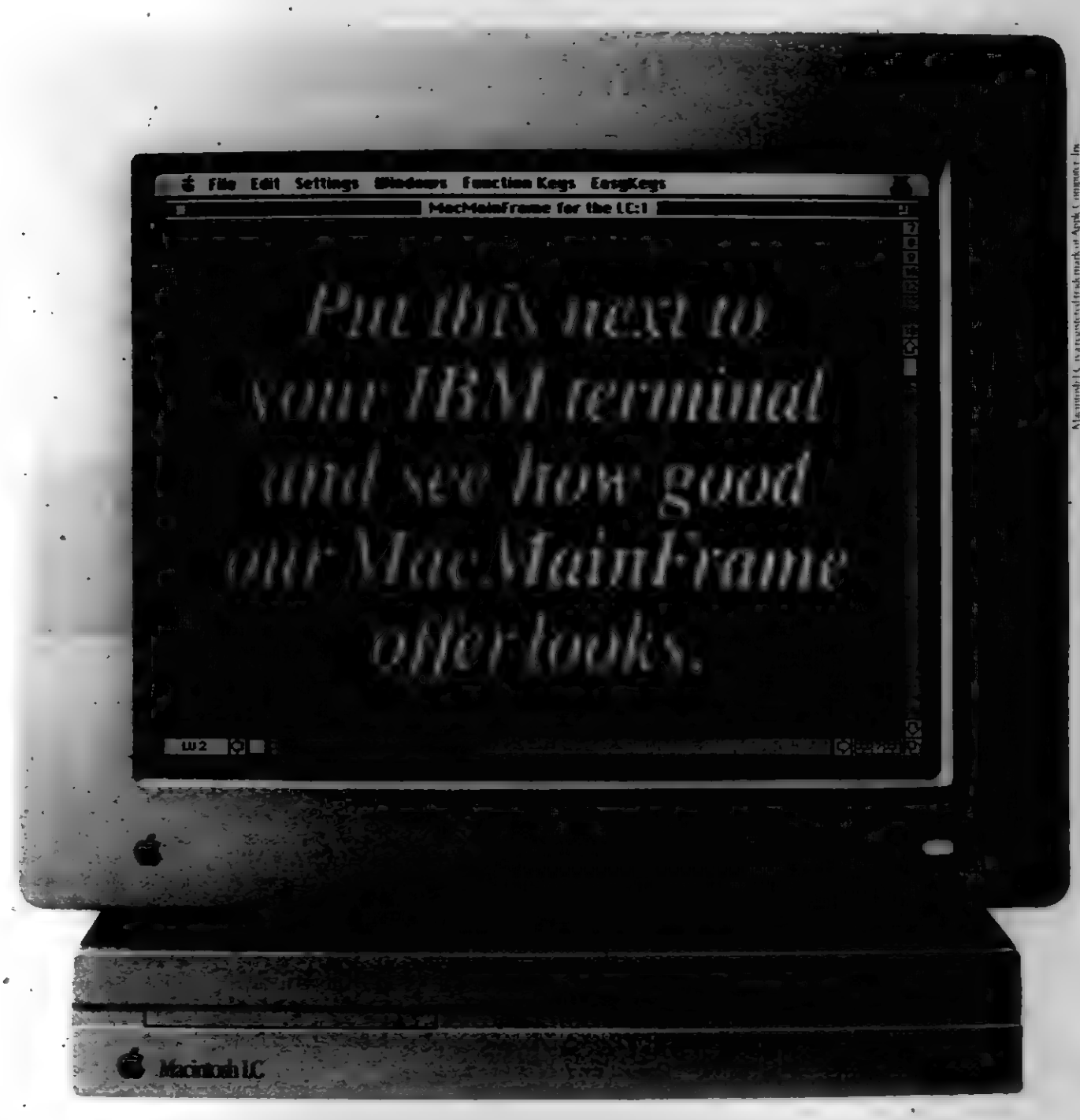
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FROM PAGE 87

Korondy said. "There's a great deal of demand for workstations in the commercial area, particularly in the financial services area. They want the same kind of workstation packages we have here [in the U.S.]."

Other firms take a different tack in selling their wares in Japan. Oracle and IBI sell through Ashisuto, Inc., a distributorship founded in 1972 by Bill Totten, a former Systems Development Corp. market researcher posted to Japan in 1969.

Ashisuto (which means "assistance" in Japanese) has hometown-team advantages. Most of its staff is Japanese, so it can provide local-language support and sell itself as a trustworthy business partner for Japanese firms.

But IBI is also working directly with Japanese computer makers to port its Focus applications development software to new systems. "There's no doubt in my mind that the people who get their product to market first with the [Japanese] national machines will gain market share," said Carl Rosenberg, director of IBI's Unix division.

In April, Rosenberg and Asian regional sales manager Joseph Lui met with several Japanese firms, including Hitachi and Fujitsu Ltd., to explore licensing agreements for IBI's Unix software.

Knowledge of the Japanese market may, in the end, be the U.S. firm's best calling card. "Clearly, the Japanese are looking to downsize many of their mainframe applications," Lui said. "So, we're looking both to our own installed base of Focus software users and to the hardware vendors in Japan to see where the opportunities are for us."

Same boom, different place?

A pool of many millions of dollars is one reason U.S.-based packaged software vendors are flocking to Japan

- In the mid-1980s, sales of all packaged software in Japan amounted to $925 million, compared with $4.5 billion Japanese users were paying for custom software.
- Some 50% of packaged software sales in Japan from 1983 to 1986 were attributed to non-Japanese firms.
- Analysts have projected the Japanese packaged software market to be several times the mid-1980s figures by 1993.

Source: Adapso CW Chart: Janell Genovese

Oracle pursues Japanese IS market

BY JEAN S. BOZMAN
CW STAFF

TOKYO — Chikara Sano knows how to sell computers to the Japanese information systems market. The 50-year-old executive sold hundreds of boxes for IBM Japan as branch manager of small systems. Now, he has been recruited by software vendor Oracle Corp. to serve as president of its wholly owned Japanese subsidiary and to spearhead Oracle's quest to gain entry to the emerging open systems market here.



Oracle Japan's Sano *is readying the company to compete in the emerging open systems market in Japan*

From a start of just three employees last year, Oracle Japan will end 1991 with about 40 employees, Sano said. By the end of 1992, he added, the firm should have about 100 employees — some 33% of them in sales and about 20% in support and maintenance.

Additional distribution and support will come from independent software distributor Ashisuto, Inc. (see story page 87), which will assign 50 employees to support Oracle products in Japan. Oracle is already installed at several sites in Japan, including Nissan Motor Co. and Canon Ltd. But Oracle is really building its business from the ground up.

To get things going, Oracle is participating in a U.S. Department of Commerce trade mission to Japan — a special program to assist 20 U.S. companies that want greater access to the Japanese domestic market [CW, April 15].

Kanji versions of Oracle's products for selected platforms have been available since 1986. Open systems are not yet widely sold, however. But Oracle is recruiting Japanese software firms as third-party sources of packaged Unix software that can run on relational database applications. "We asked about 100 software companies to attend an open systems seminar last fall," Sano said, "and about 10 companies have started to work with us on Unix database products."

By Sano's standards, things are going very well. The first trade mission, led by U.S. Commerce Secretary Robert Mosbacher in early April, was widely promoted in Japan. "When the delegation arrived and talked with top-level people here, it was broadcast on TV," Sano said. "Everybody watched this program." Personal visits by Oracle Chief Executive Officer Lawrence Ellison have helped, too. Said Sano: "He's supposed to come here once or twice a year — and he's already been here twice."

COMMENTARY

Peter Bartolik

Look back to look forward



I've been struck with a bad case of deja vu. It really hit home when executives at Compaq announced they would buy back stock — which they considered underpriced after revenue forecasts turned downward and were followed immediately by the stock price.

Don't worry, top execs told shareholders, it's just temporary. The company is well-positioned in a growth market, Chairman Ben Rosen said. The current situation won't last long.

My absolute favorite quote of all time is George Santayana's: "Those who cannot remember the past are condemned to repeat it."

The PC industry and the analysts who follow it are surely teasing that truism. Each blip on the PC front is treated in isolation — no trend here, folks — or glossed over with the simplistic explanation that troubles in the dealer channel are just messing things up for everyone else, but it won't last.

Well, it's going to last long enough to shake things up. Yes, Businessland is a situation in and of itself, but with Compaq and Apple struggling with the reality of lowered margins, it's clear the trend is away from paying premium prices for premium labels.

There are hundreds of suppliers in the U.S. who can now go out and buy quality components and slap together a PC just as functional and fully configured as those made by top-tier manufacturers. The difference is they'll sell it to you for a couple of thousand dollars.

There are clearly too many companies equipped with too much technology chasing too few customers. A betting person could easily reach the conclusion that a massive shakeout is looming.

Remember what Compaq executives said about this being a short-term phenomenon. Then think about what executives at Wang, DG, Prime and every other minicomputer vendor said just a couple of years ago when the phenomenon of hot commodity boxes based on RISC technology surfaced.

The excuses then were currency trading problems, short-term economic problems and customers having trouble absorbing the technology they'd already purchased. The excuses are much the same today, but the fundamental problem comes down to the wide availability of quality components and the growth of alternative distribution channels — factors that make it easier for usurpers to come in with rock-bottom prices and steal business from larger companies.

Businessland may be about to give up the ghost, but Compaq will very likely weather the storm. With no direct sales force to support and a traditionally low investment in research and development, it merely has to return to its roots: the days when it climbed ahead of the pack by offering something better than IBM at a lower price. Now others see Compaq as the IBM of the '90s: someone to undercut and outmaneuver.

But what happens if and when big companies such as Compaq make the transition? It will put pressure on the Dell Computers of the world. And when the Dells respond, it will put pressure on the Northgates, and so on and so on.

Those who can't respond will fall out at the bottom. And the bottom will consist of companies that insisted there was nothing to respond to.

Bartolik is Computerworld's news editor.

INTERNATIONAL

BRIEFS

The sharing of the green

▶ Computer documentation services player **R. R. Donnelley and Sons Co.** in Chicago and computer services provider **B. G. Turnkey Services Ltd.** in **Cork, Ireland**, last week teamed up to offer production and distribution aid to European firms. The new joint venture company, **Turnkey Services International**, will leverage its founders' strengths to become a full-service vendor, executives at both firms said — and will also increase each founder's footholds in the burgeoning European market. Turnkey Services International's introduction followed by one month R. R. Donnelley's opening of a plant in Singapore — a move that made the firm the first to offer documentation services to both hardware and software vendors in the U.S., Europe and the Pacific Rim, a company spokesman said.

We are and are not Acer

▶ Stung by slow U.S. sales and lagging profits, Taiwan's **Acer, Inc.** plans to sell its low-end personal computers in the U.S. market under the name Acros, according to company President Leonard Liu. The Acros name will be used to penetrate the mass merchandising channel, Liu said in a midmonth interview with the Taiwan business press; the firm's Acer and Altos product names will be reserved for high-end products.

Green light

▶ By Jan. 1, 1993, **European Community** (EC) rules guaranteeing harmonized copyright protection for software will be enforced in all 12 EC member states, following a mid-May formal directive by the EC's Council of Ministers. An EC spokesman quoted in the Belgian business press said that the decision "concludes an important and sensitive debate" and respects a balance of interest among all parties concerned.

Gotcha

▶ London-based manufacturing software specialist **Kewill Systems** continued down the takeover trail with its recent acquisition of Stuttgart, Germany-based **Weigang MCS GmbH**. Kewill is reportedly paying an initial $707,520 for the production control and manufacturing software house, with up to $766,480 more to follow, depending on performance. Kewill has been quietly snapping up companies during the last year.

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How IS execs can fill business-skills gaps

BY ALICE LAPLANTE
SPECIAL TO CW

Part II of a two-part series.

Cobol and Fortran programmers at Standard Insurance are suddenly finding their career paths coming to an abrupt dead end. Once valued for their coding abilities, the programmers are now becoming obsolete as the company's aggressive move to fourth-generation languages is allowing inexperienced users to write their own programs.

"People who a year ago never cut a line of code are developing entire systems on their own," says David Schmaltz, supervisor of process management and control. "Technology is becoming a much less significant part of development here," he says.

Each firm has a different story about why its technical professionals need to broaden their skills. A common theme is that information systems professionals need a better understanding of users' needs and the company's business. Fortunately, IS managers are successfully finding ways to meet this challenge.

One method for IS employees to pick up critical business knowledge is by working with end users, IS managers say.

For example, at Union Camp Corp. in Wayne, N.J., IS employees are assigned to work with specific end-user departments over extended periods of time. This way, they become intimately involved in the actual, hands-on business processes of the users, says John Ineson, director of corporate IS.

However, this method has its drawbacks, according to Dennis J. Murphy, director of corporate information management consulting and support at GTE Corp. in Stamford, Conn. Specifically, the IS employee could get pigeonholed into a certain business department and his career options become limited as a result.

Assignment at risk

Assigning an IS professional to an end-user department is risky, unless there is a follow-through project or an education or training effort to help make that individual more marketable to other departments or other corporations, Murphy says.

Brunswick Bowling & Billiards in Muskegon, Mich., found shorter term rotational assignments to be a better solution. "I move people in and out of end-user departments for the duration of projects and keep them moving so I can train people across the entire business spectrum," says Brian Ellis, director of MIS at Brunswick. He says he's seen greatly increased productivity and happier employees all around as a direct result.



"IS workers see their career options widening up, and end users are much happier with the systems they get," Ellis says.

However, relying on end users to train IS staff is inefficient and wastes corporate time and money because of a basic lack of understanding resulting from different backgrounds, educations and vocabularies, says Charles J. Lasky, director of MIS at Dorr-Oliver, Inc. in Milford, Conn.

"You take people with a pure business background and put them in a room with technical people, and it takes a long time before they find some common ground and begin to communicate," Lasky says. "There's also room for miscommunication and confusion, and that, ultimately, means money wasted."

Lasky says he believes that for their own good, IS employees shouldn't be passive about picking up basic business skills. He strongly recommends supplementing technical training or experience with the kinds of entry-level marketing, accounting and finance courses found at any community college.

Lasky builds a strong case for an IS worker supplementing business skills picked up on the job with a more formal education — even if the employee has to pay for the classes out of his own pocket. Three years ago, Lasky was forced to lay off some of his IS staff. The person who had the hardest time finding another job had quite a bit of on-the-job accounting experience, but her experience was too specific to that particular company and didn't translate into a more universal understanding of key business concepts.

"Interviewers were asking her general financial questions she simply couldn't answer because all her knowledge revolved around our particular system," Lasky says.

Clement Kichuk, president of Marketcorp Systems in Westport, Conn., strongly recommends that IS employees get an MBA — no matter what their eventual career goals. "The more people you have who understand the big picture, the less meetings you need between the technical and business teams," says Kichuk, who says he believes miscommunication between business and technical employees is the reason most projects fail.

LaPlante is a free-lance writer based in Palo Alto, Calif.

Walking a fine line

Generally, IS managers agree: If professionals do not elect to head down a more end-user or business-oriented path, they should become highly specialized technical gurus rather than remain as technology generalists. The Cobol or Fortran programmer who refuses to either learn C or cooperate with end users will be the first IS employee handed a pink slip during an economic downturn.

However, the technical path is not necessarily an easy one. Bob Holmes, manager of systems evaluation at Southern California Gas Co. in Los Angeles, warns that in this age of rapidly advancing technology, choosing the route of keeping up with the latest products and environments can be a daunting challenge.

"To keep up to date on the latest technologies, you will need to invest a lot of your own time beyond the normal working day," Holmes says.

However, choosing a technical route doesn't necessarily make an IS employee exempt from having to participate in the day-to-day business of the organization.

At Cigna Systems, the systems arm of Cigna Corp. in Philadelphia, President Raymond Caron says that even when hiring the most technical worker, he expects a basic understanding of business issues.

"When I hire someone, I want to see the languages they know, the systems they've implemented — all the technical stuff," Caron says. "But I want to hear it described in business terms."

ALICE LAPLANTE



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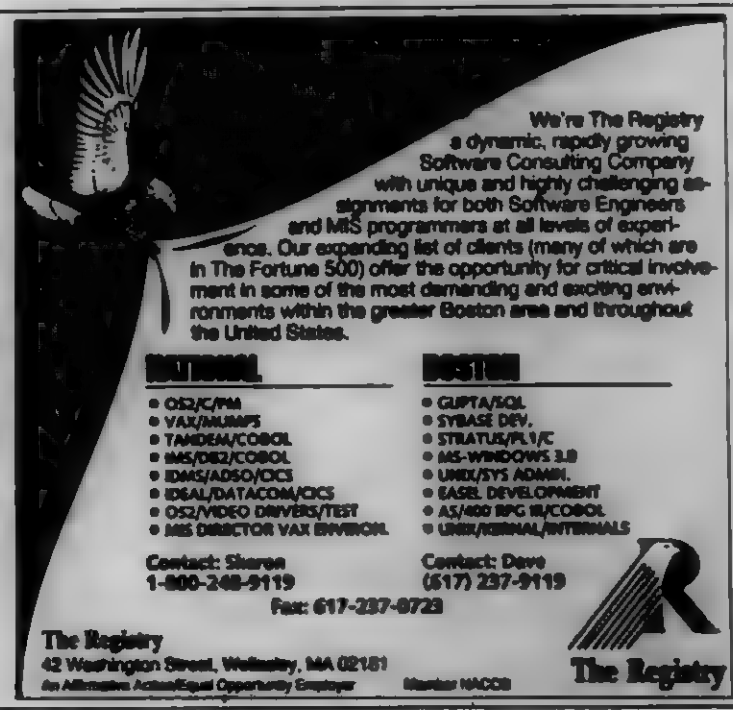
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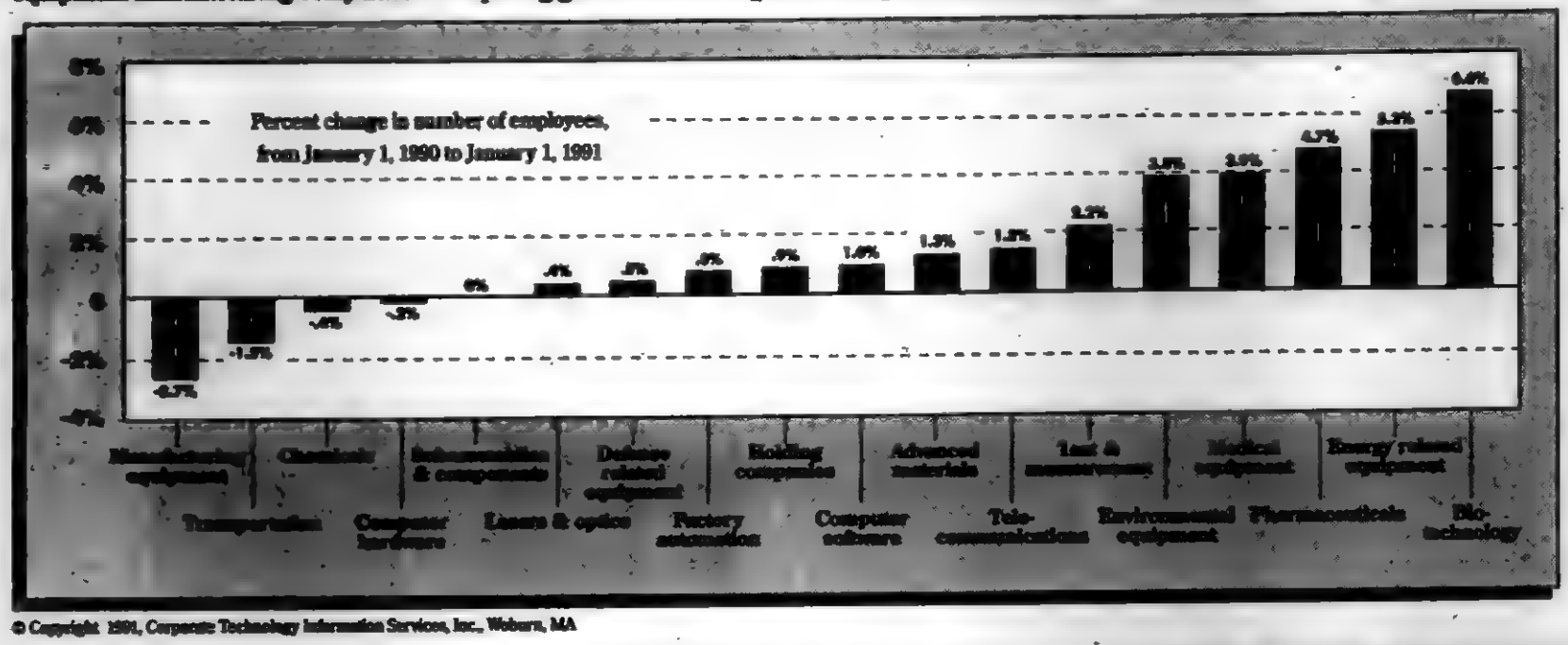
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Programmer, 45 per week, 7:00 a.m. to 3:00 p.m. $33,250 per year. Developing batch and online database system to support trucking businesses accounting and traffic information systems application using IBM 43xx, 370, OS/MVS/SX, DOS, JCL, VSAM, TSO CICS & COBOL, DEC/VAX COBOL, SAS, Assembler, HP3000 MPE COBOL IBMC PC DOS, CLIPPER, C Programming language, BITCOM communication software. Gathering and analyzing data for conversion to computer functions. Interfacing with user management to determine requirements. Defining specification, program coding, testing of software, and providing troubleshooting to users. Maintaining quality standards, and levels of documentation and developing data safeguards and user friendly backup systems, evaluating and implementing strategic opportunities presented by new information and technology. Two years of direct experience and a Bachelors degree in any field. Must have proof of legal authority to work permanently in the U.S. SEND RESUMES TO: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605, Attn: Martha Carnegena. Reference #V-IL-2551. NO CALLS. AN EMPLOYER PAID AD.

SYSTEMS ANALYST wanted. Duties: Lead programmer/analyst for analysis, design and development of an integrated insurance system. The responsibilities include process flow and data flow design, data modeling identification technical support and overall design of the application entry and reporting part of the system and meetings with users to gather requirements. Duties require using VAX 3300 and VAX 8240 computers, DBMS, RDB, FMS, TDMS, DTR, DMS software and COBOL language. Requirements: Bachelor's degree in Computer Science Engineering or Business Administration and 2 yrs. exp. as a Systems Analyst or Programmer Analyst. The related exp. must have been gained in a Commercial Application environment and include developing software using RDB database systems, COBOL language and FMS &/or TDMS Terminal interface software all on VAX computers. Pay is $32,300/yr. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref #24891. Employer Paid Ad.

Company seeks Software Engineer II to design, implement, test and maintain high performance network computing products, enhance, test, and maintain existing utilities and system interfaces of database products in NETWARE OS, DOS, OS/2 and window environment using various debugging tools; perform algorithmic analyses on database products to improve system performance. Require B.A. in computer science. Require one course in assembly language, algorithms, software engineering, UNIX and window systems. $1,423.07 bi-weekly, 40 hour work week. If qualified apply at the Texas Employment Commission, Austin, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, job order #6344707. Ad paid by an equal employment opportunity employer.

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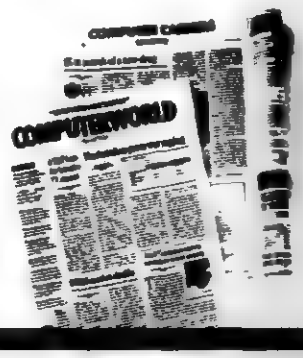
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UNIVERSITY OF ALASKA COMPUTER NETWORK
STATEWIDE ADMINISTRATION
FAIRBANKS, ALASKA
VACANCY ANNOUNCEMENT for 2 Positions

The U of AK Computer Network supports an 8,000 mile communications network linking 13 campuses statewide with 5 computer systems. We have an opening for an experienced Data Base Specialist working with IDMS and DMS/OS in an MVS/XA environment and a Senior Analyst Programmer in support of Administrative Computing. Following are the particulars.

SENIOR ANALYST/PROGRAMMER

(SALARY D.O.E. PLUS EXCELLENT FRINGE BENEFITS, annual salary range begins at $40,435), Full-Time Permanent.

JOB SUMMARY: Perform application software analysis, design, and programming at the highest level of technical complexity, scope, and risk.

MAJOR DUTIES: Create and maintain stable, accurate, efficient computer systems for the U of AK system to meet changing University requirements, goals, and objectives. Design, analyze, write, implement and test computer applications to automate University office procedures and functions. Provide assistance, documentation, and training for the user community on technical data processing matters to insure proper utilization of University information systems. Provide technical expertise to meet University goals and objectives. Properly utilize University information systems by providing assistance, documentation, and training for the user community on technical information system matters.

MINIMUM QUALIFICATIONS: Bachelor's degree or equivalent relevant experience and a minimum of 5 yrs. of related experience including lead analyst, project leader, and/or managerial experience. Demonstrated proficiency in designing, coding, testing, implementing and documenting complex computer systems and software. Applications analysis and programming, its theory and application. Demonstrated proficiency in record/file design including logical and physical database design, and work with an interactive data dictionary. Technically understand the technical and non-technical written and oral communications skills. Understanding of software engineering and systems development methodology. Skill at coordinating of technical resources in a multi-vendor environment.

DATA BASE SPECIALIST

(SALARY is D.O.E. PLUS EXCELLENT FRINGE BENEFITS, annual salary range begins at $38,771) Full-Time Permanent.

JOB SUMMARY: Develop and maintain the disk storage management plan for the U of AK. Provide analysis of data set placement, user projections, develop recommendations. Develop and maintain the data base environment, including installation, definition, access strategies, and dictionary maintenance. Develop and implement procedures to protect the data base and relevant data against unauthorized access, modification, or destruction. Develop and deliver information and training relating to the concepts and usage of the data base. Monitor and maintain data base usage and performance. Assist the Data Base Quality Assurance function in various activities.

MINIMUM QUALIFICATIONS: The successful candidate must have a min. of 2 yrs. data base management systems experience on a system equivalent to the U of AK, one of which must be in data base application analysis and design. In addition they must have 3 yrs. experience in computer programming and/or systems analysis. A bachelor's degree in a related discipline is desirable. Experience in MVS/XA, DMS/OS, IDMS, and related products is a plus.

UNIVERSITY ENVIRONMENT: We have an IBM/3090 with MVS/XA, VTAM, IDMS DB/DC 10.2, IDMS performance Monitor, ADS/O, COBOL, DMS/OS with VAM.

TO APPLY: Send a current resume and 3 professional references to: U of AK Computer Network, John Butrovich Bldg., 910 Yukon Dr., Suite 208C, PBKS, AK 99775-5180, ATTN: VI MULLEN

CLOSING DATE: Applications must be received or post-marked by 5:00 p.m. on 6-14-91

The U of AK is an AA/EO employer and educational institution. Your application for employment with the U of AK may be subject to public disclosure. Applicants will be expected to comply with the provisions of the Immigration Reform and Control Act of 1986 and possess a valid social security number.

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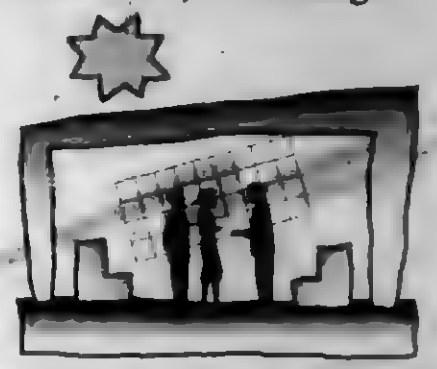
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SARASOTA COUNTY GOVERNMENT

DATA BASE ADMINISTRATOR

SARASOTA COUNTY, FL., anticipated establishment of a position for a Database Administrator in its central MIS department reporting to the Director of MIS is seeking preliminary expressions of interest from persons who may wish to be considered for the position. Starting with the definition and construction of a design reference for all the information systems of the County Government, the successful incumbent will have a primary goal of minimizing redundant systems and information content in existing and newly proposed systems. This will likely involve significant work in developing inter-local information sharing agreements within the diverse agencies of the County Government. The technical nature of the position will encompass relational data base and client server techniques in a wide variety of PC, mini and mainframe environments. The County has 35 departmental Local Area Networks and 730 personal computers and operates a five processor NCR mainframe computer center. Interested parties are invited to contact us with a current resume and a proposal letter stating their approach to and fitness for such a position, along with (mandatory) salary history. Please reply by May 31, 1991 to **Sarasota County Personnel Department, P.O. Box 8, Sarasota, Florida 34230-6668. FAX: (813) 364-4366.** Preference in appointment will be extended to eligible veterans and spouses of veterans. EOE/AA.

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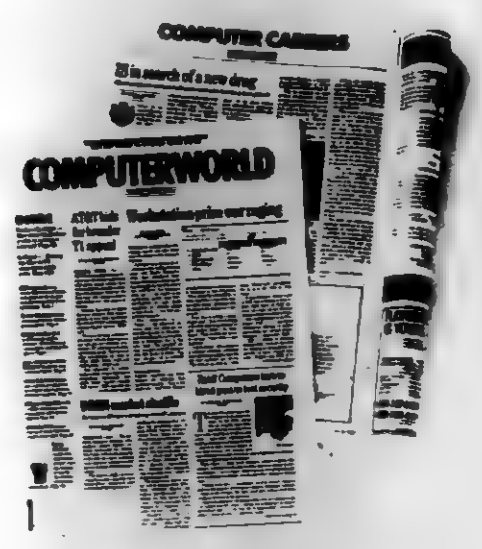
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Low-cost imaging tools enter the PC picture

BY ELLIS BOOKER
CW STAFF

The arrival of inexpensive desktop document imaging systems is a cause for joy among sophisticated personal computer users eager to eliminate the paper load in their inboxes.

However, information systems executives, who may be in the process of charting their companies' enterprisewide imaging strategy, are viewing this development with trepidation.

They're concerned about the compatibility of a hodgepodge of small, inexpensive systems at the departmental level and that these systems will not be able to use existing corporate resources such as mainframe databases.

In short, they're worrying about a repeat of the PC onslaught of the 1980s.

"Letting an individual or a department put in its own imaging solution is the same as letting them come up with their own records management policy," says David Lebenson, vice president and chief information officer at Cedars Medical Center in Miami.

However, while Lebenson runs a tight ship at Cedars, other companies are seeing a tidal push for imaging coming from the bottom up; that is, from users and departments. "Ninety percent of the projects I have been involved with started with users, who then lobbied MIS," says Allen W. Harris Jr., who directs the image systems practice at Ernst & Young in New York.

IS in control

One approach IS can take is to encourage individual departments to explore the technology but offer guidance and a comprehensive review process to ensure compatibility of the systems down the line.

That is how John J. Clark, director of systems planning and development at the pharmaceutical division of Ciba-Geigy Corp., handled the issue.

Last year, with a major imaging pilot under way in one department and "pockets" of interest in others at the Summit, N.J.-based firm, Clark realized, "If we don't do something about this, we will end up with the same situation we had with word processing." The difference this time, he says, is that integrating many different imaging products and approaches after the fact would be even more expensive.

Clark's solution was to produce a six-section guideline, which he introduced to the company's decentralized IS staffs in a one-day workshop.

Clark's publication has sections on needs assessment, hardware and software, the state of the industry, trends and the manner in which these will affect Ciba-Geigy's existing information systems. It also contains a detailed section on how individual departments should construct a request for proposal and a glossary of terms. Complementing the guidebook is a rigorous, centralized approval process.



Companies that have "multiple [imaging] solutions running around" but lack these controls are due for some expensive shocks, Clark predicts.

Prices falling

The root cause of all this interest is the tumbling cost of imaging technology.

A decade ago, the handful of vendors with imaging solutions to sell used highly customized software and hardware. At the time, the systems cost millions of dollars and were few and far between.

By 1984, the price had dropped to between $500,000 and $600,000 for a four-user solution. Two years ago, the price per workstation fell to $30,000, thanks largely to a move to commercial hardware platforms.

Today, a crop of companies are selling PC-based software systems that they claim can image-enable Intel Corp. 80386-class PCs for $500 to $1,500 a shot.

It's important to note that many "enterprisewide" imaging systems also use PCs as clients, with either Unix or proprietary servers. At issue are those packages, now part of a frenetic low end of the imaging market, for single workstations and small networks.

According to a January forecast from BIS Strategic Decisions in Norwell, Mass., the market for stand-alone systems with up to three workstations will grow 326.6%, from 1,153 sites to 3,766, by next year. Workgroup systems, those four to 15 workstations on a local-area network, will grow 288%, from 995 sites last year to 2,868 by 1992.

Together, this segment of the imaging market represents 75% of all imaging systems installed and 31% of the market last year, BIS reports.

New appearing

New systems are debuting all the time. Last week at Comdex/Spring '91 in Atlanta, for example, Westbrook Technologies, Inc. introduced Imagic, an $895 software-based package for 80386 PCs.

Like many recent PC imaging packages, it uses Microsoft Corp.'s Windows 3.0 environment as a front end.

"We're not trying to sell the MIS director," explains Dennis Graham, president of the Westbrook, Conn., company. Users needn't spend $25,000 per terminal to deploy an imaging solution, he adds.

However, Graham has anticipated concerns about a "stand-alone" solution and promises an announcement within 90 days on Westbrook's networking game plan.

But will the bustling PC-level market compel big-name companies now pushing enterprisewide solutions into this market?

"I don't think so. There's so much business at the high end that they can ignore it for a while," says Donna M. Amrhein, editor of *Imaging Business Report*, a BIS publication.

Booker is *Computerworld*'s Chicago bureau chief.

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AT Model 339	$750	$1,000	$700
PS/2 Model 30-286	$1,050	$1,300	$1,000
PS/2 Model 80	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,000	$3,500	$3,000
Compaq Portable II	$750	$1,050	$700
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SLT 286	$2,100	$2,200	$1,900
Portable 386	$2,000	$2,100	$1,500
LTE 286	$1,950	$2,200	$1,800
Deskpro 286	$800	$1,000	$700
Deskpro 386/20	$2,150	$3,000	$2,000
Apple Macintosh Plus	$750	$975	$700
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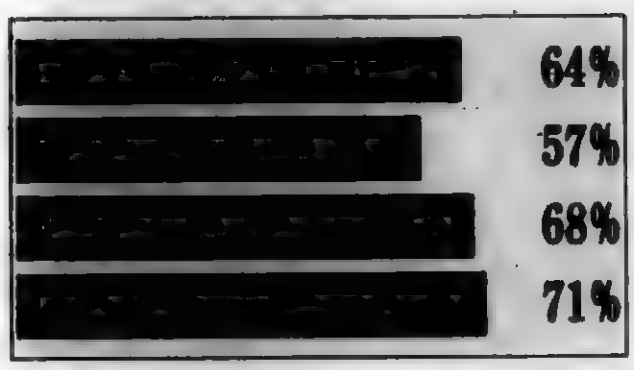
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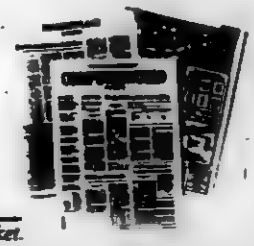
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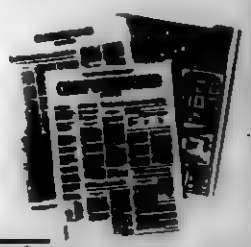
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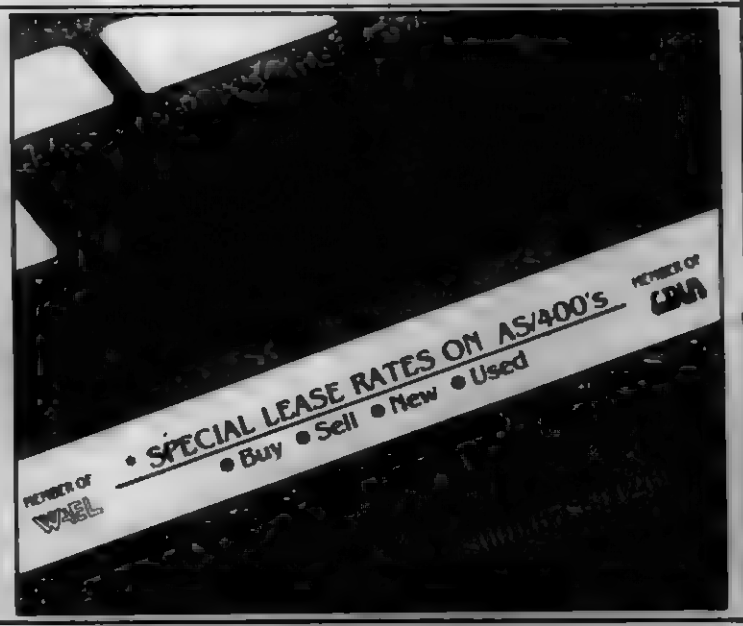
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Digital multimedia to improve training

BY MARK FRITZ
SPECIAL TO CW

Although multimedia has become common on the training scene, a more exotic offshoot of the family tree has been taking root recently. Digital multimedia — which packs the power of full-screen, full-motion, VCR-quality video and audio on a personal computer — has been drawing praise from trainers and users for the simplicity with which it handles procedures ranging from course design to hookups to remote locations.

Basically, digital multimedia differs from analog-based interactive videodisc (IVD) in that trainers and users can translate analog video signals to work with video on a computer. One of the key technical advantages is that digital video enables images and motion to be kept on a PC's storage device and does not require a videodisc player.

Currently, Intel Corp. is offering a Digital Video Interactive (DVI) chip for 80286- and 80386-based PCs. Other companies such as LSI Logic Corp. and C-Cube Microsystems, Inc. are following suit but are not yet ready to deliver their versions.

So far, trainers and users are saying that digital multimedia is a boon to training for the following reasons:

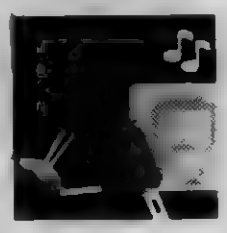
- Training can be embedded within applications not only to teach users how to use a particular function but also to serve as a highly interactive, hands-on Help facility.
- Course materials are relatively easy to develop and maintain.
- Applications can be networked or distributed to remote sites.
- Initial investment is less than that for IVD.

According to trainers and technical users, embedded training is a particularly attractive feature of digital multimedia. "If you become stuck trying to learn how to enter a formula in Lotus [Development Corp.] 1-2-3, you could double-click and go to a Help menu. Or a video window could pop up, with someone actually typing a formula into a cell," says Joan-Carol Brigham, an analyst at Framingham, Mass.-based International Data Corp.

Andersen Consulting in Dallas is currently using DVI to develop an application that embeds two kinds of training for a major retailer, says Reinhard Ziegler, a senior manager in the Change Management Services Division.

The application will teach customer service representatives how to use on-line customer information systems and how to improve their customer service job skills. DVI training will be delivered in a window that will pop up on top of a mainframe information system.

Also ranking high on trainers' lists is easy course development and manipulation of materials.



For example, at San Antonio-based Southwest Research Institute, digital multimedia permits quick development of courseware by streamlining the planning and preproduction process, says Katharine Golas, manager of the instructional systems section. "We can now polish our instructional design on the computer as we are working."

In addition, Golas says, trainers can manipulate digital images to cut down on video filming time. "If you were to film a row of switches with analog video, and that switch had 1,000 different settings, you would have to shoot it 1,000 times. But with a digital medium, you just shoot the switch once and manipulate it with software by cutting and pasting," she says.

One potential benefit of digital multimedia is that it could allow trainers to deliver training to remote sites, says Jean Korb, a manager in the management consulting group at Deloitte & Touche in Washington, D.C. For example, a systems operator could use digital multimedia to learn how to perform minor system repairs or cabling, she says.

But perhaps the most attractive feature of digital multimedia is that it is more cost-efficient than its predecessor, IVD. For example, Ziegler says that as a service to a client, his company did a price comparison between the cost of using DVI and the cost of using IVD for an operation with 150 workstations. The result, Ziegler says, showed that hardware outlay and distribution of courseware was 20% less expensive with DVI.

In a less formal estimate, Golas speculates that DVI can undercut IVD training development costs by 30%.

Not a perfect route

As with any relatively new technology, there will be some bumps in the road: One, there is a small learning curve; and two, digital multimedia isn't necessary for all kinds of training and it isn't perfect.

"Like anything you've never used before, DVI presents a learning curve," Golas says. But the curve was much steeper for those who got involved with DVI early on, before authoring systems were available, she adds.

Ziegler says that digital multimedia should be used selectively in IS training. "You have to ask yourself, 'Do I really need motion video to simulate this application?' " he says. The more complex a software application is, the more useful digital multimedia will be to its training.

But Korb cautions: "Just as a good computer and development language will not assure a good application, DVI will not assure effective learning."

Fritz is a free-lance writer based in [illegible]

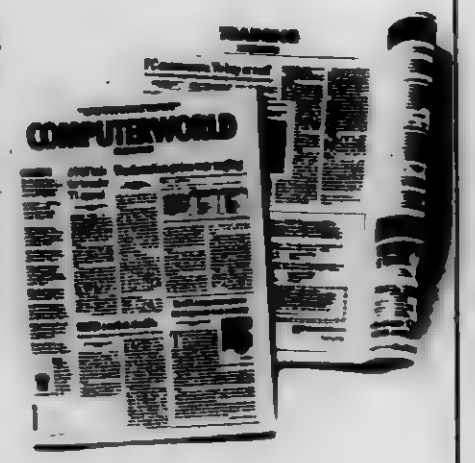
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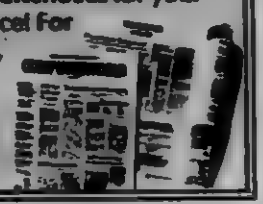
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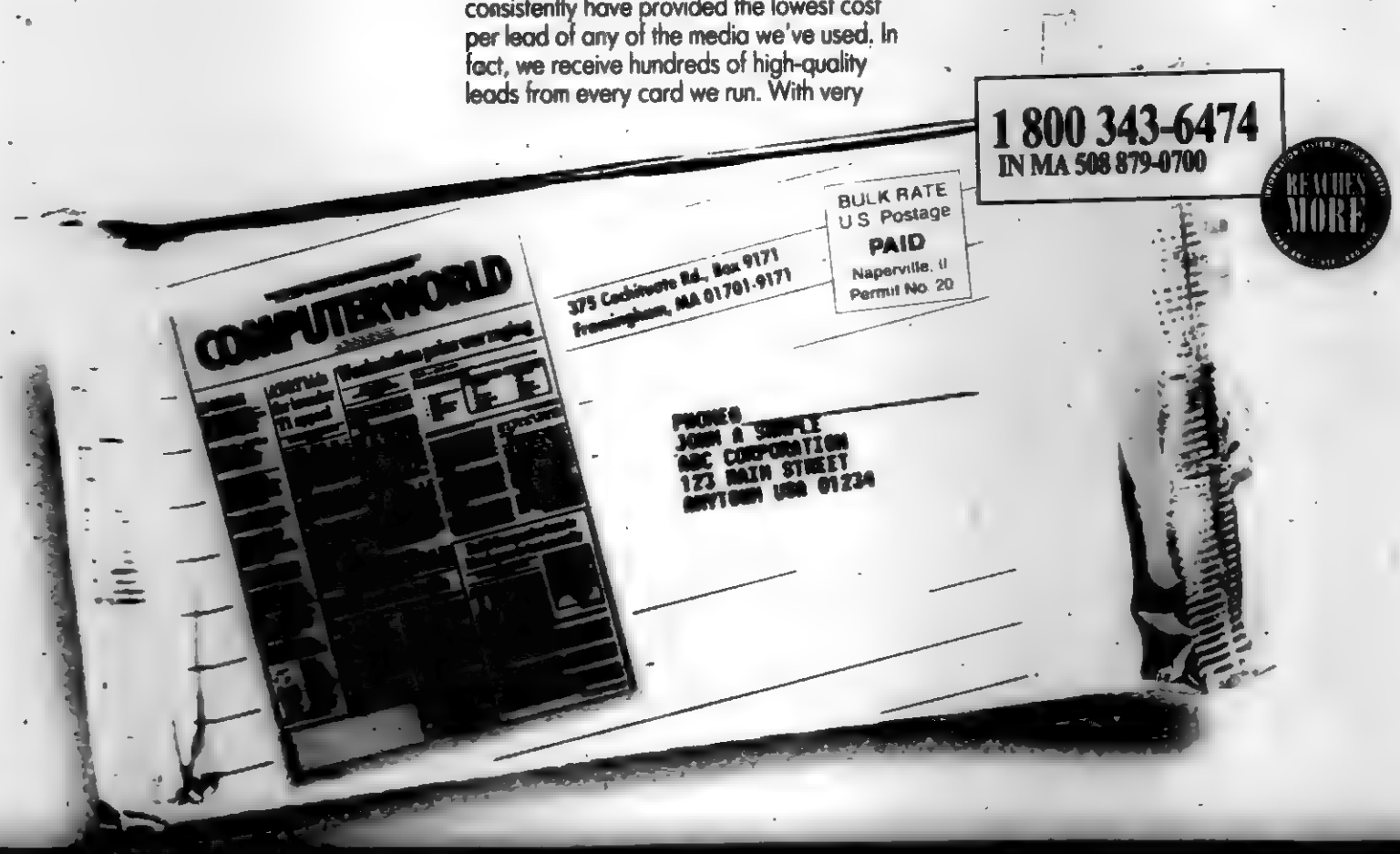
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ANALYSIS IN BRIEF

Microcomputer systems. The price wars in the personal computer industry will not decimate earnings, as some predicted. The slashed prices are not that much lower than they were before.

However, it is true that price issues, along with competition around new product introductions, will realign market share. The current downturn in the U.S. economy compounds these business risks.

Four factors determine whether a PC company will succeed: competitive pricing, broad product offerings, short product development intervals and a well-managed position in the reseller channel. By these measures, **Compaq Computer Corp.**, **Apple Computer, Inc.** and **AST Research, Inc.** are well-positioned for good growth. Second-tier companies such as **Dell Computer Corp.** must enlarge their positions in the reseller circuit.

Microcomputer software. Meanwhile, PC software tool makers are gaining visibility — and significance — in the industry. Their products make cross-platform applications development less risky for both users and vendors. Consequently, their products are becoming more popular. Watch **Spinnaker Software Corp.** and **Borland International, Inc.**, for example, emerge as strong forces in the PC tools segment. — *PC Hardware/Software remains a leadership sector, Shearson Lehman Brothers, Inc., May 15, 1991.*

RECOMMENDATION CHANGES

UPGRADED FROM NEUTRAL TO ATTRACTIVE: **Microage, Inc.** (Mabon, Nugent & Co.). Reason: Recently reported lower-than-expected sales were caused, in part, by nonrecurring factors, including distribution center start-up costs. The new, more efficient center should help the company reap rewards of increased orders if the economy picks up in the second half of 1991.

DOWNGRADED FROM ATTRACTIVE TO NEUTRAL: **Compaq** (Mabon, Nugent). Reason: Price is now the differentiating factor in the PC market; so-called second-tier clone makers are penetrating corporate accounts, and Compaq's attempts to compete will come at the expense of profits.

DOWNGRADED FROM BUY TO HOLD: **Compaq** (Bear Stearns & Co.). Reason: Mergers and acquisitions among PC dealers have clogged inventories; sales and profit growth are expected to drop this quarter because of slow U.S. demand.

DOWNGRADED FROM BUY TO HOLD: **Intel Corp.** (Bear Stearns). Reason: Major customers, including IBM and Compaq, will probably cut orders; Compaq has indicated that it will try to bring inventories in line with revised sales expectations, and IBM's Personal System/2 line is sluggish.

DOWNGRADED FROM BUY TO HOLD: **IBM** (Duff & Phelps Investment Research Co.). Reason: Increasing unpredictability of earnings coupled with lower profitability and higher debt spell uncertainty; company claims its problems lie in lagging economies worldwide, but first-quarter sales declined across virtually all product lines.

UPGRADED FROM OUTPEFORM TO BUY: **Micron Technology, Inc.** (Shearson Lehman Brothers). Reason: Higher earnings prospect than previously predicted; semiconductor stocks expected to perform well during the next year.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Shares in small systems makers saw mixed action last week. Apple Computer, Inc. continued to slide, losing 3½ points to close Thursday at 45½. Hewlett-Packard Co. gained 2⅝ points to 50⅝. HP recently unveiled a new low-priced workstation.
- Compaq Computer Corp. picked up one point, closing at 36¾. Compaq lost nearly 30% of its value recently after word got out of a profit drop this quarter.
- Elsewhere, quarterly sales at Advanced Micro Devices, Inc. (AMD) surpassed estimates. AMD shares zoomed 1¾ points to 12⅛, while Texas Instruments, Inc. tumbled 1¾ points to 36¾. Zilog, Inc. closed Thursday at 14, accruing 1⅛ points last week.
- Network firm Synoptics Communications, Inc. advanced 2⅛ points to 33⅛. Cabletron Systems, Inc. rose 2⅛ points to 36⅛, regaining some of the 5⅛ points it lost the week before last. Cisco Systems, Inc. closed at 31, up 2 points for the week.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, MAY 24, 1991

TOP PERCENT GAINERS

Bolt, Beranek & Newman	37.78
Televideo Systems	29.71
Datapoint Corp.	27.27
Phoenix Technologies	27.09
Selectorn Inc.	20.00

TOP PERCENT LOSERS

Computer Automation Inc.	-25.00
Allant Computer Sys.	-12.50
Cognos Inc.	-11.29
Interactiv	-11.11
Tandon Corp.	-10.52

TOP DOLLAR GAINERS

Microsoft Corp.	10.75
Altus Corp.	5.50
Borland Int'l	5.38
Computer Sciences	4.00
Cabletron Systems	3.63

TOP DOLLAR LOSERS

Cognos Inc.	-1.88
Bell Atlantic Corp.	-1.38
Knowledgeware Inc.	-1.38
Cray Research Inc.	-1.13
Pacific Telesis Group	-1.13

Exch	52-Week High	52-Week Low		May 24 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 0.10%**			
OTC	19.00	5.38	3 COM Corp.	7.25	-0.13	-1.69
NYS	88.75	52.50	American Info Techs Corp.	58.25	-0.13	-0.21
NYS	44.13	29.00	AT&T	36.00	0.00	0.00
OTC	6.50	0.88	Ardel Communication Corp.	2.00	-0.13	-5.88
NYS	58.25	39.50	Bell Atlantic Corp.	45.75	-1.38	-2.92
NYS	57.25	47.50	Bellsouth Corp.	48.25	-0.38	-0.77
NYS	44.00	13.13	Cabletron Systems	36.13	3.63	11.15
OTC	25.88	8.25	Compression Labs Inc.	17.75	-0.38	-2.07
NYS	41.25	23.38	Contel Corp.	41.00	0.00	0.00
OTC	5.13	2.75	Data Switch Corp.	4.25	0.25	6.25
NYS	26.13	8.88	Digital Comm. Assoc.	18.00	-0.50	-3.03
OTC	25.25	12.25	Dynatech Corp.	20.50	-0.25	-1.20
OTC	12.88	5.50	Fibronics Int'l Inc.	9.13	0.00	0.00
OTC	4.00	1.75	Gandalf Technologies Inc.	2.25	-0.38	-10.34
NYS	4.50	1.63	General Datacomm Inds.	3.25	0.25	8.33
NYS	33.50	23.50	GTE Corp.	29.50	-0.13	-0.42
NYS	60.88	40.25	ITT Corp.	58.38	0.50	0.86
OTC	44.13	17.88	MCI Communications Corp.	38.00	0.25	0.67
OTC	20.25	2.75	Microcom Inc.	7.00	0.50	7.69
NYS	10.88	4.00	Network Equipment Tech.	8.63	-0.13	-1.43
OTC	14.63	4.00	Network General	7.63	-0.38	-4.69
OTC	15.50	8.13	Network Systems Corp.	11.63	0.13	1.59
NYS	37.13	22.13	Northern Telecom Ltd.	36.88	0.63	1.72
OTC	58.50	17.25	Novell Inc.	53.75	1.25	2.38
NYS	89.50	57.00	Nynex Corp.	70.50	1.75	2.55
NYS	47.50	36.25	Pacific Telesis Group	39.00	-1.13	-2.80
ASE	15.38	4.75	Penril Corp.	14.50	0.00	0.00
NYS	29.13	8.88	Scientific Atlanta Inc.	13.75	-0.13	-0.90
NYS	58.88	47.25	Southwestern Bell Corp.	50.00	-0.13	-0.25
NYS	46.38	20.63	United Telecom	26.75	-0.50	-1.83
NYS	40.75	32.38	US West Inc.	36.38	0.25	0.69
Computer Systems			**Up 3.08%**			
OTC	8.75	0.88	Allant Computer Sys.	0.88	-0.13	-12.50
ASE	16.88	10.00	Amdahl Corp.	16.13	0.00	0.00
OTC	73.25	24.25	Apple Computer Inc.	45.88	-1.00	-2.13
OTC	13.88	4.25	Archive Corp.	6.63	-0.13	-1.85
OTC	32.75	7.50	AST Research Inc.	22.38	0.88	4.07
NYS	7.75	4.00	Bolt, Beranek & Newman	7.75	2.13	37.78
NYS	21.63	4.50	Commodore Int'l	16.25	1.50	9.96
NYS	74.25	34.38	Compaq Computer Corp.	37.00	1.25	3.50
OTC	2.13	0.13	Computer Automation Inc.	1.13	-0.38	-25.00
NYS	21.13	9.75	Control Data Corp.	11.13	0.13	1.14
NYS	30.88	8.38	Convex Computer	16.75	0.63	3.88
NYS	51.25	30.00	Cray Research Inc.	32.38	-1.13	-3.36
NYS	18.13	3.50	Data General Corp.	16.63	1.50	9.92
NYS	3.25	0.75	Datapoint Corp.	1.75	0.38	27.27
OTC	30.63	8.25	Dell Computer Corp.	24.50	2.13	9.50
NYS	66.13	46.50	Digital Equipment Corp.	63.75	0.75	1.19
NYS	38.13	13.75	Harris Corp.	25.13	-0.38	-1.47
NYS	56.13	34.88	Hewlett Packard Co.	50.88	2.75	5.71
NYS	139.75	86.25	IBM	104.88	1.13	1.09
OTC	14.00	7.75	Information Int'l	8.00	-0.25	-3.03
OTC	31.50	10.50	Intergraph	29.00	1.75	6.42
NYS	2.75	0.50	MAI Systems Corp	0.88	0.00	0.00
NYS	149.75	114.00	Matsushita Electronics	119.75	0.50	0.42
OTC	28.00	9.00	Mentor Graphics Corp.	16.75	1.63	10.74
NYS	104.25	44.50	NCR Corp	103.75	1.13	1.10
OTC	35.25	11.00	Pyramid Technology	22.75	0.00	0.00
OTC	34.00	9.75	Sequent Computer Sys.	14.00	1.00	7.69
NYS	47.25	18.00	Silicon Graphics	32.13	-0.50	-1.53
NYS	37.25	14.63	Stratus Computer Inc.	30.88	0.75	2.49
OTC	38.63	15.00	Sun Microsystems Inc.	34.88	0.38	1.09
NYS	26.88	6.88	Tandem Computers Inc.	15.50	1.00	6.90
NYS	39.50	23.50	Tandy Corp.	31.25	0.75	2.46
OTC	32.00	9.75	Teradata	16.75	1.50	9.84
NYS	7.88	1.38	Ultimate Corp.	5.00	0.25	5.26
NYS	15.88	1.75	Unisys Corp.	3.88	0.00	0.00
ASE	6.75	2.00	Wang Labs Inc. (b)	2.88	-0.13	-4.17
Software & DP Services			**Up 2.34%**			
OTC	63.00	17.00	Adobe Systems Inc.	49.25	2.00	4.23
OTC	13.50	7.00	Ascorp	7.50	-0.63	-7.69
OTC	59.88	20.25	Altus Corp.	50.50	5.50	12.22
OTC	26.50	12.00	American Mgmt. Systems	27.25	0.50	1.87
OTC	16.25	7.50	American Software Inc.	11.75	0.75	6.82
NYS	4.63	1.38	Anacomp Inc.	3.50	0.00	0.00
OTC	23.50	10.00	Analysts Int'l	15.50	0.25	1.64
OTC	13.25	4.88	Ashton Tate	9.38	0.88	10.29
OTC	10.25	4.00	ASK Computer Sys.	8.00	0.25	3.23
NYS	37.00	22.63	Auto Data Processing	32.50	1.13	3.59
OTC	60.25	32.00	Autodesk Inc.	55.88	1.13	2.06
OTC	31.50	18.50	BGS Systems Inc.	25.25	-0.75	-2.78
OTC	43.88	17.75	BMC Software	37.50	1.75	4.90
OTC	21.50	11.00	Boole & Babbage Inc.	12.50	-0.25	-1.96
OTC	64.25	14.50	Borland Int'l	52.13	5.38	11.50
NYS	9.75	0.44	Businessland Inc.	0.88	0.00	0.00
OTC	20.88	5.13	Cognos Inc.	14.75	-1.88	-11.29
NYS	16.88	4.38	Computer Associates	9.13	1.38	17.74
OTC	17.75	9.50	Computer Horizons	10.25	0.00	0.00
NYS	73.25	36.75	Computer Sciences	67.25	4.00	6.32
NYS	11.75	6.63	Computer Task Group	9.38	-0.38	-3.85
OTC	25.25	13.00	Comshare Inc.	19.00	0.50	2.86
OTC	18.00	3.75	Corporate Software	10.25	-0.13	-1.20
NYS	49.00	27.88	General Motors E (EDS)	47.63	0.13	0.26
OTC	18.75	7.25	Goal Systems Int'l	12.75	-0.88	-6.42
OTC	7.00	1.88	Hogan Systems Inc.	6.13	-0.13	-2.00
OTC	22.88	7.75	Information Resources	22.88	3.13	15.82
OTC	17.50	2.63	Informix Corp	8.06	0.44	7.78
OTC	7.88	1.38	Intellicorp Inc.	1.75	0.19	11.96
OTC	8.25	2.50	Interleaf	6.50	0.13	1.96
OTC	15.88	6.88	Interactiv	8.00	-1.00	-11.11
OTC	43.25	10.00	Knowledgeware Inc.	29.88	-1.38	-4.40
OTC	46.00	16.75	Legent Corp	37.50	-0.50	-1.79
OTC	38.25	12.50	Lotus Development	33.13	0.25	0.76
OTC	32.00	13.63	Microgram	15.50	-0.50	-3.13
OTC	117.50	50.75	Microsoft	110.00	10.75	10.83
NYS	10.50	4.00	On Line Software Int'l	8.50	0.13	1.49
OTC	24.00	4.88	Oracle Systems	6.50	0.50	8.25
NYS	14.63	7.00	Parasophic Systems	11.50	-0.25	-2.13
OTC	9.25	1.25	Phoenix Technologies	7.63	1.63	27.08
NYS	52.00	33.38	Policy Management Sys.	46.38	0.38	0.82
NYS	23.63	11.50	Reynolds & Reynolds	20.88	0.50	2.45
OTC	25.50	14.75	SEI Corp.	25.25	0.00	0.00
OTC	22.38	12.38	Shared Medical Systems	22.38	1.00	4.68
OTC	35.25	12.00	Software Publishing Corp.	18.75	-0.50	-2.60
NYS	14.63	5.50	Sterling Software	13.50	0.75	5.88
OTC	26.00	9.50	Sungard Data Sys.	16.00	0.00	0.00
OTC	55.88	17.75	Symantec Corp.	42.75	-1.00	-2.29
NYS	24.50	4.50	System Center Inc.	8.50	0.25	3.03
OTC	37.25	12.50	System Software Assoc.	13.75	-0.50	-3.51
OTC	27.38	4.75	Wonder	11.75	-0.38	-3.09
Semiconductors			**Up 4.24%**			
NYS	14.25	3.63	Advanced Micro Devices	13.00	2.00	18.18
NYS	12.50	5.50	Analog Devices Inc.	10.75	0.00	0.00
OTC	21.75	5.25	Chips & Technologies	8.50	0.13	1.33
OTC	56.25	28.00	Intel Corp.	51.00	2.50	5.15
NYS	13.00	5.13	LSI Logic Corp.	10.25	0.38	3.80
NYS	19.13	8.75	Micron Technology	14.88	0.88	6.25
OTC	21.25	7.25	MIPS Computer Systems	16.13	0.75	4.88
NYS	88.38	45.75	Motorola Inc.	88.38	3.50	5.39
NYS	8.50	3.00	National Semiconductor	7.00	0.00	0.00
NYS	47.63	22.50	Texas Instruments	37.13	-1.00	-2.69
OTC	12.25	3.00	VLSI Technology	10.00	1.00	11.11
ASE	14.88	4.00	Western Digital Corp.	4.75	-0.13	-2.56
Peripherals & Subsystems			**Up 1.77%**			
OTC	2.75	0.88	Apertus Technologies	2.25	0.06	2.83
OTC	24.00	7.50	Banctec Inc.	12.75	-0.25	-1.92
OTC	17.50	4.25	Cambex Corp.	11.50	-0.25	-2.13
ASE	11.75	4.13	Cognitronics Corp.	9.13	-0.50	-5.19
NYS	31.25	14.63	Conner Peripherals	20.50	1.25	6.49
ASE	22.00	7.00	Datarem Corp.	9.00	0.00	0.00
NYS	13.00	4.25	EMC Corp.	11.25	0.00	0.00
NYS	47.25	23.75	Eastman Kodak Co.	41.00	-0.13	-0.30
OTC	11.25	4.75	Emulex Corp.	8.50	-0.38	-4.23
OTC	32.50	14.00	Evans & Sutherland	18.75	-0.88	-4.48
OTC	6.50	3.88	Iomega Corp.	5.50	-0.06	-1.13
OTC	28.25	8.75	IPL Systems Inc.	23.50	1.00	4.44
OTC	1.63	0.13	Maxstor Systems	0.75	-0.06	-7.75
OTC	17.00	2.63	Mentor Corp.	4.25	0.00	0.00
OTC	18.00	4.38	Micropolis Corp.	15.13	1.63	12.04
NYS	83.75	73.88	3M Corp.	87.88	0.75	0.86
OTC	14.50	6.00	Prestonex Inc.	7.50	0.50	7.14
NYS	24.75	8.50	QMS Inc.	20.75	0.25	1.22
OTC	18.25	6.25	Quantum Corp.	11.88	0.38	3.26
NYS	7.63	4.38	Recognition Equipment	7.38	0.00	0.00
OTC	11.50	4.00	Reson Inc.	9.63	0.50	5.48
OTC	19.88	5.63	Seagate Technology	10.75	-0.88	-7.93
NYS	47.00	11.00	Storage Technology	43.38	1.88	4.52
OTC	4.75	1.25	Tandon Corp.	3.19	-0.38	-10.52
NYS	26.38	11.63	Tektronix Inc.	23.25	2.50	12.06
OTC	0.63	0.16	Televideo Systems	0.41	0.09	28.71
NYS	60.13	29.00	Xerox Corp.	57.38	2.63	4.79
Leasing Companies			**Up 0.00%**			
OTC	16.25	7.00	Amplicon Inc.	14.75	-0.75	-4.84
NYS	26.38	14.63	Comdisco Inc.	25.13	0.63	2.56
OTC	16.25	9.25	LDI Corporation	15.13	0.38	2.54
OTC	5.75	2.25	Sabatarm Inc.	4.69	0.75	20.00

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Lotus shows Windows suite, users say they like the view

BY PATRICIA KEEFE
CW STAFF

ATLANTA — Dangling a summer ship date before long-patient users, Lotus Development Corp. last week offered its first public test drives of both 1-2-3 for Windows and Freelance Graphics for Windows at its booth in the Windows World pavilion of Comdex/Spring '91.

Initial user feedback indicated that the version of 1-2-3 for Windows 3.0 is everything they had hoped for. "It is head-to-head comparable with [Microsoft Corp.'s] Excel," a beta-test user under nondisclosure said. "If you were a Lotus pre-Windows follower, you won't be disappointed. If you are an Excel user, I don't know that this will make you switch."

In all, the Lotus booth featured five Microsoft Windows 3.0-compatible applications: 1-2-3, Freelance, CC:Mail, Amipro and a Notes client.

Positioned as a family of Windows products designed specifically to work together — what Lotus President Jim Manzi called "fit and finish" — the Lotus quintuplet represents the only competition to Microsoft's drive to position its clan of Windows products as one-stop shopping for Windows-based desktop productivity programs.

Both vendors have said they will provide shared tools, user interface conventions and common installation utilities between their Windows products. In Microsoft's case, it has bundled together Windows versions of Microsoft Word, Excel, Powerpoint and Mail and offers users a substantial savings over buying those packages separately.

No hasty decisions

Users such as Sheldon Laube, director of technology at Price Waterhouse, are pleased with 1-2-3 for Windows but intend to wait until Borland International, Inc. releases its Windows version of Quattro Pro before making any decisions. Price Waterhouse is a major Lotus account.

Taking a slight departure from the edicts of the Windows environment, Lotus announced that it will bundle copies of Adobe Systems, Inc.'s Type Manager font technology with Lotus Windows applications. Adobe's Type Manager has also been adopted by IBM and Digital Equipment Corp.

Microsoft is committed to shipping Truetype — font technology developed with Apple Computer, Inc. — with Windows 3.1, slated to arrive this summer. Adobe officials gave mixed signals at Comdex as to whether users will encounter any compatibility problems between the two font sets.

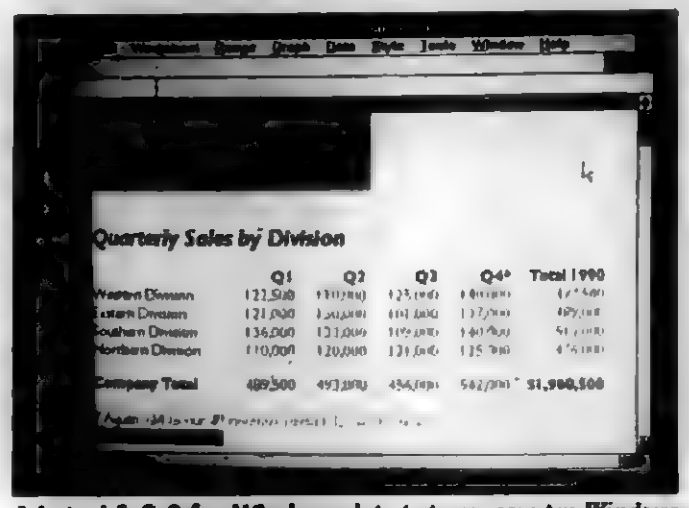
The Lotus/Adobe agreement provides Lotus with a core set of 13 typefaces from the Adobe Type Library with each application. Lotus users will gain true what-you-see-is-what-you-get capability.

Lotus' 1-2-3 for Windows will be the first of the firm's applications to ship with Adobe Type Manager. The long-awaited Windows version of the popular spreadsheet is in beta testing at 250 user sites and is scheduled to ship this summer. Users of earlier 1-2-3 versions will be able to access "1-2-3 Classic" menus by pressing the slash key.

Another key addition is a customizable suite of Smarticons that allow users to automate basic spreadsheet functionality and create, name and save sets of icons for use by others.

"Shortcut" functions simplify basic tasks such as Undo, Quick Copy, Search and Replace.

Users of 1-2-3/G, Lotus' OS/2 spreadsheet, will encounter some difficulty in moving their macros to 1-2-3 for Windows. Lotus said that problem will be corrected in a later release of 1-2-3 for Windows.



A Lotus' 1-2-3 for Windows *beta-test user says pre-Windows followers will not be disappointed*

REPORTER'S NOTEBOOK

Microsoft Chairman Bill Gates was one of three keynote speakers at Comdex/Spring '91. His was the most popular session, and the overflow crowd was sent to watch the speech on video in another room. Mostly, Gates updated the Windows success story: One year after its introduction, Windows 3.0 has sold 4 million copies along with 50,000 copies of the software developer's kit, according to Gates. "No software package has ever sold this well, except for MS-DOS," he boasted. Once "some of the large companies" (that is, **Lotus**, **Wordperfect** and **Borland**) ship Windows versions of their popular software, Gates predicted, sales of Windows applications should more than double.

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While **IBM** and others have been trumpeting promises for what OS/2 Version 2.0 will deliver, some people at **Microsoft** seem skeptical. Steven Ballmer, Microsoft's senior vice president of systems software, told questioners after a panel discussion that he thought IBM was "incredibly aggressive" in its promise to deliver by year's end an OS/2 capable of running Windows applications better than Windows does. "I wouldn't want to be heading up that effort," Ballmer said.

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Recently deposed **Zenith Data** executive Arthur Lambert was spotted next to Zenith Data's booth at Comdex, talking to another vendor. Lambert told *Computerworld* the parting was amicable, and he said he was looking forward to spending a bit more time on the golf course. His mission at Comdex? To network for a new job.

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Borland's Philippe Kahn and **Lotus Software Business Group** Senior Vice President Frank King traded gibes while speaking on one of several spreadsheet panels. First, Kahn reeled off some numbers that didn't quite add up, prompting King to suggest that perhaps the problem lay with Quattro Pro's Recalc function. After Kahn explained his numerical faux pas, King allegedly made a comment about too many Borland upgrades. That was too much for Kahn, who snapped back a "look who's talking" charge and promptly dubbed Lotus' 1-2-3 "the Kleenex of spreadsheets." Translation: 1-2-3 is the disposable spreadsheet.

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Gimmicks were few and far between at Comdex, but there was, of course, some relief from the relentless blaring of technology. **Unix International** captivated showgoers with a robot that was dressed up like a yachtsman and interacted with a live presenter. The animated mariner moved his arms and appeared to know exactly where his counterpart was at all times. Collectors loaded up on **Wordperfect** hats, **HP** neon-colored sunglasses and T-shirts galore. Attendees also lined up 50 deep to play with small, automated go-carts and stood in line to walk through **Intel's** "Inside the Computer" tour. Intel upgraded its floor display from a tour through the inside of an 80386 microprocessor to one of an 1486 processor.

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And we still don't know who sponsored the woman encased in some sort of foam computer seen alternately wearing and dragging her enormous marshmallow across the exhibit floor.

Staff members Patricia Keefe and Michael Fitzgerald contributed to this report.

Notebooks obscure pen-based dreams

BY MICHAEL FITZGERALD
CW STAFF

ATLANTA — Comdex/Spring '91 attendees heard panelists dream aloud about pen-based computing, but hands-on portable reality was dominated by notebook computers.

"[Notebook] technology has matured to the extent of providing desktop capability in portable packages, and the marketplace realizes this," said William F. Ablondi Jr., vice president of new desktop strategies at BIS Strategic Decisions.

Ablondi and other analysts said pen-based computing generated excitement largely for its newness.

What little actual pen-based action there was occurred on the show floor, as NCR Corp. displayed its coming notepad product behind closed doors, and software developers such as Microsoft Corp., Go Corp. and Slate Corp. worked on deals.

On the show floor, NCR, Philips Corp.'s Magnavox subsidiary and others added their names to the list of notebook vendors, and a burgeoning portable peripherals market made itself evident.

Analysts agreed that the market for notebooks would continue to grow rapidly — Gartner Group/Infocorp predicted worldwide portable shipments of 13.5 million in 1995, up from 4.9 million predicted for next year.



Notebook Computer Co.'s *4½-pound battery-powered 486 and 486SX portables, priced at $4,500 each, drew plenty of interest. However, buyers were turned off when none of the floor models would turn on because of what was termed a missing piece of circuitry*

Despite the presence of Intel Corp. 80386SL notebooks from Zenith Data Systems and Twinhead Corp., Comdex was not the SL hotbed some analysts had predicted. Analysts cited persistent rumors of bugs in the current Intel production runs and reports that Intel will not be shipping the SL in volume until the third quarter. Intel strongly denied both rumors.

Can't expect perfection

"There are always errata on any chip," said Dave House, Intel's senior vice president of architecture and applications. "The version for volume shipment has recently gone into production."

Zenith Data said it was already receiving bug-free chips in volume and claimed it would meet the July ship date for its Mastersport 386SL notebook. A source close to Twinhead, however, said the company had received only 100 SL chips, all with patchable bugs. It does not expect to be able to ship its Supernote 20C until September.

IBM PS/2 models join price cut melee

While reductions may not be enough to draw new customers, they might at least keep the old ones

BY CHRISTOPHER LINDQUIST
CW STAFF

Personal computer price cutting gained more momentum last week with IBM's announcement of 6% to 24% reductions on some models in its Personal System/2 line.

Following on the heels of mid-April cuts by Compaq Computer Corp. [CW, April 15], the cuts were greeted with hallelujahs by dealers, which claimed their prayers for competitive pricing had been answered. While some users said it may now be easier to reject lower priced clones, others said buying IBM will still be a high-priced religion.

John Biglin, a PC coordinator and analyst at General Waterworks Management and Service Co., said he doubted the price cuts would be enough to bring him into the IBM fold. "If their pricing were more equal, then I would consider it more, but it's been our experience that we can buy an equal or better performing system for less money."

While the cuts may not attract new customers, they may help IBM keep some old ones.

A manager at a major Chicago-area insurance company said his firm already buys IBM Personal Computers but is beginning to look at Micro Channel Architecture-based clones such as those produced by NCR Corp. and Reply Corp. He said the price cuts, while not major, "will make it harder for a clone to get in the door."

Sky-high prices

Analysts noted that even with the cuts, IBM still carries some of the highest prices in the industry. "Compaq's been accused of being the premium price setter," said Joanne Stahel, president of Storeboard/Computer Intelligence in Dallas, but "Compaq is still priced lower [than IBM]."

However, IBM dealers were more upbeat about the news. Stricken dealer Businessland, Inc. will be aided by the cuts, according to spokesman Tom Pelandini, who said corporate buyers are willing to pay a premium for name brands such as IBM, Apple Computer, Inc. and Compaq. But "the price differential had grown quite a bit, and we're pleased to see Compaq's reduction and now IBM's reduction in prices," he added. "This will help us," he said.

It will also help Computerland Corp., according to Steve Halland, director of IBM marketing at the firm. He said he expects to see a "substantial" increase in sales volume because of the new pricing. He added that IBM has been getting pressure for price cuts for some time.

Another boon for dealers — and possibly for buyers — is IBM's apparent decision not to cut dealer discounts along with prices as Compaq did during its last bout of price slashing. The entire discount is coming straight from IBM, not dealer margins, according to Halland.

The clone vendors, however, showed little concern about the announcement, although some companies had made cuts of their own prior to the IBM announcement.

NCR had anticipated IBM's cuts with price reductions of 15% to 35% one week before the IBM announcement. Alok Mohan, vice president of NCR's Workstation Products Division, said the price cuts were "nothing unusual — it's the time of the year for them, and street prices are eroding less than retail prices."

One step ahead

Zenith Data Systems, the Buffalo Grove, Ill.-based subsidiary of Groupe Bull, cut its prices the day before IBM did.

The cuts are "about what we thought," said Dan Rosensteel, Zenith Data's vice president of marketing. "We anticipated their cuts, and we think we're well-positioned."

Samsung Information Systems America, Inc., the San Jose, Calif.-based subsidiary of Samsung Electronics Co., saw the cuts as a legitimization of the PC clone market. "We think IBM is reacting to pressure from companies like ours. The market is accepting us as being as good as or better than Compaq and IBM," Samsung spokesman William H. Matlock Jr. said.

Midwest correspondent Michael Fitzgerald contributed to this report.

Joining the fray

IBM is the latest firm to enter the PC price cut race, with reductions on its Personal System/2 line

Sample cuts	Before May 20	After May 20	Percent cut
Model 30 286 001	$1,845	$1,625	11.9%
Model 55 SX 061	$3,295	$2,945	10.6%
Model 80 386 061	$5,495	$4,595	16.4%
Model 80 386 A31	$11,495	$8,695	24.3%

Source: IBM

CW Chart: Janell Genovese

IBM

FROM PAGE 1

president of the Micro Manager's Association, conceded that they would have to at least consider such an offer from IBM.

Jude Gartland, a senior vice president at the Lehman Brothers Division of Shearson Lehman Brothers, Inc., is one of those users sitting on a pile of 286s.

Whether the trade-in plan will work for him depends on whether the salvage value exceeds the trade-in credit.

For example, if the unit is worth $800 and the credit is only $500, Gartland said he would be better off downstreaming the computer within his organization.

On the other hand, some accounts would rather take the $500 credit coupled with cheap IBM credit than try to raise income by selling the boxes for $800 each, said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. The resulting paperwork from the added income, he said, would not be worth the effort for some of these sites.

IBM is no intent on finding a way to spur users into upgrading their systems that it will even consider "deploying" Windows, Guglielmi said.

'Variety of alternatives'

IBM "will work with individual customers on a variety of alternatives, which may or may not evolve into a more widespread offering," Guglielmi said.

IBM's immediate goal is to move users to the 32-bit OS/2 2.0, which has a planned delivery date of October or November. But before users can upgrade their software environment, they must beef up the hardware to at least a 4M-byte 386.

Yet despite many corporate commitments to standardize on the 80386 microprocessor, most Fortune 1,000 companies continue to wallow in a sea of 286-based machines.

It is just not considered cost-effective for many businesses, particularly given the recession, to migrate en masse to the more powerful 386.

"Many of our clients want to shelve their 286s, but the CFO is telling them no because they haven't been depreciated yet. They can't afford it," Dzubeck said.

The result has been stagnating sales, leaving struggling personal computer hardware and software vendors to find a way to persuade users to move up.

Hardware suppliers have either announced disappointing quarterly results or been forced to revise revenue estimates. Compaq Computer Corp. recently scaled back revenue expectations 15% for this quarter.

Brink of disaster

Reseller Businessland, meanwhile, teeters on the brink of financial disaster, falling $42.9 million into the red during the quarter ended March 30 [CW, May 20].

Apple Computer, Inc. has moved to shore up its defenses by announcing plans to lay off 1,500 employees (see story page 109).

Guglielmi admitted that IBM's PC inventory is larger than it would like. "We've got to start moving inventory," he said.

Matt Cain, a senior research analyst at Stamford, Conn.-based Meta Group, Inc., said IBM suffered a 17% unit shipment drop across the Personal System/2 line last quarter.

According to Guglielmi, IBM has come to the realization that it must "generate more pull from end users" for OS/2.

"Microsoft has done a better job of merchandising Windows," he acknowledged.

A second time around

IBM's acknowledgment that it is considering a new trade-in program to partially underwrite user demand for more powerful systems would be its second such attempt.

Its first try came in July 1988, months after the introduction of the Micro Channel Architecture-based Personal System/2 family. IBM Personal Computer AT and XT users were offered $200 to $300 trade-in bounties through local dealers. The program bombed, in part, observers said, because users were leery of buying into a new, proprietary architecture. Eventually, it petered out from lack of interest.

This time around, IBM is considering offering $500 trade-in allowances to 80286 users, good toward a 386-based PS/2, said Matt Cain, a senior research analyst at Meta Group, Inc. in Stamford, Conn.

It may also be part of a growing trend. Tandy Corp. and Digital Equipment Corp. already have PC trade-in programs under way.

Tandy's Radio Shack stores launched "Moving On Up" late last month. The program offers business customers up to $500 trade-in credit toward the purchase of either a 286- or 386-based Tandy computer. The trade-in credit is offered on earlier PCs from both Tandy and competitors. The deal is good through June 30.

DEC, which recently plunged back into the PC market with a line of high-end computers, is offering a flat $500 credit on "any old industry-standard PC" under its PC Trade-In Deal, according to a DEC ad. The rebate is good toward any DEC PC, starting with its 80386SX model and extending through its I486 boxes.

Representatives of Compaq Computer Corp. and Dell Computer Corp. said they have no plans to offer similar programs.

PATRICIA KEEFE

On-line commemorative stamp

At Comdex, artist Joni Carter *demonstrated the multimedia technology she used to create this stamp and four others for a series commissioned by the U.S. Postal Service to commemorate the 1992 Olympic Games*



COMDEX SHORTS

It was largely a Windows world at Comdex/Spring '91, and nowhere was that more apparent than at the packed-to-the-gills Microsoft booth, which lured showgoers with, among other things, brightly colored fanny packs. On the serious side, Microsoft announced two partnerships and a special price on its Microsoft Office bundle amid a sea of third-party Windows developers' tools and application ports (see stories pages 106 and 104).

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A fourth package has been added to the latest version (1.6) of Microsoft's Office for Windows, which also features a promotional price of $750 through Dec. 31. First introduced in October 1990, Office previously included Windows versions of Excel, Word and Powerpoint at a cost of $995; purchased separately, the software would cost $1,500. Last week, Microsoft tossed in a single-user license for Mail for PC Networks and said that until Sept. 30, it will send a free Mail server package to users who license 20 units of Office for Windows.

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Microsoft signed a cooperative marketing agreement with **Powersoft Corp.**, which just shipped Powerbuilder 1.0, a graphically oriented client/server applications development environment targeted at information systems. Powersoft will become one of Microsoft's SQL Business Partners and will market and support Powerbuilder bundled with Microsoft's SQL Server database. Microsoft also said it has licensed **Cascworks, Inc.**'s Knowledge Assisted Software Engineering tool set for inclusion with future development products.

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Westbrook Technologies, Inc. introduced Imagic, a software-based imaging package for Intel 80386-class personal computers. The $895 program uses Microsoft's Windows 3.0 environment as a front end and an indexing scheme not reliant on Boolean logic. "We're not trying to sell the MIS director," said Dennis Graham, president of the Westbrook, Conn., company. Users, he said, need to know they don't have to spend $25,000 per terminal to deploy an imaging solution.

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Also released was **Pioneer Software's** Q+E Database Library, which is said to provide developers of Windows programs and macros with programmatic access to a variety of database management systems. It is a collection of Dynamic Link Libraries (DLL) that provides a common call-level interface for database access from any application or tool capable of calling a DLL. That includes any macro, programming language script or Windows product. It also provides an industry-standard SQL interface. The database library is scheduled to ship next month and retails for $395.

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Spinnaker Software Corp. introduced Spinnaker Plus Version 2.5, a cross-platform hypermedia applications development software package, and Plus Reports, a flexible report generator. Spinnaker Plus 2.5 is said to be up to five times faster than previous versions. It implements Windows Dynamic Data Exchange and supports its DLL. The product is slated to ship Aug. 15.

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Philips Corp.'s **Magnavox** subsidiary introduced seven models of its Headstart desktop PC line based on the Intel 80286 and 80386 chips. Pricing ranges from $999 to $2,599 for a 33-MHz 386DX. Geoworks' Ensemble and Lotus' 1-2-3 Version 2.2 come bundled with all the models. Magnavox also introduced the Metalis 286- and Metalis 386SX-based notebooks, weighing 6.9 and 6.8 pounds, respectively. **Cumulus Corp.** announced a line of 486DX-based systems starting at $2,195.

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Clarion Software, developer of Clarion Professional Developer, has launched a 24-hour, toll-free information service along with multiple CPU network service.

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There was no lack of Unix boxes at Comdex. **NCR** displayed its System 3447, running Intel's still-unannounced 50-MHz I486 chip and scheduled for October delivery. **Samsung Information Systems America, Inc.** brought out the System Master 486/33TE and the SGS-19 X Window System Terminal, a 19-in. monochrome X terminal running **Advanced Micro Devices'** 29000 reduced instruction set computing processor. The System Master is slated to ship next month and will cost $7,699, while the terminal will ship in July for $2,999.

Windows takes Basic steps

BY CHRISTOPHER LINDQUIST
CW STAFF

ATLANTA — Microsoft Corp. unveiled a language product last week at Windows World '91 that it claims will greatly simplify the task of creating applications for Windows.

Visual Basic allows users to graphically create common Windows interface controls such as buttons and menus without writing code. The interface is then attached to the underlying program using a version of Microsoft's Quick Basic programming language, eliminating the need for the Microsoft Windows Software Developer's Kit (SDK).

Despite its reported ease of use, Microsoft is not positioning Visual Basic as a programming tool for end users but rather as a full-size language for programmers, according to Charles Stevens, general manager of Microsoft's data access business unit in applications.

"It's definitely a general-purpose programming language," Stevens said. "We're not trying to say it's an end-user tool."

Craig Ellis, a senior programmer/analyst at Reuters Information Services and a Visual Basic beta-test user, said the product is ideal for creating prototypes and short-term Windows programs. "It's a great tool. For applications and tools that we have to write that have a short life span, it's great," he said.

However, the price for ease of use appears to be a slight loss in speed of execution. Ellis added that the product would probably not be used for critical applications because of this.

"We use Windows as our application platform, but we need things that are time-critical, and that's not going to give it to you," he explained. "It's not that much slower, but we need that extra yard." Ellis said Reuters' more important applications will still be developed using the Microsoft C compiler and the Windows SDK.

Ellis also said Visual Basic was extensible through its support of other languages that can compile to Windows' Dynamic Link Library format.

The product should be generally available next month, Microsoft said, at a suggested retail price of $199. A Visual Basic Control Development Kit will be available next month for $49.95.



Visual Basic *allows users to graphically create common Windows interface controls without writing any code*

VGA on its way out?

BY MICHAEL FITZGERALD
CW STAFF

ATLANTA — In a move that could hasten the replacement of its Video Graphics Array standard, IBM said it expected to develop its new 1,024- by 768-pixel Extended Graphics Array (XGA) to the XT/AT bus.

While not offering a timetable and cautioning that he was not "preannouncing" a product, Jon Vitello, manager of graphics product management and graphics subsystems at IBM, told an audience at a panel on XGA, "We recognize a need to support the [XT/AT] bus."

Currently, XGA works only with the Micro Channel Architecture bus. Members of the Video Electronics Standards Association (VESA), an industry group made up of graphics board makers, monitor makers and other companies including IBM, said at its meeting here prior to Comdex/Spring '91 that they wanted XGA support of the XT/AT bus and its follow-on, the Extended Industry Standard Architecture.

James A. Anderson, director of marketing at Headland Technologies, Inc. and chairman of VESA, said an XT/AT version of XGA "is our main concern." He said a quick move to market by IBM was key to developing the new standard.

One analyst agreed that IBM has to move XGA to the XT/AT bus to ensure the strategy's success.

"[XT/AT] support will make it a standard," said Jon Peddie, president of graphics research firm Jon Peddie Associates in Oakland, Calif. Peddie said XGA would give the huge number of non-Windows applications users higher performance and better resolution for future non-Windows versions of products such as Wordperfect Corp.'s Wordperfect word processor and Ashton-Tate Corp.'s Dbase line.

Multimedia is a snap



Cardinal Technologies *introduced at Comdex/Spring '91 its Snapplus board, combining VGA graphics with video. Accommodating the RGB, S-Video and NTSC video standards, the board allows capture of live and still video in 24-bit color and will be available this summer for less than $1,000.*

ICA to highlight DEC's Phase V for VMS tool

BY ELISABETH HORWITT
CW STAFF

ANAHEIM, Calif. — Two watershed events are expected to enliven an otherwise flat International Communications Association (ICA) '91 conference next week.

Digital Equipment Corp. is expected to provide its users with the first pieces of its long-awaited Decnet Phase V for VMS. Meanwhile, a potentially ground-breaking task force of information systems executives from four Fortune 500 companies with Belgian operations will meet to hammer out a set of guidelines for Belgium's Postal Telephone and Telegraph authorities (PTT) to address the Fortune 500 companies' networking needs.

DEC will bring out the first pieces of Open Systems Interconnect (OSI)-compatible Decnet Phase V as part of a phased rollout scheduled to take place this year, according to Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. The introduction will include the latest International Organization for Standardization versions of File Transfer, Access and Management and X.400 electronic mail protocols.

Also expected to be announced at ICA, Dzubeck said, is a multiprotocol router that will support Decnet Phase V-OSI, Transmission Control Protocol/Internet Protocol and the proprietary Decnet Phase IV protocols. In addition, DEC is expected to announce new third-party product support for its OSI-compatible integrated network management platform, Enterprise Management Architecture.

A DEC spokeswoman confirmed that DEC will be making a major announcement at ICA June 3.

ICA '91 will also host the first meeting of the four-member task force of Fortune 500 IS managers whose mandate is to provide Regie des Telegraphes et Telephones (RTT) with input on how the Belgian carrier can provide the same type of volume discounting and specialised pricing packages that U.S. carriers now offer their large customers, according to Glenn Miller, manager of worldwide videoconferencing at The Upjohn Co. "We urged RTT to hear us out in that a great number of us have growing facilities and/or European headquarters based in Belgium."

Dare to be different

What makes this task force potentially different from past dialogues between U.S. users and European carriers is that the Belgian PTT has shown a willingness to listen and even act on suggestions, Miller said.

RTT has been among the most aggressive of the PTTs in lowering its international tariffs and introducing enhanced business services. However, the carrier was apparently unacquainted with specialized pricing practices, Miller said.

The task force resulted from a series of roundtables that the Belgium RTT has held with U.S.-based Fortune 500 companies over the past 1½ years.

Roundtable members said they would like something along the lines of AT&T's Tariff 12 but in a simpler form because they do not have the international telecommunications personnel to analyze complex tariff offerings, Miller said.

Apple cuts back, eliminates 1,500 jobs

Largest layoff in firm's history could help it keep technological promises

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — The cutback of approximately 1,500 jobs at Apple Computer, Inc. may allow the streamlined company to deliver on technological promises and respond to increasing marketplace pressure from IBM Personal Computer clones, Apple customers and analysts said last week.

Apple Chairman John Sculley announced the largest layoff in the company's history last week when he said 10% of its 15,600-member work force would be let go as part of a companywide restructuring to reduce costs. Analysts estimated that the move could save Apple more than $60 million annually.

"Sculley has shown he is committed to a cost structure that will allow the company's products to stay competitive and affordable," said Ben Rose, a senior analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Since taking over Apple's research and development efforts last year, Sculley has outlined an aggressive and costly product update schedule that includes a revamped laptop computer as well as Apple's entries into the notebook and pen-based computer markets.

Anxiously awaiting

Steve Bergfeld, manager of computing standards at Martin Marietta Corp. in Chantilly, Va., said he is "very anxious" to see the new laptops and has put off purchasing decisions until their arrival. "Ultimately, Apple's cost cutting could help us keep our expenses in line," he said.

Apple is also up against severe competition from machines equipped with Microsoft Corp.'s Windows 3.0. "Apple faces a lot of pressure from cheap IBM PC clones that are perceived to have more value," said Rob McPhee, a senior engineer at Du Pont Co. in Wilmington, Del. "I guess Sculley figured it's time to pay the piper."

The cutbacks are a by-product of a changing business strategy, with Apple shifting from selling expensive machines with high profit margins to high volumes of low-cost Macintoshes.

Last October, Apple unveiled three entry-level models that sent unit sales for the quarter ended March 31 soaring 85% over figures from one year earlier. Profit margins, however, dipped from 54.7% to 48.8%. Some analysts said the success of the machines may have also hurt sales of Apple's more costly Macintosh, which generates more profit margin.

Apple spokesman Christopher Escher said the impending layoffs will occur "worldwide and throughout all levels" of the $5.56 billion firm. Although Apple has been hiring steadily since the new high-volume, small-margin strategy was initiated last fall, Escher said the company had to accelerate its expense reduction process because of the rapidly shifting customer preference for low-cost products.

The administrative level is expected to take the brunt of the cutbacks. "Apple has a lot of fat in the managerial level," said Larry Hickey, an investment analyst at First Analysis Corp. in Chicago. "It seems unlikely that they'd cut anyone in R&D or manufacturing, especially considering their increase in unit shipments."

Apple is also expected to begin selling through high-volume superstores such as Comp USA, Inc., which receives a lower percentage of the sale price than computer specialty outlets do.

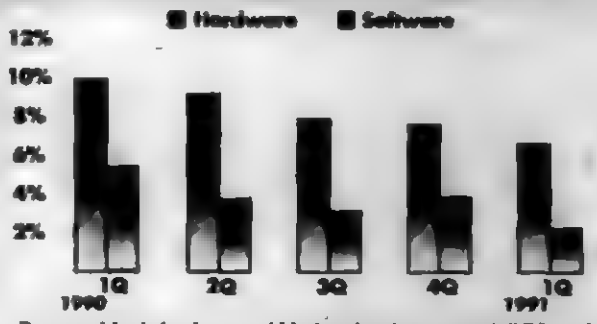
Escher said Apple is also considering other measures to reduce expenses, including consolidating facilities, curtailing discretionary spending and eliminating contractor services.

Most of the layoffs are slated to be complete by the end of the fiscal quarter June 28, with the remainder occurring by Sept. 30, the end of the fiscal year.

The restructuring costs will result in a onetime charge against third-quarter profits, which analysts estimated to be approximately $15 million.

Unwelcome mat

Despite scoring big with low-end systems in the consumer market, Apple Computer, Inc. is still struggling in the corporate world



Percent of Apple hardware and Macintosh software out of all PCs and software purchased by U.S. computer sites with 500 or more employees

Source: Computer Intelligence — CW Chart: Janell Genovese

Glitch let Scud beat Patriot

BY MITCH BETTS
CW STAFF

HUNTSVILLE, Ala. — A computer failure prevented a Patriot missile launcher from firing at the Iraqi Scud missile that killed 28 U.S. soldiers in Dhahran, Saudi Arabia, during the Persian Gulf war, according to the just-retired manager of the U.S. Army's Patriot program.

Col. Bruce Garnett said an extensive investigation traced the problem to a relatively minor algorithm in the Patriot's complex software, which processes radar data to track an enemy missile's flight path.

The Patriot's radar spotted the incoming Scud, but the faulty algorithm prevented the data from being processed. Garnett said in a brief telephone interview with *Computerworld*. In essence, a freak combination of six to 10 abnormal variables — including the unusually high speed of the incoming Scud — kept the system from recognizing the target.

"It was a one-in-a-million thing that was never detected in thousands of hours of testing," Garnett said.

The Scud attack on Feb. 25 killed 28 and injured 97 U.S. soldiers in a metal barracks near Dhahran, making it the deadliest Iraqi attack and the only time a Patriot failed to fire at an incoming Scud.

A FREAK COMBINATION of six to 10 abnormal variables kept the system from recognizing the target.

Garnett said it took "several weeks" for a team of government and contractor engineers to trace and re-create the software problem in a laboratory. Once identified, the problem was easily fixed, and revised software was sent overnight to all Patriot batteries, he said.

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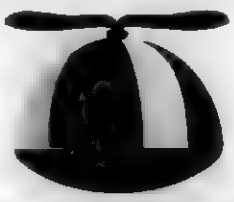
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Match game

Match the IS chief with his or her major in college.

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- Susan Mercereau, Weyerhaeuser Information Systems — History
- Charles Carlson, Sears, Roebuck and Co. — Biology
- Carlene Ellis, Intel Corp. — English literature

Answers: Biology, Mathematics, History, Carlson, English literature, Ellis, Mathematics



As if real press releases aren't malodorous enough

Fourth Shift Corp. announces the Schnozitron, a business analysis tool that assesses the current status of departments. Detects scent of success or the fragrance of failure. Features include CIM Odorizers, Nose-Link. – *From a fictitious press release*



David J. Lena

What do you get if you lose?

Winners of Computer Sciences Corp.'s Technical Excellence Award got to go to the beach and stand in a PC sand sculpture under the burning hot sun in a black tuxedo, black socks, black shoes, black top hat and gloves.

Top 10 fastest growing industries 1987-91

1. X-ray apparatus and tubes.
2. Electromedical equipment.
3. Medicinals and botanicals.
4. Semiconductors and related devices.
5. Machine tools.
6. Farm machinery and equipment.
7. Oil and gas field machinery.
8. Computers and peripherals.
9. Surgical appliances and supplies.
10. Surgical and medical instruments.

Source: U.S. Industrial Outlook (Based on constant dollar shipments)

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola at (800) 343-6474. If we use your ideas, we'll send you a gift.

INSIDE LINES

Come on down!

▶ Novell is putting together its own game show in which users and contestants will find out what they can win if they switch from networks made by 3Com, Microsoft, Banyan, Sun and Digital Communications. Effective now through Oct. 31, Novell will subtract the list price of its previous networks from the list price of its Netware 2 and 3. Novell resellers will win cash and precious metals for turning over new customers.

Aiming to serve its clients

▶ DEC will announce a host of database products this week at Database World in Washington, D.C., highlighting a new data integration server with client/server capabilities and the latest version of its RDB relational DBMS. Many of the new offerings will be aimed at helping DEC customers integrate applications across the RDB and Ultrix/SQL databases.

More reason to pass on ISDN

▶ At the ICA show next week, we hear Sprint and MCI are expected to announce support for Ascend's Multiband box, whose specialty is amalgamating multiple 56K bit/sec. lines into whatever amount of bandwidth a particular device or application needs at a given time — up to 1.5M bit/sec. AT&T is also said to be talking to Ascend so it too can offer on-demand bandwidth allocation over non-ISDN links.

Loose chips sink tips

▶ While Intel has yet to announce its 50-MHz I486 chip, it gave out a trend analysis last week that included a Dhrystone benchmark of a 50-MHz I486. The chart said the chip will run at 40.5 million instructions per second (MIPS), as opposed to 34.5 MIPS for an IBM RISC System/6000. Dave House at Intel added that Intel has spent $600 million on research and development for the X86 line and said that is "more than the total cumulative revenue of all RISC chips."

All aboard the info train

▶ There are reports that IBM is thinking of leaving the Video Electronics Standards Association (VESA) because of a February leak that said IBM might enter into an OEM contract to sell its Extended Graphics Array (XGA) product to third-party vendors. The leak was wrong, but IBM is apparently worried that it can't trust committee members enough to participate fully in VESA's technical committees. IBM denies it is leaving VESA, and XGA committee chair Bill Knapp of Cirrus Logic confirmed IBM's continued participation on the XGA committee. But sources at VESA said the issue was real, and feelings ran high at its Comdex meeting on the subject of how to stop leaks.

How to drive up CD-ROM sales

▶ Some IBM users are discovering yet another little "gotcha" in the big Application System/400 announcement last month. Buried in a mountain of IBM announcement letters is the fact that manuals and documentation, which once came free with the new operating system, are now a separately charged item, at $1,500 to $2,500 extra. IBM will give customers those manuals free of charge on a CD-ROM disk; users will need a CD-ROM player and IBM's Bookreader software.

Reaching out

▶ A spokesman for Cabletron Systems, maker of the Spectrum enterprise network management system, said the company plans to make a joint marketing and product development announcement with workstation vendor Silicon Graphics on June 17. An educated surmise might be that Spectrum support for Silicon Graphics' Ardis workstation will be added to the 40-plus other devices already supported by Spectrum and that Spectrum will somehow integrate Silicon Graphics' Netvisualizer protocol analysis tool.

Reseller opportunity? Last week's item about Microsoft's Windows Resource Kit prompted several readers to contact News Editor Pete Bartolik to place orders. He's not in that business yet, but when you think about it, if Microsoft can get into the print business ... Anyway, you have to contact Microsoft directly for that product. Our hot lines deal only with information, and if that's what you have to barter, call (800) 343-6474, send a fax to (508) 875-8931 or address a tip to 76537,2413 on Compuserve.

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COMPUTERWORLD

1-2-3 facing uphill climb in Mac world

BY CHRISTOPHER LINDQUIST
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. is scheduled to announce this week that 1-2-3 for the Apple Computer, Inc. Macintosh is being beta-tested — 43 months after it was first announced to be in development.

Users who tested the product were upbeat about its functions, but interviews with longtime Macintosh users indicated that Lotus will have a tough time peeling away Microsoft Corp.'s grip on the Macintosh spreadsheet market.

At briefings last week, Lotus said 1-2-3/Macintosh, which the firm had first talked about in October 1987, is expected to ship this fall. It will include full file, data, macro and keystroke compatibility with versions of 1-2-3 for other platforms. The $495 product will also include support for the new System 7.0 Macintosh operating system.

> "PEOPLE WHO KNOW Excel aren't going to switch unless there is tremendous increased functionality."
>
> GEORGE BRENNER
> MCA

Alpha-testers of the product were clearly impressed. "It looks like a real Mac product," said Michael Steenberge, director of information services at Corning, Inc. in Corning, N.Y., and an alpha-test user. "I've seen very few products [that] come from the DOS world go directly, first time out, onto a Mac and look like a Mac product."

Continued on page 8

Technology builds a better sub

BY MARYFRAN JOHNSON
CW STAFF

NEWPORT NEWS, Va. — Corporate computing at Newport News Shipbuilding has always maintained a low public profile, in keeping with the shipyard's highly classified work of making nuclear submarines.

That tradition is changing these days as rapidly as the technology itself, which was employed in the design of the U.S. Navy's Seawolf nuclear submarine.

The results of a massive modernization of information technology at the century-old shipbuilding company have attracted cabinet-level attention from the federal government. Executives at Ford Motor Co. and leading aerospace firms have also come calling on the shipbuilder for information.



The star of the show is the shipyard's grand-scale use of computer-integrated manufacturing and Computer-aided Aquisition and Logistics Support, or CALS, to streamline the complex task of ship design, construction and maintenance.

"We have had a complete turnaround in the use of technology to be competitive," said Larry E. Kittelberger, director of corporate computer services. "We went about this by re-examining our technology needs, establishing an architecture and developing or acquiring the necessary tools to make it happen."

As the first submarine to be designed 100% electronically, Seawolf is a prime illustration of a real-world use of CALS.

CALS is the U.S. Department of Defense's standards initiative, which requires contractors and

Continued on page 135

IBM pledges to improve LAN control

BY ELISABETH HORWITT
CW STAFF

RALEIGH, N.C. — IBM is planning a series of introductions throughout the rest of this year that will address the needs of information systems departments and help them administer and manage their exploding local-area network installations more effectively.

In recent interviews, IBM managers said the rollout will add some key systems management capabilities to IBM's two-tier network management structure, in which OS/2 servers can locally manage LANs on their own and can also act as control points for a central Netview host that oversees the entire corporatewide LAN installation.

"The idea of getting LAN information to a single point for review and monitoring is very important to us," said Steve Bortnyk, director of network management at Metropolitan Life Insurance Co., who has been briefed on several of the upcoming products by IBM.

Key announcements

One key group of upcoming announcements will detail products that allow Netview to configure, troubleshoot and collect alerts about LAN systems such as file and database servers. While Netview can already troubleshoot network boards and other LAN devices through its link with IBM's LAN Network Manager, users have been clamoring for tools to monitor and control the systems that support their critical LAN applications.

Upcoming products will set up two-way links between Netview and three IBM OS/2 server offerings: LAN Server, Database Manager and Communications Manager.

The server software will be able to send systems

Continued on page 6

Olsen seeks lead role in open systems

Products, marketing to stress integration

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Staking his company's future on systems integration and enterprisewide networking, Digital Equipment Corp. President Kenneth H. Olsen briefed analysts last week on a strategic campaign aimed at shedding DEC's reputation as a proprietary vendor.

Analysts who attended a preview of today's announcement said Olsen lumped together personal computers, workstations, servers and networks as "commodities" and said DEC's future profitability hinges on enterprisewide networks and systems integration.

According to Olsen, DEC is being reorganized into four main business units: commodities, VAX/VMS systems, systems integration and services.

The company is emphasizing its Open Advantage campaign to consolidate a variety of current and pending DEC initiatives under one corporate strategy. Key elements include the following:

- Rolling out the initial pieces of its long-awaited Decnet Phase V [CW, May 27]. With expanded

Continued on page 4

Fast 486s too much too soon

Systems ready to roll, but users putting on brakes

BY MICHAEL FITZGERALD and JIM NASH
CW STAFF

Major personal computer vendors are gearing up to offer products based on Intel Corp.'s forthcoming 50-MHz 1486 chip, but users and analysts are showing only modest interest.

IBM, Compaq Computer Corp., Dell Computer Corp. and NCR Corp. are expected to announce PCs or file servers based on the new high end of the Intel line shortly after the June 24 announcement. But system prices are expected to run upwards of $15,000, and some information systems managers are questioning whether any desktop user needs that much power.

One beta-test user of an IBM machine based on the 50-MHz 1486 said early indications were that a fully configured file server with 32M bytes of random-access memory could cost as much as $25,000.

The user said IBM's machine was too powerful for his needs in the foreseeable future, although he said he felt the price/performance would ultimately be attractive.

"I don't think you'll

Continued on page 137

Raking in the chips

One estimate predicts the 1486 chip family will easily overshadow the 80386 in terms of revenue for Intel Corp.

(Revenue in millions)

Model	1988	1989	1990	1991*
80286	$240	$125	$60	$48
80386SX	$30	$160	$325	$315
80386DX	$528	$500	$555	$413
1486	—	$90	$375	$900

*Projected

Source: Morgan Stanley — CW Chart: Marie Bilows

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IBM's a bear, according to investment analysts who have cut back their projected profit outlook for 1991. Page 4.

Computer Associates links IDMS and Datacom databases to its Compete spreadsheet product. Page 137.

Microsoft revises network applications licensing policies. Page 136.

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6 **Bull HN** catches the industry by surprise by announcing the replacement of its former president and CEO with an executive from International Data Group.

8 As the **FAA** pushes systems upgrades further off schedule, controllers in California's Bay Area make do with ancient systems that could reportedly have 'a serious impact on air safety.'

10 The key to data security, according to **Microsoft**, is public key encryption technology, which the firm plans to license from RSA Data Security.

12 Does **Aldus** have the gift of **Persuasion**? Analysts say it may have, as the company adds a convincing voice to the chorus of presentation graphics packages.

14 Two versions are better than one: **HP**'s second version of **Openview** highlights network consolidation features that promise to save users thousands of dollars in hardware costs.

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Quotable

"They can cut as many people as they want, but it won't do any good if people aren't buying their systems. And they aren't; that's the problem."

KEVIN CUSKLEY
SWISS BANK CORP.

On IBM's financial outlook. See story page 4.

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54 Technology Analysis: Reviewers say the latest version of **Wordperfect**'s Wordperfect offers even more features. The only drawback: It is still complex.

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59 Users deciding to take a bite of the **Apple** System 7.0 operating system upgrade may have to wait out a few worms.

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The 5th Wave



EXECUTIVE BRIEFING

■ **Lotus' 1-2-3 for the Apple Macintosh,** first announced nearly four years ago, is getting a thumbs-up from beta-test users. However, other Macintosh users have indicated that the company will have a tough time moving in on the Macintosh spreadsheet turf, where Microsoft's Excel dominates. **Page 1.**

■ **The IS group at Newport News Shipbuilding,** long silent because of its company's classified work, goes public with its large-scale computer-integrated manufacturing efforts. The company, which designed the U.S. Navy's Seawolf nuclear submarine, is completing a software system based on Computer-Aided Logistics Support, a U.S. Department of Defense standards initiative. The system will manage submarine maintenance and repair data. **Page 1.**

■ **Microsoft is giving users more breathing room** when it comes to licensing its network applications. The company is shifting to a policy that would base payment on the maximum number of customers using its software concurrently. **Page 136.**

■ **Large IBM systems users can expect some pricing changes** as well. A company executive says adjustments to the graduated pricing structure are ahead. **Page 29.**

■ **CEOs** spell out what they want in an IS chief: Technology know-how is good, but IS executives need to be businesspeople who are 'agents of change.' **Page 86.**

■ **IS managers are ducking out** when it comes to privacy issues on customer information, according to a recent survey of 50 IS executives by Georgetown University's School of Business Administration. Of the executives surveyed, none are taking leadership roles to direct privacy policies at their companies. **Page 79.**

■ **Wall Street analysts** show their lack of faith in IBM by downgrading earnings estimates for this year. Several say they foresee long-term trouble for IBM as it adjusts to the commodity hardware business. **Page 4.**

■ **IBM is expected to release a number of networking products** later this year to better manage corporatewide LANs. **Page 1.**

■ **Compaq moves ahead** with restructured pricing and support policies designed to appease corporate users. The changes are welcomed by customers who say it is about time. **Page 45.**

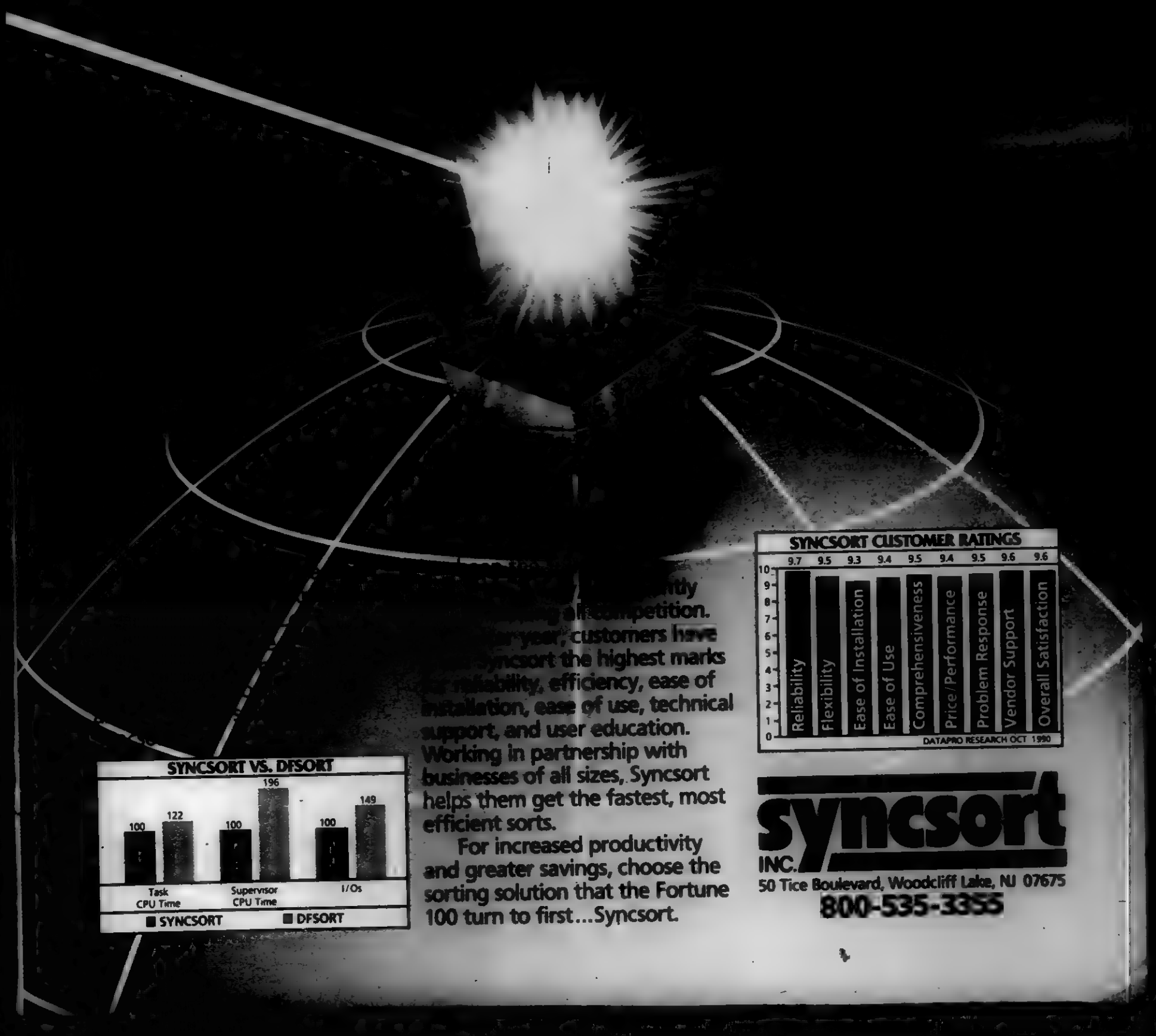
■ **Pen-based computing** holds the promise of being an explosive market, industry observers say. With sales forecasts as high as $3.5 billion by 1995, the industry's big guns are jumping into the business. **Page 111.**

■ **Getting the best lease deal** begins with understanding the ways in which lessors specialize: by product, lease-term length and transaction cost, to name a few. Then, armed with a standard bid request form, users can be sure they're negotiating with the right lessors. **Page 107.**

■ **Rapid prototyping, enterprise data modeling** and re-engineering top the list of approaches taken by IS organizations trying to integrate scattered databases. **Page 93.**

■ **On-site this week:** The U.S. Environmental Protection Agency adapts its networking strategy to meet recent federal government standards. **Page 59.** The IRS develops an expert system to assist in processing taxpayers' correspondence. The IRS hopes the software will help reduce to between 3% and 9% the number of errors it makes on the 15 million taxpayers' inquiries and claims it receives annually. **Page 33.** Florida's Lee County replaces Wang equipment with DEC systems. Wang's downfall was inadequate service and response at this user site, where frequent thunderstorms caused many system crashes. **Page 35.**

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Analysts trim IBM estimates

Wall Street observers cite low profits, recession as reasons for concern

BY NELL MARGOLIS
CW STAFF

Doubting IBM's ability to regain a bold leadership stance in the increasingly fragmented computer industry, stock market analysts have been slashing their estimates of how much profit the company will rake in this year.

Dallas-based Eppler Guerin & Turner, Inc. recently marked down its IBM projection by 12%. "Our reason is pretty simple," Eppler Guerin analyst Robert K. Hedrick said. "They're not going to make as much money this year as we'd thought."

IBM's broad array of product offerings and apparently avid customer interest in its recently introduced Enterprise System/9000 mainframes offer hope of an earnings resurgence, Hedrick added, "but only when the recession ends, and that may not be so quick a rebound."

"I've got to assume that there's still a market for mainframes somewhere," said Martin Reisinger, an analyst at Duff & Phelps Investment Research Co. "But I lowered my [IBM] estimates because I've just been getting a kind of bad feeling about the business overall." Asked whether he was referring to IBM's business or the computer industry, Reisinger said, "Both — bad about the industry, worse about IBM."

Wall Street's faith in the world's largest computer company has been under a strain since late March, when the firm — fresh from an impressive 1990 revenue and profit surge — stunned analysts by warning that first-quarter profits would nosedive because of harsher-than-expected effects of worldwide financial turmoil.

In fact, Brown Brothers Harriman & Co. analyst William Milton speculated that the recent epidemic of estimate-chopping is a delayed reaction to guidance that IBM clearly gave Wall Street but that was too discouraging for Wall Street to believe.

While some analysts took the firm's explanation at face value, others were skeptical that the problem was caused solely by external forces [CW, March 25].

Last week's airing of an employee-generated memo documenting IBM Chairman John Akers' barrage of scalding remarks fired at top executives and middle managers in late April did little to allay the unease that has been building in the analyst community, analysts said.

The Akers papers portrayed the usually circumspect chairman as enraged that a lax sales force and possibly lackluster products are at least as responsible for lost market share as adverse currency translation and worldwide recession are. The memo — the substance of which was confirmed by an IBM spokesman — left no doubt that Akers is ready to fire people to achieve a better sales record.

The potentially massive work-force reductions that the memo portends "are all to the good," said veteran IBM watcher and consultant Robert Djurdjevic, a longtime advocate of a slimmer, more efficient IBM.

"They can cut as many people as they want, but it won't do any good if people aren't buying their systems. And they aren't; that's the problem," said Kevin Cuskley, an analyst at Swiss Bank Corporation Investment Banking, Inc.

"For two straight years, through ups and downs, I've been very positive about IBM," Cuskley added. "But over the last six months, I've felt more of a concern that it is never going to reassert itself as a real leader — that it's just going to turn into a classic cyclical stock. They did a whale of a job with the [Application System]/400 — but how many more AS/400s will there be?"

Possibly none, unless and until IBM faces up to the need for quantum cultural change, said James Meyer, an analyst at Janney Montgomery Scott, Inc. "IBM needs to change its culture and take some risks," he said. "They've certainly got the talent and resources to make it happen." In the space of one year, Apple Computer, Inc. reduced its product cycle time from more than two years to less than nine months "by changing the entire way things are done at the company. IBM certainly has as much engineering talent as Apple. What they have to do is just go do it," he noted.

Digital Equipment Corp. also began to feel the edge of Wall Street's ax last week. A meeting with DEC executives failed to produce any reason to believe that DEC can surmount the beating it has been taking from the continuing U.S. recession and the spreading recession in Europe.

Ship shifting away

Analysts have been slashing their projections of [illegible] estimates of $[illegible] reported in 1990

[illegible]	[illegible]	[illegible]
Duff & Phelps Investment Research Co.	$9.00 per share	$8.00
[illegible]	[illegible]	[illegible]
Swiss Bank Corp. Investment Banking, Inc.	$9.00 per share	$7.00 (approx.)
[illegible]	[illegible]	[illegible]

CW Chart, Janell Genovese

Open systems

FROM PAGE 1

compatibility for Open Systems Interconnect (OSI), Transmission Control Protocol/Internet Protocol (TCP/IP) and the proprietary Decnet Phase IV protocols, Phase V "will pull the whole thing together with its strong open emphasis for networking," said Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn.

A key point for the success of DEC's open networks will be its new multiprotocol router, which enables direct communication between the OSI, TCP/IP and Decnet Phase IV networks.

- Revealing the first glimpses of its next-generation Advantage-Networks, DEC's catchall term for a migration strategy for customers that want to gradually phase in compliance with the OSI protocols.
- Presenting VMS Open, a Posix-compliant operating system that was demonstrated last week running on a Sun Microsystems, Inc. workstation as well as a Decstation running under DEC's Unix variant, Ultrix.

DEC executives were unclear, however, on exactly when and how the company will distribute the initial pieces of this new "portable" VMS, said David Evancha, an analyst at Workgroup Technologies, Inc. in Hampton, N.H.

- Licensing some of its own software to other vendors involved with the Advanced Computing Environment initiative, announced in April.
- Submitting its network management product suite — Enterprise Management Architecture — to the Open Software Foundation in Cambridge, Mass., as a proposed standard for corporatewide network management.
- Providing computer-aided software engineering tools from DEC that run on Sun workstations and a desktop version of DEC's transaction processing software.

ACCORDING TO OLSEN, DEC is being reorganized into four main business units: commodities, VAX/VMS systems, systems integration and services.

Portable applications

With its implementation of the first three Posix standards, VMS Open would allow users to write portable applications independent of the operating system, work on a VAX/VMS machine with a shell that gives the look and feel of Unix and write real-time applications for Unix.

With 850,000 Decnet licenses already in the field — as well as DEC's plans to have 1.5 million licenses by 1995 — networking is clearly the key to DEC's future as a multivendor systems integrator, analysts agreed.

"DEC is gravitating to systems integration very heavily," Evancha said. "They are taking a significant step away from hardware and more into software and services."

CORRECTIONS

Information about Gateway Information Services, Inc.'s DP Choice in the May 13 issue was incorrect. The product is available for any industry, not just insurance. However, it is only for sites running less than 50 million instructions per second. A $10,000 license may be purchased only after $15,000 in consulting services has been purchased.

.....

Because of incorrect information supplied by the vendor, a Product Spotlight chart [CW, April 8] listed Brock Control Systems, Inc.'s Field Activity Manager (FAM) as requiring a 150M-byte hard disk. The product requires a 40M-byte hard disk. Also, FAM runs on Unix, VMS and MS-DOS platforms, not just on Unix.

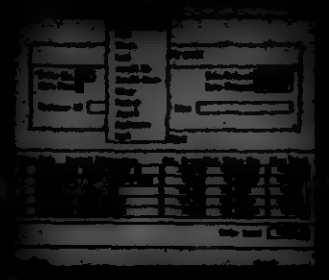
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The five-year warranty referred to in an article on Okidata Corp.'s OL 820 printer [CW, May 13] applies only to the LED printhead. The printer itself carries a one-year parts and labor warranty.

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NEWS SHORTS

IBM draws PC-DOS into factory nets

IBM announced last week a DOS client version of Distributed Automation Edition (DAE) that it said better integrates existing DOS-based factory-floor collection systems with its plant management systems. DAE is a plant management application enabler that runs on OS/2 and VM systems. PC-DOS systems can now use Communications System/DOS to develop applications able to send factory-floor data to an OS/2 server running DAE. The server can then process the data locally or send it up to a VM host running DAE. Users can also migrate OS/2 DAE-based applications down to DOS systems running CS/DOS, IBM said. Priced at $600, the product is available now.

.....

HP to cut PC prices

Hewlett-Packard Co. is expected to cut prices on its personal computer line by about 10% today, continuing the price-cutting trend among major vendors. HP's high-end Vectra PCs, based on Intel Corp.'s i486 processor, will now cost $15,999, down from $17,799. The company's 80386-based computers are similarly reduced. HP is also reducing hard disk prices.

.....

Low-cost 386SX desktops from AST

AST Research, Inc. is expected to introduce an Intel Corp. 80386SX-based desktop computer today. The basic configuration of the Bravo 386SX/20 offers Super VGA compatibility and 2M bytes of random-access memory. AST will offer a version with no hard drive for $1,895, a model with a 40M-byte hard drive for $2,395, and a 40M-byte configuration bundled with Microsoft Corp.'s Windows 3.0, Lotus Development Corp.'s 1-2-3 Release 3.1, a Super VGA monitor and a mouse for $2,895.

.....

DEC wins Navy contract

Digital Equipment Corp. announced last week that it has won a U.S. Navy PC network integration contract with a potential value of $140 million. The contract gives DEC the opportunity to sell hardware, software and services to users of some 8,000 local-area networks connecting more than 1 million PCs for the U.S. Department of Defense. A company spokesman said DEC will be the "single point of responsibility" for integrating desktop systems from various vendors as well as installing and maintaining PC LANs for the Navy.

.....

Service users want quick response

Rapid response is the most important criterion for choosing a service and support vendor, according to a recent survey of 404 information systems professionals conducted by Datapro Information Services Group in Delran, N.J. In the multiple response survey, 51% cited response time as a key factor in choosing their hardware and software support vendors, while 43% cited price, and 42% noted technical expertise.

.....

Dartmouth mandates PC use

Beginning with the class of 1995, all Dartmouth College students will be required to own a PC. A faculty vote last month made Dartmouth the first Ivy League college to require PC ownership. Financial aid-eligible students will be offered loan assistance toward the cost of the standard PC, estimated at $1,200 to $1,600. Some 90% of Dartmouth's 4,200 students currently own PCs, and nearly 80% of incoming first-year students purchase a PC as freshmen.

.....

U.S. firms to supply Japan's NTT

Five affiliates of U.S. computer companies are among the 10 suppliers chosen by Nippon Telegraph and Telephone Corp. last week for its Customer Service Integration System. The system will provide branch offices of the Tokyo-based telecommunications giant with a consolidated database to respond to customer questions and complaints. Among the suppliers chosen were IBM Japan Ltd., Nihon Unisys Ltd., Nippon Data General Corp., Nippon Information and Communication Corp. and Yokogawa-Hewlett-Packard Co.

More news shorts on page 136

Publishing exec to head Bull HN

IDG's Leblois named CEO, Pampel to serve as adviser during transition

BY SALLY CUSACK
CW STAFF

BILLERICA, Mass. — Catching the computer industry by surprise last week, Bull HN Information Systems, Inc. replaced its president and chief executive officer with an executive from the computer publishing and consulting industry.

Axel Leblois, 42, was named as the replacement for Roland Pampel, who will stay on as an adviser to Leblois during the next several months. Leblois was hired away from International Data Group (IDG), the parent company of *Computerworld* and other computer-related publications in more than 40 countries. IDG owns International Data Corp. (IDC), the Framingham, Mass.-based market research and consulting firm.

Pampel, 56, has been at Bull HN since 1988. He declined to accept a position at the company's Paris headquarters for personal reasons, a spokesman said. Bull HN is the U.S. operating arm of Groupe Bull.

Groupe Bull Chairman and CEO Francis Lorentz credited Pampel with integrating Bull HN into Groupe Bull's worldwide operations and introducing new products and services. Before joining Bull HN, Pampel served as president and chief operating officer at Apollo Computer, Inc. in Chelmsford, Mass.



Leblois: *Bull HN "clearly needs to turn around its financial position"*

Although Leblois has no direct experience in a computer manufacturing company, he said he is prepared to face several challenges confronting Bull HN.

"The company clearly needs to turn around its financial position. I have several years' experience in that," Leblois said.

According to Leblois, the first item on his agenda is to ensure U.S. customer loyalty, particularly among Bull's large-scale DPS 8000 and 9000 mainframe systems users.

Daniel J. Cavanagh, senior vice president at Metropolitan Life Insurance Co. in New York, a heavily invested Bull user, said he spoke briefly with Leblois after the announcement was made last week.

According to Cavanagh, Leblois said he was calling several large customers to reassure them that his charge from Bull is "doable," and that he was eager to establish relationships with clients.

Robert P. Tasker, vice president of the software research group at IDC and a former employee of Leblois, applauded the changes at Bull.

"I think Axel is more qualified than Pampel was — and that is nothing against Pampel, mind you — it is just that Pampel is an engineer by training. Axel is a customer-oriented marketeer."

Bull HN's cost structure far exceeds its current revenue structure, Tasker said. The company has sound technology but has demonstrated poor marketing skills, he added.

Jim Cassel, vice president and director of large computer systems at Gartner Group, Inc. in Stamford, Conn., said he has concerns as to whether Groupe Bull can survive without a serious equity partner and a trimming of its product line.

NEC Corp. is currently trying to convert an existing 15% ownership of Bull HN into 5% ownership of the parent company — a move that may be contested by the French government. Groupe Bull lost $1.17 billion in 1990.

Citing Bull's recently announced Distributed Computing Model, imaging and workstation products, Leblois maintained that Bull is very competitive with what is being done elsewhere in the marketplace.

Kirk S. Campbell was named president and CEO of IDC.

LAN control

FROM PAGE 1

management information up to the central Netview host, where it can be analyzed and responded to either by a human agent or by automated Netview applications, according to Laura Knapp, program adviser of enterprise LAN communications at IBM.

For example, LAN Server could notify Netview that a server is running out of disk space, and a prewritten C list program within Netview could respond by deleting some of the disk's back files, Knapp said. Database Manager could alert Netview of an unauthorized attempt to access a database, and Netview could automatically respond by cutting the user off.

Unlike IBM's LAN Network Manager, which can act as both a Netview adjunct and a network manager on its own, the forthcoming products will provide systems management only through the Netview host — at least for now, Knapp said.

IBM is, however, working on an OS/2-based LAN system management server that would be able to handle systems management locally without depending on Netview and would probably incorporate Hewlett-Packard Co.'s Openview, Knapp added. IBM announced last month that it would license and incorporate parts of Openview into an AIX-based LAN management workstation [CW, April 22].

IBM is also working with Novell, Inc. to enable Netview to collect systems management information from Netware servers, Knapp said.

Other projects

Other projects in the works with Novell include enabling IBM's Netview Distribution Manager to download Netware operating systems configurations.

IBM is also working to improve Netview's ability to track and manage the dynamically changing configurations and traffic patterns of a distributed computing environment, according to Bill Warner, the vendor's director of network management.

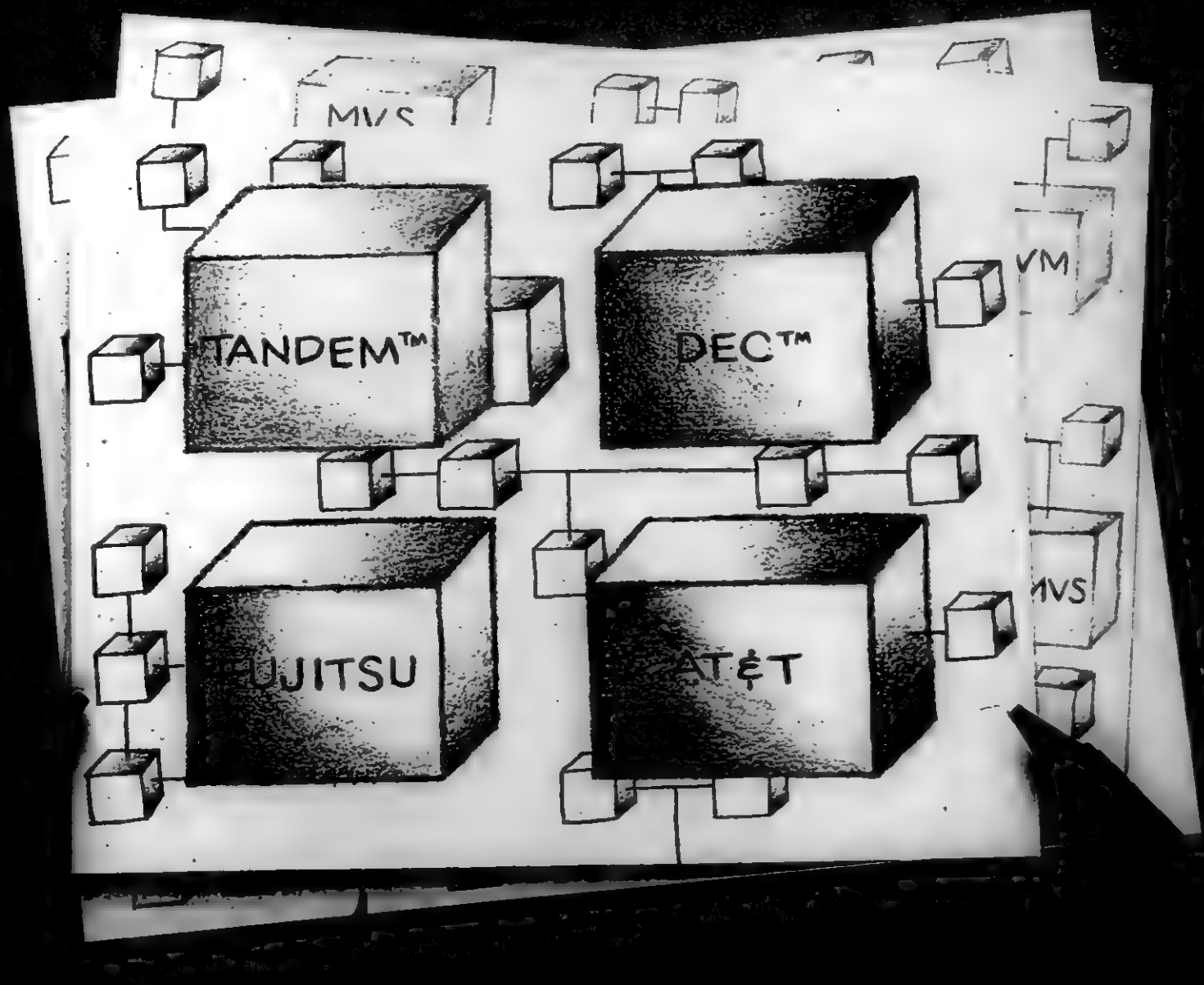
Now in the works is a table that will sit in a virtual memory cache of the host and track the status of LANs, Systems Network Architecture (SNA) devices and other network devices in a dynamic, on-line fashion, Warner said.

Currently, Netview must poll network devices or wait for alerts to be sent in order to get a view of what is happening in the network, Warner said.

In contrast, the table will allow the network manager to get a snapshot of the state of the entire enterprise network at any given time, including whether various devices are on or off and what they are connected to. The table will also include a programming interface so that automated Netview applications can make use of the status information in responding to network events, according to Warner.

Metropolitan Life is very interested in the idea of a "table-driven method of updating status information," Bortnyk said.

In particular, he added, the firm would like to see a more dynamic way of "accumulating configuration and alarm status of both SNA and non-SNA devices all in one place and having that system drive the graphics display" of network topology.


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New FAA systems in holding pattern

Delays in modernization of Univac 8303-based system mean soaring costs, questions about safety

BY J. A. SAVAGE
CW STAFF

At the Bay Terminal Radar Approach Control facility in Oakland, Calif., a horn sounds two or three times each month, signaling a system overload and subsequent failure. When it sounds, air traffic controllers directing traffic for the Oakland, San Francisco and San Jose, Calif., airports have only a few seconds to memorize the positions, speeds, courses, altitudes and destinations of the 12 planes, on the average, they are guiding. Then their screens go blank.

"It takes about 10 seconds [for the screens] to come back," said Joel Hicks, a former Oakland controller who is now director of safety, technology and training at the National Air Traffic Controllers Association (NATCA) in Washington, D.C. "Sometimes, when the information comes back, some of it is missing. That's when it gets dangerous," he added.

New computers to replace the Federal Aviation Administration's (FAA) balky ones, such as those in Oakland, were to be installed as part of an overall upgrade program beginning in January 1994. But controllers will have to keep their memories sharp because that update is now scheduled for April 1995. With such delays, the cost of that system and others integral to air traffic safety has doubled to $31 billion, according to a General Accounting Office (GAO) report issued in mid-May.

This came almost one year after *Computerworld* revealed that the FAA's computer upgrade plan was four years late and $15 billion over budget. At that time, Martin Pozesky, assistant administrator of the upgrade program, said the FAA took some responsibility for the overruns. "In retrospect, the [upgrade] plan was not thoroughly thought out," Pozesky acknowledged.



Source: GAO CW Chart: Janell Genovese

> "THE FAA HAS made some glue-and-baling-wire improvements, such as new radar antennas, but we're stuck."
>
> JOEL HICKS
> NATCA

John Burt, executive director for acquisitions at the FAA, said much of the increasing costs stem from new projects. In December 1990, the FAA changed the system upgrade plan from the National Airspace System plan to the Capital Investment Plan, which encompasses the former but adds new projects.

However, the GAO report noted that those projects are being implemented "primarily due to delays" in the modernization plan.

For instance, the full, nationwide installation of the Advanced Automation System — chiefly an air traffic controller's console based on IBM's RISC System/6000 workstations — has been delayed until 1996 from its original estimate of full implementation in 1994.

To keep the current 16-year-old Unisys Corp. Univac 8303 processors going, the FAA is adding solid-state memory and has considered asking Unisys to resume manufacturing the obsolete systems, but that is unlikely. Interim projects include new radar antennae that should send more streamlined data to the old consoles.

The new IBM-based traffic controller consoles will include additional information such as color-coded flight destinations, altitude, speed and airline name. Other systems will provide easier access to more complete weather information as well as new radio communications.

The original cost of the National Airspace System plan remains the same — $15.8 billion, according to Burt. However, Allen Li, assistant director of aviation at the GAO, said the $15.8 billion figure was for accounting purposes only.

The FAA claimed things are improving. A December 1990 reorganization of the administration's systems acquisition and implementation policies should allow the systems modernization plan to proceed with few of the glitches that have plagued it for the last decade, Burt said.

Under Burt's charge, the agency is now attempting to "fly before buying," requiring that prototype systems be submitted for FAA testing prior to production.

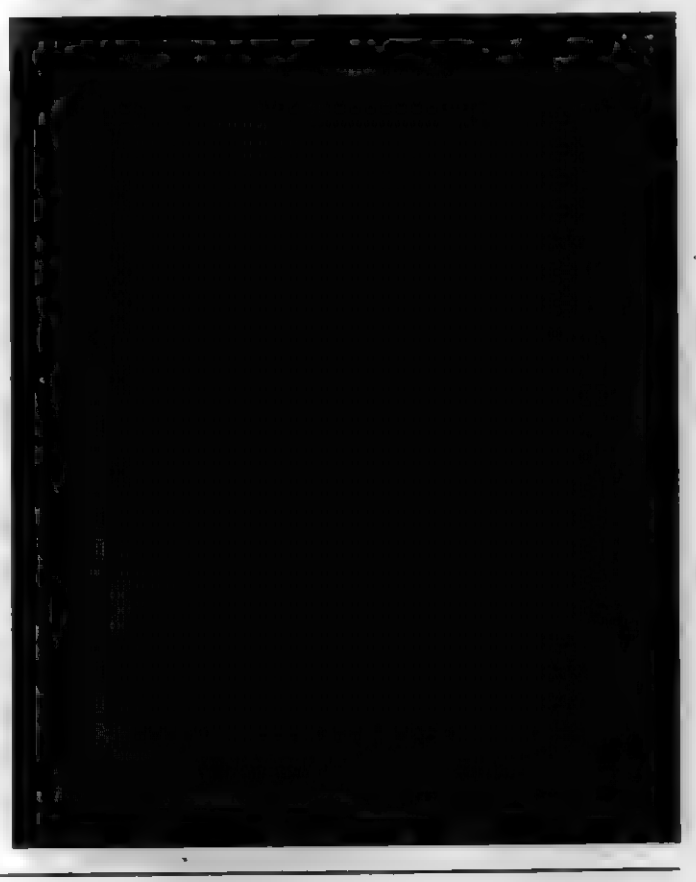
Potential danger

Oakland's controllers have repeatedly asked the FAA for upgrades to their 1970s-vintage computers, submitting more than 15 "unsatisfactory condition reports" since 1989. Their efforts have been to no avail, despite one report's charge that such "outages could have a serious impact on air safety."

The Bay Area's systems problems, like those in other well-traveled corridors such as Chicago and Dallas/Ft. Worth, are unlikely to improve for at least five more years while FAA management irons out numerous contract problems and what Li called a "consistent underestimation of the complexity of technical upgrades."

NATCA has given up trying to get interim upgrades, according to Hicks. "The FAA has made some glue-and-baling-wire improvements, such as new radar antennas, but we're stuck," he said. "The system will work because the air traffic controllers will work around adversity. They expect the consoles to break down."

Hicks, who was one of the few officials to link obsolete and overworked computers to danger in the skies, added that it will "take a disaster to get some movement on this."



1-2-3

FROM PAGE 1

While Lotus may not offer a superior alternative to Excel, Steenberge said, users would now have more choices for spreadsheets on the Macintosh.

But responses from other Macintosh users indicated that Lotus may have come up with too little far too late to have a chance at garnering much of the market now dominated by Excel.

"Where were they 2½ to three years ago?" asked Rick Christjansen, manager of administration and technical support at Manville Sales Corp.'s Denver-based research and development center. "I've got an installed base and an investment," he said, adding that Excel is a "well-oiled tool," which will make 1-2-3/Macintosh a hard sell.

Barry Eisenberg, senior management systems analyst at Hughes Aircraft Co.'s ground systems group, said Excel has been his standard for about five years.

Unless Lotus has some "wonderful and terrific new features," Microsoft would have to go out of business for 1-2-3/Macintosh to move in, Eisenberg added.

Stay or switch?

"My opinion is that people who know Excel aren't going to switch unless there is tremendous increased functionality," said George Brenner, vice president of information services at MCA, Inc. in Los Angeles. "It will affect a couple of people, but I don't think anyone's going to go wild over it."

Patricia Elfte, a presentation analyst at Pacific Gas & Electric Co. in San Francisco, said 1-2-3 users moving to Macintoshes may be very interested in the product, however.

She said the product retains features that will make DOS-based 1-2-3 users feel at home, such as the 1-2-3 Classic menuing system, which allows users to use the familiar "/" key commands. "A Lotus [1-2-3] user would not be afraid of it," she said.

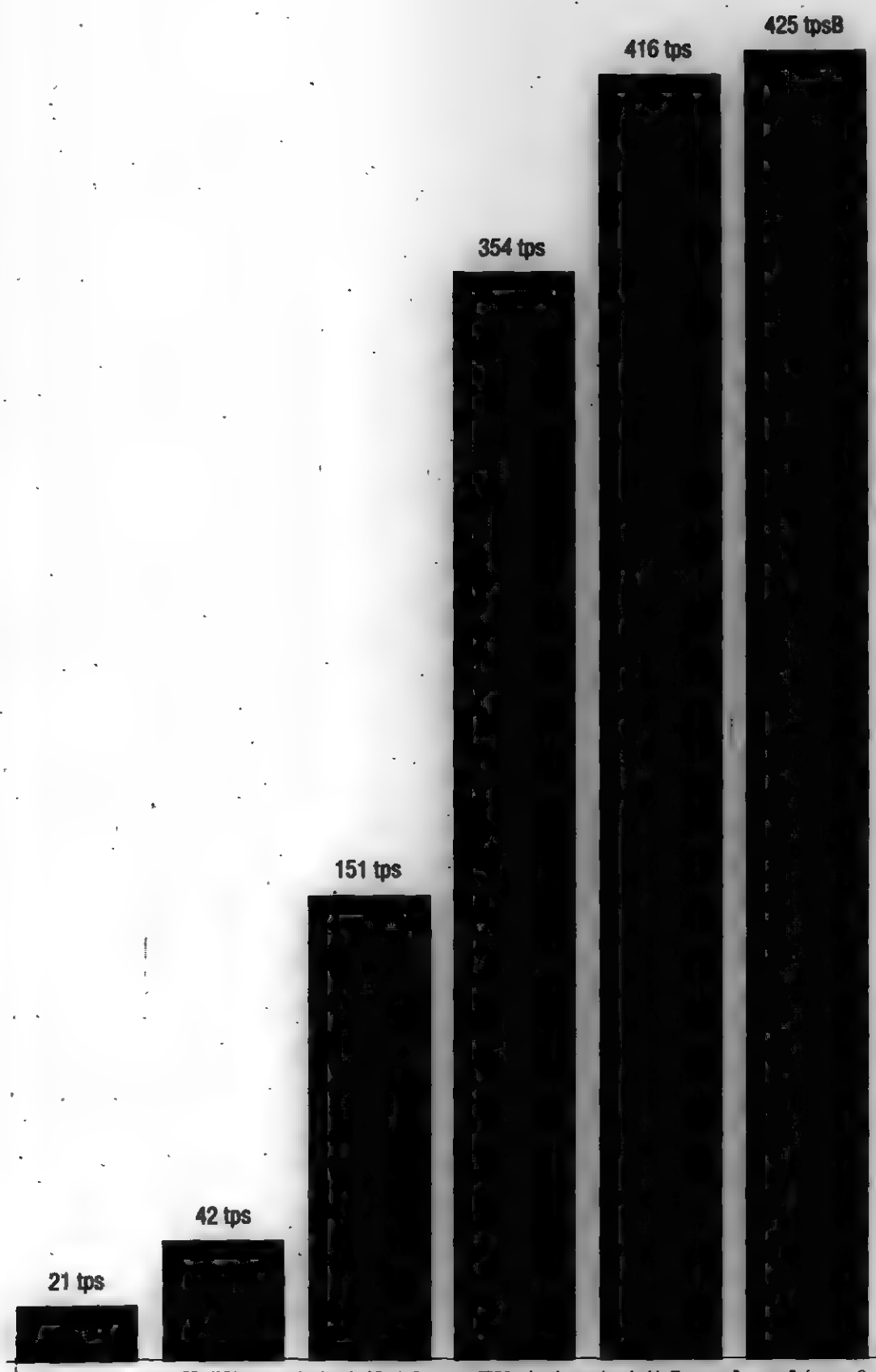


1-2-3/Macintosh *retains the classic 1-2-3 menuing system*

While Lotus' goal of breeching the Macintosh market may be a lofty one, some analysts said it can expect success.

Wordperfect Corp.'s recent move into the Macintosh arena serves as an example of an established player in the DOS world being able to take some Macintosh market share, said Bill Higgs, director of software research at Gartner Group/Infocorp. "I think that, assuming the product is an adequate product or better, [Lotus] probably can do that level of success on the Macintosh," he said.





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US West embracing distributed X terminals

BY JOANIE M. WEXLER
CW STAFF

PHOENIX — In a large-scale testament to the X terminal alternative, US West Small Business Services said last week it is installing 1,600 19-in. color models from Tektronix, Inc.

The X terminal purchase represents a major component of a five-year, multimillion-dollar re-engineering effort to move the communications company from disparate computing platforms to Unix System V Release 4 and distributed systems, according to Stan Ewert, manager of systems planning and design at the US West Communications, Inc. subsidiary.

"Our original idea was to provide a windowing environment on the desktop so our users could access multiple systems without having to spend time switching back and forth between them," Ewert explained. "We initially planned to install full-blown Unix workstations until we discovered that the cost per seat was less than half with X terminals."

The X terminals will span about 25 sites in 14 states and will replace antiquated ASCII terminals almost one for one, Ewert said.

He added that the X terminals will be used in traditional business office and telemarketing operations, collection centers and customer training and assistance sites to improve customer service and drive operating costs down.

X terminals are based on the X Window System networking protocol. "X server" software installed on terminals, workstations and personal computers allows the desktop devices to access multiple hosts running "X client" software and display files and applications in multiple windows on one screen.

US West's installation deviates from this scenario in that it is installing Digital Equipment Corp. reduced instruction set computing servers on Ethernet local-area networks composed of X terminals. The DEC server will run the "X client" software as a gateway between the terminals and the various hosts throughout the company. US West chose this configuration, Ewert said, because it did not want to invest in X client software for its mainframes.

Ewert explained that disparate IBM, Unisys Corp. and Tandem Computers, Inc. mainframes existed in the three separate Bell telephone companies that merged into US West when AT&T divested in 1984. Per-unit prices for US West's most widely installed X terminal — Tektronix's XP29 — is $4,995, according to Tektronix. However, Ewert said the price is not reflective of the total US West/Tektronix contract.

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Microsoft readies security feature

BY JAMES DALY
CW STAFF

Microsoft Corp. is expected to announce today plans for building a sophisticated data security feature into future applications to help keep documents safe from electronic snooping.

With information systems managers stressing the importance of data integrity, the firm has responded with plans to license the "public key" encryption technology from RSA Data Security, Inc. Upgrades integrating the feature could come as early as year's end, insiders said.

RSA's Public Key Cryptosystem assigns each user a secret key, or code, as well as a public key that is published in a directory. Senders use the addressee's public key to route their messages, and recipients use the secret key for deciphering. Messages include "digital signatures" imprinted with the sender's key.

Microsoft will license RSA's Bsafe and Tipem software kits, letting its engineers incorporate RSA's privacy and authentication features into their applications.

RSA's technology has already been licensed by companies including Lotus Development Corp., Novell, Inc. and Digital Equipment Corp. Internet also applies the public key methodology.

A necessary evil

Advanced security components are quickly becoming a "must-have" feature for IS professionals. "In two years, it will be considered irresponsible engineering to design products without extensive security features built-in," said James Bidzos, president of RSA.

Experts warned that added software features should not be seen as an excuse for IS managers to let down their guard. "Just because the letters of a document are scrambled, it does not mean that the document is secure," said Harold Highland, editor of the Oxford, England-based "Computers and Security" newsletter.

The high regard for the RSA methodology, however, has created a storm of controversy at the federal level.

National Security Agency officials are battling efforts by the National Institute of Standards and Technology to release a public key encryption standard, fearing that the wide deployment of a system such as RSA's would hamper intelligence-gathering efforts.

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Persuasion tries Windows

Aldus enters crowded presentation graphics playing field

BY CAROL HILDEBRAND
CW STAFF

Aldus Corp. is the latest at bat in Microsoft Corp.'s Windows-compatible presentation graphics lineup, but it may have a hard time snagging a significant niche from all the other power hitters on the field.

Users and analysts alike praised Persuasion 2.0 for Windows for its richness of features and ease of use, but they also said the market — already crowded with products such as IBM's Hollywood and Microsoft's Powerpoint — would not be an easy one to command.

"Whenever Microsoft comes out first with an application that isn't an absolute dog on Windows, it tends to become the standard," said Craig Cline, associate editor of the "Seybold Report on Desktop Publishing."

"Persuasion is a very nice product, but I don't know how much of a dent it can make," he added.

Although Persuasion and Hollywood "appear to be the ones to beat right now features-wise, you also have to take into account the marketing power of people like Microsoft," said Bill Coggshall, president of Los Altos, Calif.-based New Media Research, Inc. "We should see some good competition here."

New functions

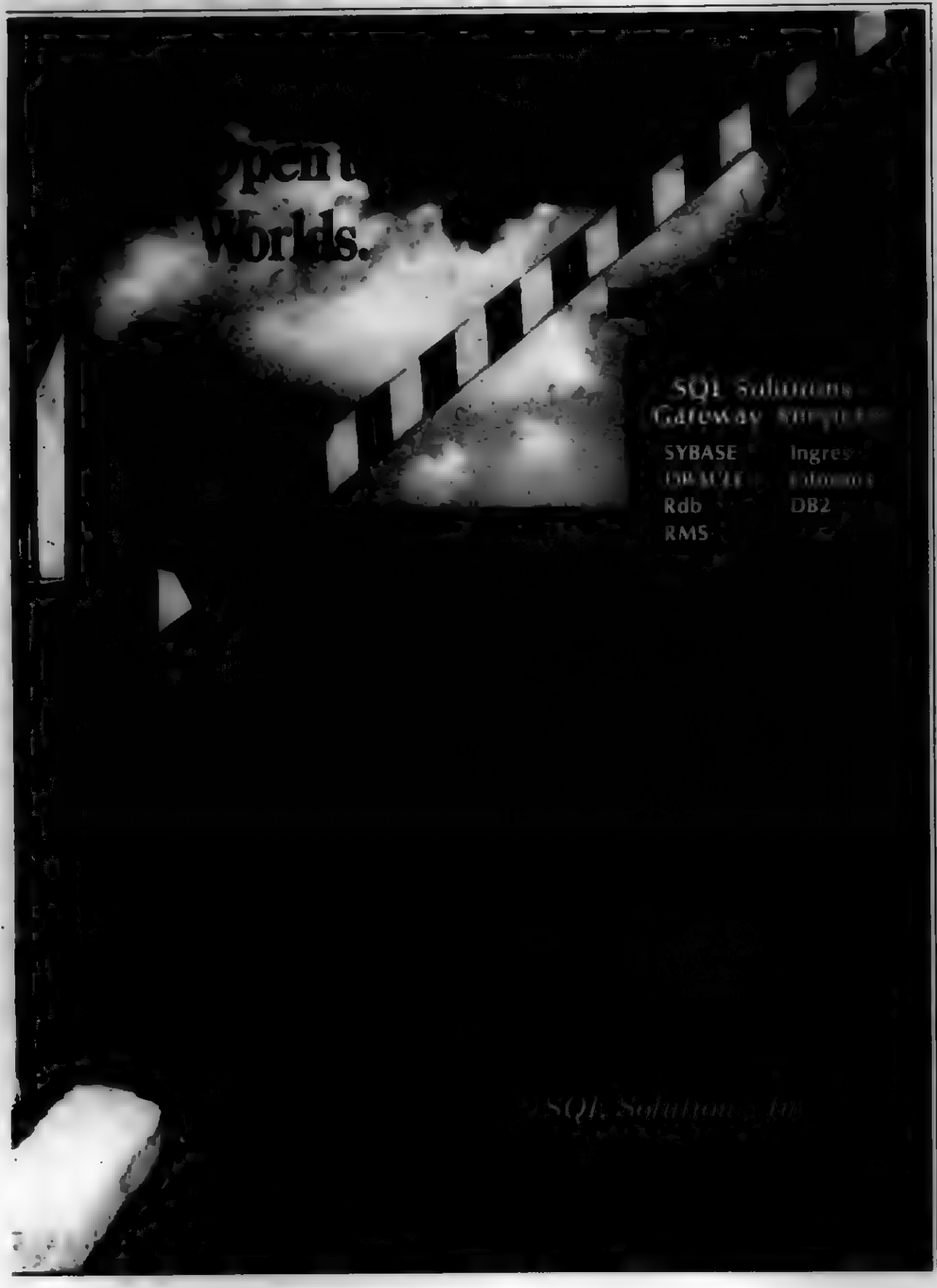
Persuasion, which Aldus recommends should be run on an Intel Corp. 80386-based personal computer with 2M bytes of random-access memory, boasts such functions as automatic templates, an outlining tool and a slide sorter.

"It strikes a nice balance between simplicity — if you just want to sit down and bang out a quick slide — and also giving you tools to do color and editing and tweaking of each slide," said Mark Moura, assistant city manager for the city of San Carlos, Calif., which beta-tested the product.

Moura added that he was especially impressed by the outliner, which automatically formats text and data into visuals and organizes slides.

Debbie Stark, a technical specialist at Princeton University, said that although the slide sorter view, which lets a user view an entire block of slides at once and allows modifications and changes in slide positioning, is "wonderful, it is the thing that really slows down once you have about 20 slides. It takes forever for it to draw [the slides] on the screen."

Persuasion 2.0 for Windows is currently available and is priced at $495.



LAN links take to space age

BY JOANIE M. WEXLER
CW STAFF

MARIETTA, Ga. — Terrestrial network users are not the only ones needing reliable interconnections of local-area network traffic at reasonable prices, a fact not lost on very small-aperture terminal (VSAT) maker AT&T Tridom.

Last week, the firm announced a homegrown router card for its VSATs — 1- to 2-meter satellite dishes that transmit wide-area traffic via satellite. The built-in $1,495 software option will reportedly be available in August to shuttle Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect (OSI) protocols between Ethernet LANs.

Navistar International Transportation Corp., a Chicago-based maker of trucks and diesel engines, said it has been successfully piloting the router-capable VSATs for one month and intends to install up to 600 of the devices.

Jim Fowler, Navistar's director of strategic partnerships and systems integration, said that "for our application, it was a no-brainer to use VSAT technology because the cost compared with terrestrial lines was substantially cheaper than that of the public packet and time-sharing networks we looked at."

AT&T Tridom's router accoutrement, Fowler said, fulfilled the specification in Navistar's request for proposal for a direct Ethernet-to-Ethernet connection. Fowler said the router is less costly and less of a management headache than protocol-converting gateways available for converting TCP/IP traffic to X.25 in the wide area.

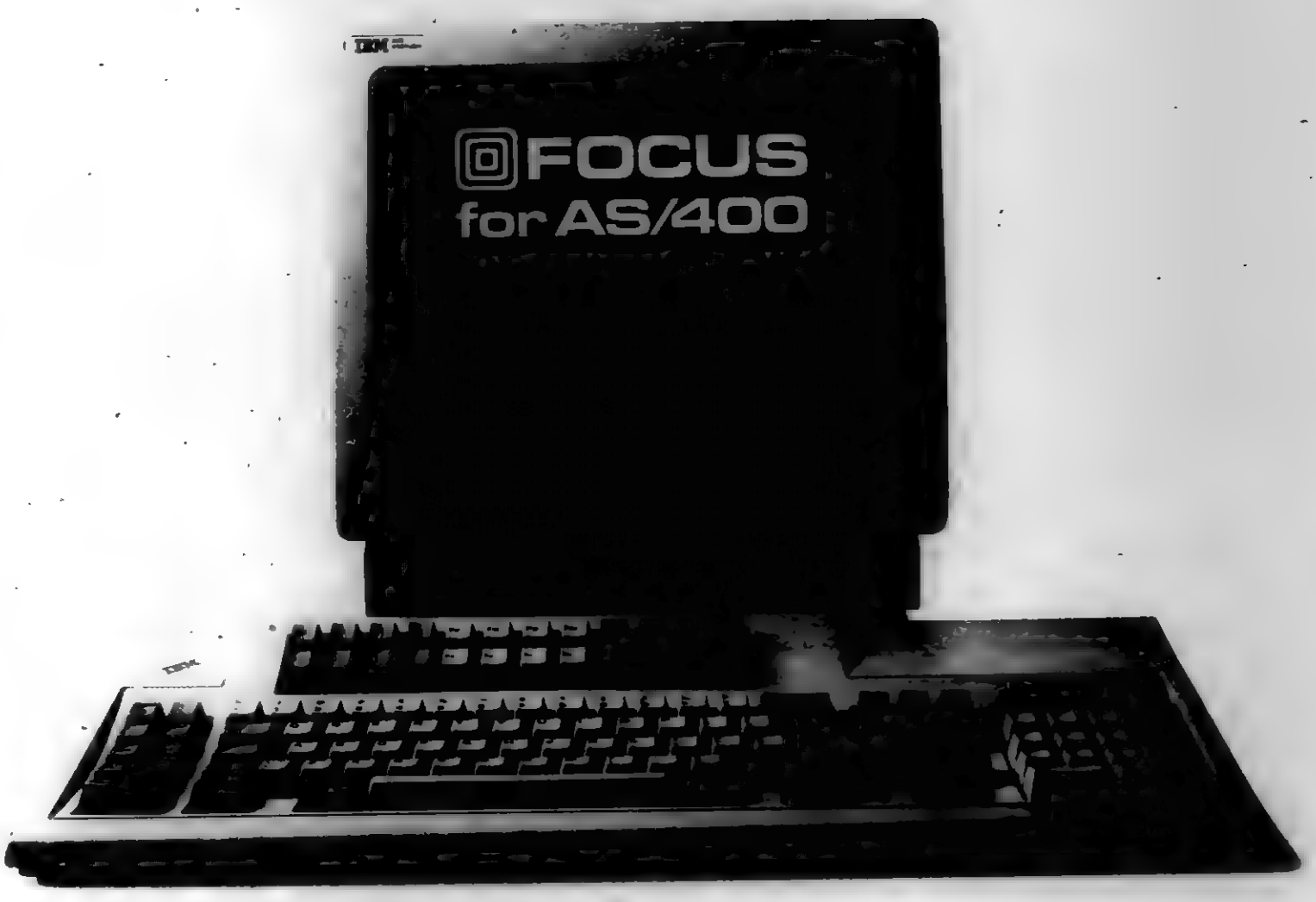
"It's cumbersome when each application has to individually address each computer at each dealership," he said. "If we eliminate addressing overhead and the cost to manage and convert protocols, it makes life easier."

Stand-alone gateways cost about $7,000 to $8,000, while gateway boards for personal computers run about $2,500.

Navistar's bid also specified support for OSI protocols to ensure a common networking environment for the future, Fowler said. He added that no other VSAT vendor could display both the direct LAN interconnect function and OSI protocols at the time the bid went out.

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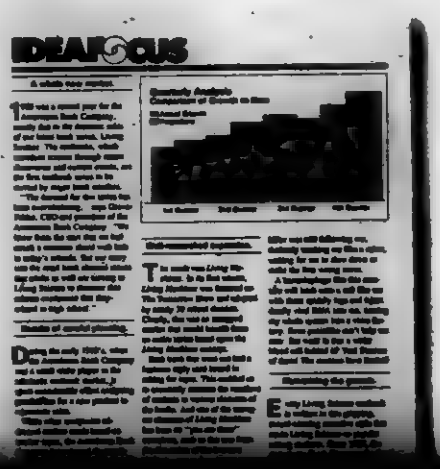
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HP broadens Unix net management product

Openview to allow integration of user-developed and third-party tools onto one console

BY J. A. SAVAGE
and JOANIE M. WEXLER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. is one of the few firms among the lean ranks of distributed network management vendors making some hay. The company is poised to ship the second version of its Unix-based Openview Network Node Manager software this month in a move to beef up Openview users' ability to manage multivendor TCP/IP networks.

Openview is HP's product for managing heterogeneous, companywide networks. Enhancements in the $15,000 Release 2.0, announced last week, include the ability to create Simple Network Management Protocol (SNMP) applications without writing code and to quickly integrate user-developed or third-party applications onto one console.

The consolidation move could save users upwards of $25,000 in hardware costs, said Duncan Campbell, marketing manager at HP's Colorado Network Division.

Openview 2.0 is aimed at managing the widespread base of networks running Transmission Control Protocol/Internet Protocol (TCP/IP) and managed by SNMP. TCP and IP are data-transfer and routing protocols typically used in Unix-based networks, and SNMP is a network management protocol commonly used with TCP/IP.

Automatic capability

Another boost with Release 2.0, one Openview user said, is the software's ability to automatically gather statistical data about network traffic loads, cabling problems and error levels and place it into a file for analysis and manipulation.

John Danos, a network engineer at Rohm & Haas Co. in Philadelphia, said that with the previous Openview version, "you have to write your own scripts," while Release 2.0 automates the process.

Another important aspect of Release 2.0 is that it "allows you to access the private [management information base] of vendors supporting SNMP through your HP interface," Danos said.

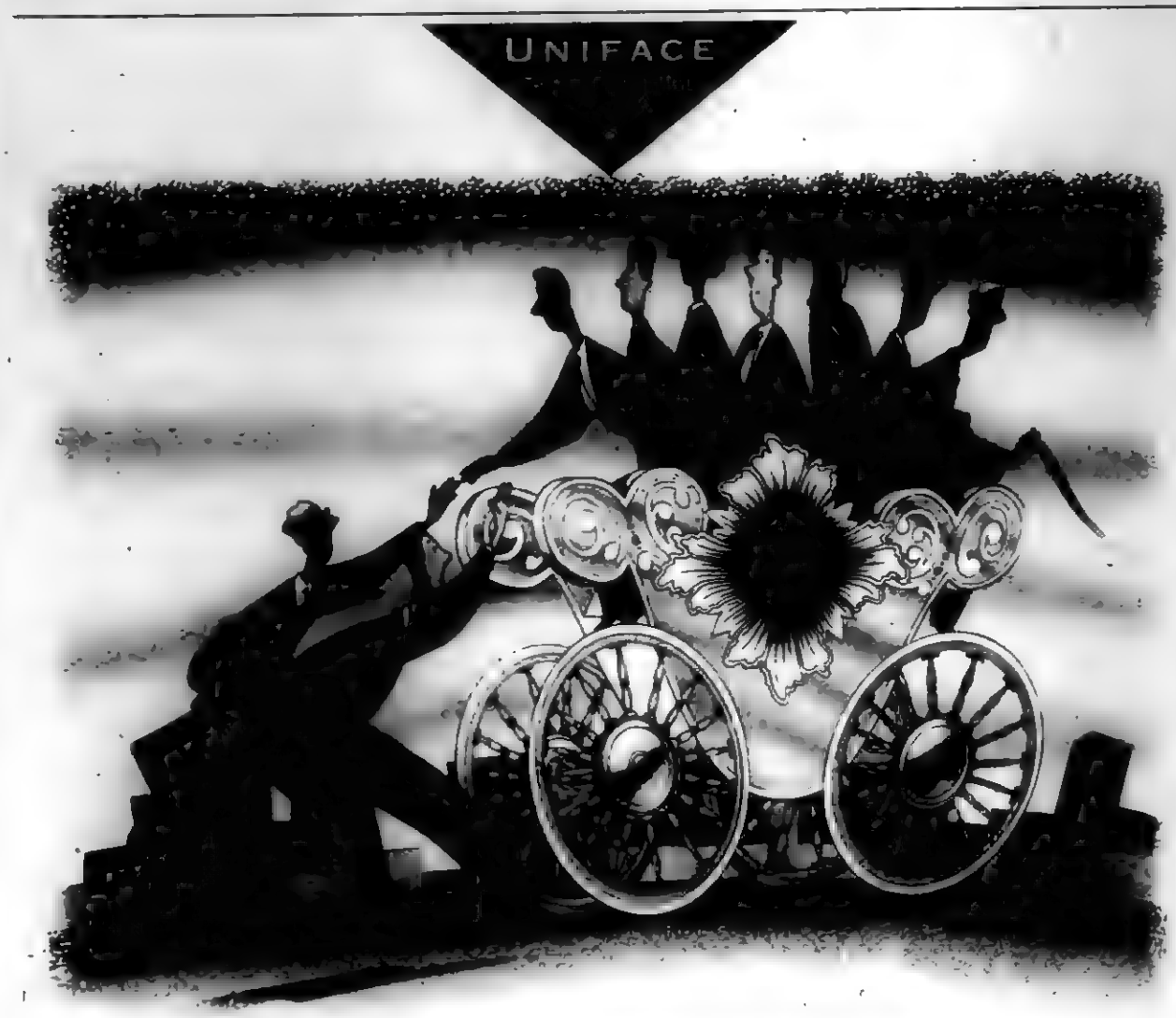
A management information base is a database of all available information about equipment on a network. With Release 2.0, for example, HP has written an interface between the Openview console and the management information base for Novell, Inc.'s Lantern network monitoring device.

Platform flexibility

In the past year, HP has endeavored to make its network management software available on other vendors' hardware, such as Sun Microsystems, Inc.'s Sparcstations. Openview 2.0 will initially run on Sun's IPC, Sparcstation 1+ and 2 workstations, and the next release should support IBM's RISC System/6000 workstations, Campbell said.

In addition, IBM recently said it will license Openview code to link Openview to its Netview network management system.

HP leads in the as-yet-sluggish efforts at enterprise network management, said George Colony, president of Forrester Research, Inc. in Cambridge, Mass. "Digital Equipment Corp.'s efforts are stalled, and AT&T has made little progress on the data side," he said. "Openview is the only product that has created any excitement over the last few months."



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Oracle to open CASE*Dictionary to other products

REDWOOD CITY, Calif. — Oracle Corp. said last week that it is building a new computer-aided software engineering (CASE) product, CASE*Exchange, that will allow users of IBM-compatible CASE packages, such as Texas Instruments, Inc.'s Information Engineering Facility (IEF), to transfer code into Oracle's data dictionary, the CASE*Dictionary.

The product will be built on top of an existing product made by British firm Software/1, said Richard Barker, a London-based Oracle senior vice president who directs Oracle's CASE product development. The terms of Oracle's agreement with Software/1, which funded the new development, were not disclosed.

Key to the CASE*Exchange product is Software/1's "bridge" import/export utility, which maps the contents of one data dictionary into another, Oracle said. Software/1's product already connects to TI's IEF, Knowledgeware, Inc.'s Information Engineering Workbench, Intersolv, Inc.'s Excelerator and Pansophic, Inc.'s Telon code generator, Barker said.

The product, which Oracle and Software/1 engineers have been developing for several months, is due within one year, Oracle sources said.

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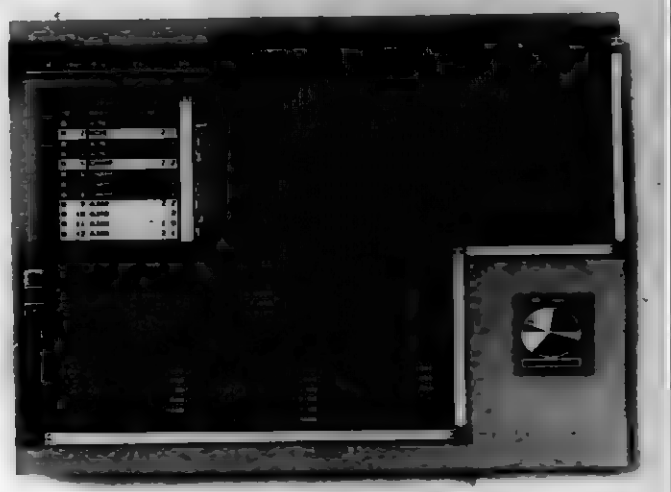
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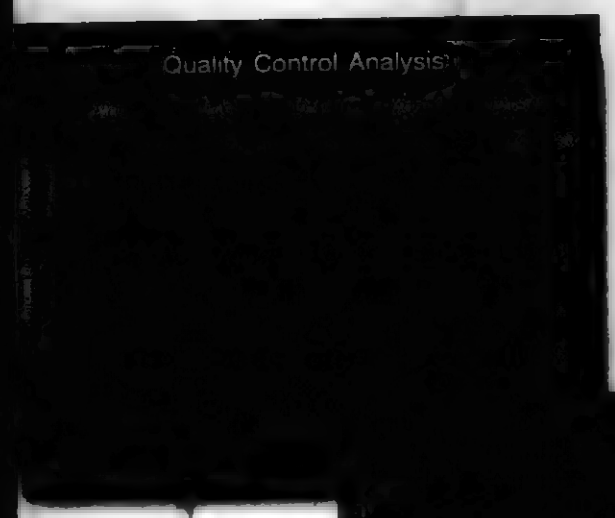
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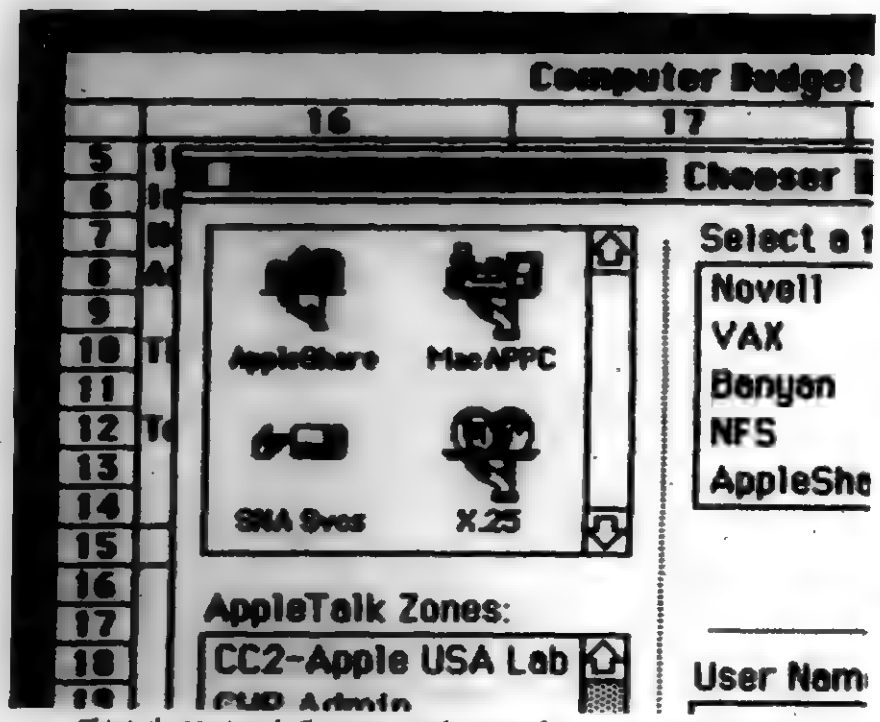
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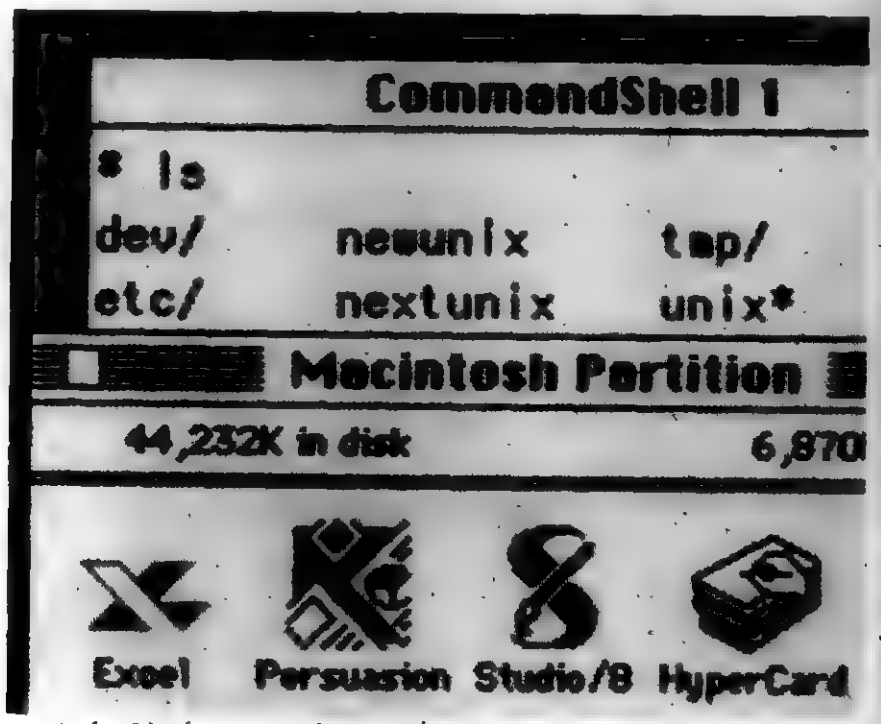
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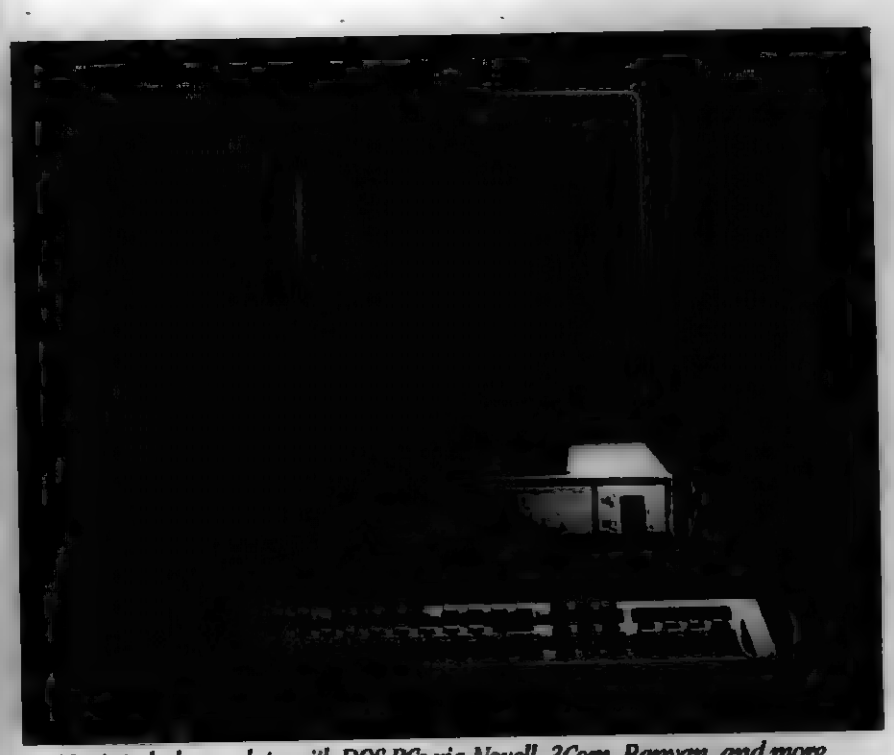
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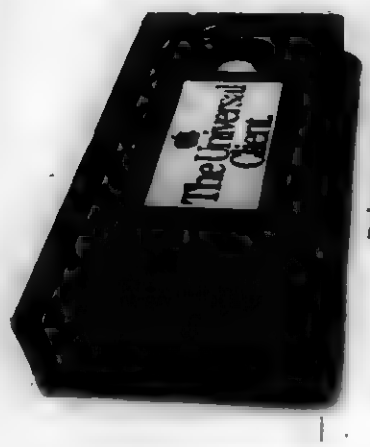
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ADVANCED TECHNOLOGY

Robots master complexity with machine vision

Technological advances provide robots with ability to measure tiny components, inspect checks for accuracy

BY SALLY CUSACK
CW STAFF

The robots that first set up shop on factory floors went blindly about their business. Today, firms are using robots that are capable of "seeing" what they are doing with machine vision.

Thanks to advances in parallel processing, supercomputing, lasers, sensors and digital video capabilities, machine vision will continue to improve dramatically in the next few decades — empowering robotics for even more delicate and complex tasks.

Machine vision systems vary according to application, but the basic setup consists of a video camera connected to a high-speed computer. Information gathered by the camera is analyzed and processed by the machine using sophisticated artificial intelligence technology.

Patrick N. Henry has been integrating visual capabilities into robotics inspection systems at Wagner Lighting in Sparta, Tenn., for the past two years. The company makes lighting component parts for use in automobile speedometers and other dashboard apparatuses.

Henry, an electrical systems engineer, purchased low-resolution vision systems from Allen-Bradley Co. four years ago to check component parts on the assembly line.

Wagner has since added two higher resolution detection systems for actual component measurement. The components are tiny — less than an inch in height and width.

"We used to have a person sitting at the end of the product line, glancing at every part to make sure everything looked normal," Henry said. Exact parts measurement data is recorded for each piece via a machine vision system from Adept Technology, Inc. in San Jose, Calif.

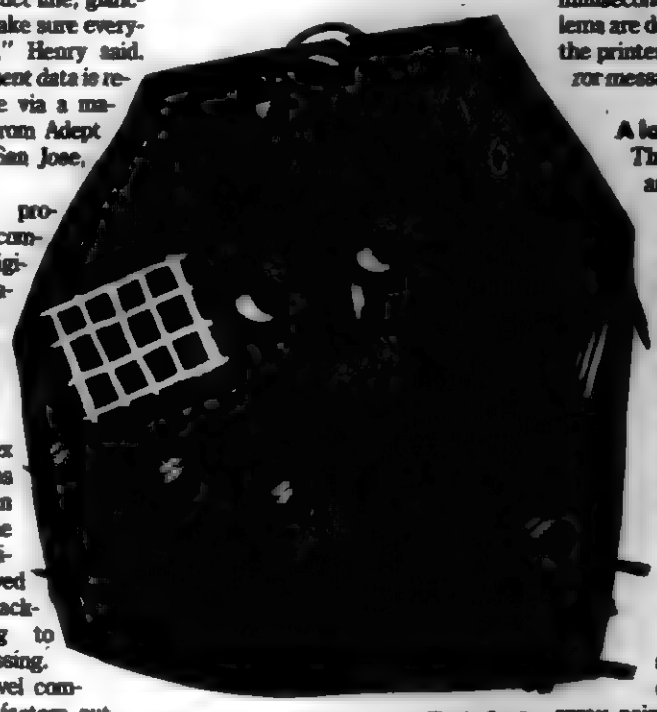
The machine is programmed to measure components against the original drawing specifications. It detects the slightest inaccuracies and guarantees that a faulty product does not leave the factory.

According to Cognex Corp., a vision systems company based in Needham, Mass., the accuracy of machine vision has been improved by advances from black-and-white processing to gray-level image processing.

Performing gray-level comparisons, the system factors out variations in contrast between actual image data and stored image data. This allows the system to tolerate lighting changes from aging light bulbs or time of day in factories.

While most Cognex customers integrate the company's vision systems for circuit board inspection and manufacturing, there are other, less obvious uses for the technology.

John Hancock Mutual Life Insurance Co. in Boston uses a Cognex machine vision system. The system is integrated with Hancock's printing equipment to inspect checks as they leave the printer.



Timothy Cassell

According to Cognex, Hancock prints between 15,000 and 20,000 checks each evening, and using the vision technology, the entire inspection process is completed in less than 1.5 milliseconds per check. If any problems are detected, the system signals the printer to stop and flashes an error message on the monitor.

A long wait

The technology is not perfect, and it will be 20 to 40 years before scientists will be able to replicate human vision on a robotic platform, said Robert Fisher, lecturer in the Department of Artificial Intelligence at the University of Edinburgh in Scotland. "The main problem is interpreting the quarter of a million to 1 million data values captured by a single camera," Fisher said. "That is hard to do in real time."

Machine vision technology has many potential applications, Fisher said. It could be used in nuclear reactor welding and spray painting, among other potentially hazardous work. Undersea vehicles could be equipped with machine vision to conduct explorations of ocean floors. The medical community is also looking at vision systems to improve body scanning procedures.

Multimedia's power, utility bear fruit in Virtual Notebook System

BY GARY H. ANTHES
CW STAFF

Jill Helms, a neuroscientist at Baylor College of Medicine in Houston, said she could never go back to using the traditional laboratory notebook with the stained pages, dog-eared corners and handwritten entries because she and six colleagues are using an experimental version of the Virtual Notebook System (VNS), a multiuser hypermedia system for networked, Unix-based, X Window System workstations.

VNS allows a user to navigate through pages of information, capturing new information from windows, files, electronic mail and programs, then organizing, annotating and sharing the information with others who may be thousands of miles away. The notebook's electronic pages can hold images, text, audio, video stills, navigation links to other pages and notebooks and action links that trigger external programs.

For example, a researcher at Baylor logs on in the morning and finds news stories that were added to his notebook overnight from wire services based on his predefined interest profile. Next, he sends a request for bibliographic information to a medical library thousands of miles away. Literature references come back, and he sends an electronic form holding the citations to his local campus library, where the articles are photocopied and sent by fax back to a message queue on his workstation.

Using a fax-previewing tool, the scientist copies and pastes sections of the fax from a window into a page of his electronic notebook. From a university library, he transfers a file of editable text to a window in his workstation, then sweeps relevant portions of it into his notebook.

To round out the research for the day, he locates a color photograph of the human brain on a laser-disc video system at another library on the network. He loads that into an image editor and annotates portions of it with text labels. He also attaches an audio icon to one region of the brain and records a voice message through an attached microphone. Then he pastes the annotated brain picture into his notebook, now stored in part on an attached video recorder.

Before closing the notebook, the researcher sets permission flags indicating which colleagues at his facility or elsewhere on the vast Internet have permission to use his electronic book.

Several companies, including BP Research, a unit of British Petroleum, and another oil company are evaluating VNS. BP is looking for a way to instantly exchange multimedia information among its sites around the globe.

"We are looking into collaborative technologies, ways to make information more manageable and accessible to a lot of people," said Douglas MacIntosh, a BP Research engineering specialist. "VNS is not just for research. We envision numerous groups in BP being able to take advantage of this technology."

According to Kevin Long, co-developer of VNS and a member of the Information Technology Program at Baylor, VNS may find use in litigation support, insurance appraisal and claim management, real-time conferencing and other situations in which processing and information resources and personnel are geographically dispersed.

VNS will be offered commercially this fall through Groupwork Systems, Inc., a Baylor subsidiary.

Tracking users
The Virtual Notebook Environment ... includes the following:

The Virtual Notebook Environment

Virtual Network System (VNS) is written in C for Unix-based workstations running X-Window System attached to TCP/IP networks such as Internet.

Information in VNS is managed by a relational database back end, either Sybase, Inc. SQL Server or NDBM, a set of Unix database library routines. It includes an Application Developer's Interface to allow user-supplied programs to access and manipulate information in the VNS.

VNS will run on workstations from Sun Microsystems, Inc., Digital Equipment Corp. and IBM.

CW Chart: Janell Genovese



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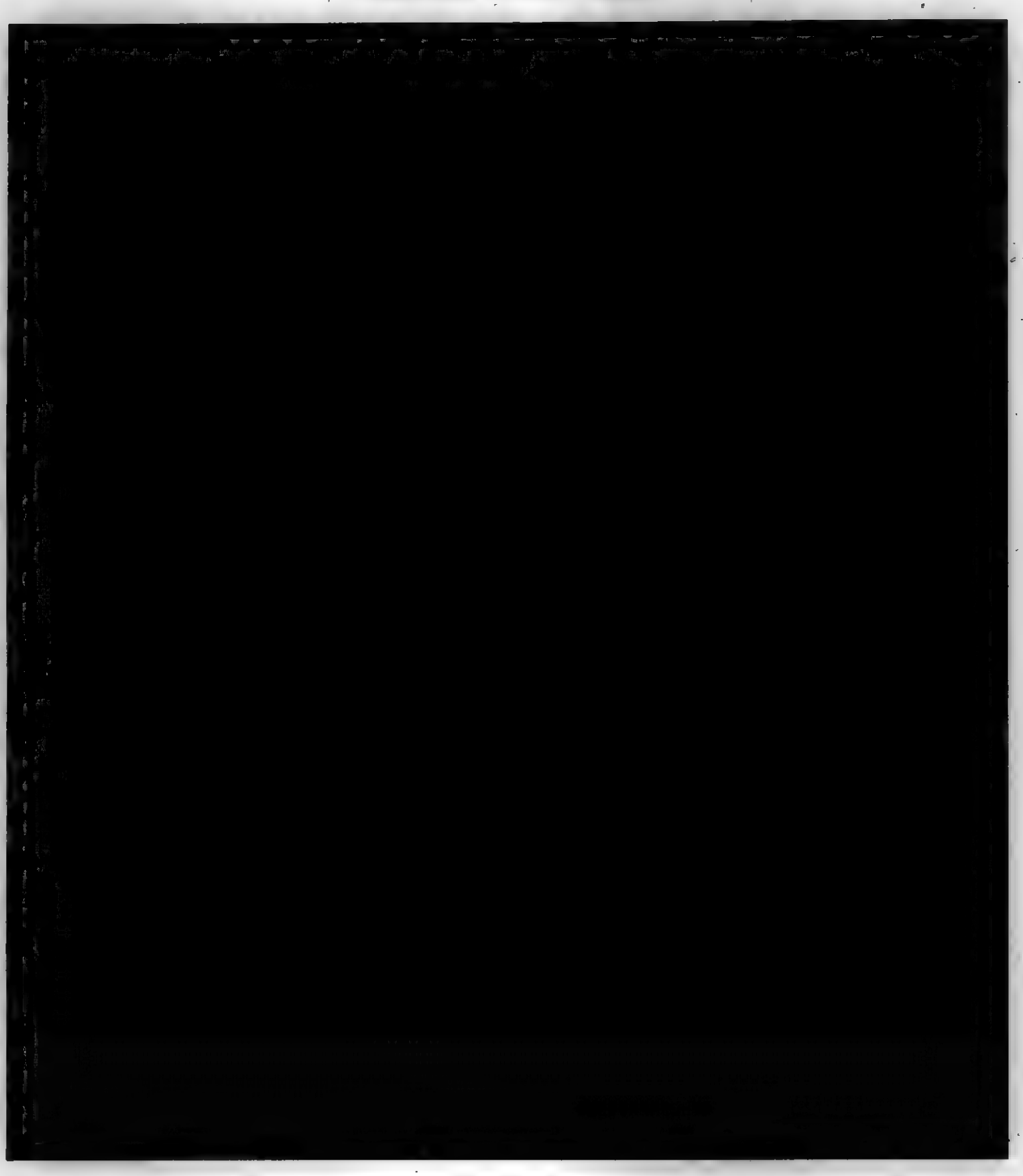
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EDITORIAL

Rights to privacy?

It all seems so innocent.

In order to qualify for the one-year guarantee on that new stereo, you have to fill out a card and send it to the manufacturer. The card has lots of questions, relating not only to your music listening habits but also to your spending habits, your income, your family and other personal things. But what the heck, it's just a guarantee.

If only that were true. The information you've provided is fodder for an endlessly expanding group of list-purchasing direct marketers who fill mailboxes with postal pollution. Or call you on the phone at home or at the office with those computerized pitches we all love. Or send mailings to the children, ages eight and ten, who you listed on that innocuous guarantee.

Clearly the worst is yet to come. A rapid decline in storage costs and great leaps in relational database management system technology will enable anyone with the system and the desire to compile, configure and decipher enormous quantities of information on individuals. And the rules on what can be done with such information are not clear.

The potential for privacy invasion in the 1990s is simply enormous. Already the courts are struggling to deal with privacy issues being raised by technologies such as automatic telephone number identification. The business value of this technology is significant — but so is the potential for abuse.

The dangers of information gone awry have been well-documented. Business press reporters have been shocked at the quantity of information they can purchase from credit-checking vendors. Far too often, this information is incomplete or just plain incorrect, yet it is taken at face value by mortgage companies and other businesses.

There are some privacy advocates who have at least slowed the implementation of technologies such as automatic number identification. But for the most part, the proper checks and balances are not in place. Instead, the courts and federal government are relying on the KISS (keep it simple, stupid) factor, allowing business essentially to self-regulate its use of the technology.

But if anyone doubts the ability of the unscrupulous to trample individual rights in the face of loose or no regulation, you have simply to recall the countless scams that have cropped up around 900 phone numbers. That business concept was considered harmless when it first came on the scene.

However, it is not necessarily government that should state the terms of regulation and control. Companies with legitimate business needs should step to the forefront and help legislators understand the great potential for the computerized abuse of what is arguably our most important right in a free society. In that way, any controls and restrictions on the use of data will take into account both the rights of individuals to privacy and the rights of corporations to conduct fair business.



LETTERS TO THE EDITOR

Leaders needed

While Microsoft needs no support from me, the attitude expressed in your April 22 editorial is yet another example of how American business and media promotes mediocrity.

The OS/2 Windows situation is more an expression of the effectiveness of the Windows approach and the ineffectiveness of OS/2 than of anything Microsoft has done.

Would everyone love Microsoft if it had focused only on OS/2 and let some other vendor develop Windows? Not likely — particularly Microsoft's stockholders. At your suggestion of putting the MS-DOS standard in the public domain — would you, if it was yours?

My congratulations and respect to the Microsoft team and its leadership. May more companies emulate its style and its success.

George Pitagorsky
Pitagorsky Consulting, Inc.
New York, N.Y.

Down on Microsoft

Regarding your editorial "Blind ambition" [CW, April 22], I frequently run into the brick wall of Microsoft's monopolistic policies. For example, I recently attempted to resolve a problem with Windows HIMEM.SYS on a Compaq 386. Microsoft technical support's only suggestion was that the client dump the software that didn't work with Windows (translation: every productivity tool not purchased from Microsoft).

The client decided instead to dump Windows. Please log my vote in favor of a federal ruling that forces Microsoft to cease all activities in the field of hardware and application software.

It is time to send a clear warning that growth is OK. Corporate arrogance is not.

Daniel A. Morgan
Morgan Information Systems
Bellevue, Wash.

Bad restrictions

Having watched federal information policy become increasingly restrictive during the past decade, I read "A $46 tape becomes a $10K print job" [CW, April 29] with great interest. The manner which government agencies use (or abuse) computer technology is an important policy issue that needs to be addressed.

While it is true that the Freedom of Information Act (FOIA) came into being at a time when virtually all federal records were maintained on paper, the underlying principle of the legislation — that the people have a right to know what their government is doing — should apply regardless of the medium in which information is stored. Several agencies have applied that spirit of openness to new information technologies and improved the public's ability to access records.

The Department of Justice, which sets FOIA policy governmentwide, must accept responsibility for these inconsistent federal information practices. It is time for the Justice Department to provide leadership and ensure that emerging technologies will be used to enhance, rather than frustrate, the public's right to know.

David L. Sobel
Computer Professionals for Social Responsibility
Washington, D.C.

Work together

In regard to "A $46 tape becomes a $10K print job," [CW, April 29], I don't know whether to laugh or cry. In some ways, I hope the New York City Buildings Department wins its case. Can you imagine the donnybrook at the IRS if all businesses could use the court case to send "printed submissions."

If I was employed by the IRS, I would be an amicus curiae for Brownstone Publishers. Isn't it wonderful and delightful how some government agencies can shoot fellow agencies in the foot. I love it. Come on — can't we work together to have reasonable responses for requests for information?

John W. Eoff
New Mexico State University
Las Cruces, N.M.

Intel opposition

Just a short note to voice my displeasure with Intel over its plan to sell a 486SX chip. Either let it be the true 486 with cache, floating decimal and math coprocessor or let it be nothing. I wish that we as a people would stand up and say no to Intel about what it is doing.

Joe Sprinkle
Detroit, Mich.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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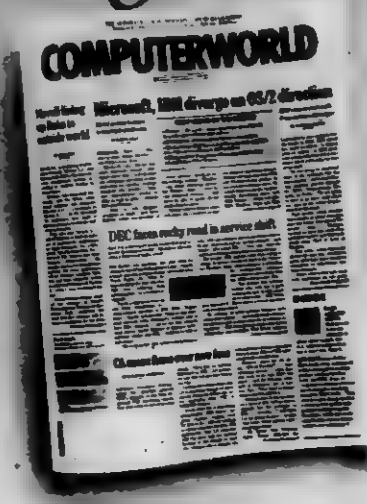
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OS/2 and Windows: The war that isn't

CHARLES P. LECHT



OS/2 isn't dead, or even seriously ailing, despite the many public proclamations of its imminent demise.

Just a few short months ago, enthusiastic and jeering Unix supporters were celebrating the end of OS/2. It didn't matter to those folks that they weren't *quite* sure what they were supporting as its successor. They were quite sure that, whatever it was, it was better. Now, Unix has faded into the background and we hear that the "resurrected" Windows alternative will seal OS/2's fate.

Most people have forgotten that Windows is about as old as DOS and that, like Unix, incompatible versions abound. What's important is the momentum. Everybody is claiming to offer Windows, so you'd think it was about to engulf us.

One thing I've noticed, though, is that big waves often break fast. A hard sell often means that the product isn't going to last very long, and personally, I don't think the current Windows product (or should I say products?) will be around long.

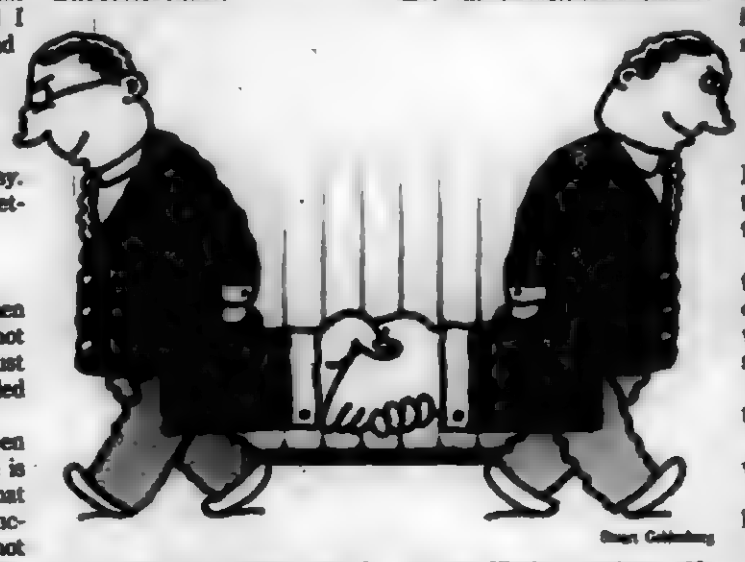
As I see it, IBM and Microsoft have to be laughing all the way to the bank over the OS/2 vs. Windows controversy. Talk about carving up a marketplace!

What a coincidence

You may think I'm kidding when I say this, but I'm not. I'm not suggesting collusion, either; just a coincidence of interests aided by a lot of misinterpretation.

That the two firms have been working together a long time is an unquestionable fact. That IBM and Microsoft were financing OS/2 is no secret. We cannot know the terms of this working arrangement; it shouldn't be surprising if we were to learn that the majority of the financing came from the bigger of the two.

That OS/2 offers a quantum leap in the effective use of today's high-powered small computer over that possible through DOS is no secret either.



Stuart Goldenberg

So where does Windows fit in? Well, some people aren't ready to take a quantum leap, so they'll use the Windows stepping stone.

Some people may have noticed that Microsoft's current version of Windows and IBM's OS/2 Presentation Manager are converging. In this I think we have the unmistakable clue of what the Windows product is. No one has argued that using OS/2 is as easy as using DOS; compare driving a Volkswagen Beetle with a 959 Porsche to appreciate this. But, which would you rather have on an open road? All right, if you can't drive a Porsche, try driving something like a Honda.

Windows, like the continuing versions of DOS, are bridges to OS/2 for those of us who don't like to get our feet wet too quickly. Managing to bring a monumental work like OS/2 to the marketplace can't be easy if the work is being done in two companies, although for all the claptrap regarding the IBM-Microsoft rifts, it's my view the two have done remarkably well thus far.

While I am certainly not privy to IBM/Microsoft meetings, I can imagine the possibility of one where the conversation went something like this:

"You take the bridges, we'll take the rest."

"No problem, but, how will we explain our new direction?"

"It's easy. Sell them on bridges for the moment!"

"How about Windows?"

"Fine. Call them whatever you want."

Lecht is an IDG News Service foreign correspondent based in Tokyo.

IBM should remember that shots can ricochet

KENNETH A. BOULDIN



If IBM wins the lawsuits it has filed against some independent computer lessors, the defendants and their customers will not be the only losers. It is IBM that stands to suffer the greatest injury — and from self-inflicted wounds.

Earlier this year, IBM and its financial subsidiary, IBM Credit Corp. (ICC) filed suit against Comdisco, Inc., Cambex Corp. and EMC Corp. Although Cambex settled out of court, the remaining suits charge that the other two defendants removed memory and other parts which were subsequently subleased or placed for sale.

As a result, according to the lawsuits, many machines returned to ICC at lease end are not the same as those at lease inception because some components would not be the original ones. In other words, lessors and lessees who remove any parts from ICC-owned equipment during the term of the lease must put those very same parts back in the equipment when the lease is up — or risk being sued by IBM.

IBM is taking a position that directly contradicts accepted industry practice. Lessees have long taken for granted the idea that equivalent replacement and reconfiguration parts — so-called "plug-compatibles" — are equal in value to the original components and therefore do not alter the original asset. In fact, the free movement of equipment parts and subleasing go to the very heart of the computer leasing and remarketing business. Few companies looking to expand can afford to strand their investments in their original computer equipment or to make huge outlays for new equipment.

IBM's hidden agenda

One doesn't have to be a lawyer to discover the hidden agenda in the IBM lawsuits. In 1989, the computer leasing and remarketing industry had a dollar volume of $21.5 billion, and the figure for 1990 is expected to be $25 billion. IBM apparently wants more than its fair share of the pie and hopes to get it by warning customers away from doing business with other firms.

IBM's current actions are reminiscent of previous tactics against the independents.

In 1967, IBM tried to impose a transfer fee for the maintenance of its equipment. At the same time, the company closed some of its distribution centers, an obvious attempt to restrict the sale of parts. The Computer Dealers and Lessors Association, with help from the U.S. Department of Justice, persuaded IBM to rescind the transfer fee and reopen its parts centers.

Shortly thereafter, IBM added a licensed internal code provision to its purchase contracts, asserting that microcode constituted intellectual property and therefore was subject to copyright laws. However, last year, a district judge found that IBM's actions with respect to "splits" of IBM 3090s violated the 1956 Consent Decree.

One of the most important provisions of that same decree is the stipulation that IBM cannot prohibit, or in any way subject to its control or approval, alterations in or attachments to an IBM machine.

The independents are turning IBM's efforts to spook customers away from doing business with other companies into terrific marketing tools. They are warning customers that if they do business with IBM, they may very well be locking themselves out of the ability to upgrade at fair prices. As a result, many customers are beginning to avoid IBM equipment in the first place.

Customers know that an IBM victory will inevitably erode competition in the computer leasing market. A recent Gartner Group, Inc. survey of 250 users in 10 cities found that 30% are less inclined to do business with ICC as a result of the lawsuits. As one Gartner Group executive put it, "IBM may have shot itself in the proverbial foot."

Bouldin is president of the Computer Dealers and Lessors Association in Washington, D.C.

Ever heard of prevention?

You don't need a problem to justify research

READER'S PLATFORM

ROBERT GORDON

I am amused by the recent rash of articles giving advice on how to run a corporate emerging technology group. All of them seem to have been written by the same person, and the messages are as myopic as they are redundant.

The theme is usually that most such groups are staffed by "oversealous technologists [as if technologist was a dirty word] unschooled in the ways of business" and engaged in looking for "problems to fit solutions."

The "solutions in search of problems" admonition implies that every potential application of new technology should be clearly related to a known business problem at the outset. In fact, successful applied research is most often preceded by basic research. Many significant implementations of emerging technology started off with people "noodling around" in their "ivory tower environments."

Valuable new applications do not always originate with someone exclaiming, "We've got a problem." Often, those who stand to benefit the most from an application of advanced technology may not even realize that there is a problem waiting for a solution.

A busy executive, for example, may not consciously recognize using a keyboard to access a decision support system as a problem. Only when shown a prototype executive workstation with fast, powerful graphics, voice and handwriting recognition and neural network technology to customize the system to his needs will the executive realize how much of his valuable time has been wasted each day tediously navigating complex keyboard commands and menu structures.

Granted, some emerging technology groups have not focused on organizational goals. The solution, however, is not to demean the activities of this important strategic function in general, but to encourage emerging technology management to develop a charter that aligns group goals with those of the organization.

Efforts should be balanced between examining significant new technological developments in order to determine how they might fit with organizational goals (solutions looking for problems) and mapping out specific strategies to meet recognized needs within the organization (problems looking for solutions).

Both approaches are valid and important. An organization that religiously restricts either (or worse, both) and elects to watch from the sidelines while the competition moves first, is going to be watching from behind.

Gordon is an information technology consultant in Parsippany, N.J.

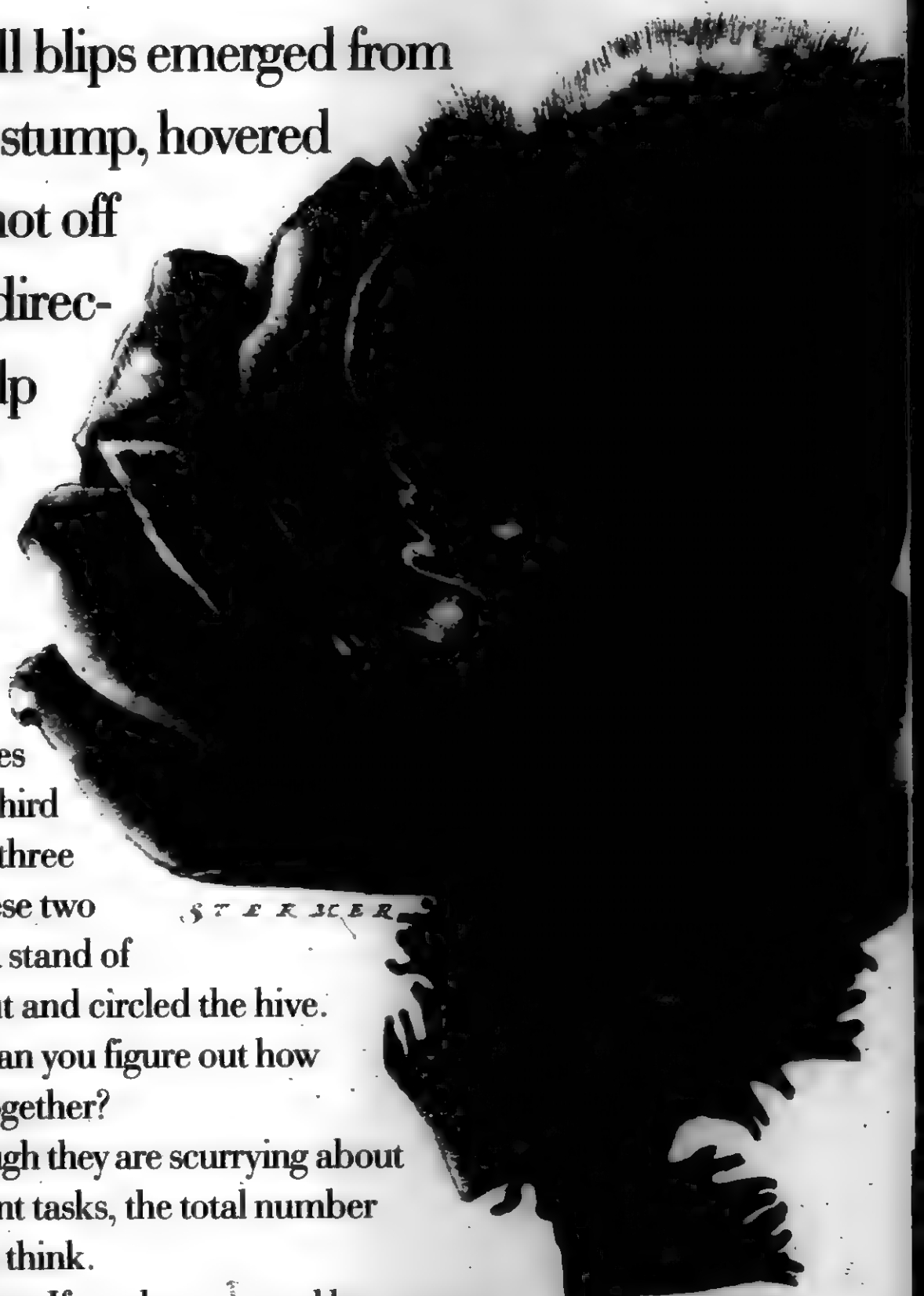
Several small blips emerged from the hollow stump, hovered briefly, then shot off in different directions to help sustain life on earth.

One-fifth of these worker bees flew to a cherry tree, one-third flew to a clover field, and three times the difference of these two numbers buzzed over to a stand of heather. One just hung out and circled the hive.

The question is, can you figure out how many bees there were altogether?

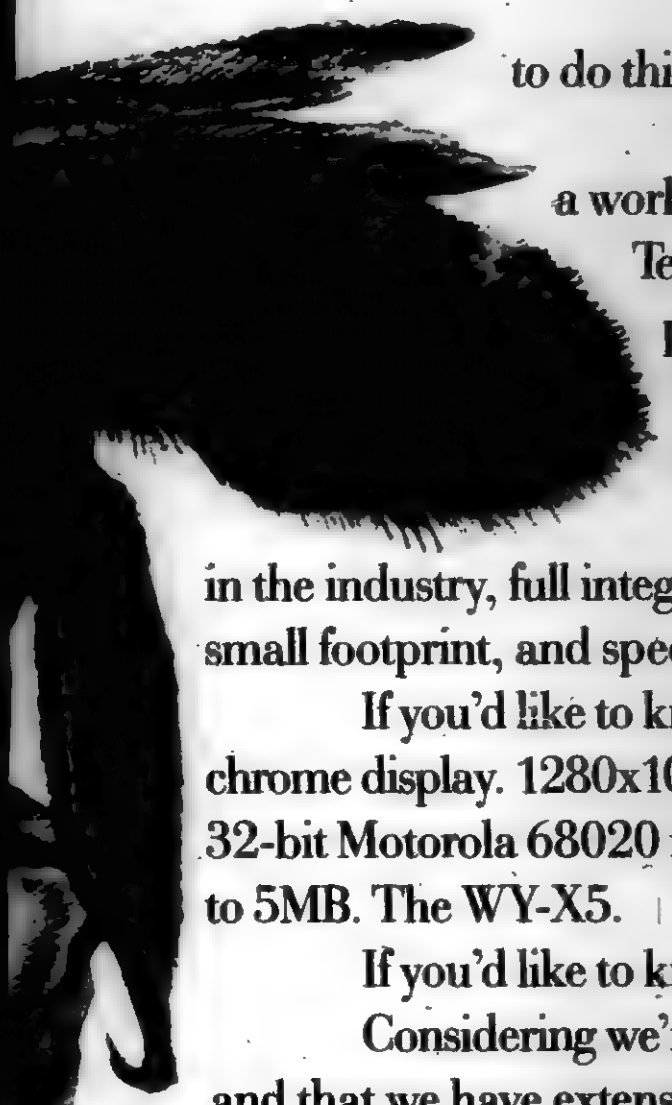
Here's a hint, though they are scurrying about working on several different tasks, the total number could be smaller than you think.

Here's another hint. If you have several host computers working on different tasks, and you'd like to access and display their information at the same time, the dollar number



In foraging, bees deliver pollen from plant to plant causing fertilization. Results: fruit, seeds, continuation of those species.

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to do this could be smaller than you think. A lot smaller.

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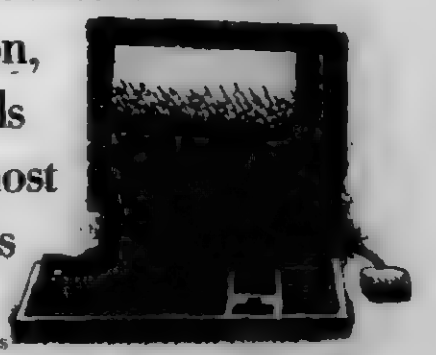
If you'd like to know some additional numbers, try these: 17″ monochrome display. 1280x1024 resolution. 70Hz flicker-free refresh rate. 16MHz, 32-bit Motorola 68020 microprocessor. 1MB display memory expandable to 5MB. The WY-X5.

If you'd like to know the number of bees, try the footnote.

Considering we're the largest independent manufacturer of terminals, and that we have extensive expertise in UNIX multiprocessor systems, this announcement probably won't come as a surprise to anyone. But, to all those who have priced quality X Terminals, it should come as a welcome relief.

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James C. Smallman, Burlington's Senior VP of Information Services, says that one of the company's major needs is to act as an extension of its customers' systems. Because those clients use a variety of computing environments, "the ability of SOFTWARE AG products to communicate with different operating systems and hardware is a real plus."

Smallman also extols the speed with which applications are developed using SOFTWARE AG technology. He reports that, thanks to NATURAL and ADABAS, an important project was completed in just 500 hours instead of the projected 1,100. "SOFTWARE AG really offers a better way to manage our business," concludes Smallman.

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COMMENTARY

Rosemary Hamilton

DB2 rising to the top?



If you need some proof that IBM's DB2 is the established standard in the mainframe relational database world, a stop at the International DB2 User Group (IDUG) Conference, held in San Francisco last month, might have done the trick. The conference was IDUG's third meeting, and it attracted almost 1,600 attendees, up from approximately 1,000 one year ago. Conference directors are planning an international meeting for next year and are predicting that about 2,000 attendees will show up at next year's U.S. meeting.

This year's meeting bears witness to the increasing number of IBM customers committing to DB2 as their strategic database of the future. Current IDUG President William Backs said IBM is shipping about 1,000 copies of DB2 per year.

However, it is not so much the numbers as what users are talking about that shows how DB2 has matured as a mainstream DBMS. It has moved beyond the phase of being a new and untrusted product. Instead of discussions on the pros and cons of relational technology, users seem more interested in discussing overall IS issues as they apply to DB2. Concerns such as continuous availability, or "24 by 7," as some users like to say, are common among large shops now. This may sound boring, but DB2 is becoming just a DBMS with which

Continued on page 34

IBM redefines its Unix CASE strategy

ANALYSIS

BY JOHANNA AMBROSIO
CW STAFF

IBM's strategy for providing software development tools on its RISC System/6000 platform recently took another twist. But although the company's plans for the technical market are now better defined, things are not quite as firmed up on the commercial side of the RS/6000 house.

IBM RS/6000 users seeking to develop engineering, embedded systems and other technical applications will soon have another suite of tools to choose from. In April, IBM announced it had licensed Hewlett-Packard Co.'s Softbench integration framework, which provides a common interface and communication among software development tools. IBM and HP will port Softbench to the RS/6000.

"This is a short- to medium-term fix on the technical side of things," said Frank Gens, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. Also, he said, IBM's restricting Softbench to just the technical side "is disappointing. It could cause concern and confusion."



Technical development (engineering, embedded systems)

- **Low end:** Hewlett-Packard Co.'s Softbench integrating technology and associated third-party software. Deal to port this over to the RS/6000 recently announced; not yet delivered.
- **High end:** Atherton Technology's Integrated Project Support Environment and associated third-party tools. Currently available, but requires a higher level of investment than does Softbench.

Commercial development (business applications)

- **Nothing in stone just yet:** At this point, IBM seems to be leaning toward providing the integration between the RS/6000 and its other systems and looking for third-party vendors to provide the specific tools, as with AD/Cycle.
- **Long term:** IBM executives have promised a suite of tools for the RS/6000 that are very similar to those available for AD/Cycle.
- **In the meantime:** Third-party software runs on the RS/6000 but lacks any formal direction or integration from IBM.

CW Chart: Doreen St. John

John Kneemeyer, IBM's technical computer-aided software engineering (CASE) marketing manager in White Plains, N.Y., said IBM has "just completed a market research study of the demand by commercial customers, and now we're determining what to do." Although there is a need here, the demand appears to be less acute than on the more established technical side, which IBM said has two-thirds of the RS/6000 user base.

Ralph Hirtler, a systems programmer at Republic National Bank in New York, said his company is beta-testing some RS/6000s as branch systems. "We're not developing the software in-house, so we don't really need CASE tools," he said.

Not large demand

Joseph Bastable, director of sales and marketing information systems at Liz Claiborne, Inc. in New York, said there is not yet a pressing need for development tools.

It is possible, observers said, that IBM will use the Softbench technology for both worlds. In the future, the RS/6000 software development environment — whatever it turns out to be — will be linked with the Repository Manager on the mainframe.

Mike Saranga, assistant general manager of IBM's Systems Structure and Management Group in Somers, N.Y., said in a March interview that the goal is to allow RS/6000 and mainframe developers to use the same

Continued on page 39

Changes coming for graduated pricing

BY ROSEMARY HAMILTON
CW STAFF

IBM plans to adjust its software pricing structure, a company executive said recently.

Several high-end users should welcome the move. They claim IBM's graduated pricing structure has long been unfair to users of larger processors.

Graduated pricing, which IBM began in the late 1980s, charges higher license fees for larger systems.

In a recent interview, Robert Goldberg, IBM's assistant general manager for software marketing, said the company intends to change pricing structures that would create fees based on the program's value.

"I guarantee we will be putting out some structural changes," he said.

Some customers have long argued that while this is a fair policy for operating systems, it should not be applied to applications and other software.

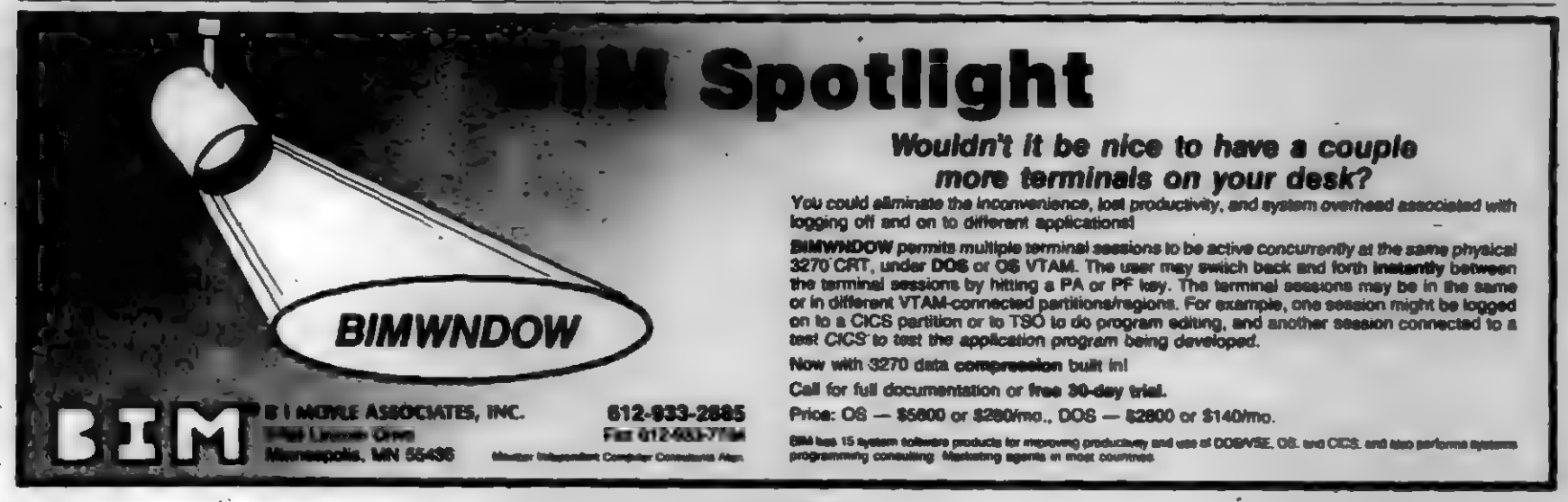
"I hate the tiered pricing approach," said David Moore, a senior vice president of information systems at Mellon Bank Corp.

Reassessing options

James Matsey, corporate director of MIS at Reynolds Metals Co., said the graduated pricing has caused him to think hard about where to put his software. As an example, Matsey said he wanted to install an imaging program from IBM on a larger Application System/400 model. But only a handful of users would actually be using the software. Matsey said he thought it was unfair to charge a price that corresponded to hardware rather than its actual use.

"I have all big AS/400s," Matsey said. "So to buy this [imaging package], I would have to pay for the large machine. We made a decision that we won't pay that kind of money, and we will just put it on a microprocessor."

According to Goldberg, software pricing is a complex issue, and in order to arrive at value-based fees, IBM must take into account the number of users as well as the amount of time a company actually runs a program.




it seem

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Frank Fitzsimmons
Director, Judicial Information Systems
17th Judicial Circuit Court of Florida

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Says Frank Fitzsimmons, Director of Judicial IS, "It takes a lot of information to move a case through the courthouse, and we're the ones who funnel it. The trouble was, the big end of our funnel was too big and too complicated. We had office software on one platform, and data on another. And the files—the clerk's, the probation division's, the jury room's and others—were set up differently."

The plan.

So they mapped out a strategy for improving data access, communications and service for their 65 judges and staffs.

"We needed some standards, and since our data was mostly in an IBM MVS host, we installed IBM electronic mail and were making good progress at integrating applications.

"Then in '89 my IBM rep said, 'Let's go to a seminar.' . . . The subject was OfficeVision, and I sat there amazed. It matched us so well it was like looking in a mirror. Yet it was going to be much easier, more flexible, and SAA™. We installed OfficeVision/MVS in 1990."

The entire judicial system is now using OfficeVision, mostly on IBM PS/2®s, connected by Token-Ring LANs. Along with E-mail, calendaring and other office functions, it works with both DOS and OS/2® software, plus CICS applications in three regions on the host.

The present.

According to Mr. Fitzsimmons, users and the IS people have both come out ahead.

"It's made life easier for all of us. OfficeVision lets us integrate PC and host applications—across all regions of the mainframe—without making users log on and off all the time. Also, we can customize menus almost instantly. Users see only what they need, and training is easier. We have a help desk, but it almost never gets calls about OfficeVision.

"This place was a paper mill, but no more. And our ability to communicate with each other—remember, we manage the case flow of 65 judges—is vastly improved. Since OfficeVision arrived, we've continually increased our application portfolio and usage goes up 20% every year. That's because people are getting information faster and more easily."

The future.

Frank also has some thoughts on investment protection.

"In government, you buy things a little at a time. You can't upset the applecart too much. That's what's great about OfficeVision—it wasn't a shock to our system, it fit right in. We're running it with brand-new OS/2 machines and 10-year-old DOS PCs. And we're integrating applications that were written by independent groups around the county.

"And as an SAA application, OfficeVision gives me comfort for the future. There have been skeptics, I know, but SAA is real. It lets me look down the road and see around the corners, to know what'll be there.

"As I said, this is government. If you make mistakes, you live with them. For us, OfficeVision was no mistake."

To learn more about the 17th Circuit Court's OfficeVision installation, call IBM at 1 800 IBM-6676, extension 857.

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IRS tries expert system for fewer errors

Agency now boasts a 3% to 9% error rate in answering taxpayers' inquiry letters

ON SITE

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The Internal Revenue Service generates 15 million letters annually in response to taxpayers' inquiries and claims. Not a bad feat except for one thing: According to the U.S. General Accounting Office (GAO), 30% of the letters — or 4.5 million — contain errors.

The IRS disputed the estimate but agreed the error rate is too high. However, it recently installed an expert system it said is reducing the rate to between 3% and 9%.

The Correspondex Expert System (CES) is one of 16 systems developed by or now under development in the IRS' Artificial Intelligence Laboratory. The systems use a variety of artificial intelligence tools and techniques and span all major IRS functions, including returns processing, collections, taxpayer assistance and auditing. The 5-year-old lab has fully implemented only a few applications so far, but its $5 million annual budget and the increasing pipeline of projects reflect the agency's growing confidence in AI.

AI at the IRS

Examples of artificial intelligence used by the Internal Revenue Service



- **Classification (7 systems)**
  Reasonable Cause Determination System will help examiners apply vague provisions of tax law that allow the IRS to forgive late filing and late payment penalties. A prototype is being field tested.
- **Assistance (3 systems)**
  One system will allow replacement of estate tax attorneys with paraprofessionals for examining and classifying estate tax returns.
- **Intelligence gathering**
  Link Analysis finds relationships among records, such as currency transactions, that may suggest criminal activity. It has been operational since 1988.
- **Planning (2 systems)**
  Automated Workload Management is being tested to offer on-line production control for mainframe computer and print jobs at IRS centers.
- **Text generation**
  Correspondex Expert System helps construct letters to taxpayers. It now has 3,000 users at 71 IRS centers.
- **Software engineering**
  A system uses an expert knowledge base to generate Cobol code that in turn generates test data. The knowledge base can be updated by tax experts with no computer training.
- **Learning**
  The IRS is experimenting with decision trees, neural networks, Bayesian classification and other techniques. Learning algorithms could help them identify criteria for auditing international taxpayers and criteria for prosecuting criminal investigation cases.

CW Chart: Dorsey St. John

"In most instances, AI has worked out better than we expected," said Ted Rogers, founding chief of the Artificial Intelligence Laboratory. That is because hardware and software for AI have evolved more quickly than expected, he added.

Until recently, tax technicians prepared letters by selecting paragraphs from a file of 300 form letters, adding custom paragraphs as appropriate. CES employs the same base of letters, but it applies expert rules that warn of nonstandard word use, block the use of contradictory or redundant paragraphs, flag missing enclosures and check spelling. CES also insists on beginning each letter with a polite opening paragraph.

CES is written in C language and runs on IBM's family of Personal Computers. Other IRS AI systems are built around expert system shells or are coded from scratch in C++ or LISP. Earlier systems were developed for Symbolics, Inc. processors, but now most are built for IBM PCs, Apple Computer, Inc. Macintoshes or Sun Microsystems, Inc. workstations.

Finding faulty returns

The Automated Issue Identification System (AIIS) helps examiners determine what issues are to be investigated on returns marked for audit by a computer. Returns are flagged based on secret mathematical formulas; tax auditors then decide which returns really need to be audited and why. That manual review, based on auditors' experience and knowledge of local taxpayer characteristics, required the equivalent of 183 full-time people last year.

In a recent test, AIIS was able to identify 90% of the audit issues found by IRS experts, according to Rogers. He said AIIS could reduce preaudit labor by 80% or could add $60 million annually in tax collections. The system, written in LISP for Symbolics processors at a cost of $5 million, is now being tested at an IRS center, Rogers said.

The AI system most visible to the public so far has been the Taxpayer Service Assistant, which helped IRS personnel answer questions this tax season at two IRS call sites. The IRS was criticized by the GAO for giving incorrect answers to telephone inquiries more than one-third of the time, although the error rate improved considerably this tax season [CW, Sept. 11, 1989]. The system will ultimately contain detailed knowledge of 150 tax topics.

> THE SYSTEMS use a variety of artificial intelligence tools and techniques and span all major IRS functions.

Although the IRS said it has high hopes for the Taxpayer Service Assistant, others were not so sure. "The expert system itself didn't significantly increase the accuracy of responses," said Howard Rhile, director of general government information systems at the GAO. Rhile said the improvements seen this year may have been more the result of management improvements made by the IRS.

Rhile said the system needs more testing but acknowledged that AI techniques at the IRS are "absolutely worth pursuing."

In 1984, most AI applications required very expensive Symbolics hardware. Now, expert systems shells and other specialized tools have decreased hardware dependency while speeding the development of application software, he said. AI will find a growing number of applications at the IRS as the agency looks for ways to analyze torrents of data that cannot be handled by more conventional data processing techniques, Rhile added.

Decline seen for half-inch tape drives

BY CHRISTOPHER LINDQUIST
CW STAFF

Overall demand for half-inch tape drives is on the decline. Certain market sectors, however, will see growth well into the 1990s, despite increased competition from other storage formats.

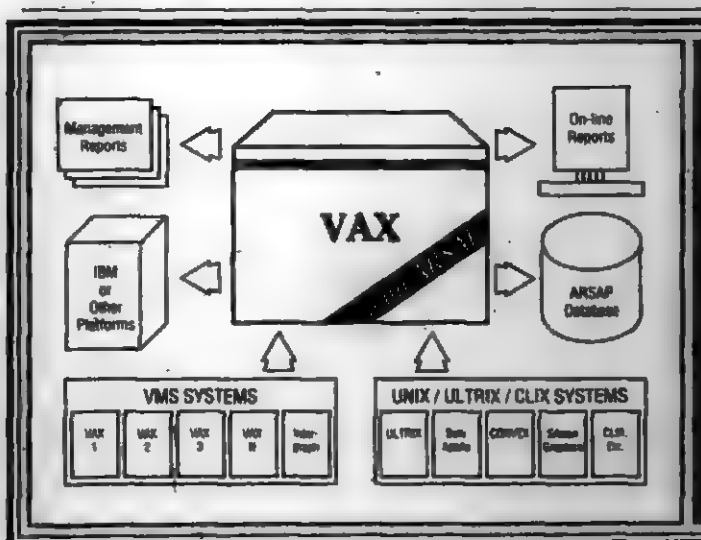
A report issued by Freeman Associates, Inc. in Santa Barbara, Calif., predicted that sales of half-inch reel drives will fall rapidly during the first half of the decade, partly because of buyers switching to half-inch cartridges such as those used in the IBM 3490 drive. However, this will be offset somewhat by overall increases in cartridge drive sales, driven by a recent trend toward standardization on the cartridge format for mainframe data interchange as well as technology advances such as automated tape cartridge libraries.

Phase-encoded drives

The report stated that sales of phase-encoded half-inch reel drives would drop from 34,100 units in 1990 to 2,400 units in 1995, a 41% annual decrease. Conversely, shipments of half-inch cartridge systems will increase from 107,500 drives to 162,000 drives during the same period, an annual increase of 7%.

All half-inch formats will be facing stiff competition from a variety of technologies. Optical discs, digital audiotape, quarter-inch tape cartridges and 8mm cartridges are all being positioned as storage alternatives for the high-end systems dominated by the half-inch format.

However, the report added that these new technologies would not find widespread acceptance among users until they are perceived as offering significant cost or performance advantages over half-inch products. It also noted that rising use of half-inch cartridges for data interchange on mid- and low-range systems and the popularity of Digital Equipment Corp.'s cartridge products indicate that half-inch drives will see continued use for some time.



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Hamilton

FROM PAGE 29

customers do their jobs.

Howard Fosdick, president of Fosdick Consulting and president-elect of IDUG, said this year's meeting shows just how much DB2 is growing up. There's a whole core of DB2 veterans, or "advanced" users, who have been running DB2 for more than five years now. Some come to meetings to share their techniques for managing large DB2 environments. These are the folks who talk about their need to keep DB2 on-line seven days per week.

Then there's a large collection of users who have a few years under their belts and have moved beyond the initial testing phase.

Both of these groups have come to learn from the veterans and "pick up performance tips," as another attendee noted. When the advanced users held a panel discussion late one afternoon (when sessions typically have low attendance), they had more than 1,000 attendees.

This description of the IDUG meeting is not intended to be a plug for DB2. The meeting was hardly a pep rally for IBM. However, it is clear that IDUG is not a bunch of crabby users, either. While many attendees interviewed had no trouble coming up with a suggestion for how IBM could improve DB2, they also seemed to be generally satisfied with the efforts the company has made so far.

Hamilton is a Computerworld senior editor, systems and software.

IBM leads slowing CAD/CAM market

BY MARYFRAN JOHNSON
CW STAFF

CAMBRIDGE, Mass. — While growth is slowing markedly in the computer-aided design and manufacturing software market, CAD/CAM is still chugging along at a projected growth rate of 12% this year with revenue of $7.7 billion, according to Daratech, Inc.

IBM remains the undisputed market leader, followed by Intergraph Corp. and Prime Computer, Inc.'s Computervision Division, the market research company reported recently.

Showing the most impressive growth — 25% projected for 1991 — is Sausalito, Calif.-based Autodesk, Inc., which produces the world's most widely used CAD system, Daratech said.

"The good news for CAD/CAM is that growth is very healthy in Europe, but the bad news is that currency fluctuations can either enhance that or mask it," said Charles Foundyller, president of Daratech. Advances in solids modeling have sharpened the accuracy, data integrity and storage abilities of CAD/CAM and computer-aided engineering (CAE) packages, Foundyller noted.

"Those advances have whetted the appetites of users for more accuracy, integrity and information, however," he added.

IBM's share of software

IBM is now providing more than $2.3 billion worth of CAD/CAM/CAE software, Daratech reported. Boosting IBM's prospects are its new Cadam and Catia releases for the RISC System/6000 workstations and servers, which are expected to open lower end markets to IBM.

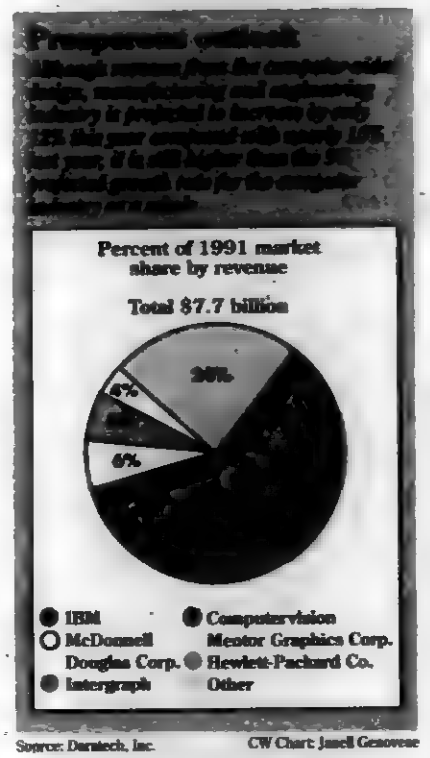
"Traditionally, IBM has been favored by very large corporations that buy multihundred-seat configurations," Foundyller said. Workstations still lag in their ability to match the security and even price-per-seat cost of mainframe-based CAD/CAM, he added.

IBM does 75% of its CAD/CAM business outside the U.S. — half in Japan, where time to market is a more important consideration than return on investment, the research firm noted.

For the No. 2 competitor — Huntsville, Ala.-based Intergraph — Daratech is projecting revenue of $1.25 billion with 10% growth in 1991. The vendor is in a major platform transition, porting its electronic design automation software and mechanical applications to Sun Microsystems, Inc. workstations.

The move beyond its own proprietary hardware should help allay customer worries. A recent Daratech survey of Intergraph users found them generally satisfied but voicing some concern about the company's resistance to non-Intergraph platforms.

For Computervision, this year promises a strong rebound. Computervision's CAD/CAM business grew by 17% in 1990 to $953 million and is expected to top $1 billion this year. Prime's holding company, DR Holdings, Inc., reported that 68% of Prime's 1990 product revenue came from its CAD/CAM-related sales.



Source: Daratech, Inc. CW Chart: Janell Genovese

A TOAST TO THE SWEDISH S

Fla. county moves to VAX 9000

ON SITE

BY MARYFRAN JOHNSON
CW STAFF

FT. MYERS, Fla. — A series of lightning strikes sparked more than computer crashes last summer in the unofficial "lightning capital" of the Sunshine State.

The summer thunderstorms also washed away Wang Laboratories, Inc. as Lee County's office automation provider, clearing a path for Digital Equipment Corp. and its mainframe VAX 9000.

"Things were getting just intolerable," said Dennis Morris, acting director of MIS for Lee County. "We expect a lot of lightning strikes, but we found when the Wang machines went down it took three to four days to get the part here, and then it was usually dead on arrival."

Wang officials acknowledged some previous service problems in Lee County but stressed how their regional office had responded by placing an on-site support worker in Ft. Myers and establishing a special Wang "parts depot" in the county's information systems department.

Nevertheless, the Lee County Board of County Commissioners forged ahead with a sweeping reform of its information services.

DEC installed

The county chose the mainframe-anchored DEC network — including two VAX 6000 minicomputers and at least 16 DEC workstations — to handle office automation, a geographic information system (GIS) and a newly automated criminal justice system.

A key consideration in the systems overhaul was the previous decade of runaway growth in the southwest Gulf Coast region, where the area including Ft. Myers, Cape Coral and Sanibel Island has grown 63% in the past 10 years to a population of 350,000.

"The county commissioners recognized our need for new and better technology," said Morris, who is pitching an IS budget of $4.9 million next year after a heavier 1990-91 capital spending budget of $6.7 million.

The 57-member IS department is currently juggling three major projects.

One project is the conversion of some 400 Wang users to the VAX 9000 running All-In-1 office software, electronic mail and Lotus Development Corp.'s 1-2-3 spreadsheet.

The second project is the replacement of an older Intergraph Corp. mapping system with the GDS GIS from McDonnell Douglas Corp.

The third project will create the Criminal Justice Information System for the State Attorney's Office. This on-line tracking and record-keeping system — about 70% completed now — will electronically follow each individual through the entire court process, with witness and jury management capabilities included.

The office automation project began in earnest two months ago, moving one week at a time through each department. While users are in retraining classes, their old Wang word processing applications are shipped to DEC's Colorado Springs, Colo., facility to be converted and sent back in All-In-1 format, Morris said.

"Our working relationship with DEC could not be much better," he said. DEC is also managing the county's Ethernet network, which connects 20 county buildings in downtown Ft. Myers via fiber-optic cabling or microwave.

The McDonnell Douglas GIS will provide the county with intelligent mapping capabilities, enabling users to effectively track sewer flows, water flows and road traffic loads for long-range planning purposes.

"We will be able to select a parcel, click on it and ask the database what will happen if we put a 100,000-sq-ft shopping center there," Morris said. "Engineering will immediately know if we have a problem with a water or a sewer line, for example."

Once the GIS goes on-line, Decstation 3100s will be placed in several county departments. "I am expecting a tremendous explosion in usage once this GIS gets going," Morris noted.

The one system remaining unchanged in Lee County's massive modernization is an IBM 3081, which handles transaction processing for the county's purchasing, property appraisal, permit assignment and code enforcement.

Re-DEC-orating

How DEC hardware helps Lee County manage its progress

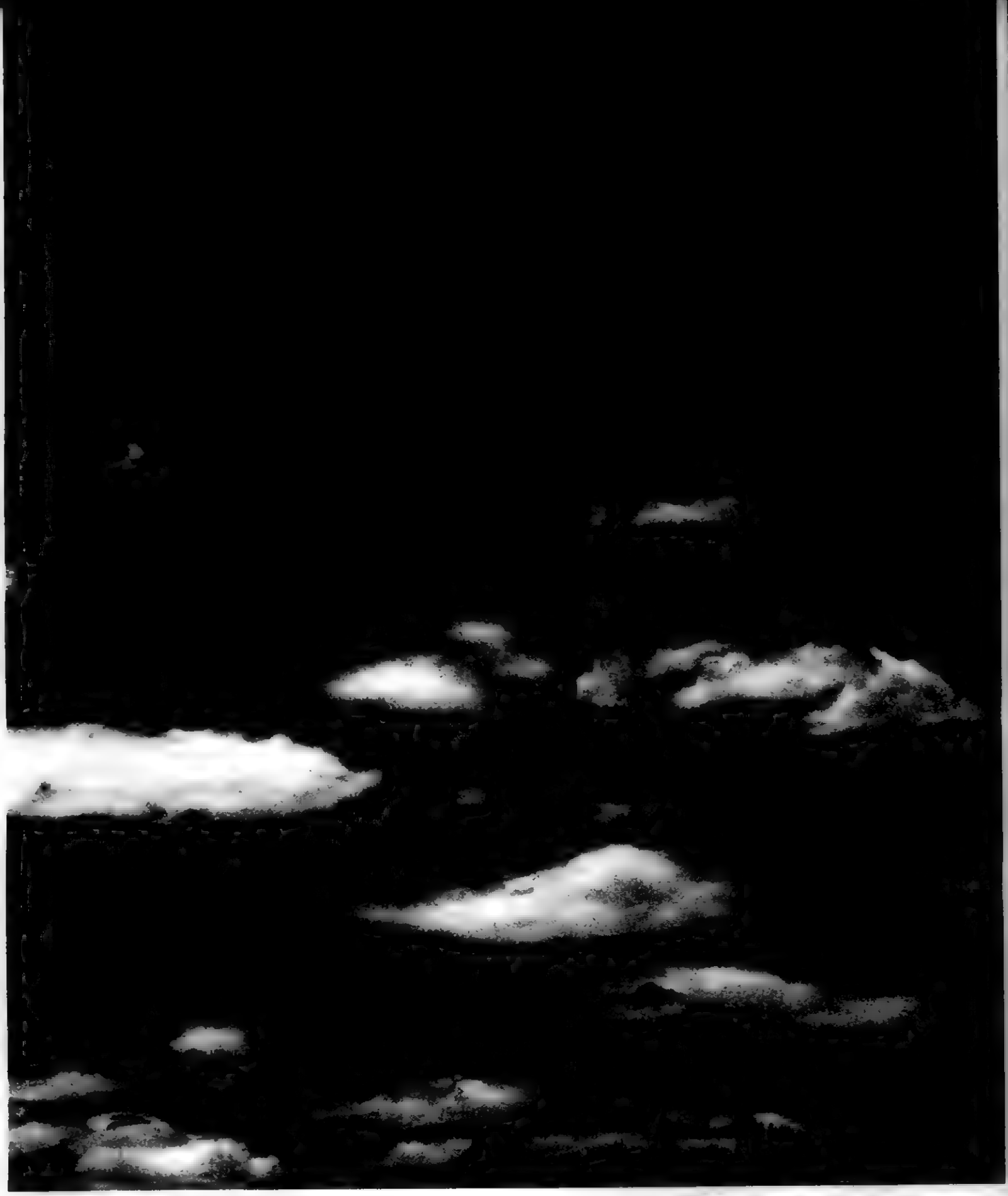
- Lee County, Fla., one of the fastest growing regions in the U.S., has installed more than $3 million in DEC equipment to manage its explosive growth.
- A mainframe VAX 9000 will run office automation under All-In-1, while a VAX 6000 Model 410 runs a geographic information system (GIS) from McDonnell Douglas Corp. in the first customer installation to run McDonnell Douglas' GIS database in conjunction with DEC's RDB relational DBMS.
- The State Attorney's Office is converting from an old Burroughs Corp. system to a VAX 6000 running customized software for the Criminal Justice Information System, an on-line tracking and record-keeping system that will eventually include Lee and four surrounding counties.

CW Chart: Eric Cormier

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Data centers going remote?

BY SALLY CUSACK
CW STAFF

Remote data center management is not a concept that has been embraced by the majority of large-scale IBM users. However, recent data reveals there will be a gradual automation of remote centers as the decade wears on and corporations continue to struggle with economic and technical issues.

A combination of factors, including cost-reduction concerns and a growing expertise crunch, will be responsible for an increasing interest in remote data center management in the 1990s.

Based on a recent study, information systems directors at Fortune 1,000 companies are asking for more automation and expert systems to reduce personnel numbers across the organization and achieve better resource management.



Source: International Data Corp. CW Chart: Doreen St. John

"People are saying that remote data centers are critical now, but they realize they are going to be even more critical in the future," says Anthony C. Picardi, director of applications development tools at International Data Corp., a Framingham, Mass.-based research and consulting firm.

This will result in a very definite move to remote data management taking place among IBM shops implementing the Systemview repository architecture, Picardi said.

The study surveyed 300 sites and categorized the respondents into very large, large, medium and small installations. Very large sites were classified with an average number of 4.7 mainframes, while small sites registered with an average of 1.1 mainframes per site.

The research revealed that the number of remotely managed data centers at the larger sites is expected to increase substantially by 1993.

Currently, the average percent of remotely managed sites is 46% for very large sites, 62% for large sites, 46% for medium sites and 64% for small sites. In 1993, these percentages are expected to increase to 76%, 71%, 59% and 66%, respectively.

While moving toward remote data center management is an important direction, users reported other issues commanding their more immediate attention.

More than 60% of the sites surveyed said the most critical issue at hand was achieving continuous availability with no downtime. Easy system expandability ranked second, and the availability of interoperable, multivendor software came in third.

However, the users surveyed said they anticipate several issues that will rapidly gain in importance.

First among these is considering the centralized management of multiple data centers, followed by reduction of total personnel (at the medium-size site level), reduction in expertise requirements and the ability to control more resources from a central location.

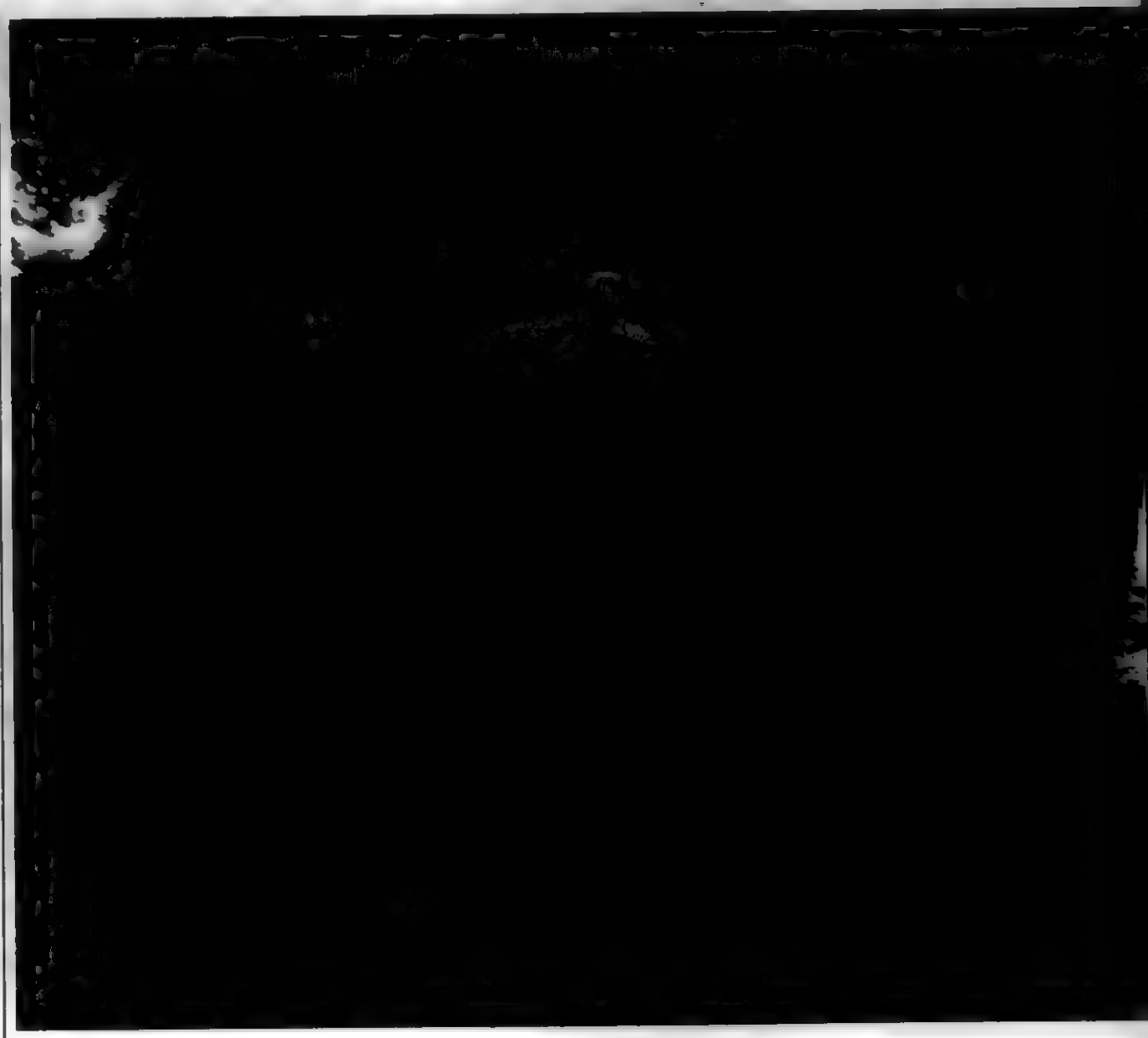
SOFTWARE SHORTS

DG adds insurance applications

Data General Corp. has announced that seven additional insurance software packages are now available on its reduced instruction set computing-based system. These include products from **NRM Computer Systems, Inc., Harte Systems, Inc.** and **Resource Information Management Systems.**

Twenty-four companies have responded to **Petrotechnical Open Software Corp.**'s (POSC) first Request for Technology on Exploration and Production Data Models. Respondents include oil companies, service companies, software vendors and computer manufacturers. Founded by five major oil companies in December 1990, POSC is a not-for-profit organization designed to promote a worldwide standard for facilitating technical computing for the upstream oil business. The submitted models will be presented to POSC in July and reviewed by POSC technical staff.

Apprehensive?



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Unisys hopes to convert IBM System/36 users

Alternative to AS/400 has the ability to run System/36 application programs

BY ELLIS BOOKER
CW STAFF

The 90,000 to 95,000 sites making up the IBM System/36 U.S. customer base have proved a difficult market to crack.

Just ask IBM.

Despite their vendor's best efforts, many System/36 users have been reluctant to migrate to IBM's current mid-range computer, the Application System/400, which the company introduced in June 1988.

Last September, Unisys Corp. offered this captive audience an alternative: the chance to run its existing System/36 applications in a more up-to-date hardware and software environment — an environment that, unlike the AS/400, would not require running System/36 software in an "emulation" mode.

Called RAMP, for RPG Application Migration Product, the Unisys offering bundles a Unisys Series A mainframe with twin-axial line connectors, an RPG II compiler and an application interface that mimics the System/36's operational control language.

The advantages, according to Unisys, are that users can continue to implement the 13,000 or so application programs for the System/36 while exploiting other programming languages (such as Cobol, C, Pascal and Fortran) and fourth-generation languages including Unisys' Link and Mapper products.

Advance Paperbox Co., a longtime user of the IBM System/34 and System/36 architecture, "was facing the loss of all our software," said Ruben Miranda, MIS director at the Los Angeles firm. Miranda, who believes he was the first customer of RAMP, said he was unhappy about a move to the AS/400 and the prospect of running his System/36 applications under an emulator. Likewise, Miranda said, he did not relish the thought of having to rewrite his software under RPG III for the AS/400.

While Miranda said the port to the A series was no more cumbersome than the operating system upgrades for the System/36, he cautioned, "It's not all plug and run. There are certain adjustments."

Nevertheless, Miranda said he is happy with his Unisys platform, installed in February, which now handles all of the corporate and manufacturing floor applications that were once run on the System/36.

In January, RAMP product group general manager Herman E. Brown told *Computerworld* he wanted to sell 1,000 RAMP-equipped Series As by the end of the year.

"Ultimately," said Brown, who runs the RAMP group in Mission Viejo, Calif., "we want 10% of the [System/36] base."

Still, several analysts who are watching the general difficulties at Unisys are dubious that RAMP will have much of an impact.

"I don't know why anyone would switch IBM to Unisys — unless they really hated IBM," said Bob Vautrain, a senior research analyst at Gartner Group/Infocorp in Acton, Mass.

Vautrain went on to note that past efforts to capitalize on IBM's System/34 and System/36 market had been unsuccessful. "I'd be surprised if [Unisys] made back their development costs," he said.



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PLATINUM technology

CASE

CONTINUED FROM PAGE 29

objects within Repository Manager. "The environments themselves should use generally the same kind of CASE tools. We think it's doable in a reasonable period of time. And we're working the tools as well with the ability of the environments to communicate with each other."

In the meantime, IBM and HP will port Softbench over to the RS/6000, although Kneemeyer would not specify a time frame beyond "as soon as possible." IBM will also work with third-party Softbench vendors to get their products running on the IBM platform.

Softbench's 26 vendors

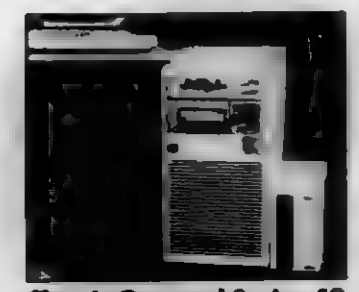
Some 26 vendors are affiliated with Softbench, but not all of their products run on the RS/6000 yet. Among the Softbench products that do are Software Through Pictures from San Francisco-based Interactive Development Environments, Inc. and Teamwork from Providence, R.I.-based Cadre Technologies, Inc.

Kneemeyer said the Softbench strategy "complements" IBM's existing CASE tools on the RS/6000. In February 1989, IBM announced a suite of technical development software, tied together with Atherton Technology's Integrated Project Support Environment.

IBM will continue to sell the Atherton-integrated software as high-end technical CASE products, Kneemeyer said. "We view Atherton as a fairly sophisticated framework, with a Repository Manager for objects. Softbench addresses the lower end." Approximately 90% of IBM's Unix CASE customers are "in the beginning of the CASE curve."

NEW PRODUCTS — HARDWARE

Power supplies



Clary's Onguard Series 40 *family filters utility power*

Clary Corp. has introduced the Onguard Series 40 family of uninterruptible power supply systems for IBM Application System/400 midrange computers.

The six models in the line filter utility power and provide perfect sine waveform power, according to Clary. The low-end Series 4010, priced at $950, offers four to 12 minutes of backup power for IBM Personal Computers working in conjunction with midrange systems. The high-end Series 4060, which weighs 599 pounds and is priced at $10,750, provides eight to 26 minutes of power for the AS/400 Model 9406-B50 and above.

Clary
320 W. Clary Ave.
San Gabriel, Calif. 91776
(818) 287-6111

I/O devices

Corollary, Inc. has begun shipping the Corollary 8X4GT, a Unix-based multiport I/O subsystem.

The adapter board includes a 25-MHz Intel Corp. 80286 processor and connects to as many as four eight-port terminal concentrators. Up to four 8X4GT boards can be installed in an Intel 80386 or 1486 host system for a maximum capacity of 128 connectable users.

Terminals may be connected up to 1,000 feet away from the host with no degradation of performance.

The product costs $895.

Corollary
17881 Cartwright Road
Irvine, Calif. 92714
(714) 250-4040

Processors

Lynk Corp. has designed a family of intelligent workstations for IBM midrange terminal emulation.

The Intellynk workstations are full-featured IBM Application System/400 terminals that also include an Intel Corp. processor, ranging from a 16-MHz 80286 to a 20-MHz 80386SX, and a 60M-byte hard drive. The systems support four host sessions, 132-column data and 122-key keyboards. On the high-end model, personal computer, AS/400 and ASCII data can be displayed under Microsoft Corp.'s Windows 3.0 and Wall Data, Inc.'s Rumba software.

Pricing starts at $2,100.

Lynk
101 Queens Drive
King of Prussia, Pa. 19406
(215) 265-3550

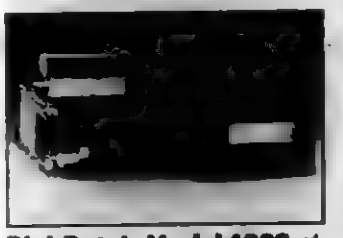
Arix Corp. has added the entry-level System90/15 to its line of Unix-based superminicomputer products.

The system includes two Motorola, Inc. 68040 processors and 64M bytes of memory. The AT&T Unix System V Version 3-based operating system is compatible with Posix, and up to 64 users can be supported.

Pricing for the System90/15 starts at $39,900.

Arix
871 Fox Lane
San Jose, Calif. 95131
(408) 432-1200

Data storage



Digi-Data's Model 4000 *attaches to Exabyte 8mm drives*

Digi-Data Corp. has announced the Model 4000 Tailgate Plus Data Compressor for Exabyte Corp. 8mm tape drives.

The product attaches to the rear apron of Exabyte 8200 and 8500 drives. An LCD display for monitoring drive status and a compression on/off toggle that mounts in the front of the tape drive are included. This model increases tape storage capacity by up to 400%, according to Digi-Data.

The product is priced at $1,200.

Digi-Data
8580 Dorsey Run Road
Jessup, Md. 20794
(301) 498-0200

MDB Systems, Inc. has introduced Diskarray, a small computer system interface (SCSI) subsystem with up to 6G-byte storage capacity.

Diskarray uses redundant arrays of inexpensive disk technology. It consists of four 20-MHz enhanced small device interface drives and a redundant parity drive. Each drive channel includes 128K bytes of look-ahead cache memory to increase access speed.

The system is priced at $43,500 for 3.1G-byte capacity and $61,200 for 6G-byte capacity.

MDB Systems
1110 W. Taft Ave.
Orange, Calif. 92613
(714) 998-6900

NEW PRODUCTS — SOFTWARE

Development tools

Distributed Image Systems Corp. (Discorp) has created Imagetools API for integrating document image processing into existing custom applications.

Imagetools API is a suite of software routines that enable users to build in image processing functions such as multiple page scan, view and print — as well as file insert and replace functions. The product also provides an interface to Discorp's Imagetools utilities, which optimize system scanning, storing, printing and document management capabilities.

Imagetools API costs $995. It is available for Unix, VMS and other environments.

Discorp
290 Easy St. #5
Simi Valley, Calif. 93065
(805) 584-0488

Interactive Software Engineering, Inc. has ported its Eiffel development software to the Digital Equipment Corp. VAX/VMS operating system.

The package includes an advanced object-oriented programming language. It also provides libraries of reusable code program elements such as multiple windowing, X Window System-based graphics, parsing and lexical analysis.

Eiffel for VMS costs $11,995.

Interactive Software Engineering
Suite 7
270 Storke Road
Goleta, Calif. 93117
(805) 685-1006

Applications packages

Trax Softworks, Inc. has introduced a version of its Edword mainframe word processing application for IBM's Professional Office System.

Edword was designed to emulate microcomputer-based word processors in ease of use, the firm said. The program includes spell checking, pull-down menus, page preview and support for printers incorporating Adobe Systems, Inc. Postscript.

Depending on processor size, a perpetual license ranges in price from $11,200 to $33,350.

Trax Softworks
5840 Uplander Way
Culver City, Calif. 90230
(213) 649-5800

Realworld Corp. has released Version 6.0 of its Realworld Accounting and Business System for Unix and The Santa Cruz Operation's Xenix platforms.

The system consists of 17 software modules covering financial and general business functions such as general ledger and inventory control. The following features are added to Version 6.0: new methods for calculating commissions, proximal billing, automatic check voiding, direct payroll deposits and custom shipping label output.

Pricing per module begins at $695.

Realworld
282 Loudon Road
Concord, N.H. 03302
(603) 224-2200

Utilities

Main Frame Software Products Corp. has introduced HDM, a help desk management software product for CICS environments.

HDM allows end users to communicate with a help desk facility on-line, maintaining the office work flow, the company reported. The host-based program automatically records system errors and includes a database to help personnel diagnose and correct problems.

License fees range from $10,900 to $14,000.

Main Frame Software
135 Glen Road
Wellesley, Mass. 02181
(617) 239-0288

Advanced Archival Products, Inc. has developed the Erasable Optical File System (EOFS), a software product for optical disc jukeboxes.

EOFS configures erasable optical media in a jukebox to appear as a standard magnetic disc system to the user. Information is stored on the optical discs in standard Unix file-system format. All magnetic disc utilities and commands work with the EOFS system, according to the firm.

Pricing starts at $4,000 and is dependent on system storage capacity.

Advanced Archival Products
Suite 114, Building D
14 Inverness Drive East
Englewood, Colo. 80112
(303) 792-9727

MacKinney Systems has released ISPF/VSAM Utility (IVU) Version 1.8, a program offering on-line access to common VSAM functions.

The product reduces the need for batch processing by storing parameters for data-set creation. In addition, IVU Version 1.8 provides editing, copying, browsing and other functions on VSAM and non-VSAM data sets. IVU Version 1.8 is executed via a panel-driven dialog under ISPF and may be run on both sides of a swapped session.

The utility program is priced at $1,295.

MacKinney Systems
Suite 103
2740 S. Glenstone
Springfield, Mo. 65804
(417) 882-8012

Compilers

Oasys, Inc. has announced immediate availability of the Green Hills C++ Compiler for Data General Corp.'s Aviion platform, including the AV7000 and AV8000 multiprocessor systems.

The Native Compiler offers object-oriented techniques, including multiple inheritance, data class abstraction and operator overloading. The Cross Compiler develops embedded applications for Motorola, Inc.'s 68000 series and 88000 processor-based systems and Intel Corp. I860 systems. The Green Hills Compiler is compatible with AT&T C++ Versions 2.1 and earlier, according to Oasys.

Pricing for the Green Hills C++ Compiler starts at $2,000.

Oasys
One Cranberry Hill
Lexington, Mass. 02173
(617) 862-2002

Systems Center, Inc. has announced Prorexx, a low-cost Rexx compiler for the IBM VM operating environment.

Prorexx supports all instructions for Rexx Release 4.0 and is Systems Application Architecture-compliant, according to Systems Center. The compiler provides code listings and cross-references and includes a runtime library.

Pricing for Systems Center's Prorexx ranges from $3,800 to $38,000, depending on the processor group.

Systems Center
1800 Alexander Bell Drive
Reston, Va. 22091
(703) 264-8000

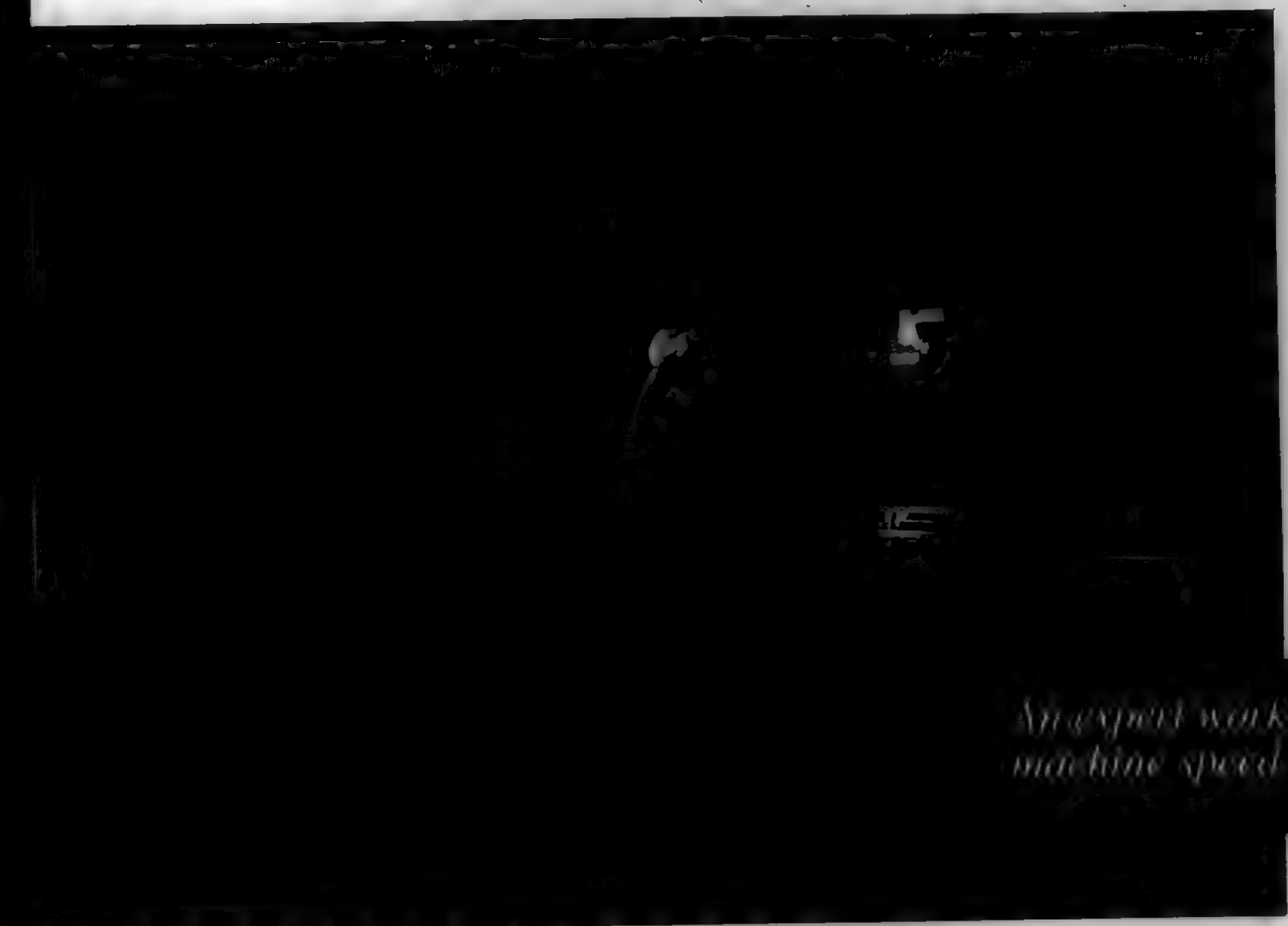
Database management systems

Prime Computer, Inc. has introduced a new interface based on SQL commands for its superminicomputer database management environments. The software product, Prime Information SQL, allows users to modify and query the Prime Information and Information Plus database management systems through standard SQL commands. The interface supports all basic SQL data manipulations and adds the ability to treat individual values in a multivalue field separately. A statement editor is included.

Pricing for the software product starts at $125 on the Prime EXL platform and at $1,500 on the company's 50 series systems.

Prime Computer
Prime Park
Natick, Mass. 01760
(508) 655-8000

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Q&A 4.0 gains tools, flexibility

BY CHRISTOPHER LINDQUIST
CW STAFF

Symantec Corp. has announced the most recent release of its word processing and database software for IBM personal computers and compatibles.

Q&A Version 4.0 reportedly includes new application programming tools, more flexible reporting and enhanced word processing capabilities combined with an easy-to-use interface.

The updated package offers a link to SQL that allows users to query corporate databases on remote mainframes.

The programming tools allow users to create such features as customized menus for specific applications.

Report previewing

With the new release, presentation-quality reports can be prepared and previewed on-screen before printing. Q&A 4.0 also includes a 660,000-word thesaurus in addition to the previously available 100,000-word spell checker.

The update is scheduled for release within a couple of weeks and will reportedly have a retail price of $399. The suggested upgrade price for registered users will be $85. It will run on any IBM Personal Computer XT, AT, Personal System/2 or compatible system running DOS 2.0 or higher with at least 512K bytes of memory.

Users laud Compaq's efforts

Direct support, price cuts, alliances could ensure vendor's future health

BY RICHARD PASTORE
CW STAFF

One year ago, few users could have foreseen that Compaq Computer Corp. would be offering direct support, segmenting its dealers by expertise, allying with minicomputer vendors, restructuring prices dramatically downward and considering selling through superstores.

These policy shifts and about-faces have been welcomed by most users, who say they come none too soon. They may also be Compaq's long-term insurance policy against the debilitating effects of the current industry down cycle.

"All these changes are geared toward better supporting their corporate customers," said Gerard Nussbaum, MIS director at Premier Hospitals Alliance, Inc. in Westchester, Ill. For Nussbaum, who is already a Compaq user, the changes strengthen his resolve to continue buying from the vendor.

Compaq's April across-the-board price cuts, for example, have lessened the heat Nussbaum was feeling from upper management to consider cheaper clones. Suddenly, the company whose price quotes were often out of the ballpark is showing up in bids with one of the lowest quotes of the group, he said.

"I think they've been getting a lot of pressure from major users about prices and clones," added Marc Kustoff, director of microcomputing at Rhone Poulenc Rorer, Inc. in Fort Washington, Pa. He said he expects Compaq to make even more reductions.

Compaq is the first to admit that its changes of heart have been prompted by customer pressure and increased industry competition. The moves have come too late to avoid the dampening impact of recession and

Continued on page 56

Time passages

The year 1991 has brought dramatic about-faces and policy changes as Compaq Computer Corp. has tried to strengthen customer ties

March 4: Inaugurates direct telephone support services.

April 9: Unveils Advanced Computing Environment alliance.

April 16: Cuts list prices an average of 21.5% across product line.

May 1: Begins designating dealers with specialized networking expertise.

May: Evaluates superstore authorization potential

CW Chart: Doreen St. John

FEATURE: PC SOFTWARE

Vendors, users face off in site license debate

BY SCOTT KRAMER
SPECIAL TO CW



In the world of personal computer software, self-interest is colliding with self-interest.

The issue is simple: Vendors prefer to sell one package for one person. Users, meanwhile — especially those with local-area networks — are increasingly seeking "site licenses" that would allow more widespread use of software, particularly for widely used packages at large firms. Although software buyers say such licensing is not their foremost concern, it has become a strong enough wish to begin forcing a solution to the impasse.

Licenses are currently based on one of three criteria: number of users, number of sites or number of users on any given node.

Maintenance of the agreements can be cumbersome, especially when the number of users of a software package at a company site can vary at any moment.

Site licenses in a non-LAN environment are in demand by customers because of their concept of unlimited use at one price, says Jeffrey Tarter, editor of "Softletter" in Watertown, Mass. But the compromise that seems to fit best for both buyer and seller is the node situation, he says.

Continued on page 52



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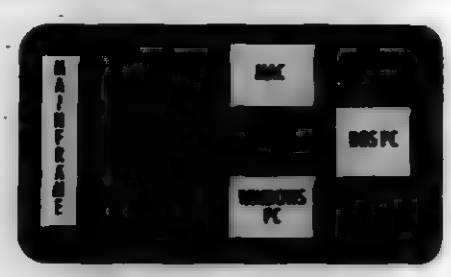
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Law firm saves with Logicraft VAX-to-PC servers

Company realized $400,000 in savings by using DOS-based servers between VAXs and end users

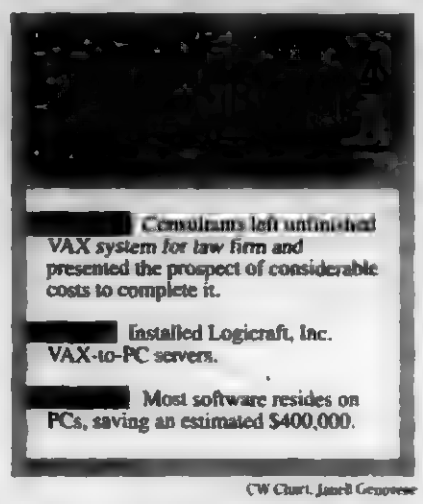
ON SITE

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — Stuck with a Digital Equipment Corp. VAX-based system that had only a bit of the usefulness promised by the consultants who installed it, the law firm of Cooley Godward Castro Huddleson & Tatum found it could get the requisite applications by using DOS-based servers between its VAXs and its end users for a fraction of the cost of finishing the promised VAX system.

"Rather than spending $60,000 on a VAX [software product], we spend $1,200 on DOS for the same usage," said Michael Armstrong, system manager at the firm. He was able to save an estimated $400,000 over the last few years by installing Logicraft, Inc.'s VAX-to-personal computer servers. The Nashua, N.H.-based company's products support multiple DOS users accessing VAX data on computers called 386Ware and 486Ware. Armstrong has two of the former for eight users and one of the latter for another eight. About 500 employees directly access the VAXs but are not heavy computer users.

Many of those light VAX users are attorneys in the downtown law firm here, which specializes in business, real estate and patent law.



CW Chart: Janell Genovese

Making paper

Much of the VAX use is for the company's document indexing database; however, the productive use of computers is at the PC level in word processing, Armstrong said. "Mostly what we do is make paper."

Armstrong found there were cheaper ways to "make paper" than to use a terminal-to-VAX setup. Innovation was necessary because the VAXs installed by outside consultants in 1988 — "Wilma," a VAX 6000 Model 420, and "Fred," a VAX 6000 Model 330 — did not deliver what the consultants had promised. "They told us we'd have automated litigation support packages within six months, but they left in three [months]," Armstrong said.

Thus, the firm is using PC software instead of VAX software where possible because it is less expensive and easier to maintain, according to Armstrong. A database for the firm's DOS users costs about $5,000. "It would be far, far, far too expensive to buy the same DEC product," he said.

Not all for VAXs

"There are also software packages available for the DOS-based system that are not available on VAXs, like some spreadsheets and databases," said Bob Coble, data center manager.

Did Armstrong search the country for a DEC niche product to help him out? No. "Logicraft found us through Dexpo [West '91]," he said. From there, Cooley Godward became a beta-test site for Logicraft. Armstrong added that "while I'm a complainer," it is easy to get engineering answers from the company.

Logicraft's servers are slightly different than typical file servers. Instead of simply serving PC users for word processing and small database access, they also access the vast numbers of legal documents stored on the VAXs. Their strong point, according to Coble, is that PC users who primarily do word processing can access spreadsheets and databases through the Logicraft servers.

"But nothing comes free," he said. "Its weak point is at the interface level, where it has to pull data from the VAX. If we have big database applications, it runs so slow that it becomes unusable."

System 7.0, Windows tackle data updates

ANALYSIS

BY JAMES DALY
CW STAFF

Apple Computer, Inc. and Microsoft Corp., two companies known for butting heads in both the marketplace and the courtroom, may disagree on many matters, but there is one topic that firmly unites them: interapplication communication.

Both Apple's System 7.0 and Microsoft's Dynamic Data Exchange (DDE) features allow data to be moved among applications, then automatically updated as the information is modified. Similar in concept, their execution is decidedly different.

First the basics: Apple's Publish and Subscribe is an integral component of System 7.0 that allows text and graphics in separate applications to remain linked as they move from one document to another. When changes are made to the original document, these alterations are automatically updated in all files using that information.

Nightmare prevention

Suppose a company wants to redesign a corporate logo — a piece of artwork incorporated into hundreds of documents ranging from advertisements to stationary designs. Updating all the disparate documents would be a logistical nightmare.

With System 7.0, users can "publish" a document with the corporate logo that other users or subscribers can then import into their own documents. When the original item changes, all subscribers are automatically updated the next time they call it up. "It's an excellent framework for tying together the many threads of a large department," said Rob McPhee, a senior engineer at Du Pont Co. in Wilmington, Del. However, there is one catch: Software developers must update their applications in order to take advantage of Publish and Subscribe.

System 7.0 also includes program linking, which allows an application to trigger events in other applications. Apple provides the hooks, called Apple Events, so users may open, save, print, copy or close files of one application while they are in another. Again, it is up to the developers to add the Apple Events functionality to their applications.

Users said the success of System 7.0 hinges on how well forthcoming applications integrate the new features. "System 7.0 can be a big deal or just a cosmetic increase, depending upon what developers do with it," said Rick Marolt, information systems manager at Great Central Insurance Co. in Peoria, Ill. A steady stream of applications that take full advantage of the linking features in System 7.0 is expected within six months.

Apple paved a fast lane to System 7.0 applications development last week when it announced an open scripting architecture that builds in Apple Events, enabling users to more easily customize their packages to include interapplication capabilities.

Working together

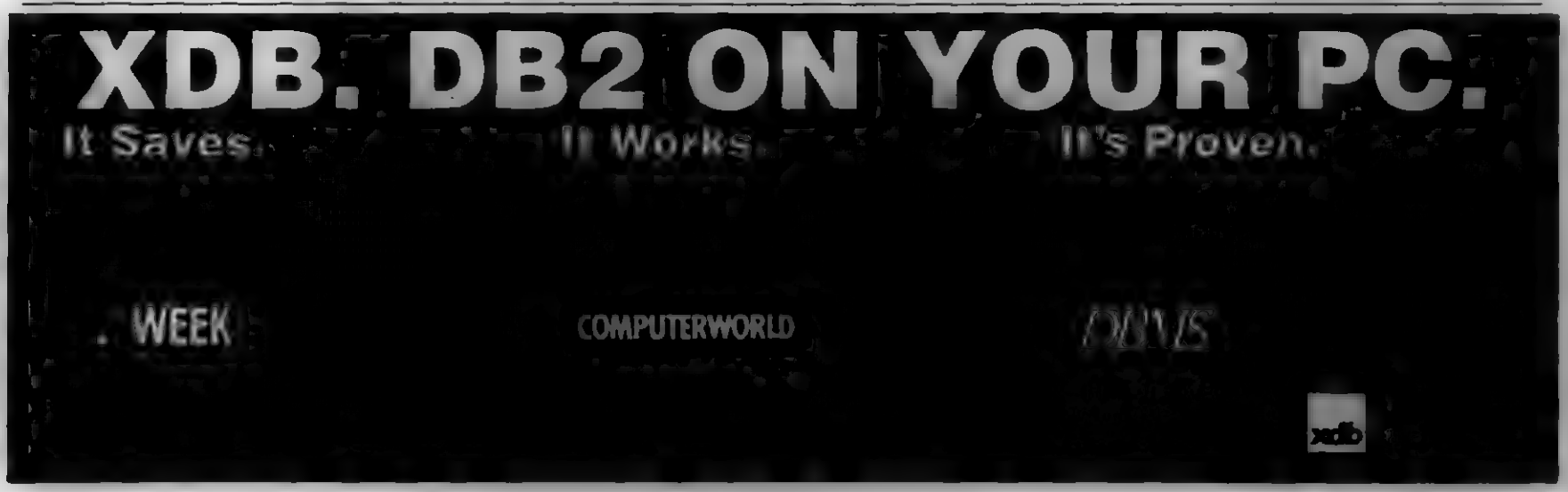
Microsoft's approach to data linking is through DDE, the main interapplication communication method used in Windows 3.0. Unlike Publish and Subscribe, DDE is a messaging protocol in which the interoperating applications must be modified to work with each other.

"Remember the intercoms you made as a kid with two paper cups connected by a string? DDE is the string, but if you don't have the paper cup at each end, it doesn't do any good," said Larry Jordan, senior director of product marketing at Ventura Publisher, Inc. and creator of the Ventura Publisher desktop publishing package.

Microsoft, however, is working on a further enhancement called Object Linking and Embedding (OLE), which builds the linking mechanism into the operating system. OLE will be included in Windows 3.1, which is expected by the end of the year. Unlike Publish and Subscribe, OLE will not be able to work over networks but is expected to work only on local hard disks.

Despite the advances made in connecting disparate data, there is still one important feature that both Apple's and Microsoft's methodologies lack: They do not work in cross-platform environments.

"When both linking technologies work in mixed environments, then we'll have true interapplication communication," Jordan added. "We're keeping our fingers crossed."



Pen-based future looks bright

Comdex attendees had positive reactions to pen-based applications

BY MICHAEL FITZGERALD
CW STAFF

ATLANTA — At Comdex/Spring '91, it seemed that pen-based notepad computers were the darling of the industry, although it is difficult to figure out exactly what use they might serve.

In fact, pen-based systems, which do not necessarily recognize handwriting, barely exist beyond such products as Grid Systems Corp.'s Gridpad and Microslate, Inc.'s Datelite.

Still, the possibilities have prompted observers such as Portia Isaacson, principal analyst at BIS Strategic Decisions' New Desktop Strategies Group, to say, "[Pen-based] computing is the biggest thing to happen since computing began."

Big is actually a misnomer because pen-based systems do not look to be large but rather notebooksize or smaller. Some of the attention comes because notepads offer a new twist on computing.

"[Pen-based systems] are one of the biggest areas of vaporware around, but it will be an exciting area once it really starts to solidify," said Peter Teige, a laptop analyst at Gartner Group/Infocorp in Santa Clara, Calif. "There are a lot of vendors interested in the technology, and a lot of people see a lot of potential [for it]."

Among these vendors are IBM, Microsoft Corp. and NCR Corp. This year NCR will introduce its System 3120 notepad, based on Intel Corp.'s 80386SL, and may be shipping the machine as early as September. IBM has announced plans to develop a pen-based system, to be introduced some time in 1992, and Microsoft has announced Pen Windows, a pen version of its Windows 3.0 package.

Smaller vendors are also jumping into the market and, in a sense, driving it. Among these vendors are Go Corp., developer of Penpoint, an operating system designed specifically for a pen environment, and Slate Corp., which has already released pen-recognition applications and is expected to release more.



Part of the interest these vendors have is a market Infocorp predicted will sell 2 million hardware units in 1995, creating an installed base of 3 million. But attendees at Comdex heard panelists talk about other factors, primarily the chance to bring completely uncomputerized users to computing.

"There's going to be a brand-new market of users," said S. Jerrold Kaplan, chairman of Foster City, Calif.-based start-up Go. "A laptop is a desktop you carry from one place to another and is not for the mobile professional — they leave their portables in the hotel room because you can't do business with it."

Still some questions

Kaplan's comments were echoed by other members of a panel on trends in portable and handheld computing. Of course, this begs the questions of how users will use a brand-new operating paradigm or how software vendors will be persuaded to develop for a market that does not exist yet.

Alok Mohan, vice president of the Workstation Products Division at NCR, told the audience that users will gain significant paybacks in increased productivity, reduced costs and better customer service, among other things, when pen-based computing becomes more widespread. Specific users would include mobile sales professionals, service-oriented professionals, such as insurance adjustors or airplane duty-free salespeople, and field service technicians.

There might be more software available for the new boxes than one might think.

Pradeep Singh, Microsoft's group product manager of the pen-based computing product unit, broke the software field down into two groups: pen-capable and pen-centric.

"Any existing Windows [application] is pen-capable," Singh told the audience. "When the machines ship, these will run as if they were pen-based [applications]."

Singh said this will give the market plenty of time to adapt to the new machines as pen-centric applications are developed.

Vern L. Rayburn, chairman and chief executive officer of Slate, told the audience, "If the Macintosh was the computer for the rest of us, the pen is the computer for all of us." However, he warned that "pen-aware applications will hold back pen-based computing."

Rayburn said pen-aware or pen-capable applications, such as those that run in Microsoft's Windows, will fail to take advantage of what he termed the "intimate" nature of pen-based computing.

Portable cuts not likely

BY MICHAEL FITZGERALD
CW STAFF

First Compaq Computer Corp., then Toshiba America Information Systems, Inc. slashed prices on their portable computers. But analysts said this will not mean top-to-bottom cuts on portables.

"I don't feel at this point that [widespread cuts] are too likely," said Peter Teige, an analyst at Santa Clara, Calif.-based market research firm Gartner Group/Infocorp.

Teige said the sudden rush of competitors to the market probably hastened the Compaq and Toshiba price cuts.

Some had other thoughts.

"In reaction to what we've done, I would anticipate that the momentum from the end-user community was so strong for Compaq that [Toshiba] decided they needed to be competitive, so they made their changes," said Ross Cooley, vice president of Compaq North America.

Compaq cut list prices across its portable line an average of 27% in April as part of a move to reposition its entire personal computer pricing. This brought Compaq's list prices below those of rival premium portable maker Toshiba.

Toshiba's subsequent 19% to 33% cut again places its machines under Compaq's retail prices in this game of laptop leapfrog.

Since then, at least two vendors have cut prices: Texas Instruments, Inc., an upper tier laptop vendor in terms of price, and Samsung Information Systems America, a midlevel vendor. TI cut prices on both its Intel Corp. 80286- and 80386SX-based notebooks, while Samsung made a second price cut of 30% on its Notemaster 386s/16, from $3,999 to $2,799.

Senior Writer Richard Pastore contributed to this report.

PC & WORKSTATION SHORTS

Veritel takes to low end

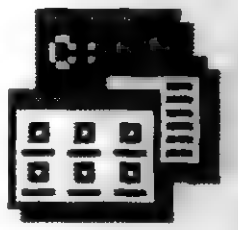
At Comdex/Spring '91, Christopher Daly, president of Veritel, Inc., demonstrated a low-end multimedia prototype that eschews compact disc/read-only memory. The personal computer will be delivered next year for less than $1,499 fully configured, according to Daly. The system uses an Intel Corp. 80386SX processor with 2M bytes of random-access memory and a 100M-byte hard disk.

Object Design, Inc. announced an August ship date for the Pre-Release Software Developers' Kit (SDK) for Objectstore for Windows, an object-oriented database that works with **Borland International, Inc.**'s C++. The $4,995 SDK will be delivered at summer conferences and includes one year of technical support and three days of training and conference participation.

User group forms alliance to benefit Windows users

BY PATRICIA KEEFE
CW STAFF

Ever on the prowl for information about Windows 3.0? Unprecedented sales of Microsoft Corp.'s windowing environment have prompted a seemingly endless wave of resources to cope with, or maybe just commiserate about, the mysteries of Windows.



The Windows Users Group Network (Wugnet) has formed the Corporate Windows Forum (CWF), an international computer conferencing and technical information exchange service for users who want to share practical tips and discuss corporate Windows and OS/2 computing and development issues.

According to Wugnet, hot topics include client/server strategies, in-house Windows development, network site licenses, overcoming DOS-to-Windows barriers and downsizing.

The players involved

The CWF board of advisors includes Daniel J. Willis, senior analyst at 3M Co.; Cheryl Currid, a consultant at Currid and Co.; Brian Moura, assistant city manager, city of San Carlos, Calif.; and George Roukas, director of systems at a Fortune 50 financial services company.

Ray Elseth, Wugnet's director of on-line services and a technical associate to Compuserve's Microsoft Advanced Windows Forum, oversees CWF. Beyond problem resolution and technical discussions, Elseth predicted that the forum will generate a library of white papers on key issues and will act as a clearinghouse for corporate Windows users.

The annual corporate membership fee is $495 in the U.S. and $550 in Canada. Additional corporate memberships can be purchased for $75 ($90 in Canada). Wugnet can be reached at P.O. Box 1967, Media, Pa. 19063 or via Compuserve.

Windows users should also note that many local personal computer user groups, such as the New York PC Users Group, are in the process of launching Windows special interest groups. Wugnet said it can help track down these special interest groups.

Users plotting a large-scale migration to Windows are the target audience of Canton, Mass.-based distributor Corporate Software, Inc., which is now shipping its Windows Migration Project Planning Manual. Corporate Software's 145-page reference guide costs $795 and was designed to assist information systems managers through four migration phases, including analysis, planning, migration and operations.

The manual is said to provide detailed instructions for conducting more than 150 distinct tasks associated with workgroup migration and includes sample documents on disk for user orientation, hardware and software inventory data gathering and user proficiency assessment. Also included is a disk containing a predesigned Windows migration project plan file created in Microsoft's Project for Windows.

Corporate Software also announced the beginning of the Windows Migration Project management workshops. These workshops are based on the planning manual and were designed for managers who are responsible for migrating users to Windows.

Widespread use

Windows training programs are springing up virtually everywhere. At the recent Comdex/Spring '91, Atlanta-based Comsell, Inc. announced what it claimed is the first interactive multimedia Windows courseware. Windows Basics is a three- to five-hour program that reportedly teaches the basic skills and fundamentals necessary to run Windows applications.

Interactive and motion video technology allow the user to toggle back and forth between the application itself and the instructor. That way, users get hands-on experience, according to the company.

Windows Basics retails at $1,195 and is scheduled to ship late this month.

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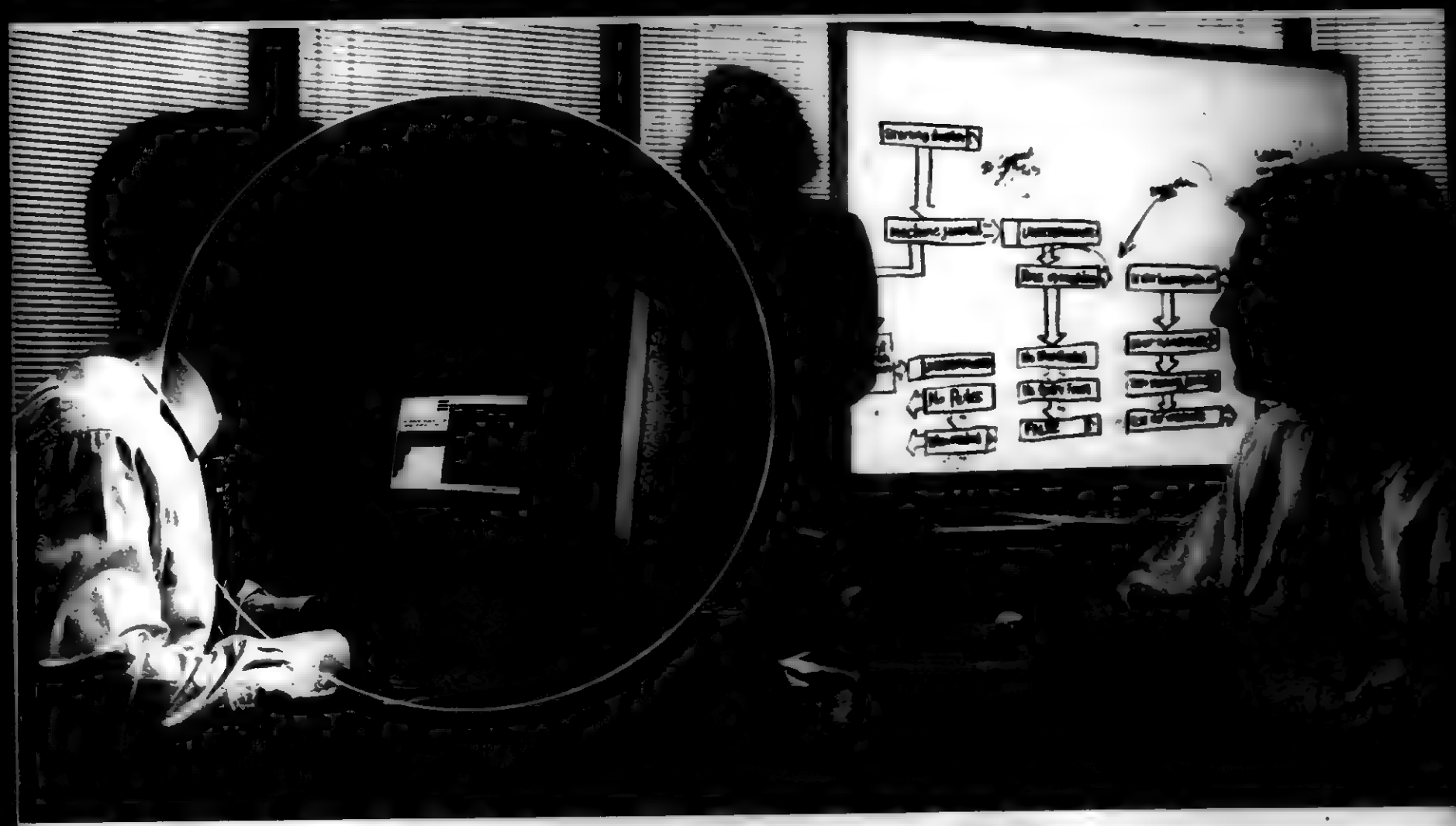
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2.

Site licenses

CONTINUED FROM PAGE 45

"It's essentially on the honor system," Tarter says. "I'm finding that even the companies that were slow to come to the site license and network license route are bowing to the idea."

Most PC software companies are moving toward "counter-based" pricing, Tarter says. "There's some sort of software device built in that counts the number of concurrent users. The concept is called a lending library approach. You have the right to use X number of copies concurrently. When all the [copies] are in use, and an extra user tries to log on, a message comes up and says all the copies are in use. Companies will then buy another license," he says. "This seems to be the dominant solution. The problem is that it represents a substantial loss to the software company."

Mort Rosenthal, president of Corporate Software, Inc., a reseller in Canton, Mass., says a vendor's size and revenue need can be factors in a user being able to negotiate a deal.

"The only vendors [selling on an unlimited use license] are the ones desperate for cash," says Rosenthal, who emphasizes the lack of large vendors willing to market a site license. "This is because it cuts off the revenue stream from the customer once the software is purchased. The only ones who are doing it this way are small vendors and Computer Associates. The only other reason to sell site licenses is if you don't think you're going to make any other money from the customer or if you're not the preferred vendor."

Information systems departments have grown accustomed to widespread software use as it exists in the mainframe world. Because of this, users are spoiled, according to experts. They expect the same rules to apply to the PC arena.

"It's not really coming into vogue," Tarter says. "Mainframe licenses are very precise. They actually identify classes of hardware, the number of terminals — a very detailed calculation. PC software companies that have looked at mainframe licenses can't believe what they're seeing. They can't possibly sell software that way."

At Burlington Air Express, Inc. in Tustin, Calif., the transition from the mid-range world to the LAN realm is being evaluated. Licensing problems alone for the LAN have discouraged administrators and raised several eyebrows toward reconsidering the shift, says John Shupe, director of station equipment, planning and support at Burlington.

While users place licensing terms high on their shopping list of considerations, they also seek a variety of items when selecting software products.

"We prefer site license companies, but it doesn't make the decision complete," Shupe says. "If we want or need the software, then we'll buy it regardless of the way the license is handled. To qualify, if the competition is strong in the market, then the service and technical support become as big an issue as anything else."

Jim Turner, a staff specialist at the South Coast Air Quality Management District in El Monte, Calif., prefers site licenses like the one he has with Xtree, a file manager from Xtree Co. in San Luis Obispo, Calif., but agrees that is not the top factor when deciding on a purchase.

"Support comes first to mind," says Turner, who maintains the licensing for 700 users. "It's a big issue. We have a large house, so we have a lot of expertise. But having to call across country on your dime [when owning per-user licenses] for support, it's not very cost-effective. With site licensing, you mostly get an 800 toll-free number. Companies like Xtree give us a single disk, so we don't have to inventory the disk. We have a department that specializes in maintaining the software." However, for use of Lotus Development Corp.'s 1-2-3 spreadsheet, which is licensed for 400 users on a per-user basis, Turner says that only 400 can access the application at any given time.

Rosenthal adds: "Most companies pick the product they want to use from the features and functions, and then they talk about the license. It's not what drives the [decision to buy]."

One top executive at a large Northeastern bank who requested anonymity says he does use his firm's size as a bargaining chip with vendors: "We do not negotiate prices. We seem to be getting good prices on site licenses by going one-on-one with the vendors. We decide the price and then negotiate with the vendor. It's a sticky issue."

This user claims his company can purchase Novell software at substantially lower prices from a third party than if it were to buy from Novell directly. "Novell increases the price significantly for someone with a thousand nodes, sometimes doubling and tripling the costs," he said. "So people are very resistant."

Kramer is a free-lance writer based in Irvine, Calif.

dFacts Are In.

DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
EASE OF USE			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications *without programming*	Yes	Yes	No
Modern pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
PRODUCTIVITY			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
POWER FEATURES			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	4	3
INTEGRATION			
#1 Selling, #1 Rated multiuser database; over 3 million users (1)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV computer environments account for approximately 30% of PC database systems and (2) database systems integrated with Digital Equipment Corp. VAX computers. Source: 1990 (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990. (3) Versions of dBASE IV are shipping for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms.

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Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

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Sun's answer: CD-ROM

Firm provides systems, software documentation on disc

BY CHRISTOPHER LINDQUIST
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. recently said it is offering all 16,000 pages of its systems and software documentation on a single compact disc/read-only memory.

System Software Answerbook allows users to view exact replicas of manual pages on-screen, eliminating the need for the 100-plus pounds of reference manuals previously required.

Users can look through documentation page by page, search for keywords, place bookmarks with attached memos, click on hypertext links to see cross-referenced information and print pages on Adobe Systems, Inc. Postscript-compatible printers.

Quick answers

Stan Hackney, an Answerbook beta-test user and principal engineer at Agfa Compugraphic Division in Wilmington, Mass., said using Answerbook is saving his company money by shortening the time it takes to get questions answered. The system's convenience makes users more inclined to use the manuals, so they are "being right sooner," saving time normally spent searching through documentation or asking questions, Hackney said.

Also, field support representatives can reduce their time per call, which Hackney said is a "perfect example [of] where time is money." He added that "one of the big problems was that no one could ever find the manual . . . The [Answerbook] kind of helped get us past that."

Mark S. Bercow, senior product marketing manager at Sun, said Answerbook is a product family name, and users can expect to see documentation for other Sun products available in the same format in the future. He also said he anticipates support for third-party documentation products using the Answerbook system.

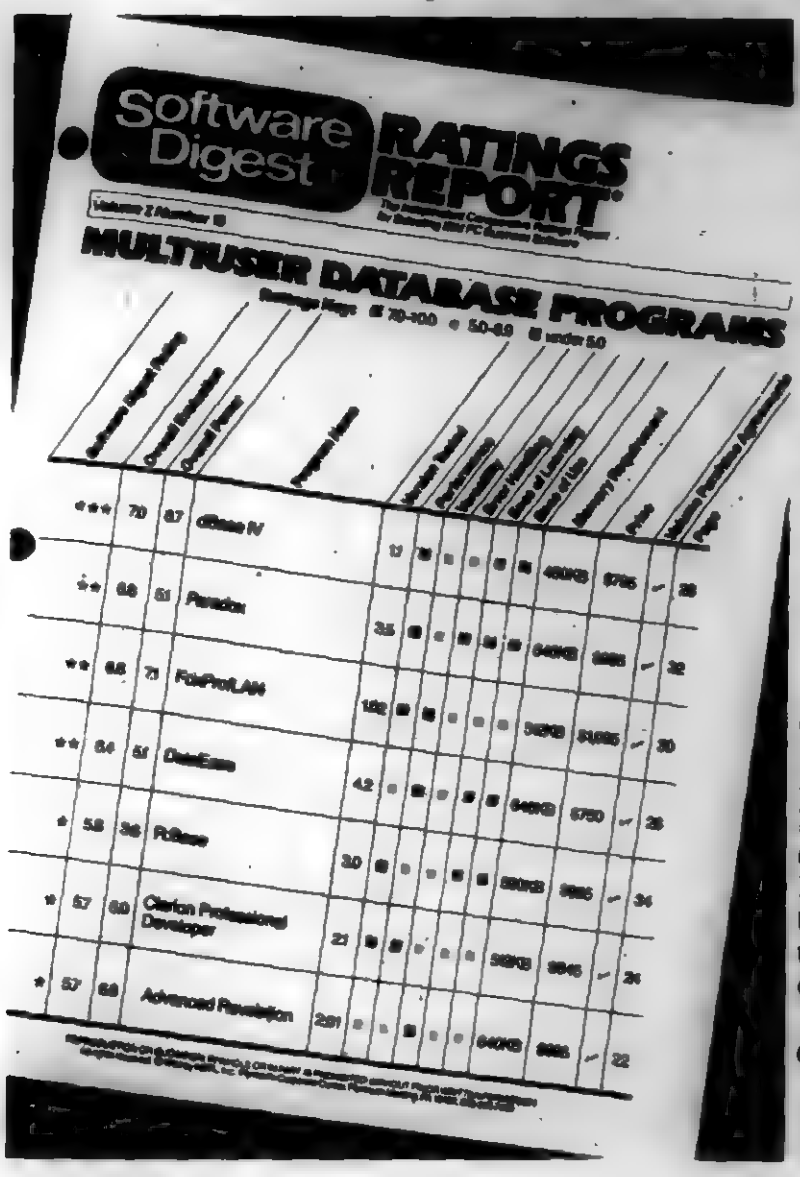
Tutorial included

System Software Answerbook includes a tutorial and complete documentation for the SunOS operating system, the computer hardware and Sun's Open Look graphical user interface.

Licensees are authorized to print a complete paper copy of the documentation, which could be used in the event of a system failure.

The product is currently available and costs $495 for a single workstation license. Additional networked stations can be licensed for $250 each. Site licenses are also available.

dTruth Comes Out.



Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

"Among the top ranking programs, dBASE IV (version 1.1) is the most well-rounded, with solid performance, versatility and usability." Commenting on speed, *Software Digest* points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use and Ease of Learning, dBASE IV scored in the Excellent Range as many times as any other multiuser database product tested.

For a free evaluation kit, including competitive details and a free demo disk, call toll-free: 1-800-437-4329 ext. 1416. Better yet, call 1-800-2ASHTON to upgrade to the new dBASE IV now.



The truth is, no other database can do so much to improve productivity.

Ashton-Tate

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Sun to VARs: No clone sales

BY J. A. SAVAGE
[redacted]

While on the one hand pontificating for open systems and engendering its own clones and compatibles for the open systems market, Sun Microsystems, Inc. has notified its resellers that selling those clones will take them out of Sun's good [redacted].

Although calling the move "stupid," Doug MacGregor, president and chief executive officer of Solbourne Computer, Inc. — a maker of Scalable Processor Architecture (Sparc)-compatible machines — said it will be to users' benefit because it will heat up competition. In other words, the move will allow those with direct sales forces, such as Solbourne, to offer better deals against value-added resellers (VAR) that are limited to Sun-only retailing.

One company that had nearly become a Sun VAR is glad it never signed the VAR agreement. Mike McKenna, marketing manager at San Diego-based Open Computing Systems Corp., said that by remaining independent, he has more flexibility to sell hardware at the best price.

"End users frankly don't care whether Sun makes the computers. They care about Sparc International [which certifies that Sun software will run on clones and compatibles]. All they care about is the technology," McKenna said.

"It tarnished their perceived image but not their business," said Jeffry Canin, an analyst at Montgomery Securities in San Francisco.

Sun's rationale

On its behalf, a Sun spokesman said that because the vendor is paying for training and education of its VARs, "we don't think others should be able to tap into it.

"Open systems has nothing to do with the resale channels," he said. "Open is defined by interfaces."

MacGregor disagreed. "This paints distributors, VARs, into a corner and clearly sends a message of who's open and who's closed," he said.

VARs have been verbally notified of the change by Sun and have a few months to evaluate Sun's new contracts, according to the spokesman.

None of the VARs contacted by *Computerworld* returned the calls.

Wordperfect 5.1: Easier to use, feature-rich

Wordperfect Corp.'s Wordperfect Version 5.1

Reviews:	Performance	Ease of use	Editing capability	Printer support	Network support	Documentation	Service	Value	Score
PC Magazine 12/11/90	Fast on its feet	Easy to learn	Flexible and powerful	Powerful	NC	NC	NC	More features than any other	Editor's choice
Users									
Steve Isenberg, Exsel Corp.									Feature-rich
Analysts									
Scott Higgs, National Software Testing Labs, Inc.									Vast, competent

Key: Very good Good Fair Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey.
**Infoworld* score based on 1 to 10 ratings. NC: No comment

Technology Analysis — A roundup of expert opinions about new products. Summary written by free-lance writer Susanne Weixel.

Wordperfect Corp.'s Wordperfect 5.1 integrates every feature imaginable into a fast, powerful package that walks the thin line dividing word processors from desktop publishers. According to reviewers, the only thing that keeps Wordperfect from meeting the challenge of being all things to all people is its own complexity.

Performance: For such a large package, reviewers reported, Wordperfect is surprisingly quick. It requires 384K bytes of random-access memory, and a hard disk is recommended. It can import and export most text and graphics formats, and it has a complete macro language with programming constructs, a mini macro editor and a macro recorder. For error handling, it offers automatic timed saving of information and a three-level "undelete."

Ease of use: Reviewers reported that Wordperfect 5.1's context-sensitive Help, on-screen tutorial, optional pull-down menus and basic mouse support make the program easier to use than earlier versions. Still, its function key-based interface often relies on less than intuitive combinations, and inconsistencies among functions can be annoying. For instance, *PC Magazine* noted that users must press the Home key twice, followed by the Up arrow to get to the top of the text in a file, but they must press the Home key three times to get to the top of a section of code.

Editing capability: Because it is character-based, Wordperfect offers no what-you-see-is-what-you-get (WYSIWYG) editing capabilities. Editing is done on a clean screen, and to edit the format or other code, a "reveal codes" window must be opened. Other than that, reviewers said, Wordperfect does just about everything automatically. In addition, it includes complete and effective tools for searching, sorting, proofing, mail merge, reference and layout. Notably, it has a table editor, an equation composer, WYSIWYG page preview and graphics support with scaling, cropping and revision marking. It also lets users have both endnotes and footnotes in the same document. What Wordperfect lacks are true automatic style sheets and a grammar checker.

According to Wordperfect Corp., there are more than 6.3 million Wordperfect users. The company had 1990 sales of $452 million, a 61% increase over 1989 sales of $281 million. Wordperfect is not a public company. W. Christopher Mortenson at Alex. Brown & Sons, Inc. rates the company's short-term performance good and long-term stability very good.



"IF ONLY [Microsoft Corp.'s] Windows-supported printers the way Wordperfect does. When you need more than just word processing, yet desktop publishing is too much, Wordperfect can fill the gap."

Ross Nichol
Assistant Vice President
First Security Corp.

Also, the outliner will not collapse text under headings. Still, as *PC Magazine* said, chances are if you want it, Wordperfect does it.

Printer support: According to reviewers, users will be hard-pressed to find a printer that will not work with Wordperfect. It has a printer driver editor, kerning and tracking as well as a landscape printing capability, and it supports all Hewlett-Packard Co. and Adobe Systems, Inc. Postscript fonts.

Network support: Wordperfect handles multiuser functions gracefully, reviewers said. User configuration settings are stored in a master file but can be modified. Files that are already open can be accessed via read-only mode; you can save changes under a new name. It lets users share a master style library, but user spelling dictionaries can be kept private.

Documentation: The documentation is adequate. It consists of one alphabetically arranged reference manual and a good index.

Service: Reviewers raved about the high quality of the technicians and the company's willingness to listen and respond to customers. Twenty-four-hour phone support is available — toll free between 7 a.m and 6 p.m. PST. There is a money-back guarantee.

Value: Wordperfect is not the leading word processing program for nothing. If users do not plan to make the move to a graphical-based word processor in the near future, a quirky function key-based interface is a small price to pay for such a comprehensive set of features and outstanding customer support. Wordperfect 5.1 lists for $495.

Wordperfect responds

Todd Ashman, product marketing director:

Ease of use: The trade-off for having lots of features is that some may be more complex to use than others. If a number of customers tells us that a particular function is awkward or unintuitive, we try to improve it in a future release. In Version 5.1, we have included pull-down menus for people who do not feel comfortable with the function key interface.

Some aspects of Wordperfect, such as the clean screen, may be intimidating to new customers, but we try to keep the program interface consistent and easy to use. Wordperfect is a character-based program, and it is not fair to expect it to have as intuitive and simple an interface as a graphical-based program.

Editing capability: We are addressing the issue of style sheets in a future release, and we hope to do something about the fact that the outliner won't collapse text under headings. Users can adjust the "reveal codes" window to display as few as three lines of code.

NEXT WEEK

▶ Wordstar International, Inc.'s Wordstar 6.0 has useful new features, but its age shows when compared with newer packages, reviewers said.

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FIFTH GENERATION SYSTEMS, INC

201

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Address _____

City _____ State _____ Zip _____

Current program version _____ Serial No. _____

Daytime Phone Number _____ Title _____

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TOTAL _____

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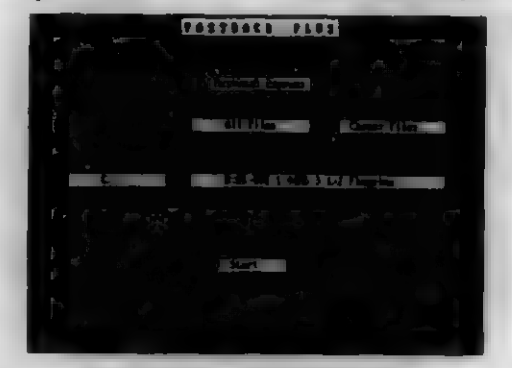
Introducing Fastback Plus 3.0

Users will automatically like it.



You should like it; after all, your suggestions helped design it. But we didn't stop there. After we made improvements you asked for, like a new windows-style interface, we added plenty of others.

- An archiving feature that erases unwanted files after backup
- Faster backups and restores: up to 10 mb/minute on some PCs (up to 3mb/minute on an average AT)
- Increased data compression to a full 80 percent, 15% more than version 2.1
- Appending incremental backups
- dBase III-compatible history file database lets you search for and restore specific files
- Backup support for "Bindery and Trustee" files on Novell Netware 286/386



The new fast, simple Express Menu.

And like all Fifth Generation products, Fastback Plus 3.0 is automatically covered by a one-year, money-back guarantee. Upgrade now for only $49 and get FREE overnight delivery*. Just mail or fax the attached reply card with your payment to the address or fax number below. Or call us toll-free. This offer is limited to Fastback or Fastback Plus users with a valid program serial number.

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If you're not backing up regularly, you either don't have the right backup program, or you don't have one at all. Fastback Plus 3.0 solves both problems with an entire program full of time and effort-saving features that make backing up so automatic, you can literally do it in your sleep.

- Scheduler and macro recorder for fully-automated, unattended backups
- Macro editor in plain English instead of DOS commands
- Optional password protection with DES file encryption capability
- New easy-to-use, windows-style interface with Express Menu
- Advanced error correction for recovering data from damaged disks

And these are just a few of Fastback Plus 3.0's new features. Now more than ever, there's really no excuse not to back up your data. Because if you don't want to do it, this program will do it for you. Automatically. For more about Fastback Plus 3.0, call the toll-free number below.

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(504) 291-7221 Fax: (504) 291-5453

*U.S. destinations only. Fastback Plus 3.0 will not restore backups made with versions 2.09 or earlier.
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Postscript upgrade race begins

BY CAROL WILDSTRAND
CW STAFF

First off the blocks in the Postscript Level 2 upgrade dash is Dataproducts Corp. with a desktop laser printer that incorporates Adobe Systems, Inc.'s first major upgrade of its popular page description language.

"It's a departure from our usual type of product," said William Barclay, Dataproducts' senior vice president of sales and marketing. "We usually concentrate on line and band printers."

Charles LeCompte, editor of "Printout," a Newton, Mass.-based newsletter concentrating on the printer industry, pegged Dataproducts' new direction as one of the interesting factors surrounding the printer's introduction.

"It's a fairly competitive product in its own right — there aren't a lot of RISC-based Adobe printers out there," he said. "But it also marks a big change for Dataproducts."

The LZR60, which at 1.3 feet boasts the industry's smallest footprint for a laser, prints at nine page/min. It uses the 8200 reduced instruction set computing processor from Weitek Corp. with a Sharp Electronics Corp. laser engine.

Barclay said Sharp modified the engine, formerly a six page/min model, to increase the output to nine page/min. The machine connects to Appletalk/Localtalk and IBM Personal Computers. Two megabytes of memory are standard, with available expansion up to 10M bytes.

A much-touted feature of the printer is its support of Postscript Level 2. According to Rob Babcock, product marketing manager at Adobe, Level 2 consists of incorporating into the core Postscript product the changes that have been made to individual Adobe products over the years. Those features include nonroman character sets and encodings.

Level 2 includes the following:

- Color extension.
- Composite font extensions.
- Display Postscript extensions.
- Improved memory management.
- Data and image compression and decompression.
- Forms support.
- Patterns support.
- Automated teller machine font-rendering technology.

However, analysts said the LZR60, a monochrome printer, cannot take advantage of Level 2's color enhancements, which are a major part of the Level 2 upgrade.

"The biggest single significance of having Postscript Level 2 on this printer is marketing, just because it's the first one. But it isn't clear that it will make any difference to users," LeCompte said.

The LZR960 costs $2,995 and is scheduled to ship this month.

Compaq

CONTINUED FROM PAGE 45

other market forces — Compaq projects a 15% decline in revenue for the current quarter. But analysts said the more competitive pricing and enhanced support could pay off in a turnaround later in the year, provided the recession lets up.

The firm is even considering authorizing sales through superstores, something that seemed an anathema to it just last year. "We don't want to turn our back on an emerging segment of the reseller community," said Ross Cooley, Compaq North America vice president. The company is working hard on evaluating this small but rapidly growing alternative channel and ironing out specifics with several dealers, he said.

Initial user reaction to the superstore prospect was mixed. For users who do not need support or plan on purchasing lower end boxes, the convenience and pricing of superstores has appeal. Others said they prefer to stick with full-service dealers for Compaq systems.

Users were consistent in their praise of Compaq's new emphasis on direct contact. In years past, Compaq was adamant about dealing with customers only through its authorized resellers. Only the biggest and loudest corporate customers had meaningful direct access. Now, the firm offers toll-free and for-fee telephone service and has been dropping in on more customer sites.

A for effort

"I'm happy because I see them making a lot of effort to increase support and make people accessible," said Richard Marolt, information services manager at Great Central Insurance Co. in Peoria, Ill. Marolt met with highly placed Compaq marketing staff members and twice called direct phone numbers to talk with "really knowledgeable" sales and technical people.

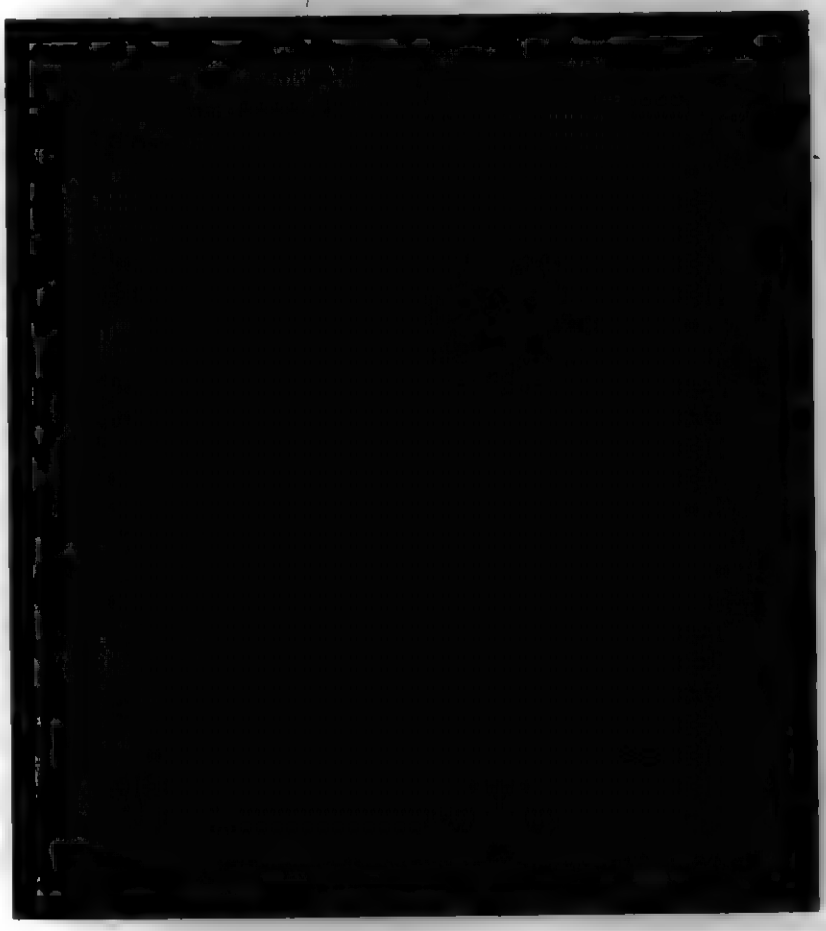
Before Compaq's change in direct-support attitude, "I never saw anybody," said Compaq Systempro user Michael Ball, data processing coordinator at the Federal Reserve Bank in Baltimore. Since then, Compaq officials have called on him twice during the last four months. "It's encouraging that they're taking an interest in our installation."

Compaq has also begun directing potential Systempro buyers to specialized dealers who have certain areas of network expertise. It would not have considered this practice in the past for fear of upsetting dealers.

SANDRA KURTZIG CHAIRMAN ASK COMPUTER SYSTEMS

"If GUI application developers could be ten times more productive, what would that do for client-server computing? We're about to find out."

In December, 1990, ASK Computer Systems acquired Ingres, the acclaimed manufacturer of intelligent relational database products. Here, CEO Sandy Kurtzig discusses the dramatic productivity increases reported by developers using INGRES/Windows 4GL, the first complete application development environment for graphical user interfaces:



"I don't see how anyone can keep from getting as excited as we are about client-server computing. The amount of information it puts at the fingertips of the end user is just phenomenal.

"You'll drastically reduce the code you now have to write."

"Of course, that much information can be frustrating—even useless—without an easier way of viewing it. That's where graphical user interfaces are coming into their own. They make vast amounts of data easy to work with, and quick to comprehend.

"But writing GUI applications using a conventional programming language is incredibly tedious. It requires hundreds of thousands of lines of code—60 percent of which do nothing but

NEW PRODUCTS

Software applications packages

Diamond Prospector 1.1, a $195 contact management program, has been released by Diamond Data Management, Inc.

The program incorporates options designed for use on portable computers, including a special video mode for low-resolution screens. Other features are a built-in word processor and one-key access to prospect notes.

Diamond Data Management
740 N. Pilgrim Pkwy.
Elm Grove, Wis. 53122
(414) 786-9000

Automatic number identification capability has been added to Telemate Plus, a personal computer-based call accounting software module from Complementary Solutions, Inc.

In conjuction with the company's Telemate product, Telemate Plus allows businesses to identify employee abuse of incoming and outgoing long-distance personal telephone calls. Users can also determine customers with exceptional service requirements and active sales accounts numbers. A memory-resident component eliminates the need for a dedicated monitoring computer, according to the firm. A report writer and on-line telephone directory are included.

The Telemate Plus module costs $1,145; pricing for the basic Telemate product starts around $1,000.

Complementary Solutions
4470 Chamblee-Dunwoody Road
Atlanta, Ga. 30338
(404) 454-8033

World Software Corp. has announced Extend-A-File, a document management software system for DOS-based personal computers.

The program includes standard file management functions such as copying, renaming, deleting and viewing. Additional features for document management are compression, archiving and version control. Extend-A-File is compatible with Microsoft Corp.'s Windows 3.0.

A single-user copy costs $99.95. Users of the firm's Extend-A-Name application can upgrade for $35.

World Software
124 Prospect St.
Ridgewood, N.J. 07450
(201) 444-3228

Systems

SAI Systems Laboratory, Inc. has introduced a 25-MHz Intel Corp. 80386-based personal computer with an Extended Industry Standard Architecture (EISA) bus.

The small-footprint system includes two floppy drives, a 120M-byte hard drive, 32M bytes of memory and a Super Video Graphics Array monitor. The product is intended to provide EISA compatibility for a lower price than Intel 1486-based PCs, according to the firm.

The system costs $2,495.

SAI Systems Laboratory
911 Bridgeport Ave.
Shelton, Conn. 06484
(203) 929-0790

Utilities

Office Solution Version 1.2, task automation software running under Microsoft Corp.'s Word for Windows, has been released by Gilbert & Associates, Inc.

Features incorporated in the upgrade include Microsoft SQL Server and Microsoft Mail support, print billing and enhanced printer support. Performance has also been improved, the firm said.

Moreover, Office Solution handles automatic fax and electronic mail transmission and document management. All tasks can be accomplished without leaving the Word for Windows word processing application.

The price is $395 per workstation.

Gilbert & Associates
Suite II
875 Via De La Paz
Pacific Palisades, Calif. 90272
(213) 454-7679

Database management systems

Condor DBMS Services, Inc. has upgraded Condor3, its database management software.

Version 2.30 simplifies command line operations through command recall and on-line Help. Data-revision and report-writing capabilities are also enhanced, the company reported.

The product costs $395. Upgrades from previous versions cost $95.

Condor DBMS Services
5209 N. Clark St.
Chicago, Ill. 60640
(312) 271-8759

Applied Information Technology has announced SQLDBATK, a database administration tool kit for SQL-based servers running under OS/2.

SQLDBATK features on-line monitoring and problem detection, storage reporting and security maintenance and reporting. The product allows users to perform many administrative tasks without knowledge of SQL commands.

A single license costs $1,195. Site licensing will be available.

Applied Information Technology
Suite 1620
350 N. St. Paul St.
Dallas, Texas 75201
(214) 855-5257

INFORMATION ANALYSIS FOR BUSINESS

produce the GUI itself. Add that to the problems of accessing data from multiple sources, a shortage of developers, and a steep learning curve for existing GUI tools, and you're talking a huge investment of time and money. No wonder client-server applications have been so slow in coming.

"A product that makes programmers up to ten times more productive."

"Well, all that's going to change once developers get their hands on INGRES/Windows 4GL—a tool that helps programmers be up to ten times more productive. At least, that's what some of our customers tell us.

"For starters, INGRES/Windows 4GL allows you to use a mouse to interactively build windows and menus without writing a line of code. Then you assign functions to those components using a very elegant fourth generation language, which a good 3GL programmer can learn in a week or less.

"So, applications that once required thousands of lines of code now take far fewer.

"Unlike simple screen painters and HyperCard-like tools, INGRES/Windows 4GL is designed for full-scale production applications. It helps you manage and coordinate multiple development teams. It even tracks different versions of your applications throughout the company. No wonder it's now being used to create sophisticated applications like shop floor control and critical care medical systems.

"Portability is one of this tool's most profound breakthroughs. An application you create in, say, OSF/Motif will be able to run flawlessly on Windows 3.0, Open Look and other popular systems. With the appropriate look-and-feel in each environment. With full interoperability with other applications. And with no rewriting.

"Your applications will also link seamlessly to the whole range of Ingres products, and—thanks to INGRES/Gateways—to other leading databases.

"Think about it: Client-server applications with GUIs and full portability, in a fraction of the time. This could be the product that finally opens up the workstation for mainstream commercial applications.

"I think it's fair to call it revolutionary."

INGRES/Windows 4GL supports Sun SPARC, DEC VAXstation/VMS, DECstation/ULTRIX, HP 9000, IBM RS/6000, and other major workstation platforms. To learn more about INGRES/Windows 4GL, call 1-800-4-INGRES.

Ingres

In December, 1990, Ingres Corporation was acquired by ASK. For more than ten years, Ingres has been a worldwide technology leader in database management systems. The family of Ingres products includes: the first intelligent relational database; the first Windows 4GL development toolset; gateways to the most popular non-Ingres systems; powerful desktop solutions; and global customer support. Ingres' reputation for technological excellence was most recently confirmed by Digital Review—the magazine's 1990 Editor's Choice, Best Database Management Software, and Best Database Tools awards went to Ingres—as did the Sun Observers' excellence award for Best Database Management System.

ASK
SOLUTIONS AT WORK

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NEW AT COMDEX

Software applications packages

Geoworks released Geoworks Ensemble Version 1.2, an upgrade of its graphical user environment and applications software package.

The new version adds a spelling checker utility with a 100,000-word dictionary, a diagnostic utility that simplifies installation, screen savers and a library of document templates.

Version 1.2 costs $199.99.

Geoworks
2150 Shattuck Ave.
Berkeley, Calif. 94704
(415) 644-0883

Zylab Corp. announced availability of Zyindex for Windows, a text-retrieval software package.

Running under Microsoft Corp.'s Windows 3.0, Zyindex uses techniques such as prefix and suffix variables for fuzzy searches, topical searches, numeric searches and Boolean logic. It also has a thesaurus.

The first copy costs $395; extra copies for network nodes cost $195.

Zylab
100 Lexington Drive
Buffalo Grove, Ill. 60089
(708) 459-8000

Software utilities

Aristosoft, Inc. released More Windows 3.0, a screen-extending software utility for personal computers running Microsoft Corp.'s Windows 3.0.

Different modes with different resolutions are offered, including a 1,024- by 1,024-pixel full-page color display. More Windows 3.0 eliminates wait time involved in scrolling the Windows screen right and left.

The program costs $99.

Aristosoft
Suite 211
6920 Koll Center Pkwy.
Pleasanton, Calif. 94566
(415) 426-5355

Data storage

Ten X Technology, Inc. announced the Optixchange 940, a multifunction optical storage subsystem.

The product supports both write-once read-many (WORM) and rewritable storage in a single drive. It can be used with both DOS and Unix systems, and it operates with standard operating system commands, according to the firm.

Storage capacity is 1G byte for rewritable media and 940M bytes for WORM media.

The subsystem costs $5,495.

Ten X Technology
Suite 3200, Building 3
4807 Spicewood Springs Road
Austin, Texas 78759
(512) 346-8360

CMS Enhancements, Inc. announced 80M- and 120M-byte internal hard drives for IBM Personal System/1 personal computers.

Average access time for both drives is 19 msec. The drives install directly behind the PS/1 faceplate. Vertisoft Systems, Inc.'s Doubledisk data compression software is included to further increase storage capacity.

The 80M-byte model is priced at $649; the 120M-byte model costs $849.

CMS Enhancements
2722 Michelson Drive
Irvine, Calif. 92715
(714) 222-6000

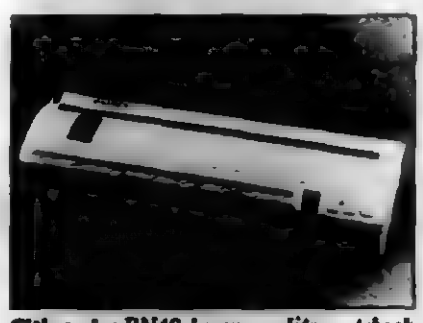
Peripherals

Intel Corp. demonstrated its Matched Memory add-in boards for the Hewlett-Packard Co. Laserjet printer series.

Versions are available with 1M byte and 2M bytes of memory; both are expandable to 4M bytes of total memory using standard dynamic random-access memory chips, allowing Laserjet models to handle graphics-intensive document printing.

The 1M-byte version costs $195; the 2M-byte board is priced at $295.

Intel
CO3-7
5200 N.E. Elam Young Pkwy.
Hillsboro, Ore. 97124
(503) 629-7354



Citizen's PN48 laser-quality notebook printer includes a Nicad battery

Citizen America Corp. demonstrated the PN48 Notebook Printer, a laser-quality printer weighing about two pounds.

The PN48 measures 3½ by 11½ by 2 in. and prints 80 char./sec. It handles letterhead, labels, envelopes and transparencies. A half-pound rechargeable battery is included. The firm also offers 24-hour express service. The PN48 costs $549.

Citizen America
Suite 600
2450 Broadway
Santa Monica, Calif. 90404
(213) 453-0614

Systems

Acer America Corp. introduced the Acerframe 3000MP, an Extended Industry Standard Architecture-based symmetric multiprocessor system for client/server environments.

The entry-level model includes one 33-MHz Intel Corp. I486 processor; three additional processors, including 50-MHz I486 chips upon availability, may be added. Up to 128 concurrent users can be supported.

Features include an on-board cache, a disk array subsystem and a programmable performance display.

The base configuration costs approximately $15,000.

Acer America
301 Charcot Ave.
San Jose, Calif. 95131
(408) 922-0333



When you compare cooperative processing development tools, MOZART® is music to your ears.

If you like the sound of an easy, affordable way to give a PC-style interface to your host application users, MOZART will strike the right chord.

Why? Because without changing a single line of IBM or other host code, MOZART lets you add a workstation-based CUA compliant GUI *and* local user assistance.

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COMMENTARY

Elisabeth Horwitt

What kind of race is this?



European carriers would have us believe they are racing against time to provide the network quality, pricing and advanced services that increasingly globalized businesses are demanding in order to take advantage of the open European market of 1992.

When you look more closely at what is actually going on, however, it becomes clear that one group of Postal Telephone and Telegraph (PTT) authorities — in France, Belgium and the UK — is consistently charging ahead, while others are "racing" at a much slower pace.

To take one example: Next week, a group of Fortune 500 telecom and IS managers will meet at the International Communications Association show to come up with suggestions as to how Belgium's PTT carrier, can meet the needs of its high-volume customers through volume discounts and other deals.

From all accounts, the carrier should be amenable. It already offers some of the lowest international connections to the U.S. from Europe as part of its aggressive strategy to attract more global business traffic.

On the other hand, Fortune 500 companies have gotten little satisfaction from similar collective bargaining maneuvers tried on other European PTTs, our roundtable source reports. We do hear rumors that PTTs such as Spain's Telefonica are, indeed, cutting special deals with large customers.

What the carriers may feel less happy about is agreeing to such deals in a structured framework and in a more open forum, which puts them on the line to offer such deals to volume customers in general.

Another area where the PTTs are proceeding at very different paces is in their implementation of various initiatives by the European Council of Ministers and other pan-European bodies that are working to harmonize the European telecommunications environment and open it up to competition.

One such initiative is the Conference on European Postal and Telecommunications

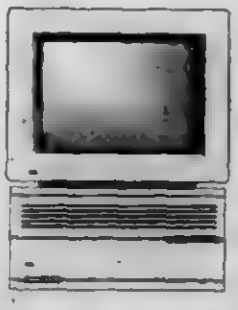
Continued on page 68

Apple networks to take cautious upgrade path

Users say they'll wait out System 7.0 glitches

BY JIM NASH
CW STAFF

Despite assurances from Apple Computer, Inc., network administrators say they are proceeding cautiously with upgrades to Apple's new System 7.0 operating system.



Several managers said they were taking extra precautions in upgrading their networks to System 7.0. Like other administrators, Brenda Horn, network computing specialist at Arco Alaska, Inc. in Anchorage, Alaska, said she expected some problems with System 7.0, just as she would with any major software upgrade.

Another manager, Dave Ballowe, senior systems analyst at the University of Colorado at Boulder, said he foresaw a period of problems but is patiently waiting them out.

"We've been limping along this far with Apple's networks. We're taking a fairly conservative approach to the upgrade," Ballowe said.

However, Horn said, "we were definitely disappointed" with reports that System 7.0 was working poorly with Ethernet adapter cards not registered with Apple and some of Apple's own applications, such as Appleshare Version 2.0 and MacTCP.

Arco Alaska is watching System 7.0 with a critical eye as its tests progress, Horn said. She added that if too many problems crop up, she may decide not to implement it.

That decision, she said, would not bode well for Apple purchases in the future. "There are a lot of other good, competitive products that outperform and outprice [Apple]," she noted.

Apple has said that while System 7.0 is not compatible with Appleshare servers, the operating system will reside on the servers. The servers will not take advantage of the new features and performance perks built into System 7.0.

A spokeswoman for Cupertino, Calif.-based Apple said she was unaware of major problems with any other Apple networking software.

In fact, she said, System 7.0 is compatible with the latest version of "most of the 4,000-plus applications" that work with System 6.0. Nonetheless, Horn said, Arco will spend the next few months testing the new operating system against all in-house and commercial software used on-site with System 7.0.

Out of proportion

Problems with both the software and the Ethernet cards have been blown out of proportion, according to Greg Stasko, a senior systems engineer at Apple in Nashville.

The card makers that have designed their own drivers independent of Apple may not have designed for System 7.0, posing a compatibility problem, Stasko said. It is only a matter of time before both application and card makers update their programming to work with the new iteration, he added.

Paul Derby, director of IS at Control Data Corp. in Minneapolis, said he has had a System 7.0 beta-test product running for six months in a test lab with few problems. Compatibility problems have been minor, Derby said, and they should be worked out by most vendors this year.

That is not comforting for some managers, however. Ballowe's concern focuses on MacTCP. Transmission Control Protocol/Internet Protocol "is the basis of a lot of our communications across campus," he said.

Stasko admitted there was "a little bit of cleaning up to do with MacTCP, but users can work around it."

Other concerns

Other users were less worried with the fact that there were problems rather than with the perceived nonchalance of third-party software vendors.

Dirk Warschewski, a computer consultant at Colgate-Palmolive Co.'s technology center in Piscataway, N.J., said it is as if some vendors are saying suddenly: "Oh, look. We're not compatible. Let's do something."

Specifically, he cited Apple documentation, warning network users that System 7.0 will not work with 3Com Corp.'s 3+Share Version 1.6 network operating system and only with Version 1.7.

Warschewski said he was unaware of the existence of Version 1.7.

Growth of networks nurtured at EPA

ON SITE

BY JOANIE M. WEXLER
CW STAFF

Federal initiatives to clean up the environment and implement communications standards among government agencies will render 1991 a record year for U.S. Environmental Protection Agency (EPA) network revamps, according to the EPA's telecommunications chief.

David A. Bittenbender heads the EPA's telecommunications branch at its national data processing center in Research Triangle Park, N.C. He is directing a network metamorphosis aimed at accommodating federal environmental mandates such as clean-up projects under way in the Great Lakes and Chesapeake Bay. He is doing so within the boundaries of the 10-month-old Government Open Systems Interconnect Profile (GOSIP).

GOSIP kicked in last August, requiring all federal information processing procurements to include the capability to communicate using Open Systems Interconnect (OSI) protocols. GOSIP's aim is to ensure that all federal government equipment is ultimately interoperable.

"My marching orders are to provide seamless individual access to all of our processing power no matter where it is," Bittenbender said. One way he is filling the bill is with 12,000 Token Ring local-area network nodes linked by fiber backbones.

"We're shifting mainframe applications to LANs because of the diversity of what people are doing and because it's cheaper to add [computing power] to LANs," he explained. In addition, he is scouting out OSI X.400-based worldwide electronic mail systems, about 600 Unix workstations to run geographical information systems software and two supercomputers that will all ultimately hook into the worldwide network.

Currently, the agency's inter-site data traffic is switched over the BT Tymnet, Inc. X.25 public packet-switching network. However, GOSIP precludes the renegotiation of that contract, requiring the agency to turn to dedicated lines sold under the General Service Administration's Federal Telecommunications System 2000 telephone services contract with AT&T and U.S. Sprint Communications Co.



Doug Van de Zande

Bittenbender *is directing a network overhaul to better handle the EPA's charge*

EPA computers interconnect among 10 regional offices to the 50 state capitals to partners in foreign countries and to the "floors upon floors" of IBM 3090 mainframes in the Research Triangle Park facility.

The workstations and supercomputers slated to join the processing resources will help the agency and its international cohorts determine pollutants and measure the effects of

To page 62

The experts say companies like yours will spend $240 billion on client-server computing.

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Ideally, it combines a PC's ease-of-use with the computing power of far larger systems. It lets people locate information on computers throughout the company — without having to know where to look, or how to get there. And it inspires workgroups to collaborate in entirely new ways.

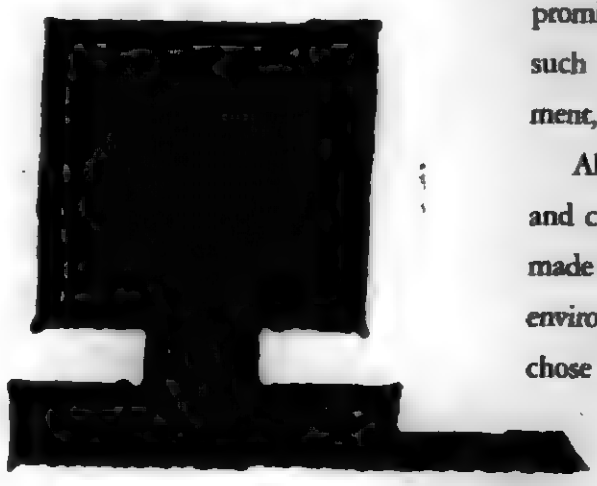
These ideals are not just Sun's. They're shared by every vendor of client-server computing.

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That way, Sun was able to devote itself to perfecting a single, integrated client-server approach.

Which leads us to another advantage Sun had in its favor:

By starting out with a completely open mind, we ended up with completely open technology.

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From the beginning, we were determined that a Sun system should include the hardware, networks, and databases you already use.

*Independent analysts Aleta Brown & Sun estimate that commercial and technical businesses worldwide will invest $240 billion or more this decade in the desktop computers and servers that comprise client-server technology.

Today, every Sun workstation and server is powered by the SPARC® microprocessor, running the UNIX® operating system, accessible by the OPEN LOOK® graphical user interface, and linked together in the ONC™ networking environment.

Each of these technologies was designed on open industry standards; or, where no existing standards were to be found, we made ours available to the rest of the computing world.

Consequently, Sun client-server systems can give users uncomplicated access to all of your existing computers — even those running proprietary operating systems such as Ultrix, AIX, Xenix, DOS, OS/2, VMS, MVS, VM, and Macintosh.

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Could a systems administrator manage an integrated, multivendor network, without seeing its underlying complexities?

Could a software developer design around a graphical user interface, without seeing a line of its code?

The answers are yes, yes, and yes.

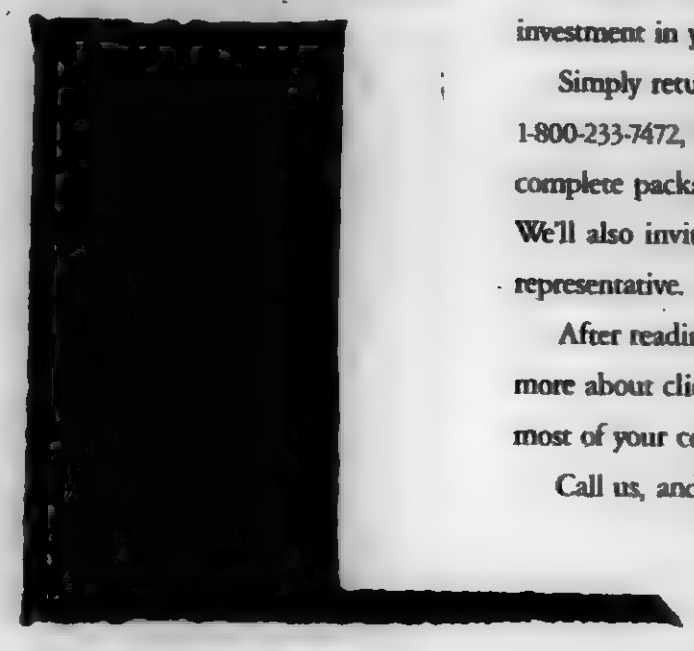
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IBM to resell second DEC connectivity tool

BY ELISABETH HORWITT
CW STAFF

WILLIAMSVILLE, Vt. — Fel Computing's Lanlink-Decnet software will be the second Digital Equipment Corp. connectivity product that can be bought directly from IBM, Fel announced recently.

Fel's package runs on a dedicated personal computer that is equipped with either two Ethernet boards or an IBM Token Ring and an Ethernet board. The resulting gateway can then connect workstations on either Ethernet or Token Ring to systems on a Decnet/Ethernet local-area network. Workstations running software from IBM, Banyan Systems, Inc. or Novell, Inc. can access Decnet servers and other systems that comply with DEC's Local Area Transport protocol.

Fel's gateway software runs on a DOS-based PC or IBM Personal System/2. It is said to support up to 100 simultaneous sessions. A five-user link kit is priced at $1,495.

IBM also resells Interlink Computer Sciences, Inc.'s Software Network Solution SNA Gateway, a family of software products that links IBM MVS hosts with Decnet for a range of purposes, according to Interlink spokesman Don Parkman.

The base product provides file transfer, terminal emulation and security. One optional module allows IBM's Netview to manage Decnet installations, a second module supports program-to-program communications between IBM and DEC systems, and a third allows DEC systems to be backed up on tape drives attached to an IBM mainframe.

Interlink, which is based in Fremont, Calif., entered an agreement last July under which its gateways are sold directly by IBM's sales force, Parkman said.

"Before July of last year, we had a marketing arrangement with IBM in which we would go into accounts as a team; they'd refer us," he added.

EPA

CONTINUED FROM PAGE 59

remedial action. Geographical information systems — which currently run on about 100 Sun Microsystems, Inc. workstations — "display tabular data boiled down into static, colorful maps," Bittenbender explained. "Rather than having to wade through volumes of statistical data, you have one color picture of all the stats to trace pollutants back through streams, see their concentration and find out where the problem is coming from."

The geographical information systems could eventually link to the two supercomputers, which will perform the massive calculations necessary to put the static information into three-dimensional motion for complex modeling and measurement. One example of the supercomputers' duties, Bittenbender said, would be to predict the dispersion characteristics of 100 pounds of a pollutant on a body of water constantly in motion. Currently, the function is performed at the North Carolina Supercomputer Center.

Allowing global workers common access to these resources will allow the EPA to follow through on President Bush's agreement with several foreign nations to team up on environmental projects, Bittenbender said. "We communicate electronically with about 100 foreign countries today," which means the X.400 OSI standard for E-mail is among the top items on EPA equipment checklists, Bittenbender said.

ONE EXAMPLE OF the supercomputers' duties, Bittenbender said, would be to predict the dispersion characteristics of 100 pounds of a pollutant on a body of water constantly in motion.

Internally, the EPA runs Digital Equipment Corp.'s X.400-compliant All-in-1, which can link to other E-mail systems through DEC's VAX Message Router X.400 Gateway.

The agency runs 190 Novell, Inc. Netware servers in addition to some DEC Decnet protocols in the research and development area over the Token Ring platform. One point of concern with the widespread Netware installation is that Novell's announcement in February of Netware v3.11 — which supports both Transmission Control Protocol/Internet Protocol and OSI stacks — was functionally good news but bad news in terms of price.

Because many of the agency's LANs run Netware 286, for which there is no upgrade price break, it would cost the agency about $1 million to move to v3.11, Bittenbender said. He said he envisioned price increases of 300% to 400% with v3.11, and he is considering the higher cost of replacing all of his Netware systems with IBM's OS/2 LAN Server.

"However, I've heard that there is high overhead with source route bridging," he said. Source route bridging is IBM's scheme for internetworking Token Ring LANs. "I'm really open to any LAN solution at this point."

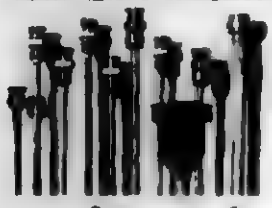


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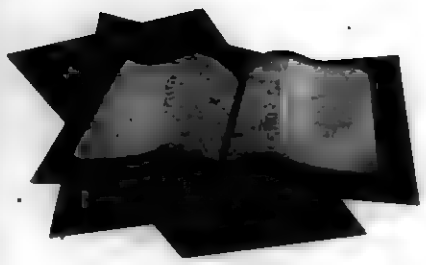
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UNIX DATABASE

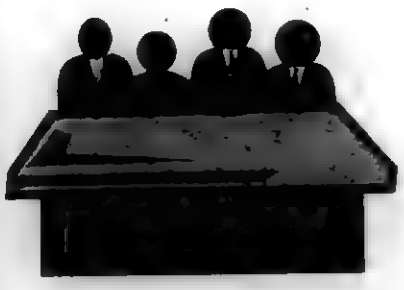
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IDC Study on UNIX OLTP

UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.



About the TPC

The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

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The Number 1 Choice for UNIX OLTP

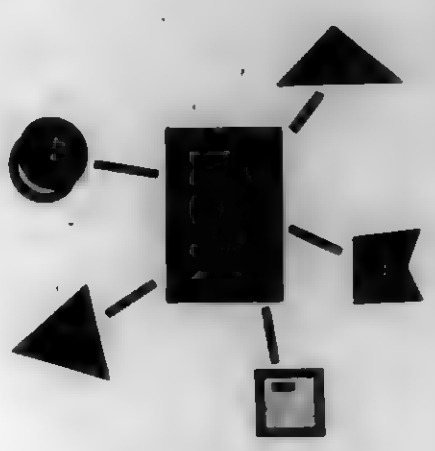
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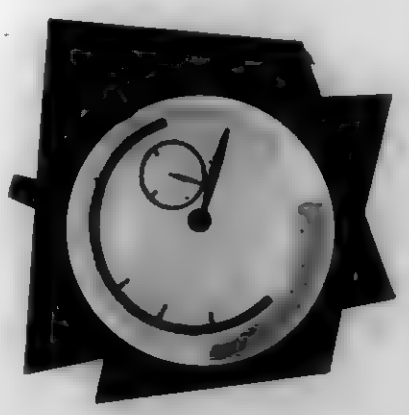
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NETWORK SHORTS

Teleos, AT&T join forces

Teleos Communications, Inc. said last week that it has teamed up with **AT&T** to stimulate sales of both Teleos' Integrated Services Digital Network (ISDN) equipment and AT&T ISDN-based services. Teleos said the firms' products and services will be marketed by both firms' sales forces in the domestic U.S. Teleos devices allow users to access an ISDN communications line, and AT&T will reportedly be displaying Teleos' 1.5M bit/sec. Primary Rate Interface equipment — which links a user site and an AT&T Primary Rate Interface network — at its customer presentation sites around the country.

3Com Corp. recently announced a network systems integrator program for existing 3Com resellers that are expanding their network adapter and hub sales to include router, bridge and terminal server products.

The **National Center for Manufacturing Science (NCMS)** has announced a partnership with **Allen-Bradley Co., Concord Communications, Inc.** and **General Motors Corp.** to promote enterprisewide factory networking. According to NCMS, the partnership will devote more than $1 million to the development of a next-generation broadband modem based on the IEEE 802.4 token-bus standard.

Enterprise networking vendor **Banyan Systems, Inc.** is breaking a new print advertising campaign today that compares its Virtual Networking System network trait for trait against Novell, Inc.'s Netware local-area network. The move represents a step toward what the industry has been nagging Banyan to do for years: get the word out about its technology advantages in constructing large networks. The brass-tacks language of the materials targets information services executives who read about Novell's walloping market share and are not necessarily tuned in to the technical subtleties that LAN administrators have picked up on.

Lotus Development Corp. has announced completion of the Soft-Switch Lotus Notes Gateway for its Notes groupware environment. It will allow Notes users to exchange mail with over 50 electronic mail systems already supported by **Soft-Switch, Inc.** That gateway "will provide the critical communications connection required to implement our distributed mail architecture," said Mark Polly, a senior end-user computing consultant at **Progressive Casualty Insurance Co.** in Cleveland. The gateway runs on a Notes server and can support an entire network of Notes servers. Slated for third-quarter availability, pricing for the gateway begins at $4,995.

Tool automates PC upgrades

Tangram's software benefits similar to IBM's Distribution Manager

BY ELISABETH HORWITT
CW STAFF

CARY, N.C. — Tangram Systems Corp. has produced a rival to IBM's Netview Distribution Manager, the software package that allows IBM mainframes to act as software distribution centers for personal computers.

An IBM MVS mainframe running Tangram's AM:PM software can automatically distribute software and data to, and collect data from, OS/2 and DOS workstations residing on a network, the software vendor said.

Tangram's communications software product, Arbiter, works in concert with AM:PM to provide a variety of ways for the mainframe and workstation to communicate.

A mainframe running the product can be programmed to automatically download software to an OS/2 system at a given time, Tangram said. The software uses the OS/2 background mode so that the workstation can continue to run other applications without interruption, according to Steve Kuekes, Tangram's vice president of product development.

DOS capabilities

The mainframe can download software to any DOS PC that is left running with the DOS command prompt on, Kuekes said. Thus, users can leave their PCs on at night and come back to updated software in the morning. If the updates must take place during work hours, the software can beep a user to get out of whatever task he is performing and return to the DOS command prompt, he added.

The software also provides the following features:

- Logging of both failed and successful attempts to distribute software to a given workstation.
- The ability to collect as well as distribute data. This is useful for production applications where, for example, the mainframe can be programmed to collect all of the data entered on PCs during the day, process the data and distribute back answers overnight, Kuekes said.
- The ability, via Arbiter, to take control of a PC from the host. The host can download software updates and then initiate a PC program to integrate them into the existing package instead of having to download the entire new software version into the PC, Kuekes said. IBM offers a similar utility.
- Interfaces to popular IBM mainframe-based security systems such as Computer Associates International, Inc.'s Top Secret and ACF2.

A security utility geared for automatic software distribution allows the mainframe to download a new password to each PC at the end of a transaction.

That new password is then used by the PC the next time it identifies itself to the mainframe as a recipient of a software update. This eliminates the need for users to store their passwords on the network, where they can easily be used by an unauthorized person, during unattended communications between the PC and mainframe, Kuekes said.

One feature that IBM provides and Tangram, so far, does not is an OS/2 version of the distribution system. IBM's Distribution Manager/2, scheduled to ship at the end of this month, is said to allow Netview Distribution Manager Release 3 running on a mainframe to distribute applications software and OS/2 operating systems software down to OS/2s running Distribution Manager Release 2.

Server functions

OS/2s running Distribution Manager can also act as servers that collect the software from the mainframe and then distribute it to OS/2 and DOS workstations over a LAN, IBM said. The recipient workstations must be running Distribution Manager Release 2 LAN Download Utility. An OS/2 server running Distribution Manager Release 2 can also act as a local software distributor without the mainframe connection, IBM said.

The next version of AM:PM, which will probably be out by year's end, will be able to download to OS/2 servers as intermediate points for LAN distribution, Kuekes said.

The initial version of AM:PM is due out by the end of this month. It will be offered as a feature of Arbiter, with prices ranging from $45,000 to $98,000 for Arbiter users.

First-time customers can buy Arbiter with the AM:PM feature for between $82,000 and $190,000, Tangram said.

FCC chairman urges less government regulation

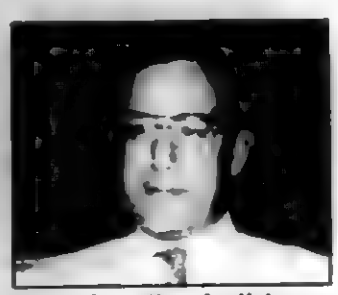
Market forces will promote technological innovation in the industry, according to Sikes

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Testifying before a congressional panel recently, Federal Communications Commission Chairman Alfred C. Sikes urged the government to lighten the hand of regulation on the U.S. communications industry. He said his vision of the future of communications will be difficult to meet without changes to the federal regulatory infrastructure.

Speaking before a subcommittee of the Senate Committee on Commerce, Science and Transportation, Sikes said, "I think . . . that those of us in government who have important responsibilities for U.S. communications policy should place special emphasis on permitting the market to determine the best mix of communications facilities and providers.

"We should place special emphasis on ensuring an environment which is conducive to the maximum possible technological progress and innovation."



Sikes is calling for lighter restrictions to promote innovation and progress

Asked to describe his vision of the future, Sikes predicted a dramatic expansion of channel capacity and advances in transmission speeds enabled by digital transmission, fiber optics, computer technology and "the seemingly limitless talent of America's software industry."

Opening new doors

Those technologies will make possible such things as electronic libraries serving rural areas and powerful new medical services based on computers, radiation treatment and diagnostic equipment linked by fiber-optic and satellite communications. In addition, Sikes predicted there will be a multimedia "seamless network of networks" combining telephone, cable and mobile networks.

Sikes referred to investments of public funds by Japan, Germany and France in specific new communications technologies, but he urged a more laissez-faire approach for the U.S.

"No government will have the optimal recipe [of technologies and vendors], and none is well-equipped to serve as the industry's master chef. The choice we need to make is to rely on private enterprise and competition to produce the best possible mix," Sikes said.

> "THE CHOICE WE need to make is to rely on private enterprise and competition to produce the best possible mix."
>
> ALFRED C. SIKES
> FCC

"The 'network of networks' is a very interesting concept," said Sen. Ted Stevens (R-Alaska). "Can we get there with existing regulation?"

"No, I think there have to be changes. There are a series of laws and arrangements that have to be revisited," Sikes replied without mentioning any specifics.

According to Sikes, current regulations are based on a simpler world of single-use technologies and are not well-suited for modern, hybrid "high-capacity technologies driven by computers."

"We can't get from here to there under the Consent Decree," Stevens said, referring to the terms of the AT&T breakup, which still largely constrain AT&T and the Bell operating companies to traditional lines of business.

"I agree," Sikes said.

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LXE

Horwitt

CONTINUED FROM PAGE 59

accord signed two years ago by 19 member nations. The initiative calls for PTTs to make one-stop shopping agreements whereby one PTT can act as a liaison between users and other European PTTs.

Such agreements can benefit PTTs and users by taking a lot of the pain out of setting up pan-European networks. An increasing number of multinational companies are signing network outsourcing contracts with global value-added network vendors because they are tired of dealing with multiple PTTs, each with its own tariffs, regulations and bureaucracy.

Perhaps the most crucial of the recent European initiatives is the Open Network Provision proposed in December 1989 at the European Community's Council of Ministers meeting. The provision includes the following directives:

- Approval of telecommunications equipment in one country means approval for all 12. This initiative would make it a lot easier for foreign telecommunications equipment vendors to introduce products across Europe.

For the initiative to work, all European PTTs would have to support the same specifications for hooking customer premise equipment to their services. That is not presently the case, sources say. One source likened trans-European communications to taking a train across Europe: At one border, you may have to stop to convert your power source; at another, you may even have to change to a different set of tracks.

- While voice telephony services should remain monopolies of PTTs, data communications services, both circuit and packet-switched, should be progressively opened up to competition. The goal is regulated competition by Jan. 1, 1993.

European governments must play a role in the implementation of the above initiative, and indeed, some have. For example, France recently passed a law requiring France Telecom to provide other network service providers with equal access to its domestic network. The UK has relaxed restrictions against third parties who lease lines from the major UK carriers and resell the bandwidth to their customers.

However, Germany, Italy and Switzerland (which is not a member of the European Community) are much less open to competition. Pricing for international leased lines remains high in these countries, and it still takes longer than many telecom managers can tolerate to order a high-speed leased line. This is not surprising — the more competition is allowed, the more the PTT is pressured to upgrade its infrastructure.

To be fair, some PTTs have unique barriers to telecom modernization. Germany's Deutsche Bundespost, although one of the more monopolistic PTTs, is putting a lot of its energy and funding into the huge task of upgrading Eastern Germany's telecommunications infrastructure. Telefonica is moving to modernize, but it has a longer way to go than many PTTs because it started late.

The fact is, no one can "win" the race to open up and modernize Europe's communications environment — any more than Europe, the U.S. or Japan can beat the rest of the world at network service quality. When it comes to global business communications, as with global ecology, we must all pull together to win — or we'll all lose. Big.

Horwitt is a *Computerworld* senior editor, networking.

PC support for Quickmail

BY JIM NASH
CW STAFF

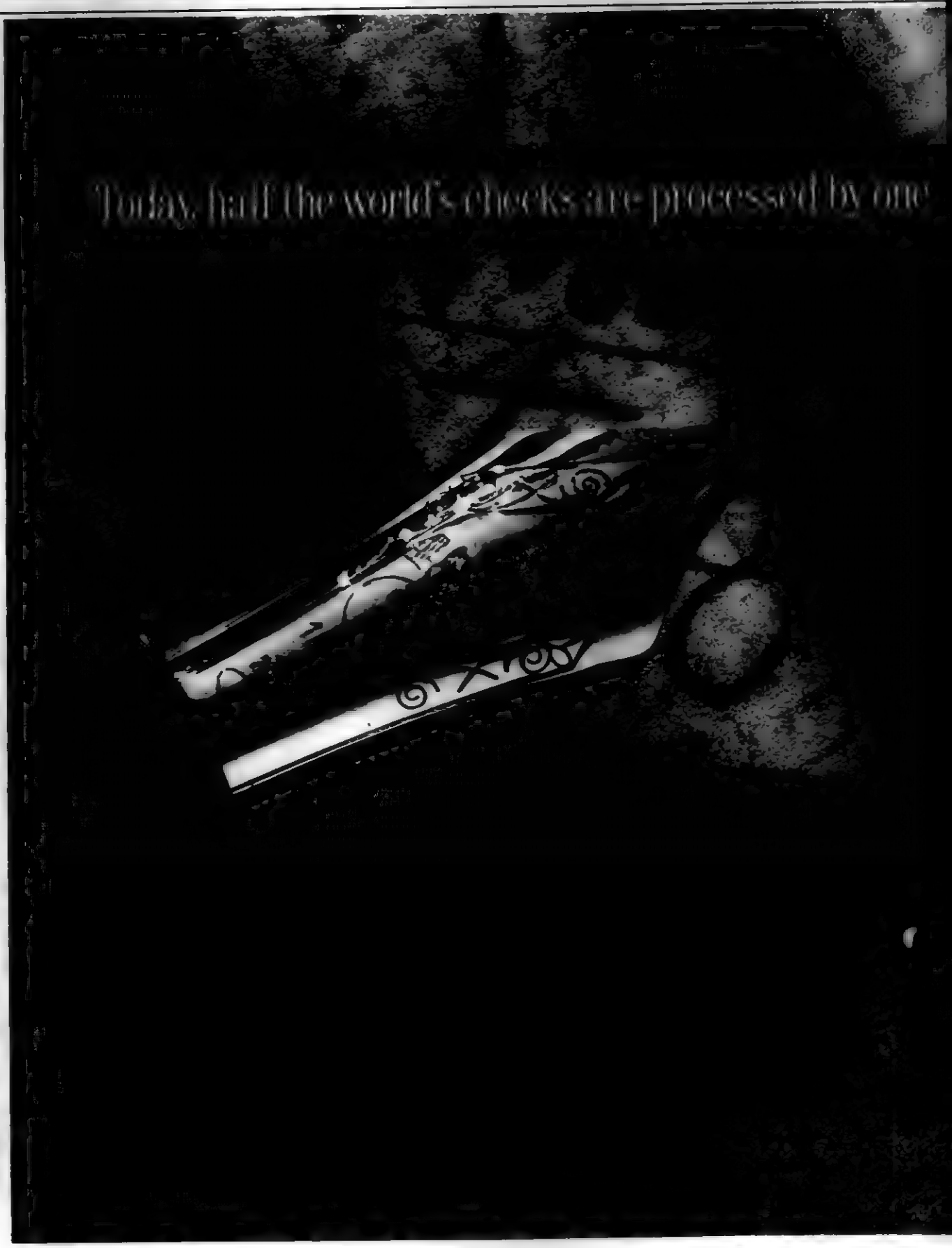
WEST DES MOINES, Iowa — CE Software, Inc. picked up support for most major personal computer platforms in the newest version of its Quickmail electronic mail application. CE announced last week that Quickmail Version 2.5 will transport E-mail on MS-DOS, Microsoft Corp.'s Windows, OS/2 and Apple Computer, Inc. networked machines.

However, one beta-test user said he was more impressed with the new efficiencies in Version 2.5. Mark Chalkley, an information systems officer at Signet Bank in Richmond, Va., said CE is now using a technique available in other PC and mainframe mail packages to conserve E-mail server memory by sending only "pointers" to mail recipients.

Only one message is created, Chalkley explained, but electronic pointers alert recipients to look at the message. Multiple users can view the message simultaneously. The new version is scheduled to ship in the second quarter of this year.

- An Apple machine must be used as the mail server. Version 2.2 on workstations requires a Macintosh Plus running System 6.03 or higher. Although Version 2.2 on the server requires System 6.04 or higher on a Macintosh Plus with a hard drive, a Macintosh SE is recommended.

Version 2.5 requires a Macintosh Plus with 1M byte of memory or more running System 6.04 or higher, and a hard drive is recommended. On the server, Version 2.5 requires a Macintosh Plus with a hard drive running System 6.05 or higher. A Macintosh SE with at least 1M byte of memory is recommended.



Electronic conference system calls for new way of business

BY JOANIE M. WEXLER
CW STAFF

DALLAS — There is a big "if" attached to whether Videotelecom, Inc. will revolutionize the way people work with the whizbang electronic conferencing system it announced recently: Is the user community ready to completely rethink the way it does business?

The Austin, Texas-based vendor demonstrated an IBM Personal Computer AT-based system that enables geographically separated co-workers to manipulate data files in real time in multiple windows on their video monitors, view each other, chat and fax hard-copy materials all across one circuit.

"Like all technologies, the concept will probably take some time to become accepted intellectually," predicted Phil Evans, president of the International Communications Association (ICA). Videotelecom plans to demonstrate the system — dubbed Mediamax — at ICA's annual conference this week in Anaheim, Calif.

Mediamax will likely appeal first to the engineering community, which can better cost-justify the company's separate Digital Video Branch Exchange, necessary for multipoint electronic conferencing, Evans pointed out.

An eight-port switch costs $70,000; a 14-port switch costs $98,000. These price tags sit on top of the $35,000 to $85,000 price of the PC-based system that is required at each connected site.

"Technical applications depend more on collaborative work from resources in remote locations to solve problems," Evans said. "In the administrative area, I would think it would be some time before companies could justify such a system."

Price Craddock, telecommunications analyst at Hardee's Food Systems, Inc. in Rocky Mount, N.C., agreed. "I could conduct a multipoint conference over the [U.S. Sprint Communications Co.'s] Meeting Channel and wouldn't have to go out and buy that switching unit," he said. "I can buy a $40,000 [coder/decoder] and let Sprint do the switching.

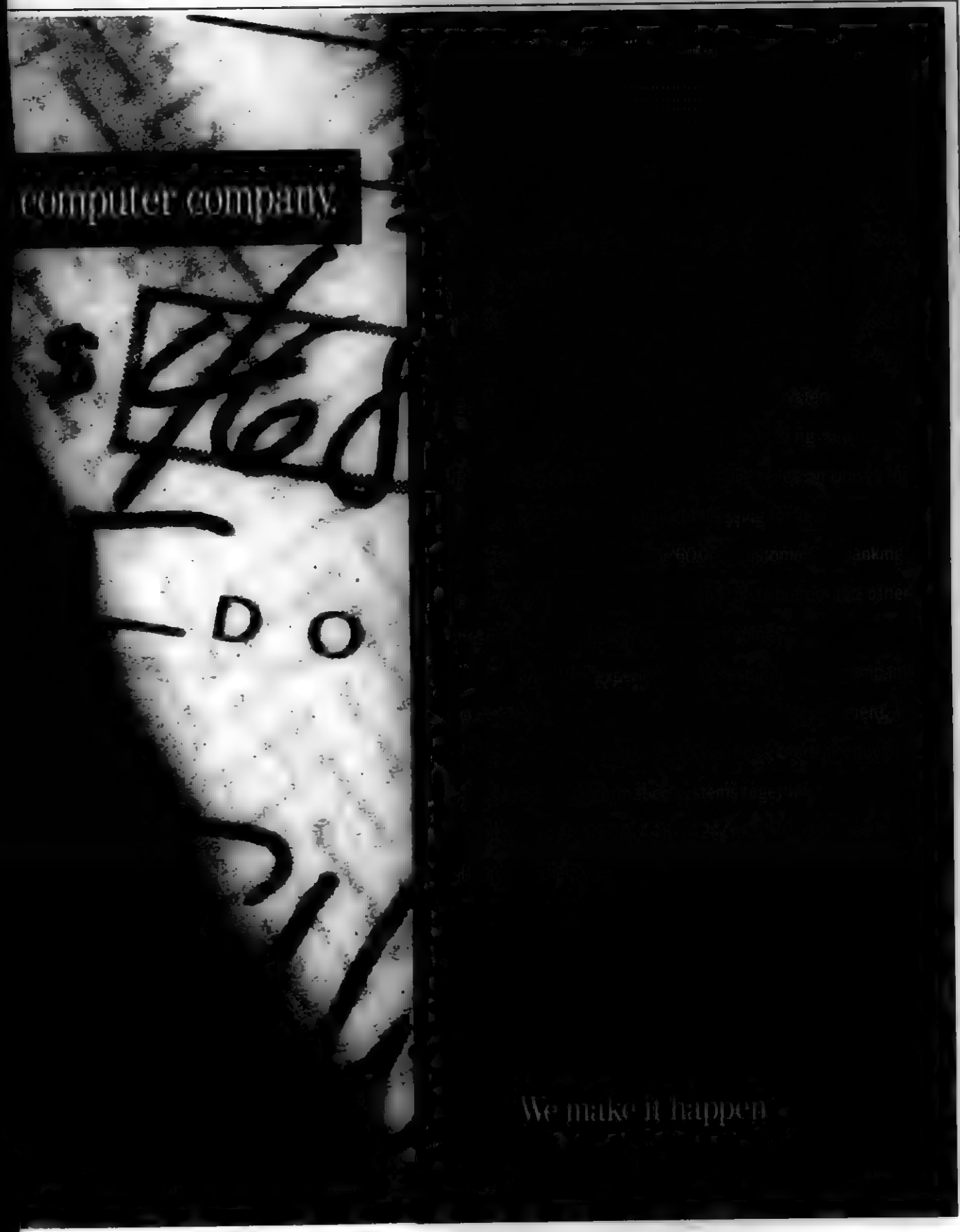
"I can't imagine any of our average videoconference users needing interactive data manipulation. How many people need that much capability at their fingertips? If you're living and breathing graphs and charts, maybe," Craddock added.

Videotelecom's system, based on an Intel Corp. 80386- or I486-based, 40M-byte PC, includes audio, video, fax and file exchange/manipulation capabilities along with an optional $4,000 record/replay feature. The option alerts co-workers across time zone barriers of a "media message" when they boot up their computers, allowing them to replay meetings and view the various versions of file revision.

"This is one videoconferencing vendor that has the right idea," commented Janet L. Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass. "With this system, you don't leave the meeting room with an action item. You design, draft proposals and sign off right there."

The integrated set of functions will work over a 56K bit/sec. channel, the vendor said, although 112K bit/sec. is recommended.

Existing Videotelecom Conference System 350 users can upgrade to the new architecture, which incorporates the newly ratified CCITT px64 standard for video compression, for $15,000.



NEW DEALS

AT&T to do Honeywell net

Honeywell, Inc. has selected **AT&T** to provide more than 200 company locations with interstate and international voice and data services. Minneapolis-based Honeywell said it expected the $20 million customized voice and data network would save the company $5 million per year.

AT&T also won a $30 million custom network contract from **Choice Hotels International** and its parent company, **Manor Care, Inc.**, for a network serving both its Washington, D.C., corporate headquarters and its hotels, nursing homes and other properties. The custom network deal with AT&T follows an agreement last year — valued at more than $90 million — for credit-card and operator assistance services.

MCI Communications Corp. said **General Electric Corp.** has signed a new, five-year agreement. The contract — which is of undisclosed value — covers a range of voice and data services, including 800, virtual private networking and private line services.



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Stratacom puts T3 on T1 unit

BY JOANIE M. WEXLER
CW STAFF

Fast-packet wide-area switching pioneer Stratacom, Inc. announced two T3 cards for its Integrated Packet Exchange (IPX) T1 multiplexer last week.

The move aims to tide over the Campbell, Calif., vendor's bandwidth-hungry customers while the firm constructs a standards-based architecture for a packet-oriented broadband switch.

"The bottom line is that this move by Stratacom gives the IPX a way to compete in providing T3 speeds today," said Rosemary Cochran, a principal at Vertical Systems Group, Inc. in Dedham, Mass. Other vendors offering T3 capability include Timeplex, Inc., Digital Link Corp., T3 Plus, Inc. and Network Equipment Technologies, Inc., she said.

Stratacom's first card, due out in the third quarter of this year, is an $18,750 circuit-switched interface that links IPXs and other equipment over dedicated circuits within T3's 45M bit/sec. bandwidth.

The second card, slated to ship in the second quarter of 1992, will be a CCITT-compliant cell-relay card that will afford T3 users the efficiencies of fast-packet switching. To date, the IPX's cell-relay scheme has been proprietary because the company's architecture preceded the formation of a standards body for the technology.

William R. Stensrud, Stratacom's vice president of marketing, said Stratacom customers have cited their initial uses of T3 as concentrating clusters of T1, private branch exchange, router and video traffic over the T3 channel into a long-distance carrier's central office. From there, individual T1s can be dispersed to a variety of carrier services.

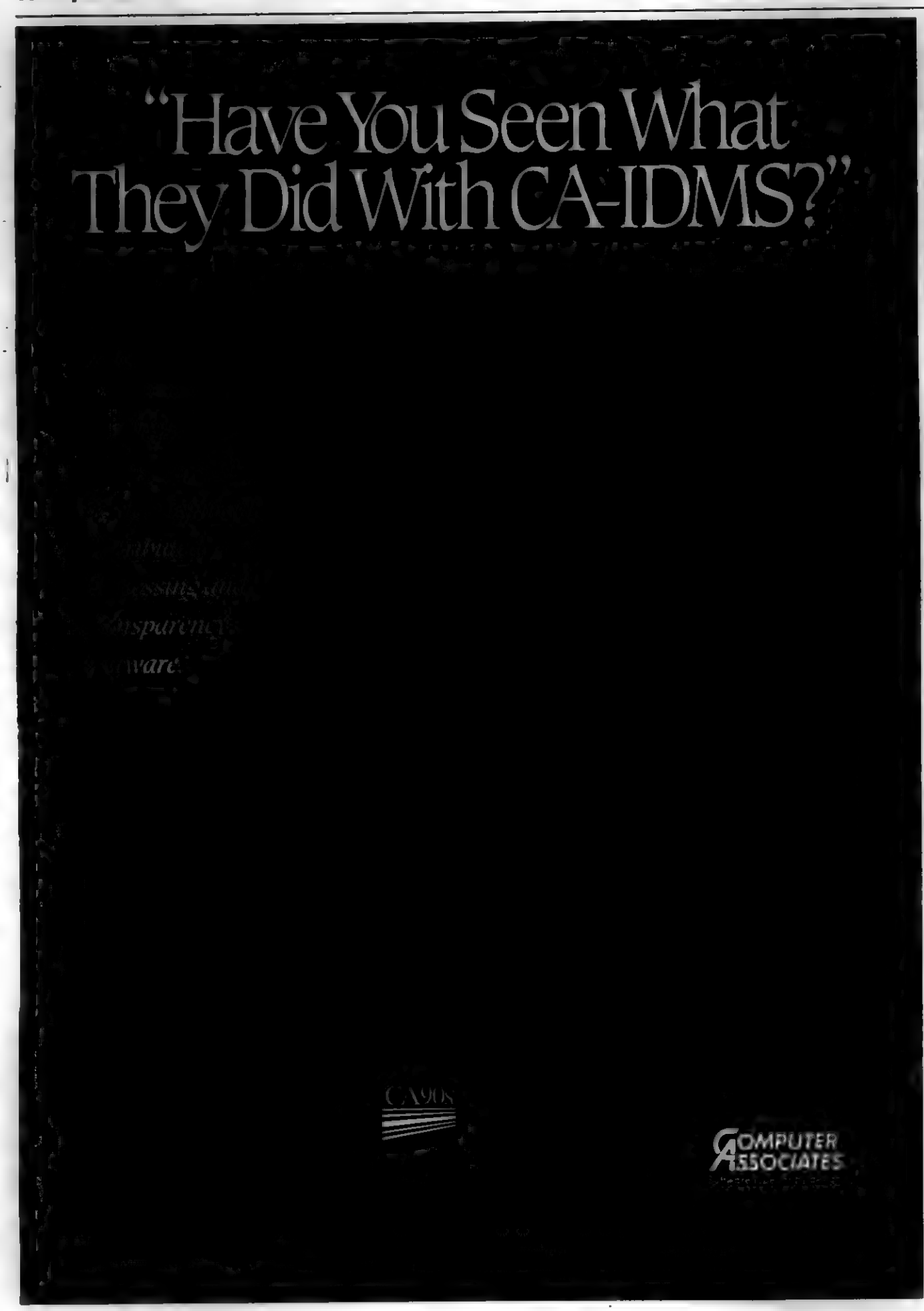
Stensrud said T3 will probably not be widely deployed until at least 1993, when Stratacom intends to roll out a new broadband IPX architecture to accommodate such emerging high-speed technologies as Switched Multimegabit Data Service, Fiber Distributed Data Interface and Synchronous Optical Network. "We don't expect users to go from T1 to broadband speeds overnight," he said.

Future growth predicted

Vertical Systems Group has not been bullish on T3 for the short term but predicted the 1991 U.S. T3 market of $45 million to grow to $200 million by 1994. Williams Telecommunications Group and Compuserve, Inc. are initial testers of Stratacom's T3 components. Because carriers aggregate large quantities of data from many customer sites, they are likely to be early adopters of the higher speed technology, Cochran said.

Mike Innell, assistant vice president of information technology development at Manulife Financial in Toronto, is an IPX user who anticipates never needing T3 bandwidth. Innell said he bought his pair of IPXs "because it was the best technology for voice compression."

With Stratacom's first card — dubbed the MT3 — traffic between IPXs converts to circuit-switched mode. This means each data stream is dedicated to an assigned 64K bit/sec. circuit within the T1 channel. Circuit switching is less efficient than packet switching for data transfer because bandwidth can sit idle on one circuit between data bursts while another circuit gets backed up.



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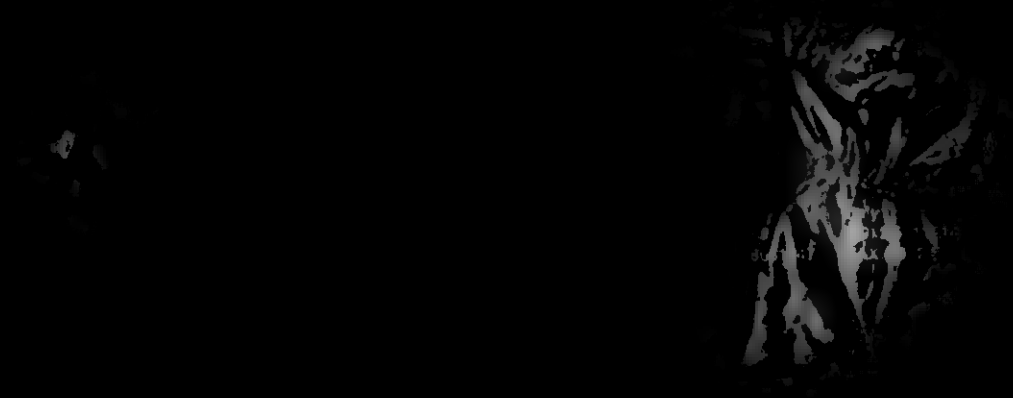
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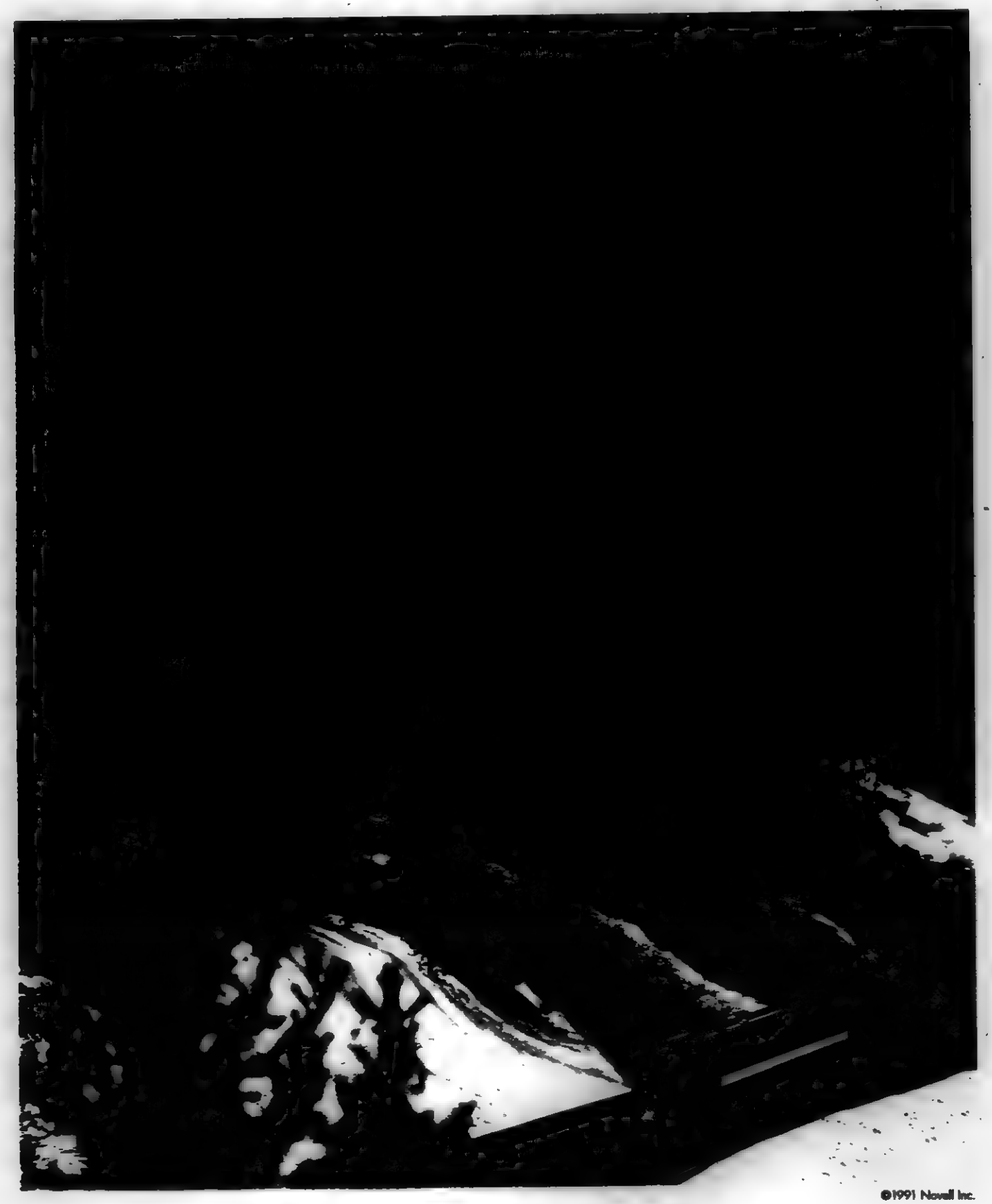
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However, ease of use, reliability and the industry's tightest security weren't the only factors that made NetWare the clear choice. "Several of our sites were already running an E-mail package and network from another vendor. NetWare was the only product that allowed us to protect our previous investment," recalls Hansen.

Fact is, NetWare is compatible with more applications, computing environments and hardware than any other network operating system.

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NEW PRODUCTS

Micro-to-host

Tektronix, Inc. has designed the Tekxpress XP29P, a terminal for development of two- and three-dimensional graphics applications supporting the Programmer's Hierarchical Interactive Graphics System (PHIGS) standard under X Window System.

The Tekxpress is the first PHIGS Extension to X protocol terminal available. The terminal includes enhancements to PHIGS such as Gouraud shading, double buffering and hidden-line/hidden-surface removal via dithering and Z-buffering.

A 0.28mm-dot pitch monitor and 7M bytes of memory are standard on Tekxpress models.

Pricing starts at $6,995.
Tektronix
Wilsonville Industrial Park
Wilsonville, Ore. 97070
(503) 682-3411

Firesign Software, Inc. has announced 3270IX, a software package offering users concurrent access to IBM mainframe and AIX-based workstation applications.

The product is the first 3270 emulator compliant with Systems Application Architecture guidelines, according to the company. It is also compatible with Synchronous Data Link Control, Token Ring, Ethernet and X.25 standards, Firesign reported.

Pricing for 3270IX starts at $795.
Firesign Software
82 Whipstick Road
Ridgefield, Conn. 06877
(203) 431-0213

Multi-Tech Systems, Inc. has announced a series of IBM 5250 emulator products for IBM midrange computers.

The 5250 emulator software packages are available for connecting personal computers to IBM System/36s or Application System/400s.

The local and remote versions each cost $250. Twin-axial add-in PC half cards providing for physical connection to the midrange systems are priced at $645.

The company also announced products allowing local and remote PCs to function as gateways connecting local-area networks to IBM midrange systems. Each version costs $1,350.
Multi-Tech Systems
2205 Woodale Drive
Mounds View, Minn. 55112
(612) 785-3500

Local-area networking hardware

Trilan Systems Corp. has introduced a system for integrating real-time data, voice and video transmission over a single 16M bit/sec. Token Ring network cable.

The system, Trilan, consists of add-in cards for personal computer nodes as well as gateways for interfacing with wide-area networks. Intelligent Node Coupling Units link nodes on the local-area network and automatically detect system failures.

The technology is compliant with industry communications standards, according to the company.

A voice transmission card costs from $2,000 to $2,500. Video cards cost approximately $7,500. WAN gateways are priced at approximately $2,000 per card.
Trilan Systems
2900 Dukane Drive
St. Charles, Ill. 60174
(708) 584-2300

Milan Technology Corp. has introduced a micro-size media converter for Ethernet local-area networks.

Attaching an Alternet adapter at each node allows users to switch networks with coaxial LAN cabling to 10Base-T unshielded twisted-pair topology, the company said. Alternet measures 3½ by 4½ inches and uses an external power adapter.

The product costs $329. A three-year warranty is included.
Milan Technology
67 E. Evelyn Ave., Suite 3
Mountain View, Calif. 94041
(415) 968-9000

Local-area networking software

A product that paves the way for concurrent Open Systems Interconnect (OSI) and Transmission Control Protocol/Internet Protocol (TCP/IP) communications capability on a single personal computer has been announced by FTP Software, Inc. and Concord Communications, Inc.

Current users of the OSI Manufacturing Automation Protocol can access files and data on Ethernet local-area networks running TCP/IP through Concord's Mapware controllers and FTP Software's PC/TCP software.

Mapware controllers contain a full OSI communications protocol stack and multiple interfaces; they also include a Network Device Interface Specification (NDIS) that communicates with the PC/TCP software.

Concord's OSI software interface, including the NDIS, costs $750 per site. It is available for the company's Series 1210, 1215 and 1410 controllers. FTP Software's PC/TCP for DOS costs $400; it costs $575 for OS/2.
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Marlboro, Mass. 01752
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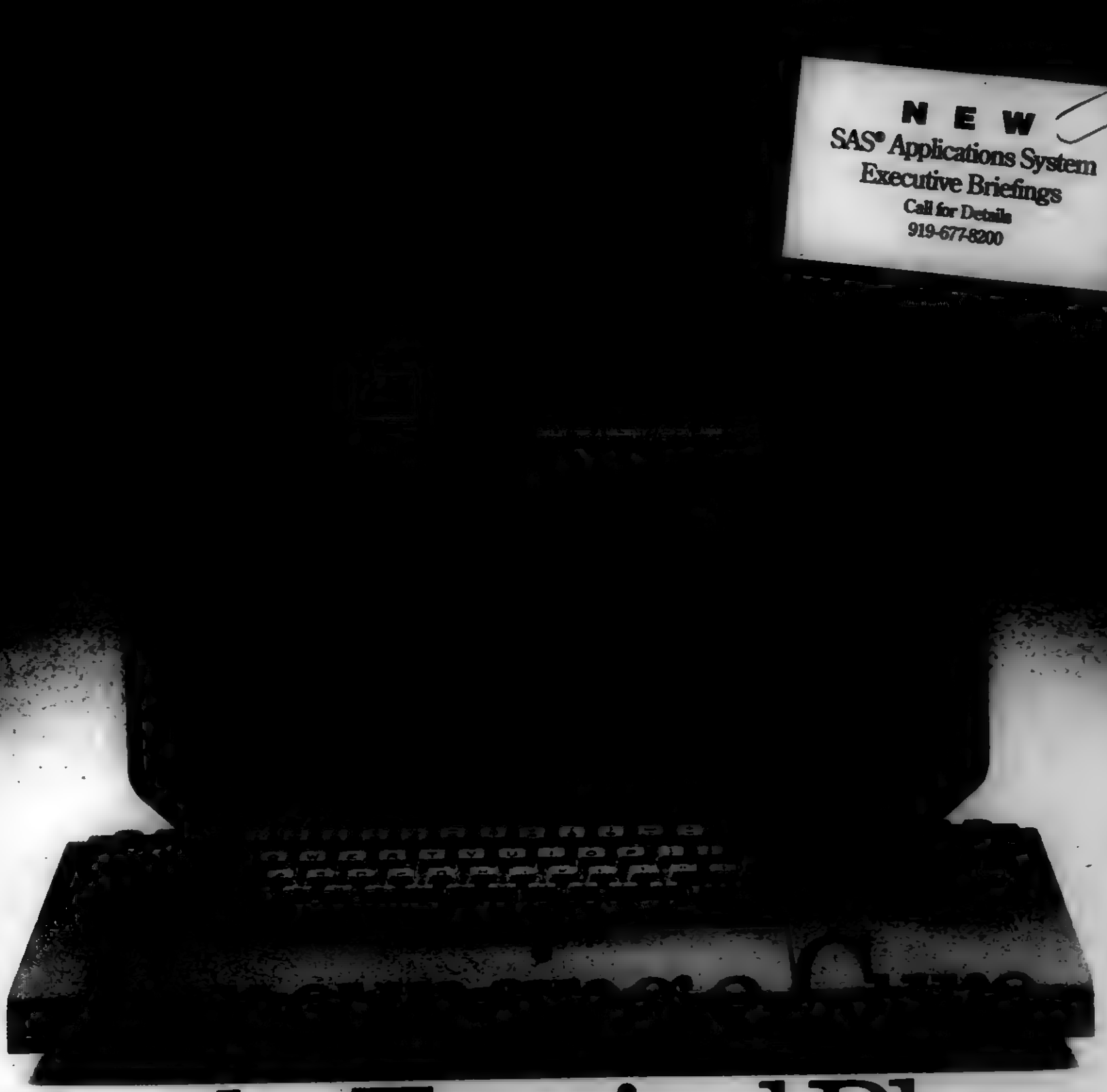
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HUGE

MANAGER'S JOURNAL

EXECUTIVE TRACK



Darwin Geiselbrecht has been named director of telecommunications and supervisory control and data acquisition services at Tenneco Gas, the Houston-based natural gas pipeline unit of Tenneco, Inc.

Geiselbrecht heads a new department responsible for all telecommunications relative to field operations. He joined Tenneco as a programmer/analyst in Hockley, Texas, in 1982. He was promoted to manager of operating network control in 1987.

Geiselbrecht was formerly employed by Teledyne Corp.'s Geotech unit and holds a bachelor's degree in electrical engineering from the University of Texas at Arlington.

.....

Alfred L. Picarelli has been appointed senior vice president of information systems at the Grumman Data Systems unit of Grumman Corp. in Bethpage, N.Y. He replaces Gerald H. Sandler, who was promoted to president of the Grumman Data Systems and Services Group in January.

Picarelli had been vice president of program management at Grumman Data Systems since 1985. A 20-year Grumman veteran, he has held various positions in project management and systems analysis.

He holds a bachelor's degree from Long Island University and an MBA from the New York Institute of Technology.

.....

David R. Hultsman has been named director of MIS at Texas Eastern Products Pipeline Co. in Houston.

He was most recently vice president of technology planning at System One Corp. He was the principal System One technology adviser in its facilities management agreement with Electronic Data Systems Corp. He previously held positions at IBM, Mobil Oil Corp., Peer Services, Inc. and Southland Corp.

Hultsman has bachelor's and master's degrees from Southern Methodist University and an MBA from the University of Dallas.

Power to the people

A complex web of computerized transactions is involved in delivery of electric power



BY SCOTT WALLACE
SPECIAL TO CW

How many computers does it take to make a light bulb work? A lot more than most people would suspect. Delivering affordable and uninterrupted power to a socket these days is a complex blend of production planning and inventory bartering that typically involves computerized transactions among several utilities.

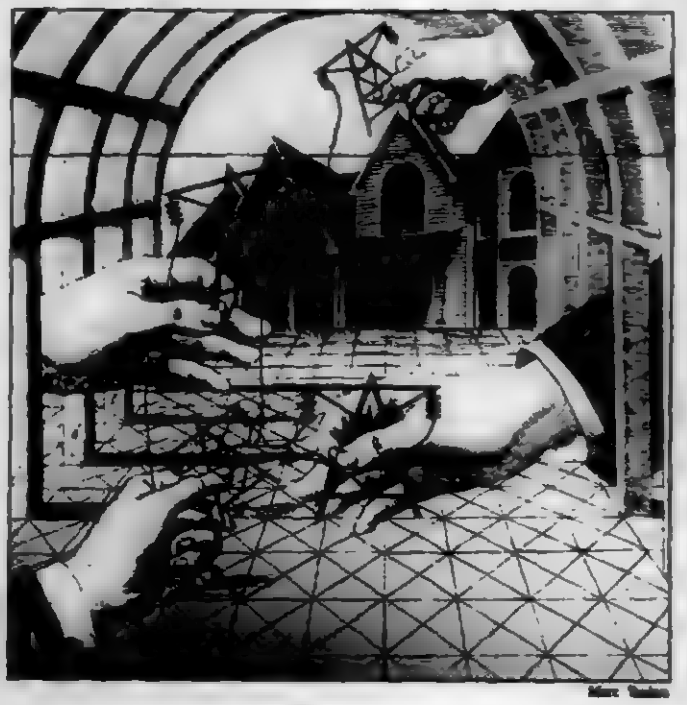
Power pooling among electric utilities has been around since the 1920s, but in recent years, timely intermember communication via technology has become critical to most pools' operations.

"The computer programs and interconnections provide us with the ability to adjust generation to demand on a five-minute basis," says Wayne Smith, manager of the New York Power Pool's (NYPP) Computer Services Group.

These links are especially important as the safety zone between demand and production capacity has dwindled and financial pressures have increased.

"Individual utilities have historically been able to produce 20% or 30% more power than their peak load demand," says Daniel Pfau, vice president of the Index Group, Inc., an information technology management consulting firm in Cambridge, Mass. "These days, those margins have shrunk considerably."

Construction of new generating facilities has slowed because of the costs of plant construction, consumer concerns about using nuclear power and oil reserves as well as growing investor scrutiny of utility financial performance.



So neighboring utilities and pool members have increasingly needed to rely on one another, with technology as the facilitator. Sometimes pooling is used to ease shortages, helping individual utilities avoid blackouts during unpredictable bouts of extreme weather. However, most power pool transactions are scheduled in advance, based on load forecasts that use historical and real-time data to predict power needs (see story page 80).

Through the NYPP in Guilderland, N.Y., seven investor-owned utilities and the New York Power Authority provide more than 99% of the state's electricity. Furthermore, during the spring and summer months each year, the NYPP also manages transmission of 800 megawatts of hydropower from Quebec to its members.

In 1990, NYPP's power brokering services, which are run out of its computerized power control center, saved its member utilities $93 million. Because operating costs are passed on to consumers, those savings were reflected on customers' bills.

Jack Valentine, communications specialist at NYPP's power control center, explains how: "One of our members will call in and say, 'My costs of generation for the next hour for my

Continued on page 80

IS concerned but not vocal on privacy issues

BY MITCH BETTS
CW STAFF

Many information systems managers come down with a bad case of "not my job" syndrome when it comes to helping the company protect the privacy of customer information, according to H. Jeff Smith, assistant professor at Georgetown University's School of Business Administration in Washington, D.C.

Smith recently conducted in-depth interviews on the privacy issue with 50 IS professionals in seven businesses: three banks, three insurance organizations and one credit-card company.

"It was a rare IS executive that I interviewed who was willing to go up against marketing people in the organization and say information should not be used this way," Smith said.

Not one of the IS executives interviewed took a leadership role in raising privacy concerns at the company, Smith reported.

Smith said the finding that the IS department takes a subservient role in privacy matters is a troubling one because the IS department probably has the best view of the company's overall collection, use, protection and release of personal information.



Compared with workers in other departments, "the IS people were more inclined to say that there is a big difference between the written policy [on information privacy] and actual practice in the organization," Smith said. "But they're not at all inclined to go into the executive suite and complain."

The IS managers said they are sometimes troubled by the way their company uses or releases customer information.

Smith cited the following statement by one IS executive as typical:

"If you ask a lot of executives here at the bank if we are violating customers' privacy, they will probably say 'no.' But some of the things that are done with customers' information would make [the customers] angry, I believe, if they knew about it."

The IS executive went on to say that despite his concerns, "it is not our role in the IS community to beat businesspeople over the head about this. It is our role to take their requirements and to implement them."

Ideally, chief information officers would raise information privacy concerns at the executive level, while midlevel IS managers could keep an eye out for privacy problems on individual system projects, according to Smith.

"What they told me is that they aren't raising those red flags very often, even though they are sometimes personally troubled."

Committee criticizes FDA systems' disarray

BY JIM NASH
CW STAFF

WASHINGTON, D.C. — A government committee's report dissecting the U.S. Food and Drug Administration (FDA) states that the agency's information systems department is rudderless and in disarray.

The agency in charge of ensuring the safety of new food and health products is in danger of being overwhelmed by political pressures and technological advances, according to the Advisory Committee on the FDA. Sherwin Gardner, one of 15 committee members and the senior vice president for science and technology at the Grocery Manufacturers of America here, said the FDA's underused and piecemeal computer system "is the single greatest problem" facing the organization.

The committee was formed at the behest of Health and Human Services Secretary Louis Sullivan, and its report was delivered to Sullivan May 15. Committee members spent one year researching the FDA and interviewing 150 witnesses. Members represent a cross section of technical, medical and managerial professionals.

Released last month, the report praises FDA employees but criticizes Congress and the president for heaping the agency with new responsibilities without providing adequate resources to meet them.

Committee Chairman Charles Edwards issued a statement with the report, warning that "without fundamental changes . . . the FDA will not be able to function adequately in the years ahead, and the risk of impending public health catastrophe will only grow." A spokesman for the FDA declined to comment on the report.

The agency's work is being diluted and delayed by a nationwide crazy quilt of FDA-owned IBM and Digital Equipment Corp. mainframes, Sun Microsystems, Inc. workstations and Compaq Computer Corp. desktop computers. Added to that are the often unique workstation and software setups that are lent to FDA application reviewers by pharmaceutical companies hoping to speed the process.

"They've got computers all over the place . . . but throughout the committee's hearings, the agency was unable to provide answers to basic questions" about the systems themselves or even the FDA's own infrastructure, Gardner said.

MANAGEMENT SHORTS

Bush pushes telecommuting

President George Bush continued to extol the benefits of telecommuting last month, saying that telecommuting is a concept whose "time has come" [CW, Nov. 26, 1990]. In a letter of greeting to the Minnesota Telecommuting Conference held in Bloomington, Minn., Bush stated that telecommuting reduces traffic congestion, fuel consumption and air pollution while meeting the needs of working parents.

After more than 18 months of discussion, the Society for Information Management (SIM) has voted to unify its more than 45 regional chapters.

According to John Owens, president-elect of the SIM user group and vice president of information systems at Carrier Corp. in Farmington, Conn., the local chapters will have until Jan. 1, 1992, to amend their bylaws and dues structures in accordance with the unified body.

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Power

FROM PAGE 79

most expensive 200 megawatts are $45 a megawatt. What have you got that's less?' " The center's Hitachi Data Systems Corp. AS/8083 computers then run through the available production and identify the cheapest 200-megawatt block, he says.

Each pool member provides daily projections of power availability and generating costs as well as power requests.

The price NYPP members pay for power is based on the projected cost for the requesting utility to produce power and the actual cost of the pool-delivered power.

"Let's say that 200 megawatts costs $25 a megawatt," Valentine says. "The selling price will be $35, a split between the $45 cost of the buying utility generating that power and the $25 for the selling utility to generate the power. It's called shared savings."

Power transactions, which are set up on an hour-by-hour basis, are handled by the NYPP's Hitachi computers. Once contingency analysis software has confirmed the security of the transactions, the system transmits generation information to the member computer. It is then up to dispatchers at the member power control center to determine which generators to ramp up or down and schedule the adjustment manually or by using a keyboard.

The NYPP computer communicates over 9.6K bit/sec. leased lines with redundant circuits to member dispatch and control centers. Microwave connections provide a communications backup in the event that phone circuits are disabled.

Tight coordination

The Pennsylvania, New Jersey and Maryland (PJM) Interconnection relies on tightly coordinated dispatch to make sure each of its members has an adequate supply of low-cost power.

"Member companies inform PJM ahead of time what generation will be available and what the cost of that generation is," says Ken West, supervisor of computer applications at Delmarva Power and Light in Newark, Del. "That's handled through an interactive, computer-to-computer link. PJM then schedules the [power generating] units that will be needed to generate the load forecast for that day."

The schedule is communicated over telecommunications links to computers at each of the member utilities' dispatch centers. It is up to the individual utility to determine the optimum way to generate its allocation, which is usually based on costs.

The operating costs for each generator vary depending on its loading. For instance, taking a generator from 90% capacity to 95% could cost a dollar more per megawatt than taking the generator from 60% to 65%.

"Each generator has a cost curve. PJM takes all the units that are available and models a composite cost curve," West says.

The cost of power is then calculated for the load at any one time, determining how much power each generator should produce.

Power as a commodity

The Western States Power Pool (WSPP), a group of public and investor-owned utilities, federal power marketing agencies and rural electric cooperatives in 22 states and British Columbia, runs what amounts to a mini commodity exchange on a personal computer bulletin board. Members can "trade" power using a system of "puts" and "takes." When a member finds power it wants to purchase, it calls the providing utility and arranges the transaction.

WSPP members in the U.S. provide about 25% of the country's generating capacity and serve more than 60 million people. From May 1988 through April 1990, WSPP transactions saved members $71 million on trades of more than 13.5 billion kilowatt hours of electricity — the equivalent of 2 million households' annual consumption.

To facilitate the exchange of information among WSPP members and other electric utilities, the Western States Coordinating Council (WSCC) in Salt Lake City has prepared a communication software standard that has been adopted by all of WSCC's regional members. "This will allow one company's computer to talk to another company's computer and exchange data," says Dennis Eyre, administrative manager at WSCC.

Wallace is a free-lance writer based in Warwick, Mass.

Forecasting first



PG&E's Hong: *Load forecasting comes before pooling*

Before there is power pooling, there is load forecasting.

Load forecasting, through its use of computer-based data analysis and modeling, enables utilities to keep tabs on power needs, scheduling additional energy from power pools as required. At Pacific Gas and Electric Co. in San Francisco, load forecasting consists of daily, weekly, monthly and yearly forecasting of system load, says Wayne Hong, supervising systems analyst in the Energy Management Systems department.

PG&E bases its forecasting on 10 years' worth of statistical data on temperature patterns in the state. For short-term forecasts (daily and weekly), this information is analyzed against real-time data gathered every two to 10 seconds, Hong says.

"We have about 300 remote terminal units that collect about 14,000 measurements from our transmission lines, towers, power plants and power houses about power flow and transmission line load," Hong says.

Number crunching for both the forecast and real-time data is done on PG&E's Control Data Corp. Cyber mainframe, which also handles statistical models of PG&E's energy load.

System dispatchers can make adjustments to the forecast on the fly or whenever increases in the load are needed, Hong says.

When more power is called for, operators telephone neighboring utilities involved in the Western System Coordination Council to buy energy. With the coupling of temperature forecasts and real-time measurement, short-term forecasts have less than a 2% error rate.

Longer term forecasts at PG&E take into consideration such factors as demographic distribution, the economy and population growth.

SCOTT WALLACE and LORY ZOTTOLA

NEWS AND VIEWS JUNE 1991

An OPEN *Discussion* on Service

Changing business climates. Open computing environments. Systems integration. Partners, pricing, and training. Here Russ Gullotti, Vice President of the worldwide Digital Services organization, addresses some of the challenges facing his services organization today. And he answers tough questions often posed by customers like you.



Russ Gullotti
Vice President
Digital Services

Why the recent restructuring of Digital's services operations? And how will it affect customers?

Now Digital has a single services story to tell. We've done some streamlining, combining our former Customer Services (CS) group and Enterprise Integration Services (EIS) under one services umbrella — simply named Digital Services.

This is proof of the company's commitment to investment in services. It's an evolution, not a revolution. Digital has always been a leader in providing services and support. Like others in the industry, we're looking to define an organizational structure that works best. We want to make the relationship between you and Digital run a little bit easier, more efficiently, and more effectively for both of us.

It's important to note that we manage and provide service locally at all our field locations around the world. Digital's working resources are right out there with you. The corporate services organization provides the ties with Digital's business units and marketing strategies to implement methodologies, tools, and training. The 43,000 services people in the field still take direction from the local account manager. Out there is where day-to-day decisions are made — in direct support of you.

Today everyone is talking about openness. Open computing. Open systems. Now we're hearing about open services. How do you define open from the services perspective?

When it comes to services, open is the ability to carry a full set of solutions into a heterogeneous computing environment. It is when we tailor a flexible package to meet your particular needs, and it includes standards. For example, Network Application Support (NAS) implements a full set of global and industry standards.

"Digital is setting the standards for open multivendor service and support."

Digital is setting the standards for open multivendor service and support. Some computer manufacturers may have open services, but not open computing. Others have open computing, but they can't offer open services.

We can provide it all — from consulting, through tailored hardware and software, tailored networking, support services, recovery services, facilities management, and training. You name it, we've got it. And if we don't have it, we've got a partner that does.

Integrate other vendors' systems together? We can do that. Write software on someone else's platform? We can do that.

Our inherent computing style and breadth of service capabilities enable us to plan, design, implement, and manage a tailored solution — to help give you the unique advantage you need to succeed in your marketplace.

Digital is known primarily as a hardware company. How can Digital remain credible as a systems integrator when recommending equipment as part of a solution?

First, we need to change that perception. I'd say the best way to describe Digital is as a solutions provider, with excellent hardware and excellent software, as well as outstanding services. The fact that 40 percent of our revenue is generated from services certainly suggests that we are much more than a hardware company.

As to whether we're biased, how much more unbiased can you be than to dedicate yourself to run on anybody's platform, whether it's Digital or not? We've proven ourselves there. We recommend other people's equipment and applications all the time. And we work solutions to incorporate existing systems from other vendors. We service some 8,000 pieces of non-Digital hardware and software, which is a strong indication that we're not intimidated by multivendor environments.

Of course, there are some customers who will never believe that we could be unbiased. In that case, we won't try to convince them. Instead we'll work with a partner they're comfortable with, and do business from there. Other customers don't care. They simply say, "Look Digital, just get that job done. If you sell us some of your equipment, that's fine, as long as the problem's solved."

continued▶

We hear from you that you feel Digital protects your investment. That's because we come in and work from where you are, building toward where you need to be.

Digital has formal alliances with several consulting firms. What do these alliances entail, and what advantages do they offer?

No company can always be an expert in everything. And no company can do everything all by itself. You have to have partners.

Early on in a project, we work with you to formulate service strategies. We decide where we will use our own skills and where we won't. Sometimes it would cost us too much inside, or we realize someone else is already much better at something and we look to utilize their established expertise.

In a formal Digital Service Alliance Agreement, like we have with Andersen Consulting, Arthur D. Little, and others, we go for high-quality partners with top-notch skill sets. Having such an agreement in place means we've worked the terms and the details out in advance — things like who'll be the prime contractor, who'll be the subcontractor, in what instances, in what time frame. So we don't waste time on contractual language when you have a business challenge to meet.

What about global systems integration? Can Digital handle it?

Yes we can, and I can back that up with a long string of success stories. Accounts are not limited geographically. We're focusing globally. Whether they're doing consulting, facilities management, or custom software, our program managers are being trained in the same jargon, with tools that span oceans.

We're all dealing with the competitiveness of today's global environment. We're the ones in the technology and information business; let us tackle that, while you "stick to your knitting" and focus on the business at hand. You do what you do best. We do what we do best. And we both win in the process.

Here's a particularly tough question: A customer says "I've let Digital run a systems integration program for me before, and you failed. Why should I give you another chance?"

Oh, I've heard similar things. But I'll bet it's been more than two years ago since we've worked with a customer who has that to say.

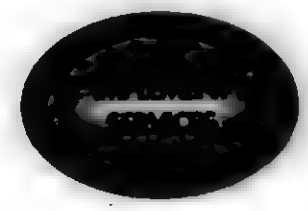
In the past few years we've put more capabilities in place, and we've concentrated on capitalizing on our experience, documenting it as we go. Digital has been doing what the industry now calls systems integrtion for 15 years. We've come a long way when it comes to collecting and sharing our wisdom. You can count on our people performing in a consistent manner, based on the knowledge that comes with experience.











We've done some things countless times for multiple customers. Sure, we've made some mistakes in the past, but we've learned from them. Today we have an extremely high success rate with the programs we're doing.

What's Digital doing to help reduce the cost of services?

Certainly we're working at being more productive as a corporation. As we succeed with that, we will be able to provide our services very competitively

We continue to invest heavily in service delivery technology to make us more effective and more efficient. Our goal is not only to reduce costs but to deliver value. There is a premium involved with truly open computing and global capabilities, but payback is there too.

Digital Services: The Open Advantage

"Digital protects your investment because we come in and work from where you are, building toward where you need to be."

You need to assess what value you expect from your service investment. If you're looking for someone to sit behind a keyboard and type in ones and zeros, you can probably get that right around the corner. But if you're looking for professional documentation of a system, comprehensive training, upgrade layering on new software releases — that's what Digital brings to the table.

What can a customer do to help ensure that a services program runs smoothly?

It's critical that you focus on what computing solution you need for your business success. Define it. Obtain a senior management commitment. And understand the process of change. Then open communication, coupled with well-set expectations and a team approach for everyone involved, will certainly provide the foundation for success.

How does Digital handle the rapid rate of technology change?

Training. Our commitment to training is phenomenal. We're keeping the pipeline of educated consultants and program managers flowing. Do we train on multivendor hardware and software?

Definitely yes. Will you ever find a person in the field who's not fully briefed on a new release of some software. Perhaps, but not for long.

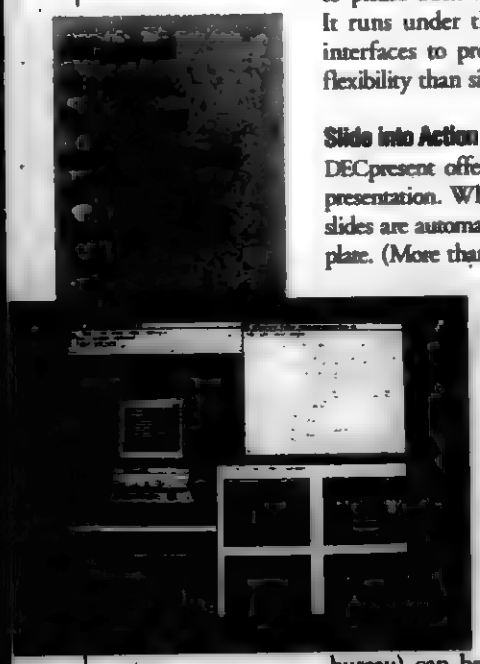
It used to be you could keep pace with the rate of change on your own. But you can't afford it anymore. So you can utilize our resources to help stay abreast.

Given the commitment Digital is making to services as a major corporate direction, what is going to differentiate your service and support offerings from others in the industry?

Our people! They are absolutely energizing. Every time I tap into another part of the services organization, I encounter a team of brilliant people. The talent is very broad-based. I find it everywhere I go. We've got a powerhouse. We are becoming the undisputed services leader in open computing support. It's our people who are going to take us there and keep us there. And it's our people — working with yours — who are going to make sure we both come out winners.

The Picture Is Clear:

DECpresent is the first affordable, easy way to use your workstation as a presentation graphics system.



A recent addition to Digital's Compound Document Architecture (CDA) suite of publishing applications, DECpresent helps you create professional-quality presentation graphics right from any VAX VMS, VAX ULTRIX, or RISC ULTRIX workstation.

DECpresent offers a long list of easy-to-use features aimed to please both novices and experienced graphic designers. It runs under the DECwindows and Motif multitasking interfaces to provide users with more power and greater flexibility than similar PC-based graphics packages.

Slide into Action

DECpresent offers an outliner for building key points in a presentation. While working in the outliner, the presentation slides are automatically created according to the selected template. (More than 20 templates are included to ensure consistent formatting and styling.) A slide sorter acts as an electronic light table for copying and deleting slides, or rearranging sequence.

DECpresent also includes a color paint package, a full-featured table editor, a charting package for creating business graphics, a free-form drawing tool kit, and a 400-item library of revisable clip art.

Output options are flexible. Color hardcopy or color transparencies can be made with the new Colormate PS PostScript printer (LF01R). A film recorder (or service bureau) can be used to produce 35mm slides. Black and white hardcopy and overheads can be output via any PostScript laser printer. DECpresent even includes a slide show utility for displaying presentations right on the workstation screen.

Ready to Work in Your Computing Environment

Thanks to its CDA capabilities, DECpresent makes it easy to import and export text, graphics, and images from compound documents created with DECwrite. Spreadsheet information from DECdecision or other spreadsheets like Lotus 1-2-3, as well as snapshots of CAD designs from DECview3D software, can also be imported and exported easily.

Using Digital's Network Application Support (NAS), DECpresent can be accessed by other applications and systems working in a multivendor environment. In turn, information located anywhere on the network is available to DECpresent. Presentations and documents can link to source data through LiveLink technology, so graphics, charts, tables, and text are automatically updated as source data changes.

For more information on DECpresent, call Digital's Technical Consulting Center at 800-343-4848, ext. 575.
If you're ready to order, call 800-DIGITAL (800-344-4825).

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[redacted]

The recently announced DECserver 90L terminal server offers a bevy of great features. It's easy to set up and use. Its software is built right in. It provides high-speed communications and fast connections to service nodes. The price is low. And the size is amazingly small — about the size of a VHS video cassette.

But, you may ask, when do you want to use the DECserver 90L? And what about Digital's other terminal servers — the DECserver 200 and the DECserver 300? When and where would you want to use them?

To answer these questions, here's some comparative information on all three DECservers to help you decide which one can best handle the job for your particular computing environment.

[redacted]

- Use LAT protocol
- Need only one session
- Need to connect async terminals and serial printers
- Don't need modem control.

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The DECserver 90L is an eight-line LAT protocol terminal server that supports terminals and printers. Each line or port can establish a single connection to one computer or service at speeds up to 38.4 Kbits per second. The DECserver 90L software is ROM-based and does not require a VAX or other CPU for down-line loading. It connects directly to a ThinWire Ethernet LAN.

The DECserver 90L offers basic functionality in a compact box at a very competitive price. It is the ideal terminal server for connecting users in a small departmental network, or connecting many small workgroups into a larger corporate network. It can stand alone or be mounted within a DEChub 90.

[redacted]

- Use LAT protocol
- Use multiple LAT sessions
- Use TD/SMP for VT420, VT330/340 dual session support
- Use full modem control
- Connect async terminals, serial printers, modems, and reverse-LAT configurations.

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About the size of a standard videocassette recorder, the DECserver 200 terminal server supports eight lines or ports, and it allows up to eight multiple LAT sessions per user.

The DS200 supports line speeds up to 19.2 Kbits per second. It also supports the TD/SMP dual session split-screen protocol for use with VT420, VT330, and VT340 terminals. Software is loaded from a networked VAX running a VMS or RISC-based ULTRIX operating system.

Another feature is full modem control with DB-25 pin connectors. This allows you to connect modems and reverse-LAT applications. This terminal server works best in environments that require flexibility — where small user groups are distributed on the network, and where applications vary from traditional terminal and printer connections, to modems, multiplexers, and non-Digital computer connections to the network.

[redacted]

- Require LAT and/or Telnet protocols
- Use multiple LAT sessions
- Use TD/SMP for VT420, VT330/340 dual session support
- Connect async terminals, serial printers, and reverse LAT configurations
- Use DTR-DSR control signals
- Require standard and/or ThinWire Ethernet.

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When you need a terminal server with higher functionality, consider the DECserver 300.

The DECserver 300 shares many features with the DECserver 200: size, multiple session capabilities, line speeds, and TD/SMP dual session support.

There are key differences too. The DECserver 300 supports 16 lines or ports. The DECserver 300 has both a Standard AUI Ethernet connector and integral ThinWire connector. Software is loaded from a system on the network — either a VAX running VMS or RISC-based ULTRIX software, or an MS-DOS-based PC.

The DECserver 300 also offers multiprotocol support with LAT and Telnet protocols concurrently. The LAT protocol is used primarily within VAX networks; Telnet primarily within UNIX networks. Such a multiprotocol capability makes this terminal server well-suited to work in today's mixed-vendor multiprotocol networks.

In fact, the DECserver 300 works best in diverse environments, with small-to-moderate sized user groups requiring flexible connections, multiprotocol communications, ThinWire and/or Standard Ethernet, and reverse LAT configurations capable of using DTR-DSR control signals.

[redacted]

Feature	DECserver 90L	DECserver 200	DECserver 300
Network Protocol	LAT	LAT	LAT/Telnet
Async Lines	8	8	16
Maximum Line Speed per Second	38.4Kb	19.2Kb	19.2Kb
I/O Connectors	MMJ	DB25-pin	MMJ with DTR-DSR
Modem Control	No	Yes	DTR-DSR Control Signals
Multiple Sessions	No	Yes	Yes
TD/SMP Protocol for VT420, VT330/340 Dual Session Support	No	Yes	Yes
E-net Interface	ThinWire	Standard	Standard/ ThinWire
Printer Support	Yes	Yes	Yes
Reverse LAT Support	No	Yes	Yes
Dedicated Circuit	No	Yes	Yes
Preferred Service	No	Yes	Yes
Password Protected	Yes	Yes	Yes
Rack-Mountable	Yes with Hub	Yes	Yes
Terminal Server Manager (TSM) Support	No	Yes	Yes
Power Supply	Wall-Mounted AC/DC Adapter	Internal	Internal
Host Software Required	No	Yes	Yes
Service Hosts VMS, RISC ULTRIX	Yes	Yes	Yes
Part Number	DSRVD-AA	DSRVB-AA	DSRVF-BA
Price	$1,450.00	$3,575.00	$4,700.00
Price per Port	$181.00	$447.00	$294.00

[redacted]

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COMMENTARY

Clinton Wilder

Successful CIOs must cultivate a business attitude



Should the chief information officer be a business expert or a techie?

The debate rages on and on. The CIO must understand the business, says one camp; technology decisions can be delegated. "That's a prescription for disaster!" say the revisionists (Gartner Group's Bruce Rogow prominent among them). "A thorough grounding in technology is more important than ever if CIOs want to implement enterprisewide information infrastructure in the 1990s."

The most popular answer, of course, is "both" (see story page 86). The model CIO should be that rare breed who moves effortlessly between the glass house and the boardroom, equally conversant in the jargon and buzzwords of each. As an added bonus, the CIO should have done a stint in consulting or academia just to complete the well-rounded picture.

> SPECIFIC INDUSTRY KNOWLEDGE can be taught; attitude cannot.

And then there is the consultant's favorite response: "It depends."

But a slightly different perspective on the debate emerged at a recent conference at Babson College's Center for Information Management Studies in Wellesley, Mass. After Robert Shafto, president and chief operating officer at The New England, the large Boston-based life insurer, gave his presentation, he was asked the $64,000 business vs. techie question.

"I think it's more a question of attitude than one of background," Shafto said. "The important thing is that the person thinks like a businessperson first."

Shafto knows from whence he speaks. Seventeen years before his promotion to president, he joined The New England as second vice president for computer systems development and information services. Before that, he worked at Electronic Data Systems for eight years.

So, you might think, Shafto was a technology whiz who eventually learned the insurance business well enough to step into the president's shoes? Nope. He started his career as a life insurance actuary in the late 1950s and got into computers quite by accident when he was asked to learn programming on an IBM 1620.

At EDS, he was hired to sell computer services to the insurance industry because he knew it well. No matter what his business card said, he was always an insurance man first and a computer technologist second.

Shafto's observation is sage advice for aspiring IS professionals trying to chart a course to the top of their organizations. Sporting an MBA or picking up postgraduate courses in marketing or finance is fine, but academic achievements don't always change the way you think.

Having the right business-oriented attitude means much more than understanding the concepts of return on equity or interest-adjusted net product cost. It means understanding your industry and your company. Where is the company now and where is it going? What changes do you anticipate in the next five years in your customers, your products and your competitors?

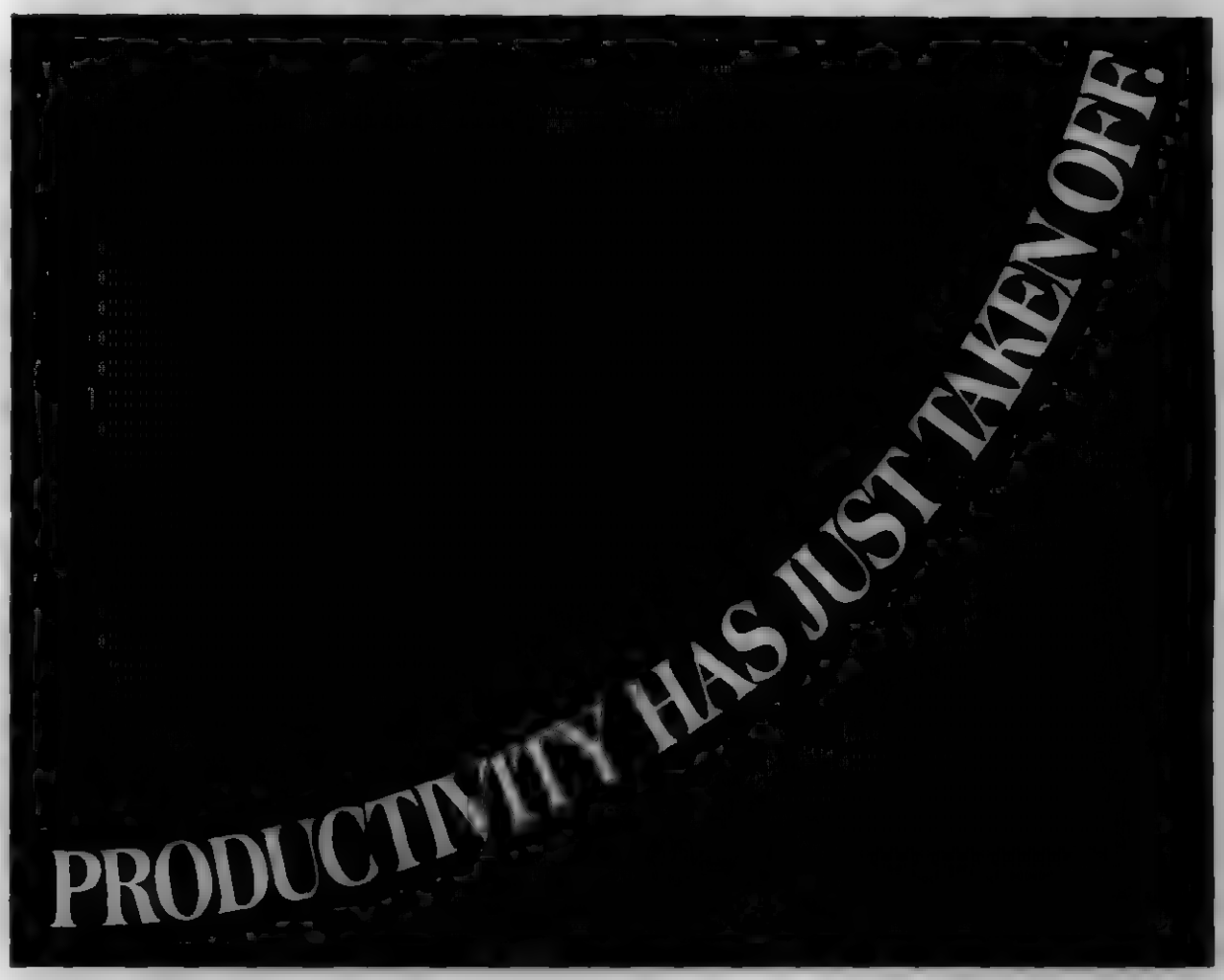
If you can't answer those questions, you certainly can't identify potential applications or new technologies that can help the firm reach its business goals. Even worse, your increasingly PC-literate end users, who do have that understanding, will feel they can design better technology solutions than you can — and they may be right.

One recent phenomenon may seem, on the surface, to contradict this point: prominent CIOs who change industries. One might ask how Jack Cooper's solid reputation for helping CSX's trains run on time made him qualified to help hawk beverages for Seagram's. Or how Allen Ditchfield's successful IS strategy at MCI can be duplicated to sell more auto insurance at Progressive.

The answer, I believe, is that the new employers of those two IS executives were convinced they had the right business attitude. Specific industry knowledge can be taught; attitude cannot.

If you happen to delight in the marvels of Cobol subroutines or asynchronous X.25 links or CICS data structures, there is nothing inherently wrong with that. But those feelings must take a backseat to your excitement over a 10% market share gain in the UK or that nice little profit spike in the third quarter. The more the CIO measures IS success as business success, the better for the company — and the CIO's career.

Wilder is Computerworld's senior editor, management.



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CEOs say CIOs should wear many different hats

BY GARY H. ANTHES
CW STAFF

BALTIMORE — Information systems executives are increasingly expected to be Renaissance people, according to their bosses at the top of the corporation.

At a recent seminar sponsored by the David D. Lattanze Center for Executive Studies in Information Systems at Loyola College, four chief executive officers explained what they expect from IS.

IS professionals now have to be "much more flexible, much more businesspeople," said Gary DiCamillo, president of the U.S. Power Tools Division of Black & Decker Corp. "They have to be agents of change. They have to understand business, and they have to integrate [that knowledge] into their work."



DiCamillo said Black & Decker is decentralizing IS by moving programmers and analysts out of the data center and into the functional departments served by systems. Of senior IS management, he said, "I look for solid businesspeople, secondarily technicians."

Robert Sywolski, chairman and CEO of Cap Gemini America, Inc., stressed that a chief information officer must have feet in both the business and technical worlds. "CEOs expect systems people to master new technology, filter it and select the right balance between technical wizardry and application utility," Sywolski said.

Several speakers said CIOs must expand their corporate horizons because it is no longer sufficient to automate manual functions. The payoff for companies with mature systems will come from fundamentally "re-engineering" the underlying business processes, an effort that requires IS people to plunge deeply into those processes.

Overhauling key business functions is a challenge facing Joseph T. Ambrosy, IS vice president at Bell Atlantic Corp., which is rethinking its business operations as part of its System 2000 project. He said Bell Atlantic's competitive advantage will come not from technology itself but from the re-engineered functions that technology makes possible. "Forget the functional stovepipes; look at the business holistically," Ambrosy advised.

Susan M. Arseven, director of medical group IS at American Cyanamid Co., said she "runs IS like a business." She appointed product managers to develop IS products such as voice mail and training services and client service representatives to sell them to users in the company. She also established total-quality management teams within IS that were so successful, they have received requests to train others outside of IS.

"Our CEO expected new systems, but we've given him more than that," Arseven said. "We're giving him methods to help him strengthen and improve his whole organization."

Despite this success, Arseven said, the full potential of her IS organization has not been tapped.

"I'd like to be more closely integrated with both the day-to-day and the strategic activities of the company. Our business units don't understand what IS does. That's changing, but not fast enough for me."

More honors for Peterson

The Lattanze Center recently presented its Lattanze Information Systems Executive of the Year award to DuWayne J. Peterson Jr., executive vice president of operations, systems and telecommunications at Merrill Lynch & Co., for "his emphasis on quality and his significant accomplishments."

Peterson joined Merrill Lynch five years ago with a CIO title, a billion-dollar budget and a charter to improve and expand the company's computers and communications dramatically. He promoted total quality management and, when he retires this month, will leave behind a legacy known as Peterson's Information Technology Blueprint.

At the Lattanze seminar, Peterson offered CEOs and CIOs this advice:

- "CEOs have to be involved; they have to appreciate IS and the CIO's role in the company."
- "Know the customer value chain as it flows back to the business. Spend time with your customers."
- "Are you the change agent or are you the reactionary? You must have change agents in your company."
- "Planning is great, but we're measured on execution."

GARY H. ANTHES

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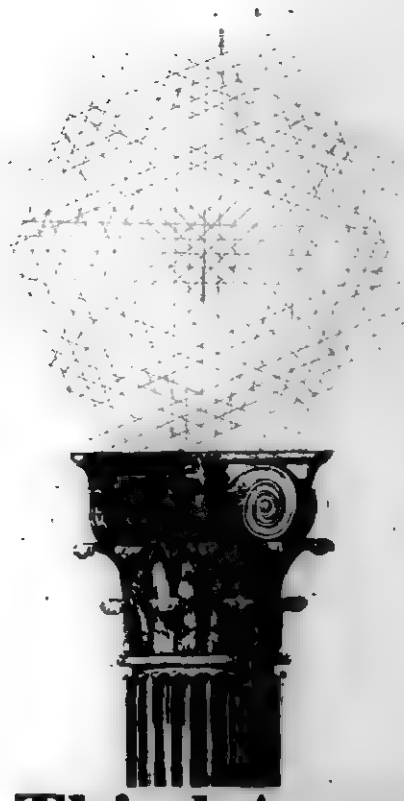
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Tight state budgets demand creative solutions from IS

BY JEAN S. BOZMAN
CW STAFF

SACRAMENTO, Calif. — As states clamp down on budgets, state government information systems managers are having to lobby even harder to get funds for their projects. But IS staff members who attended the Government Technology Conference last month, primarily those from the western states, said they have found new ways to justify their requests.

"The budget crunch makes it really tough for government to continue to train people [in computer use] at the pace they previously did," said Robert Graves, director of the conference, which drew about 12,000 users to the California state capital. "If you're going to try to bring new technology in-house, you have to show how it will fit into the existing budget and how it will increase services while decreasing future costs."

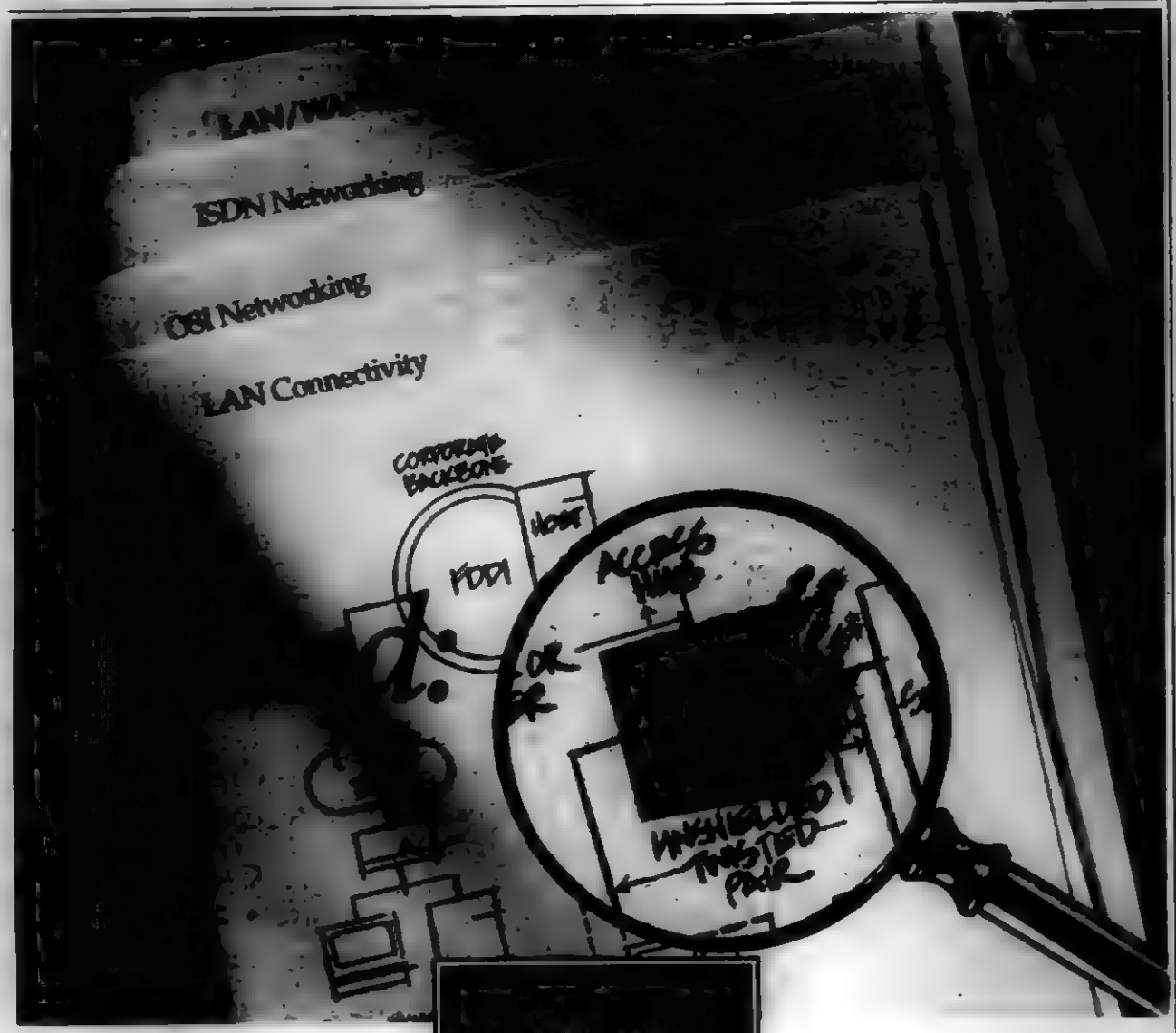
The state of California, for which many of the conference attendees work, is planning an across-the-board budget reduction of nearly $13 billion. In such an environment, attendees noted, it is increasingly hard to justify major expenditures for systems that will take several years to provide benefits.

Some new factors, such as increased spending for drug prevention and mandates to eliminate many clerical jobs, have allowed IS managers to develop new systems, with many of those systems requiring proof of near-term benefits.

More than a dozen new systems used by California, Nevada and other western states were demonstrated. One, a traffic-violation tracking system funded by the Los Angeles Municipal Court, uses digitised images of paper citations to reduce personnel costs.

Another, a mainframe-based expert system developed by Napa County and the state of California, streamlines the application process for welfare recipients. Both systems are going into production this summer.

Sometimes, the systems pay for themselves. The city of Inglewood, Calif., which uses handheld personal computers to read water meters and desktop PCs to collect the information, is selling its utility billing system to other cities. Inglewood already recouped some of the development costs for a 3-year-old traffic citation tracking system that it sold to several neighboring municipalities, including Torrance and Compton.



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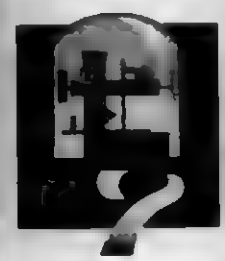
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NYSE hour challenges IS

BY ELLIS BOOKER
CW STAFF

NEW YORK — Now that the New York Stock Exchange (NYSE) has won regulatory approval to extend its trading day beginning June 13, it will be up to the exchange's information systems department to make sure the software and hardware are up to the task.



Yet the Securities and Exchange Commission's approval of a one-hour extension at the NYSE is a far cry from a global, 24-hour trading environment. For that to happen, according to experts, major changes will be required in worldwide financial procedures as well as technology.

OLTP systems needed

"Although certain aspects are computerised, current trading systems still depend on batch processing of orders after a trading session is over," said Shyam Sunder, a professor of management and economics at Carnegie Mellon University in Pittsburgh.

Sunder, who heads the university's Laboratory for Market Design, said that for trading to occur continually, on-line transaction processing systems would be required at the world's exchanges.

Even so, Sunder said he believes such technical obstacles take a back seat to regulatory and procedural ones.

While many institutions have agreements on electronic funds transfer, "there is no unified system for transferring money, no international standard," Sunder said.

NYSE IS officials were unavailable for comment on what, if any, reprogramming will be needed to support the extended-day test.

Since 1976, the NYSE has had an electronic order processing and post-trade system called Superdot, which today handles about 75% of the orders at the exchange.

Commencing June 13, the NYSE will have two concurrent after-hour sessions each day, beginning at 4 p.m.

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CALENDAR

The Center for Integrated Manufacturing Decision Systems will hold its annual conference at Carnegie Mellon University in Pittsburgh July 24-25.

Speakers will include Hal Edmunson, Hewlett-Packard Co.'s vice president of manufacturing; William Hanson, Digital Equipment Corp.'s vice president of logistics; and Regis Petrosky, Westinghouse Electric Co.'s head of quality systems assurance.

For information or to register, contact Carnegie Mellon University, Pittsburgh, Pa. (412) 268-8818.

JUNE 23-28

Structuring Business Partnerships for Competitive Advantage. Laguna Niguel, Calif., June 23-25 — Contact: AMR International, Inc., Greenwich, Conn. (203) 861-0101.

Test Engineering Conference. Atlanta, June 24-27 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

Sweep East Conference. East Rutherford, N.J., June 24-27 — Contact: Bob Daniels, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

International Windows 3.0 Developers Conference. Santa Clara, Calif., June 24-28 — Contact: Andree Fontaine, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

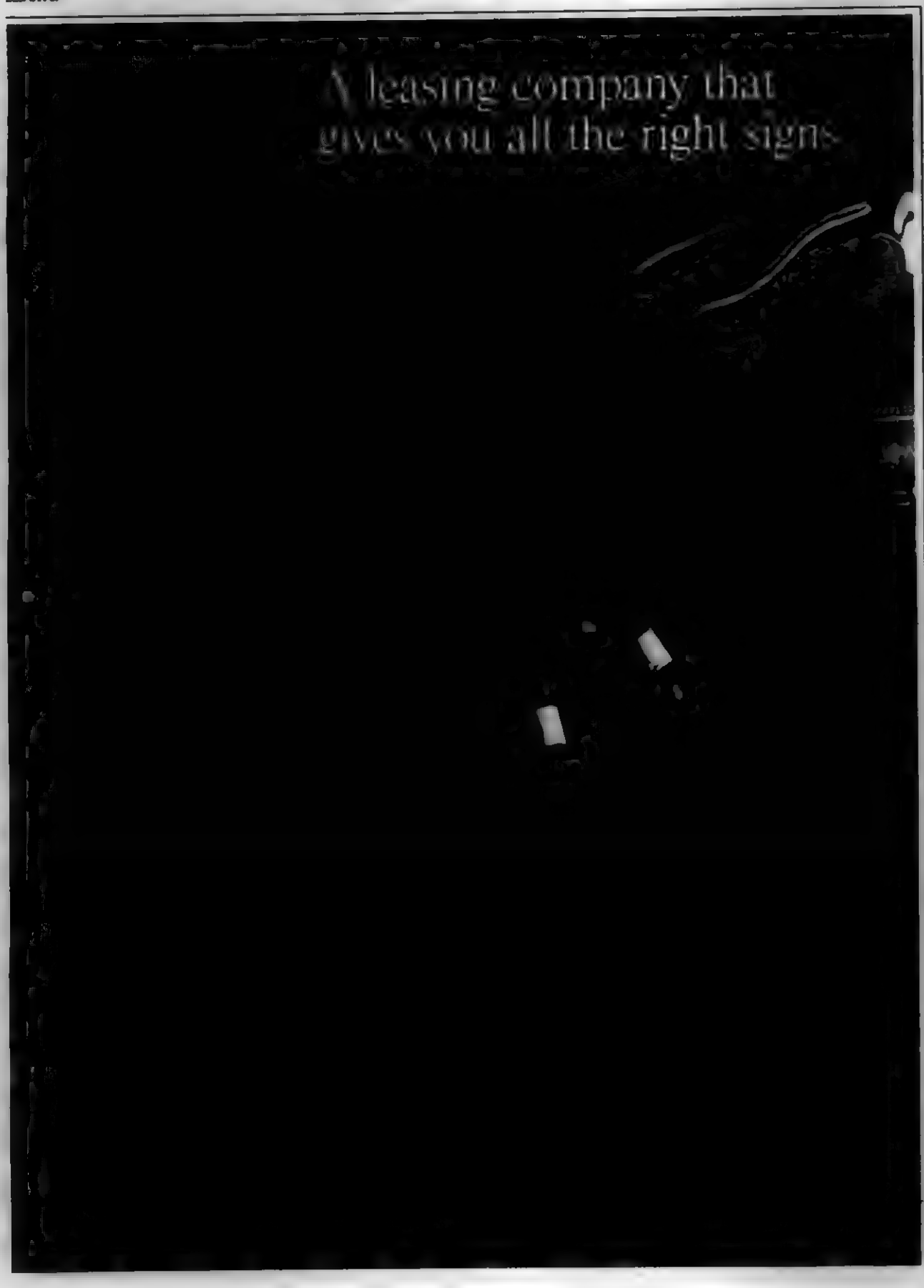
Taking Control of the Future: The Role of Information Management in Business Reengineering. Nashville, June 25 — Contact: Lisa Gibson, Computer Corporation of America, Cambridge, Mass. (617) 492-8860.

Micro '91: Auditability, Security and Productivity of Micro-based Systems. Boston, June 25-27 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Multimedia '91. London, June 25-27 — Contact: Arielle Masiquet, NGA, London, England (011-44) 081-742-8888.

PC Expo. New York, June 25-27 — Contact: Mark A. Hiviand, Bruno Blenheim, Inc., Englewood Cliffs, N.J. (201) 569-8542.

Independent Computer Consultants Association National Conference. Seattle, June 27-29 — Contact: Carolyn Karelitz, Independent Computer Consultants Association, St. Louis, Mo. (314) 997-4633.



JULY 7-13

Datapoint Users Group Meeting. Orlando, Fla., July 7-10 — Contact: Datapoint Corp., San Antonio, Texas (512) 593-7910.

OSF/Motif Graphical User Interface Toolkit: Fundamentals and Application Development. Los Angeles, July 8-10 — Contact: UCLA Extension, Los Angeles, Calif. (213) 825-1047.

International Conference and Exhibits on Failure Analysis. Montreal, July 8-11 — Contact: ASM Member/Customer Service Center, ASM International, Materials Park, Ohio (216) 338-5151.

Structured Development Forum. Portland, Ore., July 8-11 — Contact: Software Association of Oregon, Beaverton, Ore. (503) 690-1395.

National ISDN — Working Together to Make It Happen. Washington, D.C., July 9-10 — Contact: Barbara Kaufman, Bellcore, Livingston, N.J. (201) 740-4324.

Engineering Workstations Conference. Boston, July 9-11 — Contact: EWC, Santa Monica, Calif. (213) 450-0500.

Geographic Information and Spatial Data Exposition. Washington, D.C., July 9-12 — Contact: Ginder, Silver Spring, Md. (301) 445-4400.

Sony Government Technology Exposition. Washington, D.C., July 10-11 — Contact: Sony Business and Professional Group, Montvale, N.J. (800) 877-7669.

APICS 1991 Total Manufacturing Performance Seminar. San Diego, July 10-12 — Contact: APICS Meeting Registration, Falls Church, Va. (703) 237-8344.

JULY 14-20

Guide 80. Boston, July 14-19 — Contact: Guide Headquarters, Chicago, Ill. (312) 644-6610.

American Association for Artificial Intelligence National Conference on Artificial Intelligence. Anaheim, Calif., July 14-19 — Contact: AAAI-91, Menlo Park, Calif. (415) 328-3123.

TQM '91 Conference. Washington, D.C., July 15-17 — Contact: Paula Harrington, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-0777.

Communication Networks West Conference and Exposition (Comnet West). San Francisco, July 15-18 — Contact: IDG Conference Management Group, Framingham, Mass. (508) 879-8700.

Video Expo. Chicago, July 15-19 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Computer Technology and Military Planning Symposium and Exhibition. Arlington, Va., July 16-18 — Contact: Automated Missions Planning Society, Palmyra, N.J. (609) 829-7823.

Information Engineering/RAD. Washington, D.C., July 16-18 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

International Conference for Young Computer Scientists (ICYCS '91). Beijing, China, July 18-20 — Contact: Yongchun Liu, Cad Laboratory, Academia Sinica, Beijing, China. Fax: (011 86 1) 2567724 or 2568152.

JULY 21-27

IPO Quarterly Meeting. Pittsburgh, July 21-26 — Contact: National Computer Graphics Association, Fairfax, Va. (703) 698-9600.

Remittance and Document Processing Forum and Exposition. Anaheim, Calif., July 21-24 — Contact: Recognition Technologies Users Association, Boston, Mass. (617) 426-1167.

IRM '91. Beaver Creek, Colo., July 22-24 — Contact: Barrett Data Systems, Rockville, Md. (301) 762-1288.

Macitivity '91: The Macintosh Connectivity Conference. Santa Clara, Calif., July 23-25 — Contact: Wine-house Computer Co., Los Gatos, Calif. (408) 345-2500.

Software World. Toronto, July 23-25 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-0526.

Artificial Intelligence and the Help Desk. San Francisco, July 23-26 — Contact: Help Desk Professionals, Colorado Springs, Colo. (719) 531-5138.

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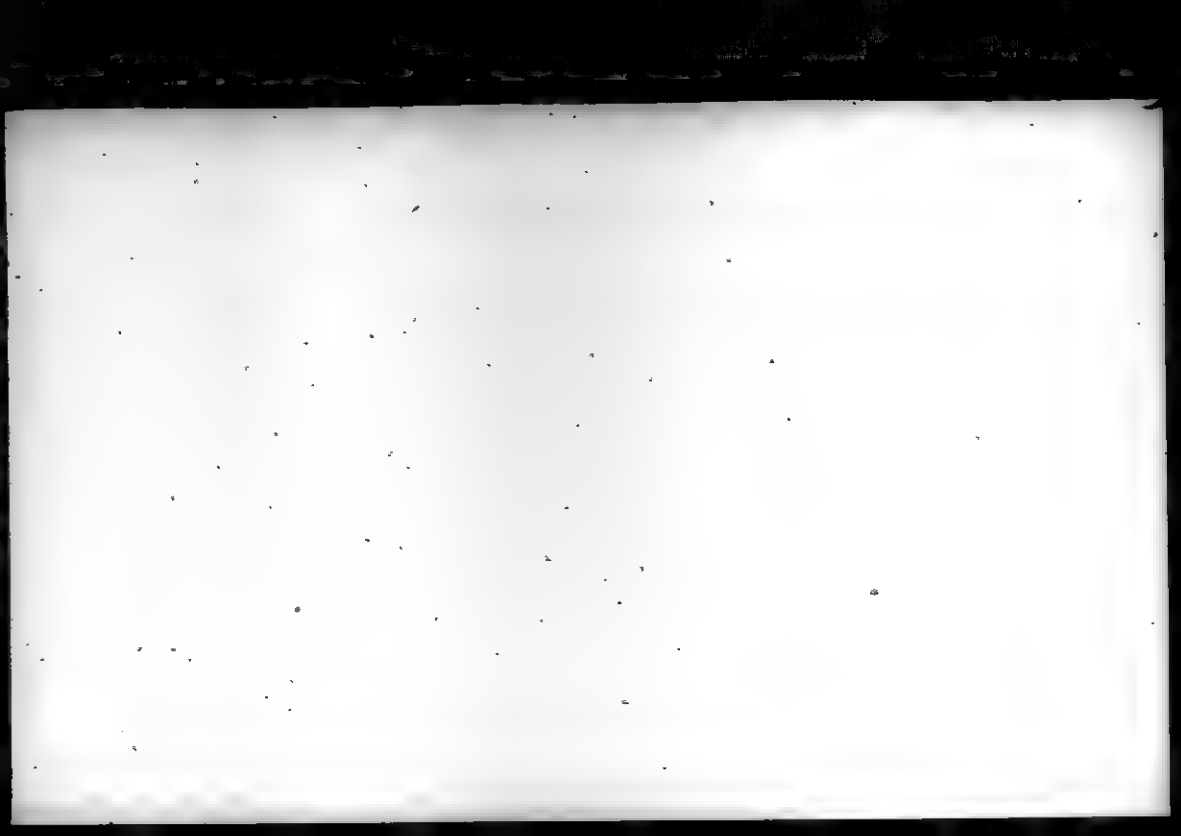
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Linking databases: Many paths

BY ALAN RADDING
SPECIAL TO CW

Users don't care whether data resides in old IMS hierarchical databases, VSAM files or new relational databases or whether it's scattered among mainframes, minicomputers, personal computers or local-area networks. They just want transparent, real-time, on-line access and update capabilities. Now.

"It sounds simple," says Dick Nelson, vice president of the agency department at New York Life Insurance Co. "But when you start to peel back the layers, it isn't simple at all."

To handle the different formats, data structures, methodologies and other problems that bedevil efforts to integrate databases, information systems organizations are taking several different approaches.

For the past two years, for example, New York Life has used a "rapid prototyping" approach, piecing together database management systems from available components and enhancing them in each subsequent iteration.

By contrast, Frito-Lay, Inc. has followed a careful process of data modeling that lets users access a variety of databases without knowing about underlying data structures or the retrieval process.

According to Mark Jankowski, chief information officer at Pepsi Foods International, which owns Frito-Lay, PC users at the Dallas-based firm can now access data though a simple point-and-click, Microsoft Corp. Windows-based interface.

"The user just asks about, say, Doritos in the Southwest. We built a back end that finds the data and puts it into the user tool," Jankowksi explains.

Public Service Company of Colorado prefers a methodical, classic approach: Begin with detailed enterprise modeling and progress to companywide data administration.

"We are working on a five-year plan to make end users more self-sufficient," says Chuck Wolff, data and security administration manager at the Denver-based nonprofit company. "We'll move as fast as technology will allow without compromising mission-critical systems. But the users want it all right now."



James Baldwin

The three companies exemplify popular tactics now being used to integrate disparate databases. Besides rapid prototyping and data modeling, software "gateways" between databases and standard access languages such as SQL are also being used to help organizations make optimum use of corporate data. But all of these approaches have their drawbacks.

"It's like people who speak different languages," Nelson says. "You have to use an interpreter between them, but even then, whenever you interpret, the fine nuances get lost."

Despite any shortcomings, many large organizations appear undaunted. A *Computerworld* survey in 1990 showed that the desire to get better access to corporate data was the most common reason for undertaking an integration project. Nearly 95% of respondents said they were working to permit sharing of databases and applications.

The sheer importance of getting key marketing, financial, manufacturing and other kinds of data to the far

Continued on page 94

London Life insures info access

New LAN will permit wider, faster access to IBM and DEC databases



BY JANET MASON
SPECIAL TO CW

London Life Insurance Co. is hoping to insure its bottom line by opening integrated IBM and Digital Equipment Corp. databases to local-area network users.

The $10 billion London, Ontario-based insurer is in the final stages of a downsizing and integration project that will link personal computer users at headquarters with 150 sales offices by the end of the year.

When work is completed in December, users will be able to access DB2 on an IBM 3090 and RDB on 12 DEC Microvax servers via a DEC Ethernet, according to John Thompson, manager of data administration at London Life.

The project is a key part of a plan to boost London Life's market share by 25% over the next five years, according to Thompson. "We are using IS to support an increasing number of sales people," he explains, "and to help the company target-market its products."

The 116-year-old firm specialises in individual life insurance policies and also offers group life and health insurance plus investment products. A unit of London Insurance Group, the firm has 5,500 employees.

The client/server system replaces an 11-year-old dumb terminal link to the IBM 3090.

"Not everyone had access to the dumb terminal system because of the mainframe transfer charge expense," Thompson says.

Now, because users will have immediate access to information on both the RDB and DB2 systems, "they will be able to respond more quickly — at least by several days — to the needs of policy owners and new customers," he says.

Greg Phelan, a London Life end user who assisted in the development of one of the company's applications, says data access is already much faster. "Download time is now several minutes, whereas with the dumb terminal, we spent all afternoon doing it," he says.

Nearly all 300 London Life information systems professionals at the company's headquarters are involved in the project, including a full-time team of 20 database designers, programmers, operations employees, security specialists and data architects.

Developers are currently working on three database projects: a mortgage application, a group sales database based on RDB and a regional office reporting database in DB2 that is

Continued on page 99



Peter Tilbrook

Need for speedy ***transactions is key, says Thompson, an avid cyclist***

How they did it: A sampling

- **New York Life Insurance:** A "rapid prototyping" approach let the New York City firm piece together an integrated sales agent system and then enhance it in subsequent iterations.
- **Roadway Express:** The payoff of a methodical, five-year data modeling process is that users at the Akron, Ohio-based trucking firm can access up-to-the-minute information on customers, shipments, trucks and drivers anywhere in North America.
- **Frito-Lay:** The Dallas snack foods vendor employs a process of data modeling that lets users access a variety of databases without knowing about underlying data structures or the retrieval process.
- **Public Service Company of Colorado:** The Denver-based nonprofit utility began with detailed enterprise modeling and progressed to companywide data administration.
- **National Grocers:** Data modeling helped this Toronto service firm create an integrated "universal production planner" database system that helps 150 users collect information on product sales.
- **Textron Financial:** Officials at the Providence, R.I., company decided that the best approach was to re-engineer the entire business process and give users local-area network access to customer, billing and collections databases.
- **Executive Re:** This 4-year-old Simsbury, Conn., reinsurer had the luxury of starting with a clean slate and built-in database integration from the start.

Continued from page 93

corners of the organization makes it a certainty that interest in database integration will remain high for some time.

"You don't want the business to be bound by the organizational structure, which can create artificial divisions of labor," says Robert Davoli, president of SQL Solutions, Inc., a Burlington, Mass.-based consultancy and systems integrator.

The following is a detailed look at several popular approaches that are used to integrate databases.



Rapid prototyping

While the sudden availability of database access tools — such as those offered by Microsoft Corp., Gupta Technologies, Inc., Software Publishing Corp. and others — encourages rapid prototyping, it nonetheless remains the road less traveled by many information systems organizations.

Rapid prototyping is a process of developing applications in a succession of small phases. Each phase brings new functionality and improvements over the previous phase. Advocates say the approach eliminates the need for comprehensive requirements planning and definition at the project's outset.

At New York Life, a high-level vision rather than a formal business model guided the process, Nelson says. "[We said], 'Here's how agents will work in the future.' Developers then came back with some ideas for implementing the vision by incorporating existing systems, applications and data."

The goal was to create a usable "integrated agent system" as quickly as possible, explains Shirley Singleton, vice president of cooperative processing at Logica Data Architects, a Waltham, Mass.-based systems integrator that worked with New York Life.

The strategy boiled down to using "a plug-and-play architecture where we can pull out one database and software and plug in another," Singleton explained.

Developers created an integrated sales system consisting of 14 different pieces of applications software, each with its own database.

The system follows the sales process from customer prospecting through applications processing and underwriter approval, building the customer database as it goes. A variety of software gateways and other tools pull data from several databases to provide a complete view of the customer.

Data modeling was limited to working out inconsistencies in Dbase III files and various flat files and on the corporate mainframe.

A prototype system for field testing was introduced in May 1989, six months after the firm gave the go-ahead. Since the initial rollout, New York Life has released five more improvements to the existing system and is testing a sixth.

Nelson says he is sold on rapid prototyping. "You can get so wrapped up in business models that you never get anything done," he says of traditional approaches. "It's an excuse for not doing anything."

Besides being quicker to develop than a model-bound system, rapid prototyping eliminates duplicate data, Nelson adds, and eliminates the need for the agent to rekey data, thus saving time and reducing errors.

Singleton agrees, saying the biggest problem with enterprisewide modeling is that technology can become obsolete by the time the system is completed. "Some data modeling is critical," she says, "but we avoid the all-encompassing corporate data model. It's too slow, and technology is moving so fast."

Nelson advises companies interested in rapid prototyping to follow some commonsense guidelines: Have a clear vision of long-term goals, express that vision in business terms, communicate clearly, start small and show results quickly, manage expectations, and don't neglect training and support.

Despite successes like those at New York Life, rapid prototyping isn't for everyone, warns Mike Hawotte, director of systems integration at Chicago management consultancy A. T. Kearney.

"You can buy a tool that provides access, and it will work in a company in which the information is there and users just need better access," Hawotte says. "But what about cases where the data isn't right?" In such instances, he says, data modeling may be a better choice.

"There are no real products that provide a canned solution," Jankowski adds. Despite the claims of some vendors rushing database access products to market, an organization must be prepared to use a variety of tools and still write pieces of code to fill in the gaps, Jankowski says.

Data modeling

A more conventional approach to integrating databases is data modeling. In this paradigm, a data model describes all of the data and the relationships between data. The model also identifies redundant data and describes the processes that generate the data.

The approach has been used successfully by Roadway Express, Inc. The Akron, Ohio-based trucker gives users access to up-to-the-minute information on customers, shipments, trucks and drivers anywhere in North America.

Users at headquarters or any one of the company's 600 terminals access local Informix Software, Inc. databases, a central corporate strategic database built on Computer Corporation of America's M204 technology and a human resources database built around IBM's DB2.



Davoli says *to avoid artificial divisions of labor*

Getting to this point took a five-year effort that began with extensive enterprise modeling. "The first thing we had to do was sit down and create a companywide data model and architecture," says Gerry Long, vice president of Summit Information Systems, Roadway's IS subsidiary.

The company had skipped the data modeling phase on an earlier project and wasn't prepared to make the same mistake again. "Anytime the business changed, we had to rewrite," Long says. "Without modeling the business processes and data, you spend 80% of your time on maintenance."

Consultants were brought in to help create the data model, which describes the data in business and technical terms, definitions, users, origin and physical characteristics. The technical staff then converted the data model into the physical database design and built user interfaces and back-end systems to access the data.

Today, Roadway officials say they believe better information access differentiates the company from its competitors while helping customer service, quality and productivity.

"Customers get status reports quicker, billing accuracy improved, and we've been able to develop a whole new set of services," Long says. For instance, Roadway provides advance notice of shipments and can even ship retail goods that are already on hangers. Drivers can be located quickly and customer records checked faster than before. The company is presently expanding the system into Europe.

The importance of good modeling is affirmed by Carl Fitch, senior manager at CAP Gemini America in New York. "Before throwing data access tools at a problem, the data must be right. You have to identify where differences [in data] exist."

Changing bad to good

The experience of National Grocers Co. in Toronto suggests that even a bad data model can be made to work.

Earlier this year, the firm rolled out an integrated "universal production planner" database system to assist some 150 users in the collection of information on the thousands of products sold in the stores from a variety of inventory, distribution, purchasing and pricing systems. The data is used to help plan promotions, set sale prices and create advertisements.

Data resides on a variety of old mainframe and minicomputer systems: Wang Laboratories, Inc., VSAM, IDMS databases and a new DB2 system.

To improve access, National Grocers undertook a massive data modeling effort in early 1990. "The scope was huge. It touched on almost every aspect of the business," says Michael King, manager of microcomputer systems development at National Grocers. The goal was to "rationalize data coming from a bunch of different places and funnel it through a single point.

"The data could be in three or four different places," King says. National Grocers is trying new tools, such as Gupta's SQLaccess, SQLwindows, SQLhost and SQLgateway, to gain access to multiple databases, but it is finding that performance is too slow.

"We need to go back and tune the applications, the databases, the network and the windows," King says. "Basically, we overnormalized our data design. Now we have to put in redundant data to make it run faster. In some cases, we're doing four- and five-table joins, and the system really grinds."

Craig Lashmet, manager of information technology at Grant Thornton, a St. Louis-based accounting and systems consulting firm, says the problem was that National Grocers "conceived the data model without relational in mind. All the tools in the world won't help if the data model is off." The consultancy is now rewriting parts of the system.

However, King adds, even slow access

is better than none. "Before, the merchandising guys were doing everything on paper . . . Now they can spend their time thinking about merchandising."

Re-engineering

Textron Financial Corp. took a different tack to provide users with access to company databases, says Paul Hamel, vice president of systems and planning. The firm found itself with host-resident DB2 databases, VSAM files and a proliferation of geographically dispersed local-area network-based Sybase, Inc. databases accessed through SQL Server.

"There is more to providing [database] access than just putting in a gateway," Hamel says. "You need an application design and architecture. It doesn't work to just try to graft something together."

With that knowledge, "we made a decision to re-engineer, rebuild from the ground up, deciding what information goes where," Hamel says.

The effort was part of a larger downsizing strategy that moved the company into client/server computing. To this end, Textron redesigned both host- and LAN-based applications to allow easy user access. For instance, Hamel explains, "We had to redesign applications to minimize the need for two-phase commits." That ensures the integrity of data in distributed databases, but it is difficult to achieve across multiple databases.

Today, Textron users routinely call up information on customers, billing and collections without knowing or caring about the location of the information. The system handles logging into and out of different databases.

The databases serve production and transaction applications such as billing, collections and customer information. Users not only query but also update the various databases in real time.

The bottom line, according to Hamel, is increased productivity. At the Minneapolis pilot site, agents realized 100% productivity gains, he claims.

Start fresh

Executive Re, Inc. in Simsbury, Conn., a reinsurance company, took what may be the easiest way to integrate databases: It started with a clean slate.

James Roberts, senior vice president of IS and administration, says the 4-year-old company was not encumbered by existing systems and applications, so he could build a system using one set of tools.

His first multiple database application, an underwriter workstation, let users access information from a pricing database and a claims database.

Keeping things simple is key, Roberts says. He faced different databases on different machines, but, he says, "They were both developed with the same front-end [graphical user interface]: Gupta's SQLwindows."

Roberts quickly built an enterprise model using Linc Systems' Extended Relational Analysis methodology. "It wasn't a complete model, but it was sufficient," he notes. He got enough to map out an entire application architecture.

Roberts says he limits users to predefined data and formats. Eventually, he says, he will allow users to roam freely, but "not until the access tools evolve to the point where you don't need to understand the database structure." ●

Radding is a free-lance writer based in Newton, Mass.

After the project, new questions

Headaches don't end with successful database integration — new ones begin.

Like many organizations, Public Service Company of Colorado discovered that sticky issues arise after the technical details are smoothed out. The debate centers around what users can access in the Denver utility's Datacom and DB2 production databases.

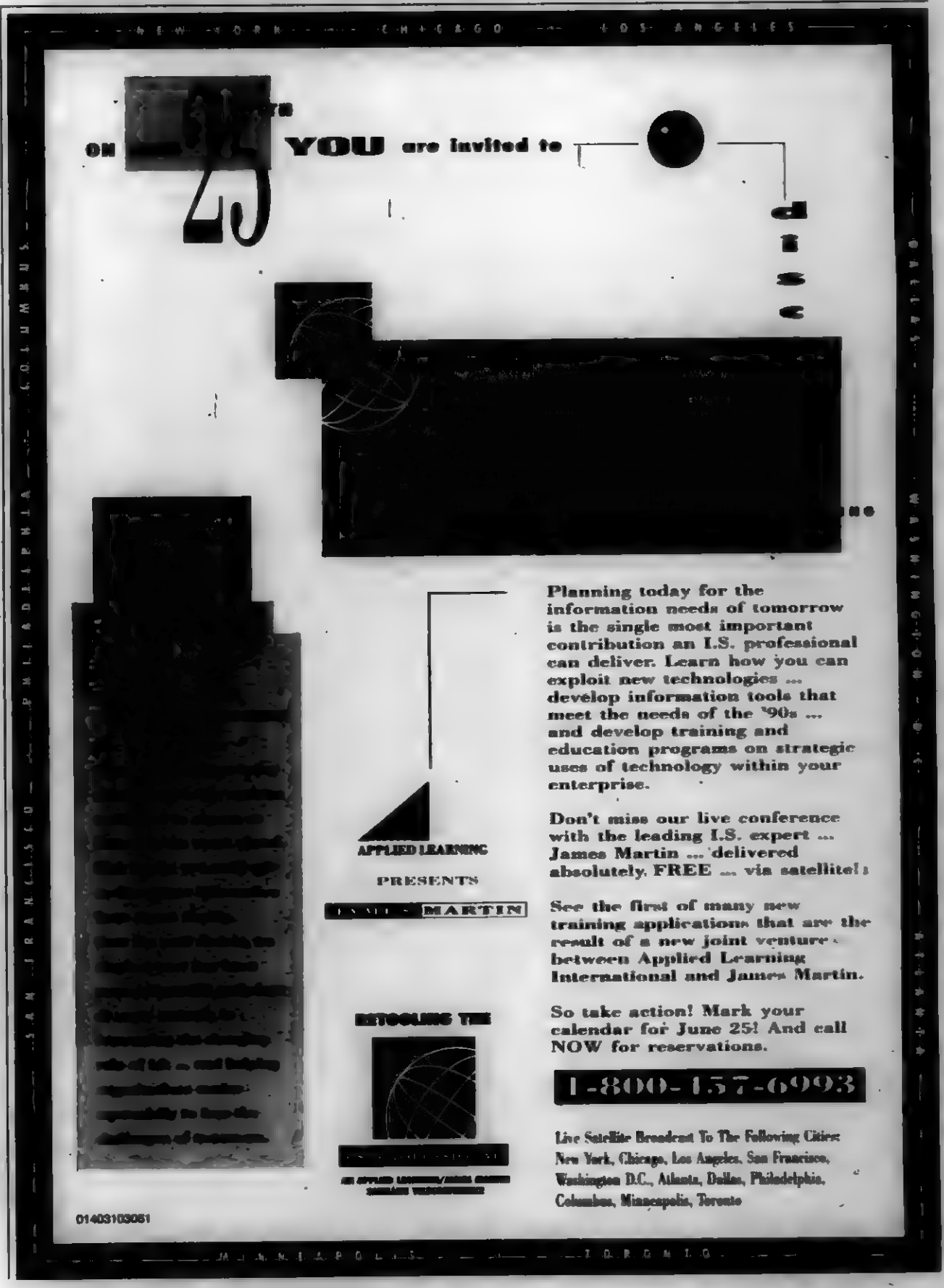
Dawn Sudmeier, manager of IS, argues that users should be able to freely access some of the company's production databases. "If you are going against a 2 million-customer database, there can be problems. But there's a difference between that and going against a 6,000-employee database."

Sudmeier says she is confident that controls built into the system will shut down a query that starts to run wild.

However, Chuck Wolff, the company's data and security administration manager, says he worries about the impact of ad hoc SQL queries by end users. "You can't have user access impacting mission-critical production systems."

Wolff and Sudmeier differ about how to best handle potential problems. Wolff wants to store extracts of the data in a separate relational database that users can access using PC-based SQL tools.

Sudmeier says that if performance is the obstacle, a library of protested queries should be created as an alternative to creating another database for users. Users can execute these, confident that they won't bog down the system, she says.



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Continued from page 93

connected through RDB.

Although still in the testing stages, the downsizing and integration effort has already paid for itself, Thompson says. "By delaying an $8 million mainframe upgrade, we shifted our spending to LANs and expanded the number of end users who have access to the information," he adds.

The database integration is scheduled to be completed by August.

Conserving customers

Conservation specialists — those who conserve the company's customers — use the system to develop more efficient retention methods.

Actuaries combine databases such as rates and mortality to calculate prices. Sales representatives use a sales illustration application to access data from cash value, premium and dividends databases.

By December, some 500 PCs will be installed. In five years, 85% of the 2,000 headquarters-based employees will have PCs, Thompson says.

Besides savings in mainframe upgrades, London Life says it is also enjoying big savings on individual applications.

For example, annual maintenance costs for a customer retention system were slashed from $87,000 (U.S.) to about $2,600 (U.S.), Thompson says. The savings stem from the use of the PC network, avoiding expensive mainframe transfer charges and the update to DB2, he says.

The system also removes the need for users to re-key information from one database to another, and in addition, it reduces staffing from two full-time clerks to one part-time position.

Thompson attributes the increased effectiveness in part to the upgrade to DB2. The previous system was based on the IBM 3090's DL-1 database.

"We decided to use DB2 because it is more flexible and easier to use than DL-1," an older IBM product, Thompson says.

The data manager — a software component of DB2 — decides how the data should be accessed, he says.

"This allows the end user to access the data directly without the assistance of a programmer," Thompson explains.

RDB proves its worth

With the move to DB2, the company also began investing in DEC's RDB databases. "DEC proved to be competitive, pricewise," Thompson says.

"At the time, IBM was promoting its System/36, which didn't offer nearly the amount of capabilities that DEC did," he says. London Life also decided to use DEC PCs because of a 20% price advantage over IBM.

PCs in the system use Borland International, Inc.'s Paradox. "We had been using Paradox in a stand-alone environment for four or five years before we decided to use it on the LAN," Thompson says.

"When we compared it to Oracle, Dbase and Microrim, we found that it was considerably less expensive and didn't require as much memory to run.

"The interface functions to accept standard SQL requests — which communicate the data to the VAX — and then ships the results back to the application," Thompson says.

According to Phelan, who is a conservation specialist, "The inner workings of the communications software is invisible with Paradox, and its menus and function keys make it user-friendly."

While the multivendor environment has not posed any drawbacks, Thompson says, he would like to see DEC get more third parties to support SQL services. ■

Mason is a free-lance writer living in Philadelphia.

Close-up

Organization: London Life Insurance Co.
Goal: Slash mainframe costs and increase market share 25% by offering faster and better data access.
Strategy: Offer LAN users access to integrated IBM DB2 and DEC RDB databases.
Payoffs: Downloading time cut from hours to minutes; $8 million in mainframe upgrade savings.

tech specs

At present, 200 networked PCs — Digital Equipment Corp. 316 and 325 SXs — are installed at London Life's Toronto headquarters. Each networked PC uses Paradox from Borland International, Inc. to access the DB2 and RDB databases.

Paradox translates the user's request into DEC's SQL services interface. The interface then accepts standard SQL requests, which communicate the data to the VAX, and then ships the results back to the application.

The PCs use DEC's Pathworks 4.0 PC integration software to link with the 12 Microvax 3100 servers, which in turn connect with the IBM 3090.

The Microvaxes use a DEC software product called Vida for DB2 server. Vida uses a language that is understandable by MVS and accesses the IBM 3090 on an LU6.2 communications session. Vida then operates as an application under CICS on the IBM mainframe.

JANET MASON

Multivendor demo planned

A consortium of leading database software and hardware companies will give what it says is the first demonstration of multivendor database interoperability next month.

The SQL Access Group, a 40-member nonprofit consortium that includes Borland International, Inc., Digital Equipment Corp., Novell, Inc. and Oracle Corp., says it will demonstrate multiple clients and database servers exchanging information in a "simulated, real-world environment."

Group officials say the announcement caps 18 months of research and represents "a first step" toward offering users true database interoperability.

The group also announced that the technical specifications underlying the demonstration will be published by X/Open Consortium Ltd.

These definitions include an embedded SQL definition for application portability and Open Systems Interconnect remote database access for database interoperability.

Founded in 1989, the SQL Access Group develops technical specifications to let multiple SQL-based relational databases and tools work together. It is based in Santa Clara, Calif.

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LEVEL 5

Subaru project aiming to put the right car in the right place

Unisys databases ensure that customers get what they want



BY MEL MANDELL
SPECIAL TO CW

To boost sales by ensuring that the right car gets to the right customer at the right time, Subaru of America, Inc. has begun the final phase of its biggest information systems project ever.

The automobile company is integrating its 10-year-old Unisys Corp. Mapper database management system with a new Unisys RDMS 1100 relational database. Both reside on a Unisys 2200/623 mainframe installed last year.

"Dealers hate to let an interested customer leave their showrooms," explains John Piccone, Subaru's director of business IS. In the past, he says, "if Subaru couldn't deliver the car the customer wanted on schedule, the dealer would bend over backwards to sell him or her another brand."

To prevent the loss of such sales, the new database will help ensure that dealers get the Subaru they need on time, according to Bill Krewson, manager of information resource management at Subaru's headquarters in Pennsauken, N.J.

Subaru, which is owned by Fuji Heavy Industries Ltd., posted a whopping 317% gain in domestic sales earlier this year. But analysts say the company isn't on easy street yet.

"At a time when the U.S. automotive market is shrinking, Subaru faces formidable competition," says Maryann Keller, an automobile industry analyst at stockbrokerage Furman Selz in New York. She adds that the improved delivery system could help the firm survive tough times.

Making big plans

Company planners are counting on the new system to play a big role in boosting projected sales to 130,000 to 140,000 cars this year, up from 118,000 in 1990.

The database integration, which began in January 1990, is expected to take up to 30 months and 70,000 man hours to complete. Subaru would not disclose how much the project will cost.

When the project is done, the company will be able to allocate 15,000 cars at a time. Subaru says it can now allocate cars to a specific dealer even before they roll off assembly lines in Japan and Indiana and can reassign them as needed.

At present, about 600 of Subaru's 750 U.S. dealers are equipped to access the database via personal computers or terminals to get information such as end-of-warranty dates and to order parts.

Early results seem positive. Will Anderson, assistant sales manager at B&L Subaru in New York, reports "a dramatic improvement" in the quality of information and speed of response from Subaru.

Moreover, company officials say the new system has already boosted the speed and functionality by 50% for company users on 1,700 Unisys PCs. Other payoffs include revamped ordering and invoicing programs and the creation of the company's first sales forecast program.

Mapper's limitations

The earlier version of Mapper currently includes the names of 1.5 million Subaru customers, parts inventory lists and dealer lists. Its main limitation, Krewson says, was an inability to handle large data structures. This meant car data could not be input until the automobiles had already reached the U.S. from Japan, and only then could a car be allocated to a dealer.

Also, once the car was allocated to one of the six U.S. sales regions, it couldn't be reassigned, even if it met the requirements of a customer in another region. This resulted in lost sales.

A lesser but still irritating problem, Krewson continues, was that dealers had incomplete descriptions of the cars before they were delivered. For instance, how was each car accessorized?

None of these was a major factor in the early 1980s, when Subarus were in their heyday and typically sold through Subaru-only dealerships, Keller says. If a given car didn't meet one customer's needs, others were ready to buy it.

However, Piccone adds, as the market shrank, more than half of Subaru's dealers added competitors' brands to their lineups. That made the company's database limitations painfully obvious.

In looking at its options, Subaru's IS group considered a Unix platform and RDBMS but chose to stay with Unisys. The big reason, Krewson says, was "the absolute automatic recoverability of both data and transactions with UDS 1100, the system under which RDMS 1100 operates. The Unix systems couldn't match that critical attribute."

The Unisys Mapper Relational Interface lets RDMS and Mapper talk to each other. Programmers are using the Mapper fourth-generation language to write screens for the new system. Batch and reporting functions are written in Cobol, and SQL is used to access information from RDMS 1100.

Initially, Subaru's IS department had estimated that 12 programmers and analysts could finish the integration in 18 months. According to Krewson, more time is needed for several reasons: Business requirements grew more complex, new code for the planning function had to be written from scratch, and nearly all the other code had to be rewritten.

The integration plan was divided into five phases: planning, ordering, allocation, delivery and invoicing.

The first phase, completed in August 1990, let the company generate sales forecasts for the first time ever.

The ordering, allocation and delivery phases, scheduled to be finished by November, will streamline the distribution process, providing for more detailed orders, national rather than regional car allocation and more efficient delivery.

The final phase, expected to be completed by January 1992, will let headquarters generate complete invoices, says Jim DiMarzio, the internal business systems consultant who managed the project.

Looking down the road, Subaru's IS group is considering integrating other existing databases, including those of parts and service, warranties and dealers, to the relational format. •



Nick Rakula

Krewson (left) *and DiMarzio steer Subaru's database integration project*

Close-up

Organization: Subaru of America, Inc.
Goal: Create a flexible, international car allocation system.
Strategy: Integrate a limited, semirelational database with relational Unisys mainframe product.
Payoffs: 50% boost in database functionality, ability to allocate 15,000 cars at one time.

Mandell is a New York-based free-lance writer specializing in technology topics.

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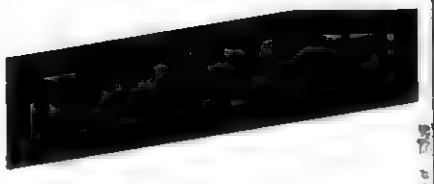
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INSIDE EDGE

The pluses and the minuses of going distributed

BY RICHARD FINKELSTEIN
and COLIN WHITE
SPECIAL TO CW

During the past few years, interest in true distributed database management systems has waned as vendors have failed to come up with the goods.

Today, most organizations are focusing their attention instead on client/server and cooperative processing.

Both of these distributed computing technologies offer several pluses for organizations eager to improve access to shared data. But these potential benefits come with several important and unresolved questions about standards and management. Following is a rundown of the major payoffs and stumbling blocks organizations face.

Pluses

First and foremost, client/server and cooperative processing permit remote access to data. Both allow stand-alone personal computer systems to be connected to local-area network-based environments that support multiuser access to shared databases.

Both approaches can also help solve a problem facing many organizations: accessing data stored in PC spreadsheets, databases and graphics packages. PC and minicomputer-based database servers offer a means of centralizing the data for greater accessibility, reliability and performance.

By storing data in a shared database server rather than in individual PC files, users are free to access common data with a variety of front-end client tools. Direct database server connections from dozens of popular PC packages such as Lotus Development Corp.'s 1-2-3, Microsoft Corp.'s Excel, Borland International, Inc.'s Quattro and Paradox and Datacase International, Inc.'s Datacase and Forest & Trees are now common. Furthermore, database servers minimize network traffic so that very large databases can be consolidated on PCs.

Drawbacks

The move toward graphical user interfaces will increase demand for access to complex data such as graphics, text and images. Unfortunately, there is now no standard way of retrieving, manipulating and maintaining these complex data types. Several DBMS vendors provide support for storing and retrieving large fields known as "blobs." But large storage requirements, coupled with the need for fast data searching and retrieval, are issues that need to be addressed.

The industry is moving toward the use of workstation client tools and applications that access shared databases on PC, minicomputer and mainframe database servers.

One of the key issues in such an environment is that it is likely to involve interconnecting database products from a variety of vendors. The existence of SQL as a standardized data access language encourages greater data integration and connectivity among vendor products. Each DBMS vendor, however, has its own SQL dialect, which adds to the complexity of building transparent links between front-end tools and back-end database servers.

Vendors and users have formed committees to address the problem of standardizing SQL. The American National Standards Institute/International Organization for Standardization (ANSI/ISO) SQL committee, for example, which published the original SQL standard in 1986, is readying a major extension to the standard known as SQL2. This enhanced SQL standard will provide a road map for vendors to follow as they extend their products, but full conformance will take many years to achieve.

Organizations such as ANSI/ISO and the SQL Access Group (see story page 99) are addressing the problem of interoperability among products. Again, it will be some time before this work is complete and vendors provide support. Meanwhile, vendors such as IBM and Apple Computer, Inc. are establishing their own de facto industry interoperability standards.

Management Issues

Perhaps the biggest issue facing users of distributed computing is the management of a distributed environment.

If organizations have to dedicate armies of systems administrators to manage the copying, backing up and recovering of shared databases and client software on departmental and LAN-based servers, the cost and productivity benefits of workstation technology will be lost.

The solution is to provide automated tools to perform and control these tasks. Unfortunately, few automated tools exist today.

To succeed in such an environment, developers will need facilities to share information (metadata) among different development tools and control the proliferation of metadata in a distributed environment.

The solution to this is a repository. A repository acts as the master source of metadata for workstation-based tools. For performance reasons, metadata from a repository will usually be extracted and copied to local workstation databases rather than accessed dynamically.

This is much like copying operational data from host-based servers to LAN-based servers for access by end users. The challenge will be to keep workstation-based metadata synchronized with repository metadata and DBMS metadata.

Although many of these new database and applications development technologies have yet to achieve full maturity, there is still considerable advantage to using them. The key to success is understanding their limits and knowing what can and cannot be done with them.

Finkelstein is president of Performance Computing, Inc., a Chicago-based consulting company. White is president of Database Associates International, a database research and consulting company in Morgan Hill, Calif.

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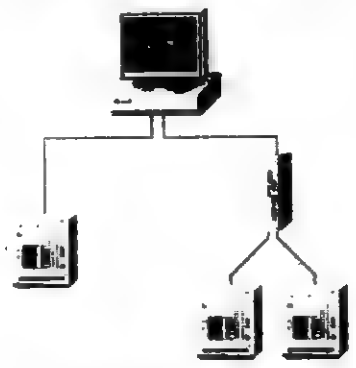
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FYI

SQL Solutions, Inc. announced new client/server-based gateways for VMS and Unix. The Burlington, Mass., systems integrator, a Sybase, Inc. subsidiary, says the products can link relational database management systems from Sybase, Oracle Corp., Digital Equipment Corp., Ask Computer Systems, Inc. and Informix Software, Inc. Prices range from $5,000 to $60,000.

•

New connectivity software from Gupta Technologies, Inc. in Menlo Park, Calif., lets users of its SQLwindows applications access data from Microsoft Corp.'s SQL Server. The cost is $1,995. A connectivity kit for existing SQLwindows users is $995.

•

Also under development by Gupta are gateways to IBM's OS/2 Extended Edition Database Manager, Hewlett-Packard Co.'s Allbase/SQL and Informix Software's RDBMS.

•

Oracle has named Houston-based Business Systems Group, Inc. a preferred systems integrator. The 4-year-old systems integrator is also the first Oracle Authorized Education Center outside of Oracle.

•

Version 1.1 of Paradox SQL Link from Borland International, Inc. adds a link between Paradox 3.5 and Sybase's SQL Server. Working under Unix or VMS, the new version includes connections between Paradox and database servers offered in the previous release. The cost for SQL Link 1.1 is $495; the upgrade version is $99.95. By year's end, Borland says, it will offer SQL Link support for Tandem Computers, Inc.'s upcoming SQL Server Gateway, IBM's DB2 via Micro Decisionware and Novell, Inc.'s Netware SQL.

•

Separately, the Scotts Valley, Calif.-based firm promised a Dbase compiler for Microsoft's Windows that will work with Paradox Engine. Called Turbo Xbase, the product will let companies migrate to Windows and still use existing Dbase files.

•

A new interface from Compuserve Data Technologies in Cambridge, Mass., links its System 1032 VAX-based RDBMS with Sequelink client/server development software from Techgnosis, Inc. Users can transparently access System 1032 data from OS/2 and Unix systems as well as from Apple Computer, Inc. Macintoshes. Available by July from Techgnosis in Boca Raton, Fla., the interface costs between $1,995 and $9,995.

•

Verity, Inc.'s new Topic SQL-Gateway lets developers integrate SQL databases into the new version of its Topic 3.0 wide-area network document retrieval system. The trick: hooking into RDBMS servers. The Mountain View, Calif., company also announced a new topic query language and support for major graphical user interfaces, including Microsoft's Windows.

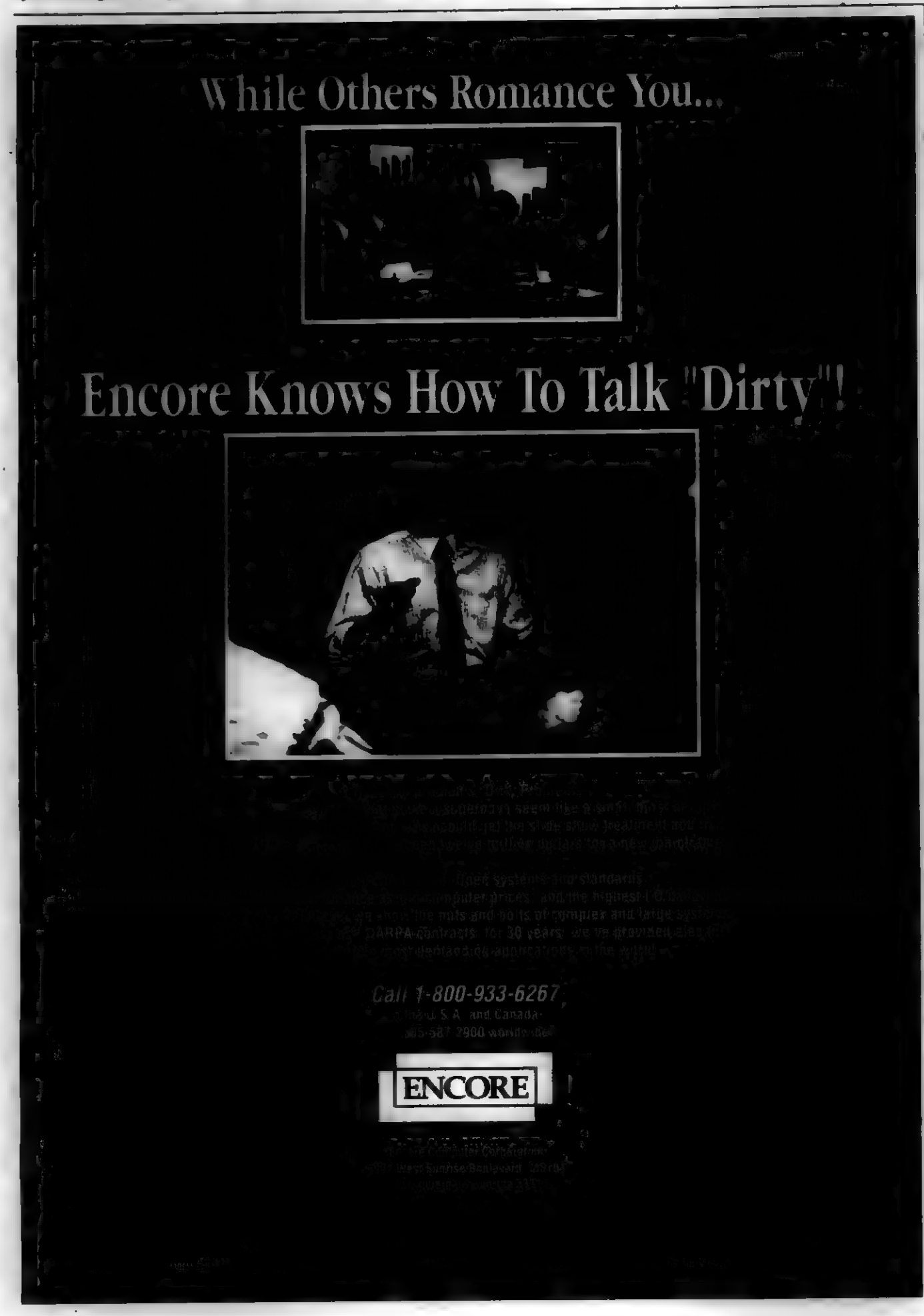
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The new DB2-Distributed Document Support (DDS) from Viewstar Corp. in Emeryville, Calif., lets users integrate IBM's DB2 as a back-end database repository for Viewstar's document management system. DB2-DDS is part of Viewstar's Enterprise Computing Architecture for document management systems across multiple internetworked sites. DB2-DDS is initially available only to Viewstar's existing customers. The target date for general sale is late 1991.

•

IBM has named Servio Corp. an IBM Business Partner/Authorized Application Specialist. The Alameda, Calif.-based firm will help IBM market and install IBM's RISC System/6000 along with Servio's Gemstone object-oriented DBMS. Gemstone lets users integrate object data, such as sound, graphics and images, with existing applications.

SUSAN NYKAMP



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Comparisons of six multiuser RDBMSs

BY CELESTE ROBINSON
SPECIAL TO CW

Six new multiuser, relational database management systems claim to live in two worlds: powerful languages and development tools for work-group applications and front ends for ad hoc manipulation. All the programs work on a local-area network, but some offer better multiuser controls. Here's a quick comparison:

Revelation Technologies, Inc.'s Advanced Revelation 2.03

Pro: Powerful form generator, file-level controls.

Con: Confusing user interface, no hand-oriented report generator, slow queries, high price.

Born to help developers create sophisticated transaction-processing applications, Advanced Revelation adds a full set of interactive tools to its programming language. Unless users need maximum programming flexibility, Advanced Revelation is only a fair value.

Datacase International, Inc.'s Datacase 4.24

Pro: Great forms, file-level controls, excellent multiuser capabilities.

Con: Difficult report generator.

Datacase is a friendly, competent DBMS with a top-notch form generator, but it still comes up short. Programmers will lament the lack of a debugger, LAN users will be disappointed by the slow multiuser queries, and just about everyone will struggle with the report writer.

Ashton-Tate Corp.'s Dbase IV 1.1

Pro: Popular language and file structure, great query-by-example (QBE) and report generator.

Con: Disorganized interface, no file-level controls.

Despite a confusing interface and middling speed, Dbase IV has a lot going for it: top-notch form, report and application generators, superb QBE and an industry-standard language and file format. If users need to enter or update data without creating applications, look elsewhere.

Fox Software, Inc.'s Foxpro 1.02

Pro: Fastest graphical-oriented interface, Dbase-compatible.

Con: Nonrelational form generator, no QBE or file-level controls.

Foxpro leads the pack in performance, development tools and ease of use. The Dbase file format and lack of QBE make it less useful for ad hoc data manipulation than some, but for applications development, Foxpro is superb.

Borland International, Inc.'s Paradox 3.5

Pro: Excellent interface, strong QBE, flexible relational capabilities, fast.

Con: No long text fields, troublesome network data entry.

Whether users are writing applications or working with data directly, Paradox is powerful, flexible and easy to use. It's also fast. Unless users demand full Dbase compatibility or plan on designing a complex transactional processing application, Paradox is your best buy.

Microrim, Inc.'s R:base 3.1

Pro: Excellent form and report generators, data dictionary.

Con: No debugger, poor network performance.

R:base makes building applications so easy, your users may not need a developer to create them. It boasts a powerful programming language, superb report and form generators, a pleasant interface and superb QBE. R:base's slow transaction processing makes it a poor choice for multiuser applications. •

Robinson is a free-lance writer in Belmont, Calif., who specializes in database management.

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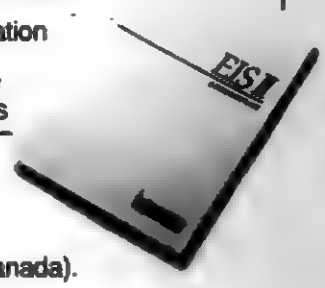
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IAAI-91

Get the lease with the most

Knowing how leasing companies specialize will help you put qualified lessors on your bid list and get the best lease rate you can

BY TOM MARTIN

Why do so many sophisticated information systems people use relatively unsophisticated means to select their computer lessors? Because they operate under the misconception that one bidder list, usually containing a small group of lessors, can meet the computer leasing requirements of all of their leased products.

This perception may not take into consideration that there are more than 500 computer lessors in the U.S., about 20 categories of computer products, 100 types of products within those 20 categories and no one leasing company that specializes in even half of the product categories.

Without knowing the size and scope of leasing options, the user may not select the lessor that can offer the best lease rate and ancillary benefits for a given product.

Finding the best lessor for the job doesn't mean merely increasing the size of your bidder list. Quality, not quantity, is the key objective.

To get qualified lessors to bid on each leased product, lessee companies need to understand lessor specialization areas, sort leasing requirements into manageable product groupings and set the bid process in motion (see story page 109).



Why a specialist?

What the specialist lessor typically offers a user is a low lease rate and specific product knowledge. Generalists typically base their pricing on residual forecasts supplied by outside forecasting services; forecasts are typically reduced by 10% to 30%. This gives them a margin of safety.

The competitive lease rates for a given product frequently require a higher residual assumption than is prudent for a generalist, so it has no recourse but to quote a higher lease rate in most cases.

By understanding how lessors specialize, customers are on their way to pinpointing those companies that can provide what they need. Lessors primarily specialize by product, in combination with factors such as lease term length, transaction cost, users' credit rating and the amount of residual risk they are willing to take.

• **Product specialization.** With the exception of being aware that lessors tend to specialize in either IBM or non-IBM products, users commonly lump lessors together. But the lessor landscape is much more complex. There are experts in mainframes, minicomputers, printers and so on.

Beyond these broad product categories, lessors segment themselves further into niches. For example, there are those mid-range lessors that deal mostly in one class of machine, such as an IBM Application System/400. While most lessors will arrange leasing for products outside their domain, they will often do so at a higher price than a specialist.

For example, during a recent bid on a large Hitachi Data Systems Corp. CPU, a generalist firm used a forecaster's residual numbers and bid on a 60-month lease, setting payments at $133,300 per month. An HDS mainframe specialist, using its own residual value numbers, quoted $126,500 per month on the same lease, saving the customer $408,000 over the life of the lease.

Furthermore, going to a product-specific lessor can provide benefits beyond cost. Its expertise in a given area can be valuable to a lessee. It's not unlike lawyer specialists: Someone who's an expert in corporate mergers is not likely to be the best advocate to handle your estate or draft your will.

• **Transaction size specialization.** Lessors also specialize in the cost of the transaction. While users often think large leasing companies are the only lessors that can handle a high-cost lease, this is not always the case. Many lessors in the industry are small "niche" lessors that have access to the necessary financing — both equity and debt — to handle a big money lease.

The user must be aware that just as the small-ticket transaction lessor (under $50,000 in cost) may be the wrong lessor for a big-ticket transaction (over $500,000), the big-ticket lessor can be the wrong one for a $50,000 lease. The big-ticket lessor would not make enough money per transaction to handle the overhead costs associated with making a small-ticket deal. In that case, the lessee might get hit with higher prices.

Users not understanding the vagaries of transaction size specialization might not make the best use of lessors. Requiring a big-ticket lessor specialist to first finance a lower cost product as a prerequisite for other business can be a mistake.

Expertise in one kind of transaction size leasing does not often carry over to another kind, and it is likely to cost the user the services of a more appropriate lessor for each transaction size.

Continued on page 108

Martin is president of Computer Financial, Inc., a leasing company in Hackensack, N.J.

• How the pros say it
• Fill-in-the-blanks bid form
• Surveying the field

Continued from page 107

• **Residual risk assumption specialization.** The lessor that specializes in a product will almost always take the highest residual position in that product because of its intense study of the residual forecast. To get the lowest lease rate, a company needs a lessor that is willing to take the greatest residual risk — that is, willing to recover the lowest amount of the cost over the lease term.

For the lessee, that means the higher the residual exposure taken by the lessor, the lower the monthly rent (see chart at right). A specialist will, however, occasionally refuse to support the product it normally specializes in if it is not economically feasible.

• **Lease term specialization.** Many users are surprised that the length of the lease term they want can qualify or disqualify some lessors from their bidder list. Lessors tend to specialize in short-term (two to three years) or long-term (four-plus years) leases based on their investment requirements or the requirements of their equity investors.

Lessors that can use tax benefits (either directly or through investors) will bid most competitively on long-term leases that have the lowest residual exposure. That translates into lower monthly rates.

For example, if a user was looking at a $1 million, 60-month lease with the vendor taking a 10% residual risk assumption, the rent not using tax benefits would be $19,470 per month. On the other hand, the monthly rent using tax benefits would be $714 cheaper and would translate to $42,840 in savings over the life of the lease.

Residual risk and you

The higher the residual exposure taken by the lessor, the lower the user's monthly rent

Term: 36 months Interest: 10% Cost: $1 million

Case	Residual percent taken by lessor	Lease rate factor	Monthly rent
1	0	3.20%	$32,000
2	10	2.96%	$29,627
3	20	2.73%	$27,253

Source: Computer Financial, Inc. CW Chart: Janell Genovese

Short-term lease specialists tend not to be tax-oriented and are willing to take significant residual risks with the expectation of substantial gains. While the lease rate may be higher, their value to the user is high flexibility in lease term.

• **Users' credit specialization.** Most lessors market to users with a specific class of credit: investment grade, middle market or high risk. Users that have an investment grade credit rating will be wasting their efforts if they solicit bids from lessors that specialize in middle or high-risk credits.

These lessors price their leases based on the interest rate requirements of their financing sources. These sources are willing to take risks in order to receive the higher rates charged for weak credit.

With an understanding of how lessors specialize, customers can begin to sort the products they want to lease into manageable groupings, each with its own leasing criteria. Groupings lessen the burden of mailing out bids and negotiating contracts with lessors for each product.

Grouping by product type is the most logical exercise, with the number of product types placed into each grouping unique to each user. An example of such a grouping would be personal computers, terminals and workstations.

Priorities for determining the products in a grouping are also based on the dollar amount and/or frequency of the leasing activity for each product. Large mainframes would usually be a separate product grouping because, unlike lower cost products, the very high product cost requires lessor selection criteria strongly influenced by lease rate alone. Furthermore, there are few bids for such big-ticket machines.

Similarly, if the user leases a great number of disk drives, it may have the drives and disk controllers in one grouping to handle the higher frequency of bids.

Selecting lessors

Once the product groupings are established, the user must determine the number and identity of lessor specialists for the bidder list applicable to each grouping. The user should be sure to have a separate bidder list for each grouping.

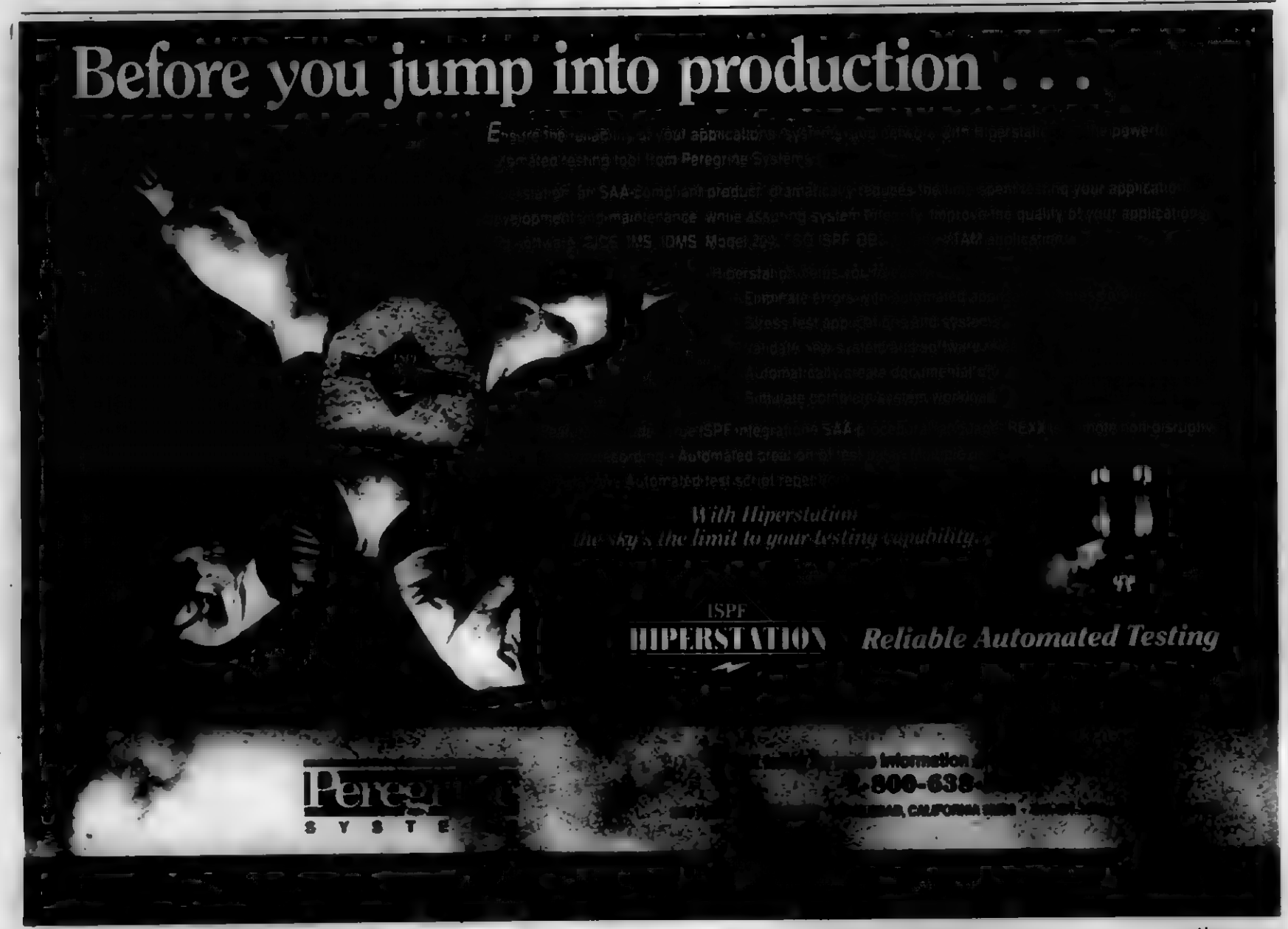
If large mainframes constitute a grouping, and if the user decides that lease rate is the only criterion for selecting a lessor for that grouping, a relatively large number of lessor specialists could be allowed on that grouping's bidder list because the bid evaluation process will be a simple comparison of lease rates.

While most companies will find lessors knocking on their doors to get involved in a deal, they may find it preferable to conduct an objective lessor survey. (For information on how to go through the survey and bid process, see story page 109.)

The survey form can be tailored to solicit specific lessor qualities the user has determined to be pertinent to each grouping. A user could send a survey form to all its existing lessors and those that want to be considered for business. The lessee can find out which leasing companies specialize in which areas by contacting leasing associations (see list page 109).

To get the most out of its computer leasing operation, the lessee must consciously approach the leasing of each product or product grouping as a separate and unique business. As such, each business transaction requires a discrete bidder list that is designed to meet the requirements of that business only.

The user benefits because the lessor bid process is streamlined, and the user has confidence that his leasing business can be awarded to the most desirable lessor for each lease transaction. •



Insider leasing terms

Learn how to speak "lease speak." Here are definitions of commonly used words in the leasing industry. Explanations are provided by the American Association of Equipment Lessors in Arlington, Va.

Capital lease: Type of lease classified and accounted for by a lessee as a purchase and by the lessor as a sale or financing.

Equipment schedule: A document that describes in detail the equipment being leased. It may also state the lease term, commencement date, repayment schedule and location of the equipment.

Finance lease: A full-payout, noncancellable agreement in which the lessee is responsible for maintenance, taxes and insurance.

Full-payout lease: A lease in which the lessor recovers, through the lease payments, all costs incurred in the lease plus an acceptable rate of return without any reliance on the leased equipment's future residual value.

Hell-or-high-water clause: A clause in a lease that reiterates the unconditional obligation of the lessee to pay rent for the entire term of the lease, regardless of any event affecting the equipment or any change in the circumstances of the lessee.

Lease: A contract in which one party conveys the use of an asset to another party for a specific period of time at a predetermined rate.

Lease rate: The periodic rental payment to a lessor for the use of assets. May also be defined as the implicit interest rate in minimum lease payments.

Leveraged lease: A type of lease wherein the lessor provides an equity portion (usually 20% to 40%) of the equipment cost and lenders provide the balance on a nonrecourse debt basis. The lessor receives the tax benefits of ownership.

Master lease: A contract in which the lessee leases currently needed assets and is able to acquire other assets under the same basic terms and conditions without negotiating a new contract.

Net lease: A lease wherein payments to the lessor do not include insurance and maintenance, which are paid separately by the lessee.

Open-end lease: A conditional sale lease in which the lessee guarantees that the lessor will realize a minimum value from the sale of the asset at the end of the lease.

Operating lease: Any lease that is not a capital lease. These are generally used for short-term leases of equipment. The lessee can acquire the use of equipment for a fraction of the useful life of the asset.

Residual value: The value of an asset at the conclusion of a lease.

A little work goes a long way

With the right tools, a smart user can juggle several lessors

BY TOM MARTIN

The path of lease resistance is to lease all products from one company and not worry about rates, terms and conditions.

While expedient, this approach is naive. A well-informed user can handle many potential lessors without great effort if he has the tools to do the job: a lessor survey to determine who should be included for each type of lease, a fill-in-the-blanks bid response form and a standard contract.

This standard contract should be one the user is familiar with and has used before to negotiate other deals. He must make clear to prospective bidders that they must accept it with few, if any, modifications.

Not only does the user have a standard gauge from which to operate, but this also saves him from going to the legal department for each new lessor bid.

In fact, one Fortune 10 company using this survey/bid/contract approach had one person successfully handle bid initiation, bid collection and analysis and contract negotiation for more than 10 data centers.

The survey

The user will want to craft a lessor survey pinpointing the areas of specialization that are important for the particular lease. This survey reveals what equipment the lessor is best at leasing. Questions should focus on the area important to the lessee, whether that be product, lease term or transaction size specialty (see standard survey form at right).

By contacting the following associations, a lessee can get a listing of specialists to which it should send its survey:

▶American Association of Equipment Lessors
(703) 527-8655

▶American Society of Computer Dealers
(202) 785-4990

▶Computer Dealers and Lessors Association
(202) 333-0102

▶Digital Dealers Association
(313) 475-8333

▶Computer Dealer Information Guide
Daily Marketing Corp.
(714) 662-0755

Once the user has targeted likely lessor candidates from the surveys, it should send out a bid request form (see form bottom left) with filled-in requirements such as cost, lease commencement date and lease term. The lessors then fill in their bids and return the bid request to the firm.

One rule of thumb on how much time should be spent researching and crafting a deal is that it should be roughly comparable to the potential savings the lease provides. For example, if the difference between two competing lessors is 1%, a customer that is leasing a $10,000 unit over a period of 48 months will have a total savings of $120. One percent of a $10 million deal, however, translates into nearly $121,000 over the same period. ●

The bid request

The process is twofold: Users send out the form with the top part filled in; lessors return the same form with their bid

BID REQUEST

Product:	*IBM 90000 - Model 320*
Features:	*1900 (extra memory)*
Cost:	*$1,540,224*
List:	*$1,604,400*
Lease Commencement Date:	*July 1, 1991*
Rent:	*Monthly in advance*
Bid Due Date:	*June 1, 1991*
Lease Term:	*48 months*
	60 months
Bidder's Lease Rate Factor:	*48 months = .022958*
	60 months = .020922

User fills in this part first, then sends bids to lessors on his list

Lessor returns bid with this part filled out

Note: Bidder must agree to abide by the terms and conditions of the lease accompanying this bid request (if it has not already been accepted by bidder).

Bidder: *XYZ Leasing Co.*
Signature of Officer: _____
Date: *May 15, 1991*

Awardee will be contacted by telephone.

Source: Computer Financial, Inc.

CW Chart: Janell Genovese

The lessor survey

While your specific questions may differ slightly, this is the basic form a lessor survey should take

DETERMINING WHO GETS ON THE LIST

What percent of your leasing business is by each manufacturer?

IBM
Amdahl Corp.
Digital Equipment Corp.
Hitachi Data Systems Corp.
Other (specify)

What percent of your lease business is in each of the following groups?

Small CPU	Other printers
Medium CPU	Communication controllers
Large CPU	Communication switches
Application System/400	Terminals and controllers
Disks and controllers	Workstations
Tapes and controllers	PCs
Laser printers	RISC System/6000

What percent of your lease business deals with the following lease terms?

2 years	4 years
3 years	5 years

What percent of your lease business deals with the following user credit classes?

Investment grade
Middle market
Weak

What percent of your lease business deals with the following transaction size?

Under $50,000
$50,000-$250,000
$250,000-$500,000
$500,000-$1 million
Over $1 million

What three products are you best (lowest rate) at financing?

1. _____
2. _____
3. _____

Number of years in business

Source: Computer Financial, Inc.

CW Chart: Janell Genovese



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NATIONAL

BRIEFS

It's 1995: Do you know where your dollars are?

▶ If the results of a recent analysis published by Burlington, Mass.-based market research firm Decision Resources, Inc. are on target, one out of every four of them spent on information systems, software and services will be for outsourcing. "The information industry will be permanently changed by the increased importance of outsourcing," concluded consultant Frederic Withington, who authored the article.

More

▶ For quarter after quarter of posted losses, representatives of **Data General Corp.** reiterated that the firm still showed a solid cash position. Now that DG's quarterly numbers are being scripted in black, the firm seems to be taking its cue from Madonna's songbook: "More is better than nothing, yes — but nothing's better than more." Late last month, DG filed with the Securities and Exchange Commission a proposed offering of $100 million in 10-year convertible subordinated debentures, the proceeds of which will go for "working capital and . . . general corporate purposes."

Clean boards, no; clean air, yes

▶ **Apple Computer, Inc.** has announced that by the end of next year it will completely eliminate the use of ozone-depleting chlorofluorocarbons to clean electronic assemblies and circuit boards. The Cupertino, Calif.-based company said it has developed a new process for circuit board assembly that does not require the boards to be clean.

No fooling

▶ Yokohama, Japan-based software player **Hitachi Software Engineering Co.** announced last week that it did indeed arrive in the U.S. on April 1. **Hitachi Software Engineering America Ltd. (Hisal)**, led by Gen Shiroo and headquartered in San Francisco, will take over the marketing of parent Hitachi Software's biotechnology software products, formerly handled through **Hitachi America Ltd. (HAL)**, the U.S. trading arm of Tokyo-based Hitachi Ltd.

Pen-based PCs poised for breakthrough

BY PATRICIA KEEFE
CW STAFF

The combined effect of a saturated desktop market, a persistent recession and fierce discounting have sent the personal computer industry into a downward spiral. Already, reports project that the increasingly competitive laptop segment could be next. The one bright spot on the horizon appears to be the promise of pen-based computing, which one observer noted is expected to "shatter the glass ceiling" that prevents new users from coming into the industry.

Pen-based computers — small tabletlike devices with electronic pens — use a paper and pen metaphor with no cursor, providing users with more familiar and more direct input control. Not only are these tablets extremely portable, but many observers think they will change the way users deal with information.

The result, according to Forrester Research, Inc., a market research firm based in Cambridge, Mass., is that pen-based computing could be the next mass market for the computer industry.

Storm warnings

Surveys have predicted from 7 million to 54 million potential customers for the technology. "It will be a major thunderstorm," Forrester Research President George Colony said.

With its attendant revenue potential, the nascent pen market is attracting all kinds of heavyweights — including IBM, Microsoft Corp., Lotus Development Corp., Apple Computer, Inc., NCR Corp., Sony Corp. and Tandy Corp. — as well as substantial investment capital directed at start-ups such as Go Corp., Slate Corp., Pensoft, Pen Pal and Momenta (see story page 117).

"I haven't seen this much concentrated activity since the first days of the PC clones," said Vern Rayburn, chairman of Slate. "This is the first computer you can put in front of people with no caveats," he added.

Sales estimates of up to $3.5 billion by 1995 have whetted appetites. That optimistic figure comes from BIS Strategic Decisions, a Norwell, Mass.-based firm that also offers a conservative prediction of $1.5 billion. Which track the market takes will depend on a number of variables during the next 18 months.

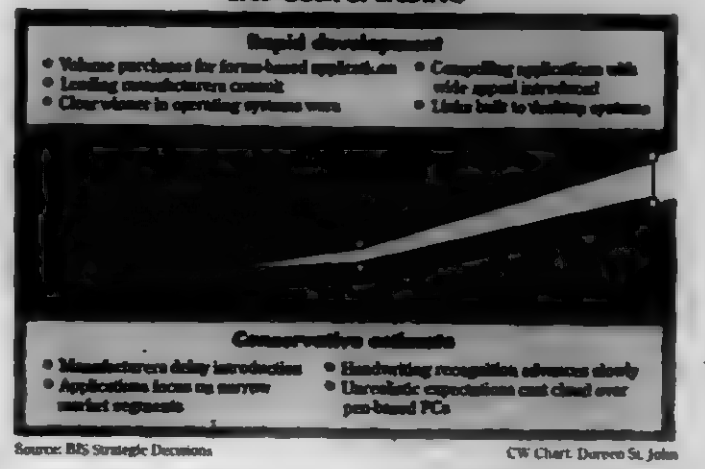
"This is a market that could . . . take off rapidly later this year and account for sales in the millions of units within a very few years," said Richard A. Shaffer, editor of New York-based Technologic Partners' "Computerletter" newsletter.

After forays by industry pioneers such as Grid Systems Corp., Wang Laboratories, Inc.

Continued on page 117

Possible futures

Depending on the events that take place during the next 18 months, pen-based computing could take off at different speeds



Source: BIS Strategic Decisions — CW Chart: Doreen St. John

Bush drums up export enthusiasm

President promises government support for those who decide to go global

BY NELL MARGOLIS
CW STAFF

BOSTON — President Bush came here late last month to urge businesses to go global and to promise his administration's aid in getting there.

"If you want to succeed in business these days, you can't worry just about competition within the U.S.," the president told the approximately 350 representatives of local government and business who flocked to Boston's World Trade Center for a daylong conference on the whys — and, significantly, the hows — of exporting. "You have to be ready to go head-to-head with the rest of the world."

Information technology — both as a subject and as an enabler of a stepped-up, government-aided export initiative — was a prominent theme in the agenda of the conference, from opening remarks by Data General Corp. Chief Executive Officer Ronald Skates to the demonstration of the National Trade Data Bank, a compact disc/read-only memory (CD-ROM) database created by the U.S. Department of Commerce to give firms a leg up in the global business arena.

Department of Commerce Secretary Robert Mosbacher joined Bush on the trip to tout the benefits of global investment, particularly for small and midsize companies that have not yet ventured overseas. Statistics indicate that many more firms are talking about global business than doing it. Massachusetts, for instance, is the 10th heaviest exporter among the 50 states. However, more than 70% of Massachusetts' firms do no exporting at all, and three technology firms — Digital Equipment Corp., Prime Computer, Inc. and Raytheon Corp. — accounted for more than 50% of the state's $11.6 billion in 1990 exports.



President Bush, *flanked by Secretary Mosbacher (left) and Massachusetts Gov. William Weld, exhorts Massachusetts businesses to venture overseas*

Because the economic future belongs to the able exporter, Bush said, it is critical that the profile in every state expand to include firms across the size spectrum. A wealth of technological aids, he emphasized, are now in place to avail the would-be exporter of pertinent information. "Just pick up the phone and dial 1-800-USA-TRADE," he urged, for information regarding "a full panoply of government services" set up to help business owners in their overseas forays.

The National Trade Data Base packs 90,000 federal documents onto a CD-ROM disc that plays on IBM-compatible personal computers. Released monthly and updated every two years, it offers would-be exporters country-specific, industry-specific and cross-referenced information ranging from legal and governmental regulations to the telephone and fax numbers of likely contacts. The price is scaled down to attract small businesses: $360 for a 12-month subscription, or $35 for a single disc.

"This kind of access certainly would have been useful to me when I started out," said Frank Wright, who as CEO of Innovation, Inc., pioneered joint venturing between the U.S. and the Soviet Union.

INTERNATIONAL

BRIEFS

I want my LCD — and in color

▶ Tokyo-based **Toshiba Corp.** and **IBM Japan Ltd.** have begun producing large color LCD screens at their recently completed joint-venture manufacturing plant located in Himeji, Japan. The joint company, called **Display Technologies, Inc.**, was announced last November and is now making 10.4-in. displays with 640- by 480-pixel resolution; Display Technologies will gradually increase the size of the products, which are expected to become popular additions to portable computers as soon as their manufacturing volumes rise and their prices drop.

The Great Network of China

▶ According to a recent report in the Chinese press, China's **Ministry of Foreign Economic Relations and Trade (Mofert)** is planning to establish a computer network that will link all related trade bodies in China and overseas. The network is expected to boost China's competitive position in international markets. Rong Xingquan, director of Mofert's computer center, estimated that the entire computerization and networking process will take five years to accomplish. The computer center is in charge of organizing the project, which is being undertaken by trade departments at various levels.

Dog days

▶ After a wave of horrific incidents involving pit bull terriers swept **London**, computers rushed to the rescue, according to a report in the British business press. Appropriately enough, the machines came from **Groupe Bull**. The French computer company has produced a dangerous dogs register, which is intended to track incidents involving canines. Police using the system will be able to identify known problem animals and their owners with greater ease, according to the company.

Windows on Tokyo

▶ **Japan**'s first exposition devoted to **Microsoft Corp.**'s **Windows 3.0** is scheduled to be held at the Nippon Convention Center in Tokyo from Dec. 19 to 21. Some 200 Japanese and overseas vendors are expected to exhibit their wares, and a crowd of 40,000 is expected.

Rocky Mountain 'Hi'

▶ Germany-based international software player **SAP AG** is expanding westward. This week, wholly owned subsidiary **SAP America, Inc.** is opening a Western Region office to serve all states west of the Rockies.

Cray expands Europe strategy

BY CAROL HILDEBRAND
CW STAFF

MINNEAPOLIS — Cray Research, Inc. is turning up the gas under its European operations, creating several new executive positions and filling some existing slots.

Robert Levy was named vice president of European development. The post puts him in charge of pursuing strategic alliances with other European organizations.

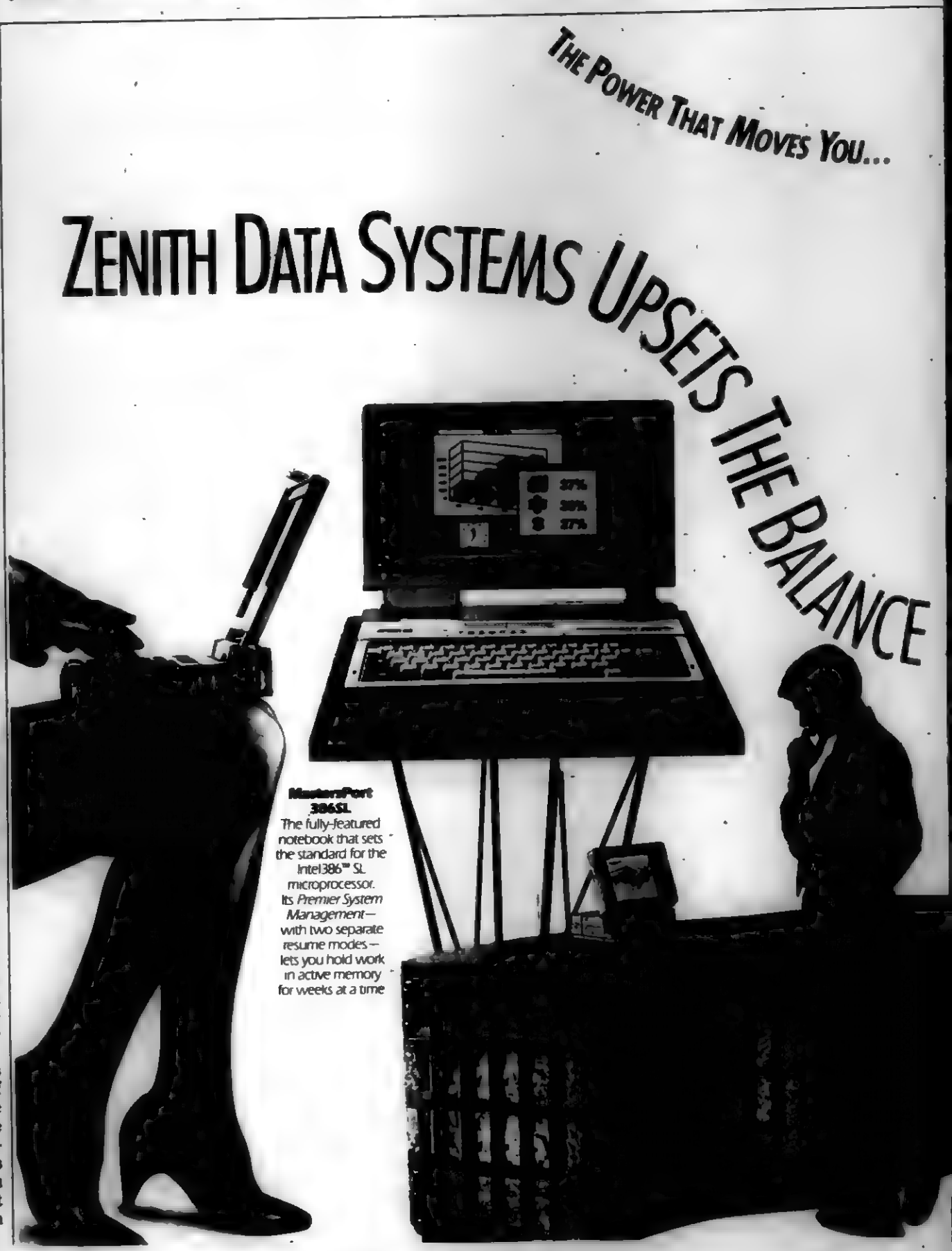
Levy, who formerly held the position of president and general manager of Cray Research France SA — which included the firm's Southern Europe region — will report to the company's Technology Council. The Technology Council is made up of six senior executives who determine the business and technical courses for Cray Research.

Only weeks ago, Richardson, Texas-based Convex Computer Corp. announced its heralded C3 series, a family of gallium arsenide-based supercomputers aimed directly at Cray Research's low end. Analysts have noted that the advent of the C3 heats up the competition in the supercomputer arena [CW, May 13].

The company's move stemmed from some strategic planning sessions held in early May, according to Cray Research spokeswoman Kate Neessen. "We determined that because a good 30% of our revenues come from Europe, we needed to pursue strategic alliances within that sector." Neessen said the alliances could encompass ventures ranging from developing a common product to marketing in conjunction with a foreign-based company.

The reorganization signaled a new direction for Cray Research, Neessen said. "It's very much a strategic change," she said. "It's not in response to business, but rather it's a projection of how we're going to have to work. Europe is the battleground for the '90s, and we want to be prepared."

In other movements, Don Whiting was promoted to the newly created position of vice president of customer services. He will be responsible for the activities of the company's worldwide service organizations, as well as its technical operations group. Filling Whiting's previous position as vice president and general manager at Cray Research Europe Ltd. will be Bryan Little.



EXECUTIVE CORNER

Moss at head of Texas start-up

Former Lotus Development Corp. Consulting Services Group Vice President **Franklin H. Moss** is the first president and chief executive officer of **Tivoli Systems**, an Austin, Texas-based start-up that was created to develop and market a suite of products and services aimed at the management and integration of distributed systems resources. Moss, who began his career at IBM, also headed the Domain Engineering Group at Apollo Computer, Inc. (now part of Hewlett-Packard Co.) and co-founded workstation manufacturer Stellar Computer, Inc. (now part of Stardent Computer, Inc.) prior to his career at Lotus.

As of now, when **IBM** says "our man in Europe," it means company Vice President **Renato Riverso**, who late last month succeeded IBM Senior Vice President **David McKinney** as president directeur general, IBM Europe. Riverso will also wear the hat of chairman, IBM Europe/Middle East/Africa. Meanwhile, McKinney is now on special assignment, reporting to Chairman John Akers; he remains a member of IBM's corporate management board. In his new capacity, McKinney will work with line management to improve IBM's business support structures as well as assuming responsibility for the firm's communications, information systems and environmental staffs.

Tim Davenport, formerly general manager of Lotus' graphics division, has assumed a new Lotus position: Late last month, he was named vice president of the Cambridge, Mass.-based software house's Graphics Products Division. In the new post, Davenport, who continues to report to Software Business Group Senior Vice President Frank King, will be responsible for overseeing the development and marketing of the company's graphics lines, the advancement of which is a high priority on the current Lotus agenda, according to King.

Washington, D.C.-based advanced communications products and research firm Comsat has named Bruce L. Crockett president and chief operating officer. Crockett, formerly president of Comsat's largest unit, the World Systems Division, replaces company Chairman and Chief Executive Officer Irving Goldstein, who had been serving as interim president and COO during the Comsat's executive search.

Robert T. Knight, who has been acting president and CEO of Digital Sound Corp. since February, was officially appointed to the office last month. A veteran of Xerox Corp. who also served as an executive at Computer Sciences Corp., Knight will be responsible for defining the corporate mission and steering the long-term marketing strategy of Carpinteria, Calif.-based Digital Sound, which manufactures a family of voice application platforms.

Los Angeles-based systems vendor Logicon, Inc. has named Frank P. Dyke to take on the position of president of the company's Logicon Fourth Generation Technology, Inc. subsidiary, which is located in La Jolla, Calif. Dyke, who formerly served on Logicon's corporate marketing staff, was a lieutenant colonel in the U.S. Air Force prior to joining the company in 1978.



Unisys to cut stake in Nihon

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. announced late last month that it would gradually reduce its 33.4% equity stake (36.6 million shares) in Nihon Unisys Ltd. by up to 2.2 million shares through sales on the Tokyo Stock Exchange.

Tokyo-based Mitsui & Co., which also holds a one-third stake in the 3-year-old, $2.6 billion information systems company, has said it will take similar action.

According to analysts, Unisys was acting on an earlier stated objective. The company had decided to sell off assets as a means of obtaining cash needed to bolster the debt-ridden corporation.

"But this is small change compared to what they really need to sell," said David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago, with regard to the proposed Nihon Unisys divestment.

At current stock prices, Unisys would net about $55 million if it sold the 2.2 million shares immediately, Schofield calculated.

Unisys has put only a small portion of its holdings on the market, Schofield speculated, because of worries that a larger divestiture would spark a negative reaction in Japanese financial and commercial markets.

Indeed, Unisys President and Chief Operating Officer Reto Braun said the planned equity sale did not alter the company's commitment to the Japanese market.

"We will continue to be a long-term player in the Japanese computer market," Braun said in a prepared statement.

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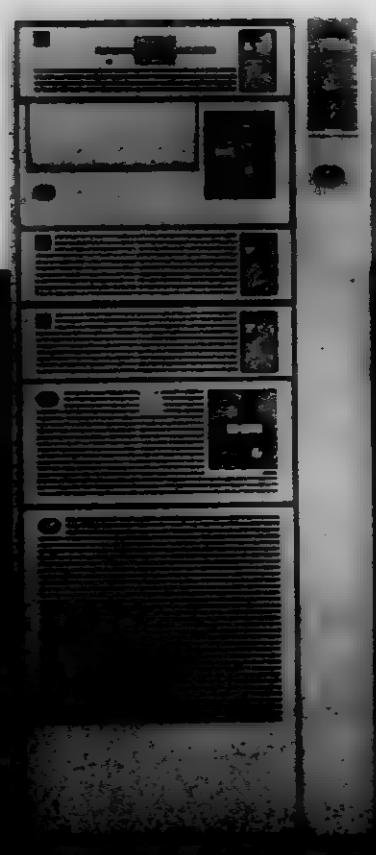
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Pen-based

FROM PAGE 111

and Data Entry Systems, the market should get a second, more important wind in early 1992, analysts said.

For instance, an initial release of Go's 32-bit, object-oriented Penpoint operating system — optimized for Intel Corp.'s 80286 processor — shipped to developers in February. The first hardware offerings and a final, 386-based Penpoint could be ready by fall, giving a green light to user pilots in 1992.

Another factor expected to propel the market forward is a relatively short learning curve for pen-based systems. Shaffer said the selling and training cycle for stylus systems is "considerably faster" than that for conventional keyboard machines.

Meanwhile, pharmaceutical, insurance and health firms are eager to exploit the technology, which Framingham, Mass.-based market research firm Technology Investment Strategies Corp. said will provide mouse replacement, editing tools and text input.

Some users have already begun development efforts, according to Rayburn (see story at right). For example, State Farm Mutual Automobile Insurance Co. in Bloomington, Ill., is already working with IBM to develop a pen-based system to estimate auto repairs. State Farm has a potential user base of 30,000 agents and adjusters [CW, Jan. 28].

Slate, which has developed an applications generator for pen-based programming, has clients already experimenting, designing applications and doing field tests. "They are getting ready to make some fairly large commitments, in the 1,000s or 10,000s of unit buys late this year or early '92," Rayburn said.

In the operating system arena, the race is between Go's Penpoint and Microsoft Windows' Pen Windows. Most analysts predicted there will be room for both products, which are attractive for different reasons. While Microsoft took the compatibility-with-today's-environment route, Go built from the ground up what some analysts have dubbed a "glamorous" platform for pen-based computing.

The two companies have worked together, trading technology in some areas. However, they do not agree on some key standards — so-called "gestures," or recognizable keyboard marks, for example.

Every market has its bumps, and pen-based computing is no exception. Cost could be a killer. Technology Investment Strategies pegs the minimum Penpoint configuration at 4M bytes of random-access memory and an Intel 80386SX chip, with system prices ranging from $4,000 to $7,000. Nor are the customized packages expected to be cheap. Microsoft's approach will be less expensive, possibly costing as little as $2,500 to $3,000, because of its focus on mainstream computing, Technology Investment Strategies added.

But this may not prove a barrier to those industries that can fully exploit the systems and quantify productivity levels. In those areas in which forms must be filled out and signed in the field, for example, return on investment can be substantial, especially if the user is able to eliminate some steps involved in processing that information.

Rayburn cited one client that processes more than 200,000 paper orders per day, experiencing a 30% error rate. If the company is able to cut that error rate even in half by switching to pen-based forms, it would pay for 10,000 units, he said.

Other areas that remain to be refined, albeit probably not in the short term, are handwriting recognition, a color display and true, effortless connectivity.

In its current state, handwriting recognition has an accuracy rate ranging from 80% to 90%, which is not considered sufficient, according to Technology Investment Strategies. It predicted developers will get around this problem in the short term via "clever interface solutions." For example, relying on forms limits the amount of data a user needs to input.

Ease of use, which encompasses the list above, is probably the biggest requirement. Pen-based systems are meant to be carried anywhere and everywhere, often by noncomputer-oriented personnel. It is critical that they be easy to use. Go has addressed this in part by embedding a document architecture into Penpoint. According to the company, when users need to run an application, they simply open their documents and go.

Putting pens in the proper places

As with most other computer markets, applications availability is said to be critical to the emerging pen-based niche. Three types of applications are seen as targets: some existing software; applications such as personal information managers that exist today on PCs but remain in niche markets; and new applications built specifically for pen-based computing.

Technologic Partners' Shaffer said he expects the market to develop in two stages. The initial market will target specialized applications for mobile sales personnel, blue-collar workers and other noncomputer users. Later, once the technology for remote communications and handwriting recognition has evolved, a more generic office market will evolve, he said.

The two operating system providers currently competing reflect this scenario. Go has already trained some 200 developers and will probably attract more attention from corporate developers and small start-ups.

Pen Windows is still under development and is expected to ship by the end of the calendar year. Pen Windows may do a better job of attracting support from industry heavyweights that already offer Windows applications for the business market.

Obviously, porting their software to Go's Penpoint will require a greater effort. However, 35 vendors, including Lotus, Novell, Inc., Claris Corp. and Wordperfect Corp., have said they will support Penpoint.

PATRICIA KEEFE

With pens poised

Among the key companies driving the fledgling pen-based or stylus system market are the following:

- Go built a handwriting-based operating system called Penpoint, which has a notebook user interface and gestures, or pen commands.
- Microsoft will add some 30 application programming interfaces to Windows 3.0 to support the pen environment. Windows applications can then be easily ported to pen systems, ensuring availability of a large amount of software in a short period.
- Grid was the first to enter this market and has already sold an estimated 10,000 DOS-based Gridpads. It has promised to ship a new notebook running under Penpoint this year.
- Slate is shipping a developer's version of its database engine-based Professional Applications Development System.
- IBM and NCR are Go licensees and plan to develop pen-based computers at some point. IBM is expected to support both Penpoint and Pen Windows.
- Wang is shipping its Free-Style stylus and is said to have three pen-based prototypes in development.

PATRICIA KEEFE

COMMENTARY

Jean S. Bozman

Pacific Rim possibilities



The meeting room in the Fairmont Hotel was so quiet, you could hear the cable cars outside on hilly California St. That is, if you were listening. The 40 executives in San Francisco for the International Computers & Communications conference, however, were looking straight ahead, eager to hear about the upside — and the downside — of forging international partnerships across the Pacific Ocean.

The good news is clear: New markets are opening up in the Pacific. That should provide U.S. firms with additional sources of revenue and profits — even if those profits don't come right away.

The bad news, however, persists: Somehow, firms have to protect their "core technology" from being taken away by cash-rich partners who get too close. The risks of partnership, especially for smaller firms trying to raise capital through foreign investment, can be staggering, speakers warned.

"Sacrificing the company's long-term success for quick money is something to avoid," said Masazumi Ishii, managing director of Azca, Inc., an international business development firm in Redwood City, Calif. "It's possible that the investment partner may use the relationship only to extract the small company's core skills."

Ishii looks for good matches between Silicon Valley firms and cash-rich Japanese companies. "These relationships are like marriages," Ishii noted. "They cannot work unless both parties make a conscious effort to get [them] to work."

Rhea Serpan, vice president of international services operations at AT&T, said he saw no need to hide state-of-the-art technology, provided there were legal limits to the relationship. That policy has served AT&T well in South Korea and in Indonesia, where long-term relationships paid off with repeat business.

"There was a time when people thought they didn't need to lead with their technology," Serpan said. "To protect their core technology, they would only share technology that was three or four years old," he noted. "Now, things are moving so quickly that to stay a week behind state of the art is to stay a generation behind. The time line is just collapsing."

However, Serpan added, before sharing important technology secrets, care must be taken to consider the consequences. "Both parties need to have a high degree of trust and confidence in what's going to happen next." The legal consequences of inventing such international partnerships are not clear, but there were some lawyers in the audience busily taking notes.

But even before legal lines are drawn there is the question of policy: How do the actions of a U.S.-based multinational firm — or a transnational firm that owes its allegiance to no country — affect national policy?

Bradley P. Holmes, U.S. coordinator for international communications and information policy, monitors these situations. "It's no secret that there's an ongoing debate about how involved the U.S. government should become in industrial policy," Holmes said. "In the last administration — and in this one — there has been a tendency to let the market determine which company will win or lose. Our market has been very open in that respect."

Sadly, Holmes noted, some opportunities have already passed by, "opportunities in which the U.S. could have capitalized on technology" to further its industrial policy. One such missed chance, he said, is high-definition television (HDTV) technology. Ironically, he noted, a particularly steep learning curve in the HDTV area could be giving U.S. firms a second chance to get in on something approximating the ground floor. Thus, government's hands-off approach to the technology marketplace is still preferable, he said. It creates as many winners as losers.

U.S.-based firms, it seems, would be well-served to look out for their own best interests — and to bring their corporate lawyers on the long, 13-hour airplane trip to the other side of the Pacific.

Bozman is *Computerworld*'s West Coast senior editor.

Beijing Stone looks to the West

Private firm succeeds at home, seeks internationalization

BY DON TENNANT
IDG NEWS SERVICE

HONG KONG — The privately held Beijing Stone Group Corp., China's largest computer company, is aiming to expand its operations beyond the mainland in a bid to become "China's IBM." With revenue reportly five times that of state-run Great Wall Computer, the company could be on track to do just that.

Duan Yongji, first vice president at Beijing Stone, spoke about his firm's pioneering efforts at China Computer '91, a symposium held here last month under the auspices of Framingham, Mass.-based research firm International Data Corp.

"Stone has set a long-term target for itself to become China's IBM," Duan said. "Of course, we don't mean that we will be on par with IBM someday."

Rather, Duan explained, "our purpose is to open an oasis in the desert of China's high-tech industry, to explore the possibility of commercializing results from scientific research and to attempt setting up an efficient enterprise with Chinese characteristics."

Beijing Stone was established in Beijing in 1984 with a $3,800 loan from a township in the Beijing suburbs. Asked to explain who actually owns the company, Duan simply said that it is owned by its employees — roughly 2,000 workers in factories operating in Beijing, Tianjin, Zhongshan as well as other provinces.



That employee ownership plan attracts the most highly skilled personnel China has to offer. The company is permitted to hire whomever it chooses, Duan said, and it can afford to be selective: There are 100 applications for each job opening.

In its first four years of operation, Beijing Stone grew 300% each year. That rate dipped to 60% in 1989, when the company's former president, Wan Runnan, was named an enemy of the people because of his involvement in pro-democracy protests. Wan has since fled to France, where he set up an unaffiliated company under the Beijing Stone name, funded by Taiwanese interests.

The presidential post at Beijing Stone is still vacant, leaving Duan as the corporate head. After close scrutiny of Duan and the company, the Chinese authorities decided to allow Beijing Stone to remain intact — and despite the political difficulties, the company has flourished. Since 1984, Beijing Stone has logged cumulative sales of approximately $670 million, $230 million of which was earned in 1990. Duan projected a further increase of 50% this year.

Climbing to the top

Beijing Stone began its climb in what appears to be typical Chinese fashion — acting as a value-added reseller and service provider for foreign companies.

Now that Beijing Stone has accumulated $38 million in capital, however, it is set to move to what Duan called the "taking-off stage."

"In this second stage, we will aim at breaking into the international markets while doing everything we can to industrialize the Stone Group," Duan said.

"Judging by the government's policy toward high-tech enterprises, a non-state-run organization like Stone cannot survive without a factory to manufacture its own products," Duan noted. "In the past 40 years, state-run factories in China have developed a large capacity for turning out machinery and electronic products. But that capacity has not been brought into full play. It is highly possible for Beijing Stone to supplement these state-owned industries and [for both] to develop together."

Duan said that in order for Beijing Stone to survive, it has to constantly adjust the balance between research and development, industrial production and trading.

"We want the products manufactured by our own group to [make up] more than 80% of the total sales revenue in three years. To reach this goal, we will not try to set up factories to manufacture complete product lines. Instead, our practice will be to have a number of the best products turned out by a group of factories in coordination with one another."

An international presence

Establishing a foothold in the international marketplace will be the secret to Beijing Stone's success in the long term, Duan said.

"Whether to improve our own performance as a high-tech company or to develop into an export-oriented enterprise, it is imperative that our company should become internationalized.

"Our company would fall short of a high-tech enterprise," he explained, "if we did not build up close links with the main high-tech product market and if our own products could not break into the world market."

Tennant writes for Computerworld Hong Kong.

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Industry groups add zest to IS careers

BY JILL VITIELLO
SPECIAL TO CW

Information systems professionals are keeping their careers fit for the fast track by joining industry associations and user groups. These organizations offer opportunities for networking and establishing a professional reputation that can lead to career advancement.

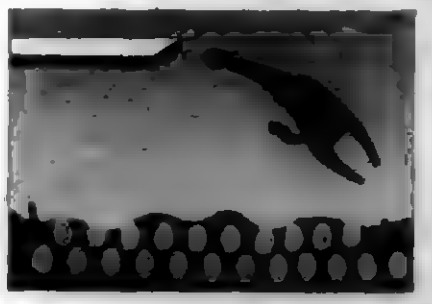
Even during a recession, user groups and industry associations offer ways to find new employment. Generally, every group and association offers professional development through monthly meetings and periodic conferences that feature workshops, seminars and question-and-answer sessions with industry experts.

Sharing career ideas and strategies with a national network of professionals is so attractive that several large groups such as the Data Processing Management Association and the Society for Information Management (SIM) are compiling data banks of their members and their areas of expertise. Soon, members will be able to do a computerized search to locate colleagues around the country who can answer specific questions about hardware, software and particular applications as well as career questions.

IS professionals can also benefit from industry and user group involvement in every phase of their careers.

For novices, professional organizations offer an entry into the industry and guidance in getting established.

"Many IS professionals get the maximum value from joining an industry group at the beginning of their careers because they find instant mentors," says Elliot Masie, director and founder of the Association for Computer Training and Support in Raquette Lake, N.Y.



For programmer/analysts or midlevel managers, the groups provide a cadre of colleagues across corporate borders from whom they can get career advice and technical opinions on vendors. "Belonging to a group also keeps you up to date with technical information, teaches you new skills and provides an inexpensive way to further your education and increase your management abilities," says Ben Parke, planning analyst at Burlington Industries in Greensboro, N.C., and president of Guide International, an IBM users group.

For IS executives, professional associations offer the ability to network within industry groups to find qualified people to fill jobs on their staffs.

For example, Harvey Shrednick, vice president of information services at Corning, Inc. in Corning, N.Y., and a member of the public relations committee for SIM, has used his SIM contacts to locate two high-profile managers for his IS department.

Shrednick views SIM not only as a good source of IS talent but also as a necessary feedback mechanism. "I can compare what I do with what other people are doing," he says. "That helps me do a better job at Corning."

While there's something for everyone, members say the way to get the most out of these associations is to become a volunteer. By doing so, an IS professional can achieve higher visibility in the technical industry.

Sam LePore, manager of technical services at Kaiser Permanente in Walnut Creek, Calif., and MVS group officer of Share, an IBM user group, says one of the chief advantages of taking an active role in industry groups is that it allows you to develop skills that might not ordinarily be learned on the job.

"I've learned to speak in public and to handle conflicts by moderating committees staffed by technical people who have strong opinions. That experience has helped me grow on the job as a manager," he says.

LePore adds that his involvement in Share has given him a broader understanding of the industry, which has translated into a reputation for high credibility among his firm's executives.

Some volunteers even go on to become sought-after speakers.

For example, LePore remembers how one IS professional's decision to become active in the organization helped her achieve an international reputation as an expert.

"This technical specialist had attended Share meetings for five years but had never done a presentation. When she realized that an application she developed at her company would be useful to others, she wrote a paper and presented it at a meeting. It was a rousing success," he says. Now she gets requests from all over the U.S. and Europe from people who want to learn more about her methodology, he adds. Industry recognition enhanced the woman's status with her own employer as well because the company realized they have a star in their midst.

Vitiello is a speech writer and freelance journalist based in East Brunswick, N.J.

Group goals

While user groups and industry associations both offer career advancing bonuses, they do boast distinct differences.

The objective of user groups is to influence the direction of vendor companies, according to Guide President Parke. Most software and hardware manufacturers support the user groups and listen to their advice and wishes, which gives members significant power in determining future enhancements and upgrades to the products they use.

Professional societies, on the other hand, are not equipment-based and do not wield the same kind of influence on manufacturers. Organizations such as the Data Processing Management Association and SIM focus their attention on predicting and preparing for industry trends, helping members process the vast amounts of information with which they must keep current to do their jobs well and providing broad-based solutions for potential problems within the industry.

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Send a letter of application, CV and the names and telephone numbers of three references to: Larry Levine, Director of Computing, Computing Services, Kiewit Computation Center, Dartmouth College, Hanover, NH 03755.

Please respond via U.S. mail. Acknowledgment of receipt of application will be sent, along with a job description. The review of applications will begin 24 June 91, and will continue until the position is filled.

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INDUSTRY CURRENTS

Government looks to attract IS execs

Better benefits, job security used to draw IS workers from the public sector

BY CHRISTINE CASATELLI
SPECIAL TO CW

The federal government, which spends more than $17 billion annually on computers and communications, is ringing the dinner bell for information systems professionals who are hungry for jobs.

The catch is that the government generally offers salaries that are lower than those in the corporate world. For example, a senior IS executive at the Social Security Administration could expect to earn roughly $70,000, while a corporate paycheck for the same job might be closer to $100,000, says Cary Green, commissioner for systems planning and integration at Social Security.

Many IS professionals, however, are willing and anxious to make the break for the public sector anyway, according to recruiters. As the recession takes its toll on the high-technology industry, computer professionals are finding that job security is more valuable than high pay and job perks.

Many opportunities

Agencies in the federal government that are offering abundant opportunities to IS professionals include Social Security, the U.S. Department of Defense (DOD), the National Cancer Institute and the Federal Bureau of Investigation. Current efforts to modernize big-ticket, high-profile systems in these agencies means more openings for professionals who can capitalize on the management and technical skills they have picked up in the private sector.

A longtime devotee of high technology, the DOD currently spends more than $9 million annually to buy and maintain its automated information systems, according to Pentagon spokeswoman Susan Hansen.



Number of federal civilian full-time computer specialists*

1981	38,617
1983	34,760
1985	48,122
1987	44,803
1989	49,042
1991	No projections

*Computer specialist includes computer programmers and systems analysts at all grade levels. The title does not include clerks or computer operators.

Source: U.S. Office of Personnel Management

Although the DOD is cutting back in most areas, budgets for computers and communications are actually growing because officials see automation as a way to keep costs down, she says.

In January, the Pentagon launched its Corporate Information Management program to consolidate information systems that handle departmentwide business applications such as payroll and accounting.

The goal of the Pentagon program is to find and eliminate systems that are duplicated among the armed forces and group them together under a single set of DOD architectures. The DOD estimates that it will save $847 million over four years through the program, Hansen says.

One of the largest computer operations on the civilian side of the federal government is Social Security, whose charter requires it to manage more than $270 billion in government payments each year.

With an annual software and services budget of $200 million and a systems staff of 2,700, Social Security is processing information on a scale most corporations cannot even imagine. With so much data flowing back and forth, Social Security is always looking for highly qualified people to fill critical computer posts.

The administration's National Computer Center in Baltimore houses a colossal benefits system, responsible for churning out checks for 40 million recipients on time each month. Conducting 12 million transactions per day over a network that links 40,000 workstations, systems staff members keep their hands full.

To round out its high-technology ranks, Social Security regularly looks for people with experience in voice and data communications, MVS and COBOL. "We're also beginning to develop requirements for intelligent workstations and local-area networks," Green says.

Social Security is supplementing it 40,000 dumb terminals nationwide with 8,000 personal computers to help with administrative functions. Spokesman Frank Battistelli says that the PCs will eventually be linked to LANs and then wide-area networks to help the centralized Social Security operation migrate to a more distributed processing arrangement.

IS professionals can also investigate opportunities at the National Cancer Institute, which is currently developing new formats on which to distribute its Physician Data Query cancer research database.

In addition, the National Cancer Institute is operating under a congressional mandate, "so we have enough program resources to make sure we are on the cutting edge," says Susan Hubbard, director of the international cancer information center.

At the cancer information center, programmers enhance and maintain the Physician Data Query cancer research database, which provides reports on the latest therapies, research and literature. The systems staff is also responsible for distributing the database in all different types of formats, including compact disc/read-only memory.

Some projects under development include software that will transmit cancer information from the database to fax, as well as workstations that will use expert systems and electronic medical records.

Technical professionals who always wanted to work for the FBI may get their chance when the agency begins modernization of its National Crime Information Center (NCIC). The FBI is revamping the 24-year-old center and turning it into an investigative network for the next century in a project called NCIC 2000.

"We definitely need people who are going to be able to help us monitor the contractors' performance in NCIC 2000," and the best people to do that are former contractors, says Thomas Walczykowski, FBI assistant section chief for systems.

AS THE RECESSION takes its toll on the high-technology industry, computer professionals are finding that job security is more valuable than high pay and perks.

The tricky part will be finding people with expertise in both multimedia techniques and project management. "I'm getting a lot of applications from senior people with 10 or more years' experience," Walczykowski says.

Resumes from former government contractors and other IS executives who are out of work or retired are flowing into the bureau at a steady pace, he says.

Though the FBI can offer these computer professionals only $40,000 to $50,000 per year, when they may be used to earning tens of thousands more, the interest is still strong.

Casatelli is a free-lance writer based in Washington, D.C.

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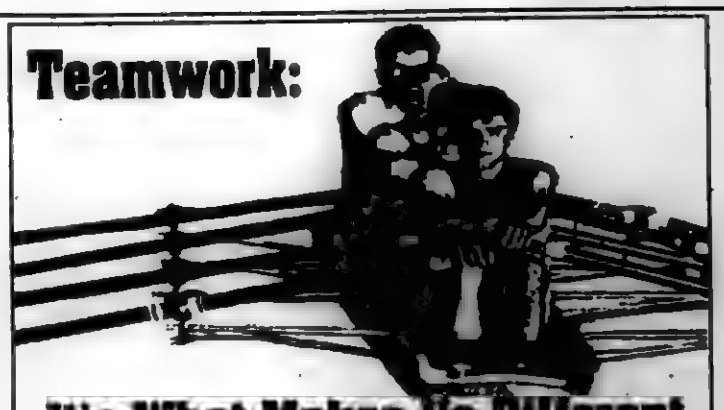
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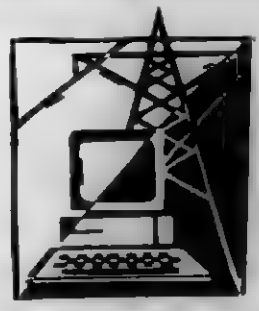
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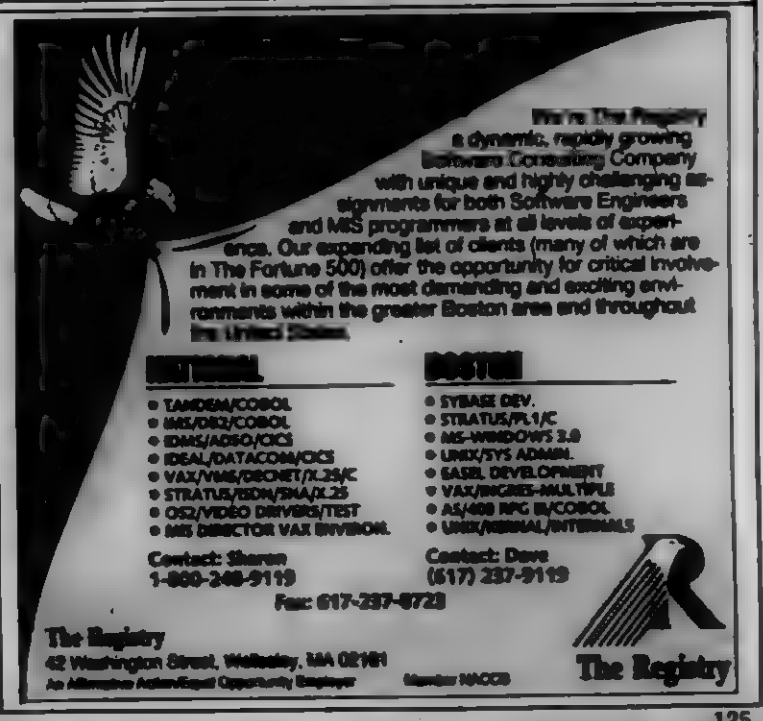
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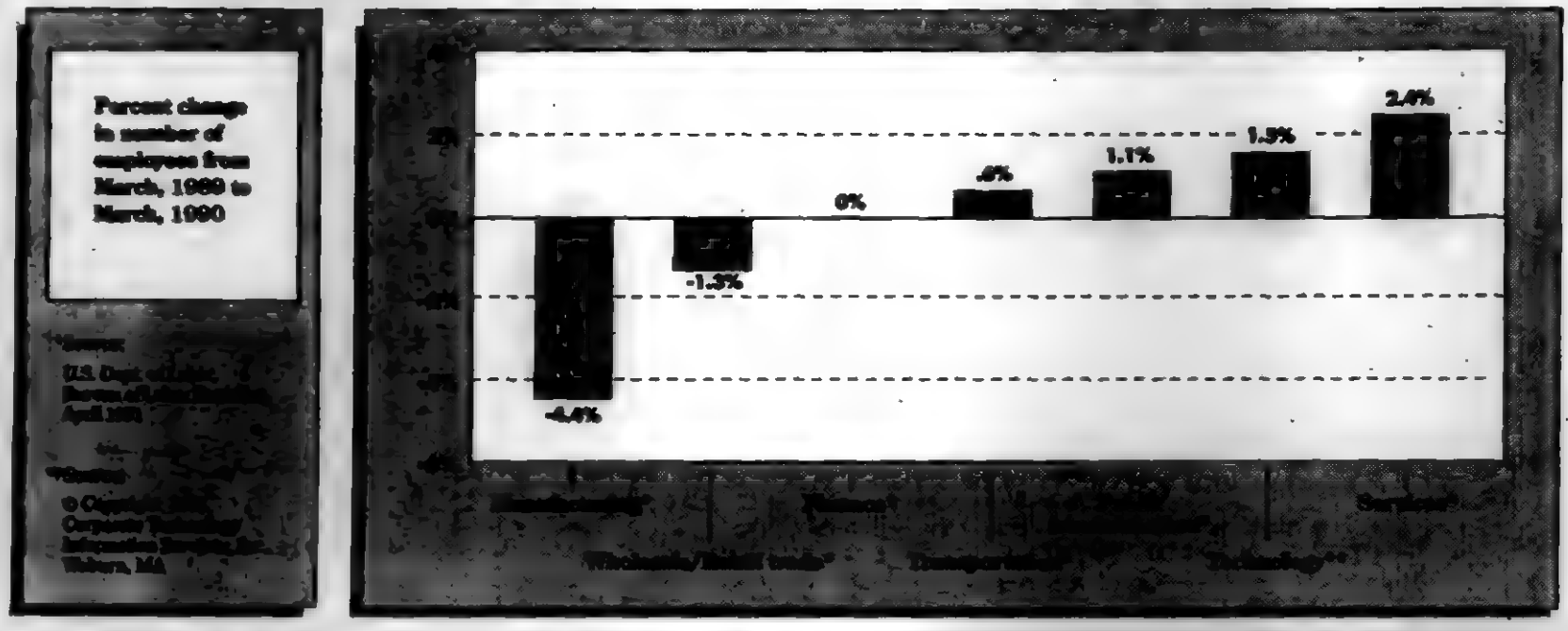
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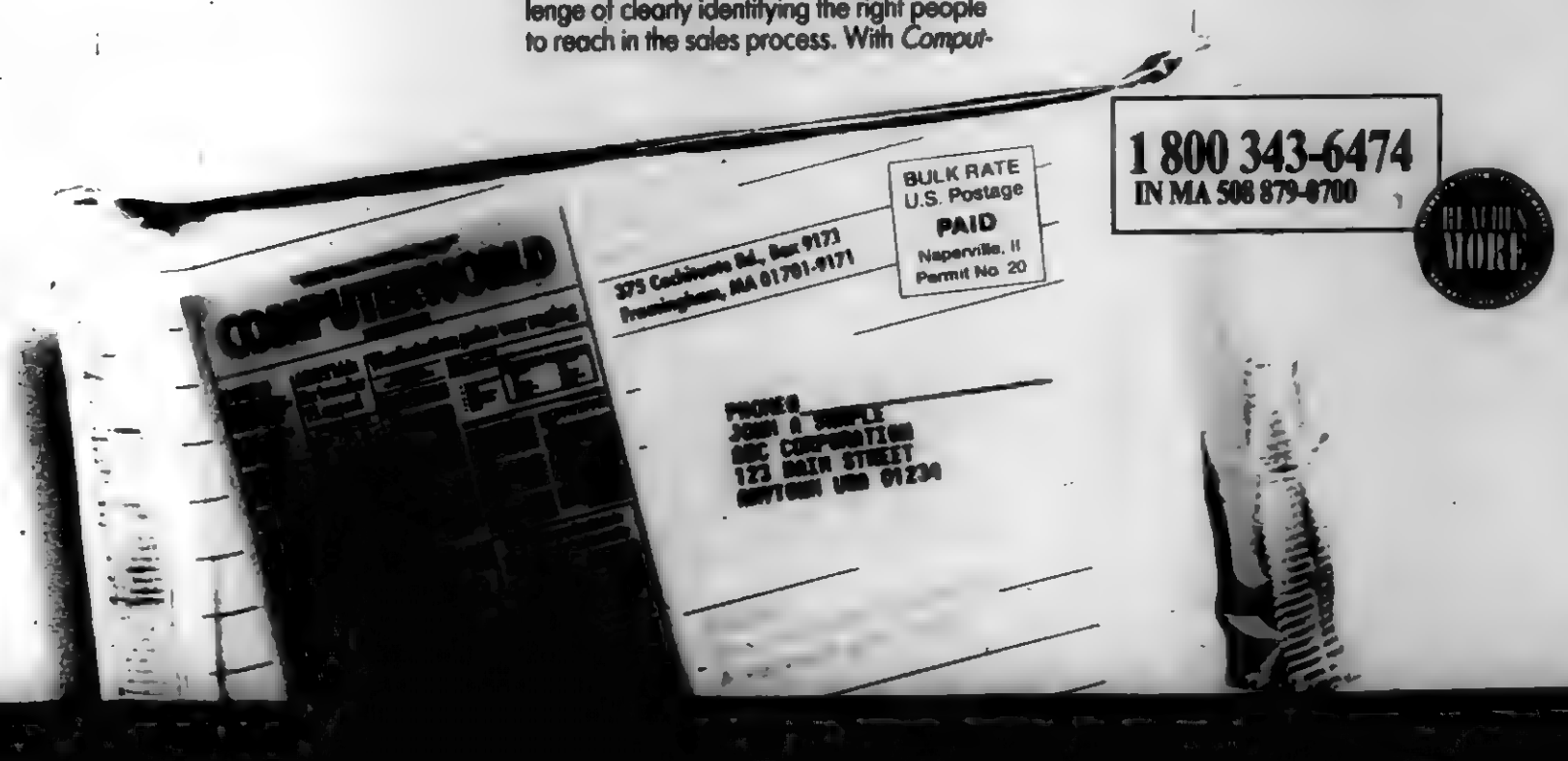
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Time-sharing is alive and well

BY TONY BAER
SPECIAL TO CW

Talk to some information systems executives about time-sharing, and they'll have you believe that it has fallen to outsourcing. But the rumors of time-sharing's death are greatly exaggerated.

The distinction between time-sharing and outsourcing depends on whether a firm ever had a data center, according to Robert Desautels, a senior software analyst at International Data Corp. "With outsourcing, you're getting rid of a burden, whereas with time-sharing, you're buying a service that you never had," he says.

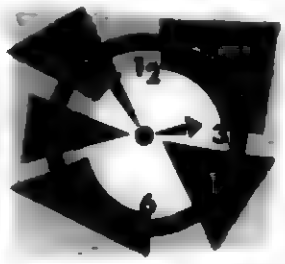
There are many definitions of time-sharing and outsourcing floating around the industry. But if time-sharing is defined as a user buying a computer service that it did not previously have, and if it involves sharing a vendor's remote computing facility with other customers, then the field is very much alive.

This type of resource sharing has been prominent since the 1960s and 1970s, when mainframe computing cost too much for most companies. The difference is that while time-sharing was the way most people obtained computer services in the past, only a small portion of companies use the option today.

The time-sharing field has seen a lot of turnover in recent years. Now, it is dominated by regional time-sharing (or remote computing) vendors, but it also includes corporations renting out the use of excess capability residing in their own data centers.

IS professionals say they use time-sharing for the following reasons:

- To access computing power that an IS operation might not be able to afford otherwise.
- To ease a company's transition during an upgrade or while building a data center from scratch.
- To assist an information center that can't keep up with its company's growth.
- To help control cash-flow problems.



Saving money

Helping an IS operation afford computing power is probably the most popular reason that companies choose to time-share.

For example, Referential Technologies, a 2-year-old, sole proprietorship, $1.2 million MVS programming tools developer in the Washington, D.C., area, has found it far more economical to pay $30,000 per year for CPU time on an IBM 3090 than to buy its own machine.

The only frustration, says Mike Shaw, president of Referential Technologies, is that the firm has to take what the time-sharing vendor offers. Shaw would like to see his vendor, Financial Technologies, a commercial spin-off of the Pentagon Credit Union's data center, update to IBM's MVS/ESA so he can update his product.

Another common reason for sharing the use of an outside computing facility is to help a company faced with major upgrades, either because the existing facilities are becoming obsolete or because the company was reorganized, sold or leveraged. Through time-sharing, the company's IS operations can run without interruption.

A little more than one year ago, H. P. Hood, Inc. in Boston faced a migration. With its IBM 4381 running out of gas [CW, April 16, 1990], Hood bought time on its parent company's machine, which was also being commercially marketed to other firms in the Northeast. The arrangement was strictly temporary, part of a three-year migration plan to divisional Application System/400s, says IS director Girard P. Hood.

By time-sharing rather than patching the old system during the transition, Hood was able to save an estimated 15% to 20% annually.

Long-time time-sharing

Sometimes temporary time-sharing arrangements work so well that they become permanent. For example, Sanwa Business Credit Corp. in Chicago needed to obtain mainframe capabilities quickly after the firm was sold by Continental Bank to Japan's Sanwa Bank Ltd. six years ago. The newly spun-off $500 million firm began time-sharing with May & Speh, a vendor with more than 30 years' experience in the field.

That arrangement remains in place today, with lease tracking performed on May & Speh's facilities and individual applications such as spreadsheets handled on networked personal computers.

According to Paul Rohde, vice president of information services, the company's 31% compound annual growth (to $2.6 billion today) required it to plow its precious IS resources into applications, not data center development. "It wasn't worth it to keep upgrading a mainframe every six months," he says.

Time-sharing can also be useful to small firms whose information centers can't keep up with the business's growth, Desautels says.

However, the business can't be too small, says New York-based independent consultant Michael Corbett, who recently wrote an outsourcing market study for Frost & Sullivan. Time-sharing is most attractive to those whose IS budgets range from $25 million to $100 million, Corbett says. Otherwise, your IS operation is either too small to realize any real savings or large enough to attain the economies of scale promised by time-sharing vendors, he adds.

Time-sharing may also be attractive to businesses with cash-flow problems, according to Donald Seiden, whose New Jersey-based firm, Computer Reserves, acts as a middleman, brokering excess CPUs from data centers across the country. For instance, a company that is now paying off high debt as a result of a 1980s leveraged buyout is not likely to be able to afford a new $800,000 data center.

Baer is president of Business and Technology Communications in New York.

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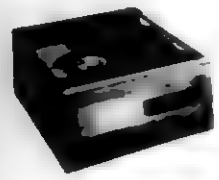
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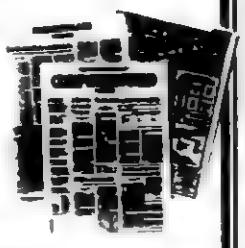
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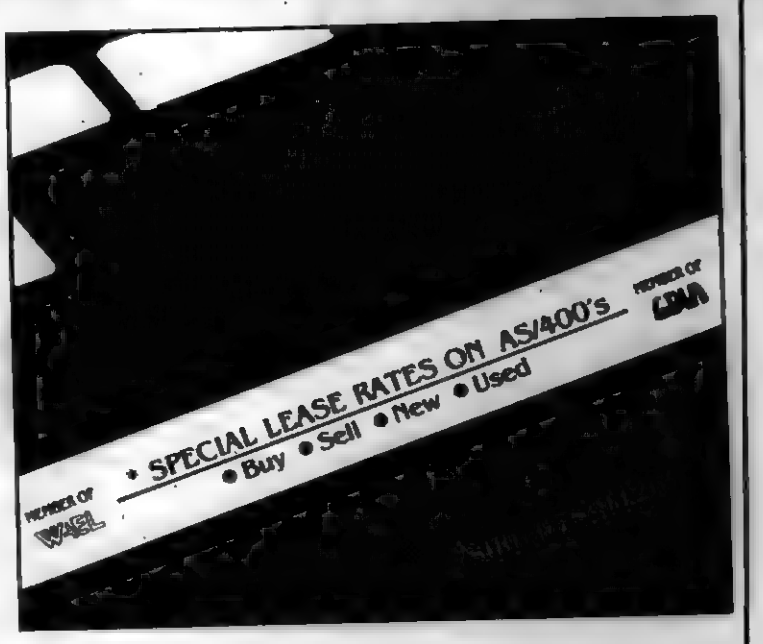
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	Closing price	Ask	Bid
IBM PC Model 176	$200	$450	$200
XT Model 089	$450	$450	$400
AT Model 099	$575	$675	$500
AT Model 239	$625	$725	$600
AT Model 339	$750	$1,000	$700
PS/2 Model 30-286	$1,050	$1,300	$1,000
PS/2 Model 60	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,000	$3,500	$3,000
Compaq Portable II	$750	$1,050	$700
Portable 286	$1,100	$1,350	$1,000
SLT 286	$1,900	$2,200	$1,700
Portable 386	$2,000	$2,100	$1,500
LTE 286	$1,950	$2,200	$1,800
Deskpro 286	$800	$1,000	$700
Deskpro 386/20	$2,150	$3,000	$2,000
Apple Macintosh Plus	$750	$975	$700
SE	$1,125	$1,250	$1,100
II	$2,600	$2,800	$2,400
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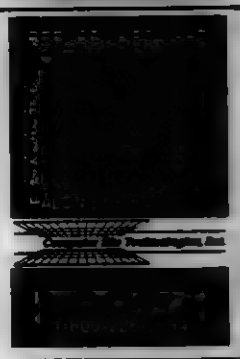
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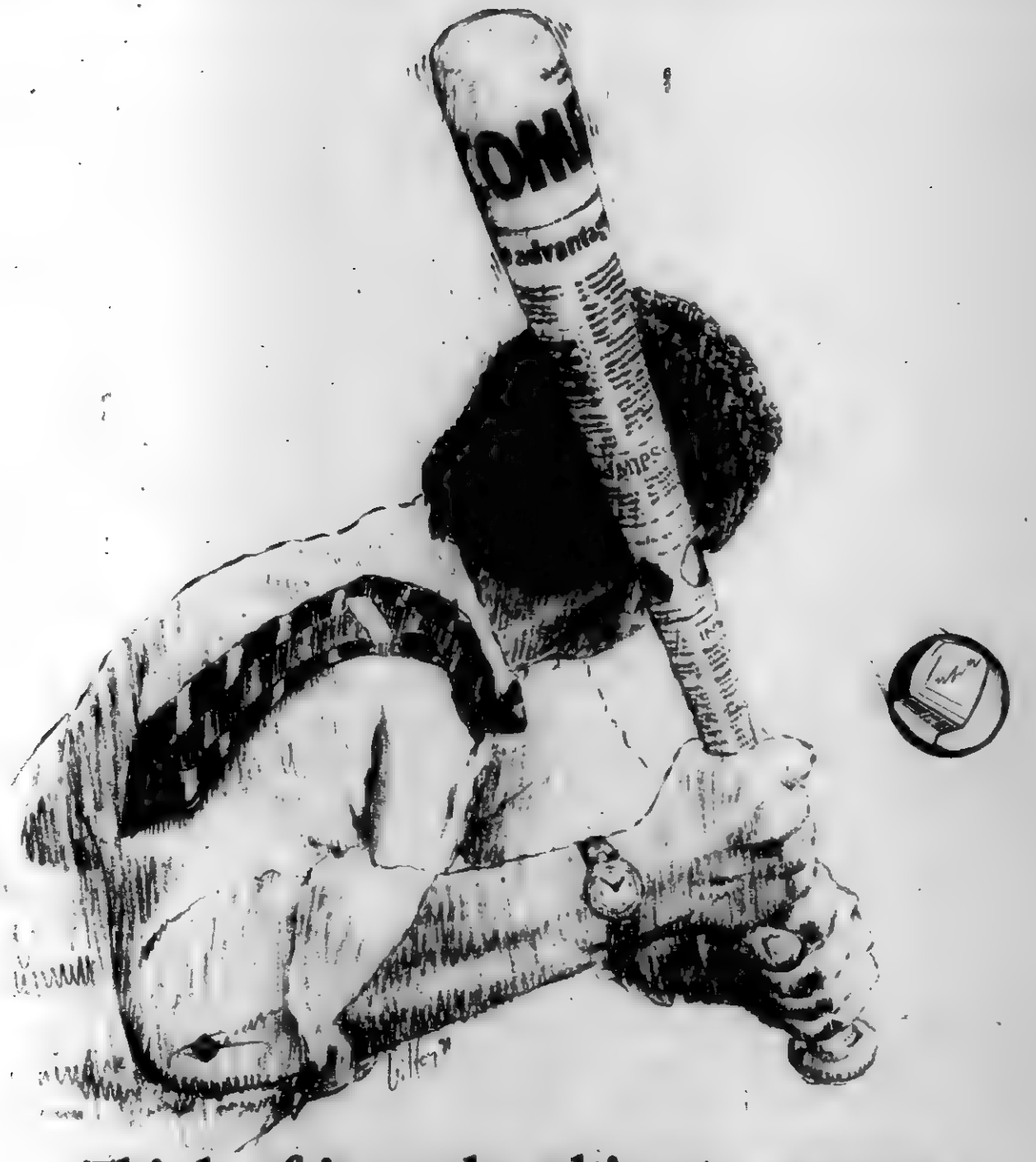
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INVESTMENT FOCUS: LARGE-SYSTEMS VENDORS

Several factors, including the hoo-ha over companies migrating to open systems and downsizing from monster machines to personal computer-based setups, have knifed the stock prices of mainframe and minicomputer vendors during the past three months, analysts said.

While Wall Street watchers would not generalise about the entire large-systems sector, they said the soft U.S. economy and unfavorable currency translation rates from overseas — as well as vibrations from the above-mentioned buzzwords and various company-specific problems — threaten big iron vendors in different ways. Not all of the news is bad; some companies seem to be withstanding the pressure. Either way, though, investors have taken heed.

Unisys Corp. In April, the fourth largest computer maker in the U.S. reported a 1991 first-quarter loss of $98 million — far deeper than the $3 million hole it was in during the previous quarter. Sales slid 10% for the first three months of this year. Although it was expected, the deficit helped reinforce sentiment that Unisys has its work cut out for it if it wants to regain the public's confidence, according to David Schofield Jr., an analyst at Duff & Phelps Investment Research Co. in Chicago. Unisys shares have been stomped down 30% since the beginning of March, sinking from 5⅛ to 3⅝ as of late May.

Digital Equipment Corp. Although 23% of DEC's share price has evaporated since March, Duff & Phelps analyst Marty Reisinger just upgraded the stock to a buy. The stock slipped from 81¾ in March to 63 in late May. The latest financial reports show disappointing sales for the VAX 9000. Ditto for the VAX 6000, and workstation revenue fell short of the overall market growth rate. Reisinger acknowledged that displacement of minicomputers by networked workstations and PCs has put DEC in a bad spot.

However, overall third-quarter sales topped $3.5 billion, up 8% over the same quarter last year. The "surprising strength" of the company's service business gave Reisinger hope for the long-term worth of its stock, he said. That, coupled with the current short-term stock price weakness, makes DEC a good deal now, he added.

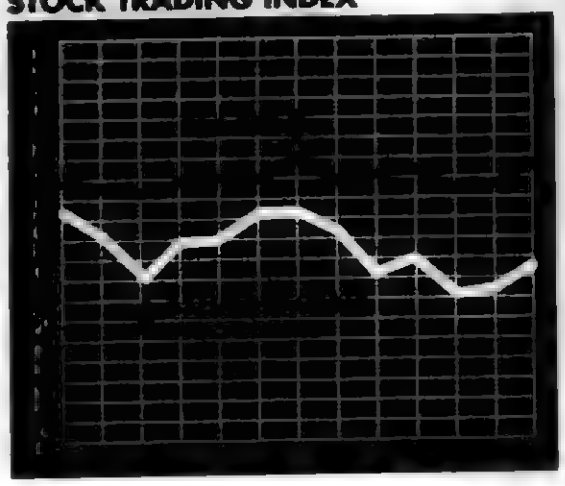
IBM. Analysts were divided over IBM's recent financial shortfall. And they still are. IBM ratings run the gamut from sell (Prudential Securities, Inc.) to strong buy (Bear Stearns & Co.). Weak mainframe business and scuttlebutt about headcount reductions may have led to IBM's 21% share price drop, from 132½ in March to a recent close of 104⅛, Prudential's Rick Martin said.

NCR Corp. NCR is strong in retail and financial markets and is well-managed, with "very strong finances," Schofield said. Investors have apparently noticed. As the stop-and-go NCR/AT&T merger chugged along, NCR shares climbed from 97⅝ to 103¼ during the last three months, up nearly 6%.

As the merger takes hold and before stock conversions from NCR to AT&T begin, NCR shareholders must decide whether to sell or wait and convert their stock to AT&T stock. For someone who bought NCR "because it's a progressive computer company, holding a large telecommunications company that has a new computer division may not be appropriate," Schofield said.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- As the Dow Jones industrial average rode past the 3,000 mark last week, several technology stocks closed higher. Among the bigger gainers, Novell, Inc. soared 4 points last week to close Thursday at 57¼; Intel Corp. added 2¾ to 53¼; and Digital Equipment Corp. advanced 3¼ points to 66¾.
- Autodesk, Inc. hit a new high of 60¼ Thursday, up 3½ points for the week. NCR Corp. also topped its previous apex, climbing 2⅜ to 105⅝. AT&T rose 2 points to 37⅜.
- Dell Computer Corp. posted a hefty profit jump for its first quarter; Dell shares picked up 1¼ points to 25¼. Everex Systems, Inc. reported a third-quarter loss last week; its stock inched up ⅛ of a point to 5¼.
- Elsewhere, IBM lost ¼ of a point, closing at 104⅛. Investors shaved ⅜ of a point from both Hogan Systems, Inc. and Oracle Corp. The stocks closed at 6 and 7⅜, respectively.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, MAY 31, 1991

TOP PERCENT GAINERS

Businessland Inc.	28.57
Wang Labs Inc. (B)	21.74
Datatrom Corp.	21.52
3 COM Corp.	18.97
Ariel Communication Corp.	18.75

TOP PERCENT LOSERS

Telecterm Inc.	-18.87
Oracle Systems	-11.76
Data Switch Corp.	-11.76
MAI Systems Corp.	-8.16
Televideo Systems	-7.84

TOP DOLLAR GAINERS

3M Corp	7.38
Digital Equipment Corp.	6.88
Intel Corp	4.75
Hewlett Packard Co.	3.63
ITT Corp.	3.50

TOP DOLLAR LOSERS

Shared Medical Systems	-1.63
Computer Sciences	-1.50
Oracle Systems	-1.00
Micropolis Corp.	-0.75
Telecterm Inc.	-0.75

Communications and Network Services — Up 3.96

Exch	52-Week High	52-Week Low		May 31 Close	Wk Net Change	Wk Pct Change
OTC	18.00	5.38	3 COM Corp.	8.63	1.38	18.97
NYS	68.75	52.50	American Info Techs Corp.	60.38	2.13	3.65
NYS	44.13	29.00	AT&T	37 13	1 13	3.13
OTC	6.25	0.88	Ariel Communication Corp.	2.38	0.38	18.75
NYS	38.25	30.50	Bell Atlantic Corp.	47 13	1.38	3.01
NYS	57.25	47.00	Bellsouth Corp.	49.88	1.63	3.37
NYS	44.00	13.13	Cabletron Systems	36.25	2.13	5.88
OTC	25.88	8.25	Compression Labs Inc.	20.13	2.38	13.38
NYS	41.25	23.38	Comsat Corp.	41.00	0.00	0.00
OTC	5.13	2.75	Data Switch Corp.	3.75	-0.50	-11.76
NYS	28.13	8.88	Digital Comm. Assoc.	17.88	1.63	10.16
OTC	25.25	12.25	Dynatech Corp.	19.75	-0.75	-3.66
OTC	12.88	5.50	Fibronix Int'l Inc.	9.00	-0.13	-1.37
OTC	4.00	1.75	Gandalf Technologies Inc.	3.38	0.13	3.85
NYS	4.50	1.63	General Datacomm Indl.	3.25	0.00	0.00
NYS	33.50	23.50	GTE Corp.	30.00	0.50	1.69
NYS	61.88	40.25	ITT Corp.	61.88	3.50	6.00
OTC	44.13	17.88	MCI Communications Corp.	31.50	2.50	8.62
OTC	20.00	2.75	Microcom Inc.	8.63	-0.38	-5.38
NYS	10.88	4.00	Network Equipment Tech.	6.88	0.25	2.90
OTC	14.63	4.00	Network General	7.50	-0.13	-1.64
OTC	15.50	8.13	Network Systems Corp.	13.13	1.50	12.90
NYS	37.50	22.13	Northern Telecom Ltd.	37.50	0.88	1.00
OTC	58.50	17.38	Novell Inc.	57.00	3.25	6.05
NYS	88.50	67.00	Nynex Corp.	71.88	1.38	1.95
NYS	47.50	36.25	Pacific Telesis Group	40.75	1.75	4.49
ASE	15.38	4.75	Perot Corp.	14.50	0.00	0.00
NYS	29.00	8.88	Scientific Atlanta Inc.	13.75	0.00	0.00
NYS	58.88	47.25	Southwestern Bell Corp.	51 75	1.75	3.50
NYS	46.25	30.63	United Telecom	38.88	2.13	7.94
NYS	40.75	32.38	US West Inc.	38.75	0.38	1.00

Computer Systems — Up 4.81

Exch	52-Week High	52-Week Low		May 31 Close	Wk Net Change	Wk Pct Change
OTC	6.75	0.50	Altsys Computer Sys.	0.88	0.00	0.00
ASE	18.88	10.00	Amdahl Corp.	16.63	0.50	3.10
OTC	73.25	24.25	Apple Computer Inc.	47.00	1.13	2.45
OTC	13.88	4.25	Archive Corp.	7.25	0.63	9.43
OTC	32.75	7.50	AST Research Inc.	23.50	1.13	5.03
NYS	8.00	4.50	Bell, Berenek & Newman	7.88	0.13	1.61
NYS	21.63	4.50	Commodore Int'l	16.50	0.25	1.54
NYS	74.25	34.38	Compaq Computer Corp.	36.13	1.13	3.04
OTC	2.13	0.13	Computer Automation Inc.	1.25	0.13	11.11
NYS	21.13	8.75	Control Data Corp.	11.50	0.38	3.37
NYS	20.88	8.38	Convex Computer	19.00	2.25	13.43
NYS	51.25	20.00	Cray Research Inc.	35.25	2.88	8.89
NYS	18.13	3.50	Data General Corp.	16.63	0.00	0.00
NYS	3.25	0.75	Datapoint Corp.	1.75	0.00	0.00
OTC	20.63	8.25	Dell Computer Corp.	24.75	0.25	1.02
NYS	92.38	46.50	Digital Equipment Corp.	66.63	5.88	9.22
NYS	38.13	13.75	Harris Corp	26.88	1.75	6.97
NYS	55.13	24.88	Hewlett Packard Co.	54.50	3.63	7.13
NYS	138.75	86.25	IBM	108.38	1.50	1.40
OTC	14.00	7.75	Information Int'l	8.25	0.25	3.13
OTC	31.50	10.50	Intergraph	29.75	0.75	2.59
NYS	2.75	0.50	MAI Systems Corp.	0.63	-0.06	-8.16
NYS	149.75	114.00	Massenvita Electronics	122.00	2.25	1.88
OTC	26.00	9.00	Mentor Graphics Corp.	18.00	1.25	7.46
NYS	105.75	44.50	NCR Corp.	105.75	2.00	1.93
OTC	33.50	11.00	Pyramid Technology	24.50	1.75	7.69
OTC	34.00	9.75	Sequent Computer Sys.	15.13	1.13	8.04
NYS	47.25	16.00	Silicon Graphics	33.50	1.38	4.29
NYS	37.25	14.63	Stratus Computer Inc.	33.13	2.25	7.29
OTC	36.63	15.00	Sun Microsystems Inc.	36.88	2.00	5.73
NYS	28.88	8.88	Tandem Computers Inc.	17.38	1.88	12.10
NYS	39.50	23.50	Tandy Corp.	33.63	2.38	7.60
OTC	32.00	8.75	Teradata	17.25	0.50	2.99
NYS	7.88	1.38	Ultimate Corp.	5.00	0.00	0.00
NYS	15.88	1.75	Unisys Corp.	3.88	0.00	0.00
ASE	6.75	2.00	Wang Labs Inc. (B)	3.88	0.63	21.74

Software & DP Services — Up 3.26

Exch	52-Week High	52-Week Low		May 31 Close	Wk Net Change	Wk Pct Change
OTC	63.00	17.00	Adobe Systems Inc.	60.50	1.25	2.54
OTC	13.50	7.00	Alcorp	7 75	0.25	3.33
OTC	69.88	20.25	Aldus Corp.	62.00	1.50	2.97
OTC	28.50	12.00	American Mgmt. Systems	27.25	0.00	0.00
OTC	16.25	7.50	American Software Inc.	12.25	0.50	4.26
NYS	4.63	1.38	Answerp Inc.	3.38	-0.13	-3.57
OTC	23.50	10.00	Analysts Int'l	15.50	0.00	0.00
OTC	13.25	4.88	Ashton Tate	9.88	0.50	5.33

Exch	52-Week High	52-Week Low		May 31 Close	Wk Net Change	Wk Pct Change
OTC	10.25	4.00	ABK Computer Sys.	7.88	-0.13	-1.56
NYS	37.00	22.63	Auto Data Processing	34.00	1.50	4.62
OTC	60.25	32.00	Autodesk Inc.	58.63	2.75	4.92
OTC	31.50	18.50	BGS Systems Inc.	27.00	0.75	2.86
OTC	43.88	17.75	BMC Software Inc.	36.75	1.25	3.53
OTC	21.50	11.00	Boole & Babbage Inc.	12.75	0.25	2.00
OTC	64.25	14.50	Borland Int'l	61.75	-0.38	-0.72
NYS	9.75	0.44	Businessland Inc.	1.13	0.25	28.57
OTC	30.88	5.13	Cognos Inc.	15.75	1.00	6.78
NYS	16.88	4.38	Computer Associates	9.75	0.63	6.85
OTC	17.75	9.50	Computer Horizons	10.25	0.00	0.00
NYS	73.25	38.75	Computer Sciences	65.75	-1.50	-2.23
NYS	11.75	8.63	Computer Task Group	9.25	-0.13	-1.33
OTC	25.25	13.00	Comshare Inc.	18.00	0.00	0.00
OTC	18.00	3.75	Corporate Software	10.63	0.38	3.66
NYS	49.00	27.88	General Motors E (EDS)	47.88	0.25	0.52
OTC	18.75	7.25	Goal Systems Int'l	13.50	0.75	5.88
OTC	7.00	1.88	Hogan Systems Inc.	6.13	0.00	0.00
OTC	23.63	7.75	Information Resources	23.13	0.25	1.09
OTC	17.50	2.63	Informix Corp.	8.25	0.19	3.09
OTC	7.88	1.38	Intellicorp Inc.	1.69	-0.06	-3.54
OTC	8.25	2.50	Interleaf Inc.	6.38	-0.13	-1.92
OTC	15.88	6.88	Interactiv	9.25	1.25	15.63
OTC	43.25	10.00	Knowledgeware Inc.	32.88	3.00	10.04
OTC	45.00	18.75	Legent Corp.	31.00	3.50	12.73
OTC	39.25	12.50	Lotus Development	38.00	2.88	8.88
OTC	32.00	13.63	Microgratx	15.75	0.25	1.61
OTC	117.50	50.75	Microsoft Corp.	108.75	-0.25	-0.23
NYS	10.50	4.00	On Line Software Int'l	6.50	0.00	0.00
OTC	24.00	4.88	Oracle Systems	7.50	-1.00	-11.76
NYS	14.63	7.50	Parasophic Systems	12.63	1.13	9.78
OTC	9.25	1.25	Phoenix Technologies	8.00	0.38	4.92
OTC	52.00	33.38	Policy Management Sys.	44.88	2.50	5.30
NYS	33.63	11.50	Reynolds & Reynolds	22.38	1.58	7.19
OTC	25.75	14.75	SEI Corp.	25.50	0.25	0.99
OTC	22.75	12.50	Shared Medical Systems	20.75	-1.63	-7.28
OTC	35.25	12.00	Software Publishing Corp.	20.25	1.50	8.00
NYS	14.63	5.38	Sterling Software	13.50	0.00	0.00
OTC	28.00	9.50	Sungard Data Sys.	17.25	1.25	7.81
OTC	55.88	17.75	Symantec Corp.	44.00	1.25	2.92
NYS	34.50	4.50	System Center Inc.	9.00	0.50	5.88
OTC	37.25	12.50	System Software Assoc.	13.75	0.00	0.00
OTC	24.88	4.75	Wang	12.88	0.75	6.16

Semiconductors — Up 1.02

Exch	52-Week High	52-Week Low		May 31 Close	Wk Net Change	Wk Pct Change
NYS	14.25	3.88	Advanced Micro Devices	13.00	0.50	3.85
NYS	12.50	8.50	Analog Devices Inc.	11.00	0.25	2.33
OTC	21.75	5.25	Chips & Technologies	9.75	0.25	2.63
OTC	86.75	25.00	Intel Corp.	86.75	4.75	9.31
NYS	13.00	5.13	LSI Logic Corp.	10.50	0.25	2.44
NYS	19 13	8.75	Micron Technology	16.88	1.75	11.76
OTC	21.25	7.25	MIPS Computer Systems	16.63	0.38	2.10
NYS	86.38	46.75	Motorola Inc.	71.25	2.88	4.20
NYS	9.38	3.00	National Semiconductor	7.00	0.00	0.00
NYS	47.63	22.50	Texas Instruments	39.13	2.00	5.38
OTC	12.25	3.00	VLSI Technology	10.63	0.63	6.25
ASE	14.88	4.00	Western Digital Corp.	4.63	-0.13	-2.63

Peripherals & Subsystems — Up 3.24

Exch	52-Week High	52-Week Low		May 31 Close	Wk Net Change	Wk Pct Change
OTC	2.75	0.88	Apertus Technologies	2.25	0.00	0.00
OTC	24.00	7.00	Silicotec Inc.	13.75	1.00	7.84
OTC	17.50	4.25	Clarotex Corp.	13.25	1.75	15.22
ASE	11.75	4.13	Cognitronics Corp.	9.63	0.50	5.48
NYS	31.25	14.63	Conner Peripherals	21.00	0.50	2.44
ASE	22.00	7.00	Datatrom Corp.	12.00	2.13	21.58
NYS	13.00	4.25	EMC Corp.	11.38	0.13	1 11
NYS	47.25	23.75	Eastman Kodak Co.	42.38	1.38	3.35
OTC	11.25	4.75	Emulex Corp.	8.75	0.25	2.94
OTC	32.25	14.00	Evans & Sutherland	23.25	1.50	6.90
OTC	6.50	3.88	Iomega Corp.	5.50	0.00	0.00
OTC	25.25	6.75	IPL Systems Inc.	23.25	-0.25	-1.06
OTC	1.63	0.13	Maxstor Systems	0.75	0.00	0.00
OTC	16.50	2.63	Maxtor Corp.	4.13	-0.13	-2.94
OTC	18.00	4.38	Micropolis Corp.	14.38	-0.75	-4.96
NYS	95.25	73.63	3M Corp	95.25	7.38	8.38
OTC	14.50	8.00	Prototrix Inc.	7.25	-0.25	-3.33
NYS	24.75	8.50	QMS Inc.	22.38	1.63	7.85
OTC	16.25	8.25	Quantum Corp.	11.88	0.00	0.00
NYS	7.63	4.38	Recognition Equipment	7.38	0.00	0.00
OTC	11.50	4.00	Rexon Inc.	10.00	0.38	3.90
OTC	19.88	5.88	Seagate Technology	11.38	0.63	5.81
NYS	47.00	11.50	Storage Technology	44.50	1.13	2.59
OTC	4.75	1.25	Tandon Corp.	3.88	0.50	15.88
NYS	29.38	11.63	Tektronix Inc.	22.63	-0.63	-2.86
OTC	0.63	0.16	Televideo Systems	0.38	-0.03	-7.84
NYS	88.13	28.00	Xerox Corp.	88.00	0.88	1.00

Leasing Companies — Up 0.10

Exch	52-Week High	52-Week Low		May 31 Close	Wk Net Change	Wk Pct Change
OTC	18.25	7.88	Amplicon Inc.	16.00	1.25	8.47
NYS	29.38	14.63	Comdisco Inc.	24.75	-0.38	-1.49
OTC	16.25	9.25	LDI Corporation	15.00	-0.13	-0.83
OTC	6.75	2.25	Telecterm Inc.	3.75	-0.75	-16.67

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Technology

FROM PAGE 1

suppliers to provide information electronically, in standard formats, rather than on paper. By one estimate, the government and its contractors are spending $2 billion per year to make their systems CALS-compliant.

As part of the Seawolf design project, Newport News is delivering a live example of CALS in the Seawolf Automated Integrated Logistics Support (Sails) system. Sails provides the logistics for a life cycle support view of the ship throughout its 40-year life span and contains unclassified information about repairable and replaceable parts.



Kittelberger *oversees revamping of technology*

Sails will run on an IBM Enterprise System/9000 mainframe, under both the IDMS database from Computer Associates International, Inc. and IBM's DB2, with worldwide access for Navy personnel and authorized contractors, said Frank Brake, manager of strategic systems architecture at Newport News.

The Seawolf CALS work is one prominent dividend of the company's long-term investment in information technology.

The hardware architecture includes five IBM mainframes for administration, design, product modeling and materials requirements.

Digital Equipment Corp. VAX 6000s, 4000s and workstations handle manufacturing and process control, and AT&T equipment is used for the shipyard's telecommunications operation — a System 85 private branch exchange larger than the Pentagon's.

With approximately 10,000 active users and 6,000 workstations and personal computers on the company network, network management is a growing concern that has led Newport News to serve as a beta-test site for a joint networking management project with IBM's Systemview and AT&T's Accumaster Integrated Network Management.

Software export

The firm is also exporting its in-house software through a new business development organization. This summer, DEC will begin marketing the shipyard's Planning Workbench, a manufacturing process planning tool that runs on Vaxstation 3100s and will soon be ported to Unix operating systems from AT&T, DEC and IBM.



Brake *manages firm's strategic systems architecture*

Newport News' technology transition began in earnest in 1983-84, with the migration of hundreds of applications off of Honeywell Bull, Inc. machines onto IBM mainframes.

During the past six years, the technology group integrated a host of separate systems running computer-aided design, manufacturing and engineering (CAD/CAM/CAE) applications onto IBM 3090s and, more recently, ES/9000s.

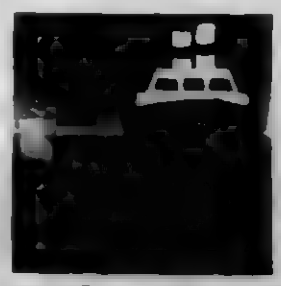
The largest application on the ES/9000s is the company's CIM initiative — called Argos after the mythical Greek shipbuilder who created the vessel for Jason to pursue the Golden Fleece.

Manufacturing a product with 1 million parts requires databases so large in size — most of them exceeding 400G bytes — that distributing the database is still too difficult to attempt, Kittelberger said.

"What really bugs me is the slowness of breakthroughs in technology. Storage media is just too slow in access time for us," he said.

Newport News vs. the U.S. Navy

Newport News Shipbuilding, which employs 29,000 people in the U.S., is making news in its hometown these days by suing its largest customer — the U.S. Navy.



A U.S. district judge has set July 11 as the starting date for the shipyard's lawsuit, in which it claims the U.S. Department of Defense illegally interfered with the Navy's award of the second Seawolf nuclear submarine construction contract. The contract went to Newport News' only competitor, the Electric Boat Division of General Dynamics Corp. based in Groton, Conn.

Because the coinstruction contract would have played such an important role in the firm, its loss could shrink the firm's 500-employee technology organization. Yet industry analysts said the shipbuilder is diversified enough to survive, with its refueling business and production of commercial shipping vessels and aircraft carriers.

Keeping the company afloat are $8.5 billion worth of contract orders for the next five years, said Gary Schneider, a research analyst at Bear Stearns & Co. in New York. With yearly earnings between $200 million and $220 million, the shipyard is a reliable revenue producer for its parent company, Houston-based Tenneco, Inc., Schneider said.

Voice recognition wins fans

BY CHRISTOPHER LINDQUIST
CW STAFF

A pair of voice recognition companies recently announced major contracts for their products, indicating that some people are very interested in talking to their computers.

Verbex Voice Systems, Inc. in Edison, N.J., announced that it has signed a contract with EJV Brokerage, Inc. in New York for a voice-controlled bond trading system. The contract, valued at more than $500,000, according to a Verbex spokesman, is for hardware and software that will allow traders to speak commands into a workstation rather than typing or inputting handwritten notes.



A spokesman for EJV indicated that the firm hopes the system will increase the accuracy and speed with which traders can make transactions.

Separately, Kurzweil Applied Intelligence, Inc. in Waltham, Mass., announced a $500,000 contract with Science Applications International Corp. (SAIC) in San Diego for a voice reporting system to be used in U.S. military medical centers.

The voice system will be part of the Composite Health Care System, a government plan for computerizing U.S. military medical installations in the U.S. and Germany. SAIC, a firm specializing in science and high technology for defense, health care and environmental organizations, was awarded the $1 billion contract in 1988.

Jack McGuire, assistant vice president of marketing at SAIC, said the 26 Kurzweil systems will be installed at 13 locations on a test basis to determine the viability of voice recognition for use in medical reporting. If the systems are found to be effective, he said, SAIC will consider installing such devices in 200 or more sites. He added that although Kurzweil is being tested, future contracts could be awarded to other companies.

John Overteuffer, president of Voice Information Associates, Inc. also in Waltham, said such contracts indicate voice recognition technology is approaching the "hockey stick" curve for market acceptance. He predicted that installation of such systems will increase rapidly over the next few years.

Systems Center opens up Systems Management line

BY ELISABETH HORWITT
CW STAFF

RESTON, Va. — Systems Center, Inc. last week released Version 2 Release 2 of its Advanced Systems Management product line, promising integration with other vendors' products, including IBM's, through a variety of industry standards.

The new version of Systems Center's operations management product, Info/Master, will be able to access information from any management product with a SQL-compliant database, the vendor said.

One such platform is IBM's Systemview. Systems Center "intends to offer solutions within the Systemview structure" and will conform with the IBM Common User Access interface used in Systemview by year's end, said Dale Vecchio, director of Net/Master product marketing.

Supports two protocols

The latest version of Net/Master, Systems Center's network management platform for IBM Systems Network Architecture (SNA) networks, is said to support two key IBM protocols: LU6.2 and Program-to-Program Interface. This will extend Net/Master's reach to all third-party devices and software programs that use those protocols to interact with IBM's Netview, Vecchio said.

Net/Master has about 7% of the installed base of IBM mainframe network management systems, compared with 93% for Netview, according to research firm Computer Intelligence.

Baxter Healthcare Corp., a beta-test site for Systems Center's latest releases, welcomes the idea of using LU6.2 instead of the less-efficient 3270 to link Net/Master and CICS-based applications, according to Michael Stough, a project leader at the firm. The company is waiting to see if host-based network monitoring packages will support the peer-to-peer protocol.

Baxter is also very interested in using the Program-to-Program Interface to link Net/Master with third-party management systems such as Legent Corp.'s Netspy, Stough said.

SQL support from Net/Master will make it easier for companies such as Baxter to interface Net/Master with complementary software products. For example, Baxter is likely to go with a DB2-based configuration database, Stough said.

Systems Center also announced Mapped Data Services, a utility for translating network management formats. The vendor intends to use this offering to interface with other vendors' networking and network management systems that comply with industry standards, Vecchio said.

In the works is support for Open Systems Interconnect network management protocols and Simple Network Management Protocol, he added.

Marked improvement

The new release of Systems Center's Resource Status Monitor shows marked improvement in the area of graphics-based user-friendliness, said Steve Moy, Baxter's senior technical consultant. The earlier release offered some graphical features but was still too textual, Moy added. The new release is said to indicate the status of network devices with "traffic light" colors and to handle SNA and non-SNA devices.

Another potentially useful Net/Master enhancement, Moy said, is the ability to group SNA devices by resource type. "We are looking to partition resources according to our logical network, so that users can identify easily what components or resource group is in trouble."

Systems Center said it plans to release the new versions in the third quarter.

NEWS SHORTS

Apple execs lose fraud case

A short-lived product offering came back to haunt Apple Computer, Inc. last week when a federal court in San Francisco found securities fraud in Apple's 1982 announcement and subsequent cancellation of a disk drive product. The court held Apple co-founder and Vice Chairman A. C. Markkula and former Apple executive John Vennard liable for some $100 million in damages. The judgment is considered significant because few stockholder suits against computer firms have actually come to trial. Apple said it will appeal the verdict.

Dell releases smaller 386SX PC

Dell Computer Corp. last week introduced the 320SX, a desktop personal computer based on Intel Corp.'s 20-MHz 386SX chip. The machine has a footprint of roughly 15 sq in. and comes with 2M bytes of random-access memory, an 80M-byte hard drive, 16K bytes of cache memory, a 16-bit IBM Video Graphics Array-compatible adapter and a $2,597 price tag. Dell said the 320SX would replace its 320LX, which had a 20-MHz SX desktop in a larger chassis.

Another rosy ISDN forecast

The number of Integrated Services Digital Network (ISDN) interfaces on private branch exchange systems will nearly triple over the next 12 months, according to a recent survey by Datapro Information Services Group. While only 9% of the 575 telecommunications professionals who responded to the survey said they currently use the ISDN interface, 24% said they plan to add the interface during the next year, the Delran, N.J.-based research firm reported.

Amdahl boosts speed

Enhancements introduced by Amdahl Corp. last week reportedly increase the performance of its 4745 communications processors by as much as 80% and also permit each device to handle eight host-processing units instead of only six, according to the company. In addition, Amdahl introduced an optional scanner that supports U.S. 1.5M bit/sec. T1 and European 2M bit/sec. E1 connections on the 4745. The products are scheduled to be available in the third quarter.

Unisys divests real estate holding

Unisys Corp. sold its Detroit office building and 31 acres of land to Henry Ford Health System. With this sale, Unisys has sold more than $200 million in assets, mostly in real estate, since it began an asset sales program in early 1990 to pay down its debt. Unisys will lease back part of the Detroit facilities from Henry Ford Health System.

Aldus adds photo package

Aldus Corp. added Style to its Windows platform with the acquisition of the worldwide marketing and publishing rights to Photostyler, a full-color image processing program. The software, which was originally developed by Taiwan-based U-Lead Systems, Inc., allows Windows users to scan, enhance, compose and print images ranging from 24-bit color to black and white and to export them to desktop, presentation graphics and multimedia applications.

PBXs on tap at ICA

Northern Telecom, Inc. will reportedly follow through on analyst predictions in March of a "PBX-on-a-wall" announcement at this week's International Communications Association convention in Anaheim, Calif. Dubbed Option 11, the standard 70-pound unit will reportedly include 75 ports, a T1 interface and voice mail for about $22,000. Meanwhile, Siemens Private Communication Systems, Inc. said it will demonstrate a Microsoft Corp. Windows 3.0-based private branch exchange (PBX) management program it announced last week. The $3,000 database management package is said to allow Siemens Saturn PBX administrators to use a PC to handle moves and changes.

Prime chief lays out cost control plans

BY SALLY CUSACK
CW STAFF

BEDFORD, Mass. — Prime Computer, Inc.'s president and chief executive officer, John J. Shields, will attempt this week to reassure a skittish customer base about the company's eroding financial situation. In an interview last week, Shields said he will outline at the National Prime User Group meeting plans for achieving internal cost control and several new products to be announced during the next few months.

Earlier this month, Prime's parent company, DR Holdings, Inc., released first-quarter results revealing an $84.4 million net loss for Prime.

"We had a fantastic 1990 and a good plan for 1991, which assumed a flattish revenue for that year," Shields said. "When we got into '91, we got a surprise."

The strengthening of the U.S. dollar abroad, along with the economic recession and Persian Gulf war, resulted in poor first-quarter performance, according to Shields.

Operating income in the first quarter of 1991 was listed as $11.8 million, compared with $23.2 million in the corresponding quarter the previous year.

The first priority will be to establish an expense level based on a lower population at the company, Shields said, adding that Prime will identify areas for saving expense through attrition. An estimated 8,300 people are currently on the Prime payroll, and the company said it plans to reduce that number by 700 by the end of 1991.

Shields said most of the reduction will come through normal attrition. A hiring freeze is now strongly being enforced directly by Shields. "No one can replace anyone without my personal approval," he said.



In addition, Prime has instituted a two-week mandatory vacation policy for employees. Employees may use accrued vacation time during these periods, and Shields estimated that profit and loss will be directly affected by $7 million as a result of the new policy.

While Shields declined to say which of the company's business units was most profitable, analysts and industry observers agreed that the Computervision Division's computer-aided design and manufacturing (CAD/CAM) product line is growing at a healthy rate as revenue from the traditional minicomputer business is falling off.

Restating Prime's commitment to its core 50 series customers, Shields said users could look forward to several forthcoming announcements.

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>
> JOHN J. SHIELDS
> PRIME COMPUTER, INC.

These will include not only software products for the Computervision CAD/CAM customers but also software for the proprietary PrimOS systems and EXL Unix boxes.

Prime has been privately owned by DR Holdings since 1988, when the latter rescued the minicomputer maker from a hostile takeover attempt.

Microsoft eases LAN license policy

BY JIM NASH
CW STAFF

Microsoft Corp. is relaxing its software licensing policy for networked applications software to require payment only for the maximum number of concurrent users. Previously, the company had required a license for each authorized user on a network, whether the user was concurrently logged on or not.

Information systems managers reacted favorably to news of the policy change, announced during a panel discussion at Comdex/Spring '91 last month. Microsoft joins a growing group of personal computer software vendors, including Symantec Corp., Lotus Development Corp. and Software Publishing Corp., that are moving to concurrent licensing.

Mike Maples, vice president of applications at Microsoft, said the new policy is effective immediately. It replaces an 18-month-old statement that prohibited users from transferring an application and its license electronically to another machine.

Under the new policy, for example, companies with 60 employees who use a given application would be required to buy licenses only for the number of employees who would use the software simultaneously.

If the user guaranteed that only 40 of those employees would use Microsoft Word at one time, for example, the company would have to buy only 40 licenses.

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"That's what everyone wants to see," said Brian Moura, assistant city manager in San Carlos, Calif. Moura said network managers will be relieved not to have to build unique Microsoft Windows interfaces for different employees based on their access privileges.

"This is more in tune with current computing styles," said Ron Houck, senior systems designer at Marion Merrell Dow, Inc., a pharmaceuticals research firm in Indianapolis.

There are several methods of automatically regulating access to applications, said Emily Pennington, staff technician at Du Pont Co. in Wilmington, Del. Microsoft's LAN Manager network operating system has a facility for regulating concurrent access on a network, and a similar utility is sold by Brightwork Development, Inc. in Tinton Falls, N.J. "This is good business sense," Pennington said.

"This is a smart move on Microsoft's part," said Dick Nelson, systems analyst at New York Life Insurance Co. "It lets them make money on their product, but it also is reasonable" for users, he said.

Staff writer Christopher Lindquist contributed to this report.

CA links mainframe DBMS to spreadsheet

BY JOHANNA AMBROSIO
LW STAFF

WASHINGTON, D.C. — What do you get when you cross a high-powered personal computer spreadsheet with the ability to access mainframe databases? A new data-manipulation tool, which is what Computer Associates International, Inc. announced last week.

Essentially, CA integrated its Compete spreadsheet-like software, which runs under MS-DOS and Microsoft Corp.'s Windows 3.0 on PCs, with its CA-Datacom and CA-IDMS mainframe database management systems. Compete, which CA acquired in January, allows up to 12 views of information.

These capabilities are similar to Lotus Development Corp.'s Datalens package, which feeds information from mainframe, Unix and Digital Equipment Corp. databases into Lotus' 1-2-3 spreadsheet package.

However, Jeff Tash, president of Database Decisions in Newton, Mass., said that while Datalens hooks into many more database management systems, Compete has a lot more powerful modeling capabilities.

The essential difference between Compete and a traditional spreadsheet such as Lotus 1-2-3 is that a regular spreadsheet can look at information from only a few perspectives. For example, financials can only be seen across time for one division. If a user wanted to look at financials across divisions for a specific time period as well, he would have to create another spreadsheet and link it to the first one.

With Compete, CA said, users can accomplish all of this within one worksheet by simply pointing and clicking. Compete allows up to 12 views of information on the same worksheet.

In addition to Compete and a CA mainframe database, users also need to have a PC package that actually enters the mainframe, extracts the data and then feeds the data to Compete. CA-Datacom users need CA-Dataquery/PC, and CA-IDMS users need CA-Infogate.

Observers and potential users gave the software good reviews. Dick Bailey, director of information services at McLouth Steel in Trenton, Mich., said his firm will test the software's productivity benefits by giving it to a handful of high-powered spreadsheet users, including the chief financial officer. The firm will use it to download information from McLouth's CA-Datacom mainframe database and perform sophisticated modeling in areas such as yield management.

THE ESSENTIAL difference between Compete and a traditional spreadsheet such as Lotus 1-2-3 is that a regular spreadsheet can look at information from only a few perspectives.

Another potential user is Herman's Sporting Goods, Inc., in Carteret, N.J. "I liked the flexibility and modeling capabilities," said Laura Berger, senior database administrator, who recently saw Compete demonstrated as a database manipulation tool.

One negative point is that CA has no plans to make the product available for non-CA database systems, said George Schussel, president of Digital Consulting Associates, Inc. in Andover, Mass. Still, he added, it should appeal to the company's 5,000 mainframe database customers, about 3,000 of whom use CA-IDMS.

CA's recommended PC configuration is an 80386-based machine with DOS 3.1 or higher, Windows 3.0 and a hard disk with at least 2M bytes of free hard disk space. The per-workstation price of Compete with one of the required data-extraction tools is approximately $1,800.

ICL scoops Nokia Data for $391M

Merger seen as likely to boost Fujitsu market position in Europe

BY DON RADOLI
SPECIAL TO CW

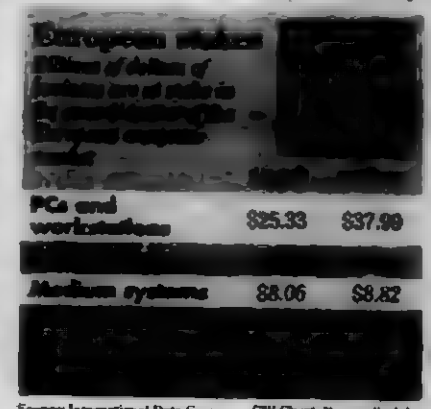
OSLO — Britain's International Computers Ltd. (ICL) said last week it will buy Nokia Data Systems for $391 million. The acquisition will broaden the European presence of Japan's Fujitsu Ltd., which owns 80% of ICL.

Finland's Nokia Corp. conglomerate, which owns Nokia Data Systems, will take a 5% stake in ICL, receiving $85 million in cash and $306 million in preferred stock. The agreement is expected to be formally completed Sept. 30.

ICL Chairman and Chief Executive Officer Peter Bonfield and Nokia Data Systems President and Chief Operating Officer Kalle Isokallio both tried to downplay the role of Fujitsu. But the move is bound to be interpreted as a Japanese attempt to acquire European market share and distribution channels.

The merger of Nokia Data Systems and ICL will result in an enlarged European computer firm with 24,000 employees and revenue of some $4 billion.

"The merger will place the new company in the top three in the UK, Finland, Sweden and Denmark, and together with its majority shareholder, Fujitsu, in Spain," Bonfield said. "It significantly strengthens ICL's market position in Germany, France and Holland."



Source: International Data Corp. CW Chart: Doreen St. John

Nokia Data Systems must work out a new arrangement with France's beleaguered Groupe Bull, whose products it distributes in Finland. Bull is reportedly infuriated that Nokia Data Systems carried out secret negotiations with ICL while also negotiating with Bull on possible cooperation in Sweden, Norway, Denmark and Finland.

The Bull/Nokia negotiations collapsed after only two weeks. The two companies reportedly had an informal agreement not to negotiate with other companies during the five months the negotiations were scheduled to last.

Nokia Data Systems said ICL has the money while Bull is drowing in a flood of red ink (see story page 6).

Don Radoli is an editor at Computerworld Norway.

Fast 486s

FROM PAGE 1

see a stampede [of buyers]," said Bruce Stephen, director of PC hardware research at International Data Corp. in Framingham, Mass. "This is not an absolute must-have."

For the short term, machines based on the 50-MHz chip could be useful only as servers for massive databases or for a large group of heavily used workstations, said Hilal Al-Hilali, senior section manager at Bank of Boston's integration lab in Boston.

"We're finding that our 8-bit Token Ring boards don't keep up with 386 33-MHz chips" in existing file servers, Al-Hilali said.

One manager foresees a selective market. "We have power users who'll eat up whatever machine we'd offer them," said John A. Chapman, coordinator of planning and architectural implementations at Amoco Corp. in Chicago. "But they're by no means a high-volume category."

NCR is already taking orders for its System 3447, 3450, 3550 and 3600 series, which are all file servers or larger, that will be based on the 50-MHz version of the I486 when they are released in the late third quarter and early fourth quarter of this year.

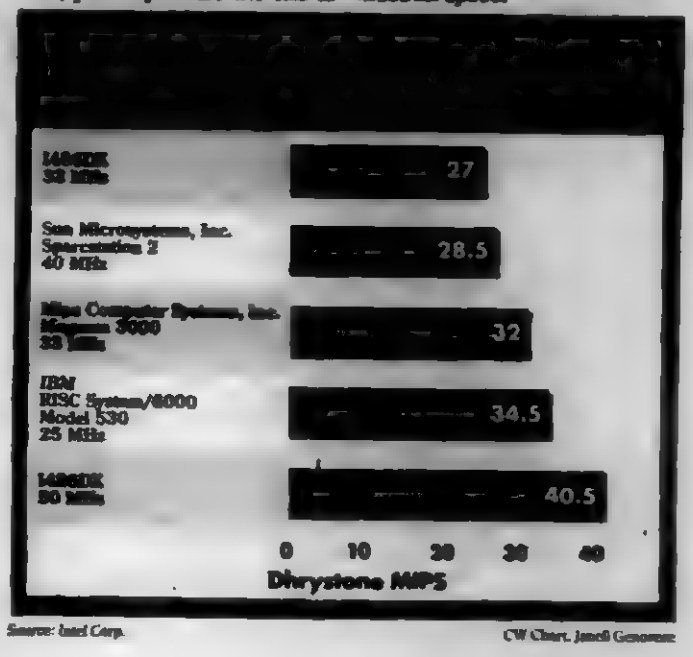
IBM, Dell and NCR have all publicly demonstrated products using the 50-MHz chip, and Intel Senior Vice President David House said IBM, NCR and Compaq were instrumental in debugging the 50-MHz chip.

IBM will not comment on a reported June 25 release date, but a spokeswoman for the firm said, "IBM is committed to bringing new technology quickly to our customers."

Dell, which is expected to release 50-MHz file servers and desktop machines as part of a line of upgradable PCs based on the Intel 486 family of processors, probably before the end of the second quarter, indicated it did not expect large initial demand for systems based on the 486/50.

Other vendors are waiting to see if a market materializes. Northgate Computer Systems, Inc. Chairman Arthur Lazere said his company would "evaluate" the 50-MHz chip but so far has found its 33-MHz cousin a tough sell for users. Sources at other second-tier compatible makers said Intel is telling them not to expect chips in quantity until December. Intel would not confirm the report.

An Intel spokeswoman said the 50-MHz chip would be aimed at PC servers and workstations. While conceding that there are currently few applications capable of taking advantage of the chip, she said, "There's always a need for speed."



Source: Intel Corp. CW Chart: Janell Genovese

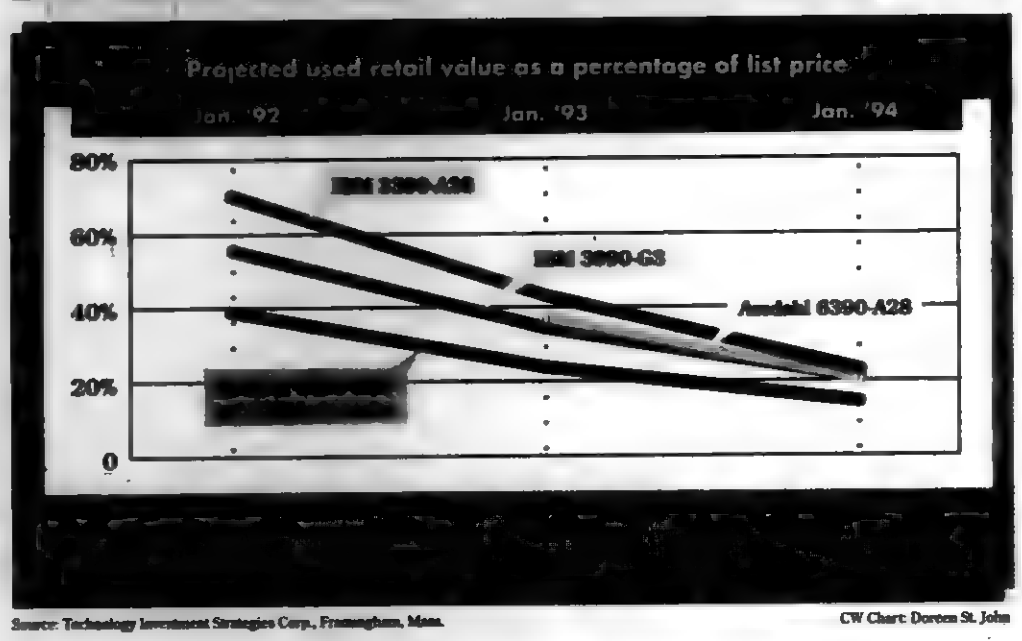
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TRENDS



	Announced	List price	Projected retail residual value Jan. '92	Jan. '93	Jan. '94
Amdahl 6390-A28	March 1991	$212,650	New*	$78,681	$44,657
Amdahl 6100-200 w/32M-byte cache**	May 1988	$258,950	$100,991	$62,148	$36,253
IBM 3390-A28	Nov. 1989	$212,650	$148,855	$91,440	$48,910
IBM 3990-G3**	Sept. 1987	$213,690	$117,530	$72,655	$42,738



Source: Technology Investment Strategies Corp., Framingham, Mass.

CW Chart: Doreen St. John

NEXT WEEK

It's not all fun and games at the California State Lottery, which brings in $2.5 billion annually, making it the nation's largest lottery. **Joanne Ichimura-Hoffman**, director of information management and services, heads an operation that handles an average of 20 million transactions per day. Her profile appears in Manager's Journal. ▶



Andy Freeberg

Without a change to existing software development processes, putting in a technology such as computer-aided software engineering is worse than worthless. In Depth will explore the need for IS to examine and revamp the process behind the technology, managing the organizational changes and quality improvements that follow.

INSIDE LINES

Ready to make Windows squeak

Yet another Silicon Valley software company is set to take a swipe this week at the growing market for Microsoft's Windows 3.0. Gupta Technologies, a Menlo Park, Calif., database server firm, plans to announce its first Windows-based end-user application — one that will reportedly allow managers with no knowledge of SQL to access IBM DB2 and Oracle relational databases. It's all done with graphical user interface icons, company sources say.

Only the lowly

Apple retailers are beginning to sweat bullets over reports that Apple is close to inking a distribution deal with Comp USA, a Dallas-based superstore. Longtime Apple retailers say the move would seriously drive down prices and hurt their profits, particularly with the Macintosh LC and Macintosh SI. They are willing to live with the deal as long as Apple gives Comp USA only the low-end Classic.

Celebrating Independence Week?

Employees at Silicon Graphics' Mountain View, Calif., headquarters are being asked to take the entire Independence Day week off to cut costs. The once high-flying company recently hit a dry spell for its third fiscal quarter when earnings dipped to $3.1 million, down from $8.7 million one year earlier. One antidote: a new low-cost workstation, code-named Hollywood, that is expected to debut in July or August for about $6,000.

Chippy attitude

While Intel is posing its 1486 chip as a competitor to reduced instruction set computing (RISC) chips such as those made by Sun and Mips Computer Systems, Intel last week told Wall Street analysts gathered for a preview of its 1860 follow-on that the 586 would be its true RISC competitor. One attendee said Intel told the group it would combine the 860 and the 486 to make the 586, which it would unveil sometime in 1992.

Pincushion

Speaking of Intel, the new 1860 chip, due to be introduced Wednesday, is not pin-compatible with the 1860XR introduced in 1989. A motherboard component maker said fitting the chip — which sources said holds more than 2 million transistors — onto boards holding the XR will require board redesigns. The lab costs at Intel will also integrate more peripheral components such as external memory caches into one device. An Intel spokeswoman said that with the increased transistors, it would be almost impossible for it to have pin compatibility, and it is typical for one generation of chips not to be pin-compatible with the predecessor.

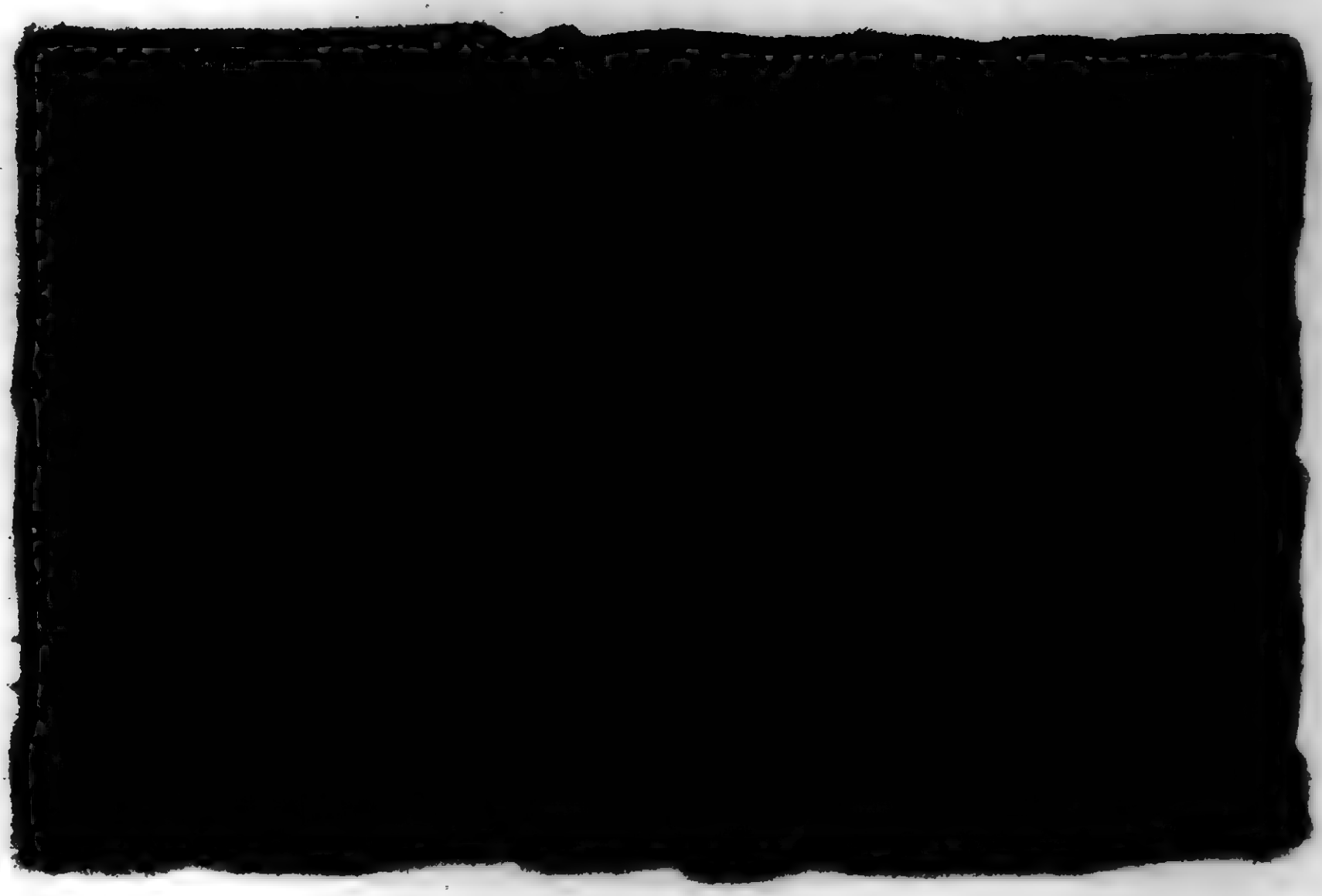
Changing labels

While NCR and AT&T have had little to say about the progress of their merger talks, one AT&T reseller reports that the word from Dayton is AT&T resellers will get the green light to sell NCR boxes by the end of this month.

Emperor to get some clothes

DEC is planning to put a little beef into its Enterprise Management Architecture next week with the first network management application designed specifically for the platform, a DEC spokeswoman confirmed. DEC has taken heat from industry analysts for some time now for failing to provide any actual function modules for the so-called open architecture beyond revamped versions of its proprietary Decnet Phase IV management products.

The controversy over call ID services has taken on a new twist with privacy advocates now being faced with advocates of the counterblock, or the right of recipients not to accept the call of someone who refuses to be identified. As one source puts it, "If you have the right to block the peephole when you come to my door, I have the right not to let you in." Well, we won't block you out or necessarily take down your number. Contact News Editor Pete Bartolik at (800) 343-6474, send a fax to (508) 875-8931, or address some info to our Compuserve address, 76537,2413.



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COMPUTERWORLD

AT bus rides high again at IBM

BY RICHARD PASTORE
CW STAFF

IBM is expected to announce three personal computers this week that incorporate the AT bus, a capitulation to entrenched demand, according to sources briefed by the company. While IBM may be becoming less dogmatic about its Micro Channel Architecture bus, it will incorporate MCA into one other PC to be announced this week.

In all, IBM plans to introduce four Personal System/2s, dubbed Models 35, 35LS, 40 and 57SX, each of which will use the 20-MHz Intel Corp. 80386SX chip. IBM currently sells only 16-MHz 80386SX models, while many of its competitors have been shipping the 20-MHz version since last year. Analysts said the move is a hedge against an anticipated sales decline for the 16-MHz 386SX computers.



CW Chart: Doreen St. John
Source: International Data Corp.

Despite its reputed technological superiority, IBM's MCA has made few strides in the face of users' stubborn loyalty to the old AT bus, analysts noted.

In 1987, the company introduced MCA as a standard for its entire corporate PC line.

"That strategy failed dismally," said Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn. IBM said it did not foresee end-user resistance to "proprietary

Continued on page 99

IBM unit finds first outsource gem at Zale

BY NELL MARGOLIS
CW STAFF

IRVING, Texas — Three weeks out of the starting gate, IBM's outsourcing subsidiary last week captured its first big deal: a 10-year outsourcing and business consulting contract with Zale Corp., a billion-dollar retail jeweler based here.


Zale's Karney *has faith in ISSC*

The pact will launch IBM's Integrated Systems Solutions Corp. (ISSC) unit into the lucrative retail market while helping Zale further its long-held automation strategy. Meanwhile, outsourcing vendors that view IBM's competition as unfair and illegal met in the nation's capital to urge the U.S. Department of Justice to take up their case.

Nearly 100 jobs at Zale will be eliminated as a result of the contract, an IBM spokesman said. David Karney, Zale's vice president of information systems, said those employees will be offered jobs within the partnership group being formed to manage the operations. The Zale data center will remain physically intact in the Dallas area but will be operated from an ISSC center in Lexington, Ky.

ISSC will manage all information processing for the huge retailer. In addition, ISSC will administer its new client's existing disaster recovery operations and

Continued on page 101

Oracle white knight wears samurai garb

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp. has found a way out of the yearlong cash squeeze that nearly brought the growth of its business to a standstill. Last week, the firm said it will obtain $200 million in financing from Nippon Steel Corp. in Tokyo.

In exchange, Nippon Steel will acquire a 49% ownership in the U.S. firm's Japanese subsidiary and the option to convert its investment into Oracle common stock. The deal could be finalized this summer.

Longtime Oracle users and industry analysts said they were comfortable with the prospect of a $19.3 billion Japanese giant financing their software supplier, mostly because it will ensure financial stability at Oracle.

"They had to give a little to get a little," said Warren Cappa, president of the Mid-Atlantic Oracle Users Group in the

Continued on page 7

Rating the benchmarks

Benchmark	Very important and very familiar	Not important and not familiar
RAMP-C	2.0%	39%
TP1	1.7%	43%
TPC-A	1.0%	47%
ET-1	0.6%	49%
AIMS	0.0%	54%

Percent of respondents (Base: 297)

Percentages equal those respondents who indicated yes to both importance and familiarity criteria

Source: The Standish Group International, Inc. CW Chart: Janell Genovese

Benchmarks score low *among those purchasing on-line transaction processing systems, according to a recent survey.* *See story page 101.*

Macs tune in to databases

BY JAMES DALY
CW STAFF

Moving Apple Computer, Inc. personal computers into a client/server scheme can be slogging at first, but perseverance can ultimately yield major productivity gains and financial savings, according to users who are making the effort.

A growing portfolio of client/server success stories is good news for Apple, which is pushing hard to sell the Macintosh in the corporate world. Apple took an important step when it announced its first licensing agreements for its Data Access Language, or DAL, a connectivity language that allows PC users to access relational database information from the server host [CW, April 1].

Lotus Development Corp. also announced last week that 1-2-3 for the Macintosh, which is expected to ship in the fall, will support DAL.

DAL licensing arrangements with Novell, Inc., Tandem Computers, Inc., Data General Corp., Blyth Software, Inc. and Pacer Software, Inc. as well as earlier DAL pacts with Digital

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Bank bailout costs jobs

Rescuer slashes Bank of New England tech staff

BY MARYFRAN JOHNSON
CW STAFF

PROVIDENCE, R.I. — Nearly 1,000 Operations and Technology Division workers will lose their jobs in a computer systems consolidation between Fleet/Norstar Financial Group and the recently acquired Bank of New England, Fleet officials announced last week.

The consolidation is expected to save Fleet up to $350 million annually by shifting most of the acquired bank's technology operations to Fleet's own data processing and bank operations center in Albany, N.Y., during the next 18 months.

New plans

Fleet plans to close the bank's Boston-based systems and programming office, eliminating 140 jobs, as well as moving the bank's Malden, Mass., data center, which employs 850 people, to the Albany data center.

Fleet began operating the failed Bank of New England operations in Massachusetts, Connecticut and Maine on April 29 under an interim management agreement with the Federal Deposit Insurance Corp. The 3,000 employees in the Operations and Technology Division in the three states will be trimmed to roughly 2,000, Fleet officials said.

The personnel cuts will affect a broad swath of systems

Continued on page 100

INSIDE

IBM's Repository Manager has had mixed results among early users in its first year. Page 6.

DEC customers approve of the company's conversion to the 'open systems' philosophy. Page 8.

1-2-3/Windows finally launched as Lotus begins campaign to battle Microsoft as the one-stop applications provider. Page 14.

Product Spotlight — Minicomputers are sometimes the right machines for a server job. Page 63.

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6 Intel has jumped into RISC waters with the release of its I860 XP microprocessor, but observers say Intel may have missed the boat.

8 Ten companies will be honored by *Computerworld* and given Smithsonian Awards for the outstanding ways in which they use information technology to benefit the general public.

10 Looking for privacy: Microsoft said last week that it has licensed a data security software package from RSA Data Security that would allow PC users to encrypt private messages to be sent across data networks.

16 Computer Sciences takes an early exit from the New Jersey State Insurance Contract. The state cancelled a contract with CSC, citing performance problems and less need for CSC resources.

99 IBM fits more pieces into its multimedia jigsaw puzzle with the announcement of several products.

100 Prime'd and ready: The user group meeting in San Antonio showcases new products and promises of lifelong commitments.

101 Benchmarks get no respect from a lot of people when it comes to OLTP systems purchases.

Quotable

"They will still have a tough sell in non-DEC environments, but I would tell people to listen to their message and see what they have."

STANLEY ROSE
BANKERS TRUST

On DEC's open systems commitment. See story page 8.

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The 5th Wave



"A PORTABLE COMPUTER? YOU'D BETTER TALK TO OLD BOB OVER THERE. HE'S OWNED A PORTABLE LONGER THAN ANYONE HERE."

EXECUTIVE BRIEFING

■ **Minicomputers as servers?** 'Yes,' say 31% of IS managers surveyed by Business Research Group in Newton, Mass. These machines are particularly attractive to people with very large, critical applications and a dire need for service and support as well as to companies that own minicomputers now and would like to extend their use. On the downside, the machines are still expensive, and their resale value is dipping. **Page 63.**

■ **Already tough times** got tougher for 1,000 IS staff members last week when Fleet/Norstar Financial Group announced it is laying off operations and technical personnel as part of its acquisition of the failed Bank of New England. The Providence, R.I.-based financial concern plans to close most of Bank of New England's operations centers and bring their work under Fleet. **Page 1.**

■ **The celebration is muted** as IBM's Repository Manager approaches its first birthday. A sampling of early users finds that although some have made progress with IBM's strategic software development application, many are still quite cool to the concept, and one has stopped development altogether. **Page 6.**

■ **DEC users are confident** the vendor can achieve its goal of becoming a master open systems integrator. But DEC faces problems finding people with the right skills as well as getting its own field sales force to buy into the new strategy. **Page 8.**

■ **Lotus takes the one-stop shopping route,** touting plans to make its interfaces and data consistent across product lines and platforms. The new strategy relies heavily on the success of the Notes groupware application. **Page 14.**

■ **The AT bus lives** inside IBM's PS/2s. The 7-year-old architecture is expected to be at the heart of three desktop systems scheduled to be announced this week, indicating that IBM's bid to move customers to the Micro Channel Architecture is faring poorly. **Page 1.**

■ **A white knight saves Businessland** from bankruptcy, and experts say buyer JWP's strength is in keeping prices low. **Page 4.**

■ **IS professionals** who have had their antennae up in search of a job in broadcasting may want to change channels to where the jobs are: cable television. **Page 85.**

■ **Third-party maintenance vendors** can offer savings of up to 50% on annual contracts for large systems, but IS managers should shop carefully. **Page 93.**

■ **Microsoft is moving to end incompatibilities** between Windows and many graphics boards. The company is releasing tool kits that let developers write drivers that work with nonstandard video equipment. **Page 37.**

■ **A Canadian government agency** will link 12,000 terminals together using an X.25 packet-switching network to connect five networks that barely speak today. **Page 50.**

■ **The state of New Jersey cancels** a processing services contract with CSC, saying the vendor isn't performing well. **Page 16.**

■ **Companies with ill-defined software development processes** shouldn't try to justify CASE until they fix those poor processes. The sequence is to standardize, mechanize, then automate. IS departments have been telling that to users for years. Now it must heed its own advice. **Page 75.**

■ **On site this week:** Milwaukee finds network-based purchasing software does the job as well as a mainframe. **Page 47.** Market research firm puts technology in consumers' hands, letting bar-code readers do the work of finding out which cereal is on their shopping lists. **Page 31.** A trucking firm uses imaging to dig itself out of a blizzard of 50 million pieces of paper per year. **Page 31.**

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U.S. and Japan sign semiconductor pact

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The U.S. and Japan signed a bilateral trade agreement last week that calls for foreign penetration of the Japanese semiconductor market to rise from its present rate of 13% to 20% by the end of next year. The target carries no penalties if it is not met.

According to the five-year agreement, the U.S. and Japan will no longer collect cost and price data used to detect and monitor dumping. However, the pact provided for a "fast-track" procedure by which Japan will supply such data "on an expedited basis" if a U.S. antidumping investigation is undertaken.

The pact also eliminated sanctions on the import of certain Japanese products imposed on Japan in 1987 for violations of the 1986 U.S./Japan semiconductor trade agreement.

"Computer systems manufacturers applaud the new agreement," said John Young, chief executive officer of Hewlett-Packard Co. and chairman of the Computer Systems Policy Project (CSPP), a coalition of CEOs from 11 major U.S. computer companies. CSPP and the Semiconductor Industry Association (SIA) set aside traditional buyer-supplier differences last fall and made a joint proposal for the new agreement with Japan.

"Japan's public recognition that the foreign share of the Japanese semiconductor market will increase to a minimum of 20% by the end of 1992 is a historic milestone," said Wilf Corrigan, CEO of LSI Logic Corp. and chairman of the SIA.

But it is not the first such milestone. The 1986 agreement was accompanied by a secret letter of understanding containing the same 20% target to be met by July 31, 1991. But the foreign share of Japan's semiconductor market grew from 8.6% in 1986 to only 13.2%, with the U.S. owning a 12.3% share.

Industry groups generally praised the agreement, but some on Capitol Hill were less pleased.

"The agreement contains no specific commitments by Japan to guarantee market share opportunities for U.S. semiconductor producers . . . I don't see why we should reward Japan for failing to live up to an agreement they've already signed," House Majority Leader Richard Gephardt (D-Mo.) said.

The agreement should prevent dumping while further opening the Japanese market, said Sen. Max Baucus (D-Mont.), chairman of an international trade subcommittee. But he added that the trade sanctions should not have been lifted. "The commitments have still not been met," he said.

The pact may be terminated after three years by mutual agreement.

Counting the chips

U.S. semiconductor manufacturers have slowly increased penetration of the Japanese market



Source: World Semiconductor Trade Statistics, Inc. CW Chart: Doreen St. John

Faltering Businessland finds savior in JWP merger offer

BY RICHARD PASTORE
CW STAFF

PURCHASE, N.Y. — Businessland, Inc., which seemed headed for the brink last month after reporting a shocking $43 million quarterly loss, has been tossed a lifeline by JWP, Inc. The technical services company offered to merge the $1.3 billion computer dealer with its current $843 million reseller operation to create the U.S.' largest wholly owned personal computer dealership.

JWP, which started out 14 years ago as an investor-owned water utility, has since diversified into computer sales and distribution, systems integration and mechanical and electrical services. The firm logged close to $3 billion in sales last year.

In 1990, JWP purchased PC dealer Neeco, Inc. to fill out its Computer Systems Group PC dealer operation. That group plies a Fortune 1,000 clientele exclusively with an outbound sales force.

As a dealer organization, JWP is noted among industry analysts for its efficient hardware order and delivery system, something that should benefit Businessland customers. Despite numerous attempts to reorganize its distribution and trim overhead, Businessland continues to have problems with delivery efficiency.

Businessland's troubles have prompted several customers to jump ship. "The level of service deteriorated toward the end of last year, so we signed our 1991 supplier contract over to Nynex Business Systems," said a large corporation's network manager, who preferred anonymity.

It remains to be seen whether JWP can stem the tide of defections or lure back the disaffected accounts. However, the firm's short but highly effective track record running Neeco speaks well for it, said Doug Kass, an analyst at Dataquest, Inc. in San Jose, Calif.

Businessland's largest customer, Eastman Kodak Co., is relieved by JWP's offer. "It's a positive development in continuing our long-term relationship with Businessland," said Leon Griggs, director of PC services at Kodak.

JWP's low-cost delivery system should allow it to continue offering the low prices Businessland buyers are accustomed to while adding the solid backing and consistent service Businessland has failed to provide, analysts said.

Pending approval of the merger, JWP spokesmen would not comment on particulars of integrating Businessland into the operation. However, analysts speculated that Businessland's management will not be retained. Businessland has not earned a net profit since the third calendar quarter of 1989. It has lost more than $90 million in that time.

Apple eyes chip defection

BY PATRICIA KEEFE and JAMES DALY
CW STAFF

A history of late deliveries, most recently with the 68040 from chip supplier Motorola, Inc., has Apple Computer, Inc. rethinking its commitment to Motorola's 88000 RISC chip.

If Apple were to defect to another supplier of reduced instruction set computing (RISC) processors, it would pose a serious blow to Motorola's semiconductor business, analysts said.

An Apple spokeswoman confirmed that the company is talking to multiple RISC suppliers but would not confirm or deny a published report last Friday about a pending deal for IBM's RISC chip set in exchange for Apple software.

An IBM spokeswoman said IBM has never ruled out licensing its proprietary RISC chip set, which sits at the heart of the RISC System/6000 line.

Analysts speculated that Apple may be pressuring Motorola to ensure a prompt delivery of its RISC chips. A dissenting view came from Lotus Development Corp. Vice President Don Casey, who said, "When I was at Apple, I never felt we lacked for Motorola's attention. Doing this [pressuring Motorola] in public doesn't strike me as consistent with Apple [policy]."

Other observers seemed to think that a software licensing arrangement between IBM and Apple was more likely.

Analysts said that IBM might want to integrate pieces of the Apple operating system into OS/2 in exchange for assisting Apple in resolving more advanced IBM connectivity issues as well as providing technology such as IBM's Advanced Peer-to-Peer Networking.

Apple's product delivery plans for a 68040-based Macintosh were set back when Motorola was six to 12 months late delivering the chip, said Tim Bajarin, an analyst at Creative Strategies Research International, Inc.

CORRECTIONS

Because of a reporting error, a Comdex/Spring '91 notebook item that referred to a spreadsheet panel discussion incorrectly identified the speaker from Borland International, Inc. Steve Kahn, not Philippe Kahn, represented Borland.

.....

Richard Goldberg, IBM's assistant general manager of software marketing, was incorrectly identified as Robert Goldberg in the June 3, 1991, issue.

.....

TGV, Inc., maker of a Transmission Control Protocol/Internet Protocol-to-VAX/VMS connectivity application called Multinet, will give full credit to those who bought Novell, Inc.'s OEM version of the product. TGV, and not Novell, sells and supports all versions of Multinet.

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NEWS SHORTS

IS management bonuses slashed

Information systems executives have seen their bonuses slashed an average of 23% because of the recession, according to a 1991 survey by Edward Perlin Associates, Inc., a New York compensation consulting firm. The survey of 800 IS managers at 31 major corporations found an average increase of 7% in base pay compared with last year's survey and an average drop of roughly 1% in total compensation. Companies have been shifting financial incentives to bonuses, which can be cut in hard times and still enable the company to keep salaries competitive, the firm reported.

Slate schedules shipment

Slate Corp. sketched out plans to expand its pen-based computing packages last week with support for Microsoft Corp.'s upcoming Windows for Pens operating system, which is expected late this year. Slate's first Microsoft offering will be the Penapps development environment, a product it now produces for Go Corp.'s Penpoint system. Chairman Vern Raburn expects the company's Microsoft-based Penapps to be available by the second quarter of 1992. A development environment version of Penapps will cost $2,500, while a runtime edition will sell for $99. The Scottsdale, Arizona-based Slate also plans to up its linking capabilities and begin to produce Penpoint products using Traveling Software's communications technology.

AT&T opens up Accumaster

At last week's International Communications Association conference in Anaheim, Calif., AT&T said it will publish its Accumaster Integrator alarm interface and support documentation for AT&T's Simple Network Management Protocol. The company said opening Accumaster's network management interface would bring the product closer to compliance with OSI standards by allowing developers to write Open Systems Interconnect (OSI) and non-OSI software for management applications.

Bells get Senate support

The U.S. Senate voted 71 to 24 to allow the seven regional Bell telephone companies to manufacture communications equipment, a $115 billion line of business prohibited by the Consent Decree that broke up AT&T in 1984. The Baby Bells are expected to find more resistance when the U.S. House of Representatives takes up a similar bill. President Bush threatened to veto the bill if it retains a provision limiting the foreign content of the equipment. The Bell companies also may not sell information services or long-distance services.

NSA publishes specs for DBMSs

The National Computer Security Center, a unit of the National Security Agency, has published the Trusted Database Management System Interpretation (TDI) of the Trusted Computer System Evaluation Criteria, the so-called "Orange Book" detailing specifications for trusted operating systems. The TDI extends the concepts of trusted systems to applications in general and to DBMSs in particular. The center said it has so far received six technical proposals for trusted DBMSs for evaluation and certification at various levels of security.

Xerox adds imaging system

Xerox Imaging Systems last week announced a new high-speed document imaging system offering a 30% increase in throughput over its earlier products for personal computers. At the heart of the K6200 document input system is a reduced instruction set computing (RISC) processing unit featuring the AM29000 RISC chip from Advanced Micro Devices, Inc. The system also includes proprietary intelligent character recognition software and a high-speed, heavy-duty scanner with an automatic document feeder. Following numerous other imaging vendors, Xerox choose Microsoft's Windows 3.0 environment as the end-user interface for the K6200, which will be available at the end of June at a price of $25,950.

More news shorts on page 100

Repository users slow to start

After a year, AD/Cycle hub draws mixed messages from early installers

BY ROSEMARY HAMILTON
CW STAFF

Nearly one year after its release, IBM's Repository Manager has yet to catch the fancy of many users.

It has had mixed results at early-user sites, with at least two customers in a small group of early users reporting progress but with another putting Repository Manager on hold because it was too difficult to work with. Some other users contacted last week said they are still not ready to embrace the concept, much less install the software.

"We looked at the general concept and approach and didn't feel it was going to be immediately beneficial to us," said Doug Underhill, a vice president at CSX Technology, the information systems arm of CSX Corp. "I also have to confess that I am still confused by what it is."

Piece of the puzzle

Repository Manager is a key piece of IBM's AD/Cycle, its software development strategy. The software, which is essentially an application that sits on DB2, is designed to act as the central storage and control mechanism of a computer-aided software engineering (CASE) environment.

IBM shipped an initial version of Repository Manager/MVS in June 1990. It has maintained that this release is not a full-blown repository and as such is intended for other vendors and advanced users.

"I think the level of interest could be stronger," said Paul Hessinger, chief technology officer at the Computer Task Group. "IBM continues to say this release was for the tools builders, but the interest should be stronger in terms of planning for it, planning for it generically as well as planning for Repository Manager."

An IBM spokesman last week said developments in both AD/Cycle and Repository Manager are an evolutionary process. "If customers are satisfied with the progress they are making, then so are we," he said. "If they are not, then we've got more work to do."

Two early users contacted last week gave this release good marks. However, a third, Depository Trust Co., which installed Repository Manager before it was officially released, stopped working with it early this year.

"We aren't ready for it, and we aren't sure it's ready for us," said Emmanuel Ackerman, director of data administration at the firm.

Ackerman's staff tested the software for several months, he said, "but we haven't done anything since the first of the year."

Still, both the Bank of Montreal and Phillips Petroleum Co., also early-user sites, report more positive experiences.

"We have been well-supported by IBM, and we've done some of our tool building, and we have decided that to the extent that it was painful, it was worth the pain," said John Meadows, a senior vice president at Bank of Montreal.

Moving along

The bank is likely one of the more advanced shops. Meadows said his staff has been moving data in and out of the repository with their own tools. Other sites, including Phillips Petroleum Co., have spent most of their time testing and studying the software.

"We've used this time to learn what we can do with it," said R. W. Hankinson, manager of client applications and technology services.

"We've been able to communicate our needs back to IBM as to what they need to develop and what kinds of interfacing [the third parties] need to do," Hankinson added.

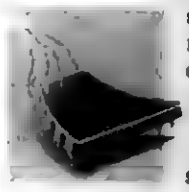
Other users do not expect to be at this stage for a few more years. "I don't even have a position on it," said James Stuber, a first vice president at Mellon Bank. "We just haven't looked at it recently. We are concentrating on more immediate things, like CASE tools and building DB2 applications."

Observers skeptical of Intel's I860

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — With the introduction of Intel Corp.'s new I860 XP microprocessor, the company has proved it can surf with the best on the reduced instruction set computing (RISC) wave.

But observers said Intel has grabbed the wave too late and too close to shore. Few computer makers use the I860 in their workstations or mainframes.



Those that do use it cater primarily to niche needs centering on complex graphical displays. Observers predicted that the XP will have little impact on the majority of information systems departments requiring RISC systems.

The company, based here, last week announced preproduction shipment of the XP, a 2.5 million-transistor chip capable of 100 million floating-point operations per second. Intel is offering 40- and 50-MHz versions of the XP for use as CPUs in supercomputers and as accelerator boards in workstations.

The XP, Intel executives said, will be followed by a 60-MHz version now under development. It was preceded in 1989 by the one million-transistor, 33-MHz XR. Though considered different generations, both are RISC chips. Also last week, Intel announced availability of a scaled-down XR running at 25 MHz and costing $176 each in sets of 1,000.

An Intel spokesman said he expects to see systems running on the chip in "six to nine months."

Gordon Bell, chief scientist at Stardent Computer, Inc. in Sunnyvale, Calif., said his company will have an XP-based machine out this summer. No other computer vendor using an I860 chip would be so specific.

Michael Slater, editor and publisher of "The Microprocessor Report" in Sebastapol, Calif., said the entire line of I860 chips was handicapped early on by Intel's late arrival into the RISC architecture arena. Slater said by the time Intel introduced the XR two years ago, most computer hardware makers had already standardized on microprocessors by IBM, Hewlett-Packard Co., Mips Computer Systems, Inc. and Sun Microsystems, Inc.

By Intel's own reckoning, 60% to 70% of the market belongs to entrenched competitors. The company instead will focus on a handful of primary computer vendors including Stardent Computer, Alliant Computer Systems Corp., Oki Electric Industry Co. Ltd., Samsung Electronics Co. and its own supercomputer division.

The XP, which will cost $699 for the 50-MHz version and $560 for the 40-MHz version, is likely to be a "very good companion product to the X86 line," said analyst Millard Phelps at Montgomery Securities in San Francisco. But its role remains primarily that of an accessory, Phelps said.

"As a coprocessor, you can unload [data] and it will crank away," he said.

Oracle

CONTINUED FROM PAGE 1

Washington, D.C., area. "They needed cash, and they had to give away 49% of Oracle Japan to get it." Oracle said it will maintain 51% ownership of the Japanese business — which is expected to generate more than 10% of its revenue by 1995 — and has an option to increase its share.

The issue of financial stability seemed to outweigh any prospect of Oracle opening the door to future foreign control.

"At least this isn't another American software company trying to take Oracle over," said Tony Ziemba, chairman of the New York Oracle Users Group. "We just want to know that our vendor will be there for us and that their revenue stream will allow them to continue their product development plans and to improve customer service."

Cash flow dried up

Oracle's cash flow had trickled to a virtual halt earlier this year. Oracle executives said in January that the $971 million firm then had less than $50 million cash on hand and that more than $300 million in back payments from customers had to be collected.

During its third fiscal quarter, Oracle decided to write off $42 million of those bills as uncollectible. However, positive cash flow returned that quarter, and by March, Oracle had $72 million in cash.

As part of the Oracle Japan pact, Nippon Steel will gain $100 million worth of Oracle preferred stock, convertible in four years to Oracle common stock, and is guaranteed a 6% return on that money. It also owns $100 million in 10-year convertible notes, which will produce a guaranteed 9% interest.

For the moment, however, Oracle's stock — which slid from $28 per share to $6 per share on news of a $36 million loss for the first quarter last fall — will remain undiluted until 1995. Oracle stock is now trading at about $10.

Analysts said Oracle will use the Nippon Steel money to reduce Oracle's $168 million line of credit with an international syndicate of 13 banks. The banks have been growing impatient since Oracle failed to meet its loan covenants in February because of insufficient profits.

The lingering debt situation left one Oracle customer wary about the lasting impact of last week's deal. "They're just moving the debt around and making it more manageable," said the California Oracle user, who did not wish to be identified.

Resignation announced

In another development last week, Oracle announced the resignation of former Chief Financial Officer Jeffrey Walker.

In March, Walker was reassigned to direct Oracle's Applications Division, a group he had started in 1988. "It's a positive thing, from Wall Street's point of view," said Charles Phillips, a senior analyst at Soundview Financial Group, Inc. in Stamford, Conn. "But his resignation is not as important as the fact that he was replaced as CFO." Walker will serve as a consultant to Oracle, the firm said.

Walker's departure came May 31 but was only announced last Tuesday. Oracle has since named George Koch, 44, a longtime associate of Oracle Chief Executive Officer Lawrence Ellison, as senior vice president and director of the Applications Division. Koch, whose banking applications firm, Koch Systems, Inc., became one of Oracle's first value-added resellers in the 1980s, will also serve on Oracle's management committee.

"Even though Koch is an outsider," Ziemba said, "he's got that personal relationship with Ellison that will make him an effective player inside Oracle."

Trendsetter

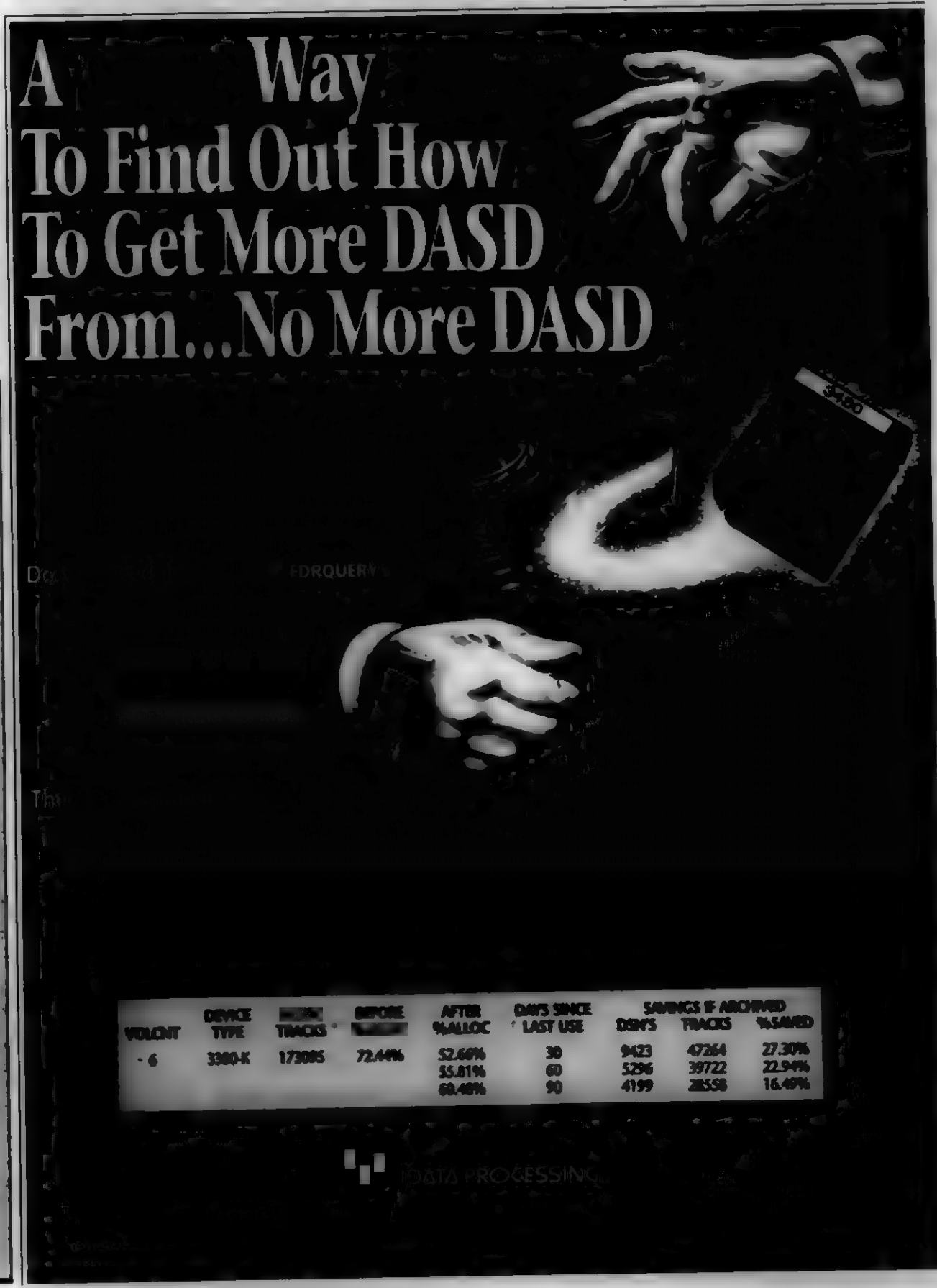
Oracle's deal with Nippon Steel is just the latest example of a growing trend toward Japanese investment in U.S. relational database management system firms.

Tokyo-based Nippon Steel already has a large systems integration business with 3,000 employees in Japan. The firm has the ability to use Oracle products in its turnkey solutions for Japanese customers and to distribute Oracle products throughout Japan, analysts said. Nippon Steel also owns Libretto, Inc., a 1-year-old San Jose, Calif., firm that makes laptop computers.

Last year, Ascii Corp. in Japan bought 5% of Menlo Park, Calif.-based Informix Software, Inc., which has a large share of the Unix RDBMS market. In 1989, Informix had made an investment in Ascii, in part to help Informix distribute software in the Japanese domestic market.

In November 1990, Sumitomo Metal Industries Ltd. in Tokyo joined in a three-way business venture with Unify Corp. in Sacramento, Calif., and Air Co., a Japanese firm that distributes Unify's software in Japan. Air set up a value-added reseller network within Japan that sold applications developed with Unify's Accell/SQL fourth-generation language. Unify also sells an RDBMS engine for use with Unix systems.

JEAN S. BOZMAN



DEC converts to open systems

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Acknowledging that proprietary systems are a bitter pill that users hesitate to swallow, Digital Equipment Corp. last week declared its corporate conversion to open systems, leaving many customers and industry analysts nodding in approval.

"The big thing DEC has to do now is convince people of what they've been doing all along with their strategy to tie together heterogeneous platforms," said Stanley Rose, vice president of technical strategic planning at Bankers Trust Co. in New York.

"They will still have a tough sell in non-DEC environments," Rose added, "but I would tell people to listen to their message and see what they have."

Along with its "Open Advantage" marketing campaign, DEC unveiled 30 networking (see story at right) and software products last week, including a few that run on the Sun Microsystems, Inc. platform and several more that run under MS-DOS, Microsoft Corp.'s Windows 3.0 and Apple Computer, Inc.'s Macintosh.

"I think DEC is working very hard to give us a migration strategy so we don't get caught," said Ken Krallman, manager of information systems at Carleton Technologies, Inc., an aerospace manufacturer in Orchard Park, N.Y. Formerly an all-VMS shop, Carleton is expecting its first Unix-based Decstation 5000 next week.

DEC's Open Advantage campaign will stress a broader definition of openness, meaning a standards-based, plug-and-play network into which any vendor's hardware can be inserted for the best fit with any application.

"In a sense, DEC is moving the debate on open systems to a higher level," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. "Users are more interested in where their applications can run on the network than in which variant of Unix a vendor supports."

Overall, DEC customers seem confident that DEC can deliver on its promises.

> "I THINK DEC is working very hard to give us a migration strategy so we don't get caught."
>
> KEN KRALLMAN
> CARLETON TECHNOLOGIES

"DEC has shown us they are moving as aggressively as they can into open systems while maintaining their installed base," said Ingvar Petursson, vice president and chief information officer at McCaw Cellular Communications, Inc. in Kirkland, Wash.

"We are adopting the philosophy DEC is talking about, and they seem strongly on the path to an open philosophy of interconnecting systems," said Robert Grandle, a systems manager at the National Aeronautics and Space Administration's Langley Research Center in Hampton, Va., which uses a Unix-based network with systems from IBM, DEC, Hewlett-Packard Co. and Sun.

Yet users and analysts agreed that DEC faces daunting business and technological challenges over the next two years.

The VAX line is being re-engineered from a complex one to a reduced instruction set computing-based CPU, and the proprietary VMS operating system is being "opened" with the addition of Posix-compliant industry-standard interfaces.

In the meantime, layoffs are trimming company size from 125,000 to roughly 116,000 by the end of this year, while company executives claimed that people-intensive areas such as services and systems integration will become the key money makers.

"There's not that many people around with all the skills needed for systems and network integration," Krallman noted.

A key issue in DEC's success with this new strategy will be communicating it to thousands of sales representatives in the field, analysts and users said.

"Out in the field, the salespeople are very strong in their conviction that this move to open systems isn't happening," said John Brauckseicker, MIS director at Protein Technologies, a subsidiary of St. Louis-based Ralston Purina Co.

"DEC had better start educating its employees in these new philosophies," Brauckseicker said.

Clear, open advantage

DEC's Open Advantage campaign features a strong networking bent, with several key products and capabilities falling under its Network Applications Support (NAS) program. NAS is a set of programming interfaces, tool kits and software products that allow users to integrate and distribute applications across VMS, Unix, MS-DOS, OS/2, Sun and Apple Macintosh platforms.

Following are highlights of last week's announcements:

- The extension of NAS to provide transaction processing software for MS-DOS and Macintosh desktops and the addition of new capabilities to DEC's Compound Document Architecture for Macintoshes and MS-DOS personal computers.
- Delivery of NAS products for multivendor platforms.
- The intent to extend DEC's Enterprise Management Architecture products into the NAS products, eventually providing "common agent" software that will allow access to various managed resources, such as applications and databases.
- The rollout of multiprotocol routers, available immediately, that support Decnet, Transmission Control Protocol/Internet Protocol and Open Systems Interconnect protocols and a frame-relay interface.
- A shipping date of August 1991 for network adapter cards supporting Fiber Distributed Data Interface's 100M bit/sec. data rates on shielded twisted-pair wiring or DEC's thin-wire copper cabling.
- A joint development and marketing partnership with Bell Atlantic Software Systems for software that ties The Santa Cruz Operation's Unix and AT&T Unix System V Release 3 and 4 into Decnet sites.
- A resale agreement with OSI software maker Retix Corp. that allows DEC to market Retix's X.400 Open Server for linking disparate local-area networking electronic mail systems.
- Plans to beta-test this fall the Network Integration Server 600, which amalgamates bridge, router and X.25 switch functions in one box.

Smithsonian Awards for outstanding technology use

WASHINGTON, D.C. — Ten winners selected from a field of more than 270 entrants will be honored here tonight at the third annual *Computerworld* Smithsonian Awards. The awards recognize outstanding uses of information technology that benefit the general public.



A field of 50 finalists had been chosen in the categories of business, education, manufacturing, environment, finance, government, media, medicine, science and transportation.

Judging was done by experts from government, business and academia in each of the 10 categories. The winners will be included in a permanent exhibit at the Smithsonian Institution.

Previous winners have included Sierra/Misco, Inc., which developed an early flood warning system; LC Technologies, Inc., developer of a computer that allows disabled people to type; and the Jason Project, which beams live underwater exploration pictures into classrooms around the country.

The ceremony will be held at the National Building Museum.

Phase V tweaks Decnet OSI strategy

BY JOANIE M. WEXLER
CW STAFF

MAYNARD, Mass. — In the aftermath of Digital Equipment Corp.'s "open" computing announcement avalanche last week, users were upbeat but not euphoric about the tardy arrival of the company's Decnet Phase V for Ultrix and VAX/VMS.

The Phase V arrival includes an Ultrix version of the communications protocols scheduled for rollout this month, and VAX/VMS/OSI hooks, expected to ship in August.

The VMS product is a precursor to full-blown Phase V for VMS, slated to hit the streets in early 1992.

Decnet Phase V — now renamed "Advantage-Networks" — modifies DEC's Decnet Phase IV suite of proprietary communications protocols by swapping in OSI protocols at the bottom four communications layers of the OSI reference model.

Those layers, or networking tasks, specify standard rules that tell devices how to physically connect and access a medium, what type of cabling to use and how to transfer and route data.

A surprise in the Phase V/Ultrix announcement was the bundling of the widespread Transmission Control Protocol/Internet Protocol (TCP/IP) into the same processor as OSI.

"Companies with a need for open networks have already implemented TCP/IP, and no way are they going to rip those out and put in OSI," said Janet L. Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass.

Not in any big hurry

Users said they have not been wringing their hands waiting for Decnet Phase V, despite the criticism DEC has received for missing its original September 1990 rollout deadline.

They explained that there have not been enough OSI products available from other vendors to fuel the need for OSI interoperability with DEC equipment.

"When you have multivendor networks with thousands of nodes, nothing accommodates them except OSI," said Sholom Bryski, manager of distributed systems and networks at Bankers Trust Co. in New York. However, "Until now, we weren't approaching that situation," he added.

The goal behind the seven-layer OSI model is to provide one universal set of networking rules that allow all vendors' equipment to intercommunicate.

"I haven't been sitting around waiting for OSI, but I will definitely use it," said Ray Parcell, computer operations specialist at Naval Mine Warfare Engineering Activity in Yorktown, Va.

While Parcell's organization is not under Government Open Systems Interconnect Profile (GOSIP) pressure to specify OSI-capable equipment in new procurements — a federal mandate that kicked in last August — he said it is being absorbed by a federal agency on the West Coast that requires GOSIP compliance.

"Phase V will help us because we have a supercomputer procurement in progress, and you don't go talking to supercomputers via Decnet," added David A. Bittenbender, telecommunications chief at the U.S. Environmental Protection Agency in Research Triangle Park, N.C.

As part of the Phase V rollout, DEC announced File Transfer, Access and Management (FTAM) for Decnet/OSI for Ultrix, as well as a gateway to link FTAM and TCP/IP's File Transfer Protocol (FTP).

FTAM and FTP are counterpart application utilities in the OSI and TCP/IP worlds that allow transparent access to files on a network regardless of the particular host operating system or file format.

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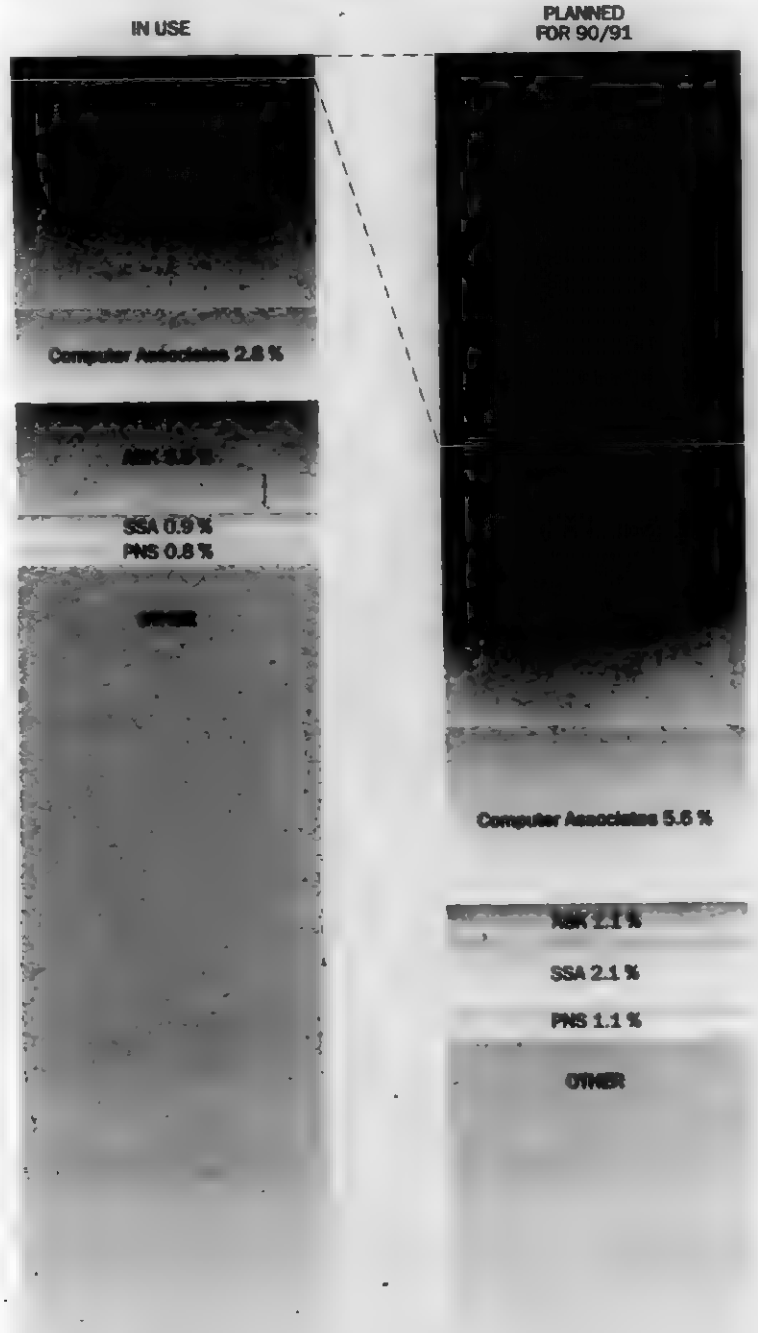
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IBM automates CICS management

BY ELISABETH HORWITT
CW STAFF

RYE, N.Y. — IBM last week introduced automated software designed to take much of the grunt work out of managing and maintaining an enterprise network of IBM CICS.

CICS Automation Option/MVS works with IBM's Netview network management platform on each CICS host to respond automatically to a range of alerts and events across the network and to minimize the need for a human technician at each site, according to IBM staff programmer Evelyn Treuil.

In addition, the system provides the network manager with the ability to control and monitor an enterprise network of multiple CICS regions from a single console, Treuil said.

One of the package's key features is a monitoring component that keeps an eye on the LU6.1 and LU6.2 links that support CICS sessions, according to IBM spokesman Mack Phelps. The monitor attempts to reacquire a session when a link goes down and notifies IBM's Automated Console Operations software if the attempt fails, he added.

The program can also automatically reacquire links that were cut off as the result of a Network Control Program failure, Phelps said.

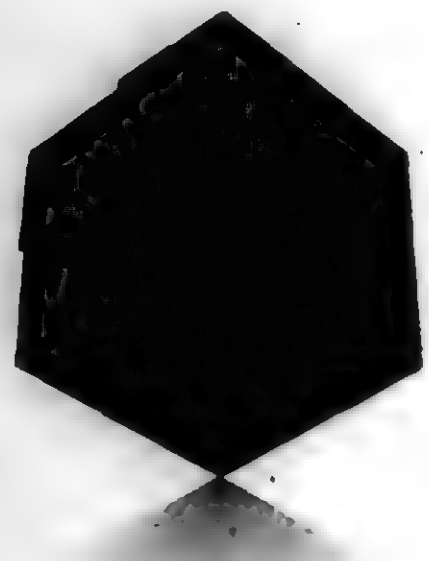
Other key features include the following:

- Operator notification when "abends," or abnormal terminations of programs, within CICS exceed a preset threshold. The software can also be programmed to ignore certain types of failures, such as those resulting from the failure of an individual terminal.
- The ability to monitor and resolve problems with Inter-System Communications and Inter-Region Communications links between CICS..

The new CICS software works with IBM's Automated Network Operations/MVS, an enhanced version of its Solutionpac Netview Automated Network Operations software, which IBM officially released last month. It is said to provide significant performance improvements over IBM's existing Solutionpac software.

CICS Automation Operation/MVS also provides a dynamic, color-coded graphic depiction of the changing status of VTAM network components, IBM said.

Priced at $18,400 for the basic system, the program is available now.



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Microsoft to add security

REDWOOD CITY, Calif. — Microsoft Corp. said last week that it has licensed a data security software package from RSA Data Security, Inc. that will allow personal computer users to encrypt messages to be sent across data networks.

Microsoft Chief Executive Officer Bill Gates said the license will be used to create future PC software products. Eventually, the code will be "pulled" into the Microsoft operating system, he said.

"People's assumptions about physical access [to a data network] and about having a single person control that access no longer apply," Gates said. "In the very large networks of the future, information will come from many sources and from many networks, and you'll have to worry about who's tapped in and who's watching those data packets go by."

RSA's system works by issuing users a public key, or very long number, that is widely distributed around a network and a private key, or a set of two long numbers. The key system allows businesses to verify the identity of any sender of electronic information. Without it, Gates said, "someone else could masquerade as Bill Gates at Microsoft and give out memos purporting to come from me."

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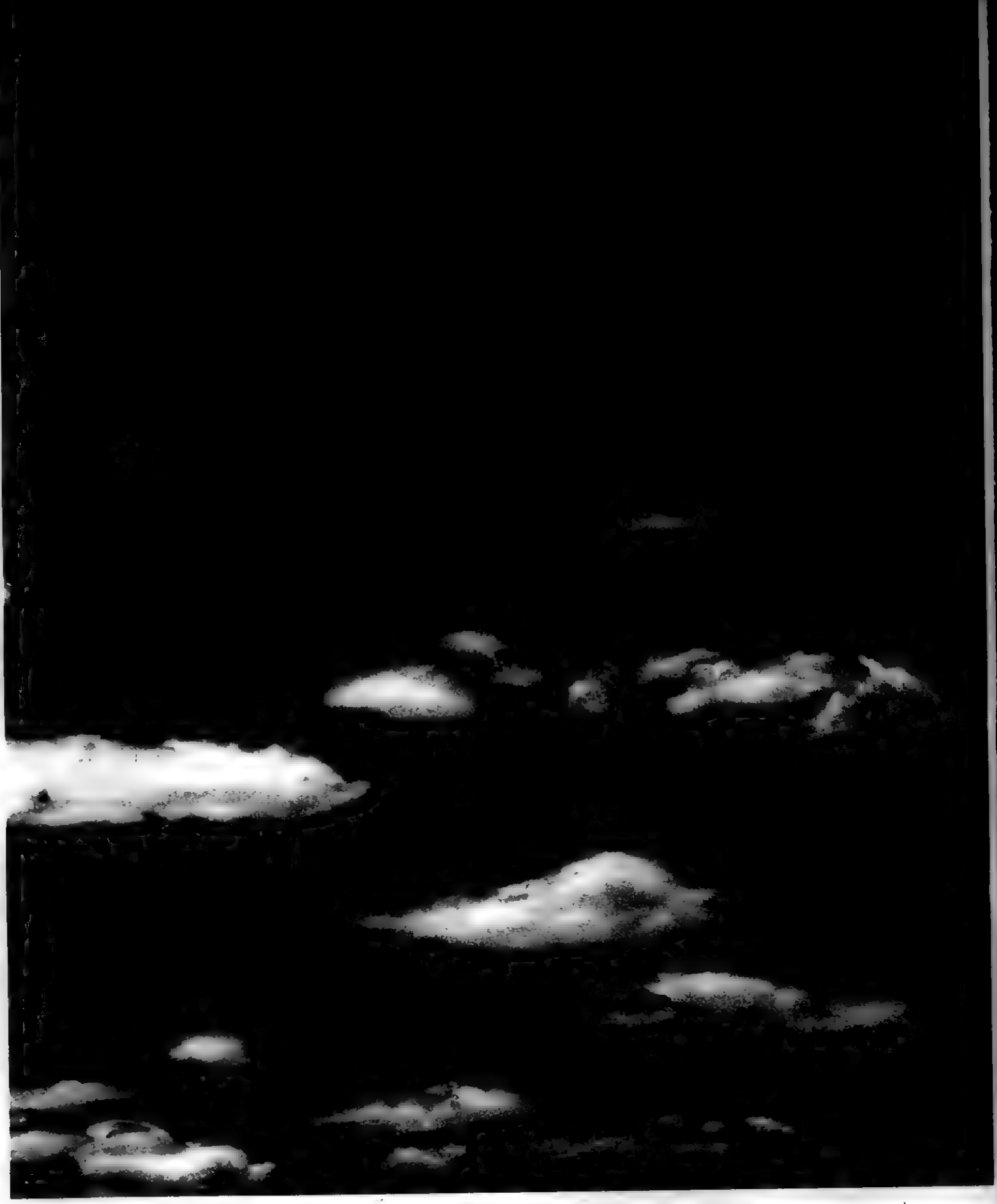
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Lotus faces off with Microsoft

Work-group applications key to one-stop shopping title

BY PATRICIA KEEFE
CW STAFF

BOSTON — Lotus Development Corp. took advantage of its annual meeting to up the ante in its race with Microsoft Corp. to become the one-stop work-group provider to corporate accounts.

Lotus executives told attendees at last week's meeting that it is moving to better exploit graphical interfaces, to ensure similarity of operation between its packages and to incorporate groupware hooks to better tie together those programs through Notes.

Lotus has taken the first step down this path by building a suite of Windows applications that feature identical icons for the same commands. Last week, the firm formally announced 1-2-3 for Windows, which is scheduled to ship this summer at a price of $595.

Lotus also said it would not shut third parties and developers out of its plans. However, certain features, such as Smart Icons — user-definable, user-customizable what-you-see-is-what-you-get buttons for certain functions — will not be made available, a spokeswoman said.

The theme "Working together," which translates to consistency and integration among applications, was carried through presentations by company executives, including Frank King, senior vice president of the Lotus Software Business Group.

Lotus' effort takes its lead from the Windows 3.0 environment, which is supposed to provide a common look and feel across applications. Lotus is expanding on that concept by taking it a level lower into the application. King summed up Lotus' strategy as ensuring consistent appearance (color, fonts, menu bar, screen layout and icons), behavior (print, file open, Help, color, font selection and common user objects) and compatibility.

"User interface consistency beyond the conventions defined by the operating environment will [become] vital as users switch between information types in creating and exploring compound documents," King said, adding that Lotus will re-engineer applications to achieve this.

That approach won early praise from users. "We are judging applications by how well they function within a family of applications and how vendors' applications are internally consistent with one another," said Ronan McGrath, vice president at Canadian National Railways in Montreal.

Also key is that many users do not need more base functionality, said Sheldon Laube, director of technology at Price Waterhouse in New York. They need better integration among packages to ease work-group communication.

For example, by building hooks into Notes and its automatically replicating database, Lotus will enable Laube to simplify and shorten the process by which he sends a worksheet to another user.

In addition, Lotus gave signs that Microsoft Office's bundle of four Windows applications will not go unchallenged. King said that while Lotus was not making any public statements, it is entertaining a variety of licensing requests from users' accounts.

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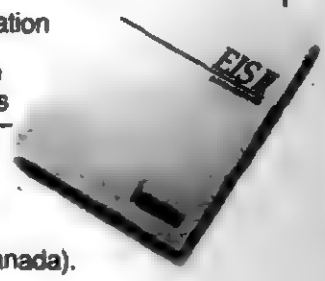
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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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Token Ring card price hacked 50%

BY JOANIE M. WEXLER
CW STAFF

WHITE PLAINS, N.Y. — IBM lashed out at the Ethernet market last week by slashing its 4M bit/sec. Token Ring network adapter card prices by 50%.

Users and analysts said the move will probably spur users whose purchasing decisions hinge on price to choose the Token Ring alternative for medium-size local-area networks that exchange enough traffic to bog down an Ethernet.

The performance of Ethernet can drop even lower than Token Ring's 4M bit/sec. on a heavily loaded network because of the haphazard network access method it uses.

"Token Ring's token-passing access method is immune to that, and Token Rings are easier to manage," said Bill Sheehan, network support specialist at Stone & Webster Engineering Corp. in Boston.

IBM marked down its cards, which attach Micro Channel Architecture and AT bus computers to a 4M bit/sec. Token Ring LAN, to $395 from $700 to $800.

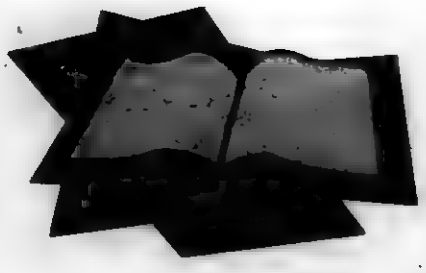
IBM was able to drop prices because "we've refined our processes over the last five or six years and are passing along our savings to our customers," said Bill Spencer, IBM's product planner of LANs. IBM also dropped the price of its 4/16M bit/sec. card from $957 to $895.

IBM competitors Proteon, Inc. and Madge Networks, Inc. have not indicated that a price war is afoot.

"Given the [positive] direction of 4/16M bit/sec. Token Ring, there hasn't been much activity in the 4M area," said Charlie Robbins, director of communications research at Aberdeen Group in Boston. "Dropping the price is a way of giving it a midlife kick."

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IDC Study on UNIX OLTP
UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.



About the TPC
The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

Within the past five months, *every one* of these companies selected and used the INFORMIX-OnLine database server to demonstrate to their customers the power of their latest UNIX systems. No other UNIX database product has been this extensively benchmarked—because nothing shows performance like OnLine.

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In each case, the Transaction Processing Performance Council's rigorous TPC A and TPC B benchmarks—the new standard for comparing system and database performance—were used to highlight OLTP performance and database throughput.

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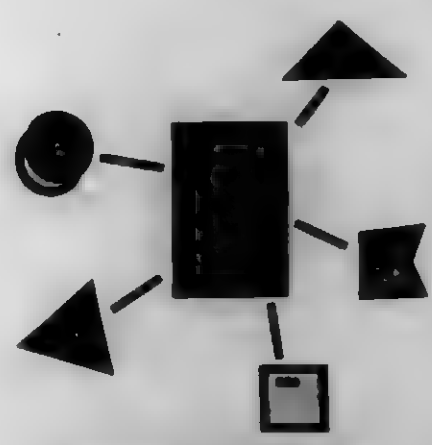
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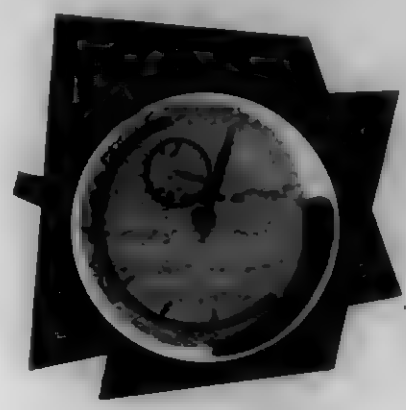
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Gupta on end-user Quest for SQL link

BY JEAN S. BOZMAN
CW STAFF

BURLINGAME, Calif. — Gupta Technologies, Inc. announced an end-user database query tool last week that supports Microsoft Corp.'s Windows 3.0 graphical user interface and allows corporate end users to create their own database reports without information systems help.

The $495 product, called Quest, was designed as a companion to Gupta's SQLwindows query tool for software developers. Quest can be used to obtain data from IBM's DB2 and Oracle Corp.'s Version 6.0 RDBMS as well as Microsoft's SQLserver for OS/2 and IBM's OS/2 Extended Edition Database Manager.

Connectivity software for mainframes and minicomputers could significantly boost the cost of ownership. The Gupta host-based software for IBM's DB2, for example, will cost users $40,000 to $100,000. SQLgateway, another Gupta product required for use with DB2, is priced at $3,500. A similar gateway for Oracle host databases is also priced at $3,500.

Quest can also share data with any Windows 3.0 applications program running Microsoft's Dynamic Data Exchange facility. In this way, Quest could obtain data from DB2 and "paste" it into a Microsoft Excel spreadsheet.

However, system security and database integrity are matters that Gupta will leave up to IS and database administrators. "It is fair to say that Quest is a data access tool and not an information management tool," company founder Umang Gupta said. "We assume that security privileges and data are maintained by somebody at the back end [database server]."

Industry analysts present at the Quest demonstration here were upbeat about the product's capabilities. "With all the competition in the relational database market, they have placed less emphasis on their SQLbase database and more emphasis on their tools," said Donald Feinberg, program director at Gartner Group, Inc.'s Software Management Strategies service in Santa Clara, Calif. At the same time, he said, the market has a relative lack of graphically oriented database tools for end users — something that has slowed general acceptance of local-area network database servers.

However, Quest may have an uphill marketing fight, with some analysts questioning whether Gupta, with only about $15 million in revenue, can have an impact on the vast LAN marketplace.

N.J. agency axes CSC pact

BY JOHANNA AMOROSO
CW STAFF

TRENTON, N.J. — The state of New Jersey said last week that it will cancel the remainder of an insurance services contract with Computer Sciences Corp. (CSC), citing a shrinking amount of business and performance problems.

The contract was scheduled to run until 1993 but will expire as of September 1992. The decision reduces the value of the $228 million contract by approximately $35 million, which a CSC spokesman said "is not material" to the company's financial performance as a whole.

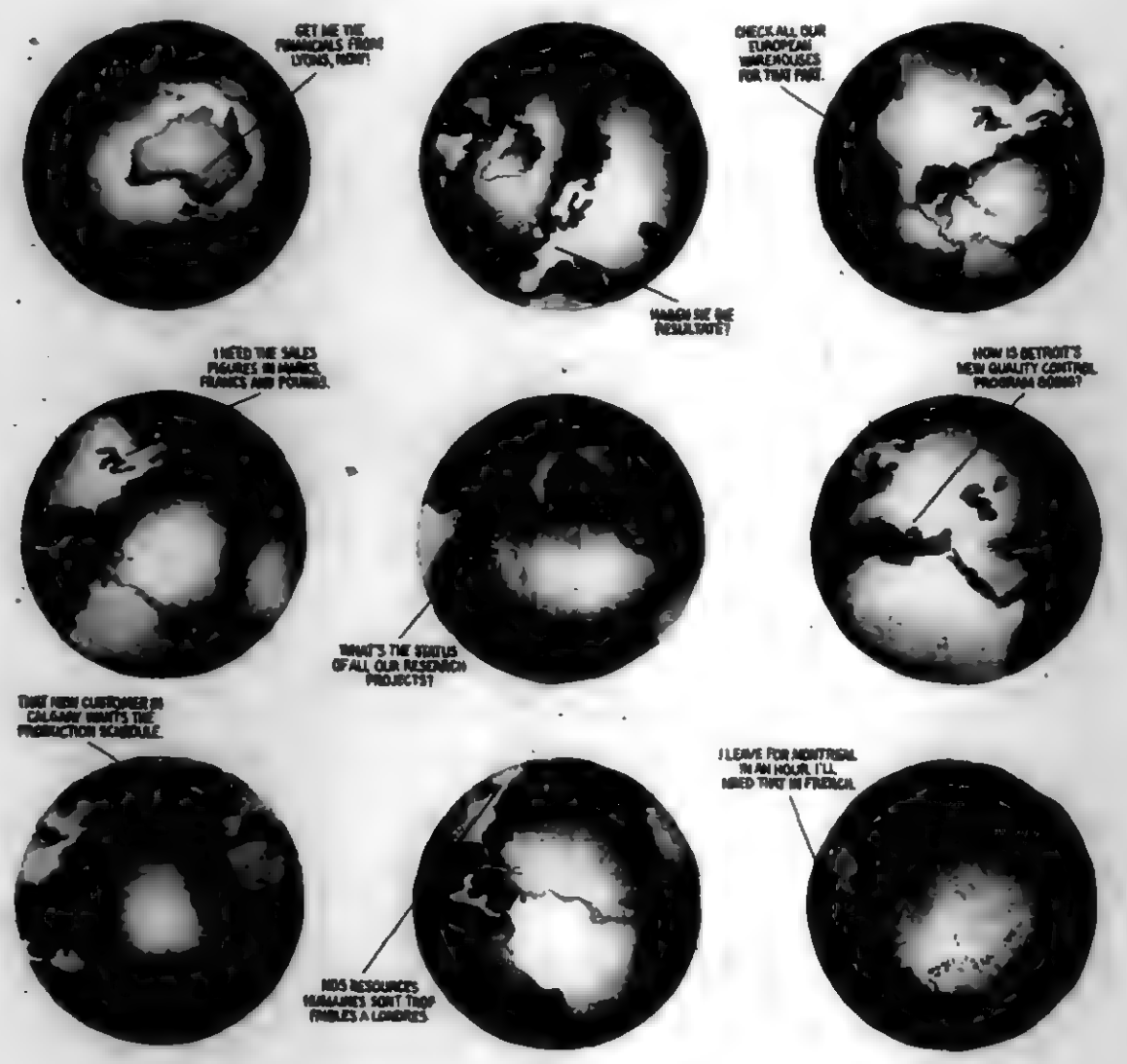
The spokesman said CSC, which is based in El Segundo, Calif., had been notified by letter of the state's decision, which he said did not mention any performance problems. "We disagree with their comments in connection with our performance," the CSC spokesman added.

Under terms of the contract, CSC serviced automobile insurance policies for people unable to buy insurance through regular means. The policies were underwritten by a state-sponsored agency. The other servicers for the contract include Policy Management Systems Corp. in Columbia, S.C.; Amgro, Inc. in Worcester, Mass.; and Warner Insurance in Fairlawn, N.J.

Given a declining number of policies to service, the state chose to cancel CSC's contract because "CSC has never had a passing score" on any of the state-sponsored audits, according to a spokesman for the New Jersey State Insurance Department. Additionally, he said, the company's complaint ratio — the number of complaints vs. vehicles covered — has also been consistently higher than that of the other three service organizations.

The CSC spokesman declined to comment on the state's audit results and said, "I don't know where those numbers came from." He said he did not have any internal CSC statistics that countered the state's results.

CSC is not the only computer company that has had problems with a New Jersey state automobile insurance contract. Back in October 1990, Electronic Data Systems Corp. (EDS) in Dallas started voluntarily withdrawing from an earlier, related contract that will expire later this year, according to an EDS spokesman.



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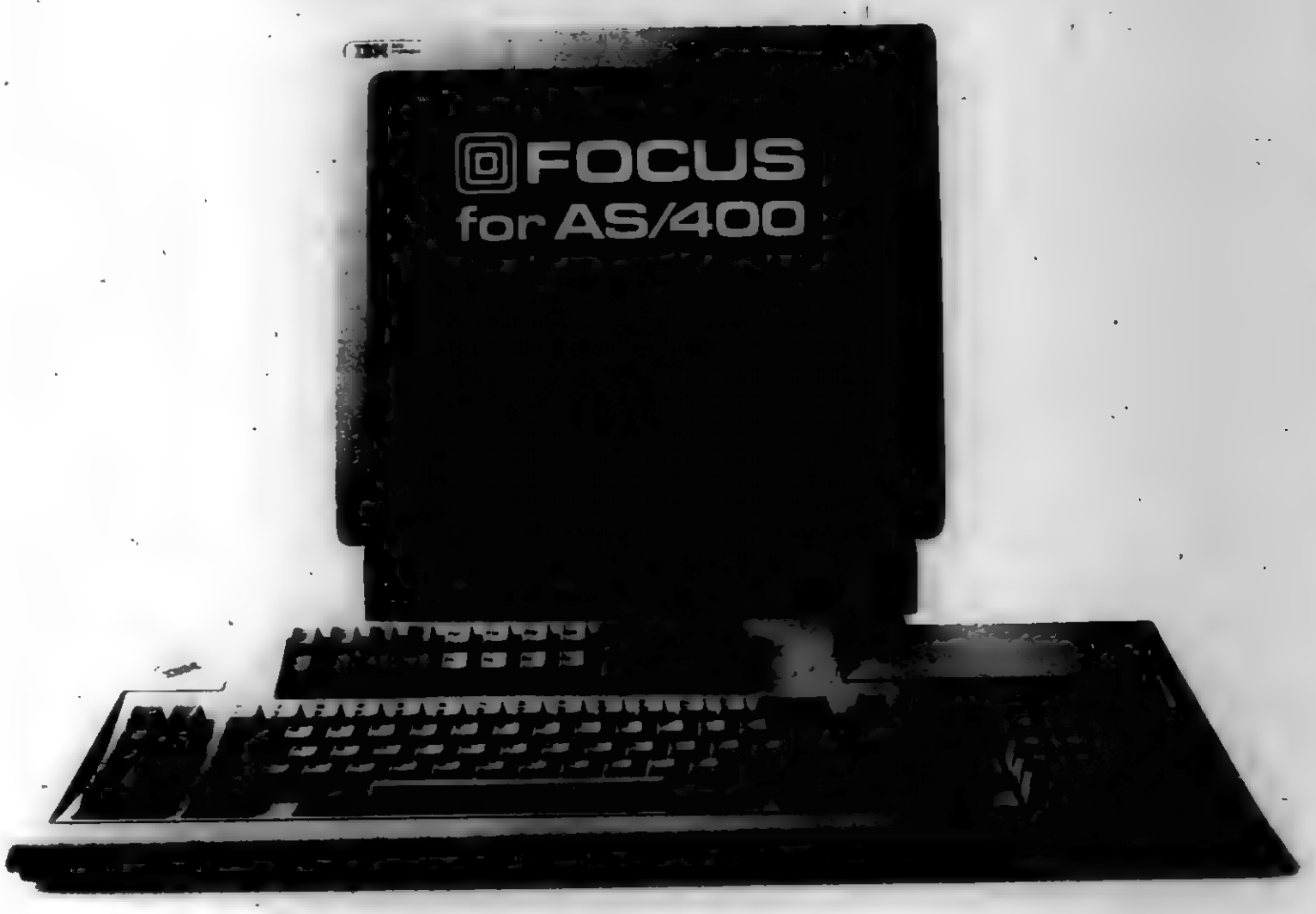
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TECH TALK

Video camera on a chip

■ Scientists at Edinburgh University in Scotland have developed a chip that incorporates all the functions of a video camera. The chip opens up the potential for videophones and electronic surveillance systems, according to VLSI Vision Ltd., a new company formed to negotiate with industrial companies on royalties and joint venture projects.

"The 3mm-sq chip with 100,000 transistors is one example of the patented technology, which opens up a huge potential market in vision telephones, security and road surveillance, vision toys, bar-code readers, aerospace and robotic vision worth an estimated $9.75 million a year in royalties within three years," said VLSI Vision President Roy Warrender. The first prototypes of the chip were completed 18 months ago by six Edinburgh University scientists under the leadership of Peter Denyer and David Renshaw, but because of the commercial significance and the need for comprehensive patents, the device has been kept under wraps until now, the company said. The new chip will allow manufacturers to produce a full-function video camera the size of a wrist watch. It will operate silently and use minimal power. "We're looking at new applications where the low cost of the devices will create new mass markets," Warrender said.

Display tag team effort

■ Toshiba Corp. and IBM Japan Ltd. said recently they have started producing large-size, color LCDs at their recently completed joint venture manufacturing plant in Himeji, Japan. The plant is now making 10.4-in. displays with 640- by 480-pixel resolution and will gradually increase the size of the products, which are expected to become popular in portable computers once their manufacturing volumes rise and prices drop. The joint venture, called Display Technologies, Inc., was announced in November 1989.

Fluid dynamics comes down to earth

Faster, more powerful workstations bring this design tool to everyday manufacturing

BY J. A. SAVAGE
CW STAFF

Computational fluid dynamics, a concept already 250 years old, is starting to show up on graphics-intensive workstations. Color-gradient graphics, representing pressure as computer-generated air or water flows over an object, are slowly beginning to replace expensive and cumbersome wind tunnels. While primarily used in the initial design phases of airplanes, its use is rapidly expanding to such everyday items as automobiles as well as critical devices such as artificial hearts.

Two centuries ago, fluid dynamics was a derivative of the "what goes up must come down" theory, evolving to "what goes into a flow volume must come out." In the 1980s, the math behind the dynamics was done on supercomputers, but as workstations increase in speed and graphics ability, computational fluid dynamics is being brought into the realm of everyday manufacturing. In addition to increased efficiency of computers, software engineers are rewriting fluid dynamics' underlying algorithms to make them simpler yet more powerful.

Fluid dynamics, however, is most often used in the early stages of airplane design. The software can model the flow of air as it passes over such parts as a wing or an engine or across the surface of the entire plane. While engineers still use wind tunnels in the final experimental stages, fluid dynamics can cut down on the time and costs it takes to develop a practical design.

Fluid dynamics has greatly speeded the process of airplane design. Now airplane engineers "want to go from the geometry to a solution in one or two days," said Ed Tinoco, associate technical fellow at Boeing Commercial Airplane Group in Seattle.

The design process still takes "tens to hundreds of hours of computer time," said Thomas Edwards, assistant chief, applied computational fluids branch of the National Aeronautics and Space Administration (NASA) in Moffett Field, Calif. "We can afford to do that; industry can't."



Fluid dynamics *is most often used in the early stages of airplane design to model the flow of air across the plane's surface*

NASA develops computational fluid dynamics code and basically gives it to industry in its raw form. Engineers such as Tinoco develop their own applications from NASA's base.

However, the underlying code for fluid dynamics is not yet reliable enough to eliminate wind tunnel testing, Tinoco said. "[Computational fluid dynamics] is good at giving you lots of information. It's not good at bottom-line numbers like what is the drag of an airplane and what will it feel like to the pilot. You need information on thousands of points on a model and that can take up to 10 hours for each point. At that juncture, it's cheaper and faster to build a wind tunnel," he added.

Within computational fluid dynamics this is a well-known argument between the "experimentalists" and fluid dynamics engineers — who say that wind tunnels are rarely needed. However, in many areas of manufacturing, fluid dynamics can replace wind tunnels. In the near future, computational fluid dynamics will be used to design bicycle helmets and other everyday products.

Bicycle helmet design can use fluid dynamics in several stages instead of manufacturing prototypes by trial and error.

The algorithms can measure and visualize heat loss through the bicyclist's head, help design the helmet aerodynamically so there is less drag and help find the most efficient method of manufacturing the helmet through injection molding, said Philip Raymond, manager of the computational fluid dynamics group at Silicon Graphics, Inc. in Mountain View, Calif.

NASA is using fluid dynamics to help design artificial hearts. "If the disks that open and shut the valves are not designed correctly, they can tear blood cells," Edwards said. The appliances must be designed to allow blood to move through them fast enough to keep from clotting.

While fluid dynamics is promising, some software advances are still needed to make it easily applicable in design. Currently, developing a grid placed around an object that is needed to calculate measurements can take days or weeks.

"For a simple bike helmet, a visor or chin strap can make that process more difficult," Edwards said.

NASA project spins off 3-D sound system

BY MICHAEL ALEXANDER
CW STAFF

Call it virtual reality for the ears.

Crystal River Engineering, a Groveland, Calif.-based company, began marketing a system called Convolvotron that promises to deliver three-dimensional sound reproduction to headphone-wearing personal computer users.

The technology, a spin-off from an advanced research project sponsored by the National Aeronautics and Space Administration (NASA), enables IBM Personal Computer and compatible users to locate up to four independent and simultaneous sound sources in space. Convolvotron manipulates the listener's spatial perception of sound by simulating the acoustic cues the ears ordinarily rely on to gauge distance and direction.

Convolvotron is already being used in research and advanced development projects in a variety of fields, said Scott Fisher, designer of the system and president of Crystal River Engineering. It is used in the development of binaural hearing aids, in virtual reality systems and in devising early detection techniques for Alzheimer's disease, he said.

The 3-D sound system could potentially be used to create radically new home high-fidelity systems as well. Even with today's most advanced stereo headphone systems, the listener perceives that sound emanates from inside or near the head. With Convolvotron, the listener would hear sounds emanating not only from outside the head but also from the front, back, right, left and anywhere in between.

The system also compensates for the listener's movement. For example, a sound that appears to come from behind the listener will seem to come from the front as he turns toward it. A small locator device allows the computer to correct for the movement of the listener's head.

Crystal River Engineering markets the 3-D sound system for $20,000.



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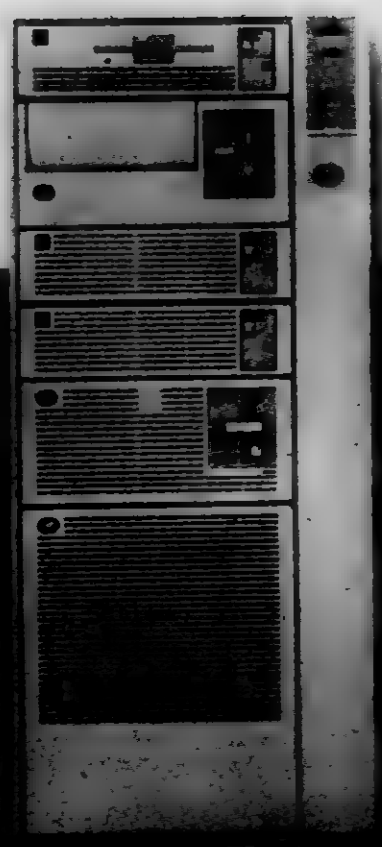
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EDITORIAL

Identity crisis?

There's a peculiar trend at work these days.

DEC has unveiled an aggressive campaign to prove it is not the proprietary company it had always been. Microsoft is trying to cast itself as a kinder, gentler company to shed the vicious competitor image it has had. IBM has resorted to some interesting moves (see below) to show the world it really isn't mired in its own bureaucracy. Lotus is determined to redefine itself as something other than a one-product company. AT&T is willing to recast its computer business in the image of another company altogether.

The list goes on, and in doing so, it begs the question, "Doesn't anyone like themselves anymore?" Or perhaps more appropriately, "*Why* doesn't anyone like themselves anymore?"

Changing one's approach to keep up with or even stay ahead of market dynamics is beneficial to the company and to the customer. What the customer absolutely must determine is whether the change is a cosmetic one designed to appease unhappy users or a fundamental makeover driven primarily by shifting customer preferences.

If you look around these days, you'll see an awful lot of atoning going on for the gross excesses of the 1980s. Debt-laden governments, corporations and individuals today realize just how badly they took their eyes off the ball.

For many computer companies, the burden of the 1990s is the result of taking their eyes off their customers. They got away with it for a while, but the overbearing force of competition now has them scrambling for a share of markets they pooh-poohed in those heady proprietary days of not so long ago.

Case of the blues

And speaking of change, it sure looks as if that was one brilliantly executed "leak" IBM pulled on the big business papers recently, getting them to air at great length the gory details of the message of an unkinder, tougher Chairman John Akers blasting his sales, marketing and product development staffs. The tactic didn't do much to buoy the perception of IBM with the stock jockeys, although it likely sent some shivers through the rank and file at the company.

The tactic, however, is not new. We fished out an interview with Akers, published in *Fortune* magazine more than four years ago. In it, a quality-bent Akers warned his vaunted development laboratories that if customers didn't get the software they wanted, he'd let the marketing people go out and acquire it from outside vendors.

He stayed true to his word, going on a binge and buying into more than a dozen independent software companies a few years ago. Now the embattled chairman is back on the hustings, excoriating those same marketing people. It's almost getting to sound desperate.



LETTERS TO THE EDITOR

No bureacracy

Rep. Don Ritter is right: Manufacturing does matter [CW, May 6]. Manufacturing, mining and agriculture are still the means by which most of our nation's wealth is produced.

On the other hand, Rep. Ritter's seven terms in the U.S. House of Representatives have warped his judgment on how to re-energize private industry. He would have us believe that Congress and the U.S. Department of Defense can select, fund and manage the gestation of complex technological instruments.

However, the record shows that government and the DOD in particular are incapable of picking "high-tech" winners. Like Ada, bubble memory and VHSIC before it, high-definition systems are the wrong technology being promoted the wrong way by the wrong organizations at the wrong time.

Don't let high-definition display technology slip away from U.S. industry — keep Congress and the DOD out of it!

Dave Nelson
Information Engineering
Garmisch-Partenkirchen, Germany

Different thought

Regarding "Sterling announces initiative to focus on development" [CW, May 20], my comments concerning the effort and time it will take Sterling to fully deliver Corporate Applications Management Initiative (CAMI) were taken out of context.

CAMI addresses more of the pieces of IBM's AD/Cycle architecture than any other single vendor. Better yet, all of the products already exist. Sterling's approach allows an organization to implement any of the products in CAMI knowing that full integration is coming.

Sterling does not have to wait for the IBM Repository Manager because it provides its own repository technology, Sterling Integrator, within CAMI. This approach allows an organization to start implementing AD/Cycle today without risking its investment in the future. When the IBM Repository Manager becomes viable, the option will be available to convert because the Sterling Integrator is fully compliant with AD/Cycle and the IBM Repository Manager.

Finally, CAMI provides an open architecture facility where "best in class" tools can be linked to their repository. If Sterling does not satisfy a specific AD/Cycle requirement, a third-party vendor tool can be implemented without losing the integration.

Edward S. Topor
President
Casetek International, Inc.
Lake Bluff, Ill.

Gains a following

Regarding "Sterling announces initiative to focus on development" [CW, May 20], in which I was quoted, I have been very impressed by the strategic initiatives under way at Sterling Software's various systems software divisions, and I have been recommending investment in the company's stock.

I believe Sterling is now offering innovative products that help the data processing professional shift to IBM's vision of dispersed computing without making existing software obsolete.

As this becomes more recognized on Wall Street, I think Sterling could attract a wider following of other analysts.

Robert E. Williams
Investment analyst
The Principal, Inc.
Dallas, Texas

Unnecessary wait

It was very amusing to read the article by James Daly [CW, May 6] about the upcoming version of MS-DOS 5.0.

As usual, Microsoft will bring out its new DOS version with all sorts of hype about how great it is and how the masses will beat down the doors to get at it. I, however, will not be in line June 11. I have beaten Microsoft to the punch. Two months ago, I purchased Digital Research's version of DOS 5.0.

I have all the amenities touted for the new DOS version at my disposal now, including the removal of Qualitas 386MAX from my hard drive.

It also gives me great pleasure to exit into DOS, type MEM and see that I have 616K bytes of memory available without shuffling the system's files. So, good luck to all who will wait until June 11 for MS-DOS, when Digital Research DOS works now.

Walter E. Bialik
Marina, Calif.

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Let's learn to look before we leap

We shouldn't develop wireless networks without checking the health risks

LOUIS SLESIN



At a time when the computer industry is scurrying to calm public fears over VDT radiation, a new source of electromagnetic radiation is being introduced into the electronic office — wireless networks. If computer companies want to gain acceptance for the microwave transmitters that will replace computer cables, they must think hard about the VDT experience and avoid making the same mistakes all over again.

Public safety — and good public relations — demand that the possible health hazards of wireless computer networks be investigated before hundreds of millions of dollars have been invested.

It is still unclear whether VDT radiation contributes to pregnancy problems or to the development of cancer. This is hardly surprising — not a single study has ever been carried out in the U.S. to investigate the effects of VDT radiation. Incredibly, American scientists have been unable to raise a dime to follow up experiments carried out in Sweden, which indicate possible risks to pregnancy. Industry and government officials alike pretend that the Swedish data does not exist.

To its credit, IBM co-sponsored a study with Ontario Hydro in Canada — but, so far, nothing has been initiated for radiation research here in the U.S.

IBM and other companies that market low-emission terminals have never acknowledged that VDT radiation might present a health risk. Instead, they say they are responding to consumer demand for shielded VDTs. A lingering distrust of electromagnetic radiation remains — especially among those using one of the more than 50 million unshielded terminals.

Bigger unknowns

VDT radiation is an unintentional by-product of the deflection coils that move the electron beam in a CRT. Wireless networks, on the other hand, entail intentional sources of microwave radiation. NCR's Waveland system operates at 900 MHz. Motorola's Altair system (part of its new Wireless Inbuilding Network) uses 18,000-MHz radiation, while Apple is planning to use 1,850 to 1,990 MHz for its Data Personal Communication Services.

Each of the microwave frequencies may be associated with similar, or possibly unique, health impacts. Microwave radiation is different from the extremely low frequency (ELF) and very low frequency fields emitted by VDTs. To be sure, wireless technology uses very low power signals to transmit information but, just as with VDT radiation, no one knows where the thresholds for ill effects lie. Nor are we likely to find out with the current level of research effort.



M.F. Cohen

A working group of the Institute of Electrical and Electronics Engineers is delving into the health issues related to wireless LANs, while developing an industry standard, but reliable risk assessments must be based on experimental data. Good intentions cannot make up for the absence of long-term exposure studies.

To support its contention that wireless radiation is benign, the computer industry is citing the American National Standard C95.1 microwave exposure limits. There is no doubt that the systems will conform to this 1982 standard and the proposed revision expected soon, but that is hardly reassuring. The standard is based only on short-term heating effects and not on possible long-term, low-level effects, such as cancer. Indeed, the Environmental Protection Agency has consistently refused to endorse it.

There can be a huge difference in the threshold for ill effects associated with short and long-term health risks. For instance, a number of epidemiological studies point to a cancer risk among children and workers chronically exposed to ELF radiation more than 1/1,000 times lower than the guidelines adopted by the International Radiation Protection Association in 1989, which are based on short-term effects.

Not long ago, experts scoffed at the possibility that ELF radiation could be dangerous at such low levels. But it is precisely this concern that started the rush to market low-radiation VDTs. What is considered low today may be too high tomorrow.

Anticipate questions

Some executives say that the public has reacted hysterically to the VDT radiation threat. Even if this is true, it means that people may one day overreact to the radiation threat from wireless computing. The only way to prevent a repetition of the VDT mess is for the computer industry to sponsor studies to answer some basic questions about radiation risks.

The controversy over microwave radiation health effects has been simmering for 25 years and is far from settled. ELF radiation risks were also on the back burner until a couple of key studies made the ELF/cancer connection a national issue. The public is notoriously fickle in its assessment of risks, and the microwave dispute could become front page news overnight. The time to find out about possible wireless radiation hazards is now.

Slesin is the editor and publisher of New York-based "Microwave News" and "VDT News."

The job description never said a thing about running a data center

DENNIS E. NOONAN



Like many professional personal computer users, I am getting fed up with the overhead involved with having a data center on my desk.

Here I am, sitting in front of a 386SX/20, with a full-color IBM Video Graphics Array screen, a 110M-byte hard disk, a modem, a mouse and 6M bytes of extended (or is it expanded?) memory. Boy, am I automated!

I have more technology on my desk than I could have possibly imagined even two years ago. I have an Ethernet connection to the mainframe and the local-area network. I can call up any node in the known universe. I don't miss a single electronic mail broadcast. And every memo I send out is scrupulously spell-checked.

But sometimes I just have to stop and wonder what, in good grief, I am doing with all this iron and wire when most of the useful software I use demands access to 512K bytes of my 640K-byte random-access memory.

My desktop data center keeps choking up because I can't free up the 200-odd K of RAM that's being held prisoner by a memory-hungry menu manager. When I complain to my friendly help desk techie, he tells me to check the device allocations in my CONFIG.SYS file. Thanks, pal, that's a lot of help. I don't even want to know what a CONFIG.SYS file is. What the heck does such a thing have to do with my job?

Detours and diversions

How are computer users supposed to be productive when every time we need a document, we must run down the hall to the laser printer to load paper or worse, change toner cartridges? And why is it that when I need information from the customer database on the VAX, I have to invoke something called Smarterm to make my expensive data center act like a cheap dumb terminal?

I think this whole process is pretty silly, but who am I to question leading-edge technology?

Techie friends advise me to write macros or to learn some programming. They also say I should upgrade to Windows and stop sniveling. A graphical user interface is just the ticket for worker weenies like me, they say.

But I don't need icons; I need intuitive information tools. I don't need protocols, or whatever you call them, to control my activities. I want enabling tools that allow me to energize and redefine my work. I don't need a bookshelf full of software that doesn't work together.

I have work to do. I don't want to spend half my morning doing disk backups or checking the CONFIG.SYS file or formatting floppy disks. Furthermore, I'm sick of having to read a dozen screens of READ.ME and insert 30 pages of errata notes in the manual every time I get a new software product.

It always seems that if I need data in a hurry, something will go wrong — the printer will be down for maintenance, the network will be "not responding" and there won't be a spare formatted disk handy. I never remember to check whether I'm printing in landscape or portrait and it always takes a few tries before I get the exact "look" I want.

> IT ALWAYS SEEMS that if I need data in a hurry, something will go wrong — the printer will be down for maintenance, the network will be "not responding" and there won't be a spare formatted disk handy.

It seems to me that the real obstacles to productivity are mundane chores and annoyances that seem to multiply as PC power increases.

We have been brainwashed to accept that complex machines will periodically fail and possibly wipe out a day's work (oops, sorry); that software doesn't have to be perfect (tell us exactly how and where you found the bugs and we may fix them next time); and that documentation doesn't have to be understandable (hit CTRL-C six times to escape, then warm start and check the CONFIG.SYS file for device allocations).

Willing down

But designer techies don't listen to users. If they did, they might hear that the real power of machines like the Apple Macintosh is not the emphasis on the graphical, but the emphasis on ease of use. These machines hide the CONFIG.SYS file and they don't make you feel like a failed data center manager.

As for me, you can take my data center back and give it to somebody who wants to write macros. I need to get some work done.

Until recently, Noonan managed an end-user group at a Cambridge, Mass., software company.

Bethlehem Steel forges its DB2 administration with BMC Software.

Bethlehem Steel, one of the nation's leading steel producers, strives to improve productivity in an increasingly competitive market. When Bethlehem Steel started using DB2, they immediately began looking for DB2 administration tools.

For nine years Bethlehem Steel has relied on BMC Software for their IMS database and data communication needs. But to determine the best source for their DB2 needs, they developed a comprehensive evaluation process designed to stress DB2 products to their limits. Few of the products could handle the heat.

While other vendors made promises for increased function, only BMC Software delivered comprehensive capabilities in MASTERMIND for DB2. With BMC, advanced features were already available.

Program manager Nancy Friedel explained, "The sophistication with which ALTER for DB2 was able to make multiple changes at one time and generate the worklist in the sequence of the proper creation of objects was far advanced compared to the other products we looked at."

The time savings led technical analyst Mike Best to say that the return-on-investment has been tremendous.

The other [illegible] capabilities for Bethlehem Steel.

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BMC SOFTWARE



COMMENTARY

Rosemary Hamilton

An IBM world view



While reporting on IBM's software business recently, we interviewed some IBM executives and had the chance to ask them about some nagging industry perceptions.

At times, executives took a question head-on and answered frankly. However, at other times, they offered their own perceptions, with which some people would disagree. In any case, it provided us with a good sense of how IBM sees the world. Following are some snapshots of these exchanges:

Perception: IBM's major software initiatives, such as AD/Cycle, are too mainframe-oriented. Some say the architectures are just another way to sell mainframes.

Response: "Well, this is a damned if you do, damned if you don't situation," said Robert Libutti, director of market strategy for IBM's Programming Systems Division. "The fact is, our customers have large mainframes. The fact is, that's where their problems are . . . So, [it's a question of] what do you do first, and we think we are doing those [things]. You've got to do the others in a real hurry. It's a question of timing."

When asked if he believed IBM was moving fast enough, Libutti said, "No, I wish we could go faster. We have made decisions, for example, in architecting some pieces of AD/Cycle by bringing our business partners in. In one way, that slowed us down, but then it will put us light years ahead in terms of getting the full function out there."

Perception: IBM should be saying more now about how these architectures will accommodate other platforms.

Response: "We try to talk about a two-year horizon because otherwise you get a bit into la-la land," Libutti said. "You start painting pictures on things you haven't done the technical work on, and you're creating visions."

Perception: IBM can not transfer the dominance it has in large systems to the desktop market.

Continued on page 32

Early testing a must for big systems

When software systems involve millions of lines of code, testing shouldn't be an afterthought

BY ELLIS BOOKER
CW STAFF

CHICAGO — It can test the mettle of even the most quality-conscious developer: a software package with a half-dozen integrated subsystems totaling perhaps several million lines of computer code.

However, automated environments able to analyse such complicated applications — ones that ensure that the millions of pieces fit together smoothly — may not be the answer, according to experts in the field. Those experts say the way they avoid big problems is to address the testing issue — either through tools or procedures — in the initial phase of a software project, rather than leave it as an afterthought.

Users may find more need for taking such precautions and for testing products as applications grow larger through the integration of numerous modules.

Test tips

"We believe these tools are not anything more than power tools," said Wayne Smith, regional vice president at Computer Power Group, Inc. in Oak Brook, Ill.

Smith's firm has been in the software testing business for 15 years, handling jobs that typically involve software with a minimum of 1 million lines of code.

Waiting until software is built to begin testing is asking for trouble, said Smith, who notes that the cost of fixing a flaw increases exponentially as the life cycle increases. "It can be 300 times as expensive to fix a bug in the integration phase than if it is caught in the requirements phase," he said.

One of Computer Power's products is a system to track the various stages of a quality test, which Smith argues can overwhelm users or developers familiar with techniques appropriate for checking the integrity of a program with only several hundred thousand lines.



At the simplest level, such audit procedures are vital, considering the accepted rule of thumb that for every 20 defects corrected, one defect is introduced.

"To integrate and test 5 million lines of code is an order of magnitude more difficult than [doing this on] a stand-alone system," agrees Carleton F. Kilmer, managing partner for aerospace and defense at Chicago-based Andersen Consulting.

Kilmer is referring to Andersen's Mac-Pac/D family of manufacturing management systems for the defense and aerospace industry. Nine months ago, Kilmer explained, Andersen began a major initiative to strengthen the testing component of Mac-Pac/D. A substantial part of the $48 million Andersen will spend this year on Mac-Pac/D will be allocated for the test engine work. He is quick to point out, however, that this is "virgin territory," that few companies have developed such a state-of-the-art test engine.

A more fundamental issue may be the development of industrywide, standard approaches to software testing.

Although the nuclear industry and the National Aeronautics and Space Administration have gone the furthest toward establishing software quality-testing methodologies, according to observers, the commercial marketplace has lagged behind.

On the other hand, developers and some end users of commercial software systems have begun using a common suite of testing tools, according to Beth Layman, research director at the Quality Assurance Institute in Orlando, Fla.

Among these tools are "capture/playback" systems that allow the user to enter test data and describe expected results and have the tool check to see if the expected result matches the actual result. Comparison tools, which compare code and data files, are common, as are code analysis tools, which report on the complexity of a given piece of software coding.

However, subjecting software to conditions as close as possible to the real world is always an essential step, said Jim Straw, district manager of 4ESS technology at AT&T.

The 4ESS, the digital switching system at the heart of AT&T's long-distance telecommunications network, is a complex hardware and software environment — first created in 1976 — comprising 115 switches and software, that has grown to contain millions of instructions and thousands of features.

"We want to simulate the real AT&T network . . . but we don't want to test [hardware and software] in the real network," Straw explained.

The AT&T approach

AT&T's solution is the ITN, for integrated test network, a microcosm of the real AT&T telecommunications system, complete with several switching, database and signaling systems but totally separate from the "real" network that carries customer traffic.

Hardware and software is exposed to ITN after earlier tests in the laboratories of Bell Laboratories, AT&T's research and development arm.

But the ITN is not perfect.

One software patch that got through the test bed last year caused the worst network disruption in AT&T's history.

The Martin Luther King Day outage, which disrupted phone service to millions of AT&T customers last January, can be used as a model of how difficult it is to eradicate bugs from enormous and complex systems.

That bug, in fact, lay dormant for nearly a month before a set of four or five events occurred in succession and caused it to activate, bringing the AT&T network crashing down.

MSA users hold last Interact meeting

Customers of the former MSA and M&D will gather next year in Atlanta

BY SALLY CUSACK
CW STAFF

ANAHEIM, Calif. — An era ended last month when 3,500 former Management Science America, Inc. software customers gathered for their last official Interact user group meeting. The company was merged with McCormack & Dodge Corp. to become Dun & Bradstreet Software in March 1990.

Michelle Pihos, chairwoman of the Interact user committee, said that next year's conference will see the merger of customers from both companies. The meeting will be held in Atlanta sometime in April.

"We don't have a name for it yet — we are just calling it User Week," Pihos said. The combined user groups will create a 10,000-member organization.

Concerns about neglect

According to Pihos, users attending this year's conference needed to get a "warm and fuzzy feeling" that neither side of the product house was, or would be, neglected in terms of support and development.

"We had a chance to talk to D&B Software's management team and hear them address issues," she said. "I am confident that they got our message."

Since the merger, some product enhancements have been neglected, and users wanted reassurance that the situation would be remedied, Pihos said. She mentioned an expert management reporting feature of the E-Series General Ledger as an example of an enhancement delay.

Next year's user group attendees will expect to see more development in the promised client/server area, Pihos said.

John Landry, executive vice president at D&B Software, addressed the client/server issues, saying that migration would progress in an incremental, step-by-step process for both E- and M-Series clients.

He also said that some components of this technology would be available by the end of 1991.

In a speech to users, Landry was reported to have said that he did not believe the "traditional competition can afford to make this change quickly. All of our development employees are being extensively trained in the key technological building blocks of client/server."

"They have an enormous project ahead of them," said Clare Gillan, manager of application solutions at International Data Corp., a Framingham, Mass.-based market research firm. "I expect their competition will try to take advantage of this transition period."

In addition to traditional competitors such as Computer Associates International, Inc., Gillan said that D&B Software will be feeling pressure from new sources, such as Sap America, Inc. in the manufacturing sector and Ross Systems in the Digital Equipment Corp. user arena.

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A wave of a wand tracks buying habits

ON SITE

BY CAROL HILDEBRAND
CW STAFF

Picking up a few groceries seems like a mere chore, not enough to be important. But he who buys a box of Cheerios as opposed to the Rice Krispies right down the aisle is closely followed by manufacturers — the knowledge can save them advertising money and rake in extra sales.

NPD/Nielson, Inc., a member of A. C. Nielson Co. family of companies, has evolved from using a handwritten diary method of collecting data from survey households to capturing data using customized technology that not only eliminates data entry costs but also improves data accuracy.

Headquartered in Port Washington, N.Y., NPD/Nielson has a stable of 15,000 households nationwide recruited on the basis of demographic characteristics such as income, education and age. "We're looking for a representative group of households for the U.S.," said Mike Oak, vice president of information services at the company. "These homes are used as projections of what the U.S. is doing."

Recruited households carefully track their shopping habits. Each time they submit information to the company, they are rewarded on a point system. They can trade in the points for various types of gifts. Long-standing survey members gain special status, such as gold or platinum standings, and are allotted extra points.

Survey households are equipped with a bar-code reader, or what Oak calls a wand, that has been customized for this use. As a purchase comes out of the bag, the shopper scans the bar code with the wand.

The wand is preprogrammed with pricing from stores that participate in Nielson's "Scantrack" program. It is then a matter of entering the number of units bought. If that box of cereal came from a non-Nielson store, the lack of preprogrammed numbers will cause the wand to prompt for prices. It will also ask whether or not the buyer used a coupon, or whether the item came from a special promotional display, Oak said.

Once the information has been input, it is transferred via modem to a personal computer-based front end, and from there to two Hewlett-Packard Co. Series 3000 980 minicomputers with nearly 100G bytes of memory, Oak said. Analyzing the information yields such information as what outlet a manufacturer's products are moving through and how different demographic groups react to particular discounting and pricing policies.



This bar-code reader *helps NPD/Nielson organize data based on consumers' shopping habits*

Trial and error

Oak said that NPD/Nielson went through several testing stages before moving away from paper-based data collection and onto the system it is currently using. "We tested the major markets first — New York, Chicago and Los Angeles — before we launched the full panel about three years ago," Oak said. "These devices are not cheap for the amount of them we're talking about." He added that NPD/Nielson presently uses wands from both Handheld Products, Inc. in Charlotte, N.C., and Telxon Corp. in Akron, Ohio.

Expensive or not, the wands have allowed NPD/Nielson to expand the amount and type of data it captures. "In the past, we just collected data on 20 or so product categories," Oak said. "This allows us to have data on just about everything that's bar-coded."

Another plus is the fact that collecting the data from a household rather than from the point of purchase allows the company to more accurately track a consumer's spending habits. "We're not tied to a particular store," Oak said. "Because the source of data capture is in the house, we can capture all outlets, from warehouse stores and regular supermarkets to mom-and-pop operations."

Having the household members scan in the data has cut data entry expenses as well, Oak noted. "Basically, we don't have a data entry staff — our data entry staff is at the households out there." He estimated that if his current survey sample were using paper diaries, he would need approximately 100 people to input and edit the data.

The success of this program has prompted the company to begin expanding the number of surveyed households from 15,000 to 40,000 over the next several years.

At the same time, NPD/Nielson plans to phase out both its paper diary-based and store-based collection efforts.

Tandem system lightens trucker's load

BY JEAN S. BOZMAN
CW STAFF

PORTLAND, Ore. — Consolidated Freightways, Inc. wanted to throw away all the paper that was piling up at its 1,000 trucking depots nationwide — 50 million documents per year.

Those paper piles should stop growing now that CF has become the first user of Tandem Computers, Inc.'s new image-processing system, a combination of Tandem products that were integrated over the last four years to meet CF's specifications.

The enterprisewide imaging system, which cost nearly $10 million — including hardware, software, consulting and installation fees — was officially put into production in mid-May. It will translate all of those paper bills of lading and delivery notices into digitised images that can be stored on hard disk drives and optical discs at CF's data center here, according to spokesmen for the Menlo Park, Calif., company.

The CF system is built on Tandem's Tandem Image Processing System (TIMS), which was officially announced for general use in April.

TIMS, developed by Tandem software engineers in conjunction with CF's information systems planners, was originally designed in response to the trucking firm's request for proposal, issued in late 1987. Scanned images of the trucking receipts generated throughout CF's enterprise will be forwarded to Portland for storage and for retrieval by more than 6,000 customers nationwide.

No central site

"We were well aware that optical storage offered us a suitable alternative to solve this massive paper problem," said Phillip Seeley, CF's vice president of MIS. "The problem was that the optical storage systems then available were largely for centralised processing. We wanted a wide-area network solution, because we didn't want to move all that paper into a central site to archive it."

The technical solution to CF's distributed archiving requirements involves several Tandem VLX systems, based here, and 48 Tandem CLX midrange processors, running at 48 scanning centers scattered throughout the U.S. Each Tandem CLX has a 300M-byte storage capacity, allowing it to collect thousands of scanned documents before sending them to the Tandem machine in Portland over CF's T1 backbone network, Seeley said.

Special imaging workstations — IBM-compatible personal computers outfitted with special image-recognition "cards" — handle data compression and identify bar-coded labels to create indexed files. The index resides on a Tandem Nonstop SQL relational database in Portland and directs users to images on disk drives or optical drives.

There are 100 people assigned to the scanning process, working in two shifts nationwide to make sure that documents are digitised within hours of their creation on paper, Seeley said. As of last week, 190,000 documents were being scanned and digitised each day and then sent on to the central computer room.

Once here, the digitised documents are recorded both on Tandem disk drives and on Tandem-label Hitachi Ltd. optical disc drives, which house 12-in. optical platters. Each double-sided optical platter has 2.6G bytes of capacity. The documents can then be accessed on-line, via disk drives or off-line by accessing the correct optical disc.

IBM connections

CF's system accommodates the use of IBM 3270 terminals at 6,000 customer sites, all of which are tied to CF's IBM mainframe here.

"If a customer calls up asking for proof of delivery, they key into the IBM mainframe, which then routes the request to the Tandem [VLX] machines via IBM's LU6.2 protocol," Seeley said.

Once requested, the digitised documents, which are stored with standard fax protocols, are sent to the customer via standard fax machines.

Tandem plans to offer specialised consulting help to other users who plan to install TIMS, said Jeri Edwards, manager of imaging strategy at Tandem's Cupertino, Calif., headquarters.

JCL tools assist users with changing needs

BY JOHANNA AMBROSIO
CW STAFF

A new duo of tools is now helping users whose shops are undergoing conversions, consolidations or other kinds of changes.

The software, called JCL/Convert from MB Solutions, Inc. in Denver, searches through job control language (JCL) statements and finds all references to names of files, programs, jobs and procedures. Once all of these are cross-referenced, users can change all of the names by issuing global commands.

Steven Smuts said he used the tools when he was a systems programmer at the Texas State Comptroller's Office in Austin. Smuts is now a senior programmer/analyst at the Texas Guarantee Student Loan Corp., also in Austin.

"We had a massive JCL project where we had to change data set names to conform to newly written standards," he said. "The problem was that everyone had their own naming conventions, so we standardized."

Time savings involved

Smuts said the project involved 1,500 production JCL members and approximately 650 catalog procedures. "Doing all this manually would have taken time we did not have," he said JCL/Convert saved "at least" 200 hours of work, he added.

Bob Grant, an applications toolsmith at Security Life in Denver, said he uses JCL/Convert to "maintain a cross-reference of where files and programs are within JCL. We use it for impact analysis during maintenance to see what jobs would be affected by a change."

Grant said that JCL/Convert is "real thorough" and searches through places that some competitive products do not. "In general, I've been very happy."

Other users, MB Solutions said, have used JCL/Convert to standardise naming conventions when two or more data centers consolidate.

JCL/Convert is a repackaging of two existing MB Solutions products, JCL/Cross-Reference and PDS/Manager. It is priced at $11,000 — a savings of 10% over the price of the two products purchased separately.

Transaction rate, cost linked in tests

Transaction Processing Performance Council releases first benchmarks

BY J. A. SAVAGE
CW STAFF

The 3-year-old Transaction Processing Performance Council recently found that Sequent Computer Systems, Inc.'s Symmetry 2000/200 was the most cost-effective of 48 systems tested in recent benchmarks.

In its first published results of tests in which transaction performance and system cost were related, the coalition of 42 vendors also found that AT&T's Starserver E with Informix Software, Inc.'s Online 4.0 came up with a lower cost per transaction than did 22 other systems tested in a database-oriented test — $2,670 per transaction.

In a test of a single, simple update-intensive transaction, a Sequent machine running Informix Online 4.0 tested at nearly 50 trans./sec. on a local-area network at a cost of $14,950 per transaction.

In contrast, Unisys Corp.'s A16-61E running Data Management System II was clocked at 272.5 trans./sec. at a cost of $43,190 each.

The council was organized in 1988 with eight original vendors, including Tandem Computers, Inc. and Pyramid Technology Corp.

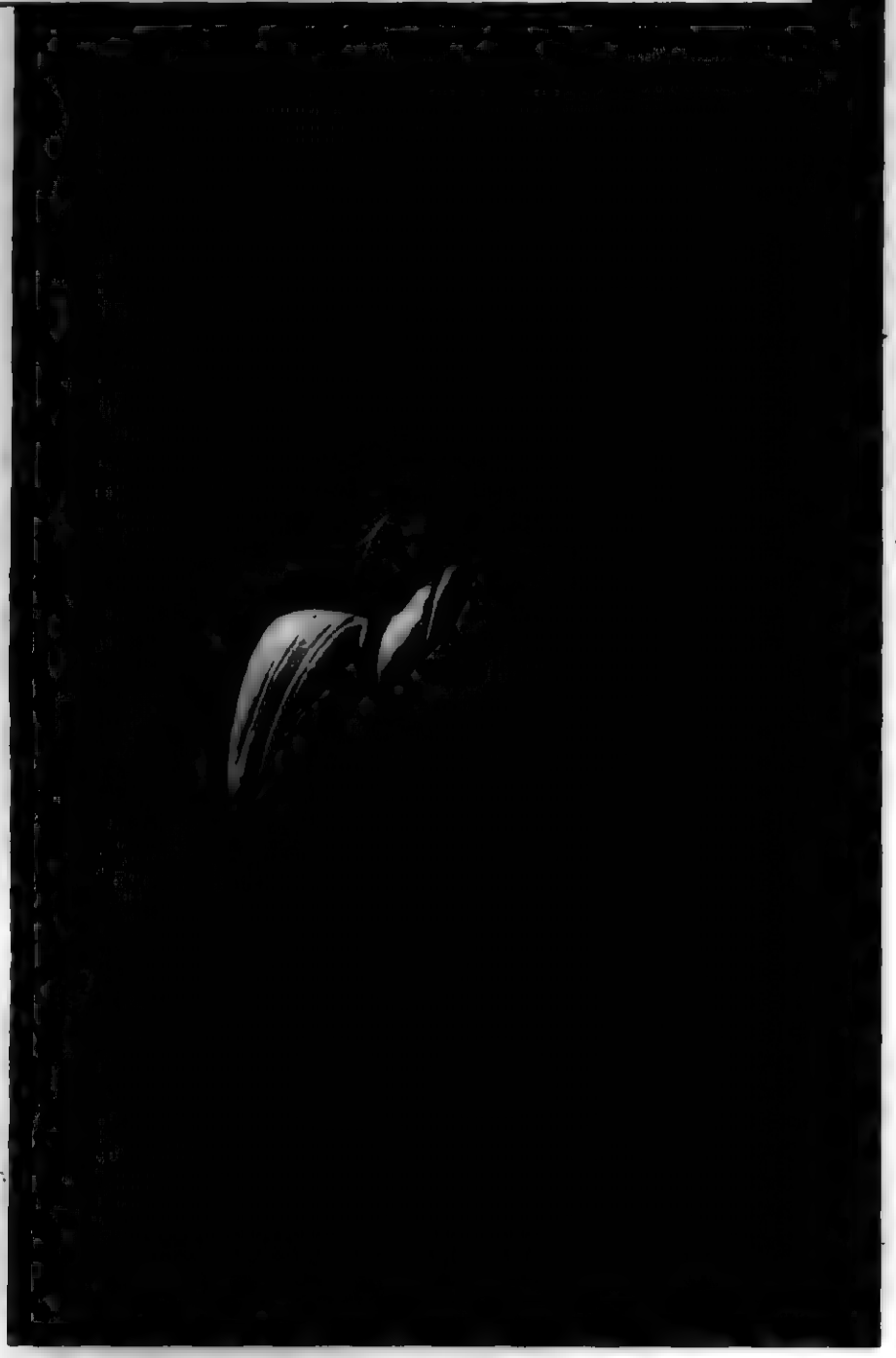
System-independent

It has taken the group several years to publish its first results because each benchmark had to be built for a system that followed the council's specifications; that way, each benchmark was operating system-independent, a spokesman said.

In addition, it cost a vendor "tens of thousands of dollars and a couple man-months to run it" as well as to finish the documentation, according to the spokesman.

In future benchmarks, the council plans to address real-time complex data management and business service applications.

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Hamilton

FROM PAGE 27

Response: "When you start looking at individual packages — graphics, spreadsheets — those things for the moment are really secondary in terms of where we would make our investment as opposed to building the workstation infrastructure," said Richard Goldberg, IBM assistant general manager of software marketing.

"It depends on how you answer it, OK? We haven't built a spreadsheet; that's fair," Goldberg added.

Perception: Systems Application Architecture (SAA) is still more concept than reality.

Response: "This is a half-empty, half-full issue," Libutti said. "SAA has made enormous strides. Now we are managing ourselves to those disciplines. We can have a lot of debate on that statement. As you get to the next level of integration with AD/Cycle and Officevision, clearly there's a lot more work *to* be done. We have started down the path and we are adding to it."

Perception: The products within SAAs are not being delivered fast enough.

Response: "I think at the architectural level, there are lots of good examples of customers moving into SAA, and it will accelerate," Goldberg said. "We are moving in an accelerated fashion."

Perception: The Officevision delays were a setback for IBM.

Response: "Look, there's no question we would have liked to deliver the next release of it," Goldberg said. "But when you look at what's out there, there are lots of people using Officevision for real productive work."

Hamilton is a *Computerworld* senior editor, systems and software.

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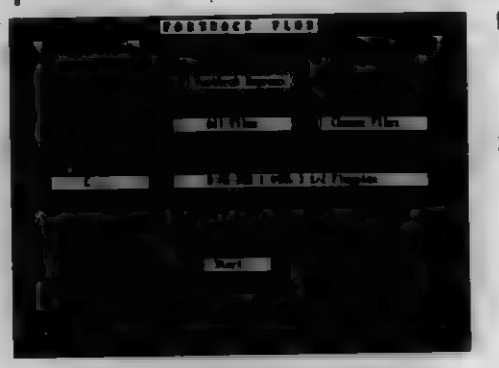
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NEW PRODUCTS — SOFTWARE

Database management systems

Candle Corp.'s Database Tools Division has announced an upgrade of DB/Explain, a SQL optimization tool for IBM DB2 databases.

New features in Version 2.2 include a custom macro facility, database application quality assurance and connectivity to IBM's Query Management Facility. In addition, the product also analyzes SQL performance and offers single-screen optimization.

DB/Explain runs under MVS/ESA and MVS/XA.

A license costs from $12,000 to $42,000, depending on processor size.

Candle Database Tools Division
6464 Savoy Drive
Houston, Texas 77036
(713) 952-8880

Development tools

On-Line Software International, Inc. has announced the availability of Ramis Information System Release 7.2, enhancing its information management system for end users.

The upgrade offers an improved MVS/CICS interface, a window for SQL commands and a Cobol FD Reader that allows Cobol file definitions to be read into the Ramis data dictionary. An interface for the SAS Institute, Inc.'s SAS System has also been added.

Prices for Release 7.2 range from $25,000 to $170,000, depending on processor size and operating system.

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Applications packages

Computer Associates International, Inc. has added a Collection Management System and a Recovery Management System to its integrated line of business applications software.

Both products support automatic account sequencing, real-time access, user-controlled job prioritization and assignment and automatic or selective letter generation. The Recovery Management System accounts for payment delinquency and automatically reports to the General Ledger.

Pricing for each application starts at $60,000 on the MVS and VSE operating systems. The Collection Management System is also available for the IBM Application System/400 platform starting at $30,000.

Computer Associates
711 Stewart Ave.
Garden City, N.Y. 11530
(516) 227-3300

Change Man, a change management software package for MVS systems has been updated by Optima Software, Inc.

Release 3.3.1 includes an option for linking Change Man on the host system to IBM programmable workstations via the Token Ring protocol, allowing workstation users to check out and stage source code from the mainframe. According to Optima, 15,000 lines of code can be transferred in one minute.

The program's DB2 option has also been revised, and an Information Management option is available for automatic updating of Information Management change request records.

Graduated processor pricing starts at $40,000 for the base system and $10,000 for the network option.

Optima Software
Suite 109
1765 Challenge Way
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Utilities

Goal Systems International, Inc. has created Faver for DB2, a utility for quick, efficient copying, restoring and reorganizing of IBM DB2 databases.

The product creates multiple copies in one pass and uses parallel processing to speed reorganization of partitioned table space. It also eliminates unused storage areas and optimizes free space in individual tables.

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HARDWARE

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Upsonic has announced uninterruptible power supplies for the network, minicomputer and telecommunications markets.

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COMMENTARY

Patricia Keefe

Improving Windows



Microsoft takes a hint. In a recent Microsoft survey, Windows users ranked the following attributes according to importance and usefulness: ease of use, ability to run multiple DOS packages, graphical user interface, applications integration and memory management. Chairman Bill Gates said he hopes to move applications integration to the top of the list.

In the meantime, Gates, who gave one of the keynote speeches at Comdex/Spring '91, said he wants to get the waiting time on the 2,500 Windows support calls that Microsoft receives daily down to less than one minute.

He also acknowledged that many of the problems users have today with setup and memory management can be avoided through better documentation and installation programs. "Windows is not as easy to install and use as it should have been," conceded Mike Maples, who heads Microsoft's applications software efforts.

Gates promised that close coordination with network providers will iron out networking issues, which industry observers say occur primarily on Novell

Continued on page 42

On the road to standard graphics drivers

BY MICHAEL FITZGERALD
CW STAFF

ATLANTA — Any user who has ever purchased a graphics add-in board only to have it not work with certain programs can take some heart from events that took place here before and during Comdex/Spring '91.

For instance, Microsoft Corp.'s Keith Laepple, program manager of the DOS and Windows business unit, addressed the Video Electronics Standards Association (VESA) meeting here before Comdex, with a stated aim of improving the performance of Microsoft's Windows environment when Windows 3.1 is released later this year. He told attendees that Microsoft, seeing a world where "nonstandard drivers may exceed standard drivers," wants to get a maximum number of drivers working with Windows.

"The significance of this is that Microsoft is opening Windows up to everyone's boards," said James A. Anderson, chairman of VESA and director of strategic marketing at board maker Headland Technology, Inc./Video Seven in Fremont, Calif.

Microsoft's move, which includes a soon-to-appear test suite of applications for board developers to test their own compatibility, may also represent a shift in graphics development, from needing hardware register compatibility with hardware standards such as IBM's Video Graphics Array to being able to write successfully to the application program interface (API) that is present in all software packages. This sort of shift would be transparent to users but would help eliminate incompatible cards.

Hardware not the issue

"Hardware compatibility is not the issue that it was in 1987," said Jon Peddie, president of Jon Peddie Associates, an Oakland, Calif.-based graphics research firm. "Today, hardware manufacturers of display controllers are obliged to provide a driver for either Autocad's API or Windows' [graphic device] interface. That becomes a neutralizing API. Therefore, it's of little concern to the software vendor or end user if hardware is the same or not."

Still, Peddie said, hardware will continue to be important in defining graphics standards, in

Continued on page 40

Phoenix aims reference kit at 386SL-based portables

BY MICHAEL FITZGERALD
[illegible]

NORWOOD, Mass. — In what it called an effort to boost development of portable computers based on Intel Corp.'s 80386SL power management chip for portables, Phoenix Technologies Ltd. announced its SL-Leader reference kit for developers.



The SL-Leader kit is hardware-oriented and contains a full, working model of a notebook-size form factor system board, complete with an 386SL chip, slots for flash memory, hard disk and floppy disk, fax/modem abilities and IBM Video Graphics Array monitors.

Analysts said this seemed to be a repackaging of several Phoenix announcements made in the past six months and was unlikely to generate a large number of new laptop OEMs.

"What Phoenix has done is some tweaking [to the system] and then reannounced," said John Dunkle of Workgroup Technologies, Inc. in Hampton, N.H. He added that given Phoenix's target market of overseas OEMs, the repackaging probably made sense.

Phoenix officials indicated it would probably package future BIOS products with a hardware reference kit.

"This reference design provides an ability for OEMs to focus on product differentiation and have product sooner," said J. Gerry Purdy, senior director of portable computer systems at Phoenix.

The reference kit costs $75,000, and Phoenix said it expected to sell no more than 50 of them. It also said it had already concluded most of its sales and negotiated widely different terms with OEMs.

Mastering speed

Keith Laepple, Microsoft's group manager of the DOS and Windows Business Unit, told VESA attendees that the firm is looking to improve Windows' speed. One less-than-ideal way, he said, is to use bus-mastering, the technology used by IBM's Video Graphics Array (VGA) follow-on, Extended Graphics Array, or XGA.

"Bus-mastering is not a good idea for Windows . . . You have less need of a co-processor but also less flexibility and less compatibility with VGA," Laepple said.

Laepple recommended a programmable co-processor as the most effective way to make Windows run faster. While Laepple did not recommend any single product by name, one example would be Texas Instruments, Inc.'s Graphics Architecture.

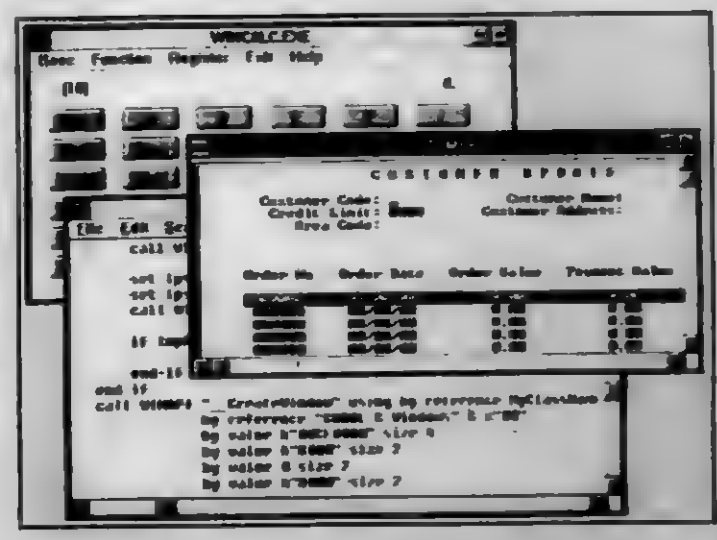
MICHAEL FITZGERALD

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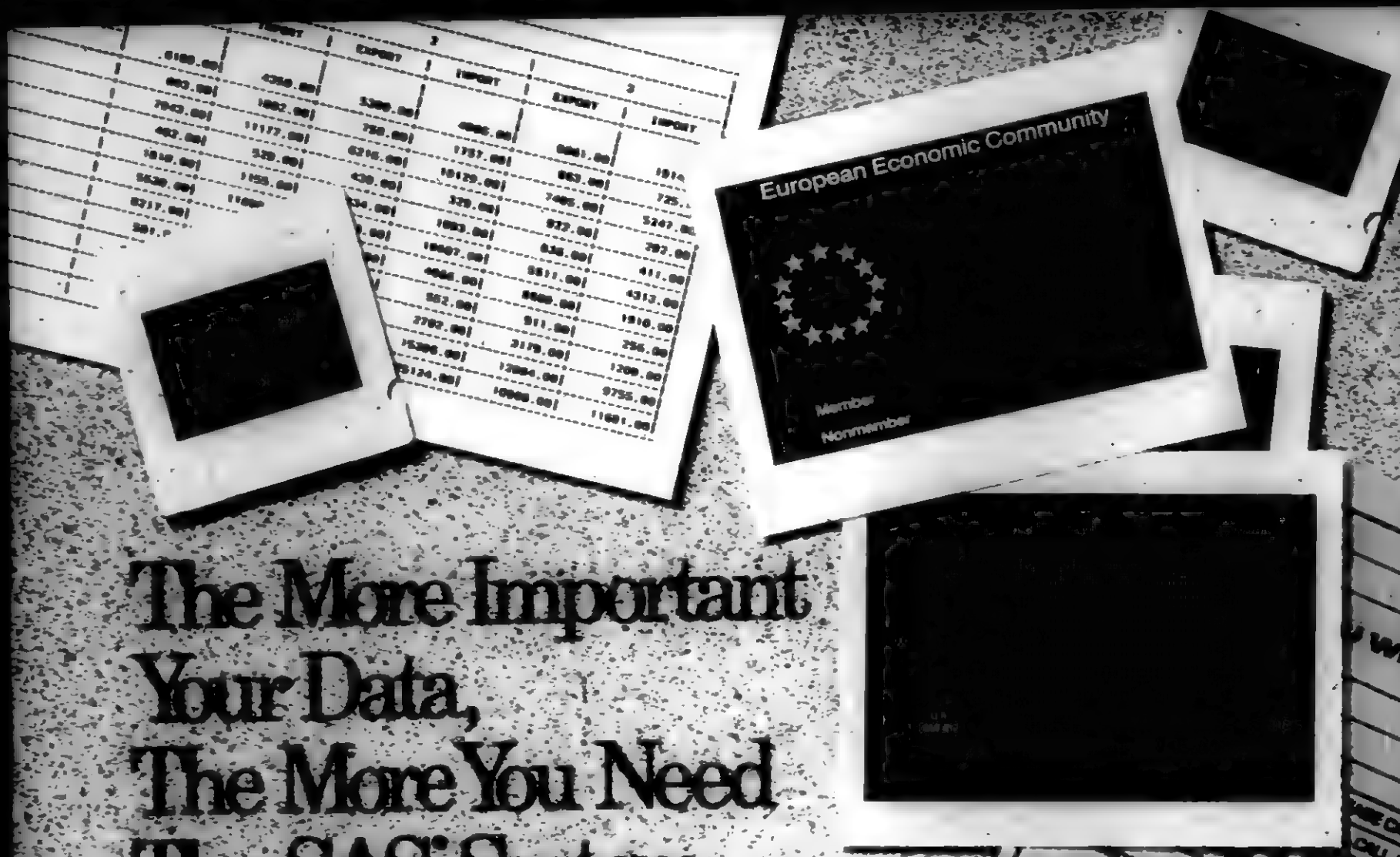
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Silicon Graphics serves an ACE system

BY J. A. SAVAGE
CW STAFF

Taking one step toward an Advanced Computing Environment (ACE) operating system, Silicon Graphics, Inc. last week released Irix 4.0, which it says runs applications 10 times faster than its last operating system did.

"When the ACE specifications come out, it will be a recompile. It shouldn't be a rewrite," said Barbara Shelhoss, director of software product marketing at Silicon Graphics Entry Systems Division.

ACE is a consortium of 21 vendors that have said they will standardize DOS and Unix software on computers using the Mips Computer Systems, Inc. architecture. Silicon Graphics markets workstations using Mips processors.

Irix 4.0 is based on AT&T's Unix System V but has parts of the Open Software Foundation's Unix base.

"The ACE consortium is leaning toward OSF1," said Jim Terhorst, software product marketing manager. OSF1 will be used most in The Santa Cruz Operation's ACE. Vendors with AT&T's Unix System V Release 4 should also be able to use ACE specifications, Shelhoss said.

While Silicon Graphics may be betting on ACE, it is hedging its bets on software engineering. The code for what the firm does best, graphics, is separate from other functions, such as windowing. "In the old operating system, the windows commands were all intermixed in code," Terhorst said. With the next operating system — including whatever specifications ACE sets for it — the company will not have to rewrite all of its graphics code.

The new operating system will be generally available by the end of this year and will cost about $2,000, Shelhoss said.

Army considers developing battle-ready portable PC

BY MICHAEL FITZGERALD
CW STAFF

FORT MONMOUTH, N.J. — The traditional grunt complained about the food and smoked Lucky Strikes from a hard pack. Tomorrow's GI will still complain about the food but might be toting a cigarette-pack-size Soldier's Computer.



The Soldier's Computer currently exists only as a research project commissioned by the U.S. Army's Communications-Electronics Command (Cecom). Cecom awarded Agilis Corp. $50,000 to conduct a feasibility study. The contract was passed along to Texas Microsystems, Inc., a maker of ruggedized personal computers, when it purchased the assets of bankrupt Agilis.

"This was in thought stage three years ago," said James R. Schoening, an electronics engineer at Cecom's Advanced Systems Concepts Office. "Maybe in five years we'll be going out to buy them." Schoening said the technology the Army wants could be available in a one-pound package by then.

Among the Army's criteria for purchase are the following:

- The ability to support numerous applications, including a Global Positioning System that will supply instant updates on enemy field positions during battle.
- Voice and data messaging to reduce the confusion of troop movements during battle.
- Database derivations that might, for example, let technicians pull up repair manuals in the field.

"Conceptually, the ultimate goal is to outfit the entire army, but it'll be a long time before we get to that point," said Schoening, who estimated a 15- to 20-year rollout.

Michael Stewart, president of Texas Microsystems, said that despite his company's lack of experience with portables — it makes one such machine and bought Agilis for its ruggedized portable — he is confident that the firm will eventually compete for an Army contract and will also develop commercial versions of the machine.

Stewart said the feasibility study would take three to four months. Cecom will then decide whether to award a contract for an engineering prototype.

Music to GUI users' ears

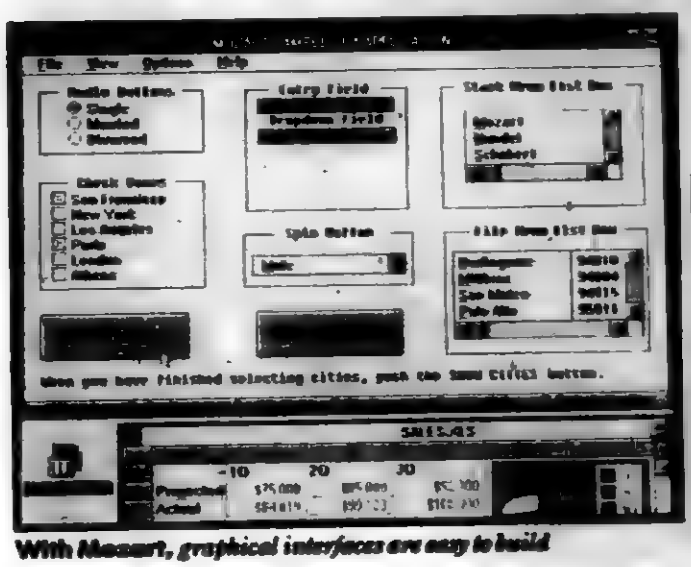
BURLINGAME, Calif. — Mozart Systems Corp. has announced an object-oriented applications builder that allows developers to build graphical user interfaces that will run without modification under both DOS and Microsoft Corp.'s Windows 3.0 environments.

Mozart 3.0 lets users sidestep a problem that has dogged developers: Applications developed on one platform must be ported to DOS and Windows 3.0, a process that normally requires considerable recoding.

It also lets developers streamline the crafting of complex applications. Mozart 3.0 allows development with existing personal computer configurations, so developers can build complex cooperative processing applications, for example, without costly hardware upgrades. The result: extended life for a firm's valuable host applications.

The application builder also supports all major Windows 3.0-specific features, including multitasking and direct data exchange, Mozart President Alan Parman said.

Pricing starts at $7,000 for Composer, the development environment, and at $500 each for 10 to 24 licenses for Performer, the runtime module.



With Mozart, graphical interfaces are easy to build

Office for Mac revised

REDMOND, Wash. — Microsoft Corp. has revamped The Microsoft Office software package for Apple Computer, Inc.'s Macintosh environment to include the latest versions of a pair of recently updated applications.

Version 1.5 includes the Microsoft Excel Version 3.0 spreadsheet and Microsoft Mail Version 3.0 electronic mail system. It also has the Word Version 4.0 and Powerpoint 2.01 presentation graphics programs.

Excel was updated several weeks ago with more than 100 additions, including the addition of a Toolbar feature that lets users format cells or find the sum of a row or column with a single click of the mouse.

The refreshed Microsoft Mail is also packed with new features, including one that allows users to send multiple files by attaching them to a mail message. One caveat: The Microsoft Office contains only a client version of the mail software. At least one set of Microsoft Mail servers must be purchased separately and installed on a Macintosh workstation on the network.

The Microsoft Office Version 1.5 is available now and sports a suggested retail price of $849.

WANTED: MVS and COBOL Programmers to test an ISPF/PDF-style text editor for OS/2

We want you! If you are familiar with ISPF/PDF on IBM mainframes and are working on OS/2, we want you to put SPF/2 to the test in your workplace. See for yourself how SPF/2 provides all the editing power of the mainframe program, and more.

SPF/2 offers you the same familiar environment, command structure and editing capabilities on your PC. You already know how to use it—no training required.

SPF/2 takes advantage of OS/2's powerful features. It uses virtual memory to handle very large files. In addition, HPFS (High Performance File System) long file names are supported. And SPF/2 uses OS/2's REXX for its macro language—75 mainframe-compatible ISREDIT edit sub-commands provide the interface.

SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 even displays the same status indicators.

SPF/2 has features not available on the mainframe. For example, SPF/2 supports 48 PF keys, automatically adapts to the various OS/2 video modes (full-screen or text-window), and scrolls the file as you move the cursor. In addition, SPF/2 has virtually instantaneous response time, 100% system availability, and no connect-time charges.

If you have a departmental or company-wide need for SPF/2, a special cost-effective Multi-User License is available directly from CTC. For information, call our Sales Department at (800) 336-3320.

Test SPF/2 for yourself with a free real-working-code demo disk—it contains a production-level version of SPF/2 except it will not save your editing changes to disk. Call our toll-free, Demo Request Hotline at (800) 648-5794 and ask for SPF/2 Demonstration Disk #178.

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Command Technology Corporation

1040 Marina Village Parkway
Alameda, California 94501
Telephone: . . (415) 521-5900
Orders: . . . . . (800) 336-3320
Fax: . . . . . (415) 521-0369
Telex: . . . . . 509330 CTC

Vendors take economical path

Wyse Technology and AST Research bring out PCs

BY CHRISTOPHER LINDQUIST
CW STAFF

A pair of personal computer vendors, Wyse Technology and AST Research, Inc., took separate roads to affordability last week.

Wyse Technology's path to more affordable high-performance computing involved the announcement of systems based on Intel Corp.'s 80386 25-MHz and I486 33-MHz chips.

The firm's AT bus-based Decision 486/33T comes standard in a tower case with 4M bytes of memory, expandable to 32M bytes on the motherboard. Pricing ranges from $5,999 to $9,399, depending on configuration.

The Decision 386/25 comes with 2M bytes of memory standard, expandable to 32M bytes, and a 64K-byte cache. The system is priced from $2,599 to $3,599, depending on configuration.

Upgradable systems

AST Research took the low-end trail, padding its least expensive product line with upgradable systems based on Advanced Micro Devices, Inc.'s 16-MHz AM-80L286-16 and Intel's 20-MHz 80386SX chips.

The company is calling the Bravo 286/16 ideal for use as a network node. The PC comes complete with integrated Super VGA and 1M byte of memory and can support up to 16M bytes on the motherboard. The system can also be upgraded with a 20-MHz 386SX chip. Pricing begins at $1,195.

The AST Bravo 386SX/20 includes built-in Super VGA and 2M bytes of memory. Pricing ranges from $1,895 for a system without a hard drive to $2,895 for a system with a 40M-byte hard drive, Microsoft Corp.'s Windows, Lotus Development Corp.'s 1-2-3 Version 3.1 and a Microsoft mouse.

Cirrus condenses video controller

FREMONT, Calif. — Claiming the CL-GD6410 controller will reduce the size and weight of portable computers while improving screen displays, Cirrus Logic, Inc. plans to release the chip today.

The GD6410 comes on a 4-in. video subsystem board; competing products can take up as much as 11 inches on a board, according to George Alexy, Cirrus' vice president of marketing.

"The issues in the portable market are display technology and the cost of that and the power curve," said Ken Lowe, an analyst at market research firm Dataquest, Inc. Lowe said the Cirrus chip may find buyers among OEMs. The chips will list for $52 each in quantities of 1,000.

The GD6410 features on-board random-access memory digital-to-analog converter, which lets it interface directly with an external monitor, on-chip LCD interface logic and power sequencing, which enables it to shut off the screen when applications are running, saving battery power, Alexy said. The chip also provides IBM Video Graphics Array resolution with 64 shades of gray and supports 800- by 680-pixel resolution.

Full production of the GD6410 is expected by September. Alexy predicted that machines using the chip will be on display at Comdex/Fall '91 in November.

Graphics drivers

CONTINUED FROM PAGE 37

particular for the huge installed base of non-Windows applications. He said two paths could develop, one focused on register compatibility with the display controller and the other software written to the APIs of major environments, such as Windows or OS/2 Presentation Manager.

While Laepple said his presentation "really wasn't intended to be a commentary on standards for video," others said it is part of Microsoft's move to make Windows a widely recognized standard.

"We believe it's Microsoft's intent to become involved with as many industry groups and standards as possible and open Windows to the point where there is no incompatibility between hardware and software," said John Dunkle, vice president of Workgroup Technologies, Inc. in Hampton, N.H.

Microsoft would not be alone in this goal: IBM has encouraged developers to write to the API at least since it introduced its 8514/A card in 1987.

This could present an opportunity for cards with "intelligence" to recognize which software applications are in use.

"Windows 3.1 is the first step to providing mechanisms for intelligent graphics," said Ken Lowe, an analyst at Dataquest, Inc. in San Jose, Calif. Lowe said a new generation of cards would greatly improve the speed of functions by recognizing when they are in Windows-based applications and using off-screen memory to store memory-intensive functions.

Still, Windows 3.1 is not even an official product yet, and VESA will not vote on an IBM Extended Graphics Array standard until Comdex/Fall '91, if then. Users will still have to suffer poor drivers for graphics boards for some time to come.

THE WORLD'S MOST ADVANCED ON-LINE UPS... IS ALSO THE BEST SELLING.



The EPS 2000 (11-125 kVA) 3-phase on-line UPS (Uninterruptible Power System), represents dramatic advances in the field of on-line power protection for critical load applications. Its innovative features and high reliability have made the EPS 2000 the world's best selling UPS, ever, and set a new industry standard in performance.



Features like a Transistorized Pulse Width Modulated (PWM) inverter allows a higher tolerance of non-linear loads while maintaining the clean sine wave output required by computers. And it's so compact and quiet that even with its matching battery-backup cabinet, the EPS 2000 can be installed in a computer room.

The EPS 2000 provides total power protection and conditioning for a range of critical load applications. And with thousands of installations worldwide, this system has proven itself in the field time and again. The EPS 2000 is controlled by microprocessors that continuously monitor all system parameters, while providing diagnostics and status information.



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Wordstar 6.0: Solid, fast, dependable editing

Wordstar International, Inc.'s Wordstar Version 6.0

Reviews	Performance	Ease of use	Editing capability	Printer support	Network support	Documentation	Service and support	Value	Score
Infoworld 1/1/91	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PC Magazine 12/11/90	NC	Awkward commands	Mix of old and new	Unique preview	NC	NC	NC	Upgrade almost obligatory	Still life in old classic
PC World 8/91	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Users									
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Thomas Galway, Galway Computer Enterprises	[illegible]	[illegible]	[illegible]	[illegible]	NC	[illegible]	[illegible]	[illegible]	Performs well
[illegible] City School District	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Analysts									
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Scott Higgs, National Software Testing Labs, Inc.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Right for current users
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Key: Very good, Good, Pair, Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. **Infoworld* score based on 1 to 10 ratings. NC: No comment

***Technology Analysis** — A roundup of expert opinions about new products. Summary written by free-lance writer Susanne Weixel.*

Vendor financial ratings

Analysts	Long-term stability	Short-term performance	Outlook
[illegible]	[illegible]	[illegible]	[illegible]
Alfred Tobin, Mabon Nugent & Co.	■	■	Poor

Wordstar International, Inc. in Novato, Calif., reported a loss of $2 million in retained earnings in 1990 compared with a gain of $2.5 million in 1989. Ratings are based on a telephone survey of analysts who track the company's financial performance

Wordstar International, Inc.'s Wordstar has been around since the dawn of personal computer-based word processing. Version 6.0, according to reviewers, reconciles the features that have kept customers loyal over the years by providing the advancements that new buyers demand.

Performance: Except for reformatting, which is not automatic, the core Wordstar word processing engine executes most functions quickly. The performance of the add-on modules, however, is slower and less functional. Wordstar requires 512K bytes of random-access memory and a hard disk for full functionality. File size is limited only by the disk space available.

Ease of use: Wordstar's CTRL-KEY command interface was developed before the advent of function keys, so users' fingers rarely have to leave the home row of the keyboard. This version also offers pull-down menus, although reviewers claim that the lack of first-letter shortcuts makes the menus clumsy to use. *PC Magazine* advised the user to learn the CTRL-KEY commands to navigate the command structure.

There is no mouse support. Novice users may be intimidated by the control characters and other dot-based commands that quickly fill most files, and reviewers complained about the lack of consistency among the interfaces of the different Wordstar modules and add-on programs. Luckily, on-line Help is quite good, they said.

Editing capability: On one hand, Wordstar offers some highly sophisticated features, such as its page preview, in which the user can display multiple pages on-screen or zoom in for a close-up view. A graphics card is required for the page preview feature. On the other hand, it can be quite primitive. For example, fonts can only be viewed when in preview mode. Also, the program cannot show columns side by side on the screen; headers and footers are limited in length to five lines; and line drawing is so awkward that *PC Magazine* claims it will never be used.

The spell checker and thesaurus are good, although there is no grammar checker or backtracking during a spell check. Both the add-on outliner and mail merge perform well. Like other add-ons, however, they are not very well integrated into Wordstar. The outliner cannot automatically create Wordstar files.

> WORDSTAR'S CTRL-KEY command interface was developed before the advent of function keys, so users' fingers rarely have to leave the home row of the keyboard.

Additional plusses are multiple-level indexes, concurrent endnotes and footnotes and the ability to open two windows on different files and define blocks in each window simultaneously. Missing are automatic style sheets and a table editor. Another drawback of this version is that only one style can be used per file.

Printer support: Wordstar supports the basic font and printer categories, including Hewlett-Packard Co.'s Laserjet and compatible printers that support Adobe Systems, Inc.'s Postscript. It also supports landscape printing on laser printers. According to *Infoworld*, it has some capability to kern text in pairs. Also, boldface, underlined and super- or subscripted type can be selected.

Network support: On a network, users can read a file that another user is editing but cannot save any changes. Spelling dictionaries, configuration information and printer driver files are all stored in user directories.

Documentation: Wordstar comes with a number of well-written booklets that include useful indexes. It has a tutorial, and reviewers said its on-line Help is among the best. The Help level can be set to automatically display CTRL-KEY menu options if the user hesitates after typing the first letter in a two-stroke command.

Service and support: There is a 30-day warranty and free but not toll-free telephone support. According to reviewers, technical assistance has improved quite a bit recently.

Value: Unless the user requires a great deal of formatting and layout, reviewers agreed that Wordstar is worth a second look. Some of its features may not be on the cutting edge, but its editing capabilities are solid, fast and dependable. The biggest obstacle is the learning curve required to get up to speed with the CTRL-KEY commands. But once users learn the commands, they become loyal fans of Wordstar's editing capabilities. Wordstar 6.0 costs $495.

Wordstar responds

Lisa Linnenkohl, Wordstar product manager

Performance: Reformatting is not totally automatic, but our customers have not complained that it is too slow.

Ease of use: In Version 6.0, we made certain features available in the add-on modules. Now we are working toward integrating them fully in future releases. We do offer limited mouse support for pull-down menus, and the Inset graphics program supports a mouse.

In the next release, due this fall, we will have full mouse support as well as first-letter accelerator keys for our pull-down menus.

Editing capability: We offer a wide variety of layout and formatting tools including scalable fonts, kerning and paragraph styles. There is no table editor, and it is not high on our users' priority lists. If we include it in a future release, we will also include support for parallel columns.

In the next release, we will integrate graphics conversion technology into the product.

NEXT WEEK

▶Microsoft Corp.'s Word for Windows Version 1.1 is seen as one of the strongest products among word processors. With powerful basic features and advanced capabilities, it is also priced lower than the competition.

Keefe

FROM PAGE 37

networks. By addressing these concerns, Gates expects to reduce support calls by a factor of two.

Yeah, that's the ticket. Windows 3.1 will have have "literally thousands of improvements," according to Gates. These will include better developer support in the form of Open Tools and better software hooks, Truetype fonts, building an enhanced version of Object Linking and Embedding into the operating system and its built-in applications to provide greater levels of integration and improvements in performance and usability. A summer release is expected.

PART OF THE Patriot pitch is that there is a whole host of new and different applications waiting to be discovered once developers are freed from having to port their packages to multiple environments.

Then why the fuss? Gates briefly mentioned New Technology (portable) OS/2, stating he does not expect to achieve large sales volumes with NT, which is two years off. Then again, Maples said users won't see any impact from 32-bit processing. Asked if the same held true for 32-bit Windows, he nodded yea.

Put 'em up! Microsoft has definitely taken off the gloves. Ex-IBMer Maples complained about the "the myth that OS/2 is for line-of-business applications while Windows is for expert programmers." Also combating that idea, Gates shrewdly incorporated into his keynote demonstrations from three large accounts using Windows in mission-critical applications.

These included McDonnell Douglas, which is using Windows to help build the Space Station; Fidelity Investments, which is using Windows to improve its on-line customer service; and Otis Elevator, which is using the technology to cut its paper output and to speed report production worldwide. Maples claimed Microsoft shifted through at least 20 major accounts before settling on those three.

He's from Missouri. Maples also took aim at Patriot Partners, a joint venture between IBM and Metaphor Systems that is building an object-oriented shell to which developers of different 32-bit environments can write — once. Developers reportedly will only have to write one version of their software, and users will be able to run OS/2 and Unix software under the same shell. Sounds great, right?

Part of the Patriot pitch is that there is a whole host of new and different applications waiting to be discovered once developers are freed from having to port their packages to multiple environments. "I'm a software developer, and I can't buy into that. When I ask them what those applications are, they say they don't know," Maples said.

He also predicted that it will be difficult to get vendors like Sun and DEC, each of which have their own "open" platforms, to back the Patriot concept. "They want applications unique to their platforms," he said. As a result, it won't matter how easy Patriot's shell is to write to. "Just because it is easy to write to Nextstep doesn't mean it is a good business alternative."

Sounds good to me. Microsoft recently announced it has licensed Caseworks, Inc.'s Knowledge Assisted Software Engineering (KASE) tool set for inclusion with "future development products." A source claims KASE will be bundled in with Microsoft's Quick C, once it's ready to ship.

Keefe is *Computerworld*'s senior editor, PCs and workstations.



NEW PRODUCTS

OS/2 software

SPSS, Inc. has upgraded SPSS for OS/2, a statistical data analysis package.

Release 4.1 ($995) adds Dynamic Data Exchange support, logistic regression and matrix tools for the Advanced Statistics module and database management systems interfaces. The firm also announced SPSS Categories ($495), an add-in that performs conjoint analysis and optimal scaling techniques.

SPSS
444 N. Michigan Ave.
Chicago, Ill. 60611
(312) 329-2400

Development tools

Information Engineering Systems Corp. has released IE:Expert Version 5.0, a tool for designing information systems.

The DOS-based, Microsoft Corp. Windows 3.0-compatible program generates graphical maps of business and systems projects based on text input and indicates data dependencies between elements. It includes model analysis based on the firm's Information Engineering techniques to ensure consistency and completeness of all models. It also offers modification audit trails, a report generator and a SQL schema generator.

The product costs $17,500, with one year's support and maintenance included.

Information Engineering Systems
[illegible] Floor
201 N. Union St.
Alexandria, Va. 22314
(703) 739-2242

Micro Focus has upgraded its line of Cobol language programming tools.

Version 2.5 of the Cobol/2 compiler ($750) includes support for intrinsic functions. It supports programming for Microsoft Corp.'s Windows 3.0 and IBM OS/2 Presentation Manager. The Cobol/2 Toolset 2.5 ($750) includes a memory manager that makes 16M bytes of memory, as well as file sharing and report writing utilities, available to the developer.

The Cobol/2 Workbench 2.5 ($2,500) comprises the compiler, tool set and several additional programming utilities. The package's Cobol Source Intelligence facility (a real-time analysis tool) and the Advanced Animator (a source code debugger) have been enhanced.

Micro Focus
Suite 400
2465 E. Bayshore Road
Palo Alto, Calif. 94303
(415) 856-4161

Software applications packages

Symantec Corp. recently announced Justwrite Version 1.0, a word processor for the Microsoft Corp. Windows 3.0 environment.

The product was designed for ease of use, Symantec reported. It includes automatic file format conversion, document templates, intelligent mail merge and support for Dynamic Data Exchange. Network operating systems from Novell, Inc., IBM and Banyan Systems, Inc. are supported as well.

Justwrite costs $199.

Symantec
10201 Torre Ave.
Cupertino, Calif. 95014
(408) 253-9600

Pageahead Software Corp. announced a software product that provides integration of leading database and desktop publishing packages.

The product, called Pageahead, runs under Microsoft Corp.'s Windows 3.0 environment and interfaces with Oracle Corp.'s Oracle and Ashton-Tate Corp.'s Dbase IV relational database management systems as well as with Aldus Corp.'s Pagemaker page layout software. It automates the process of integrating database information into publishable report formats, the vendor said.

Pageahead costs $795.

Pageahead Software
Suite 300
2125 Western Ave.
Seattle, Wash. 98121
(206) 441-0340



eader

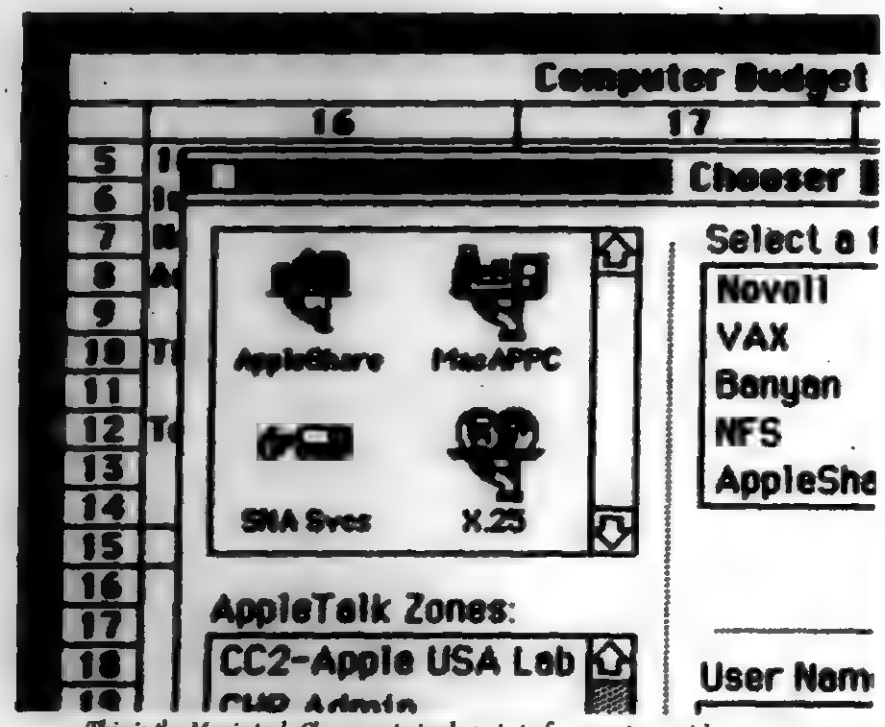
Or, Why Broadband Services From Your Local Telco Will Be Music To Your Network.

Broadband services unleash the true power of the public switched network. Let networks of computers listen and talk. Allow you to bring up a remotely stored document in one window. Video conferences in two others. How? By using cell relay, fast packet switching, it allows existing public networks to transmit more information at faster speeds. So things impossible now, will be possible tomorrow with broadband. High-definition television. Interactive education. Image processing. High-resolution faxes. To learn exactly what broadband services can do for you and your business, talk to the broadband leaders. Call your local phone company or AT&T Network Systems at 1 800 638-7978, ext. 6110.

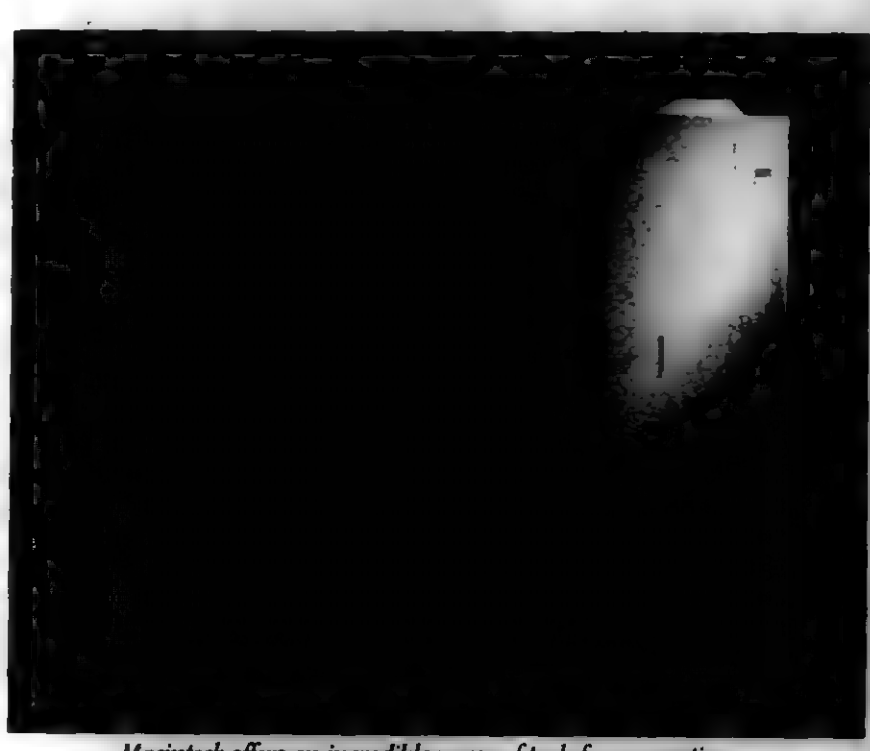
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AT&T Network Systems

We're open



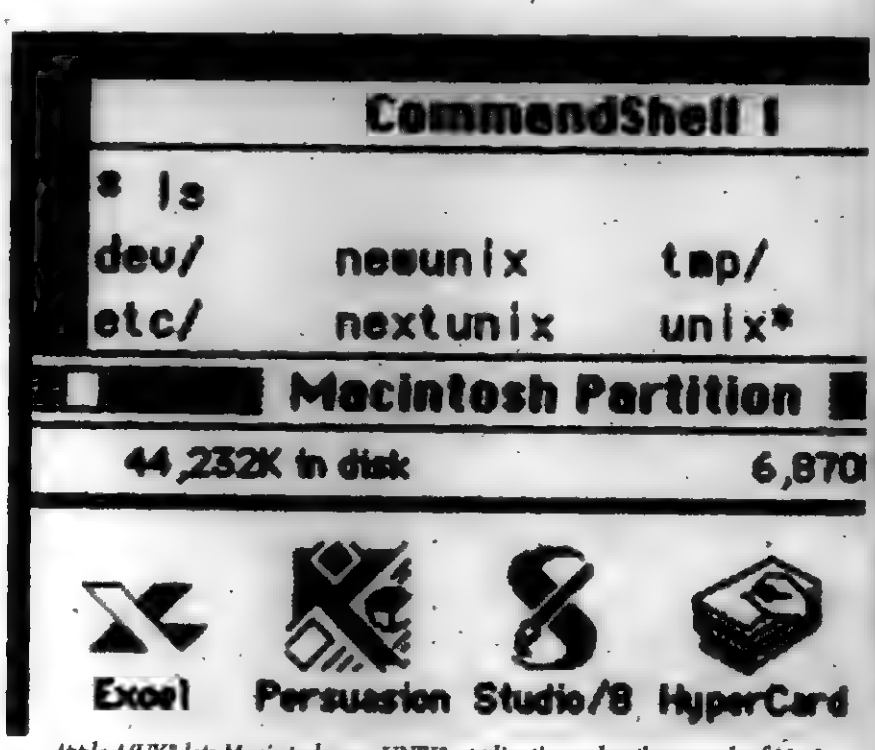
This is the Macintosh Chooser. A single point of access to a wide range of systems. The Chooser shows available network resources graphically and consistently. Just point the mouse and you're connected.



Macintosh offers an incredible range of tools for connecting with virtually any host-based environment, whether it's running SNA, TCP/IP, DECnet™, or OSI.



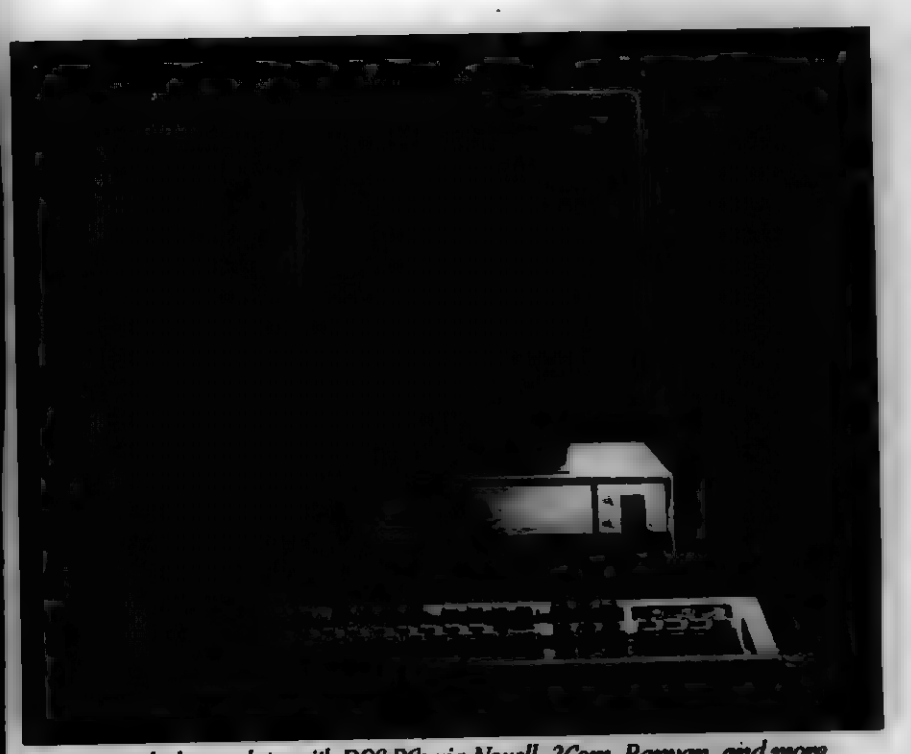
Apple's Data Access Language (DAL) adapts popular off-the-shelf database, spreadsheet, and data analysis software to major SQL environments. So nontechnical users can easily access remote databases.



Apple A/UX® lets Macintosh run UNIX® applications plus thousands of Mac® programs. At the same time you can run X-Window and MS-DOS applications, and cut, copy, and paste between any of them. No other desktop computer can do this.

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to anything.



Macintosh shares data with DOS PCs via Novell, 3Com, Banyan, and more. Macintosh reads and writes DOS files on a floppy disk. Macintosh runs DOS programs. Maybe your next DOS computer should be a Macintosh.



Information isn't much good to people who can't get to it. Macintosh sorts out the complexities of multiple computer systems and presents vast information to people at the desktop in a single, consistent way.

is a trademark of Massachusetts Institute of Technology. One videotape per customer. Offer good only in the U.S. and while supplies last. Allow 4-6 weeks for delivery.

While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

What is politely referred to as the "multi-vendor environment" is an amalgam of disparate hardware, incompatible operating systems, dissimilar databases, and multiple networks. Nevertheless, IS people are expected to make these all work together in perfect harmony.

But lately, a lot of people are finding the source of their solution a pleasant surprise: the Apple® Macintosh® computer.

They're finding that Macintosh comes out of the box with sophisticated networking capabilities designed right in.

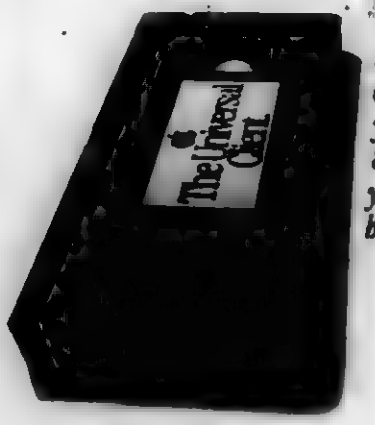
That Macintosh is open to virtually any host, any file server, or any database, through any network.

That Macintosh makes the desktop the place where diverse systems come together.

And that with Macintosh you can build systems that let even nontechnical users access information from the desktop, no matter where that information resides.

And because Macintosh works with all your networks, databases, and hosts in one consistent and graphic way, it delivers major savings in implementation and training.

In short, Macintosh gives you the power to make information systems more valuable to the people who use them. The power to be your best.®



Macintosh gives people a single, simple view of the information and services that can help them do their jobs and serve your organization. See for yourself. Call 800-635-9550, ext. 554, and we'll send you a free video showing how Macintosh helps unify complex systems.

10BASE-T NETWORK MANAGEMENT MADE EASY.

NETWORK SHORTS

Card costs changing

Token Ring network interface card maker Madge Networks Ltd. has raised the price of its Micro Channel Architecture-compatible adapter — switchable from 16M to 4M bit/sec. speeds — from $995 to $1,025 in single-unit quantities. The cards, as well as those for the IBM Personal Computer AT, are available in packages of 10 at a 10% discount, the company said.

The move came shortly before IBM slashed the price of its 4M bit/sec. adapter cards by 50%.

Meanwhile, IQ Technologies, Inc. has lowered the price of its 4M bit/sec. Token Ring adapter card from $950 to $845. It also recently announced a $995 16/4M bit/sec. switchable card. According to the company, the card works with most laptop, notebook and desktop PCs.

The price of Hughes LAN Systems, Inc.'s Proline desktop connectivity product has reportedly dropped by 31%: from $595 to $495 per single-user package and from $505 to $350 per 25-user package. Proline allows MS-DOS and Microsoft Corp. Windows 3.0 PCs to concurrently access multiple hosts, file servers and network operating systems, according to the company.

T1 demands more safeguards

Firms needing constant uptime use Clearview expert system

BY JOANIE M. WEXLER
CW STAFF

The tendency of T1 users to dump voice traffic back onto the public network and replace it with business-critical data is giving way to the need for tighter management tools to protect companies' quickly appreciating corporate backbones.

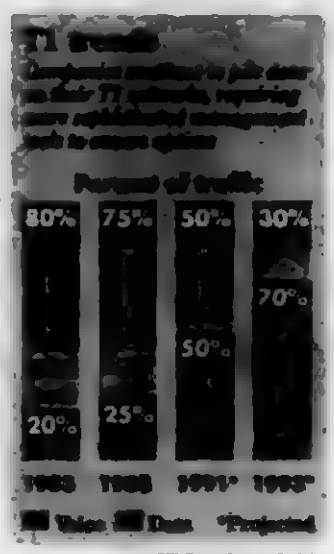
The trend to anchor business on corporate data networks that can tolerate virtually no downtime is apparent in some firms' recent decisions to install or expand monitoring of their T1 circuits and equipment with an artificial intelligence-based system from Clear Communications in Lincolnshire, Ill.

The vendor announced last week that telephone switch maker Northern Telecom, Inc. and GTE Data Services have installed its Clearview Surveillance System and that Mastercard International has expanded its use of the product nationwide.

The system runs on a Sun Microsystems, Inc. workstation and aims to pick up where diagnostics in multiplexer vendors' network management systems and channel service units (CSU) leave off. CSUs terminate a digital circuit, collect network performance data and provide alarms for follow-up action.

Before-the-fact protection

Clearview, on the other hand, provides real-time fault isolation and diagnostic tools to alert managers to degrading performance before the network falters. The after-the-fact reporting done by multiplexer vendors' proprietary network management systems and CSUs often do not offer enough nitty-gritty details for heading off lost data and network



CW Chart: Doreen St. John
Source: Datapoint, Inc.

outages at the pass, some Clearview users said.

Mastercard said it has expanded its use of Clearview because Banknet, the company's network, "is the business," explained Steve Crider, director of network communications at Mastercard's operations facility in St. Louis.

Mastercard just bumped its number of Clearview-monitored T1 circuits from 80 to all 119 U.S. Banknet circuits connected via a Racal-Milgo T1 backbone.

Mastercard demands 99.99% Banknet availability, and Clearview serves as an "early-warning and real-time system" that resolves network problems before they happen, Crider said. It automatically and continuously pulls information from all T1 links, documents it and prints it in graphical form, he added.

Also important to Mastercard is that "when a [telecommunications]" carrier is out of compliance, we can call him on it and get a refund," Crider said. Clearview has twice tagged poor carrier performance resulting in potential carrier service paybacks to Mastercard, he added.

Northern Telecom is also using Clearview to ensure that its worldwide private T1 network does not miss a beat. "There is a gap in T1 [multiplexer] technology in the sophistication of tests you can run," explained Mike Hill, manager of network control for the Mississauga, Ontario-based data services arm of Northern Telecom. "You can get basic diagnostics such as bit-error rates, but you certainly can't get errored seconds and other information you need to isolate problems quickly."

Hill boiled his goal down to: "I don't want to get a call from a VP because he's in the midst of a videoconference and the picture goes bad. To keep up with the exotic data demands we're running across our corporate networks, we need to resolve glitches quickly or we'll have a quagmire of problems."

Hill said his goal for network uptime is 99.8%, a charge made more complex by the 24-hour, global nature of Northern Telecom's network because there are no "off-hours" when the network is "closed." Also, the network comprises T1 multiplexers from vendors with different network management systems: Racal-Milgo, Timeplex, Inc. and Newbridge Networks, Inc.

Both Hill and Crider said they use multiple interexchange carriers, and Clearview provides an efficiency rating of each carrier and vendor — "something that would require hours of manual work on a PC database," Hill said. The function allows the companies to grab statistics and compare vendor report cards, allowing them to tell carriers and vendors to "get their acts together," Crider said.

Reality means savings for Milwaukee

BY CHRISTOPHER LINDQUIST
CW STAFF

MILWAUKEE — The city of Milwaukee's purchasing department wanted to cut costs, turnaround time and inventory levels. The cure it decided to try was a dose of Reality.

The city hopes that Reality, a local-area network-based purchasing software package from Structured Computer Systems, Inc. in Avon, Conn., will allow shorter lead times and more efficient operations than were previously possible.



Reality's combination of features made it very appealing to the city. It performs basic purchasing functions such as bid and purchase-order processing and is priced far below mainframe packages with similar features.

"I think as far as actual requirements go, [Reality] could match the mainframe systems," said Tom Hoeppner, automation services administrator for the city. The fact that it ran on a network was an added bonus, as the department had already planned on installing a LAN that would be

Continued on page 51



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HEWLETT PACKARD

Agency plans five-net integration

BY ELISABETH HORWITT
CW STAFF

QUEBEC — The Canadian Employment and Immigration Commission (CEIC) plans to take five networks that can barely talk to one another and mesh them into an organizationwide system that will support 12,000 terminals.

Under a $7.1 million, five-year contract signed last month, BT North America, Inc. will provide the CCITT X.25-compliant packet switches to put the network together.

CEIC is responsible for unemployment insurance, job listings and immigration management. Unisys Corp. mainframes at each of the five centers serve a group of user terminals and personal computer local-area networks. Interaction among the different centers is currently limited to file transfer that uses Burroughs Corp.'s Network Architecture, CEIC Director General Steve Connolly said.

The new network, CEInet, will provide a single, integrated communications system within the 25,000-person agency, Connolly said. CEIC "has all kinds of internal reasons to talk" across its disparate agency networks, including the need to collect data across the organization for internal finance and personnel systems, he added.

Use of X.25 packet switching will provide much more efficient utilization of CEIC's private network. This is an important point, given that the backbone covers an area roughly 4,500 miles long and 150 miles deep, according to Steve Kay, CEIC's director of data communications and office automation. X.25 "supports an easier mix of on-line terminals and file transfer and permits easier and lower cost sharing of the backbone," Kay said.

The industry standard will also keep CEIC independent of any one vendor's networking devices and will enable the organization to route flexibly around circuit failures, Connolly said.

Installation plans

CEIC will not migrate to X.25 immediately, however. During phase one, BT will install Turbo Engine 4800 switches to connect CEIC hubs in Montreal, Hull, Belleville and Toronto at speeds of 56K bit/sec. Eleven other cities will be equipped with BT PXL engines and linked over 9.6K or 19.2K bit/sec. lines. During this phase, CEIC will continue to run the proprietary Burroughs Poll Select protocol across the network without X.25, Connolly said. Phase one will connect 5,000 terminals.

During phase two, BT will provide software on the PXLs to translate Burroughs Poll Select to X.25, and 7,000 terminals will be added to the network.

One key application that will run on the network is an organizationwide electronic mail system. Right now, terminal users have a very limited form of E-mail on the host and no effective way to exchange messages outside of their regional networks. CEIC is now evaluating the CCITT X.400 standard as a possible basis for the E-mail network, Kay said.

CEIC is also standardizing its LAN installations on Banyan Systems, Inc.'s Virtual Networking Software, according to Connolly. While most sites now use Banyan, a few use other LAN products, such as Novell, Inc.'s Netware.

After competitive bidding by 10 vendors, CEIC chose BT because the company offered "the best type of solution at the lowest cost," Connolly said.

Telecom firms set standards for multinational networks

BY ELLEN BOOKER
CW STAFF

NEW YORK — AT&T and three foreign providers of telecommunications services said late last month they had settled on standards and procedures for offering coordinated, global private networks to large multinational customers.

The alliance between AT&T, British Telecom, France Telecom and Kokusai Denshin Denwa (KDD) of Japan was announced last November. The arrangement is aimed at creating a "one-stop shop" for multinational networking. Without such a service, multinationals face the often cumbersome task of dealing with each national telecommunications agency in turn.

Called the Joint Network Initiatives, the standards call for coordinated billing, network testing and a single point of contact, regardless of which company bears the territorial responsibility for any part of the network.

The initiatives cover the provision of telecommunications services; network hardware, including private branch exchanges, in some cases; project management; network design; equipment installation; and network management.

The partners claimed that harmonized testing and configuration procedures help to reduce network design time by as much as 50% and that customers will be assured of end-to-end service integrity.

The partners announced that Nippon Express Co., a large Japanese shipping firm, would be the first customer of the joint offering.

A spokesman for the group said the Nippon Express network will cover Japan, the U.S. and Europe; will include voice, fax, telex and data services; and will connect up to 13,000 telephone terminals in Japan.

Nippon spends approximately $219,000 per month on international calls placed from Japan. The firm said it hopes to save $102,000 per month under the coordinated service.

The initial cost to Nippon Express will be about $4 million, the spokesman said.

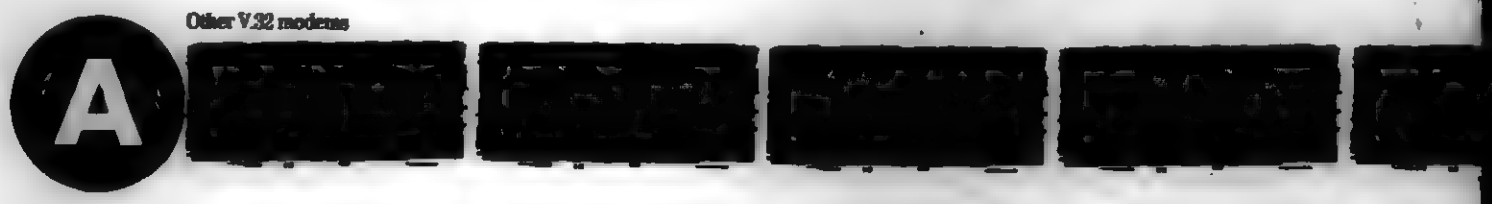
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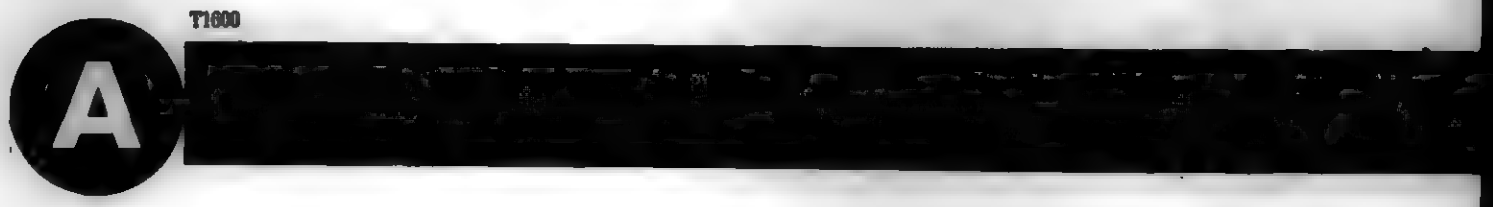
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T1600



Lansystems users expect Intel to be good to them

Improved technical support cited as a likely benefit of the small software firm's recent acquisition

BY JIM NASH
CW STAFF

Network managers see more pluses than minuses in Intel Corp.'s acquisition of Lansystems, Inc.'s networking software division. Intel's greater resources, at least in the short term, could aid in supporting Lansystems software.

Intel's acquisition of Lansystems' network products last month caused little more than a tremor among users of its network utilities. Lansystems software is largely based on Novell, Inc.'s network operating system, although some versions of certain products, such as its print server application, Lanspool, were based on Microsoft Corp.'s LAN Manager.

"In terms of support, I would assume things will be better" under Intel, said Victor Tam, a programmer at Continental Insurance Co. in New York.

Dennis Laplant, systems analyst at the Sarasota County, Fla., building and zoning department, said support from Lansystems has been good, but he expects it to become quicker under the much larger Intel.

Tam said he must work on the road with remote users and is sometimes frustrated by slow turnaround with smaller companies.

"When I'm out in the field, I can't call in for advice and just sit there for three hours waiting for a reply," he explained.

Tam said Intel may make the logical move and begin to combine its hardware products with Lansystems' applications.

For example, Intel could merge its Lanport, a device that hooks directly to a network port and acts as a dedicated print server, with Lanspool, a Lansystems application that allows users to designate a nearby workstation as a temporary print server, according to Tam.

That could be a negative for some managers, however, said Alex Resnick, president of systems integrator Practical Computer Corp. in Markham, Ontario. Resnick pointed out that companies now using Lansystems' software products may be left with dead end products if they are made into firmware.

Of the two vendors, said Michael Karfopoulos, an analyst at consulting firm Gartner Group, Inc. in Stamford, Conn., Lansystems stands to benefit most. Karfopoulos said there had been conflicts between the company's integration and manufacturing divisions.

Karfopoulos said company integrators have sometimes recommended software other than Lansystems'. He added that Intel will benefit most if it exploits the Novell connections it gains by picking up the product lines.

Reality

FROM PAGE 47

attached to other systems around the city.

Milwaukee has 16 servers that are interconnected by a fiber-optic backbone. Using Reality, the purchasing department will be able to perform requisitions and track orders across all of the interconnected networks from a central location. Hoeppner said interconnecting the systems will help reduce inventory levels by cutting lead times and making information more readily available.

In another bid for improved efficiency, a fax gateway has been connected to the LAN, allowing the department to eliminate some paper flow by electronically sending such things as bid documents to vendors.

The department has looked into electronic data interchange (EDI), but the sheer number of vendors the city deals with makes EDI a prospect for the far future, Hoeppner noted.

"We have, for example, about 8,000 bid vendors in our vendor bid file, so it's kind of difficult for us to target and get EDI relationships going with our vendors," he said. However, he added, "It is our vision down the line to be able to eliminate some of the documentation that flows back and forth."

Purchasing had been a manual process for the city, and the turnaround time from request to approval was 30 days or more, Hoeppner said. This lag time, combined with the lack of an efficient means of inventory management, resulted in inventory levels two to three times higher than those in cities of comparable size. "Our current level is somewhere around the $6 million mark; cities of our size are normally in the $2 million to $3 million level," Hoeppner said.

In response to this problem, the city last year issued a request for proposals (RFP) for a computerized purchasing system intended to cut lead times and provide a centralized way to manage both purchasing and inventory.

Performance, not platform, was the most important consideration, Hoeppner said. "We basically put out an RFP that said, 'We don't really care what kind of platform you run on; we're looking at the requirements for a purchasing system,' " he said.

After testing software for a variety of platforms from personal computers to mainframes, the city decided on the LAN-based Reality and signed a $158,000 contract for software with Structured Computer Sys-

The system is currently being installed, and Hoeppner said he hopes to begin pilot testing within about six months.

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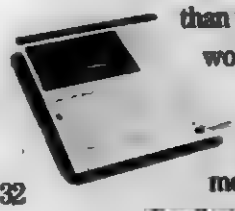
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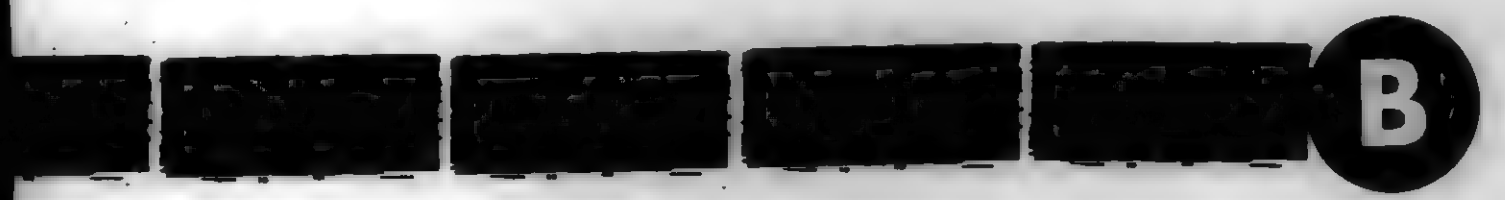
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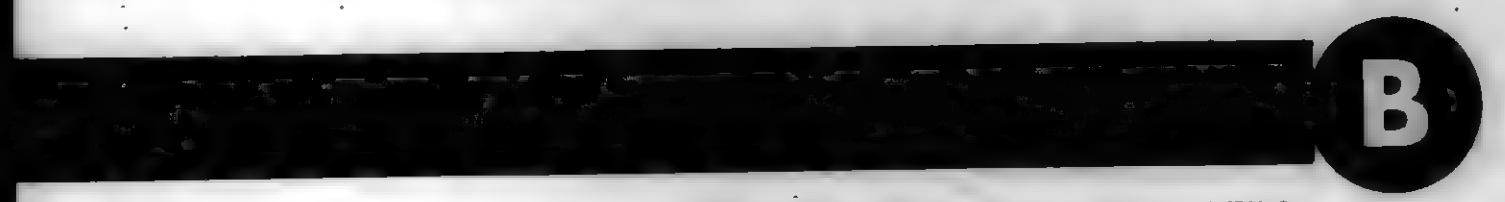




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NEW PRODUCTS

Local-area networking software

KEA Systems Ltd. has introduced KEAlink IPX, a software product that makes possible concurrent connections under Novell, Inc.'s Netware, Transmission Control Protocol/Internet Protocol (TCP/IP) and Digital Equipment Corp.'s Local Area Transport (LAT) protocol.

KEAlink IPX allows users to maintain connection with a Netware server while accessing data on multiple hosts that run LAT and TCP/IP. The product converts Netware communications to the Network Device Interface Standard, which offers simultaneous, multiprotocol communications.

The product costs $75.

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Network services

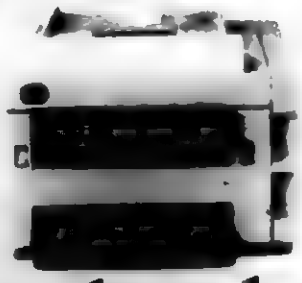
An off-site backup and retrieval service for personal computers and PC networks has been announced by Secure Data Network, Inc. (SDN).

SDN installs the Subscriber System 1000, a high-speed modem, in a subscriber's PC under DOS and Novell, Inc. network environments. The system automatically compresses, encrypts and transmits copies of files that have been altered since the most recent backup. Files are stored by a substation that transfers data to digital audiotapes and returns files to the user in the event of data loss. A central station provides daily backup for all substations and archives information permanently on optical discs in secure, remote locations.

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Electronic mail

Soft-Switch, Inc. has announced integration of fax and telex capabilities into its electronic mail gateway product line.

The Soft-Switch products can send messages to distribution lists encompassing a combination of fax, telex and E-mail contact information. Images and graphics may be incorporated into E-mail and fax transmissions.

The gateways are immediately available for the IVM/VM operating system. Pricing begins at $32,000 for the Enterprise Fax Gateway/VM and $30,000 for the Enterprise Telex Gateway/VM.

Soft-Switch
640 Lee Road
Wayne, Pa. 19087
(215) 640-9600

Gateways, bridges, routers

Lan-Link Corp. has announced an Ethernet bridge that communicates at 56K bit/sec. over analog lines.

The LCS-IIA connects remote Ethernet local-area networks over two-wire dial-up and four-wire dedicated analog lines. According to the company, the bridge works with all 802.3-compliant operating systems and is protocol-independent. An optional adapter card connects Token Ring and Arcnet LANs.

The LCS-IIA is priced at $7,500.

Lan-Link
744 Goddard Ave.
St. Louis, Mo. 63005
(314) 537-9800

Micro-to-host

Mozart Systems Corp. has added support for the Microsoft Corp. Windows 3.0 environment to its personal computer-based mainframe applications development software tool.

Mozart 3.0 develops graphical user interfaces for host applications running on PCs. Design features include object-oriented functions, a fourth-generation language, an interactive debugger and mapping facilities. Mozart is IBM Common User Access-compliant; it supports Transmission Control Protocol/Internet Protocol and IBM's LU2, 3270 and 5250 communications.

The development environment costs $7,000; runtime modules cost $500 or $175 each for more than 1,000 licenses.

Mozart Systems
Suite 630
1350 Bayshore Highway
Burlingame, Calif. 94010
(415) 340-1588

Network management

Digital Pathways, Inc. has announced Multi software for management of remote networked security devices.

Multi collects and analyzes audit trail data from the company's remote Securelink X.25 (SLX) and Digital Authentication Device (DAD) security devices. The product also manages remote databases via its script language.

A version of Multi that supports DAD costs $995. A version that supports DAD and SLX costs $4,000.

Digital Pathways
201 Ravendale Drive
Mountain View, Calif. 94043
(415) 964-0707

MANAGER'S JOURNAL

EXECUTIVE TRACK



Richard H. Serafin has been named vice president of information systems and chief information officer at **VWR Corp.**, a distributor of laboratory and chemical supplies in Media, Pa.

He was most recently director of business systems consulting in the Philadelphia office of Arthur Andersen & Co. Before that, he was director of quality assurance for Arthur Andersen's southeast region.

Before joining Arthur Andersen, Serafin was an information technology consulting partner with Arthur Young in Philadelphia and Richmond, Va.

Raymond L. Mobley has joined **American Express Information Services Corp.** as president of its new outsourcing services unit, Boston-based Integrated Systems Technologies.

The unit manages the combined IS operations of The Boston Co. and The Shareholder Services Group.

Mobley, 55, was most recently president and chief executive officer of Atek Information Services, Inc. He was founder and president of Business Systems Technologies, a financial industry consulting firm. Before that, he spent 19 years at Electronic Data Systems Corp.

Edward M. Pillard, formerly vice president of Salomon Brothers, Inc.'s Technology Services unit, was named vice president of the eastern region at Network Management, Inc. in Fairfax, Va. Pillard reports to Network Management President and CEO Francis A. Dramis, who also recently left Salomon's IS department.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

IS turns chance into a science

Dependable, accurate systems are the ticket to a winning California State Lottery

BY JAMES DALY
CW STAFF

At the California State Lottery, the day will be forever remembered as Lotto Fever. The history books will be somewhat more clinical, reporting simply that on April 17 of this year, state lottery officials drew the largest jackpot in U.S. history: $118 million.

By early evening, tycoon wanna-bes were scoffing up 6.3 million tickets per hour. Limousines were double-parked at Lotto retailers in Beverly Hills while across the state, store owners reported hour-long waits for tickets, with lines snaking around corners and down blocks.

Just before 8 p.m., the lucky numbers were picked, and 10 winning ticketholders went shrieking off into the night, their futures changed forever. But for Joanne Ichimura-Hoffman, the lottery's director of information management and services, it was just another day — a weird, wonderful, computationally demanding day in which she played a pivotal role.

"You could say it was our finest hour," she says. "I'm very proud of that."

Ichimura-Hoffman commands the information systems of an operation so successful that its $2.48 billion annual revenue would rank 42nd in sales in the Fortune Diversified Service 100 and first in profitability. She has been a big part of that, having headed the lottery's IS department for the past four years.

Any lottery's success stems primarily from its reputation for honesty. The average Lotto player may buy a ticket and Chees-Doodles, only to forget about the transaction two minutes later. Dependency translates into trust, and trust results in sales. "The lottery must perform without missing a beat," Ichimura-Hoffman says. "It's the only way our integrity will never be jeopardized."

Equal parts traffic cop, security expert and dispenser of dreams, she stitches together myriad tasks during days that may find her in her Sacramento office at 4 a.m., slumbering on a couch given to her by a boss who grew tired of finding her asleep on the floor. During her lengthy workday, she delights in sneaking away to indulge a perverse pleasure. "I love stress-testing the system," she says. "I like to have millions of transactions a second blasted through the system to see what happens, what it's capable of."

Ichimura-Hoffman's "no surprises" philosophy emanates from a childhood steeped in adversity. Born in a Japanese internment camp during World War II, she was shuffled around the

Continued on page 58

PROFILE: Joanne Ichimura-Hoffman



Andy Freeberg

Position: Director of information management and services at the California State Lottery
Mission: Handling the IS needs of the lottery's 1,100 employees

Survey uncovers resistance to outsourcing

BY CLINTON WILDER
CW STAFF

Despite all the hype, there is still considerable resistance to the outsourcing wave, according to a recent survey by Mountain View, Calif.-based Input, Inc.

The survey of information systems executives and managers at 55 Fortune 1,000 companies established that 75% of the companies have not even evaluated outsourcing as an option for their IS functions. Input defines outsourcing as farming out all or part of a company's IS operations for three years or more.

Even among the one-quarter of respondents who have looked at outsourcing, "a lot of them were nudged into it by declining economic conditions," said J. P. Richard, principal consultant at Input's Vienna, Va., office. "We expected about 50-50; 75% is a big number," he said.

The reason for such resistance is "they want to protect their own empires, and rightly so," Richard said. "But within the next five years, I think there will be a lot more pressure from financial executives to evaluate the option.



"Enlightened IS executives will do it, either to save money by outsourcing or to use the option as a baseball bat to reduce costs on their own staff. We have seen where that can be very effective," he said.

IS executives in the banking industry were among the most receptive to outsourcing, according to the survey, while the retail industry was the most resistant. "In retail, we ran into a lot of people who said, 'These [outsourcing vendors] don't understand our business; it's unique,' " Richard said.

Input continues to predict fairly healthy growth for the outsourcing market. However, the firm estimates a 17% annual increase from $7.4 billion in 1990 to $15.9 billion in 1995. Richard is optimistic that current IS management resistance will be overcome in the next few years. The resistance "just dampens what could be an extremely healthy growth rate," he said.

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E N A D V A N T A G E .

Ichimura-Hoffman

CONTINUED FROM PAGE 55

country several times. Her most vivid memory is of years spent in the dark and isolated camps. "I remember sitting on a curb in Kansas City soon after we were released, and I was just fascinated by the neon signs. I had never seen so many lights," she recalls.

That fascination with blinking lights returned at California State University in Sacramento when she began using computers while studying for a chemistry degree. Later, she combined her analytical and chemistry skills to establish a criminalistics laboratory information system.

In addition to handling the IS needs of the lottery's 1,100 employees, Ichimura-Hoffman maintains the trust of millions of lottery players. A system that handles more than 20 million transactions daily must perform as effortlessly as a kitchen toaster, or the whole process is undermined. "We're not perfect — but we can always try," she says. Her ultimate goal: "A zero-defect, quality product that performs at highly stressed levels."

Unlike other state agencies, the lottery is a fund-raising organization. Approximately 34 cents from each $1 Lotto ticket go to the California public school system. Since the lottery's inception in late 1985, it has raised more than $4 billion for public schools.

Team player

Ichimura-Hoffman's management style stems from a philosophy of managers as an interworking team, able to share many chores within a department or process. "Joanne is constantly challenging us so we stay fresh, and we're never afraid of getting stuck in a rut," says Lou Mucci, chief of gaming systems for the lottery.

There are plenty of challenges for the 200 employees in the lottery's $55 million IS department. Nearly 10,000 lottery terminals peppered throughout the state continually inject information into a data site at Sacramento in the north or Whittier in the south. Even this relatively simple process comes under Ichimura-Hoffman's edict of "no surprises." Network bridges drop any terminal location that may be adversely affecting other retailers on the shared circuit until the problem is resolved. Switching equipment can also reroute transmissions to a backup facility.

Each site contains two Concurrent Computer Corp. 3280s, one serving as the primary machine and the other as its backup. The backup maintains a record of every transaction received by the primary system so it can take over in the event of a failure. Each primary computer transmits all of its data to the primary computer at the other data center.

Co-workers praise Ichimura-Hoffman's decision to use multiple 3280s because they allow the blossoming operation to expand easily. "You just continue to attach more processors and increase your throughput," Mucci says. "Its possibilities are unlimited."

The expandability is critical for a system so dependent on record-taking. Each ticket contains a serial number that records where, when and in what order it was purchased. This information stockpile typically approaches 100 million per week and is kept for the six months during which winners can redeem their tickets.

Ichimura-Hoffman enlists the aid of an outside vendor for the formidable task of running the on-line operations. Lotto games, which are updated regularly, are developed jointly with Providence, R.I.-based Gtech Corp. The lottery staffers deliver all the design specifications to Gtech, which codes the software. Gtech also handles software development work and data center operations and repairs terminals in the field.

The end user — the Lotto ticket buyer — sees little in this complex arrangement except computational efficiency. Prizes of $25 or less are verified and awarded nearly instantaneously at the retailer outlets, even when the systems are dealing with processing bursts as unpredictable as human nature itself. After the final out of one World Series game, for instance, sports fans flooded out of their homes to buy lottery tickets. "It was horrendous, but we hung in there," Ichimura-Hoffman says.

One area Ichimura-Hoffman obsesses about is security, an absolutely crucial component to the trustworthiness of each drawing. All on-line terminals include audit trails, and each terminal is uniquely identified to the computer, ensuring that the terminal accepts only data meant for it and that the central computer accepts data only from a known lottery terminal. Data is encrypted for sending.

The draw machines and balls used in the twice-weekly Lotto drawings are measured and weighed regularly to ensure uniformity before being trotted off to a secured safe room. New staffers are carefully screened, and access to lottery headquarters is closely monitored.

Ichimura-Hoffman likes to know what's going on at firms that are critical to the success of the lottery. The firm that supplies the ticket stock, for example, was informed that it had better be ready to spring if a retailer's supply was low. Both AT&T and MCI Communications Corp. were given stern warnings during the record-breaking drawing.

"We don't even want them near our circuits," she says. "We told all the electricians not to come back until another week has passed; we don't want them to do anything with the wiring. We don't want air conditioners fixed unless they're in the computer room. We freeze all software, all testing."

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CALENDAR

"Insourcing vs. Oursourcing: Innovation Without Headcount," The Yankee Group's second annual conference on outsourcing, will be held July 30-31 at the Westin Resort in Hilton Head, S.C.

Speakers from user companies include Fred Cisewski, senior vice president at Bank South NA, and Al Jones, director of information systems at Kelsey-Hayes. Vendor speakers include Mel Bergstein of Computer Sciences Corp. and Howard Frank of Network Management, Inc.

For more information or to register, contact Betsy Gray, The Yankee Group, Boston, Mass. (617) 367-1000.

JULY 7-13

International Conference and Exhibits on Failure Analysis. Montreal, July 8-11 — Contact: ASM Member/Customer Service Center, ASM International, Materials Park, Ohio (216) 338-5151.

Structured Development Forum. Portland, Ore., July 8-11 — Contact: Software Association of Oregon, Beaverton, Ore. [illegible]

National EDI '91 — Working Together to Make it Happen. Washington, D.C., July 9-10 — Contact: Barbara Kaufman, Bellcore, Livingston, N.J. (201) 740-4324.

Engineering Workstations Conference. Boston, July 9-11 — Contact: EWC, Santa Monica, Calif. (213) 458-0500.

Geographic Information and Spatial Data Exposition. Washington, D.C., July 9-12 — Contact: Gisdec, Silver Spring, Md. (301) 445-4400.

Sony Government Technology Exposition. Washington, D.C., July 10-11 — Contact: Sony Business and Professional Group, Montvale, N.J. (800) 877-7669.

APICS 1991 Total Manufacturing Performance Seminar. San Diego, July 10-12 — Contact: APICS Meeting Registration, Falls Church, Va. (703) 237-8344.

JULY 14-20

Guide 69. Boston, July 14-19 — Contact: Guide Headquarters, Chicago, Ill. (312) 644-6610.

American Association for Artificial Intelligence National Conference on Artificial Intelligence. Anaheim, Calif., July 14-19 — Contact: AAAI-91, Menlo Park, Calif. [illegible]

TQM '91 Conference. Washington, D.C., July 15-17 — Contact: Paula Harrington, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-0777.

Communication Networks West Conference and Exposition (Comnet West). San Francisco, July 15-18 — Contact: IDG Conference Management Group, Framingham, Mass. [illegible]

Video Expo. Chicago, July 15-19 — Contact: Debbie Botolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Computer Technology and Military Planning Symposium and Exhibition. Arlington, Va., July 15-18 — Contact: Automated Missions Planning Society, Pequea, N.J. (609) 529-7023.

Information Engineering/EAD. Washington, D.C., July 16-18 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

International Conference for Young Computer Scientists (ICYCS '91). Beijing, China, July 18-20 — Contact: Tongxiao Liu, Coal Laboratory, Academia Sinica, Beijing, China. Fax: (011 86 1) 2567734 or 2568152.

JULY 21-27

IFO Quarterly Meeting. Pittsburgh, July 21-26 — Contact: National Computer Graphics Association, Fairfax, Va. (703) 698-9600.

Remittance and Document Processing Forum and Exposition. Anaheim, Calif., July 21-24 — Contact: Recognition Technologies Users Association, Boston, Mass. (617) 426-1167.

IBM '91. Beaver Creek, Colo., July 22-24 — Contact: Burnett Data Systems, Rockville, Md. (301) 762-1288.

Macivity '91: The Macintosh Connectivity Conference. Santa Clara, Calif., July 22-25 — Contact: Wingbrae Computer Co., Los Gatos, Calif. (408) 345-2500.

Software World. Toronto, July 23-25 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3536.

Artificial Intelligence and the Help Desk. San Francisco, July 23-26 — Contact: Help Desk Professionals, Colorado Springs, Colo. (719) 531-5138.

JULY 28-AUGUST 3

International Management Graphics User's Group Meeting. Las Vegas, Aug. 1-4 — Contact: MGI, Minneapolis, Minn. (612) 854-1220.

AUGUST 4-10

Robots Technologies Conferences. Seattle, Aug. 4-7 — Contact: Andy Rabala, The Wentworth Group, Boulder, Colo. (303) 449-3410.

Software Maintenance and Re-engineering. Washington, D.C., Aug. 5-9 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

CASE World. Boston, Aug. 6-8 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3536.

Localnet '91. San Francisco, Aug. 8-10 — Contact: Local Area Network Dealers Association, Elmhurst, Ill. (708) 279-2355.

AUGUST 11-17

Information and Technology: Gateway to Solutions. San Francisco, Aug. 11-15 — Contact: URISA, Washington, D.C. (202) 289-1695.

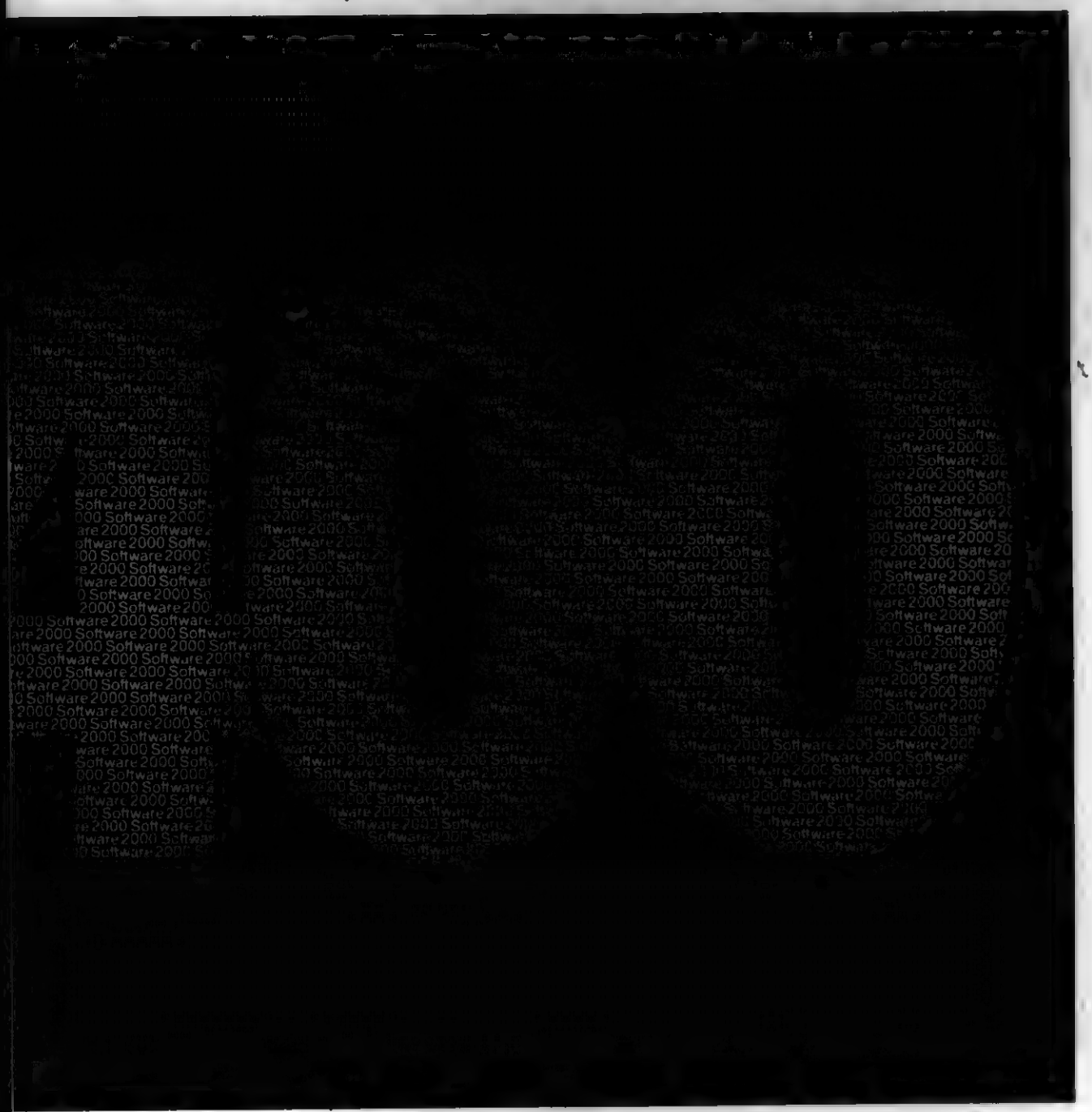
Manufacturing Networks Conferences. Chicago, Aug. 12-13 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Electronic Data Interchange for Government. Washington, D.C., Aug. 13-15 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

The National Conference on Computing. New Haven, Conn., Aug. 13-16 — Contact: The Research Center on Computing and Society, Southern Connecticut State University, New Haven, Conn. (203) 397-4423.

Windows and OS/2. Boston, Aug. 14-16 — Contact: [illegible]

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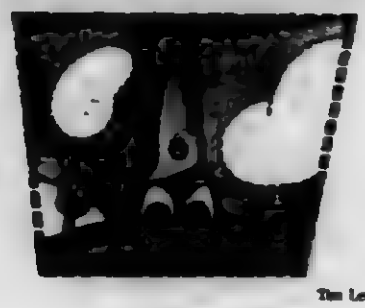
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CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"A diagnostic approach to information management problems in the organization"

By Richard J. Palmer, Martin W. Tucker and James B. King II

Journal of Systems Management
May 1991

■ The information systems manager can improve the overall efficiency and effectiveness of IS by identifying areas for improvement through the development, distribution and analysis of a user satisfaction survey.

In order for IS managers to maintain an information system that will satisfy present and future needs of management, the following guidelines must be adhered to:

- Begin with a philosophical commitment to customer service. The products IS departments provide to users should create high customer satisfaction.
- Manage the information base proactively by taking steps to ensure that customers receive what they need in a timely manner and are not given what they don't need. Surveys can often be valuable tools in determining whether the needs of the users are being efficiently and effectively satisfied.
- Anticipate the future information needs of customers. An IS manager can be successful by meeting customers' current needs. However, to remain successful, managers must be able to foresee users' future needs and keep the user informed of the progress made toward meeting those needs. — *Kelly E. Dwyer*

"Teaching smart people how to learn"

By Chris Argyris

Harvard Business Review
May-June 1991

■ There is a learning disability affecting corporations today: Many highly educated, high-profile professionals — including IS managers — are having a hard time learning on the job.

Their success in education is precisely the reason they have difficulty learning. Their educational records speak to their success and to the fact that they have almost never seen failure.

To correct this weakness, managers must realize that learning is not just problem solving; It also involves reasoning. Behaviorial changes might be in order so that managers can obtain their highest level of success. Managers need to be taught that failure is a part of the learning process. Accepting failure, rather than trying to shift the blame for it onto other employees, is the key to successful learning. — *Stefanie McCann*

"Client/server architecture promises radical changes"

By Grey Freeman and Jerry York

Cause/Effect
Spring 1991

■ By the mid-1990s, client/server architecture is expected to be in widespread use among Fortune 500 companies. But before it can be widely adopted, some transitions will be necessary.

While users working from their personal computers or workstations on a network have for years been able to access other platforms and tiers through local-area and wide-area networks, doing so involves a patchworked system. The client/server model takes accessibility many steps further and makes the process easier.

Basically, the client/server architecture gives the PC user a consistent user interface to access a variety of resources from different vendors and architectures connected through networks. The user may not know or care which vendor's platform is being accessed, the hardware and software characteristics of that platform; the commands necessary for the access or how that access request is routed through the network. The PC is used to gain access when the user makes a request. When the user's "client" system requests access to a computing resource, his PC or workstation will either handle the request itself, if capable, or pass the request through the network to an appropriate "server."

The problem is that hardware technologies to make the client/server concept viable are available, but software technology and standards for the architecture have not yet fully emerged.

To plan for the emergence of client/server architecture, companies and institutions will need to adopt new technologies, develop new applications design and development methodologies and restructure their IS organizations. — *Alan J. Ryan*

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Teaching minis new tricks

Necessary changes lie ahead, but midrange machines are proving they can be the right machine for a server job

BY JIM HAMMONS

Amid all of the client/server fanfare, there are two groups of people decidedly not swayed by the idea of using personal computers or workstations as the server component in such a setup: vendors of minicomputers and owners of minicomputers who would rather take advantage of what they already have.

Take Lee Bockhorst, manager of technical research at Central Area Data Processing Cooperative near St. Louis, which manages systems and services for a group of rural utility companies in the Midwest.

Bockhorst used connectivity software provided by Unisys Corp. and existing communications lines to turn the cooperative's Unisys U6000 minicomputers into servers. All in all, he says, it was a relatively smooth transition.

"We sort of grew into it over time as users wanted more access to data from their PCs and LANs," Bockhorst says. "It's what we've had installed, and there's no sense moving from it now."

In a time of restricted budgets, the ability to find an additional use for existing minicomputer resources is extremely attractive. With the help of the original vendor, companies are finding they can avoid the purchase of an additional server — even a low-cost PC server — and put more resources into software and connectivity.

The question is: Is the minicomputer actually a better choice than the smaller machines as a local-area network server? Is it ever a good idea to purchase one instead of a PC or workstation?

According to Business Research Group, a market research firm in Newton, Mass., a significant number of users think so. In a recent study, 31% of 100 information systems managers surveyed said they plan to purchase minicomputers as LAN servers in the future.

Certainly, the minicomputer vendors would like you to think so. All of the major players are now making a concerted effort to reposition and reconfigure their traditional terminal-to-host minicomputers as very powerful servers for the burgeoning networks their customers are installing.

The newer machines, such as Digital Equipment Corp.'s VAX 4000 and Hewlett-Packard Co.'s latest 3000 and 9000 systems, have significantly improved I/O performance and can be configured with server software and PC connectivity options direct from the manufacturer.

In addition, these systems do not require a multiuser license or some of the components typically needed to support a traditional minicomputer installation.

At the same time, PCs undoubtedly hold quite a few more trump cards than their larger predecessors, even these sleeker models. PCs are easier to install, increasingly able to handle critical applications and less expensive, both to purchase and to maintain. However, minicomputers may still be worth more than just a second look.

For instance, vendors such as DEC and HP are working to make the minicomputer environment — which is notoriously difficult in terms of configuration and maintenance — more familiar to PC users.



Debbie Fabus

Minicomputers are also better able to accommodate growth than even an Intel Corp.-based I486 PC server.

Superservers from Compaq Computer Corp., Netframe Systems, Inc. and Parallan Computer, Inc. are addressing growth and storage limitations of PC servers, but minicomputers ultimately offer higher top-end growth.

With superservers, you also run the risk of locking yourself into a local-area rather than a corporatewide configuration. This is because minicomputers are better and more experienced at wide-area connectivity.

Other strengths of server-configured machines include the following:

- Strong systems management.
- Support of existing multiuser applications.
- High levels of service and maintenance (see story page 68).
- Better fault tolerance.

However, while fault tolerance and offerings such as systems management are all well and good, they are proprietary solutions, and people seriously considering minicomputers as servers need to look beyond the proprietary world to connectivity with PCs and LANs.

It is here, in the area of

Continued on page 64

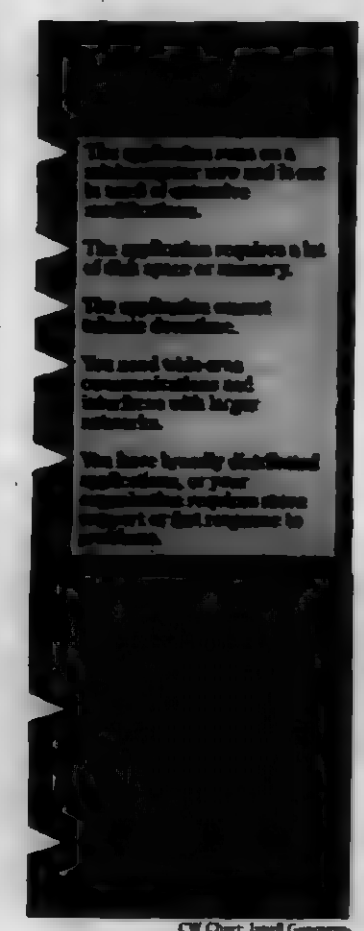
Hammons is an independent consultant in Mesa, Ariz., and was formerly an analyst at The Sierra Group, Inc.

INSIDE

Falling Resale Zone
Many factors have newer minis dropping in value.
Page 64.

At Your Service
Service ain't what it used to be: It's a whole lot better.
Page 68.

Product Guide
A comprehensive listing of late-model miniservers.
Page 69.



CW Chart: Janet Genovese

Continued from page 63

connectivity with existing PC protocols, that minicomputer vendors will have to become more innovative. HP, for one, has been quietly upgrading its proprietary database, Allbase, to accommodate standard SQL database calls.

"This will allow nearly all the PC SQL products to work with the HP minis as database servers," says William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Dave Heck, communications engineer for the city of Tempe, Ariz., and a current user, says he hopes to try the new database. The city government has approximately 21 HP 3000 systems installed — too big an investment to just throw away. "We plan to convert about 60% to 70% of those 3000 systems to SQL database servers, probably using Allbase," Heck says.

Another step minicomputer vendors are taking to integrate new miniservers with existing LANs is to support network operating systems such as Novell, Inc.'s Netware and Microsoft Corp.'s LAN Manager.

Novell's Portable Netware runs on DEC's VMS operating system and Unix. In addition, HP, Wang Laboratories, Inc. and Data General Corp. each have licenses to the network operating system, which they have ported to their own operating systems. Microsoft's LAN Manager has been ported to run on most Unix systems.

Slow going

While support of these network operating systems allows the minicomputer to act as a network file and print server while concurrently supporting other network functions such as server-based database applications, it can also make the minicomputer quite sluggish: In many cases, the network operating system is implemented on top of the minicomputer's native environment.

A much larger roadblock to minicomputer popularity is its higher price.

Several vendors are working to bring the cost of their entry-level miniservers down to more competitive levels, but they are still more costly than even more advanced PC servers such as the Compaq Systempro.

Minicomputers offer much higher potential value on the secondary market. Even though resale values are declining (see story below), they are still much more attractive to lessors than PC-based systems, including superservers.

For one thing, says Tony Coppola, president of Computer Products Marketing in Laguna Niguel, Calif., residual values at the end of the lease for PC-based servers are typically very small.

In addition, lessors would rather have customers renew a lease — a common practice in the minicomputer world — than try to remarket a PC server at the end of a lease. They are particularly skittish about establishing any resale value at all for the multiprocessing superservers because those companies have no track record.

Third, Coppola says, "minicomputers can be remarketed as a server or as a minicomputer. It gives the user a better deal in the end."

In other words, because the lessor has two ways to resell a used minicomputer, the potential value at the end of the lease is higher. With this higher residual value, users can negotiate lower lease payments over the term of the lease.

Beyond justifying the cost, the most difficult short-term problem minicomputers contend with is the lack of innovative new software that implements true client/server functionality.

PC vendors actually have the same difficulty in finding applications that allow a server and a workstation to process different parts of the same application at the same time. But because minicomputer vendors see this as their proving ground, they tend to feel the burden more acutely.

Proving ground

What many minicomputer vendors are waiting for are standards to emerge in wide-area networking, such as the Open Software Foundation's Distributed Computing Environment.

Because such standards would support common procedure calls and application programming interfaces across a network, they would allow developers and users to create applications using computing resources and data from across the enterprise.

Such standards would do much for the minicomputer vendors' advantage over PC server vendors, especially when you consider their previous experience in wide-area communications and the fact that most minicomputer operating systems, including Unix, support multithreaded commands.

Midrange vendors may be aggressively pursuing the server market, but PC vendors are certainly not standing still. Many are adding fault-tolerant capabilities, network management features and increased storage to their systems.

As Bluestein suggests, many of the advantages miniservers currently enjoy will not last, especially if vendors don't move quickly to improve their support of PC and LAN protocols.

Still, the strength of the installed base and the experience of the minicomputer vendors should not be underestimated. In particular, those IS organizations familiar and comfortable with midrange systems will find it a relatively easy transition into using those systems as servers on their networks. ●

Watch out for plummeting residuals

BY KARLYN KILROY and TONY MEMBRINO

Caution: Falling resale values ahead.

There seems to be no end to their plummet. Compared with the 1980s, today's minicomputer product life cycles are shorter, price/performance improvements are more frequent and aggressive, and vendor discounts are steeper.

Price/performance improvements especially have a devastating effect on the value of older — and sometimes not so old — machines. For example, the 3-year-old VAX 6000-310 is trading for 33% retail, whereas it took nine years for the VAX 11/780 to drop to 28% retail.

Recent research indicates the IBM Application System/400 9406 B30 — less than three years old — is trading for approximately 41% retail. An IBM System/38 Model 8 traded for 60% retail during the same period of its life cycle.

Lower resale values can be good news for buyers, but they can be bad news as well. It is difficult to get the expected value for the system when it comes time to sell it. There is still bargaining room, however, especially with minicomputers emerging in server roles (see story above).

Minicomputer vendors today will probably get even more aggressive with price/performance improvements and marketing incentives.

In fact, the proliferation of personal computer local-area networks and open systems is placing even more pressure on midrange firms to offer competitively priced feature-rich products more frequently. ●

Kilroy and Membrino are analysts at Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

Market value

Vendor	Model	Current list price	Current fair-market value $	Percent of retail	As of this date
DEC	VAX 6000-310	$193,305	$87,000 $72,000	45% 37%	Feb. '91 April/May '91
	VAX 8550	$427,560	$48,000 $52,000	11% 12%	April/May '91 Feb. '91
	Microvax 3600	$104,600	$34,000	33%	March '91
Data General Corp.	MV/15000-8	$62,500	$10,000	16%	April '91
Hewlett-Packard Co.	3000-70	$185,000	$20,000	11%	March/April '91
Wang Laboratories, Inc.	VS 65	$35,200	$2,000	6%	Feb. '91
	VS 7150	$212,600	$48,000	23%	Feb. '91
IBM	Application System/400 9404-B10	$21,060	$11,600 $10,700	55% 47%	Jan. '91 April '91
	9406-B30	$29,790	$20,900 $16,400	70% 55%	Jan. '91 April '91
	9406-B45	$70,280	$54,800 $41,500	78% 59%	Jan. '91 April '91
	System/36 5360-B24	Current list $64,950	$9,100 $5,800	14% 9%	Jan. '91 April '91
	5360-D2K	Current list $80,030	$29,600 $26,000	37% 32%	Jan. '91 April '91

Fair market value of System/38 processors was not established during 1991 due to minimal trading

Source: Technology Investment Strategies Corp.

CW Chart: Doreen St. John

PEOPLESOFT, INC.
Walnut Creek, California
$5,000,000
SERIES A PREFERRED STOCK
Financing provided by
Norwest Venture Capital

To each vendor, its own server strategy

BY JIM HAMMONS

Each minicomputer vendor has taken a different tack in ramping up its server offerings. What follows are synopses of each.

IBM

IBM announced connectivity software for its Application System/400 in April; it was then that the company first dared to call any machine in its minicomputer line a server.

The announced software, PC Support for the AS/400, implements IBM's own Advanced Program-to-Program Communications protocol, but it does not natively support the most common personal computer networking protocols, such as Novell, Inc.'s Netware and Microsoft Corp.'s LAN Manager.

The AS/400 is also limited in its ability to interface with other servers, according to some analysts. In addition, it still has only a proprietary database, although many third-party developers are developing client/server applications for it. The AS/400 does offer excellent connectivity with IBM host systems.

DEC

Digital Equipment Corp. has received positive reviews for its efforts to integrate PCs into its overall office strategy and for its connectivity to IBM mainframes.

DEC's recent cooperation with Apple Computer, Inc. has also produced some of the best Macintosh integration products on the market.

However, DEC remains committed to its own Decnet protocols, although the company does provide support for LAN Manager, and analysts say they expect the company to support Netware on the VAX soon.

On the software side, DEC is still heavily promoting its own RDB database product but shows some signs of working with other vendors to improve third-party database support.

DEC also intends to significantly improve the ease of installation for its server products.

Hewlett-Packard

Hewlett-Packard Co. has done well on the communications front, supporting both Netware and LAN Manager on its HP 3000 and HP 9000 systems. It also connects well with IBM host systems. Its ability to integrate with other servers on a network is very strong because of the company's early commitment to Transmission Control Protocol/Internet Protocol (TCP/IP).

HP's New Wave software provides some of the most impressive client/server capabilities in the industry. HP has also been a leader in opening its proprietary database to other front-end products and in recruiting

Continued on page 74

Take two

One of the most important things to remember is that you do not have to use minicomputer- or PC-based servers exclusively.

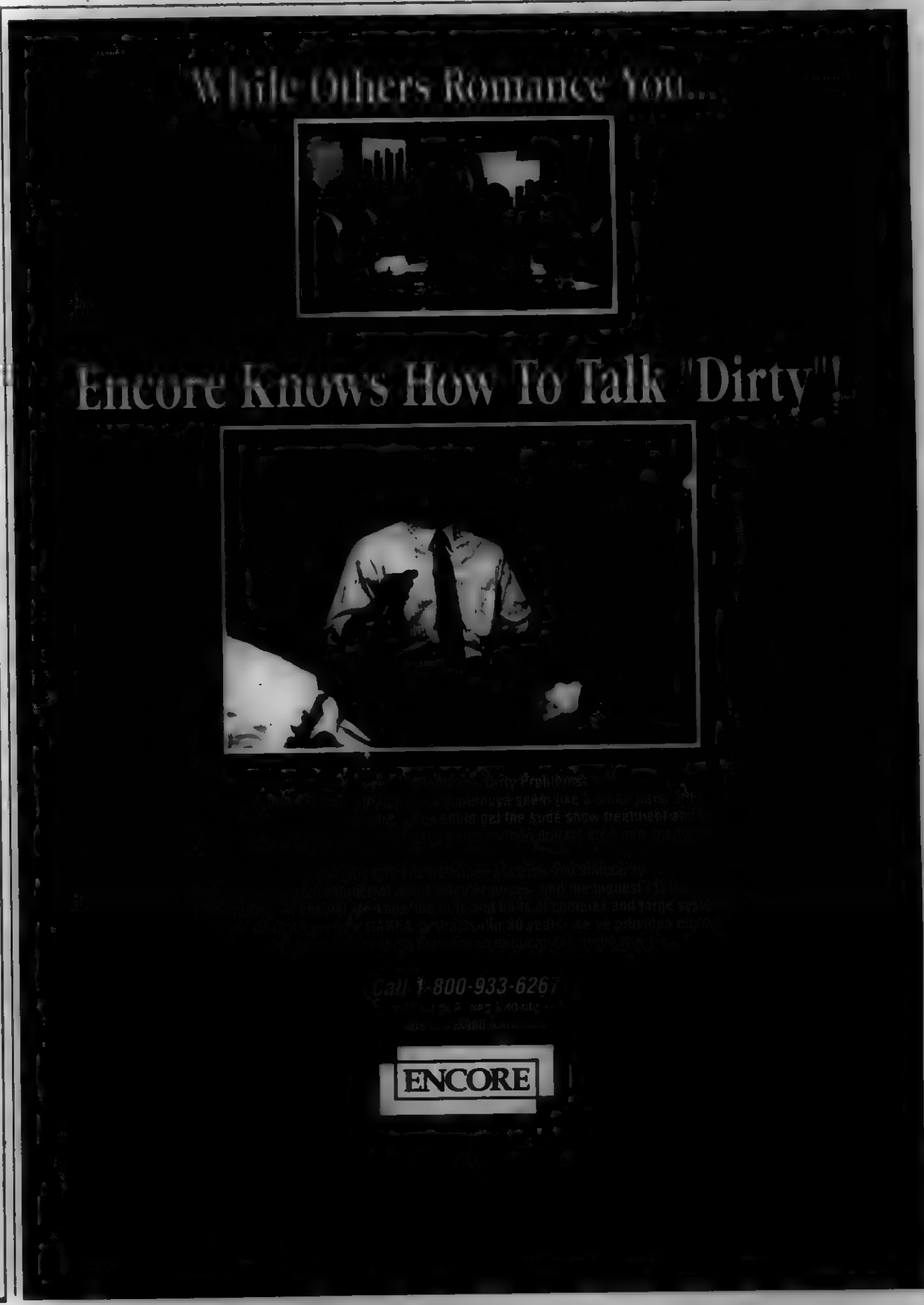
Applications in most organizations are diverse enough that both types of servers may be justified in different situations.

For example, you may use miniservers for all network-based transaction processing applications and PC servers for smaller work group applications.

These networks could all be tied together on the same enterprisewide communications backbone.

What this means for minicomputer vendors is that they're no longer the only game in town. "The mini will be just another system on the network," says William Bluestein, an analyst at Forrester Research, Inc..

JIM HAMMONS





I'm sitting in a
about my son
above our house
I told him that
hand; however,
some unknown
and my little boy
MAINTENANCE
come up with
actually happen.
switch is devoted
for the tip and he
fly right, Dad,
for me going to

corner office on a round planet and I'm thinking and how last night he looked at the crescent moon and said, "Daddy, broken moon, broken moon." And the moon would be fixed soon by a silent and unseen the PBX that I bought for the corporation from company might not be fixed any time soon at all, who is only five said, "Dad, AT&T has a REMOTE lab in Denver set up to detect any problems that might their DEFINITY® System and fix them before they You see, Dad, a full 1/3 of the memory of a DEFINITY entirely to self-maintenance." And I told him thanks looked up at me and said, "Straighten up and because no silent and unseen hand is going to pay college."

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Service options on the rise

BY LORI KLEINMAN

When you look over your options for minicomputer support and service, don't be surprised if the list has gotten lengthier and the offerings more complex than they used to be.

Especially with minicomputers taking on new roles in many organizations, minicomputer vendors are expanding their service portfolios beyond remedial maintenance to include multivendor and network support and are customizing and adapting technologies to meet customers' business needs.

With this new emphasis on service, users will need to get accustomed to a new way of pricing. Service used to be thrown in with the product purchase as a sales negotiating tool; more and more, service and support is being charged separately.

What follows are the support offerings from the major systems vendors:

IBM

During the past few years, IBM has concentrated primarily on simplifying its service contracts. Last month, however, it introduced value-added services through its newly organized Integrated Systems Solutions Corp.

The company's Professional Services and Education/Training Groups of the Applications Solutions Division, announced last fall, also offer enhanced services.

Network integration is still offered through custom bids, however, rather than packaged support offerings.

IBM has yet to expand End-User Services — help desk support for its own and multivendor personal computers — to minicomputers, but as the minicomputer's server role increases, the company may have to consider that.

DEC

Digital Equipment Corp. is one of the few vendors to support distributed systems with its VAX and Microvax service portfolio. It offers full support on the primary server system — including rights for designated people to call the support centers directly — and "economy" support on connected systems.

With its Vendor Application Services, DEC is well ahead of its competitors in providing third-party software support for midrange applications.

DEC has also gotten a jump on configuration service, which is being overlooked by other vendors. For example, DEC will configure and set up 1,000 or more PCs connected to a server for a large account.

Like IBM, DEC may need to consider adapting some of its desktop services for PCs and workstations to provide help desk support to other VAX platforms.

Hewlett-Packard

Hewlett-Packard Co. offers separate, tiered hardware and software support portfolios for its HP 3000 minicomputer product line, allowing customers to choose the level of support appropriate for their environments.

New services

The following trends have emerged as vendors attempt to address customers' minicomputer support needs more fully:

- Greater supply of value-added services.
- Integrated hardware and software service contracts.
- Increased availability of multivendor support.
- Differing levels of support for the server and nodes.
- Comprehensive network support offerings.

The company may expand its integrated hardware/software/network support to its minicomputer products, although it is currently available only for its workstation product line.

HP does offer network support under its Consultline services, which are priced separately from the traditional hardware and software support contracts.

NCR

NCR Corp. recently developed nine specialized "centers of expertise": systems integration, software engineering, account support, product, education, customer support, logistics, industry (vertical market focus) and business manage-

These are essentially specialized organizations with the staff and resources to deliver highly customized, nontraditional services.

NCR also offers a well-rounded portfolio of network integration services.

Unisys and Prime

Unisys Corp. and Prime Computer, Inc. each have recently announced reorganizations that separate value-added services from traditional remedial maintenance business units. ●

Kleinman is manager of software support at Ledgeway/Dataquest, a market research firm in Lexington, Mass.

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Server-configured minicomputers

VENDOR	PRODUCT	COMPARABLE SYSTEMS	MAXIMUM NUMBER OF CPUs/MACHINE CYCLE TIME (MHz)	HOST COMPUTER OPERATING SYSTEM; (NETWORK OPERATING SYSTEM)	CLIENT(S) SUPPORTED	DATABASE(S) SUPPORTED	BENCHMARKS[1]	PERFORMANCE IN MIPS[2]	MEMORY RANGE (BYTES)/CACHE CAPACITY (BYTES)	DISK CAPACITY (BYTES)/DISK TRANSFER RATE (BYTE/SEC)	LAN PROTOCOLS SUPPORTED	SUPPORTS ETHERNET OR TOKEN RING	OPEN SYSTEMS STANDARDS SUPPORTED	PRICE RANGE WITH CONFIGURATION
[illegible]	System 7000 models 700A, 700S, 700D, 700D ES	DEC VAX 6000, IBM ES/9000, HP 9000 Series/800	1/[illegible] nsec	Data System V 4.0; IBM; (LAN Manager for Unix)	DOS, OS/2, Unix	All, including Informix, Oracle, Sybase	208.5 tpmC/sec, running Informix	14 - 168	16M - 512M/16M per CPU	1.0G - 69G/[illegible]	SNA, TCP/IP, X.25, SDLC, BSC, NMP, Data ID, VCS	Ethernet	Posix	$95,000 - $945,000 with 1 - 12 CPUs, 512M-byte memory, 1.2G-byte disk
	Runner FT	Tandem Integrity S2 Guardian 22/2000	2 physical/ 1 logical/ 14.67 MHz	Data System V Release 3.1.1; (LAN Manager for Unix)	Unix	Informix, Ingres, Oracle, Sybase	8.28 fault-tolerant TPS/sec./sec. (tested)	11 - 15.5	16M - 192M/64K (instruction cache, 64K data cache	97G/1.5M	SNA, TCP/IP, X.25	Ethernet	Data System V Interface Definition	$120,000 - $307,000 with 2 physical and 1 logical CPUs, 16M- to 128M-byte memory, 600M-to 1.5G-byte disk; $1,200 for operating system
	[illegible] 70, Model 80	NCR Tower, IBM AS/400	4/33 MHz 24 MIPS	Unix System V Release 3.2; (LAN Manager for Unix)	DOS, OS/2, Unix	Informix, Ingres, Oracle, Sybase, Unify	NP	6 - 16	16M (Model 70), 32M (Model 80) - 640M/4M, NP	1.6G (network), 1.2G (transaction)	SNA, TCP/IP, X.25, SDLC, BSC, Data ID, VCS	Ethernet	Posix, Data System V	$44,000 - $74,000 with 2 physical and 1 logical CPUs, up to 64M-byte memory, 1.6G-byte disk
Bull HN Information Systems, Inc. (508) 294-6000	DPX/2 Model 150 ETS	AT&T Starserver, NCR 3445	1/33 MHz	SCO Unix or Open Desktop; (LAN Manager for Unix)	DOS, OS/2, Unix	Informix, Oracle SCO Directory package	10.4 Specmarks	15	4M - 64M/128K	2.4G/4.8M	TCP/IP	Ethernet	Posix, X/Open CAE, FIBS	$15,000 + with 1 CPU, 4M-byte memory, 320M-byte disk, LAN, monitor, 128K cache, operating system
	DPX/2 Model 210, Model 220	NCR Tower 32 Model 300 and compatibles	1/25 MHz	Bull Open Software; (LAN Manager for Unix, NFS)	DOS, OS/2, Unix	Informix, Oracle, Progress, Sybase, Unify	NP	5.2	4M - 32M/64K	3G/Up to 4M	OSI, TCP/IP	Ethernet	Posix, XPG3+	$12,000 + (Model 210), $17,000 + (Model 220) with 1 CPU, 4M-byte memory, 155M-byte disk, streamer, console, operating system
	DPX/2 Model 250	IBM RS/6000 Model 320, Unisys S/4040	1/25 MHz	Bull Open Software; (LAN Manager for Unix, NFS)	DOS, OS/2, Unix	Informix, Oracle, Progress, Sybase, Unify	9.8 TPC/A; 9.5 Specmarks	12 - 15	4M - 32M/256K	3G/Up to 4M	OSI, TCP/IP	Ethernet	Posix, XPG3+	$17,000 + with 1 CPU, 4M-byte memory, 155M-byte disk, streamer, console, operating system
	DPX/2 Model 320, DPX/2 Model 340	IBM RS/6000, HP 9000, NCR 32	2/25 MHz, 4/33 MHz (Model 340)	Bull Open Software; (LAN Manager for Unix, NFS)	DOS, OS/2, Unix	Informix, Oracle, Progress, Sybase, Unify	8 TPC/A trans./sec. (1 CPU) (Model 340)	6 - 12, 7.5 - 30	8M - 72M/64M per CPU	11G, 23G/Up to 4M	OSI, TCP/IP	Ethernet	Posix, XPG3+	$18,300 + , $20,300 with 1 CPU, 4M-byte memory, 155M-byte disk, streamer, console, 64K cache, operating system
	DPX/2 Model 360	IBM RS/6000, NCR 3000, Sequent 2000, Wyse 9000	4/25 MHz	Bull Open Software; (LAN Manager for Unix, NFS)	DOS, OS/2, Unix	Informix, Oracle, Progress, Sybase, Unify	14.123 TPC/A trans./sec. (1 CPU), 22.74 TPC/B trans./sec. (1 CPU); 8.9 Specmarks	15 - 60	16M - 144M/64M per CPU	Up to 23G/Up to 4M	OSI, TCP/IP	Ethernet	Posix, XPG3+	$28,455 + with 1 CPU, 16M-byte memory, 336M-byte disk, streamer, console, 64K cache, operating system
	DPX/2 Model 510	IBM RS/6000, RS/6000 Model 550	1/60 MHz	Bull Open Software/RISC; (NFS)	DOS, OS/2, Unix	Informix, Oracle, Progress, Sybase, Unify	44 Specmarks	60 MAX	32M - 512M/64K	675M - 40G/Up to 4M	TCP/IP	Ethernet	Posix, XPG3+	$160,000 + with 1 CPU, 32M-byte memory, 675M- 40G-byte disk, SCSI controller board, 512K multilevel cache, 1560-byte tape
	DPS 6000 Models 200, 500, 600	DEC VAX 6000, IBM AS/400	2 - 5/210, 200, 140 nsec	GCOS 6 HVS, GCOS 6 HVS ISC Unix, HVS, Unix; (LAN Manager for Unix)	Unix	Informix, IFS, IDS-II, Oracle	77.0 (25 MHz); 11.6 (33 MHz) Specmarks	1.7, 5.7 10	4M - 64M/16K - 192K	3.6G - 38.4G/1.2M - 3M	OSI	Ethernet	ISC Unix	$12,500, $38,500, $79,700 with 1 - 2 CPUs, 2M to 16M-byte memory, 68M to 290M-byte disk
[illegible]	[illegible]	NP	[illegible]	[illegible] (Portable Netware)	Unix, Macintosh, Dos, HP	[illegible]	NP	[illegible]	[illegible] - 128M/64K	NP	IPX/SPX, Banyan, OSI, SNA, TCP/IP	Ethernet, Token Ring	Unix System V	$60,000 with 2 CPUs, 16M-byte memory, 660M-byte disk, 150M-byte tape, operating system, NFS
	[illegible] Model 7010	HP	[illegible]	[illegible] (Portable Netware)	[illegible]	[illegible]	HP	40 - 60	16M - 128M/64K	NP	IPX/SPX, Decnet, OSI, SNA, TCP/IP	Ethernet, Token Ring	Unix System V	$82,700 with 2 CPUs, 16M-byte memory, 660M-byte disk, 525M-byte tape, operating system, NFS
	[illegible] Model 7020	NP	[illegible]	[illegible] (Portable Netware)	[illegible]	[illegible]	NP	80 - 120	16M - 256M/64K	NP	IPX/SPX, Decnet, OSI, SNA, TCP/IP	Ethernet, Token Ring	Unix System V	$99,900 with 2 CPUs, 16M-byte memory, 660M-byte disk, 525M-byte tape, operating system, NFS
Control Data Corp. (612) 863-8445	4330	NP	1/25 MHz and 33 MHz	EP/IX; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle, Sybase, Basis Plus	25.1 Specmarks	40	8M - 128M/64K	6.3G/NP	IPX/SPX, Decnet, SNA, TCP/IP, OSI, Cdcnet	Ethernet, Token Ring, FDDI	Posix	$10,640 - $80,000 with 8M-byte memory, 1 CPU, 400M-byte disk capacity, Ethernet
	4350	NP	1/33 MHz	EP/IX; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle, Sybase, Basis Plus	31.5 Specmarks	41	16M - 128M/128K	11G/NP	IPX/SPX, Decnet, SNA, TCP/IP, OSI, Cdcnet	Ethernet	Posix	$35,350 - $150,000 with 1 CPU, 16M-byte memory, 660M-byte disk
	4360-300	NP	1/33 MHz	EP/IX; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle, Sybase, Basis Plus	32.1 Specmarks	41	32M - 256M/128K	147G/NP	IPX/SPX, Decnet, SNA, TCP/IP, OSI, Cdcnet	Ethernet, FDDI	Posix	$60,550 - $200,000 with 1 CPU 32M-byte memory, 660M-byte disk
	4680	NP	1/60 MHz	EP/IX; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle, Sybase, Basis Plus	55.7 Specmarks	68	32M - 384M/896K	179G/NP	IPX/SPX, Decnet, SNA, TCP/IP, OSI, Cdcnet	Ethernet, FDDI	Posix	$136,550 - $500,000 with 1 CPU, 32M-byte memory, 660M-byte disk, channel, QIC tape drive, Ethernet
	Cyber 930A, 930C	Silicon Graphics, Inc. 4D300S series, 4D400S series	8/33 MHz - 40 MHz	IRIX; (LAN Manager for Unix)	Unix	Informix, Oracle, Sybase	19.5 - 150 Specmarks	30 - 200	8M - 256M/64K, instruction cache, 64K data cache, 256K data cache per CPU	300M - 47.5G/4M (IPI), 2.4M (SCSI)	Decnet, SNA, TCP/IP, FDDI	Ethernet	Posix	$34,900 - $184,900 with 1 - 8 CPUs, 8M-byte memory, 300M to 47.5G-byte disk, operating system
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8M - [illegible] internal	[illegible]	[illegible]	Ethernet	[illegible]	$[illegible] + with 1 CPU, 8M-byte memory, [illegible]

All products or models listed become available after December 1990; all listings are traditional minicomputers positioned as servers. [1]Per-second performance ratings, based on the following industry-standard benchmarks: DS — Dhrystones, Version 1.1, unless Version 2.1 is noted; DC — DebitCredit transactions based on 95% subsecond response); LP — Linpack (100 X 100 full-precision MFLOPS); LL — Livermore Loops Guarmonic mean; 14 loops); TPC/A — the first benchmark implementation of the Transaction Processing Council. Vendors supplied actual or estimated benchmark figures. [2]MIPS — Millions of instructions per second. [3]VUP — VAX Units of Performance, a measurement used by DEC in which one VUP equals the performance of the VAX-11/780. [4]MAI Systems Corp. measures performance by the number of concurrent users that can be supported by a given machine. The GPX 5070 supports up to 160 users; the GPX 6070 supports up to 360 users.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.



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PRODUCT SPOTLIGHT

VENDOR	PRODUCT	COMPARABLE SYSTEMS	MAXIMUM NUMBER OF CPUs/MACHINE CYCLE TIME (MHz)	HOST COMPUTER OPERATING SYSTEM/ (NETWORK OPERATING SYSTEM)	CLIENT(S) SUPPORTED	DATABASE(S) SUPPORTED	BENCHMARKS[1]	PERFORMANCE IN MIPS[2]	MEMORY RANGE (BYTES)/CACHE CAPACITY (BYTES)	DISK CAPACITY (BYTES)/DISK TRANSFER RATE (BYTE/SEC)	LAN PROTOCOLS SUPPORTED	SUPPORTS ETHERNET OR TOKEN RING	OPEN SYSTEMS STANDARD SUPPORTED	PRICE RANGE WITH CONFIGURATION
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Dataquest Corp. (512) 383-7000 (800) 733-1580, Ext. 7084	7000	Mid- to low-end DEC products	2/33 MHz	Resource Management System; (ARC: Attached Resource Computer)	DOS, OS/2, Unix	Oracle	NP	NP	8M - 128M/ application-dependent	4.74G/ function of disk	TCP/IP, ARC	Ethernet, Token Ring	Open Systems Connection	$21,995+ with 1 CPU, 8M-byte memory, 798M-byte disk
	7000	Mid- to low-end DEC products	6/33 MHz	Resource Management System; (ARC: Attached Resource Computer)	DOS, OS/2, Unix, RMS	Oracle	NP	NP	32M - 256M/ application-dependent	28G/function of disk	TCP/IP, ARC	Ethernet, Token Ring	Open Systems Connection	$100,000 with 2 CPUs, 16M-byte memory, 2 ARC interfaces
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	COMPARABLE SYSTEMS	MAXIMUM NUMBER OF CPUs/MACHINE CYCLE TIME (MHz)	HOST COMPUTER OPERATING SYSTEM; (NETWORK OPERATING SYSTEM)	CLIENT(S) SUPPORTED	DATABASE(S) SUPPORTED	BENCHMARKS[1]	PERFORMANCE IN MIPS[2]	MEMORY RANGE (BYTES)/CACHE CAPACITY (BYTES)	DISK CAPACITY (BYTES)/DISK TRANSFER RATE (BYTE/SEC)	LAN PROTOCOLS SUPPORTED	SUPPORTS ETHERNET OR TOKEN RING	OPEN SYSTEMS STANDARDS SUPPORTED	PRICE RANGE WITH CONFIGURATION
MAI Systems Corp. (xxx)	OPX Model 6000	AT&T 3B2, IBM RS/6000 Model 320, Prime Series 50	16/20 MHz	Sun/VZ dual Unknown (Unix)	DOS, Unix	Sun	Sun footnote[3]	MP	16M - 96M/64K	12.5G/8M	TCP/IP	Ethernet	Unix System V Release 3.2	$80,000+ with 2 CPUs, 16M-byte memory, 612M-byte disk, 525M-byte tape, 16 ports, 1 system, diagnostic software
Mips Computer Systems, Inc. (408) 720-1700	RC3230, RC3330	IBM RS/6000 Model 320, Sun Sparcstation 2	1/25 MHz, 1/33 MHz	RISC/OS; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle, Sybase	18.8 Specmarks, 25.1 Specmarks	25, 41	8M - 128M/256K	2668M-6.3G/6M	Decnet, OSI, SNA, TCP/IP	Ethernet, optional Token Ring	OSF/1, Posix	$7,000 - $20,000, $11,000-$30,000 (RC 3330) with 1 CPU, 8M- to 128M-byte memory, 280M- to 6.2G-byte disk
	RC 3350	IBM RS/520, Sun Sparcstation 330	1/33.3 MHz	Unix System V Release 3, 4.3BSD; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle, Sybase	20.5 Specmarks	41.5	16M - 128M/64K instruction cache, 64K data cache	12G/8M	Decnet, OSI, SNA, TCP/IP	Same as above	OSF/1, Posix	$36,500 with 1 CPU, 16M-byte memory, 328M-byte disk, 150M-byte tape, unlimited user license
	RC 3360	HP 832 S, IBM 530, Sun Sparcstation 470	1/33 MHz	Unix System V Release 3, 4.3BSD; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle, Sybase	20.5 Specmarks	41.5	32M - 256M/64K	20G/8M	Decnet, OSI, SNA, TCP/IP	Same as above	OSF/1, Posix	$65,500 with 1 CPU, 32M-byte memory, 663M-byte disk, 150M-byte tape, unlimited user license
	RC 6260	IBM 550, Sun Sparcstation 490	1/60 MHz	RISC/OS; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle, Sybase	45 Specmarks	60	32M - 384M/64K instruction cache, 512K data cache	160G/8M	Decnet, OSI, SNA, TCP/IP	Same as above	OSF/1, Posix	$139,500 with 1 CPU, 32M-byte memory, 663M-byte disk, 150M-byte tape, Ethernet, unlimited user Unix license
	RC 6280	IBM RS/6000 Model 960, HP 9000/870-100	1/60 MHz	RISC/OS; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle, Sybase	NP	60	32M - 384M/960K	160G/8M	Decnet, OSI, SNA, TCP/IP	Same as above	OSF/1, Posix	$155,500 with 1 CPU, 32M-byte memory, 655M-byte disk, 150M-byte tape, Ethernet, unlimited user Unix license
Perkin-Elmer, Inc. (800) 631-1569	Interpro 1000	Harris Nighthawk, Concurrent	1/25 MHz	Real/IX; (SVR)	DOS, Unix	Informix, Ingres, Oracle, Progress	14.5 Specmarks	20	16M - 256M/128K	Up to 6G/8M	Decnet, TCP/IP	Ethernet	Posix	$33,500 - $110,000 with 1 CPU, 16M- to 256M-byte memory, 300M- to 6G-byte disk, operating system, C compiler, OI Windows, OSF/Motif available separately)
	Interpro 2000	Harris Nighthawk, Concurrent, Encore 90	4/25 MHz	Real/IX; (SVR)	DOS, Unix	Informix, Ingres, Oracle, Progress	29-68 Specmarks	58-115	16M - 384M/128K	Up to 6G/8M	Decnet, TCP/IP	Ethernet	Posix	$36,700 - $113,000 with 2 - 6 CPUs, 16M- to 256M-byte memory, 300M- to 6G-byte disk, operating system, C compiler OI Window and OSF/Motif available separately)
NCR Corp. (513) 445-5000	NCR Tower 32/300	Altos 600, HP 9000 8085, IBM RS/6000	1/20 MHz	Unix System V Release 3; (Portable Netware)	DOS	Informix, Ingres, Oracle, Unify	10,266 DS (actual)	5.8	4M - 32M/16K	128M-760M/1.25M-1.65M	OSI, SNA, TCP/IP	Ethernet, Token Ring	Posix	$11,290 - $20,000 with minimum of 4M-byte memory, 126M-byte disk, 3 channels, 150M-byte tape, operating system
	NCR Tower 32/500	Altos 2000, DEC 3100, HP 9000 Model 800, IBM RS/6000	1/20 MHz	Unix System V Release 3; (Portable Netware)	DOS	Informix, Ingres, Oracle, Unify	10,242 DS (actual)	5.8	16M - 64M/16K	126M-2.3G/1.25M-1.65M	OSI, SNA, TCP/IP	Ethernet, Token Ring	Posix	$14,300 - $63,900 with 1 CPU, minimum of 4M-byte memory, maximum of 170M-byte drive, 7 channels, 150M-byte-tape, operating system
	NCR Tower 32/750	Compaq Systempro, DEC 486/33, HP 9000 832 series, IBM RS/6000 Model 520	1/25 MHz	Unix System V Release 3; (Portable Netware)	DOS	Informix, Ingres, Oracle, Unify	33,296 DS (actual)	19	16M - 64M/16K	126M-2.3G/1.6M-2.5M	OSI, SNA, TCP/IP	Ethernet, Token Ring	Posix	$23,500-$76,000 with 1 CPU, minimum of 8M-byte memory, maximum of 126M-byte disk, 7 channels, 433M-1.3G-byte DAT, operating system
	NCR Tower 32/850	HP 9000 Models 850, 855, IBM RS/6000, Sequent Symmetry S/27, Pyramid Mlimerver	6/30 MHz	Unix System V Release 3; (Portable Netware)	DOS	Informix, Ingres, Oracle, Unify	11,655 DS (actual)	6.6	8M - 384M/256K	170M - 6G/2M - 4M	OSI, SNA, TCP/IP	Ethernet	Posix	$81,300 + with 1 - 6 CPUs, minimum of 8M-byte memory per CPU, minimum of 760M-byte disk, 20 channels, 433M- to 1.3G-byte DAT, operating system
Tolerant Computer, Inc. (800) 852-6000	NF Series, Models 1210, 1220, 1230, 6370, 6400, 6800	DEC VAX 4000, HP 3000, IBM AS/400	1 - 2/50.4 - 120 nsec.	Princeton (SVR)	Token Ring	Tolerant Information, Informix, Ingres, Oracle	8.4/MP, 68.88 DS, 6.3 - 4.7 LP (200 x 200, 32 AS (actual)	8.6 - 84.4	8M - 128M/128K	Up to 36.1G/8.6M	SNA	Ethernet, Token Ring	NP	Up to $3 million with 1 - 2 CPUs, with minimum of 8M-byte memory, 32 channels, terminal, tape drive, power supply, 320M-byte disk
Pyramid Technology Corp. (415) 965-7200	Mimerver S Series	DEC VAX 9000, HP 9000, Sequent 2000	12/33 MHz	Unix System V Release 4; (Portable Netware)	DOS, OS/2, Unix, Macintosh	Over 20, including Informix, Ingres, Sybase, Unify	NP	10-300	16M - 512M/48K	113G/MP	Decnet, OSI, SNA, TCP/IP	Ethernet	Posix, XPG3	$55,000 - 81 5M with 1 - 12 CPUs, 16M- to 512M-byte memory, 332M- to 113G-byte disk
Sequent Computer Systems, Inc. (503) 626-5700, (800) 854-8428	Symmetry 2000/40, 2000/200, 2000/400, 2000/700	VAX 6000, 8000, HP 9000, IBM RS/6000, Pyramid S series	16/20 MHz (Model 40), 25 MHz (mix of models)	Dynix/PTX; (LAN Manager for Unix, PC-NFS)	DOS, Mac, Unix, Macintosh	Informix, Ingres, Focus, Cincom's Supra, Sybase, Pick	120 TPC/B, 600 TPC/B	24 - 480	64M - 4160M/512K	88.8G/8M	Decnet, OSI, SNA, TCP/IP	Ethernet	Posix, XPG3, FIPS, SVID	$16,400 - $8.5 million with 1 - 30 CPUs, 48- to 896M-byte memory, 210M- to 64.8G-byte disk, operating system, C compiler, parallel programming library
Sequoia Systems, Inc. (508) 480-0800	Series 300	Stratus XA2000, Tandem Cyclone	32/25 MHz per CPU	Unix System V Release 3; (OSFS)	DOS, OS/2, Unix, Macintosh, HP/Apollo, Sun	Informix, Ingres, Oracle, Pick, Unify	251 DC	20 - 640	32M - 4G/2M - 64M	756M - 2T/2M per disk	OSI, SNA, TCP/IP	Ethernet	Posix	$300,000 with 2 CPUs, 128M-byte memory, 1.8G-byte disk, tape drive, 100 I/O ports, Unipalm E-mail software
Siemens Nixdorf Information Systems, Inc. (617) 273-0480	Targon 35/70	NCR 32/700, 32/650, Pyramid, Unisys 5000/65, 7000/55	1-4/10 MHz	Targon Operating System; Chameleon network operating system)	Unix	Informix, Oracle	NP	60	96M - 128M/128M	17.8G/8.4M	Decnet, OSI, SNA, TCP/IP	Ethernet, Token Ring	OSF/1, Posix, X Open, XPG3	$103,000 with 1 CPU, 32M-byte memory, 1G-byte disk, tape, printer, Ethernet, disk interface, system console
Stratus Computer, Inc. (508) 460-2000	XA2000 Continuous Processing Systems Models 30, 75, 80, 200 - 280	DEC Vaxcluster, FT, Tandem VLX and CLX	8 duplexed (Model 280)/ 24 MHz	VOS, FTX; (Nome)	DOS, OS/2, Unix	Oracle, Sybase, Informix (under the FTX operating system)	132,130 trans./hour, moderate mix; 99,470 trans./hour, heavy mix (actual)	NP	8M - 32M (Model 30), 64M (Models 270, 280) - 32M (Model 30) 128M (200 series Models)/128K per CPU	1.3G (Model 30) - 31.3G (280 Series Models)/2.5M - 25M	Decnet, OSI, SNA, TCP/IP, NFS, Netbios	Ethernet, Token Ring	Posix, SVID Issue 2	$49,800 (Model 30) - $1.4 million (Model 280) with 1 - 8 duplexed CPUs, 4M-byte to 64M-byte memory, 152M-byte disk, VOS or FTX operating system, duplexed power supplies, battery backup
	XA/R Model 30 Continuous Processing System	Tandem Integrity S2	1 duplexed CPU/ 32 MHz	VOS, FTX, Pick; (Nome)	DOS, OS/2, Unix	Oracle, Sybase, Informix (under the FTX operating system)	NP	NP	32M - 96M (duplexed) 4K instruction cache, 8K data cache, 512K on-board cache	7G/4M-12M	Decnet, OSI, SNA, TCP/IP, Netbios, NFS	Ethernet, Token Ring	Posix, XPC/3, SVID Issue 3, FIPS 151 - 1	$275,000 with VOS; $347,000 with FTX with 1 duplexed CPU, 32M-byte duplexed memory, 1 duplexed input/output system, duplexed power supply, battery backup

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	COMPARABLE SYSTEMS	MAXIMUM NUMBER OF CPUs/MACHINE CYCLE TIME (MHz)	HOST COMPUTER OPERATING SYSTEM; (NETWORK OPERATING SYSTEM)	CLIENT(S) SUPPORTED	DATABASE(S) SUPPORTED	BENCHMARKS[1]	PERFORMANCE IN MIPS[2]	MEMORY RANGE (BYTES)/CACHE CAPACITY (BYTES)	DISK CAPACITY (BYTES)/DISK TRANSFER RATE (BYTE/SEC)	LAN PROTOCOLS SUPPORTED	SUPPORTS ETHERNET OR TOKEN RING	OPEN SYSTEMS STANDARD SUPPORTED	PRICE RANGE WITH CONFIGURATION
Tandem Computers, Inc. (408) 285-6000	Nonstop CLX 800	VAX 6000, IBM AS/400, ES/9000 (in-context)	16/80.6 MHz	Guardian 90; (Expand, Multilan)	DOS, OS/2, Unix, Macintosh	Nonstop SQL	13.2 TPC/A (CLX 820); 25.9 TPC/A (CLX 840); 103.6 (CLX 880)	NP	24M - 512M/3.1G	466.9G/ 1.88M	OSI, TCP/IP, Tandem Expand	Ethernet	XAPIA, X.400, FTAM	$125,000 (CLX 820) - $906,000 (CLX 880) with 2 - 16 CPUs, 32M- to 512M-byte memory, 1.2G- to 10.3G-byte disk, operating system, DBMS
Unisys Corp. (215) 986-6981	U6000/51, U6000/55	IBM RS/6000, NCR 3000, Tower series	1/25 MHz, 1/33 MHz	Unix System V Release 3.2; (Portable Netware, LAN Manager for Unix)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle	10 TPC/A trans./sec. (U6000/55)	8, 16	4M - 80M/64K	168M - 3.96G/2.5M	IPX/SPX, OSI, SNA, TCP/IP	Ethernet, Token Ring	Posix	$15,000 - $55,000, $21,000 - $75,000 (U6000/55)
	U6000/80	IBM RS/6000, NCR 3000, Tower series	1/25 MHz	Unix System V Release 3.2; (Portable Netware, LAN Manager for Unix)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle	NP	15	4M - 80M/64K external, 16K internal	168M - 3.96G/2.5M	IPX/SPX, OSI, SNA, TCP/IP	Ethernet, Token Ring	Posix	$24,500 - $92,000
	U6000/85	AT&T Starserver, IBM RS/6000, NCR 3000 series	5/33 MHz	Unix System V Release 4; (Portable Netware, LAN Manager for Unix, PC Interface)	DOS, OS/2, Unix, Macintosh	Informix, Ingres, Oracle	NP	27 - 110	16M - 256M/256K	168M - 40G + /5M	IPX/SPX, OSI, SNA, TCP/IP	Ethernet, Token Ring	Posix	$36,000 - $350,000
	U6000/75, U6000/85	Encore, HP 9000, Pyramid Mserver	30/25 MHz	Unix System V Release 3, (Portable Netware, PC Interface)	DOS, OS/2, Macintosh	Informix, Oracle	129 TPC/A	28 - 420	40M - 384M/512K per CPU	330M - 90G/3M	IPX/SPX, OSI, SNA, TCP/IP, X.25	Ethernet	Posix, Xopen, XPG3	$145,000 - $1 million or more with 2 CPUs, 8M-byte memory, 330M-byte disk, 16 asynchronous ports, 150M-byte QIC tape drive
Wang Laboratories, Inc. (800) 638-6200	VS6000	IBM AS/400	1/25 MHz, 32bits	VS/OS; (Banyan Vines)	DOS, DOS Windows	Oracle, Pcos, Pcos, Natural Adabas	NP	NP	4M - 32M/NP	40GB,384MB/?	SNA, TCP/IP, XNS	Ethernet, Token Ring	NP	$12,600 - $125,000 with 1 CPU, 4M - 32M-byte memory, 320M - 40 G-byte disk
	VS8000	IBM AS/400 B60, VAX 6000	1/80 - 120 nsec	VS/OS; (Banyan Vines)	DOS, DOS Windows	Oracle, Pcos, Pcos, Natural Adabas	NP	NP	8M - 128M/128K	160G/8M	SNA, TCP/IP, XNS	Ethernet, Token Ring	NP	$120,000 with 1 CPU, 8M-byte memory, over 320M-byte disk per CPU
	VS9000	IBM 4381, DEC VAX	1/66 - 120 nsec	VS/OS; (Banyan Vines)	DOS, DOS Windows	Oracle, Pcos, Pcos, Natural Adabas	NP	NP	16M - 128M/64K - 128K	160G/8M	SNA, TCP/IP, XNS	Ethernet, Token Ring	NP	$300,000 - $750,000 with 1 CPU, 32M- to 128M-byte disk, 320M- to 640-byte disk



Strategy

CONTINUED FROM PAGE 65

developers for its platforms.

Where HP's problem lies, according to Cambridge, Mass.-based Forrester Research, Inc., is in its user ratings and market presence in Fortune 1,000 accounts.

Data General

Data General Corp. has shifted its focus from the MV/Eclipse, its proprietary minicomputer, to the more open world of the Aviion workstation.

DG is aggressively promoting its Aviion as a standards-based system, with support for Netware and planned support for LAN Manager. The company's host communications are relatively robust, but the ability of its systems to integrate with other servers remains a question.

DG also has a strong client/server software offering — CEO Object Office — that runs on the Eclipse and is compatible with HP's New Wave environment. DG is recruiting third-party vendors for further database and applications support.

Wang

The plan at Wang Laboratories, Inc. is to transfer its experience in imaging and office applications to the open systems and networking markets.

These Open Image products run not only on Wang's own minicomputer servers but also on native Netware servers for non-Wang local-area networks.

Wang supports Portable Netware on its VS systems and provides one of the most robust implementations of Banyan Systems, Inc.'s Virtual Networking Software (Vines) on the VS. It does not support LAN Manager, however. Wang also provides a SQL-based database for Vines and Oracle Corp.'s database.

Stratus

Stratus Computer, Inc. has upped its server participation, supporting standards bodies and lending its support — along with IBM and HP — to companies such as Transarc Corp., which offers distributed transaction processing protocols. Stratus supports Netware, and it offers excellent connectivity with IBM hosts. Its products also integrate well with other systems.

Stratus is positioning its machines as high-availability processors for critical on-line applications in a client/server mode — a narrow but increasingly popular niche.

Unisys

The U6000 line is where Unisys Corp. is focusing its server efforts. These systems support Portable Netware and offer a high level of integration between Unix applications and the network environment. Unisys has also stated that it will support PCs in a peer-to-peer mode on its larger networks. However, its support of other protocols such as TCP/IP is lacking.

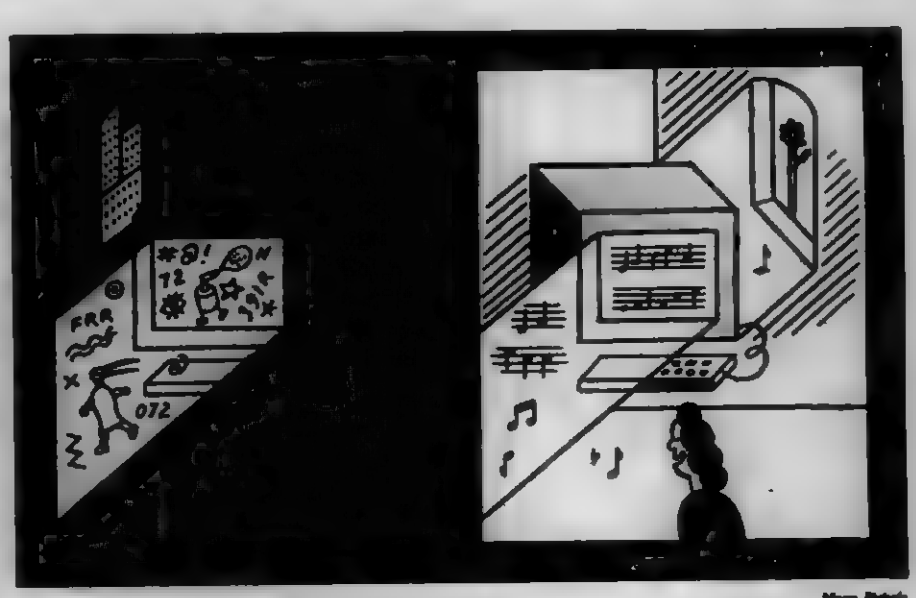
Prime

Prime Computer, Inc. has made a headlong rush into the client/server environment, establishing an alliance with Novell and rapidly announcing server products. Its primary focus seems to be in technical areas such as computer-aided design and manufacturing. However, Prime is still not seen as a company whose products integrate well with other systems. It has made some efforts recently, however, to gain third-party software support. •

Getting the process right

Before moving automated software development from pilot to production mode, make sure your development process is stable and manageable

BY GREG BOONE
AND VAUGHAN MERLYN



Mara Bidwell

While most companies are managing pilot CASE programs effectively, it's during full-scale implementation that the real problems become apparent.

In a pilot, the project team is handpicked, the application is carefully selected, and the team is coddled with extra support and resources. With this special attention, the implementation can go very smoothly. Generally, this situation makes a good showing for computer-aided software engineering (CASE).

It is when you move CASE beyond pilot programs into widespread use that problems crop up. Resistance, skepticism and disasters are not uncommon. These problems are the result of the failure of many software development organizations to recognize that CASE does not just speed up existing software development activities. Rather, it transforms the software development process.

Companies that understand this difference are paying attention to how software is developed, not just looking to buy new development technologies. They realize that hundreds of small improvements to the software development process add up to huge savings in development time.

Firms that don't understand this difference are dealing with an invisible, unmanageable process subject to change with every new technology. The challenge for information systems is to concentrate on the software development process, not just the technology, managing the quality improvements and organizational changes that are likely to occur.

Housecleaning

Organizations with ill-defined processes and poor methods shouldn't try to justify CASE until they get their houses in order. It's embarrassing to realize how many organizations buying CASE don't know that structured methods, data modeling methods, project management techniques and more disciplined practices are what CASE is really about.

Instead, they think they are buying only an "automated" solution. Without a change to the existing software development processes, however, the technology is worse than worthless. It can actually get in the way.

What is a process? It is a set of activities that transforms inputs into a useful output. Processes are generally repetitious, as with an accounting process such as payroll. What is a software development process? It is the transformation of customer needs into a useful software output.

It is difficult, however, to describe the software development process explicitly. The world of information management, real-time systems and embedded software is already highly abstract and invisible.

What takes place is a highly complicated series of activities undertaken in a highly individualized crafting manner. One of the characteristics of the craft style of building software is that its attempts to improve quality and productivity are only as good as the skill level of the specific individual producing the product. And because the "project" is the vehicle for organizing work, it becomes difficult to see software development as a continuous process instead of a unique, discrete effort.

As long as the software development process exists only in the heads of individual developers, it will remain unmanageable, difficult to improve and subject to the changing technology. The process can only be managed to the extent it is clearly known.

For example, what is the process of moving from the analysis phase of development to design? How do designers do their jobs? What sequence of activities do they pursue? Is it always the same, or is it different? When is it different, and why? Do they know why? What considerations do they take into account? What methods do they use?

When software development is low in process and high in dependence on technology-

Continued on page 76

Boone is president of Systems Research, Inc., an Issaquah, Wash.-based consulting company specializing in total quality improvement. Merlyn is a partner at Ernst & Young's Center for Information Strategy and Technology in Boston.

The new context for CASE

Companies should approach CASE implementation from a holistic viewpoint



- **Continuous process improvement is the goal**
- **Motorola, HP have spruced up their processes**
- **Don't overlook the human impact of change**

Continued from page 75

specific individual expertise, then changes in technology have an enormous impact on the productivity and capability of software developers. By contrast, traditional engineers may use new materials with radically different properties, but because they have a better defined, proven process, there is less impact.

Therefore, there are very good reasons for attacking processes first. Once you understand the process, changes to it are more meaningful and manageable.

Process improvements, which can lay the groundwork for CASE, can be arrived at quite simply or more rigorously.

One IS shop with an unusually high number of maintenance requests had a practice of extensive financial analysis for each one before proceeding. This analysis also examined the extent of the change and was used for making decisions about request priority.

One day, a programmer discovered extensive analysis was extraneous. Maintenance requests could be divided into categories of large, medium and small, with small ones taking less than one day, medium ones up to four days and large ones longer. Furthermore, it didn't take much effort to make that determination.

Now, the company does a first cut on the requests by size and has significantly reduced labor from unnecessary analysis of maintenance requests. It has also speeded up the response to requests.

Motorola, Inc. has also recently demonstrated the value of having a defined process. The company was faced with an older methodology that forced an overly elaborate software development process. It also handled certain types of development problems inadequately, specifically those related to distributed systems.

First, IS streamlined the methodology by producing what it calls a "project administration manual." This outline delineates the overall software development process with references to other manuals and documents, depending on the requirements of the specific applications development effort. In this way, developers don't have to wade through 13 three-ring notebooks to find what they need.

Second, it developed a new adaptation of the distributed systems methodology. Because Motorola has developers dispersed throughout the world supporting these systems, it has been an enormous benefit for everyone to be able to use a common frame of reference for software development.

While both firms use CASE, what is important is their process improvement initiatives. The improvements made by the companies above weren't responses to special circumstances; they were responses to repeatedly encountered circumstances.

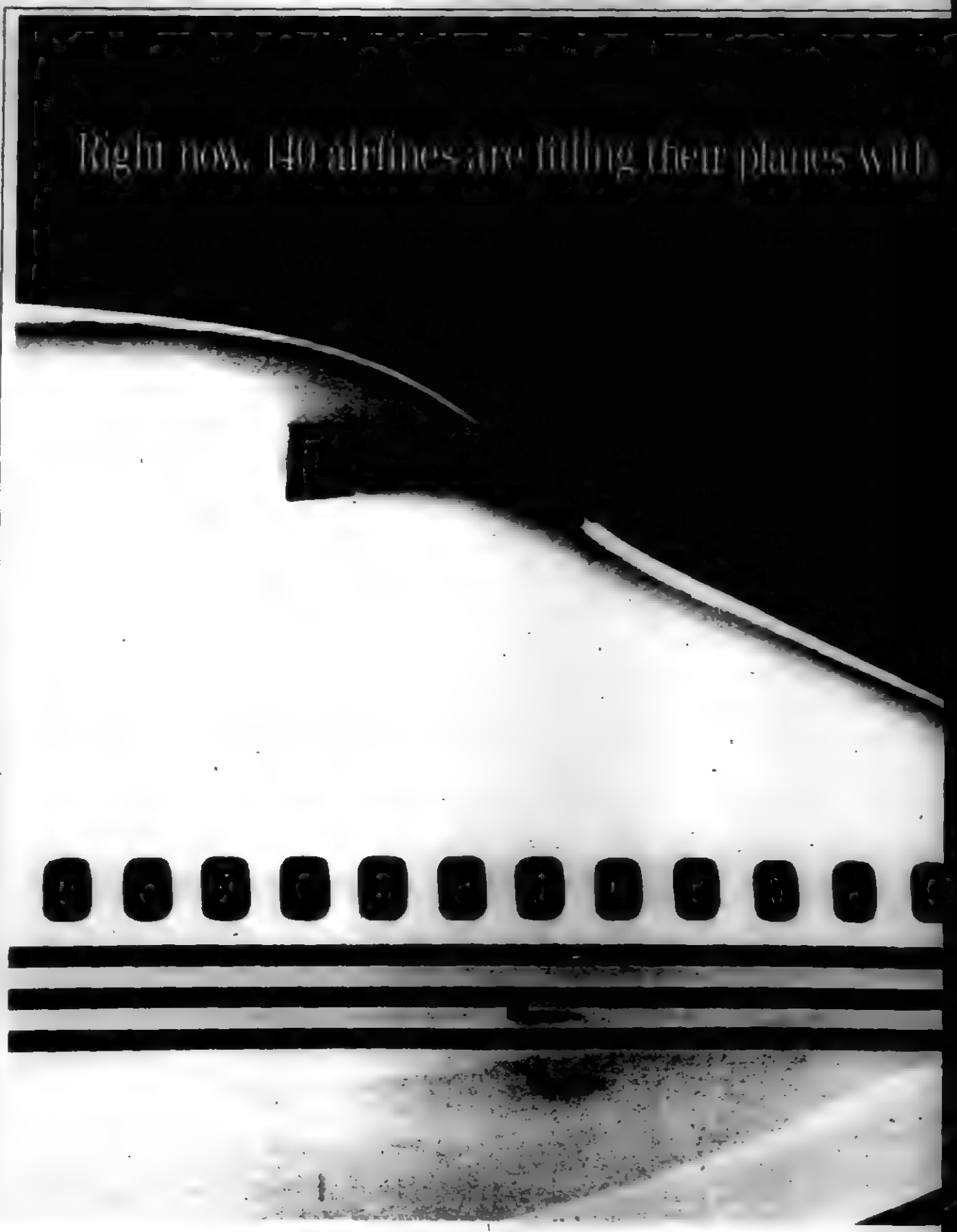
Rather than work around or ignore the problem altogether, these companies sought the cause and implemented a remedy that eliminated the source of the chronic problems. This preventative approach is key to making sustainable progress. Such remedies free up valuable resources to take on new classes of problems rather than waste time solving the same problem over and over again.

Derived from Japanese thought

A more advanced improvement approach is called continuous process improvement. It is based on the Japanese philosophy known as kaizen, the ethic of constantly seeking incremental improvement and perfecting existing processes. Kaizen, process engineering, continuous process improvement, employee involvement, feedback loops and measurement are some of the key features of the new quality movement known as total quality management.

Continuous process improvement differs from process improvement in that it relies on a stable process, a process that is consistently followed and repeatable, one that gives reasonably consistent results.

A simple indication of a stable, consistent process is project cost and schedule estimation. If actual software development results are within 5% to 10% of the estimates more than 95% of the time, you have a good chance of having a relatively



Mark of distinction



What is the distinction between process management and process engineering?

Process management describes management commitment and actions to transform the work environment so that everyone in the organization can cooperatively work on the continuous improvement of processes.

Process management contrasts with project managment in that project management refers to the techniques used to create a specific product or service successfully within the process framework. Process management establishes the framework and improves it.

Processes are improved by **process engineering**, which involves systematic measurement, evaluation of measurement, team problem identification and team problem-solving, as well as the implementation of changes to the work production system.

stable process. If not, the process is probably ad hoc, improvised and variable.

One of the hallmarks of continuous process improvement is decision-making based on facts, not intuition. This means continually monitoring the process and providing feedback.

Hewlett-Packard Co. is an example of a firm that applies the principle of continuous process improvement and feedback loops in its software development process. HP has a team of developers responsible for porting software to all HP hardware platforms. Through the collection of errors and defect data, the firm determined that a chief cause of problems had to do with register utilization. It found that the team had inadequate training in register use and applied a remedy: training. A class of errors was eliminated.

Only by taking a process improvement view can the real breakthroughs in productivity be obtained. The technology solution alone has proven insufficient.

Implementing such process improvement initiatives is not without cost, although few of the actual improvements involve significant cash expenditures. The real cost is the agony of change. Organizations and individuals can have a very difficult time coming to grips with the nature of change and the implications of change — how responsibilities are altered, how a person's role changes in the eyes of his peers, how power bases are affected and so forth (see story below).

These factors are very real and crucial to manage if a process change is to be successful. Change must be accomplished within the expected time frame and at the expected cost. Too often, the change takes significantly longer, and the cost is far more than expected. Many CASE implementations are abandoned midstream for these very reasons.

Instead, if firms are sensitive to the reaction to change and the change process, resistance could be anticipated and handled constructively. The stresses involved in moving from uninformed optimism to informed pessimism during CASE implementations are predictable.

Various forms of what organization development specialists call "interventions" can be used to facilitate change. For example, an assessment is a form of intervention that finds out the current state of an organization, including its strengths and weaknesses. Gauging the magnitude of the weaknesses is imperative because unless an organization acknowledges the status quo and is dissatisfied with it, there is little motivation for change.

Employee involvement in the design and implementation of the change is crucial. Furthermore, recognizing that "informed pessimism" is a normal stage in the change process can be sufficiently reassuring in itself.

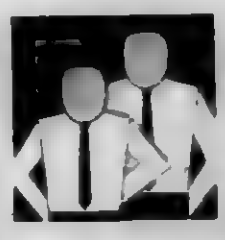
New context for CASE

Companies should approach CASE implementation challenges from a holistic viewpoint. CASE shows up the deficiencies in software development practices. The new battleground is no longer CASE but continuous process improvement. Basically, companies know a lot about technology but have missed an obvious and essential element: the context for the technology (see chart page 75). Those companies that have paid attention to this context have been more successful. Without a context, the technology lacks purpose, direction and integration into the existing environment.

The context for CASE includes an appreciation for explicitly managing and continually improving the software development process. In turn, the software development process cannot undergo significant transformation without paying attention to the human response and managing organizational change.

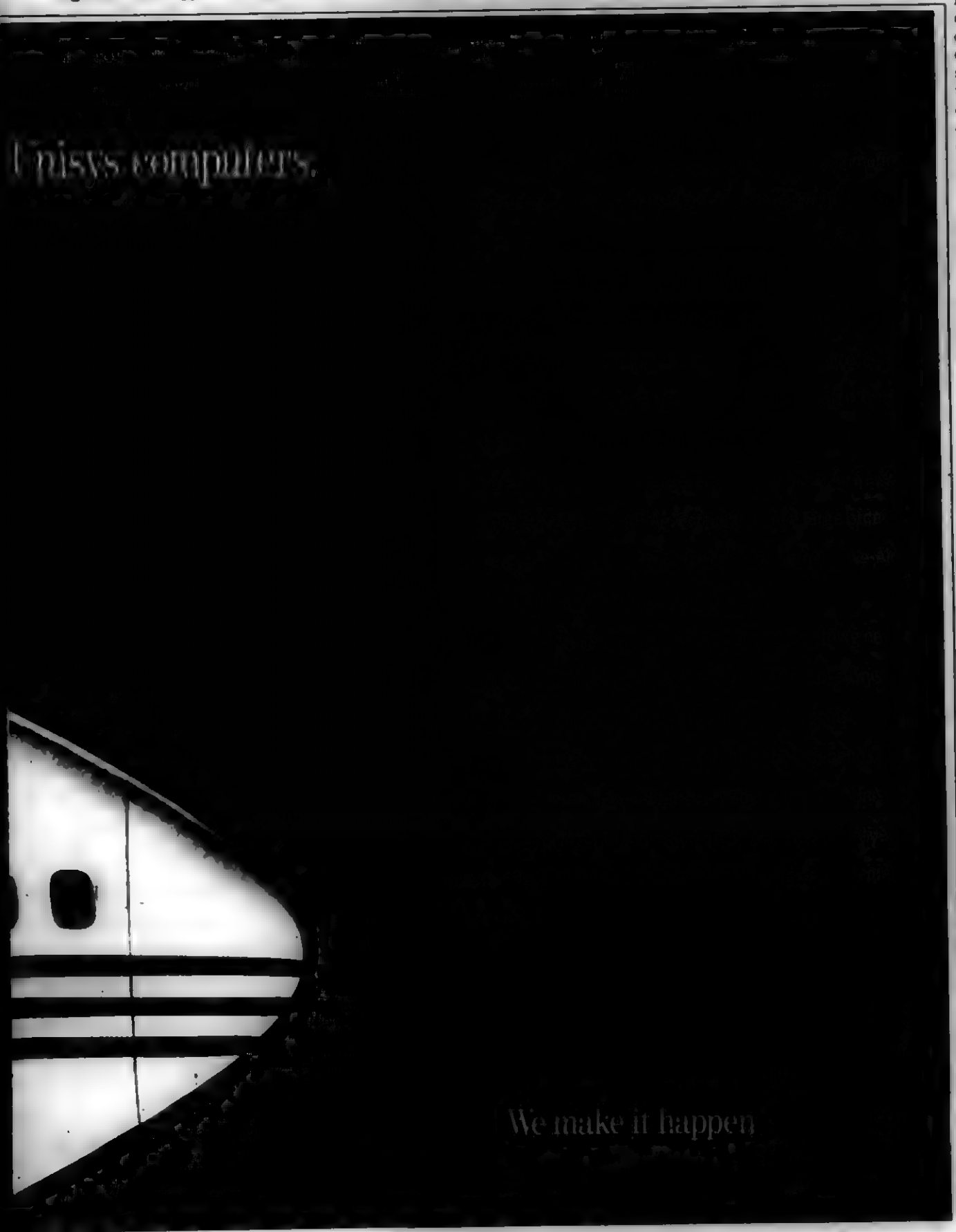
The context of process engineering and managing change explain the new emphasis on quality rather than productivity. That's when CASE will be a success. •

Stressed for success



The change wrought by revamping the development process and zeroing in on quality can be stressful for IS workers. Here are some questions firms implementing CASE may need to deal with:

- **IS skills portfolio:** What skills exist now, and how will they change? Should developers forego their technical skills for the softer analysis, design and communications skills? Why should developers give up their successful "artisan" approaches for engineering disciplines?
- **Resistance:** How can resistance be managed?
- **Motivation:** How will developers be motivated to adopt CASE? How do you convince developers to share their work with others in a high-reuse environment rather than creating original work?
- **Participation:** Will everyone have to adopt CASE or just those who are willing and able?
- **Career paths:** How will career paths change? Will valuable developers leave?



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GRAND LANPLAN HIGHLIGHTS

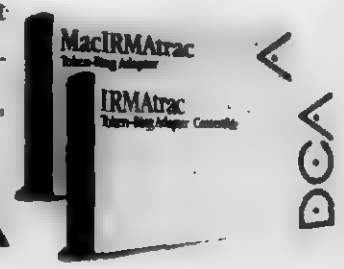
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NATIONAL
BRIEFS

Whodunit?

▶ **Digital Equipment Corp.** did it; so did **AT&T**, **Sun Microsystems, Inc.**, **Hewlett-Packard Co.**, **Microsoft Corp.** — and now, **IBM** has done it, too. Last week, IBM became the latest of approximately 130 computer industry vendors and users to join The Object Management Group, a Framingham, Mass.-based association dedicated to the development of guidelines and standards for the creation and implementation of object-oriented systems.

Buy and cell agreement

▶ **Ameritech** continued down its avowed expansion path last month with the purchase of cellular communications service providers **Cybertel Financial Corp.** and **Cybertel RSA Cellular L.P.** The Chicago-based telecommunications player will pay an approximate $512 million in cash for the Cybertel firms, which serve the St. Louis metropolitan area.

State of the Art offering

▶ As of May 23, **State of the Art, Inc.** is a public company. The Irvine, Calif.-based high-end microcomputer accounting software firm completed an initial public offering of 3.45 million shares at $9 per share, raising some $12 million. The funds will be used to provide liquidity to State of the Art's early-stage investors as well as to position the company for future growth, according to a spokesman.

Jelly good fellows

▶ Five employees have been named **IBM** fellows, winning their firm's premier technical honor and the chance to pursue their choice of projects for the next five years. Singled out for their contributions to technology were: programming languages and systems-design specialist **Marc Auslander**, a reduced instruction set computing pioneer; **Paul Bardell**, whose achievements in built-in testing of digital circuits helped speed the Enterprise System/9000 to market; **Richard Baum**, also noted within the company for his contributions as a large-systems architect; **Tak H. Ning**, noted for his work in semiconductor technology; and **Bernhard Pogge**, an innovator in the semiconductor fabrication process arena.

It's got the whole world in its plans

BY CAROL HILDEBRAND
CW STAFF

WILMINGTON, Mass. — Ian Davison is a man who likes to think in terms of the big picture, which perhaps explains his company. While many other firms are scrambling to position for global commerce, Octocom Systems, Inc. is not: It was founded specifically as a global enterprise.

"Our first customers were on the West Coast [of the U.S.], London and Sydney [Australia]," said Davison, president and founder of the 6-year-old firm.

Octocom, which manufactures and supports network access and management systems, has parlayed its global outlook into a financial success. Its 14,886% growth over the past five years landed it the ninth spot on *Inc.* magazine's 1990 listing of America's 500 fastest-growing privately held companies.

Its figure of 80% of revenue derived from exports has garnered national attention. Recently addressing a group of some 350 New England-area business and government representatives on the urgency of developing export expertise, President Bush made references to Octocom as exemplary.

The company has also received the president's "E" award, given to companies showing excellence in exporting.

Balance the key

Davison based his firm on what he calls the "founding balance." He noted, "What we did was create a corporation that fundamentally melted together the basic attributes of European innovation, American technology and the vital commodity from the Far East that is generally referred to as quality and support.

"If you get the founding balance right, everything in the business will automatically create itself," Davison said.

This means that while having good technology remains important, it should not be the overriding factor, he added. Finding innovative uses and marketing strategies for a business' technology as well as total concentration on service and support are vital to commanding a place in the global business sphere, he said.

Octocom claimed its place in the sun by designing products that satisfy the myriad regulatory environments, telecommunications bodies and applications requirements found in various countries. For example, one of the firm's early products was a modem that put four communications standards in one box, Davison said.

The Quattro modem, as it was called, married Europe's prevailing standard with several others used in different parts of the world, obviating the need for multinational users to buy two or three different products.

"Octocom made a very conscious decision from the beginning that in almost everything they did they were going to look at international opportunities," said Abbie Goodman, executive director of the Massachusetts Office of International Trade.

"There are a lot of market opportunities out there, but the only way companies will benefit is if they go into them and do something about it," Goodman explained.

Recession clouds are also not as threatening to Octocom's financial picture as they have been to the bottom lines of many other firms. Recession in one part of the market is often offset by increased activity in another sector, Davison said. "U.S. business could halve, and it would have no effect [on us]," he said. "We'd just pick it up from somewhere like Indochina."

Being able to ride out regional downturns is a key Octocom strength, agreed Andrew Bendheim, director of the Massachusetts Port Authority's trade development unit.

"They'll be able to take advantage of different economic

Continued on page 80



Octocom's Davison *credits his firm's growth to a 'founding balance'*

Up and Coming:
Octocom Systems, Inc.

- **Location:** Wilmington, Mass.
- **Incorporated:** 1984
- **President:** Ian Davison
- **Employees:** approx. 180
- **Product line:** modems, network management systems, security devices

New face, new focus at head of MDSI

Move to open systems closes profit gap at systems integration firm

BY NEIL MARGOLIS
CW STAFF

ST. LOUIS — What do you get when you divide 31 into 3? At McDonnell Douglas Systems Integration Co. (MDSI), the answer is $398 million.

In the past two years, the computer arm of aerospace player McDonnell Douglas Corp. has undergone a quiet revolution. Under the stewardship of Mark Kuhlmann, then president and now the firm's general counsel, the 30-year-old company switched its product emphasis from turnkey hardware systems to manufacturing and geographical information systems (GIS) software. It also sold off noncore businesses and whipped what remained of its 31 autonomous business units into a tightly focused triad: Manufacturing & Engineering (M&E), including computer-aided design and manufacturing (CAD/CAM); Infrastructure Solutions, or GIS; and Information Systems, which includes outsourcing and systems integration consulting.

Emphasis on standards

Additionally — and critically — MDSI "embraced standards wholesale," said former M&E head John Mazzola, who succeeded Kuhlmann as MDSI president in April. The move to open systems, he said, makes the firm "possibly the only CAD/CAM vendor that isn't hardware-aligned."

As a result, in 1990, the firm that for years had been awash in red ink posted its second consecutive year of solid profit, tripling pretax earnings to $11 million on worldwide revenue of $398 million, some 90% of which came from external sales. It also logged a cash flow increase that exceeded its plan by $40 million, saw its backlog swell 57% over that of 1989, completed the streamlining of its businesses from eight at the year's start to the targeted three and recorded a 57% increase in government systems integration sales and a 21% worldwide revenue growth in its manufacturing software.



MDSI's Mazzola *says MDSI has 'embraced standards wholesale'*

In the consulting industry, where "You've got to walk the talk" is an oft-mouthed maxim, MDSI's dramatic turnaround gives the firm not only the ability to blast further ahead into its target markets but also credibility with which to offer its services. Indeed, in its systems integrator role, the company plans to preach what it has painstakingly learned to practice, Mazzola said.

"The sobering reality is, you can spend huge amounts of R&D time and money, and there's always going to be someone out there with a product that's better than yours in some way, for some customer," he said.

Whole world

FROM PAGE 79

cycles," Bendheim said. "Not everybody goes into recession at the same time as Boston or New England." Working in a global marketplace also allows the firm to compete in arenas that are far less competitive than the crowded domestic scene, he added.

So far, the formula certainly seems to be working for Octocom. Last year, as the U.S. recession battered the bottom lines of many firms, Octocom logged a 40% growth in revenue.

Global foresight

In addition to seeing the international advantage before "global" became an industry buzzword, Octocom has also benefited from an early and consistent focus on service and support. Its two support centers in the UK and the U.S. operate 24-hour call-in centers. Jeff Shaw, vice president of global support operations, said he takes to heart the Avis, Inc. principle of "We try harder."

"Sometimes we do things that aren't always cost-effective for us," he said. For example, "We send a guy to Japan, and he doesn't leave until the problem is fixed. But that's the attitude," he explained.

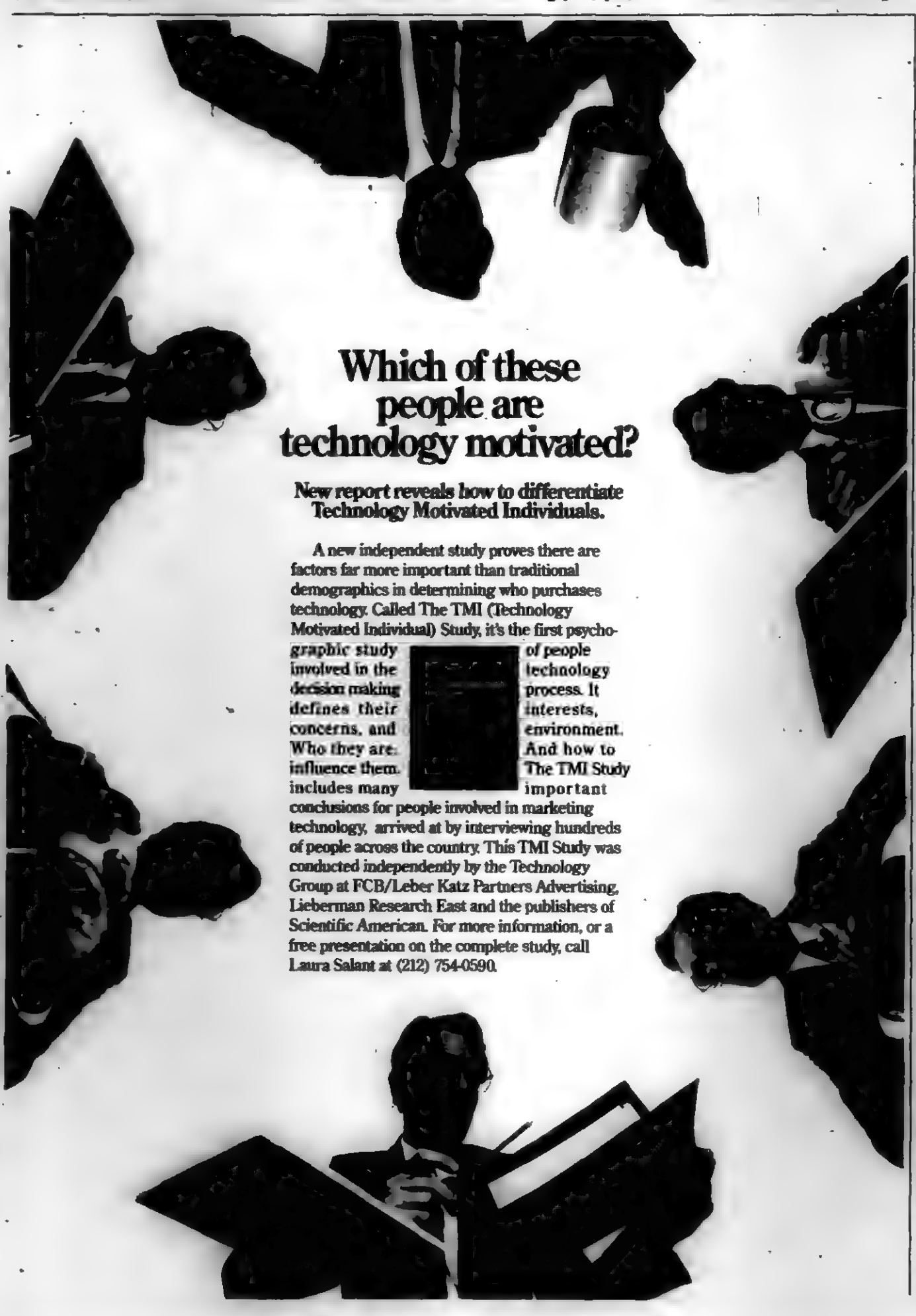
Shaw noted that the international aspect can make for some unusual hours, citing a 2 a.m. walk-through with a client to try to isolate a problem.

"That's just the kind of stuff you have to do," he said. "Working internationally, you just understand time zones and just think differently."

Octocom moves its products through a series of local distributors, except in the UK, where it operates a wholly owned subsidiary. According to Sales Vice President Rob Scott, this distribution network serves a number of purposes. It establishes a company presence quickly and inexpensively by sidestepping issues such as language barriers, company registration, mandatory hiring of local employees and the lengthy process of getting import approval from the local post office, he said.

The distributor base currently represents about 80% of the firm's business, although there are plans to add more subsidiaries, Scott said. "We'll pick off the individual countries where we feel we'll make the best impact with direct sales," he said, referring to nations with a current high rate of sales or areas in which a distributor is not doing well.

Davison, who said he would like to see sales increase by as much as 60% next year, also expects regional markets to slowly adapt to a more global perspective. "By the time we get to the millenium, most people — bankers, lawyers, whatever — will have the same concepts of expectation with equal amounts of innovation, fundamentally applied technology and service and support."



INTERNATIONAL BRIEFS

Sharp thinking

▶ Japan's **Sharp Corp.** and **Samas-Groep NV**, the Utrecht, Netherlands-based parent of Sharp's Dutch distributor, **Ormas BV**, have teamed up to establish a Sharp sales subsidiary in Houten, The Netherlands. Opened last week, the new concern is aimed at reinforcing Sharp's distribution channels in The Netherlands in time for the scheduled 1992 unification of the European Community market. Sharp and Samas said they are targeting the $33 million mark for their venture's first-year revenue; second-year sales are projected at $48 million.

What's up down under

▶ Despite structural casualties, the Australian information technology industry will continue to outperform the nation's economy, according to market research firm International Data Corp. Australia. Hardware sales will slow considerably, gaining by only 5% between now and 1995; software and services, which are projected at 16.3% growth by 1995, will help fuel industry growth, the firm said.

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23. Dir./Mgr Sys. Development, Sys. Architecture
31. Mgrs., Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
85. Sys. Integrators/VARs/Consulting Mgt.
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13. Treasurer, Controller, Financial Officer
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85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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41. Engineering, Scientific, R&D, Tech. Mgt.
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The Newsweekly of Information Systems Management

NEC to plow profits into microchips

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — Although microchip sales, notably in memory chips, dragged its bottom line down last fiscal year, NEC Corp. plans to pump up semiconductor production this year.

NEC recently announced that declining memory prices drove down 1990 net profits 36.2% to $386 million. According to industry projections, investment by Japan's semiconductor companies will be off this year from the double-digit growth logged in recent years to only 5% of sales, the result of soft personal computer sales and trade pressure from the U.S.

Nonetheless, analysts here said they expect chip makers to put their money behind next-generation 16M-bit dynamic random-access memory chips starting this year and continuing into 1992.

NEC, which produced $5.58 billion worth of semiconductors in its most recent fiscal year ended March 31 — a 6.6% year-to-year increase — plans to produce 10.3% more microchips of all types this year for a total valued at $6.15 billion, the company said. The figures include both captive consumption and overseas sales of microchips.

- Last year, NEC consumed 27% of its overall production. This fiscal year, which began April 1, it said it plans to use 25% of its production in its own products.
- Last year, the firm exported $819.23 million worth of microchips, not counting parts made overseas and exported to other countries — a 5.8% decrease from the previous year. This year, it expects to export $892.31 million, an 8.9% increase.
- Last year, NEC invested $807.69 million worldwide; this year, it plans to invest $923.08 million.

The firm is currently plowing $384.62 million into a new plant in Japan to be called NEC Yamagata Ltd. It is scheduled to be completed in the third quarter of 1992 and begin trial production of custom, large-scale integrations in the fourth quarter of fiscal 1992. Mass production is scheduled for the first half of fiscal 1993.

RISC chips from Mips

NEC is already producing reduced instruction set computing (RISC) chips under license from Mips Computer Systems, Inc. in the U.S. It is now shipping and producing the 40-MHz VR3000 chip, which it claims is the fastest in the world, and is gearing up to produce the VR4000, which will likely be produced in Japan.

NEC said the VR4000 is its opportunity to become a big player in the microprocessor market. Although it produces complex instruction set computing (CISC) chips, its proprietary V series, it admits to being behind in the CISC area.

"NEC doesn't have the CISC products to be a majority producer, but we do have a chance in RISC," said Hajime Sasaki, vice president and director at NEC, in a recent press briefing. Along with Kubota Corp. and Sony Corp., NEC has joined the Advanced Computing Environment initiative, a U.S. effort to promote the Mips RISC chip as a standard.

Although strong in semiconductor memory technology and products, Japanese companies have lagged behind U.S. firms in microprocessor development.

Industry observers here said they see the VR4000 as a product that could transform NEC into a major microprocessor producer, as it plans to make the VR4000 in Japan. "We have the production capacity to produce whatever amount is needed," Sasaki claimed.

NEC said it plans to make a total of 100,000 VR3000 and VR4000 Mips RISC chips per month in 1992.

In addition, the firm said it is planning to develop its CISC architecture further to use the V60, 70 and 80 microprocessors in applications, including embedded controllers, customized processors for factory automation and telephone switches. It is now making 1.5 million processors per month in the 16- to 32-bit V series and about 30,000 monthly of the V60, 70 and 80 CISC products. The firm is covering both bases, as Sasaki said RISC CPUs could be used instead of CISC chips in low-end products.

NEC sent a sample of the 50-MHz VR4000 to Mips in April for testing, which is expected to be completed this month, Sasaki said.

In addition to focusing on memory and RISC chips, the firm is pushing into Application Specific Integrated Circuits (ASIC). NEC now has 18 ASIC design centers overseas and plans to add new centers this fiscal year in Toronto and Houston and two centers by March 1993 in Rome and Madrid.

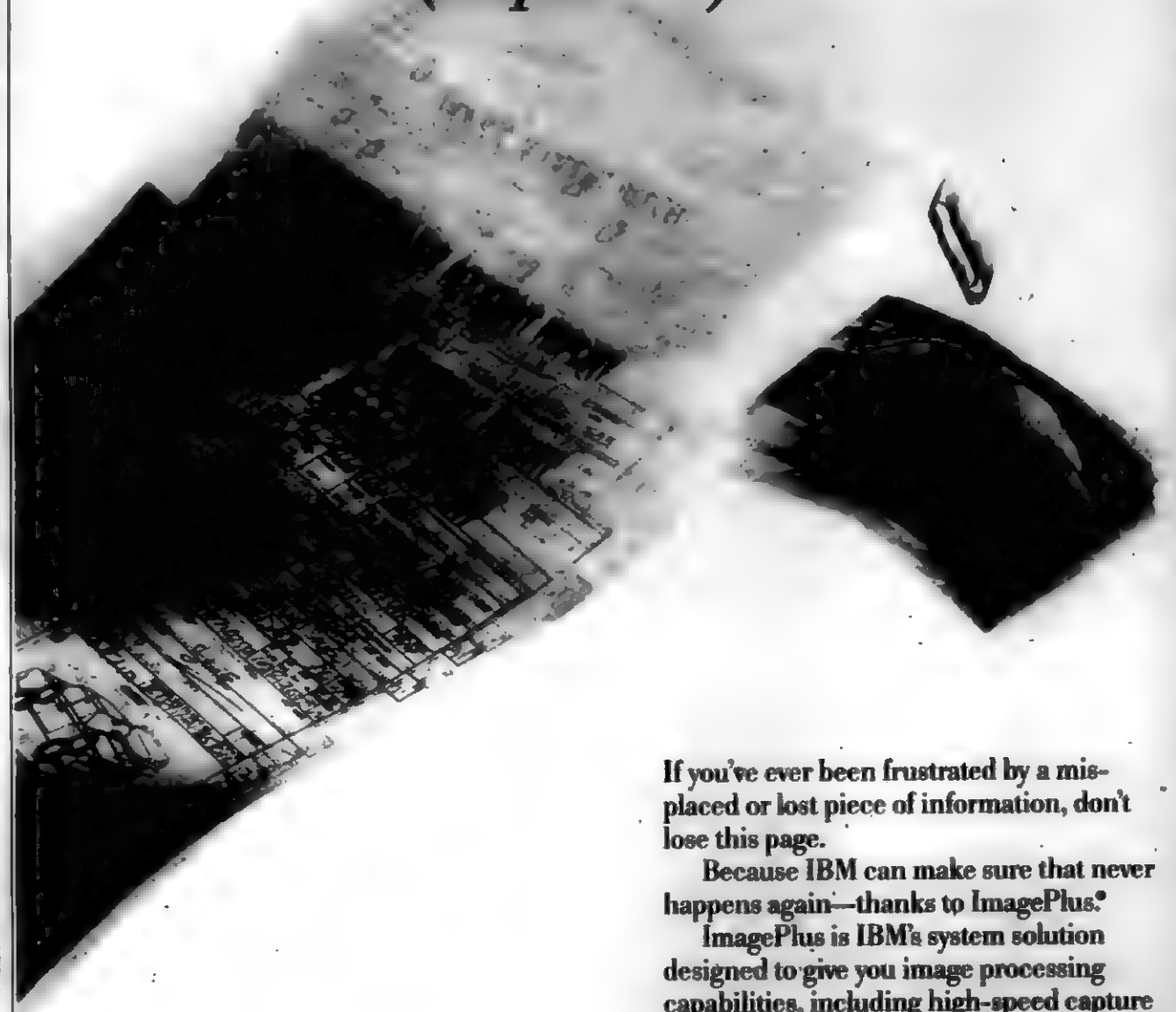
NEC's European Technology Center, established last October in Dusseldorf, Germany, to make ASICs for the European market, will release its first product, an 8-bit microcontroller to be used in mobile communications applications, this fall.

By the end of fiscal 1992, NEC said, it expects to invest $23.08 million in the research and development center, which hopes to triple its employee roster by 1995. Sasaki said future plans call for designing ASICs for cordless telephones and automobiles.

Valigra is the Tokyo bureau chief for the IDG News Service.

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EXECUTIVE CORNER

Kiger captains Microterm manufacturing team



St. Louis-based computer terminal manufacturer Microterm has a new president: Stanley L. Kiger. After coming to Microterm in 1990 from Stardent Computer, Inc., Kiger served as vice president of sales until his promotion to the 15-year-old firm's presidency late last month.

Alpha Microsystems announced late last month the appointment of Chief Executive Officer **Clarke E. Reynolds** to the additional office of chairman of the board. Reynolds replaces co-founder **Robert B. Hitchcock**, who resigned from both the chairmanship and the Alpha Microsystems board.

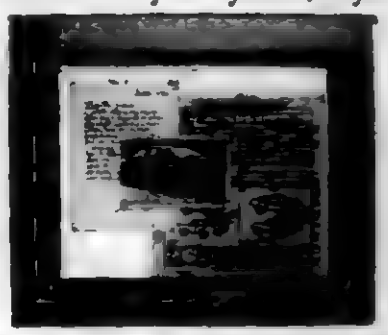
Franchon M. Smithson, vice president of corporate development at Legent Corp., has been appointed to the additional post of chief financial officer at the Vienna, Va.-based systems software and services vendor. In his new capacity, Smithson — who returned to Legent after a brief stint as vice president and treasurer at Computerland Corp. — will be responsible not only for all financial reporting functions of the firm but also for its MIS and corporate services groups. He replaces Arthur F. Knapp Jr.

Washington, D.C.-based **Computer Law Association** heads into the summer with a new slate of officers and directors in place. Leading the approximately 1,400-member international association are newly elected President **Oliver R. Smoot** in Washington, D.C.; Vice President **Edward F. Langa** in Southfield, Mich.; and Secretary/Treasurer **Mark L. Gordon** in Chicago.

Networking and computer I/O products vendor **Xylogics, Inc.** elected **Frank J. Pipp** chairman of the board late last month. Pipp, who has been serving as a board member, replaces **Bruce Bergman**, who will continue to man the posts of president and CEO at the Burlington, Mass.-based firm.

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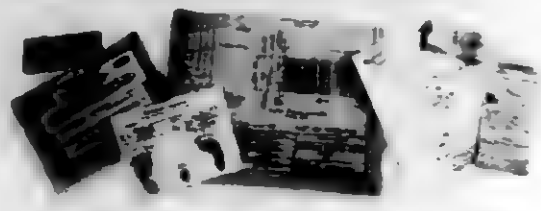
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UK firm buys out Nokia Data

BY DON RADOLI
SPECIAL TO CW

OSLO — Great Britain's International Computers Ltd. (ICL) has announced that it will acquire Nokia Data Systems for $391 million. The cash and stock deal, consisting of $85 million in cash and $306 million in preferred stock, is expected to be formally completed by Sept. 30. In addition, Finland's Nokia conglomerate, which owns Nokia Data, will take a 5% stake in ICL at the time of flotation.

Although ICL Chairman and Chief Executive Officer Peter Bonfield and Nokia Data President and Chief Operating Officer Kalle Isokallio downplayed the role of Fujitsu Ltd. in the takeover, industry observers said Fujitsu had a hand in the deal.

The merging of Nokia Data and ICL will result in an expanded European computer company with a total of 24,000 employees and some $4 billion in revenue.

"The merger will place the new company in the top three [computer firms] in the UK, Finland, Sweden and Denmark and together with its majority shareholder, Fujitsu, in Spain," Bonfield said. "It significantly strengthens ICL's market position in Germany, France and Holland. This move is an important one."

Better left unsaid

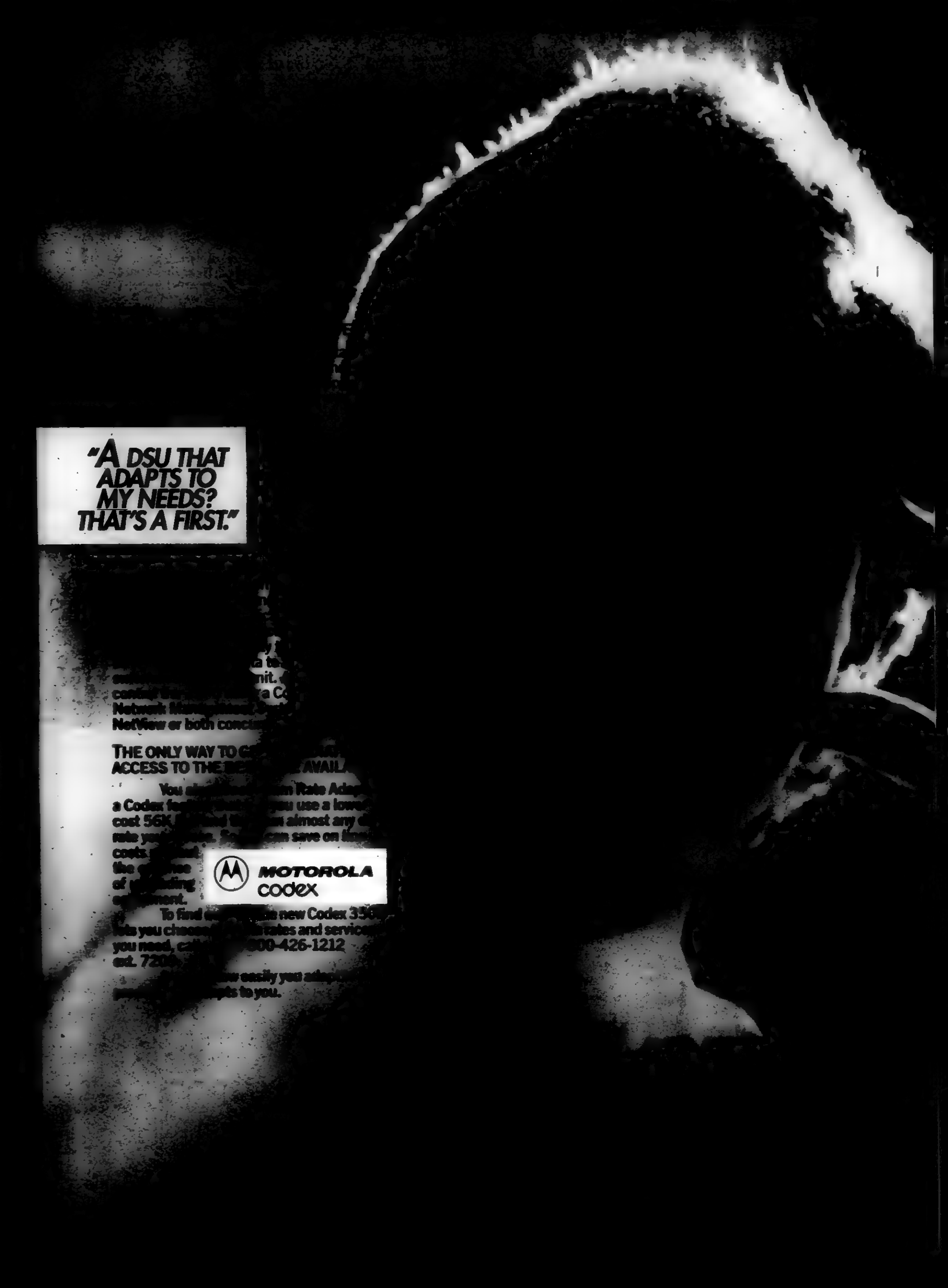
Perhaps more important is what Bonfield and Isokallio did not say. First, they did not want to comment on Fujitsu's role in the takeover. The move is bound to be interpreted as a Japanese attempt to acquire European market share and distribution channels.

Second, the move means Nokia Data will have to work out a new arrangement with France's Groupe Bull, whose products it distributes in Finland. Bull is reportedly infuriated that Nokia Data carried out secret negotiations with ICL while also negotiating with Bull.

The Bull/Nokia Data negotiations collapsed after only two weeks. The two companies reportedly had a "gentleman's agreement" not to negotiate with other companies during the five months the negotiations were scheduled to last.

Nokia Data offered a simple explanation for its choice: ICL has the money, while Bull is drowning in a flood of red ink.

Radoli writes for Computerworld Norge, *an International Data Group publication.*


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Cable TV is your best IS bet in broadcasting

Cable TV operators and programming providers are becoming hungry for seasoned professionals

BY ALAN RADDING
SPECIAL TO CW

If you're looking for an information systems position in television and have been scanning the major networks, change the channel. The fast-growing cable television companies are where you'll find opportunities.

Although some IS skills are in demand throughout broadcasting, particularly in local-area networking and personal computer-to-mainframe connectivity, the industry is consolidating and retrenching.



Cable TV is an exception, however, and currently offers the most promising entry into the field.

Much of the systems work in TV revolves around the sale of advertising and the scheduling of programs with the help of specialized industry applications.

In cable TV, the IS effort aims at managing and servicing the subscribers. Systems are generally small — primarily minicomputers and PCs — and business knowledge is important.

Individual cable TV systems are typically part of larger multisystems groups. New services, such as pay per view, in which computerized systems turn particular services to subscribers on and off at a moment's notice, add to the IS challenge. Cable TV industry-standard packaged software is used widely.

Large cable TV operators, however, are beginning to develop applications on their own. At Continental Cablevision of New England, which uses the largest of eight Continental data centers, the IS group now develops SQL applications for PCs, reports Bob Tekin, MIS director.

Tekin prefers to hire people with a professional IS background, but "I'm thrilled if I can get somebody with DP and cable experience," he says, because the cable industry is so young. Continental Cablevision of New England employs 18 IS people, three of whom do programming.

IS salaries in cable TV are comparable to those in other similarly sized businesses in the market, says Dave Moore, MIS manager at Continental Cablevision of Michigan, Inc.

IS professionals pull down between $30,000 and $60,000, depending on geographical location, size of the system and level of responsibility.

Another growing segment of the cable TV industry is that of major cable programming providers such as Turner Broadcasting in Atlanta. Turner runs the Cable News Network (CNN), and its IS group runs an IBM mainframe, several Digital Equipment Corp. VAX systems and a Microvax.

CNN's IS department prefers to purchase and enhance applications rather than develop from scratch. PC systems handle market research and analysis, reports Michael Johnson, corporate director of MIS/telecommunications.

Johnson emphasizes business experience in new hiring unless he is hiring for a specific project requiring a particular technical skill. Interpersonal skills are valued: "We work with a lot of diverse groups of users, so it is also important to be able to communicate," he adds.

Major league

Network television — CBS, NBC and ABC — is the major league of the broadcast industry. Here, an IS professional will find the largest IS organizations and the highest pay, although the weak economy has forced the networks to cut back.

Over the past several years, CBS consolidated multiple small data centers into one large data center, reducing staff from 500 people to about 230, reports John Lalli, vice president of MIS operations at CBS, Inc. in New York.

> **ALTHOUGH SOME IS skills are in demand throughout broadcasting, the industry is consolidating and retrenching. Cable TV offers the most promising entry into the field.**

During that time, CBS spun off nonbroadcast businesses.

The CBS data center manages the network's inventory of air time, handles pricing, billing and affiliate payments and supports a network of more than 2,000 terminals and PCs spread throughout the organization.

The company also supports an active application development organization, where a major effort is under way to create a corporatewide data warehouse using SQL and fourth-generation language technology to give users throughout the organization access to a variety of different data, Lalli says.

As a general rule, CBS looks inside for most IS staff. When CBS hires from the outside, it looks for specialized computer skills — particularly CICS, DB2, SQL and telecommunications, according to Lalli.

IS salaries at CBS and the other networks are comparable to IS salaries at the largest Wall Street firms, he reports.

The next level down are the large multisystem cable TV operators and the large conventional broadcast station groups, which have also been hit hard by the recession.

At this level, most companies use minicomputers — particularly IBM System/36s, 38s and Application System/400s, according to John DiFronzo, vice president at Milford, Conn.-based Group W Information Services, which is a division of Westinghouse Broadcasting Co.

PCs and LANs, however, are growing in importance and may present increasingly promising IS career prospects, DiFronzo says.

With an IS staff of 68, down from more than 100, Westinghouse is one of the larger station group IS operations. Salaries are competitive, if not a little better than elsewhere.

Individual stations, at the bottom of the hierarchy, generally use service bureaus or run small PC-based or turnkey minicomputer systems with little need for professional IS staffs.

Radding is a free-lance writer based in Newton, Mass.

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Gain management experience

Fast Track is a bimonthly column dedicated to answering questions on career directions.

BY STEVE FOGLE
SPECIAL TO CW

Q I've been chief information officer at a Fortune 1,000 firm for the past five years and am ready to make a move. How would you suggest I leverage my 15 years of information systems experience into a new position?

Initials and town withheld

A Obviously, you could take on a new CIO position in a larger and more challenging company, but I would suggest that you investigate other alternatives as well. For example, take on any type of general management responsibility, including running a small company division or assuming some of the duties of your company's chief operating officer. This will help you in your current company or in any future job opportunity.

Q I am a city and regional planner with two master's degrees in civil engineering and urban planning. I'm pursuing a graduate degree in IS in database design. Should I seek a position as a database administrator, stay in the government IS department or become a consultant?

A.S., Dallas

A Spending all of your IS years in government may limit your mobility in the future. After you complete your degree, you may want to make a transition into the corporate world.

Consulting is always an option and may help bridge your government background into industry if you join a generalist firm. However, I would recommend you broaden your IS experience first.

Q I am an independent personal computer network consultant interested in short-term contracts overseas. What kind of market exists for this type of work?

F.M.S., Montvale, N.J.

FAST TRACK
CAREER ADVICE FOR THE '90s

A There is a small market for this work. The best contacts may be from the jobs you have already completed. In addition, get in touch with international trade commissions and agencies in target countries and ask for their insights.

Q I am a student majoring in IS and minoring in finance. I want to work with a New York-based brokerage firm developing trading systems and software. How can I prepare myself?

R.M., New York

A Pursue a summer internship in a brokerage firm. Experience will be the best training. Identify a few people who currently hold entry-level positions in brokerage firms and learn about their backgrounds and how they approached their initial job search. These individuals will be your best sources of information. Keep an open mind with regard to your target industry. Although it is good to have goals, don't limit your opportunities.

Q I'm seeking an associate's degree in IS, but I'm concerned that when I graduate, my Pick systems background will limit prospects for a better-paying position. Where might I find some specialized training to improve my chances?

S.C., Yonkers, N.Y.

A Try finding a firm that is using Pick on a limited basis. This way, you can pick up training on other systems while using your previous experience. Also, finish your associate's degree and then pursue a bachelor's degree in IS. Your compensation will increase as you gain more experience and education.

Fogle is an executive at Korn/Ferry International, a senior-level management search firm based in New York and Los Angeles.

We welcome your questions. Send them to Cathy Duffy, Careers Fast Track, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Your initials and town will be printed unless you request otherwise.

JOB SNAPSHOT

CASE project leaders

Job Snapshot is a monthly column identifying key attributes of information systems career positions.

▶ **BEST EDUCATION:** *No standard education track has yet emerged for project management in the computer-aided software engineering (CASE) arena. People are coming from all kinds of educational backgrounds (teaching, biology, computer science, mathematics, business, engineering) but usually from disciplines that are based on logical, analytical thought.*

▶ **CAREER PLUSES:** *Many of the career pluses can also be career minuses, based on the fact that this is a position of tremendous exposure in the company. Vice presidents and chief executive officers often monitor projects on a weekly basis, so the project leader may have to provide status reports. CASE project leaders also hold extremely high profiles in the user community. If users are satisfied and the project comes in on time and under budget, the project leader can become a hero.*

▶ **CAREER MINUSES:** *High profile means high risk. If a project does not satisfy users or comes in late and over budget, the fallout can be as bad as the rewards for winning are good. Also, companies are often looking for CASE tools to provide easy solutions. When they don't, the project leader will take the fall. There is little positive feedback until major deliverables are hit. The position typically involves long hours, pressure and stress. CASE tools can easily be misused and huge amounts of money can be spent without goals being realized.*

▶ **BEST JOB OPPORTUNITIES:** *The best job opportunities are generally thought to be in medium to large companies with larger IS staffs and budgets to support sizable investments in CASE tools.*

Areas that are the most extensively involved in CASE include petroleum, banking, insurance, accounting and management consultants.

▶ **REAL WORLD ADVICE:** *CASE project leaders should select companies through careful evaluation: What CASE tools are they using? How are they using them? What stage of the life cycle are they in? Are they using integrated tools? Which ones? Leaders should also learn to speak multiple languages — those of the user community, of developers and of quality assurance staff. Additionally, they should learn as much about the business as possible.*

Researched and written by Kathy Gow, a free-lance writer based in Medford, Mass.

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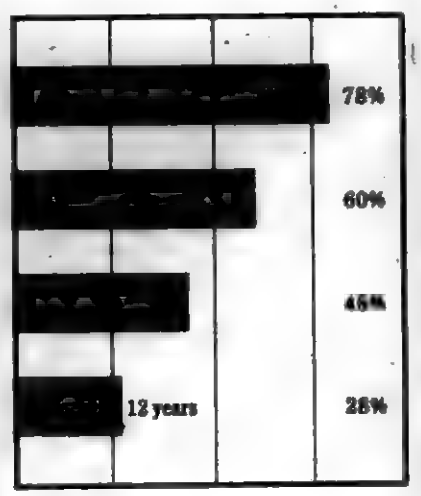
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For almost 10 years, Devon Consulting has been staffing large data-processing shops in the Philadelphia area with temporary high-tech programming professionals. As President Joel Adams explains, the firm essentially provides programmers, technical writers, and DP specialists like systems programmers, software engineers, and database administrators to companies on a contractual basis as needed. Looking at the specialized computer skills required by their ever-expanding client base, he knows their recruitment message must reach the most qualified audience available. So, like fellow NACCB members who report favorable results, he, too, advertises in *Computerworld*.

"Our clients - banks, insurance firms, pharmaceutical and chemical companies, and software developers - typically require seasoned professionals with unique, hard-to-find skill sets. However, professionals with a minimum of three years' experience in specific technical areas are often few and far between. To fully satisfy our clients' objectives, I need to target an audience with very technical expertise. With its highly qualified readership, *Computerworld* is crucial in helping us make that match.

"As we began to expand outside the immediate area into New Jersey and Delaware, our need to reach a wider technical base grew as well. Unlike our advertisements in Sunday editions of local metropolitan newspapers, our recruitment advertising in *Computerworld* draws qualified candidates not only from New Jersey and New York but also from all around the world. It's by far our single most-effective vehicle for reaching our target audience. Clearly, our recruitment advertisements in *Computerworld* cost less than in other newspapers and produce higher quality responses. In the past two weeks, for example, nearly 20% of the resumes we received came from *Computerworld* alone.

"In our business, recruitment results like these are key. In 1990 we placed about 135 new starts in addition to the employees we already had in place. This year we expect that number to total 165 or possibly higher. To ensure that Devon Consulting continues placing the right professionals in the right jobs, we fully intend to run an ongoing recruitment advertising schedule in *Computerworld*. When it comes to advertising, we believe that consistency is just as important as the size, message, and vehicle.

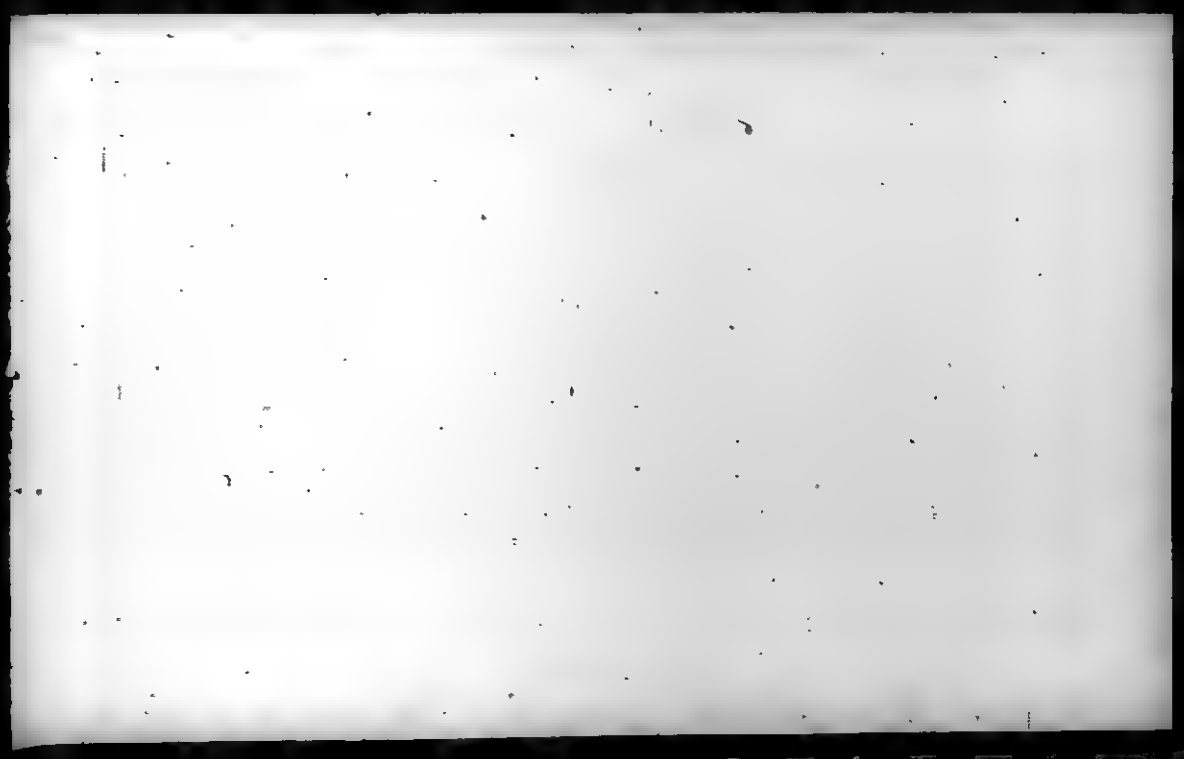
"Overall, our *Computerworld* recruitment advertising fulfills a threefold purpose. First and foremost, it's invaluable in recruiting all the top technical talent we need. It also helps us gain share of mind among a highly qualified base of readers. Finally, we know our clients read *Computerworld* and view its advertisers as significant players in the industry. When they read our advertisement, then, they see Devon Consulting as an advertiser in the industry's trade journal. That kind of presence only enhances our company image."

Computerworld. It's where serious employers - like Joel Adams - reach qualified candidates with key computer skills. Every week. Whether you use computers, make computers, or sell computer products and services, *Computerworld* can help you recruit the experienced professionals your business demands. For all the facts, call John Corrigan, Vice-President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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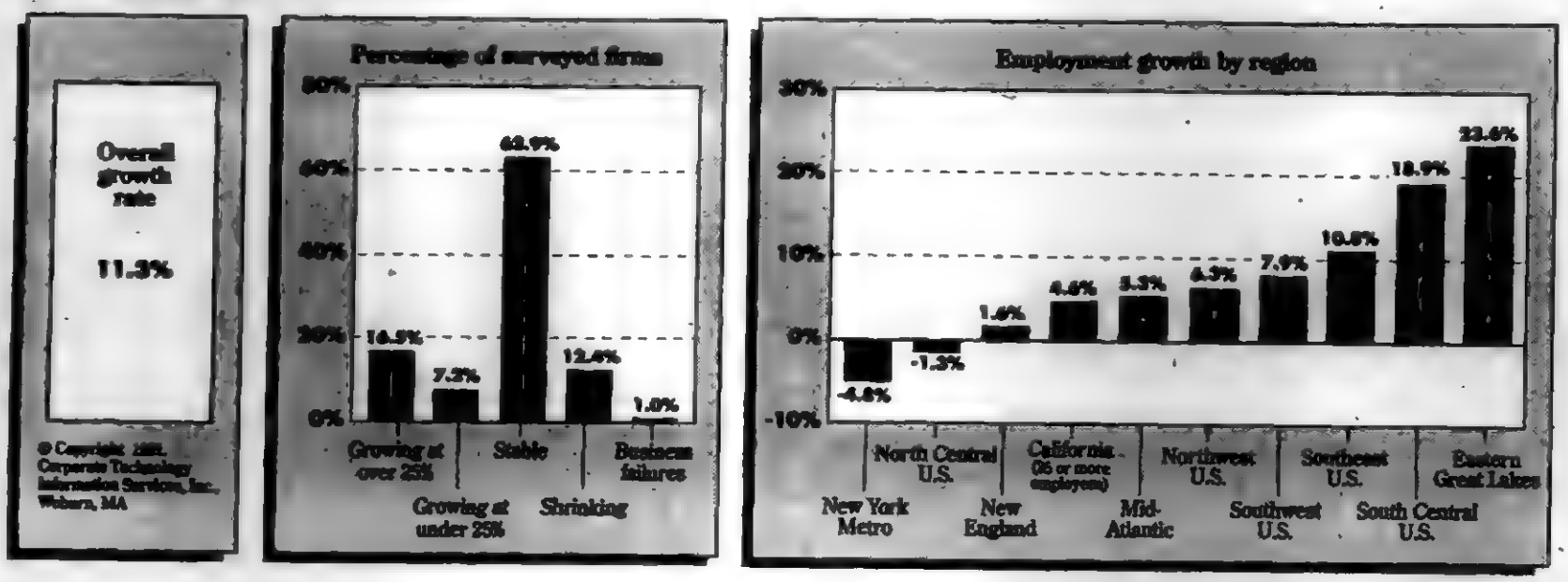
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Computerworld/CorpTech Career Index

GOVERNMENT SOFTWARE COMPANIES — Only one-quarter of small- and medium-sized high tech firms involved in government software have expanded their workforce during the past year, while another two-thirds remained stable, based on a survey of 97 government software manufacturers



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SOURCE: Skill Survey of Computerworld's Audience, May 1990.
* Includes 8,673 complimentary copies distributed to computer sales and marketing professionals. ** Total readers or paid subscriber copies (does not include 8,673 complimentary copies)

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  - TANDEM (COBOL/TAL/SCOBOL/SQL/ORACLE)
  - STRATUS (Systems Administrator, Programmers, Performance Analysis, Configuration Control)
  - UNIX (C, C++, X-WINDOWS)
- Operating Systems
  - MVS/VM, MVS/JES, CRAY, DEC/VAX, IMS, TANDEM
- Scientific Systems
  - Engineering Workstations (CAD/CAM/CIM, SUN, APOLLO, CATIA)
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"...The largest percent of our advertising-generated leads come from one source - Computerworld's Marketplace Pages."

- Don Seiden
President
Computer Reserves, Inc.

In business since 1968, Computer Reserves, Inc. of Pine Brook, NJ, is the leading nationwide locator of computing services. According to President Don Seiden, the company acts as a broker of computer services, representing hundreds of data centers throughout the U.S. which have virtually every combination of hardware, software, and peripheral services to sell. Whether it's called remote computing, timesharing, or outsourcing, their mission is to help potential buyers locate data centers that best meet their exacting mainframe specifications in the areas of overflow, backup, disaster recovery, production, and software development.

"Our customer base includes just about everything from A to Z - small start-ups, government agencies, the Fortune 100, Big Six accounting firms, software developers, and manufacturing companies. Trying to reach every potential user of our services is where *Computerworld's* breadth and depth of coverage really pays off. I see *Computerworld's Marketplace Pages* being read by an excellent cross section of professionals - both decision makers and doers - who are in a position to use our services.

"For 10+ years, no other classified advertising vehicle, and we've tried them all, has been as fruitful as *Computerworld's Marketplace Pages* in delivering results. In fact, Computer Reserves is the oldest continuous advertiser in the Time/Services section because it's keyed directly to our business.

"Based on our volume of leads, we know that buyers who can use our services read *Computerworld's Marketplace Pages.* Since we carefully track every lead, it's clear that the largest percent of our advertising-generated leads come from one source - *Computerworld's Marketplace Pages.* And, with company placements and profits having grown tenfold since the mid-1980's, it's fair to say that a substantial number of these quality leads typically become productive business. As an extra benefit, *Computerworld's Marketplace Pages* have brought us many of our best service providers as well.

"I'm a firm believer in the value of advertising continuity, especially when there's an immediate need and high demand for value-added services like ours. I also believe that advertising should be commensurate with growth. Having orchestrated four major outsourcing placements in just 18 months, we need to maximize our exposure in the computing services marketplace. That's why Computer Reserves is now running in *Computerworld's Marketplace Pages* - our tried-and-true advertising platform - every week."

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IS shops can cut costs with third-party fixes

BY ALICE LAPLANTE
SPECIAL TO CW

With the economic heat turned up full blast, savings offered by third-party maintenance vendors can look attractive to information systems shops seeking to trim operating costs.

Very attractive.

IS managers say they can save upward of 50% on annual contracts for large systems by going to a third-party firm rather than IBM, Digital Equipment Corp. or Wang Laboratories, Inc. In addition, managers say, intense competition is spurring third parties to go the extra mile and provide additional services free of charge.

A growing number of well-established maintenance vendors — such as Sorbus, Inc., Comdisco, Inc. and TRW, Inc. — sport solid track records and strong financial balance sheets, making it much less risky these days to sign a third-party contract.

Not only do many such firms offer no-penalty "exit clauses" that allow IS managers to terminate the contract if they are unhappy with the quality of the service, but many also promise to pay the "recertification" costs of putting a leased system back under its manufacturer's official service protection.

Tempting cost savings

The potential savings third-party maintenance providers can offer are enormously appealing. They caused Robert Lopez, telecommunications manager at the Aerospace Division of Fairchild Industries, Inc. in Culver City, Calif., to switch his maintenance contract from IBM to a third-party provider. He estimates that his current contract with Sorbus for his firm's 3081 and 4381 mainframes saves him $16,000 to $24,000 annually.

"IBM still approaches me every year, and I tell them to give me their best shot," Lopez says. "But since the competition is always 10% to 20% lower, I have to say no."

Moreover, Lopez says, Sorbus offers more for that lower price. Lopez's firm gets value-added services such as free installation of new machines and de-installation of older ones, guaranteed caps on annual price increases and contract exit clauses.

Some IS managers say vendors became overly confident of their business and wound up providing shoddy service, which caused customers to look elsewhere.

"IBM became complacent, didn't respond to service calls and didn't have the right technical people in place," says George Tabback, director of corporate IS at Ingersoll-Rand Co. in Woodcliff Lake, N.J. He recently signed a contract with Sorbus, which provides "excellent and responsive service," he says.

At Townecraft, Inc. in Glen Rock, N.J., electronic desktop publishing director Patrick J. Lee says his current maintenance provider — U.S. Computer Maintenance, Inc. — gets malfunctioning systems up and running much faster than his vendor, DEC, ever did. Moreover, his annual costs have been cut in half.



"Sometimes I felt DEC was using our site as a training ground for younger technicians," Lee says.

Resisting temptation

At the other end of the spectrum, many IS managers argue that the manufacturer is the best choice to service a system — even if it costs more. Not only does the vendor know the equipment better than anyone else, but signing the maintenance contract can also further solidify a good vendor/client relationship.

"I am guaranteed the latest revision levels for boards and system software as well as the highest quality of preventive maintenance," says James S. Kurz, manager of IS at Stanley MagicDoor in Farmington, Conn.

Frank Herriott, IS director at Westminster College in Salt Lake City, continues to sign contracts with Mips Computer Systems, Inc. and Prime Computer, Inc. for the same reason. "I like the comfort factor, and I like the extra attention my vendor gives me for being a good customer."

Beyond today

Moreover, firms that invest in leading-edge technology say they simply don't have a choice: Third-party providers just don't have the expertise to service their equipment.

"We periodically visit with third-party maintenance people to see what they have to offer, but they aren't in a position to maintain a good part of our inventory," says Fred L. Heger, vice president of IS at Southwestern Bell Telephone Co. in St. Louis, which uses IBM and Unisys Corp. as maintenance providers for this reason.

Many IS managers also doubt the financial stability of third-party firms. Sometimes, the best prices are offered by start-ups with no solid customer history. IS managers can take a significant risk by hiring such firms, according to Ivan Gelb, president of Gelb Information Systems Corp., a systems consulting firm in Brooklyn, N.Y. "The financial incentives offered by such organizations can be substantial, but," he asks, "is it worth it?"

At the Hotsy Corp., in Englewood, Colo., IS director David Long stuck with the maker of his system, Prime, to service his CPU, despite tempting offers from third parties. "They just didn't have a track record that made me comfortable," says Long, whose caution turned out to be justified. Of the three third-party firms in his area that work on Prime systems, two have gone out of business, and the third is in a "suspicious" financial state, Long says.

Even satisfied customers of third-party vendors urge caution. Lee visited U.S. Computer's repair facilities as well as some of its customers before deciding the firm was reliable. "Don't sign anything until you've talked to other customers," he advises.

La Plante is a free-lance writer based in Palo Alto, Calif.

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AT Model 339	$750	$1,000	$700
PS/2 Model 30-286	$1,150	$1,300	$1,000
PS/2 Model 60	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,000	$3,500	$3,000
Compaq Portable II	$750	$1,050	$700
Portable 286	$1,100	$1,300	$1,000
SLT 286	$1,900	$2,200	$1,700
Portable 386	$2,000	$2,100	$1,500
LTE 286	$1,950	$2,200	$1,800
Deskpro 286	$900	$1,000	$700
Deskpro 386/20	$2,150	$3,000	$2,000
Apple Macintosh Plus	$750	$975	$700
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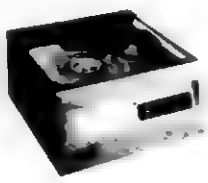
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

DOWNGRADED FROM OUTPERFORM TO MARKET PERFORMER: Oracle Systems Corp. (Montgomery Securities). Reason: More conservative sales practices raise concerns about fiscal 1992 earnings. Oracle holds dominant share in independent relational database market, but domestic sales are slow. Company indicated it may seek financial booster in the form of Japanese investment.

UPGRADED FROM MODERATELY ATTRACTIVE TO VERY ATTRACTIVE: Goal Systems International, Inc. (Donaldson, Lufkin & Jenrette, Inc.). Reason: Good long-term buy because demand for systems software remains healthy, despite lagging sales of mainframe hardware. Firm's data center management division is a major player in the market and earns 80% of Goal's revenue.

UPGRADED FROM NEUTRAL TO BUY: Lotus Development Corp. (Alex. Brown & Sons, Inc.). Reason: New products appear quite competitive and will drive earnings for next few quarters. Freelance 4.0 began shipping last month, and 1-2-3 for Windows is expected to hit the market this summer. Do not expect hefty sales this year of 1-2-3 for the Macintosh, however.

UPGRADED FROM NEUTRAL TO ATTRACTIVE: Goal Systems (Mabon, Nugent & Co.). Reason: Recent share price drop creates buying opportunity. Company locked in substantial revenue from recent deal with Banc One Corp. for computer-based training. Financials have remained strong despite Goal's mergers and acquisitions (CW, April 16, 1990).

DOWNGRADED FROM BUY TO NEUTRAL: Adobe Systems, Inc. (Alex. Brown). Reason: Company is solid, with superior technology, but it has a tough job ahead penetrating Windows market. Also, weakness in Apple Computer, Inc.'s high-end product sales affects Adobe's royalties and revenue. Apple is selling a lot of printers, but growth comes from its low-end line, based on its own Truetype font technology and not Adobe's Postscript.

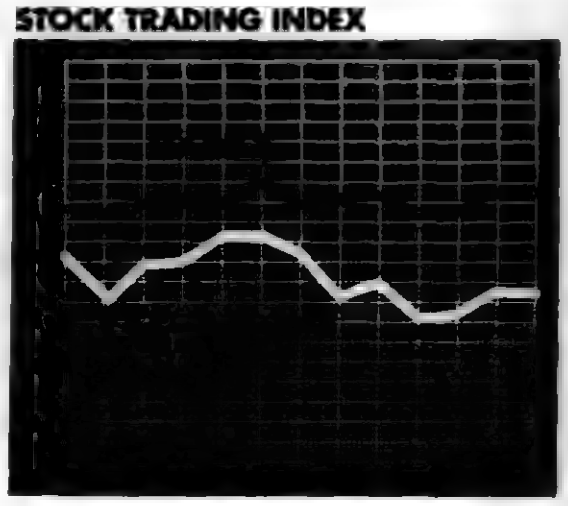
DOWNGRADED FROM BUY TO NEUTRAL: IBM (Alex. Brown). Reason: Both mainframe and personal computer markets are saturated. New Enterprise System/9000 mainframes unavailable until the second half of 1991, and bridging strategies have failed to generate interest. Price cuts on low-end RISC System/6000 signal a crowded desktop arena.

UPGRADED FROM HOLD TO BUY: Marshall Industries (Prudential Securities, Inc.). Reason: Although prospects for electronics distributors are currently poor, Marshall's earnings look good over the long haul. Stock is currently cheap enough that any negative financial news will not greatly affect its price, but be aware that it is a high-risk proposition. Expect explosive profit growth once economy picks up.

UPGRADED FROM NEUTRAL TO BUY: LSI Logic, Inc. (Alex. Brown). Reason: Big profits should come from an expected surge in orders for Scalable Processor Architecture and reduced instruction set computing chips. Company has hired new managers in the key areas of new products, finance and operations.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Digital Equipment Corp. unveiled its new open systems strategy last Monday; DEC stock slipped ⅜ of a point last week, closing Thursday at 66¾. Meanwhile, Unisys Corp., which announced impending staff cuts, gained ½ of a point to 4⅜, up nearly 13% for the week.
- After JWP, Inc. said it will take over Businessland, Inc., shares in the financially troubled retailer gained ⅛ of a notch to 1⅛; JWP dropped 1¼ points to 17½. Elsewhere on the retail scene, Intelligent Electronics, Inc., which four weeks ago unveiled plans to acquire Bizmart, Inc., jumped 1½ points last week to 23, while Bizmart slipped ⅛ of a point to close Thursday at 16¾.
- Among semiconductor issues, Texas Instruments, Inc. picked up 1⅛ points to 38¾, while Motorola, Inc. stumbled ⅛ of a point to 68½.
- Elsewhere, action was mixed. IBM fell 1⅛ points to 103; Lotus Development Corp. declined 2½ points to 32½; Knowledgeware, Inc. tumbled 5¼ points to 27¼.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JUNE 7, 1991

TOP PERCENT GAINERS

Alliant Computer Sys.	29.57
Oracle Systems	23.33
On Line Software Int'l	18.18
American Software Inc.	15.31
Ashton Tate	12.96

TOP PERCENT LOSERS

Micropolis Corp.	-26.09
MAI Systems Corp.	-20.00
Knowledgeware Inc.	-17.11
Datapoint Corp.	-14.29
Compression Labs Inc.	-14.29

TOP DOLLAR GAINERS

American Software Inc.	1.88
Oracle Systems	1.75
Cognos Inc.	1.63
On Line Software Int'l	1.38
System Software Assoc.	1.25

TOP DOLLAR LOSERS

Ashton Tate	-6.88
Knowledgeware Inc.	-5.63
Motorola Inc.	-4.63
Xerox Corp.	-4.38
IBM	-4.38

Communications and Network Services — Off 2.69

Exch	52-Week High	52-Week Low		June 7 Close	Wk Net Change	Wk Pct Change
OTC	19.00	8.38	3 COM Corp.	8.88	0.25	2.90
NYS	68.75	52.50	American Info Techs Corp.	56.88	-3.50	-5.80
NYS	44.13	29.00	AT&T	36.38	-0.75	-2.02
OTC	6.00	0.88	Ariel Communication Corp.	2.38	0.00	0.00
NYS	56.25	39.50	Bell Atlantic Corp.	44.63	-2.50	-5.31
NYS	57.00	47.00	Bellsouth Corp.	47.38	-2.50	-5.01
NYS	44.00	13.13	Cabletron Systems	35.75	-2.00	-5.54
OTC	25.88	8.25	Compression Labs Inc.	17.25	-2.88	-14.29
OTC	5.13	2.75	Data Switch Corp.	3.63	-0.13	-3.33
NYS	26.13	8.88	Digital Comm. Assoc.	18.38	-1.25	-7.06
OTC	25.25	12.25	Dynatech Corp.	19.75	0.00	0.00
OTC	12.88	5.50	Fibronics Int'l Inc.	6.63	-0.38	-4.17
OTC	4.00	1.75	Gandalf Technologies Inc.	3.25	-0.13	-3.70
NYS	4.25	1.63	General Datacomm Inds.	3.13	-0.13	-3.85
NYS	23.50	23.50	GTE Corp.	29.38	-0.63	-2.09
NYS	63.00	40.25	ITT Corp.	61.50	-0.38	-0.61
OTC	44.13	17.88	MCI Communications Corp.	22.63	-1.88	-5.95
OTC	11.25	2.75	Microcom Inc.	6.13	-0.50	-7.55
NYS	10.38	4.00	Network Equipment Tech.	8.50	0.63	7.94
OTC	14.63	4.00	Network General	8.00	0.50	6.67
OTC	15.50	8.13	Network Systems Corp.	13.75	0.63	4.76
NYS	37.75	22.13	Northern Telecom Ltd.	37.25	-0.25	-0.67
OTC	58.50	17.25	Novell Inc.	53.25	-3.75	-6.58
NYS	88.00	67.00	Nynex Corp.	69.00	-2.88	-4.00
NYS	47.50	38.25	Pacific Telesis Group	39.50	-1.25	-3.07
ASE	15.38	4.75	Rexel Corp.	14.50	0.00	0.00
NYS	23.00	8.88	Scientific Atlanta Inc.	13.75	0.00	0.00
NYS	56.88	47.25	Southwestern Bell Corp.	49.75	-2.00	-3.86
NYS	44.75	20.63	United Telecom	27.88	-1.00	-3.46
NYS	49.75	32.38	US West Inc.	35.63	-1.13	-3.08

Computer Systems — Off 3.02

Exch	52-Week High	52-Week Low		June 7 Close	Wk Net Change	Wk Pct Change
OTC	8.75	0.50	Alliant Computer Sys.	1.13	0.25	28.57
ASE	18.88	10.00	Amdahl Corp.	16.25	-0.38	-2.26
OTC	73.25	34.25	Apple Computer Inc.	46.13	-0.88	-1.86
OTC	11.25	4.25	Archive Corp.	7.13	-0.13	-1.72
OTC	32.75	7.50	AST Research Inc.	23.00	-0.50	-2.13
NYS	8.38	4.00	Bolt, Beranek & Newman	6.38	0.50	8.36
NYS	21.63	4.50	Commodore Int'l	15.50	-1.50	-8.82
NYS	74.25	34.38	Compaq Computer Corp.	38.75	-1.38	-3.61
OTC	2.13	0.13	Computer Automation Inc.	1.13	-0.13	-10.00
NYS	29.00	6.75	Control Data Corp.	11.50	0.00	0.00
NYS	29.88	8.38	Convex Computer	17.00	-2.00	-10.53
NYS	50.38	28.00	Cray Research Inc.	36.38	1.13	3.19
NYS	18.13	3.50	Data General Corp.	16.25	-0.38	-2.26
NYS	3.25	0.75	Datapoint Corp.	1.50	-0.25	-14.29
OTC	30.63	8.25	Dell Computer Corp.	25.13	0.38	1.52
NYS	80.38	46.50	Digital Equipment Corp.	57.00	-2.63	-3.77
NYS	38.13	13.75	Harris Corp.	28.50	-0.38	-1.49
NYS	55.13	24.88	Hewlett Packard Co.	51.38	-3.13	-5.73
NYS	139.75	88.25	IBM	102.88	-4.38	-4.11
OTC	13.50	7.75	Information Int'l	8.25	0.00	0.00
OTC	31.50	10.50	Intergraph	23.25	-0.50	-2.09
NYS	2.75	0.50	MAI Systems Corp.	0.50	-0.13	-20.00
NYS	148.75	114.00	Matsushita Electronics	118.50	-3.50	-2.87
OTC	28.00	8.00	Mentor Graphics Corp.	10.88	-1.13	-9.38
NYS	105.88	44.50	NCR Corp.	104.88	-0.88	-0.83
OTC	32.50	11.00	Pyramid Technology	23.75	1.25	5.56
OTC	34.00	9.75	Sequent Computer Sys.	14.25	-0.88	-5.79
NYS	47.25	18.00	Silicon Graphics	33.00	-0.50	-1.49
NYS	37.25	14.63	Stratus Computer Inc.	32.38	-0.75	-2.26
OTC	38.63	16.00	Sun Microsystems Inc.	36.25	-0.63	-1.69
NYS	25.63	8.88	Tandem Computers Inc.	16.00	-1.38	-7.81
NYS	38.50	23.50	Tandy Corp.	33.00	-0.63	-1.86
OTC	29.50	6.75	Teradata	16.13	-1.13	-6.52
NYS	7.88	1.38	Ultimate Corp.	5.25	0.25	5.00
NYS	15.50	1.75	Unisys Corp.	4.13	0.33	8.45
ASE	5.75	2.00	Wang Labs Inc. (a)	3.50	0.00	0.00

Software & EDP Services — Off 0.90

Exch	52-Week High	52-Week Low		June 7 Close	Wk Net Change	Wk Pct Change
OTC	63.00	17.00	Adobe Systems Inc.	48.25	-2.25	-4.46
OTC	33.50	7.00	Alcorp	7.50	-0.25	-3.23
OTC	59.88	30.25	Ashton Tate	48.50	-6.50	-12.09
OTC	28.50	12.00	American Mgmt. Systems	25.50	-1.75	-6.42
OTC	18.25	7.50	American Software Inc.	14.13	1.88	15.31
NYS	4.63	1.38	Anacomp Inc.	3.25	-0.13	-3.70
OTC	23.50	10.00	Analysts Int'l	16.00	0.50	3.23
OTC	13.25	4.88	Ashton Tate	11.13	1.25	12.66
OTC	10.25	4.00	ASK Computer Sys.	8.38	0.50	6.35

Exch	52-Week High	52-Week Low		June 7 Close	Wk Net Change	Wk Pct Change
NYS	37.00	22.88	Auto Data Processing	32.00	-2.00	-5.88
OTC	60.25	32.00	Autodesk Inc.	58.00	-0.63	-1.07
OTC	31.50	16.50	BGS Systems Inc.	38.00	1.00	3.70
OTC	43.88	17.75	BMC Software Inc.	36.25	0.50	1.29
OTC	21.50	11.00	Boole & Babbage Inc.	11.00	-1.75	-13.73
OTC	64.25	14.50	Borland Int'l	50.63	-1.13	-2.17
NYS	9.00	0.44	Businessland Inc.	1.13	0.00	0.00
OTC	20.88	5.13	Cognos Inc.	15.50	-0.25	-1.59
NYS	16.63	4.38	Computer Associates	8.38	-0.38	-3.85
OTC	17.75	9.50	Computer Horizons	10.50	0.25	2.44
NYS	73.25	38.75	Computer Sciences	65.75	0.00	0.00
NYS	11.75	8.63	Computer Task Group	8.38	-0.88	-9.46
OTC	25.25	13.00	Comshare Inc.	19.63	1.63	9.06
OTC	16.00	3.75	Corporate Software	10.38	-0.25	-2.35
NYS	49.00	27.88	General Motors E (EDS)	48.75	0.88	1.83
OTC	16.75	7.25	Goal Systems Int'l	14.25	0.75	5.56
OTC	7.00	1.88	Hogan Systems Inc.	5.88	-0.25	-4.08
OTC	23.63	7.75	Information Resources	20.63	-2.50	-10.81
OTC	17.50	2.63	Informix Corp.	5.75	-0.50	-8.00
OTC	7.88	1.38	Intellicorp Inc.	1.63	-0.06	-3.72
OTC	8.25	2.50	Interleaf Inc.	8.38	0.50	0.00
OTC	15.88	6.88	Intersolv	8.25	0.00	0.00
OTC	43.25	10.00	Knowledgeware Inc.	27.25	-5.69	-17.17
OTC	45.00	18.75	Legent Corp.	32.25	1.25	4.03
OTC	38.25	12.50	Lotus Development	32.25	-3.75	-10.42
OTC	32.00	13.63	Micrografx	15.00	-0.75	-4.76
OTC	117.50	80.75	Microsoft Corp.	110.25	0.50	0.46
NYS	10.50	4.00	On Line Software Int'l	9.88	1.38	16.18
OTC	24.00	4.88	Oracle Systems	9.25	1.75	23.33
NYS	14.63	7.00	Parasonic Systems	12.13	-0.50	-3.96
OTC	9.25	1.25	Phoenix Technologies	7.50	-0.50	-6.25
NYS	52.00	33.38	Policy Management Sys.	48.25	-0.63	-1.28
NYS	23.63	11.50	Reynolds & Reynolds	22.63	0.25	1.12
OTC	25.75	14.75	SEI Corp.	25.75	0.25	0.98
OTC	22.75	12.50	Shared Medical Systems	20.38	-0.38	-1.81
OTC	35.25	12.00	Software Publishing Corp.	19.50	-0.75	-3.70
NYS	14.63	5.50	Sterling Software	13.50	0.00	0.00
OTC	28.00	9.50	Sungard Data Sys.	17.50	0.25	1.45
OTC	65.88	17.75	Symantec Corp.	41.38	-2.63	-5.97
NYS	24.50	4.50	System Center Inc.	8.88	-0.13	-1.39
OTC	37.25	12.50	System Software Assoc.	16.00	1.25	9.09
OTC	24.88	4.75	Wallach	11.38	-1.25	-10.00

Semiconductors — Off 6.03

Exch	52-Week High	52-Week Low		June 7 Close	Wk Net Change	Wk Pct Change
NYS	14.25	3.63	Advanced Micro Devices	13.00	-0.50	-3.70
NYS	12.50	8.50	Analog Devices Inc.	10.25	-0.75	-6.82
OTC	21.75	6.25	Chips & Technologies	8.88	-0.88	-8.97
OTC	59.25	28.00	Intel Corp.	52.25	-3.50	-6.28
NYS	13.00	6.13	LSI Logic Corp.	8.63	-0.88	-8.33
NYS	19.13	8.75	Micron Technology	15.63	-1.00	-6.02
OTC	20.88	7.38	MIPS Computer Systems	15.38	-1.25	-7.52
NYS	88.38	46.75	Motorola Inc.	68.63	-4.63	-6.44
NYS	8.38	3.00	National Semiconductor	6.63	-0.38	-5.36
NYS	47.63	22.50	Texas Instruments	37.75	-1.38	-3.51
OTC	12.25	3.00	VLSI Technology	8.63	-1.00	-8.41
ASE	14.88	4.00	Western Digital Corp.	4.63	0.00	0.00

Peripherals & Subsystems — Off 4.69

Exch	52-Week High	52-Week Low		June 7 Close	Wk Net Change	Wk Pct Change
OTC	2.75	0.88	Apertus Technologies	1.94	-0.31	-13.67
OTC	23.50	7.50	Banctec Inc.	13.25	-0.50	-3.64
OTC	17.50	4.25	Cambex Corp.	11.88	-1.38	-10.38
ASE	11.75	4.13	Cognitronics Corp.	9.25	-0.38	-3.90
NYS	31.25	14.63	Conner Peripherals	19.25	-1.75	-8.33
ASE	22.00	7.00	Datacom Corp.	11.88	-0.13	-1.04
NYS	13.00	4.25	EMC Corp.	10.88	-0.50	-4.40
NYS	47.25	33.75	Eastman Kodak Co.	42.75	0.38	0.88
OTC	11.25	4.75	Emulex Corp.	6.88	0.13	1.85
OTC	32.25	14.00	Evans & Sutherland	19.50	-0.75	-3.70
OTC	6.50	3.88	Exabyte Corp.	5.50	0.00	0.00
OTC	28.25	6.75	FPL Systems Inc.	23.75	0.50	2.15
OTC	1.63	0.13	Monitor Systems	0.75	0.00	0.00
OTC	16.00	2.88	Mentor Corp.	4.38	0.13	3.06
OTC	18.00	4.38	Micropolis Corp.	10.63	-3.75	-26.09
NYS	95.63	73.88	3M Corp	93.00	-2.25	-2.36
OTC	14.25	6.00	Printronix Inc.	8.50	-0.75	-10.34
NYS	34.75	8.50	QMS Inc.	19.75	-2.63	-11.73
OTC	19.25	8.25	Quantum Corp.	11.25	-0.63	-5.26
NYS	7.63	4.38	Recognition Equipment	7.38	0.00	0.00
OTC	11.50	4.00	Reston Inc.	8.50	-0.50	-5.56
OTC	19.88	5.63	Seagate Technology	10.50	-0.88	-7.69
NYS	67.00	11.00	Storage Technology	43.50	-1.00	-2.25
OTC	14.75	1.25	Tandon Corp.	3.38	-0.31	-8.49
NYS	29.38	11.63	Tektronix Inc.	23.88	1.25	5.52
OTC	0.56	0.16	Televideo Systems	0.34	-0.06	-8.27
NYS	69.13	29.00	Wang Corp.	53.63	-4.38	-7.54

Leasing Companies — Off 8.19

Exch	52-Week High	52-Week Low		June 7 Close	Wk Net Change	Wk Pct Change
OTC	16.25	7.00	Amresco Inc.	16.25	0.25	1.56
NYS	28.38	14.63	Comdisco Inc.	24.75	0.00	0.00
OTC	16.25	9.25	LDI Corporation	14.63	-0.38	-2.50
OTC	6.75	2.25	Selectcom Inc.	3.75	0.00	0.00

NOTE: Comtel Corp. was acquired by GTE Corp. and removed from the list.

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Multimedia boost added to Apple's System 7.0

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. added a multimedia booster to its System 7.0 operating system engine last week when it introduced Quicktime, a software extension designed to make the integration of sound, video and animation into Macintosh applications more affordable and accessible.

Quicktime consists of four major components — systems software, file formats, compressors and interface standards — that provide the functional foundation necessary to build multimedia applications. The features allow users to compress and decompress photographic images, play video clips and extend the Macintosh user interface throughout the presentation, Apple officials said.

While Quicktime will work with any of the standard Macintosh II computers, the voracious memory appetite of most multimedia applications will probably require system upgrades. At least 4M bytes (preferably 8M bytes) of random-access memory as well as 160M bytes or more of hard disk space are suggested. Users will also need at least an 8-bit color screen with 640- by 480-pixel resolution and at least 8 bits of digital audio sampling.

Because Quicktime will make multimedia accessible to new segments of users, the package could lead to the creation of applications in virgin areas such as videoconferencing, store-and-forward video mail and low-cost video editing, Apple said.

Quicktime will be distributed as an add-on package until the next major revision of the Macintosh operating systems, which insiders said they expect will arrive next year. Current distribution plans call for a beta-test release of Quicktime to head out to developers this summer and general availability by the end of the year. No price has been set yet for the package.

In related multimedia news, Microsoft Corp. revealed plans to license image compression technology from Xing Technology Corp. Microsoft officials said they plan to use the licensed software in conjunction with their operating system.

IBM begins multimedia push

Desktop-to-mainframe strategy to unfold this week and in fall

BY MICHAEL FITZGERALD
CW STAFF

IBM plans a multimedia product announcement this week that represents the first pieces of its commitment to a broad, desktop-to-mainframe multimedia strategy that will take fuller shape in the fall.

"[Multimedia] is one of the top half-dozen corporate strategies stated in the 1990s," said Peter Blakeney, manager of market programs, multimedia and education at IBM in Atlanta.



"The reason that it is so important is that as you add these functions — video, image, animation, sound and different user interfaces which are collectively called multimedia — those technologies allow IS technology to be deployed in a vastly larger set of opportunities."

John Dunkle, vice president of Workgroup Technologies, Inc. in Hampton, N.H., said IBM is pointing toward the fall announcement to define its multimedia direction.

The products due on Wednesday, part of a general personal computer announcement (see story page 1), include two multimedia kits directed at training and desktop presentations: the 8516 Touch Display, a touch-screen IBM Video Graphics Array monitor radically different from IBM's current Infowindow touch-screen monitor, and a 128M-byte 3½-in. rewritable optical disc drive. There will also be an Information Delivery System, essentially a Personal System/1 with a compact disc/read-only memory drive added to it, that will serve as IBM's low-end multimedia platform, and a device that will let users access information they may not be able to manipulate on their own systems.

The kits will work on all Personal System/2 models with the Micro Channel Architecture bus or anything above a Model 50. They mix current technology with new products at a price lower than what the pieces would cost separately. The training-oriented kit includes IBM's M/Motion video card, a laser disc player and audio speakers, all in existence today. The kit for desktop presentations has IBM's M/Audio sound recording card and the new optical disc drive. Blakeney said IBM would follow this marketing approach with future releases.

IBM is working for an August introduction of enhanced Digital Video Interactive capabilities. It will follow this with a major announcement late in the third quarter. Sources said this will include a fully integrated multimedia PC and packaged peripherals and software aimed at the manufacturing and education markets; other possibilities are being discussed.

Tim Bajarin, executive vice president of Creative Research Strategies International, Inc. in Santa Clara, Calif., said IBM will need to work with strategic partners in a variety of areas, including data compression and communications, to make the strategy work.

> "THIS IS THE first time I've seen [IBM] attack a concept correctly, really embrace it and as a result develop the right technologies and strategies to make it happen."
>
> TIM BAJARIN
> CREATIVE RESEARCH STRATEGIES

But, he added, "I've been watching [IBM] work for many years, and this is the first time I've seen them attack a concept correctly, really embrace it and as a result develop the right technologies and strategies to make it happen."

Unisys unwraps I486 CTOS

NEW YORK — Unisys Corp. introduced last week an Intel Corp. I486-based version of its CTOS networked computer line composed of plug-in and self-configuring components.

Unisys said the new design will cut down on costs associated with technical support calls from users of these workstations.

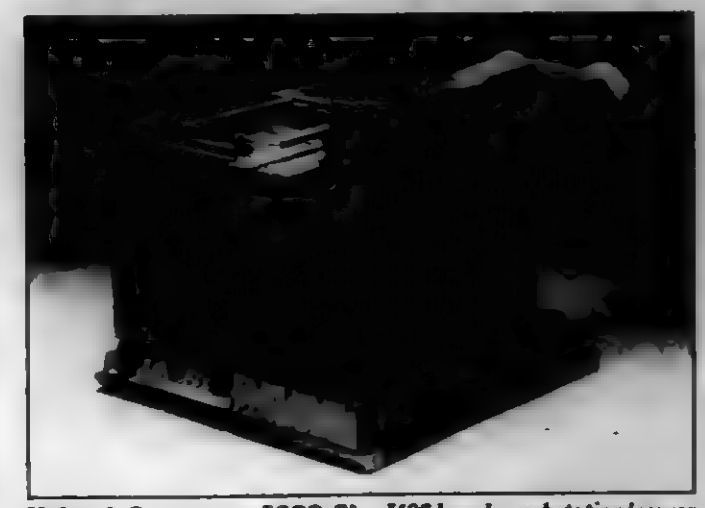
The firm unveiled two CTOS workstations.

The $2,995 diskless Supergen Series 2000 uses an Intel 80386SX running at 20 MHz, 2M to 8M bytes of random-access memory and built-in networking.

The $13,995 Supergen 5000 contains an I486 chip running at 33 MHz, 4M to 36M bytes of RAM, a 32-bit bus, a 3½-in., 1.44M-byte floppy disk and a small computer systems interface adapter, among other I/O ports.

Both systems use plug-in cartridges, slide-in drives or slide-in expansion units, and all add-in components are encased in copper-and-nickel-coated plastic to prevent electrostatic discharge damage and to provide ease of handling.

Both of the Supergens support Super VGA video monitors with up to 1,024- by 768-pixel resolution.



Unisys' Supergen 5000-2's ***I486-based workstation/server uses plug-in cartridges, slide-in drives or slide-in expansion units***

Unisys leasing arm tackles $3.8B debt

BLUE BELL, Pa. — In a move designed to pare its $3.87 billion debt, Unisys Corp.'s leasing arm last week sold lease receivable-backed certificates for $131 million in cash.

The transaction for the Unisys Credit Corp. certificates was conducted privately by Unisys Finance Corp. in Detroit.

According to a Unisys spokesman, the sale to approximately 40 undisclosed investors gives the buyers fractional ownership in the leasing company's trust property, which includes future payments due from customers and related rights and interests.

With the lease certificate sale, Unisys was able to announce that its debt reduction program, begun early last year, has netted more than $300 million. Unisys has said its debt reduction target this year is $600 million.

AT bus

FROM PAGE 1

technology on the desktop," according to Michnoff. The goal was to create a new standard that was difficult to clone without permission.

At Dow Chemical Co.'s research and development arm, MCA is a tough sell. While MCA is a faster bus than the AT, there are not enough applications to take advantage of it to justify the additional cost for the bus, group leader Terry Frazier said. His users prefer the AT bus, which is one reason he buys more AT bus Compaq Computer Corp. PCs than IBM buses.

MCA will be used in the PS/2 Model 57 SX, which will be positioned as IBM's 386SX high end. It will also be the first machine from a major PC vendor to feature a 2.88M-byte floppy disk drive, doubling the 1.44M-byte capacity common today, several sources confirmed.

IBM would not comment on the specifics of the products other than to confirm a Wednesday announcement.

This dual bus strategy may only increase users' anxiety levels. With a nonhomogeneous bus environment, end-user sites face more hassles in tracking machine types and card inventories and in training internal support people.

"There's too much difficulty maintaining two sets of network cards and add-in boards," said Stephen Anderson, information systems architect at the Department of Social and Health Services for the state of Washington.

Diskless Model 35

The PS/2 Models 35 and 40 will each offer 40M- or 60M-byte hard disk drives and 16-bit Video Graphics Array adapters. The Model 35 LS will be a diskless version of the Model 25.

The Models 35 and 40, which differ only in number of expansion slots and drive bays, will be priced starting at just under $3,000, sources said.

The Model 57 SX will range in price from $3,000 to $6,000, depending on hard disk drive capacity, which ranges up to 320M bytes.

NEWS SHORTS

PC cuts roll along

Following an across-the-board price cut in April, Toshiba America Information Systems, Inc. has taken the ax to prices on its T1000XE and T1000SE notebook personal computers again. The Intel Corp. 8088-based PCs will now cost $1,399 and $990, respectively. Everex Systems, Inc. and Hewlett-Packard Co. last week joined the price war that has gripped IBM, Compaq Computer Corp., Dell Computer Corp. and others. Everex cut prices 18% to 33% on all Step desktop PCs and 13% to 25% on Tempo desktop models. HP trimmed prices on its Vectra PCs by up to 10% and on storage by up to 33%.

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NFSnet goes commercial

Advanced Network & Services, Inc. (ANS), the consortium that manages the National Science Foundation's NSFnet, announced last week that it will open the high-speed government and education backbone to commercial users. The commercial NSFnet service will be provided by the recently formed ANS subsidiary, ANS CO+RE Systems, Inc. Profits from the service will be used to improve NSFnet's infrastructure, said Allan H. Weis, president and chief executive officer of ANS. Nonprofit customers will pay less than commercial customers for NSFnet use, he added. Likely customers for the new service include information services, computer companies and contractors that want to communicate with government and research groups, Weis said.

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Apple cuts from the top

Top Apple Computer, Inc. executives can expect to have their pay slashed by as much as 10% as part of a broad cost-cutting program the firm recently adopted, according to an internal company newsletter. Last year, Apple's five highest paid executives earned nearly $10 million in salaries and bonuses. Day-care services, company cars and some fitness centers may also fall under the cost-cutting ax, an Apple spokeswoman said. The company recently announced plans for widespread belt-tightening measures that include the elimination of about 1,560 jobs, or about 10% of its work force.

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U.S., Japan limit super sales

The U.S. and Japan agreed to tighten their export controls to prevent supercomputers sold abroad from being used to develop nuclear weapons and missiles, the White House announced late last week. Strict safeguards — such as inspection of software programs — will be imposed on supercomputers exported to countries that "pose a national security or [nuclear] proliferation concern," and some export applications may be denied, spokesman Marlin Fitzwater said.

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U.S. Privacy Council formed

Several leading privacy advocates last week formed the U.S. Privacy Council to promote stronger privacy rights for consumers in the computer age. The Washington, D.C.-based council plans to focus on such topics as credit reports, caller identification services, privacy-enhancing technologies, lobbying for a federal data protection board and helping U.S. firms adhere to the Code of Fair Information Practices. Leaders include Evan Hendricks, publisher of "Privacy Times" newsletter, and Marc Rotenberg, director of the Washington, D.C., office of Computer Professionals for Social Responsibility.

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Thinking Machines claims title

Thinking Machines Corp., a pioneer in the area of massively parallel computing, last week introduced its newest Connection Machine, a 100-user supercomputer with a peak speed of 40 billion floating-point operations per second. According to the firm, the CM-200 is the first supercomputer with an operating environment — dubbed CMOST, for Connection Machine Operating System: Timesharing — built on standard X Window System and Motif protocols for workstations. Cambrige, Mass.-based Thinking Machines also introduced a standalone version of CMOST for Sun Microsystems, Inc.'s workstations to let users become familiar with parallel programming techniques at their workstations.

AT&T cashes in on departure from Sun

BY NELL MARGOLIS
CW STAFF

AT&T's divestiture of most of its 19.1% stake in Sun Microsystems, Inc. last week will likely have no effect on the rival Unix alliances the original AT&T/Sun relationship sparked to life, according to analysts.

"If this move had come several years ago, it might have had a striking impact on OSF," said Judith Hurwitz, vice president of the Seybold Office Computing Group in Boston. The Open Software Foundation (OSF), a Cambridge, Mass.-based consortium, is developing a Unix operating system that will compete with Sun's. It was originally mounted to prevent the Sun/AT&T combination from essentially locking all other comers out of the promising Unix market.

However, Hurwitz noted, "Things have gone way beyond the catalyst stage, now." Paul Cubbage, an analyst at San Jose, Calif.-based market research firm Dataquest, Inc., said the OSF has become a player in its own right. "They've established a whole new way of doing a whole new kind of business," he said.

As for Sun, he said, "They got the financing [from AT&T] when they needed it. They don't really need it any more."

Earlier this spring, as its prospects of buying NCR Corp. brightened, AT&T spun off subsidiary Unix System Laboratories, Inc. (USL) to 11 computer vendors, including Sun. Last week's stock sell-off, analysts said, was a natural follow-up to the USL spin-off, both of which allow AT&T to approach the altar with NCR unfettered by old, competitively awkward ties.

The telecommunications giant will pocket a pretax gain of about $137 million from the transaction, under which Sun will repurchase some 5 million of AT&T's shares at $36.25 per share. New York-based investment banker Salomon Brothers, Inc. will buy most of the remainder for resale to institutional investors.

"This is simply a very pragmatic move," Hurwitz said. "AT&T can take its money out of Sun and invest it in the development that NCR needs to do."

Prime trumpets tools for 50 series

BY SALLY CUSACK
CW STAFF

SAN ANTONIO — Declaring undying devotion to proprietary systems customers, Prime Computer, Inc., announced several products for its 50 series at the National Prime User Group (NPUG) meeting here last week.

"We feel great," said Cathy Van Orman, chairwoman of NPUG. "Prime is finally moving ahead of customer needs. Users are telling me that instead of trying to get Prime to respond to problems, they are trying to figure out which sessions will teach them the most."

The highlight of the conference was an announcement by Prime officials that, for the first time, Prime's Pick-like relational database, Information, would be available to run on Unix-based hardware from IBM and Digital Equipment Corp. sometime in the third quarter of this year.

Initial conversions have already been completed for the IBM RISC System/6000 workstation, and engineering testing is already in progress. More than two-thirds of Prime's proprietary installed base use Information.

Information's sales

According to Richard Snyder, president of Prime's computer systems business unit, Prime's Information accounted for 50% of 1990's fourth-quarter sales and 60% of 1991's first-quarter sales revenue.

Other product announcements included the following:

- Hyper Session, a Microsoft Corp. Windows-based product that takes data from host-based Information files and translates it into personal computer applications such as Lotus Development Corp.'s 1-2-3 and Microsoft's Excel.
- Redundant arrays of inexpensive disk technology demonstrated at the conference and slated to be introduced formally sometime later this year.
- Plans to port the Computervision Medusa computer-aided design and drafting software to the Prime EXL 7000 series of Unix-based multiprocessors. The porting process is scheduled to be completed during the first half of 1992.

"We are also designing a multiprocessor based on Mips [Computer Systems, Inc.] technology," Snyder said. "This board-swapping type of architecture will preserve 50 series user investments while transitioning to EXL systems."

Jim Bloomquist, a former NPUG technical chairman, applauded Prime's product introductions, noting that the vendor may be able to save 50 series users as much as 85% of their original investments while migrating to Unix.

Referring to 50 series-to-EXL Unix migration, Bloomquist said a major problem exists in convincing chief financial officers of Prime's stability in the financial world.

"The next 24 months will determine whether Prime will survive," said George Weiss, vice president at Gartner Group, Inc., a Stamford, Conn.-based research and consulting firm. "They must react to the market quickly, exploit technology and form alliances."

Bank bailout

FROM PAGE 1

programmers, applications developers and data center and computer operations employees.

Finding new jobs could be a grim task for the dismissed employees. "There are just not many jobs available," said Sara Johnson, a managing economist at DRI/McGraw Hill in Lexington, Mass. The current unemployment rate in the area is 9.6%, and the only industry adding jobs is health care, she said.

However, many of those 860 data center jobs may be preserved because Fleet needs at least two major check processing centers in New England, said Michael R. Zucchini, chief information officer at Fleet.

"Most people expected that the technology areas would be consolidated first, but we felt it was important to announce our intentions to the staff as early as possible so they can play a role in the conversion," Zucchini said. "There is a transition period that gives us some time to help them find other positions, both internally and externally."

Albany upgrades

Zucchini said Fleet has an IBM 3090 Model 720 located in Albany, and that will have to be "substantially upgraded" or supplemented with an additional processor.

The conversion to Fleet's own software systems — a mixture of in-house-developed and commercial applications chosen as a companywide standard — will begin immediately, Zucchini said. The end of 1992 is the target date for all computer operations to be settled in the Albany center.

Ultimately, Fleet will close 60 Bank of New England branches in New England.

Benchmarks get no respect

BY CHRISTOPHER LINDQUIST
CW STAFF

Benchmarking may be pervasive but not persuasive in the marketing of on-line transaction processing (OLTP) systems today, according to a recent survey.

The report by The Standish Group International, Inc. in Hyannis, Mass., said that only 5.1% of the 297 respondents involved in the purchasing of OLTP systems at medium- and large-size companies considered such benchmarks to be "very important" in selecting a "short list" of possible vendors.

Conversely, 38.3% of the respondents rated common OLTP benchmarks as being "not important" in determining their short list.

James H. Johnson, chairman of The Standish Group, indicated that he believes benchmarks are a good thing but that it appears users were not consulted sufficiently when the existing benchmarks were designed. "It's almost like they created all these benchmarks, but no one ever went out and said to the user base, 'Gee, what kind of benchmark would you like to see?' "

Interviews with users of OLTP systems corroborated the survey results. Clarence Golson, vice president of technical support at Amsouth Bank NA in Birmingham, Ala., said he believes benchmarking is highly susceptible to errors, adding that his firm prefers to subject systems to a "stress test" of its own applications to determine suitability.

Other users agreed that benchmarking was not a first choice for determining performance. "We look first for comparable data from live environments similar to our own," said Robert L. Tucker, general manager of information resources and technical operations at Key Services Corp. in Albany, N.Y. However, benchmarking is "better than not having any empirical evidence at all," he added.

Some users indicated that in addition to benchmarking, performance is also secondary to the overall functionality of a system in making a buying decision.

When the Student Loan Marketing Association was looking for an OLTP system, connectivity was considered most crucial, said Robert Kramer, director of software development. "The critical thing was the number of networking protocols that it worked with."

Joseph Vincent, director of technology planning at Humana, Inc., concurred: "If the functionality is there, we're willing to compromise somewhat on total transaction processing efficiency," he said. "We have people who are capable enough in the areas of performance and tuning to be able to compensate for inefficiencies in an on-line transaction processing system."

Vincent added that his company had chosen a system based on business needs rather than technical abilities — a sentiment echoed in the report.

The survey also had good news for the makers of Unix-based OLTP systems. According to the report, 23.9% of those users considering the purchase of new OLTP systems within the next three years said that they are planning to purchase new Unix-based systems.

Thinking bigger

Most users of on-line transaction processing systems are planning new or upgraded systems within the next three years.



Percent of respondents
Base: 297

Source: The Standish Group International, Inc.

Macs

FROM PAGE 1

Equipment Corp. and IBM are expected to speed the production of DAL-based servers and play a vital role in Apple's scheme to penetrate the corporate world.

Early client/server implementors attending the Management Apple Computers in Information Systems conference in Washington, D.C., last week said the design can make sense out of a multivendor environment.

At the Marshall Flight Center in Huntsville, Ala., chief of management systems Gary Gray has used the client/server model to unite information from a wide variety of hosts, including models from DEC, Data General Corp., Hewlett-Packard Co., IBM and Cray Research, Inc.

"Sometimes, it seems that the only company we don't buy hardware from is John Deere," Gray said. "The trouble is, you have to be an expert to go from system to system."

The center's new design uses a DAL-equipped DEC VAX 4000 as an interface among dozens of Macintoshes and mainframes. The users get the power of the big iron while the data maintains a consistent look, no matter which machine it is from.

Payoffs for a successful client/server installation can often be dramatic. Conz Wilson, manager of technology services at TRW, Inc.'s headquarters in Cleveland, is replacing an IBM 4300 system with a Macintosh-based distributed PC network. The arrangement is expected to save TRW as much as $175,000 per year in maintenance and depreciation costs, Wilson said. "I'm very high on the client/server model," he said. "There's no doubt the mainframe is an endangered species."

Battle of the glitches

Like many client/server pioneers in the Apple community, Saskatchewan Telecommunications (Sasktel) business manager Bob Novakowski has battled maddening network slowdowns and software glitches while fine-tuning the shift from a mainframe-based system running dedicated terminals to a distributed PC environment.

The Regina, Saskatchewan-based telecommunications company's first shot at implementing a client/server architecture was an unmitigated dud. "Totally unacceptable," the taciturn Novakowski said of the original design, which hooked up desktop Macintoshes to a Macintosh FX server running Acius Corp.'s 4th Dimension database.

Novakowski learned the first rule of client/server strategizing: Be flexible. A revamped server design using an Oracle Corp. database on a DEC Vaxserver 3400 was installed, and Sasktel was back in the fast lane. "It really opened things up," said Novakowski, who now has a cost-effective open architecture that uses a graphics interface to access a traditional database.

Zale

FROM PAGE 1

provide end-user support, including help-desk assistance, to its approximately 1,500 desktop systems and 2,000 stores.

The Zale contract is worth "hundreds of millions of dollars," according to ISSC President Dennie M. Welsh.

"The key thing is that we're moving into a new area — retail sales — that we haven't done a total outsourcing deal in before," Welsh said.

Zale is not the first major retailer to outsource — Brooks Brothers, Addis & Dey, Inc. and Southland Corp., for example, have also opted for outsourcing.

Nevertheless, Douglas Wilder, manager of the systems operations program at market research firm Input, Inc., noted that the retail sector has distinctly lagged behind others such as health care and banking in choosing this route.

"I talked to a guy at Toys R Us, for example, and they see their data systems as absolutely critical to their competitive edge," Wilder said. "No way do they want to outsource. Mid-range banks, on the other hand, generally can't afford much [in the IS line] that is unique — and there really isn't all that much available to them that is unique. Outsourcing doesn't raise the same concern."

IBM's "longtime interest in the retail segment" and particularly Zale's belief "that IBM could bring some technology partnering to the deal" weighed heavily in the retailing player's decision to sign with ISSC, Karney said.

> "WE STILL believe . . . IBM is seriously committed to the retailing industry."
>
> DAVID KARNEY
> ZALE

In late 1988, Karney left his post as vice president of MIS at Dallas-area general retailer Southland to join Zale in pursuit of "an opportunity to get into specialty retailing, which is an area I've always wanted to move into," he said [CW, Nov. 14, 1988].

At that point, Karney said, Zale had efforts under way for a new retail information system and a new generation of in-store point-of-sale systems. These systems are now in place.

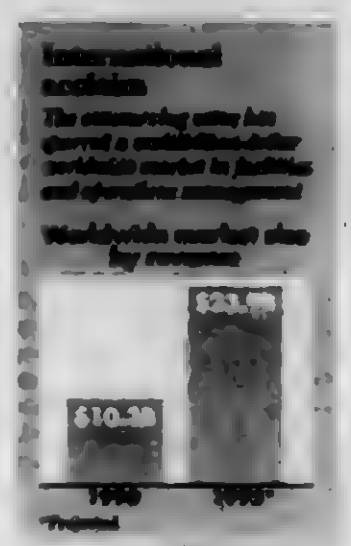
Last week, he confirmed that he was seminal in spearheading Zale's decision to outsource; he will remain in place as part of the new Zale/ISSC team.

First ever

Negotiations with IBM, then bidding against "several major [outsourcing] providers," began in April, Karney said. This makes the deal the first to be initiated with IBM but consummated with ISSC.

"Frankly," Karney said, the midnegotiation creation of the outsourcing subsidiary "was kind of neutral to us. We still believe what we believed before: that IBM is seriously committed to the retailing industry."

Karney's sanguine opinion was not universal, even within Texas borders. "This contract is going to be very controversial,"



CW Chart: Doreen St. John
Source: Ledgeway/Datapoint

said Darwin Deason, chairman of Zale neighbor and ISSC competitor Affiliated Computer Services, Inc.

Deason's firm is one of several that are trying to spearhead a government investigation into IBM's outsourcing business.

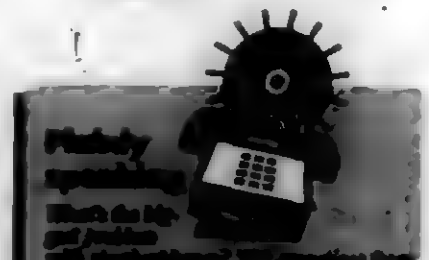
Two days after the ISSC/Zale agreement was announced, Deason commented, "We've got a group in Washington today meeting with [the Justice Department]. You can be sure that Zale is one of the subjects they are discussing."

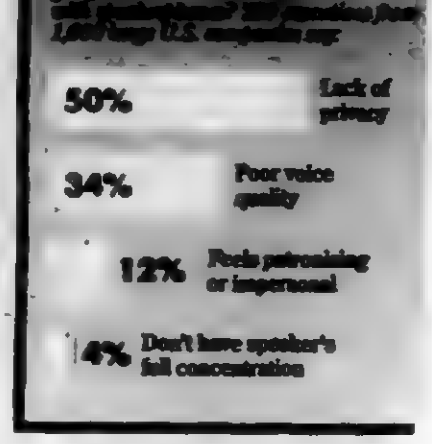
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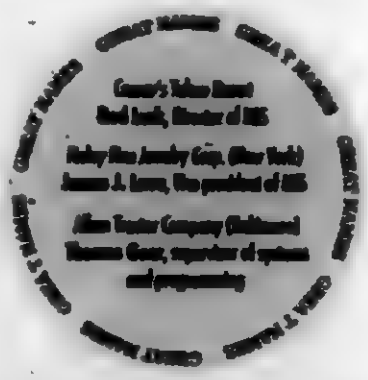
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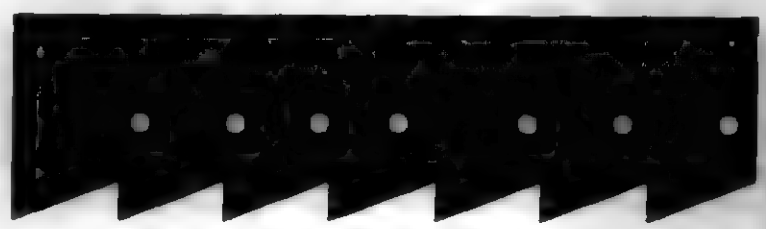
Press releases we never finished reading

"Announcing Worksheet Optimizer 'The Weight Loss Program for Fat Worksheets!' Targets Lotus 1-2-3 Release 2 Users. Makes worksheets faster and smaller."



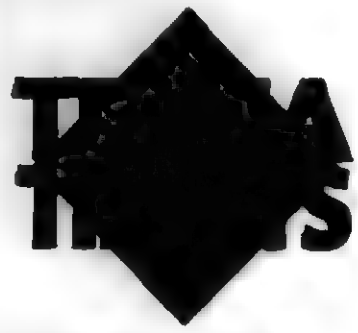






What will they think of next?

A couple of unfinancible business plans venture capitalist Robert Kunze has received:
*** A semiconductor chip that would make a great guitar pick if it failed.**
*** High-technology knee pads for Catholics (endorsed by Rome) with a side market – gardeners.**



1. The word modem is formed from what two words?
2. Is Silicon Valley south or north of Route 128?
3. A famous computer pioneer was also an opium addict and gambler. Was it Alan Turing, Ada Lovelace or Norber Weiner?
4. What computer-related book won a Pulitzer Prize?

1. Modulator and demodulator. 2. South. 3. Ada (mistake #1: Soul of a New Machine by Tracy Kidder



The Computer Museum, Boston

Butt seriously: The aluminum ashtray (at right) was made in 1959 at MIT and is the first object produced using computer-aided design. Upon the ashtray's debut, the *San Francisco Chronicle* wrote: "The Air Force announced today that it has a machine that can receive instructions in English, figure out how to make whatever is wanted and teach other machines how to make it. An Air Force general said it will enable the United States to 'build a war machine that nobody would want to tackle.' Today it made an ashtray."

ACRONYM HELL

Ever wonder what computer acronyms mean in other industries?

CAM
Clean Air Movement
Coalition for Apostolic Ministry
CISC
Canadian Institute for Steel Construction
Construction Industry Stabilization Committee
PC
Periconia circinata (toxin-producing fungus)
Plasma cell (oncology)
Poor Clares (Roman Catholic women's religious order)
SAA
Serum Amuloid A (clinical chemistry)
Sex Addicts Anonymous
SNA
Saudi News Agency
Student naval aviator

▶ Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola at (800) 343-6474. If we use your ideas, we'll send you a gift.

(Sources: Accountemps; Nothing Ventured (Harper Business); special thanks to the Computer Museum, Boston)

INSIDE LINES

DOS 5.0 debut or duel?

▶ DOS 5.0, the Microsoft version, is slated to arrive in New York tomorrow with a flourish. Microsoft plans to speed the acceptance of the new version by distributing an upgrade-only version through the retail channel — a first for the company. The upgrade will sport a retail price of $99.95. One day later, IBM is expected to announce its version of DOS 5.0; according to an IBM source, it "will be identical but not identical" to MS-DOS 5.0. IBM, of course, has Micro Channel Architecture hardware and, most probably, OS/2 Version 2.0 considerations to address. Both versions of DOS are expected to be compatible, however.

Do it yourself!

▶ Apple is readying the release of Tech Tool, a handheld diagnostic box that plugs into the Macintosh's small computer systems interface port and can determine what is wrong. The unit, formerly called The Black Box, will go out to service providers in September and to everyone else next year. The Cupertino, Calif.-based firm is also working on a network design simulator tool to help during systems design.

Can't make up their minds?

▶ Sources at NCR say its System 3125 notepad is still changing, despite a June 24 announcement date. In the last two weeks, NCR has killed an optional 20M-byte hard drive. Also, reports that the Intel 80386SL-based box will have a six-hour battery life are wrong; NCR is only telling customers it will reliably last four hours. The sources did say that when unveiled, the box will weigh 3.9 pounds and use a flash memory card.

Transition casualty

▶ Several rumors out of AT&T say the company has killed a ready-for-market 3B2 follow-on board based on a new Mips Computer Systems chip set. The follow-on board would have allowed users to upgrade easily to the Mips-based System 7000, which AT&T gets via OEM channels from Pyramid. This would not be compatible with NCR's System 3000 family. Instead, AT&T will speed development of an alternate Intel I486-based board to migrate 3B2 users to the System 3000.

Live and under the Sun

▶ Lotus is scheduled to announce tomorrow a real-time version of 1-2-3 for Sun Microsystem's Unix. Also participating and demonstrating related products will be Teknekron Software Systems, Sybase, Reuters Information Services, EJV (a consortium of Wall Street firms) and FDX/Telerate System, Inc.

Put your whetstones in this!

▶ Speaking at the debut of Intel's newly announced I860 XP RISC chip, Gordon Bell, chief scientist at Stardent Computer, said the chip could create 16 three-dimensional teapots per second on Stardent's Vistral workstation. Two years ago, he explained, Stardent's I860 XR-equipped Titan could produce no more than two teapots per second for four times the Vistral's $20,000 price tag.

Information at whose fingertips?

▶ A proud Lotus last week unveiled demos of its long-awaited 1-2-3 for the Apple Macintosh and 1-2-3 for Windows alongside 1-2-3 for DOS before a large crowd of major corporate accounts. In the midst of these demos, however, a mortified Lotus watched its 1-2-3 Windows demo blow up, one user reports. The culprit was not the application but the dreaded UAE, or Unexplained Application Error, that plagues Windows users from setup to shutdown, often for no ascertainable reason. Further proof, perhaps, that the long arm of Microsoft reaches everywhere?

Gil 'Just call me Alexander Haig' Williamson is apparently firmly ensconsed at the helm of the merged NCR/AT&T computer operations, according to analyst Tom Nolle at CIMI, who says progress reports scheduled to be released today will show NCR running the show. Nolle said AT&T executives who have carped to AT&T corporate about NCR President Williamson's order-giving have been told he is in command here" at the Computerworld *information exchange [telephone: (800) 343-6474; fax: (508) 875-8931; and Compuserve: 76537,2413], where you can pitch tips, ask questions or gripe about coverage.*

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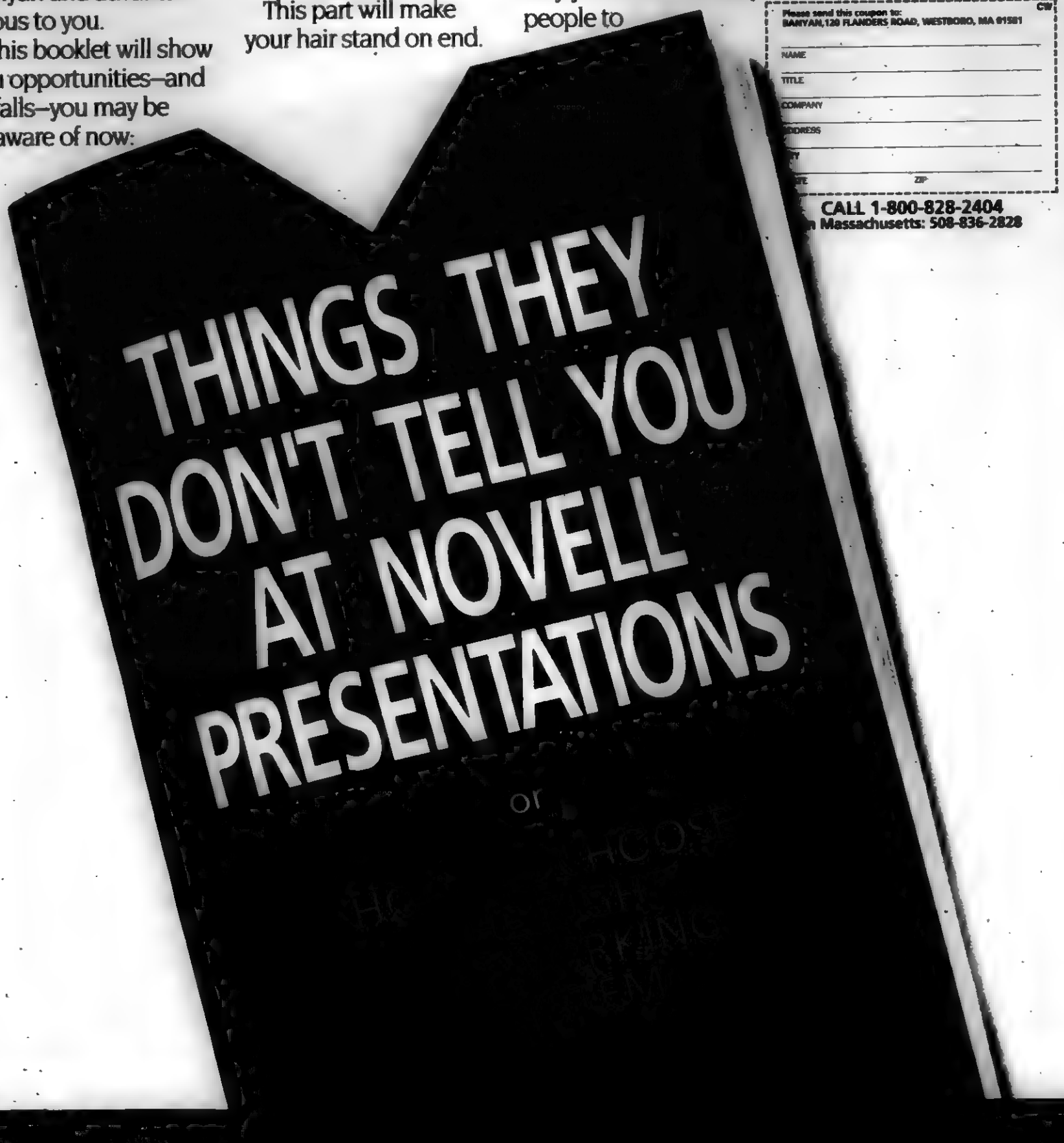
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COMPUTERWORLD

Users greet Timeplex sale with relief

BY JOANIE M. WEXLER
CW STAFF

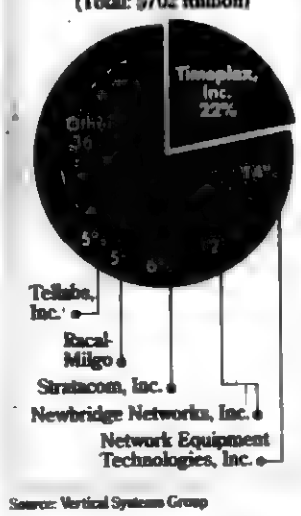
In the wake of Unisys Corp.'s sale of networking subsidiary Timeplex, Inc. last week, several corporate Timeplex customers expressed quiet relief that their vendor is shedding the onus of its financially unstable parent.

Corporate customers and industry analysts said the deep pockets and ambitious business goals of Timeplex's two buyers — $2 billion operating parent Ascom Holding AG in Switzerland and $157 million Mercedes Information Technologies, Inc. in South Africa — could ensure continued research and development dollars and accelerate products to market.

"Frankly, I'm glad to see this acquisition," said Jess Reed, assistant vice president of telecommunications at Geico Corp., an insurance firm in Washington, D.C. "My feeling is that for some time, Unisys has diluted

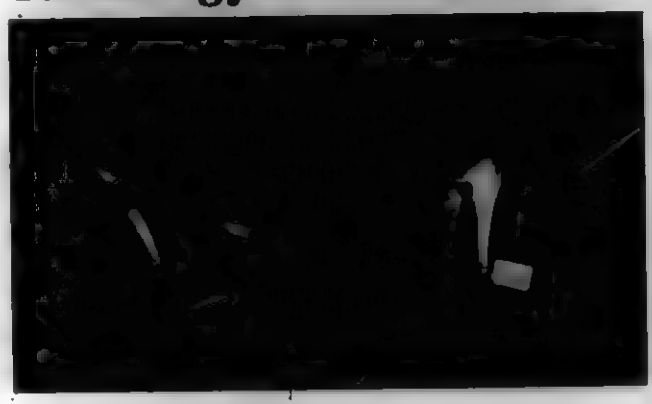
Continued on page 8

Top dog
Timeplex, Inc. led the T1 multiplexer market share in 1990



Source: Vertical Systems Group

Technology heroes honored



Ed Bradley of *60 Minutes* presents a *Computerworld* Smithsonian Award to Paul Kaiser of The Lab School of Washington for his work helping disabled students. See pages 89-91.

Cheers, caution as DOS upgrade hits the street

Users like features but plot measured migration

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Microsoft Corp.'s MS-DOS 5.0 is expected to trigger the largest upgrade in the history of desktop software. However, initial reactions from users indicate that migration among the estimated 60 million DOS users will probably be at the low end of the 10% to 50% rate that many in the personal computer community are predicting by year's end.

For the most part, the lag is no reflection on the features of DOS 5.0, which shipped last week. Nor does it seem related to price or availability. DOS 5.0 upgrade packs are available from IBM, Microsoft and 7,000 resellers. Pricing as low as $30 per unit has been combined with corporate upgrade programs to encourage large-scale upgrades to the new operating system.

The aggressive promotions have apparently succeeded in making DOS 5.0 the standard for new system purchases almost overnight. But upgrades are another story.

Corporate decision makers are expressing caution after running into earlier problems with

Continued on page 93

TAKE 5

▶ Microsoft smoothes upgrade path, but there are still a few gotchas; IBM's aggressive PS/2 pricing pleases users. Page 93.

Open up — this is the software police!

BY MICHAEL FITZGERALD
CW STAFF

One day last March, Snap-on Tools Corp. Chairman Marion Gregory completed an afternoon meeting and walked into the lobby of the firm's headquarters.

Gregory stopped dead in his tracks at the sight of three armed federal marshals and four other somber-looking men appeared ready to do battle with drug lords.

The stunned Gregory asked Snap-on's internal legal counsel who the visitors were.

"The Software Publishers Association," the counsel said.

The experience following was painful for Snap-on as the SPA conducted a



full-scale audit of Snap-on's personal computers, looking for pirated software.

"It was a pretty grim couple of days," said a Snap-on spokesman, who related the Gregory story. During a 2½-week period, Snap-on's internal auditors joined its microcomputer managers and other departments to dig out purchase orders, invoices and manuals that proved Snap-on had paid for all of its software.

Ultimately, the SPA recanted its charge against the Fortune 500 company. But many of the approximately 70 companies that have been raided by the SPA end up paying thousands of dollars in fines.

Users who have been through an SPA raid say the experience is alarming. Representatives

Continued on page 92

Apple notebook crowd forms

Buyers ready to give totable Mac another chance

BY JAMES DALY
CW STAFF

Apple Computer, Inc. is preparing to dive-bomb the portable personal computer market this fall, dropping a trio of notebook-size Macintosh computers into a target area where it has so far only landed a dud.

PC zealots who have lugged the clunky 16-pound Macintosh Portable around for the past two years said they are anxious to gobble up the lightweight Macintoshes, if early indications about their feature set prove to be [illegible].

The new entries include a low-end model built by Sony Corp., which uses the 16-MHz Motorola, Inc. 68000 microprocessor and weighs about five pounds, sources familiar with the machines said. A midrange and high-end edition based on the 16- and 25-MHz Motorola 68030 processor, respectively, will each weigh about seven pounds. "I've been waiting for a Mac portable that doesn't break my arm," said Diana Hunt, a PC trainer in the data processing division at the Employment Development Department in Sacramento, Calif.

Apple customers said they also hoped for a machine within the price range of the

Continued on page 6

Wall St. score for RS/6000

BY MARYPEAK JOHNSON
CW STAFF

NEW YORK — In a $65 million, worldwide revamp of its branch office network, Prudential Securities, Inc. is moving from a proprietary minicomputer-based platform to open systems. By 1993, the Wall Street brokerage firm will deploy 460 IBM RISC System/6000s as servers for up to 10,000 Personal System/2 workstations.

Prudential Securities Chief Information Officer William Anderson is counting on annual savings of $7 million through 1998, plus a tenfold improvement in systems reliability. The platform is intended to give financial advisers at the 400 worldwide branches faster and better access to the corporate data center in New York.

The initial rollout begins this fall with 80 to 90 RS/6000s installed in the U.S. and abroad, replacing Unisys Corp. minicomputers. In 1993, Prudential Securities plans to begin replacing

Continued on page 10

INSIDE

Apple and IBM appear close to striking a deal for a technology exchange involving RISC chips and operating systems. Page 92.

A grand plan is in place at the IRS, and better communications with the taxpayer may emerge. Page 8.

Executive Report — More and more IS shops evolve into a hybrid structure. Page 57.

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4 Employees and users alike are waiting for lightning to strike at Wang, as analysts predict stormy weather for the end of the firm's fiscal fourth quarter.

4 Development directors at U.S. firms have the vision for business and user partnerships — but not the wherewithal.

6 Cognos opens Windows of opportunity with its Powerhouse 4GL and a blueprint for porting Powerhouse applications to a client/server architecture.

8 With one hand preparing to shell out a reported $190 million to the Pentagon, Unisys holds out its other hand for $207 million in exchange for Timeplex.

12 Surprising only for its speed was the announcement from NCR and AT&T's Computer Systems Division as to which products will rise and which will fall.

13 Cabletron and Silicon Graphics are concocting a recipe for tighter network control by crossbreeding their promising network management systems.

16 Rather than look a gift computer in the mouth, users of relic systems are intrigued by IBM's trade-in offer crediting competitors' machines toward new PS/2s.

93 IBM's quartet of newly announced PS/2s is priced to be music to users' ears.

Quotable

"While [Unisys'] ownership of Timeplex has not had much tangible impact on us, its presence has given us a lot of explaining to do to executive management at product acquisition time."

MICHAEL ACKERMANN
BLUE CROSS/BLUE SHIELD OF MICHIGAN

Expressing relief at sale of Timeplex. See story page 1.

SYSTEMS & SOFTWARE

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IT'S NOT THAT IT DOESN'T WORK AS A COMPUTER, IT JUST WORKS BETTER AS A PAPERWEIGHT.

EXECUTIVE BRIEFING

■ **Prudential Securities will replace Unisys minicomputers with a RISC server/PC architecture** during the next two years. The Wall Street brokerage firm hopes to realize productivity gains with IBM's Unix-based RS/6000 and as many as 10,000 PS/2s and terminals. CIO William Anderson says the increase in power is 'like going from a PC to a mainframe.' **Page 1.**

■ **Hybrid IS organizations** that combine the strengths of centralization and decentralization are becoming a popular choice for many large firms. Data center operations are being consolidated, while applications development teams are placed in specific business units. Each firm must find its own balance, as exemplified by the approaches taken by *Computerworld Premier 100* industry leaders Paine Webber, 3M and FMC. **Page 57.**

■ **Systems development directors remain frustrated** by aging Cobol portfolios and obsolete skill sets in their departments, according to a survey by CSC Index's Summit group. **Page 4.**

■ **Hyatt Hotels' successful downsizing strategy** results in a promotion to senior vice president for IS chief Gordon Kerr. The IBM AS/400-based system saves an estimated 20% over the former mainframe and allows faster market response by travel agents and Hyatt reservations agents. **Page 10.**

■ **Corporations raided by the Software Publishers Association** for using allegedly pirated programs say it can be a grim experience. However, some applaud the SPA's efforts for helping them clean their own houses. **Page 1.**

■ **High tech's human touch** is the theme as computer innovators from all fields of endeavor are honored at the third annual *Computerworld Smithsonian Awards* in Washington, D.C. **Pages 89-91.**

■ **Unisys sells off Timeplex** for $207 million and may be close to settling its Pentagon fraud case. Timeplex customers are relieved that the networking vendor is out from under 'a dark cloud.' **Pages 1 and 8.**

■ **Veteran IS executives** Anthony Vallario of Bergen Brunswig and DuWayne Peterson of Merrill Lynch are both retiring this month. Each helped establish a model of success and partnership. **Pages 53 and 54.**

■ **Apple will lose weight this fall** in the form of three notebook Macintoshes, one reportedly weighing as little as 5 pounds. Potential customers hail the improvement over the current 16-pound Macintosh portable, while Apple will try to make up for lost ground in the red-hot portables market. **Page 1.**

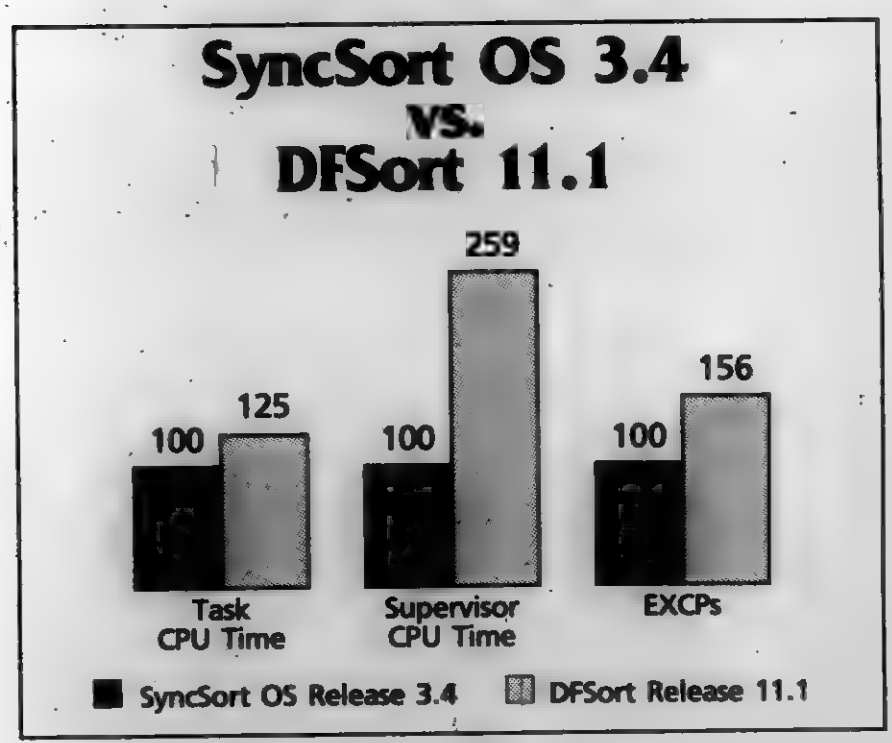
■ **Turbulent change in computer law** is expected over the next ten years. Advances in networking and data sharing and increases in vendor alliances are putting pressure on lawyers and users to shape the industry's legal future. **Page 65.**

■ **Rotating jobs and responsibilities** has several advantages, IS professionals say. Rotation gives a broader perspective of the business, improved interpersonal skills, more technical proficiency and better interdepartmental communication. **Page 76.**

■ **C programmers who write applications for Unix** find themselves at the head of the job-hunting class as Unix gains popularity in the commercial sector. **Page 77.**

■ **On-site this week:** How do you handle a hungry database? Dialog Information Services in Palo Alto, Calif., depends on increasingly denser disk drive technology to store its more than 1T byte of online information. **Page 29.** Imaging technology is helping General Development, a Miami-based construction firm, out of bankruptcy. Optical disc systems are cutting the cost of processing thousands of claims by the firm's creditors. **Page 41.**

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Systems development stalled

Survey respondents find frustration with old code, obsolete skills

BY CLINTON WILDER
CW STAFF

CAMBRIDGE, Mass. — Systems development directors are frustrated by an aging Cobol applications base and the increasingly obsolete skill sets of veteran programmers, according to a survey released last week. Yet computer-aided software engineering (CASE) may not present any magic-bullet cure.

The second annual survey, conducted by the Summit research service of consulting firm CSC Index, Inc., polled 142 development directors in U.S. firms with average revenue of $4.1 billion. Although 98% said development must be oriented toward business and user partnerships, the research revealed major obstacles to translating that vision into reality.

For example, only 23% of the directors said they have effective programs for training systems analysts in business problem-solving. Nearly 75% said retraining personnel to use new methods is a major challenge.

"Systems development is one of the most conservative disciplines you'll ever see," said Nicholas Vitalari, a CSC Index vice president and director of Summit. "Almost every director I've talked to is trying to find a way out of old applications, skill sets and maintenance demands. There are ways out, but none of them are cheap, and none of them are easy."

The survey offered further evidence of the end of the honeymoon with CASE tools. Only about 25% of the respondents have implemented CASE tools, and less than 5% use reverse-engineering, simulation or object-oriented methodologies. A more encouraging 38% said they use reusable code modules, but Index acknowledged that "reusable code" could encompass a wide range of methods.

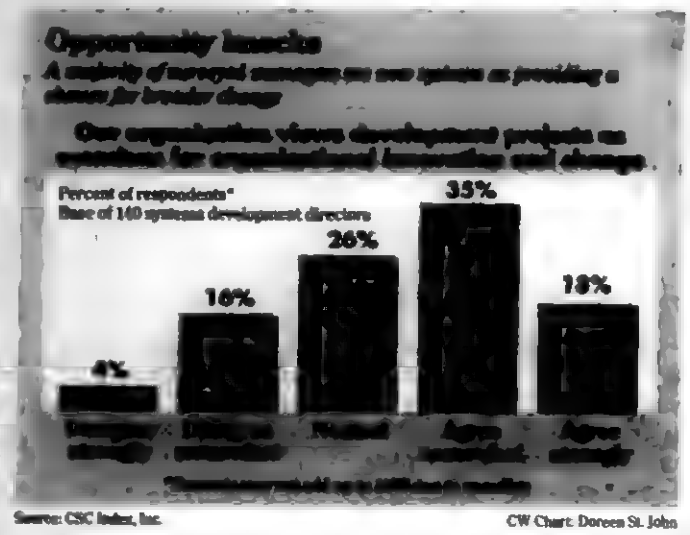
CASE is "an expensive technology," Vitalari said. "In today's economy, development directors are gun-shy about investing large amounts that may not get results. In order to get results with CASE, you must reorganize the whole function."

Reflecting the budgetary effects of the recession, "increasing developer productivity" jumped to the top of the issues ranking. Last year's No. 1 issue, "developing an information architecture," dropped to fourth. "Dealing with maintenance, systems obsolescence and migration to new systems" moved up from No. 8 to No. 5, reflecting the nature of the sites surveyed.

The average site profile in the survey had a 7-year-old applications portfolio, with the oldest application developed in 1973. Cobol applications accounted for an average of 74% of the portfolio, and maintenance ate up 38% of the applications budget of $31.8 million.

"Most of the people doing the maintenance have the skill sets that are becoming obsolete, and they lack business orientation or passion," Vitalari said. It becomes a catch-22 situation when senior business executives perceive development as a back-office, technically oriented function — making it even harder for the development director to get budget approval for the training and tools needed.

"Too many departments can't explain what's going on in the glass house in a language that the business can understand," Vitalari said. "When that happens, all the other corporate functions that can explain themselves in business terms win out, and IS loses."



Source: CSC Index, Inc. CW Chart: Doreen St. John

Getting more for the money

Improving staff productivity hurtled past developing an information architecture to become the leading concern in systems development

1991	TOP 10 SYSTEMS DEVELOPMENT ISSUES	1990
1	Increasing developer productivity	4
2	Developing strategic information systems	2
3	Rapidly responding to systems requests	3
4	Developing an information architecture	1
5	Dealing with maintenance, obsolescence and migration	8
6	Supporting cross-functional systems	6
7	Instituting total quality management	NR*
8	Showing development value to senior executives	11
9	Implementing CASE tools	13
10	Managing end-user systems development	12

* No rating

Source: CSC Index, Inc.

Wang denies layoff rumors, awaits results of fiscal Q4

BY SALLY COSACK
CW STAFF

LOWELL, Mass. — An atmosphere of uneasy anticipation settled around Wang Laboratories, Inc. last week as reports of pending employee layoffs surfaced.

Wang has already reduced its work force by approximately one-third, down from 28,000 employees in 1990 to less than 18,000 in March.

However, Wang President and Chief Executive Officer Richard Miller said last week that the company has no plans now for either employee cutbacks or selling off portions of the business.

Miller said the company is waiting to evaluate the results of the fiscal fourth quarter, which ends June 30, before embarking on any major business changes.

"There is no plan at this point; we don't want to overreact or underreact," Miller said.

Wang posted a net loss of $48.9 million for the fiscal third quarter on March 31 this year, compared with a net loss of $146.6 million for the corresponding quarter in 1990.

Matthew J. Gilman, president of the U.S. Society of Wang Users, said rumors of a company takeover have been creating some concern among the user group's members, most of whom have adopted a wait-and-see attitude toward Wang's financials.

Wang's next segment of Office 2000 product introductions had been scheduled for this week. Miller said the announcements have been delayed because the company does not want to "distract any key people and disrupt the busiest financial quarter of the year."

Low-cost color printer debuts

BY CAROL HILDEBRAND
CW STAFF

New printing technology from Tektronix, Inc. could pave the way for color to hit the desktop without hitting up users for a big chunk of cash.

The Wilsonville, Ore.-based company is slated to announce today the Phaserjet PXI, a color printer that accepts nearly any type of paper in a variety of sizes ranging up to 12 by 18 inches.

The printer differs from other ink-jet printers in that it does not require special coated paper to produce high-quality, 300 dot/in. color prints.

Priced at $9,995, it is approximately one-third the price of existing color laser printers offering the same resolution, according to Tektronix spokesman A. J. Rogers, strategic marketing manager at the company's printing and imaging division.

Rogers said the company uses solid wax-based inks that melt and then resolidify upon hitting the paper's surface, preventing the absorption that costs other ink-jet printers their color quality. It is used in conjunction with a proprietary fusing process that improves ink adhesion.

The printer produces color pages at the slow rate of one page every two minutes and is aimed at the high-end graphic arts market.

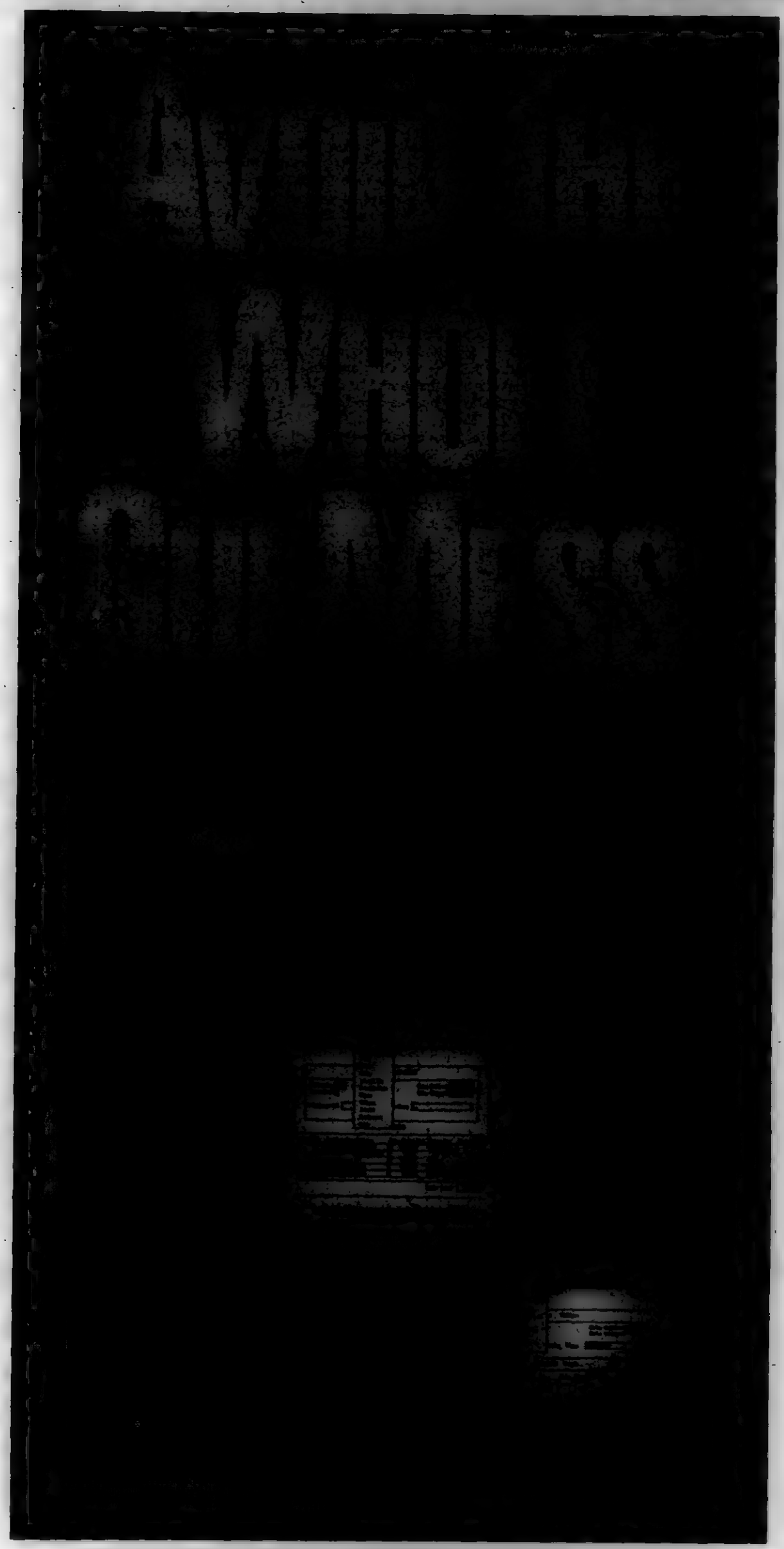
The technology should trickle down to the office environment within one year, analysts said.

"A machine that sits on the desktop needs to be faster and less expensive," said Dan Miller, a senior industry analyst at Dataquest, Inc. "But the fact that it prints on plain office paper is really important in an office environment."

The Phaserjet, slated to be available in July, also supports Adobe Systems, Inc.'s Postscript Level 2. Most important Level 2 enhancements are color-related.

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NEWS SHORTS

Pooled efforts on Wall Street

Securities firms are finding out that mother's advice about sharing can also work to a company's economic advantage. One industrywide initiative may help companies that choose to standardize on common telecommunications equipment. The project, called the Securities Industry Network, calls for companies to standardize on modems, line types and other telecommunications gear. If it comes to fruition during the next few months, it will "save time and money, strengthen network management, increase standardization and security and also enhance reliability," said John Compitello, chairman of the Securities Industry Association (SIA). He outlined the project at an SIA-sponsored conference held last week in New York.

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Face-lift for RS-232

The venerable RS-232 interface standard for computer cable connections, which dates back to May 1960, has been updated to include a small alternative connector for use on notebook computers and other small devices, according to the Telecommunications Industry Association in Washington, D.C. The new 232-E standard specifies an extremely small "26-pole connector" that is not much bigger than a telephone plug.

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New Carbon Copy released

Norwood, Mass.-based Microcom, Inc. said it is shipping Carbon Copy Plus Version 6.0. The new version allows systems administrators to manipulate personal computers over a local-area network for the first time. Previously, a company spokesman said, doing remote diagnostic work or file access required dialing up each machine equipped with a modem. The new version will access any operating machine on a Novell, Inc. Netware or IBM Netbios network after connecting with one networked PC with a modem. Carbon Copy Plus costs $199.

.....

HP, NCR join forces

Hewlett-Packard Co. announced last week that it will work with NCR Corp. on a plan to develop technologies to manage distributed computer systems and networks. The two firms said they found complementary ideas in separate proposals they submitted to the Open Software Foundation (OSF). The OSF called for plans for new products supporting its Distributed Management Environment standard. HP endorsed Object Manager, NCR's plan for managing Unix- or DOS-based machines, and NCR said it stands behind Management Framework, which HP and IBM submitted jointly. The relationship between HP and NCR does not preclude cooperation between either firm and other submitters nor does it restrict the OSF from choosing its own combination of technology offerings.

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Cincom, Fujitsu tighten ties

Cincom Systems, Inc. said it has extended its relationship with Fujitsu Ltd. to include a joint marketing and development arrangement with the Japanese company's subsidiary, Fujitsu Canada. The two companies will team up to sell Fujitsu systems and Cincom database products to Canadian customers. They will also work together to port the Cincom products to the Fujitsu Unix platform. Cincom has worked with Fujitsu since 1988 and has similar arrangements with the company in Japan and Australia, a company spokesman said.

.....

Framework gets boost

Ashton-Tate Corp. has beefed up the database size and expanded the graphics capabilities in its latest release of Framework, a suite of seven business applications united under a single menu system. Framework IV includes a new database management system that uses disk-based .DBF files — the file format used by Dbase — enabling users to build larger databases, the company said. In addition, the update now accesses Dbase files in both single and multiuser environments. On the graphics side, Framework IV now supports up to 60 internal and cartridge fonts per document. Framework IV has a suggested retail price of $695.

More news shorts on page 32

Novell announces Netware for SAA

BY JIM NASH
CW STAFF

PROVO, Utah — Novell, Inc. said last week it is shipping Netware for Systems Application Architecture (SAA) Version 1.0 and offered a peek at the network-to-mainframe communications product's next iteration, due in August.

Originally scheduled for shipment last month, Netware for SAA is a software module that provides up to 64 concurrent IBM mainframe or Application System/400 sessions over Token Ring or synchronous data link control connections.

Novell has often previewed the SAA product, saying it would provide 1,000 host sessions. However, neither Version 1.0 nor 1.1 later this summer will come close to that mark, according to a company spokesman.

"We've got machines just stacked around here," said Brad Dickey, a senior analyst at Conoco, Inc. in Houston. "We've got host-access servers, file servers, database servers..."

Dickey had yet to see Netware for SAA but said it could cut down on the number of dedicated machines spread throughout his combined 6,000-workstation network.

A money saver

Robert Biello, senior data communication specialist at Blue Cross/Blue Shield of Rhode Island, added that there would be a substantial cost savings for large companies that now have to buy and maintain gateways.

Gerry Machi, director of product marketing for Novell's communications products, said the Netware loadable module is the company's first runtime version of a product.

Netware for SAA Version 1.1, now in beta testing, will provide up to 254 concurrent sessions and two host links, Machi said. Adding another SAA module would increase the session maximum to 508 on a server.

Information systems managers will also have to wait for Version 1.1 for a status screen that is expected to show all logical units at once, noting, for example, which are connected.

Apple

FROM PAGE 1

current line of DOS-based portables — around $3,000. "I hope they can slim it down without lightening my wallet," said Arthur Masson, director of transportation system development at CSX Technology in Jacksonville, Fla.

Early indications are that the Sony notebook will retail for approximately $2,400, while the midrange will cost about $3,100. Both will start with 2M bytes of random-access memory and a 20M-byte hard disk. The high-end model is expected to sell for approximately $5,000 with 4M bytes of RAM and a 40M-byte hard drive.

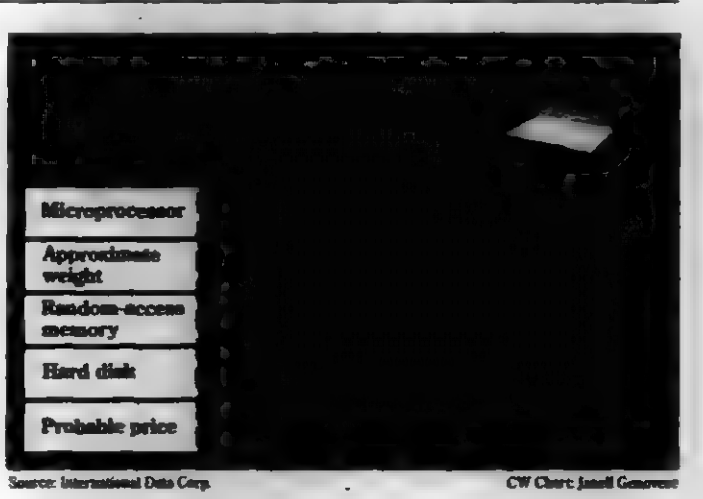
The trackball pointing device will be centered below the space bar, although a standard mouse can be added. Sealed lead batteries will offer up to three hours of useful time.

Another important consideration is that the "display technology has got to feel and look like a Mac, not like it was just thrown together," Masson said. Early reports are that the new models will use backlit LCD screen technologies that also offer manual brightness controls.

A second effort

Apple's earlier portable was a disastrous misfire in a market that Framingham, Mass.-based International Data Corp. estimated will grow by 37% this year — more than five times faster than the growth rate in the desktop PC field.

Rick Marolt, information systems manager at Great Central Insurance Co. in Peoria, Ill., plans to issue the new Apple notebook models to field representatives handling claims and safety inspectors "if Apple comes through," he said. "Hopefully, the words *Macintosh* and *portable* will no longer be exclusive."



Source: International Data Corp. CW Chart: Janell Genovese

Analysts said the pent-up demand for an adequate portable Macintosh is so great that product shortages could be felt almost immediately, much like those felt soon after last fall's introduction of the immensely popular Macintosh Classic. "All of the people who spent the last two years lugging around a Mac Portable are going to jump on these machines," said Ben Rose, a senior PC analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Users are also getting increasingly fussy about not compromising power for portability. Apple's partnership with miniaturization giant Sony could help it steer clear of those shoals.

The Sony connection could also represent an important signpost for Apple, which is expected to abandon its proprietary architecture soon and begin licensing its operating system. "Apple is starting at zero in a very hot market, and it's very likely that you'll see Sony selling these products as well," said Benny Lorenzo, an analyst at Dillon Read & Co. in New York.

Cognos goes client/server

ANAHEIM, Calif.— Software tools developer Cognos Corp. last week outlined plans to migrate its Powerhouse suite of applications development products to a client/server architecture.

A new version of its Powerhouse fourth-generation language, Version 7.0, will support Microsoft Corp.'s Windows 3.0 graphical interface, with the first implementation slated to appear on Hewlett-Packard Co.'s MPE/XL platform late this fall.

Users will be able to reuse their existing applications on personal computers that have a Windows 3.0 interface and do cooperative processing, Cognos executives told a meeting of more than 700 users here. A multithreaded server feature will allow multiple Cognos applications to run on different Windows screens.

The key to Version 7.0's flexibility is a central repository stored on an Ashton-Tate Corp. Interbase database that contains "generic" descriptions of the screen formats that are used by a Powerhouse Version 7.0 application.

Cognos also introduced a Powerhouse version for the IBM RISC System/6000 and an enhanced version for Digital Equipment Corp. VAX systems.

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Progress, problems for Unisys debt plan

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — There were almost equal measures of good and bad news last week for Unisys Corp., which announced the $207 million sale of its Timeplex, Inc. subsidiary but was also reported to be close to paying a $190 million penalty to the Pentagon to settle a long-standing procurement fraud case.

"We have said we will not be all things to all people," Unisys Chairman and Chief Executive Officer James A. Unruh said in a memo announcing the Timeplex sale to Unisys employees last week.

Unisys will focus on "providing mission-critical solutions on open networks in high-transaction environments," he said.

The Timeplex deal is the largest move to date in an asset-sale program launched early last year to reduce Unisys' debt. At the end of its first quarter in March, the company reported a debt of $3.3 billion.

Unisys has generated $500 million in cash from the sale of Timeplex, various real estate holdings, a portion of its equity in its Japanese joint venture and — just two weeks ago — $131 million worth of lease receivable-backed certificates from its leasing arm. Unisys has said its debt-reduction target this year is $600 million.

Timeplex was purchased in January 1988 for 10 million Unisys shares, which were then selling for $33 per share. At the time, the value of the transaction was $330 million.

"We are not taking a loss, and we may report a slight gain," a Unisys spokesman said. Since 1988, the book value of the subsidiary has risen from $125 million to $200 million, he noted.

Financial observers who had predicted Unisys would sell off the profitable data communications equipment unit agreed. "Because of accounting rules, they can sell it for less than they bought it for and still break even," explained David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago.

TIMEPLEX TERMS

- ▶ New owners: Ascom Holding AG ($2 billion company and 51% partner) and South African Mercedes Information Technologies Ltd.
- ▶ Dewaine Osman to remain Timeplex president.
- ▶ Separate U.S.-based Timeplex business unit to handle government contracts.
- ▶ $207 million cash sale slated to close Aug. 31.

The timing of the sale was significant, Schofield added. Unisys, he said, wants to complete the transaction by Aug. 31, just two weeks before a $300 million public note matures on Sept. 15.

On the reported Pentagon settlement, a Unisys spokesman said the company was still negotiating with the U.S. Department of Justice. He would not confirm the details of a story published June 10 in *The Wall Street Journal*, which reported Unisys had agreed to a $190 million settlement.

However, in a statement issued last week, Unisys did say the company was negotiating for a cash settlement over a five-year period, a previously disclosed forfeiture of profits from the North Warning radar system contract and contingency payments based on possible asset sales and the company's return to profitability.

Unisys said it did not believe that the settlement package would have a "material financial impact" on the company, the spokesman said.

Unisys does have some cushion for the penalty, however. In the third quarter of 1989, it set aside $150 million, the majority of which it said was for the Pentagon case. The Pentagon case stems from the government's "Operation Ill Wind" investigation into illegal activities of military contractors.

Meanwhile, analysts speculated that an end to the Ill Wind case may actually bring the $10 billion corporation closer to a larger strategic goal: that of selling its defense unit and honing its business along the lines described by Unruh last week.

Timeplex

FROM PAGE 1

Timeplex's strength from a service and marketing standpoint." Unisys, which purchased Timeplex in early 1988, reported a $3.3 billion debt at the end of its first quarter in March (see story above).

"Unisys has been a dark cloud," said Michael Ackermann, systems engineer on the network services staff at Blue Cross/Blue Shield of Michigan in Detroit. "While its ownership of Timeplex has not had much tangible impact on us, its presence has given us a lot of explaining to do to executive management at product acquisition time."

However, government users were less upbeat. Some said they were concerned about Timeplex's now-foreign ownership and the fact that one of the new owners is based in South Africa.

William Micklin, manager of the bureau of telecommunications for the city and county of San Francisco, said the ownership issue will prohibit him from considering Timeplex in an upcoming bid because of strict city and county ordinances against doing business with any South African-owned company.

"The sale will really put them out of business with us," he said, "and that's unfortunate, because Timeplex has one of the best boxes on the market."

Government user Jim Webster, a department head within the Directorate of Naval Telecommunications at the U.S. Naval Intelligence Command in Suitland, Md., said he had "grave concerns" about the sale.

"I would not want representatives of a South African firm having access to U.S. government-owned facilities," he said. He added that the sale "will certainly cause us to do a lot of soul-searching on future procurements."

A separate Timeplex entity will be set up to handle government contracts because of federal regulations prohibiting classified agencies from doing business with any foreign-owned firm, Timeplex President Dewaine Osman said. Government sites reportedly represent about 8% of Timeplex's business.

Not an issue

"In a legal sense, I don't think there's an issue for government agencies buying products from a South African entity," said Richard Malone, principal at Vertical Systems Group, a market research firm in Dedham, Mass. "All the local and federal agency regulations concerned with South African sanctions say you cannot be an investor in a South African venture, not the other way around."

John Paccibene, vice president of telecommunications at brokerage firm Garban Ltd. in New York, called foreign ownership "a trend being led by the likes of AT&T and IBM. Technology is a global issue. Ascom is eager to make inroads into the U.S. and will probably make Timeplex more aggressive."

Nongovernment Timeplex customers, Osman said, "will have the same service, sales and management people dealing with them." However, six-year Timeplex customer Jack Sadler, group manager of technical services at Lucky Stores, Inc. in Dublin, Calif., said that when Unisys bought Timeplex, he noticed field and management personnel changes that made his relationship with Timeplex "less desirable than it had been."

IRS to overhaul system in bid to reduce its reliance on paper

BY CAROL HILDEBRAND
CW STAFF

WASHINGTON, D.C. — A massive system overhaul at the Internal Revenue Service holds promise of an IRS that not only answers questions more promptly but also pries tax dollars out of reluctant pockets more successfully.

The $8 billion task, some segments of which are already under way, was announced last week. The multipronged effort should do much to move the tax collection system away from a paper-intensive process supported by isolated and outdated processing to a totally integrated electronic system.

"There's got to be a reason that every other major financial institution in the country has gone this way," IRS spokesman Henry Holmes said.

The project, under development for nearly three years, includes the following broad goals:

- **Streamlining service.** Such projects as the Taxpayer Service Integrated System will give IRS representatives databases that allow them to quickly access information needed to answer queries, which will cut down the number of manual searches, follow-up calls and correspondence. A second system will enable the agency to update taxpayers' records of payments quickly. The agency said it will eliminate 95% of notices that currently go out after payment has been made.
- **Encouraging electronic filing of taxes.** Since its inception in 1986, the electronic filing program has grown from 25,000 to 4.2 million electronically filed returns in 1990.
- **Updating collection techniques.** Networked databases of information should allow for more efficient enforcement. Today, only about 2% of the IRS' tax account data is on-line.
- **Turning paper into electronic data.** Using an imaging system to convert paper documents into electronic images, the IRS will then maintain data on integrated databases that provide on-line access to taxpayer information.

Tax man goes techie

The IRS is embarking on a 10-year automation plan

- **Implementation time:** Full completion targeted by the year 2000.
- **Estimated cost:** $8 billion.
- **Key goals:** Improve service to taxpayers, streamline case processing, emphasize electronic tax filing and use information technology to cut failure to file returns.



Holmes said the project will have a tremendous impact on almost every aspect of the IRS. "You can't just look at the tax system modernization as a change in technology," he said. "It is inseparable from operations."

Holmes targeted the electronic filing and imaging projects as particularly important. "The key is getting data into electronic format and then organizing it correctly," he said.

Smooth implementation of the modernization project will not be simple. The agency said the project should pay for itself with productivity gains as well as increased tax collection, but funding for the 10-year duration of the project is subject to the yearly whims of Congress.

Holmes said the agency is currently in "fairly good shape" regarding funding, although there has been congressional debate about deferring some of that spending until fiscal 1992. Speaking at a press briefing last week, IRS commissioner Fred T. Goldberg Jr. said he considers that "not a good idea."

According to an official at the IRS' General Accounting Office (GAO), which will be involved in overseeing the plan, the very scope of the effort will expose it to heightened scrutiny. "They have something like 20 major procurements that they're going out on the streets for over the next few years," said the official, who asked to remain anonymous. "The IRS really needs to get a congressional buy-in."

A Senate hearing on the subject is set for next week.

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FROM PAGE 1

personal computers from Convergent Technologies, Inc. with PS/2s or equivalent machines, Anderson said.

"We are getting a ton of power with this change. It's like going from a PC to a mainframe," Anderson said of replacing the Unisys Megaframe computers with RS/6000s.

Among the key strategic benefits the CIO identified are the competitive advantage of an open architecture with better price/performance, portable Unix-based software and the ability to put full-motion video on the financial advisors' workstations in the future.

Moving to the RS/6000 platform makes Prudential Securities a prominent example of the accelerating trend toward cost-effective computing with reduced instruction set computing (RISC) technology, said Paul Zagaeski, a senior analyst at The Yankee Group in Boston.

"Customers are extending the business, gaining flexibility and power while cutting costs," Zagaeski said.

As of last week, Prudential Securities was still negotiating final contract terms with its market data vendors. The hardware and software platforms will be settled, however, after a yearlong pilot project testing a variety of RISC machines.

The change affects only the branch network at this point. Unchanged in the computing scenario is the corporate data center in Brooklyn, N.Y., which is anchored by an IBM 3090 Model 600, an Enterprise System/9000 Model 720 and a Digital Equipment Corp. Vaxcluster.



Joyce Rydel

Anderson *counts on saving $7 million yearly*

An IBM spokesman confirmed last week that this RS/6000 deal ranks among the largest and most significant commercial sales of the Unix-based platform first introduced in February 1990.

In Prudential Securities' branch offices worldwide, the RS/6000 Model 320s and 530s will act as servers, running AIX, IBM's Unix variant, with a Sybase, Inc. database handling client and brokerage applications written in C for portability.

Also significant is the full IBM Systems Network Architecture LU6.2 connectivity established between the corporate mainframe host and the Unix machines.

"Establishing that took a good bit of work," Anderson said. "With LU6.2, we can share the same communication network, and that gives us the ability to multidrop on the same line, so we have multiple branches on the same line."

In Prudential Securities' domestic branches, the PS/2s rolled out in 1993 will replace the Convergent PCs. Linked by an IBM Token Ring network, the PS/2s will handle quote delivery to the branches. Automatic Data Processing, Inc. (ADP), a market data vendor, will provide the software that drives the quote system as the information arrives from New York over a newly installed GTE Corp. satellite network.

Sybase is replacing ADP's proprietary database system, which now runs on the Convergent PCs.

The expected tenfold jump in reliability refers to the difference in mean time between failure for the Convergent PCs installed in 1984 and the new PS/2s.

Byron Walker, an analyst at Moody's Investors Service in New York, said the RS/6000 is making "very definite inroads" in the commercial market.

Hyatt rewards IS downsizer

CHICAGO — Hyatt Hotels Corp. last week rewarded Gordon Kerr for an application downsizing job well-done by promoting him from vice president to senior vice president of MIS.

Hyatt's move from an IBM mainframe-based reservations system to one using Unix processors and a relational database management system [CW, Sept. 24, 1990] has resulted in more than a 20% cost savings over the old system, which cost $7 million to $8 million per year in leasing and maintenance.

"Saving money per se wasn't the issue. It was how quickly we could respond to changes in the marketplace," Kerr said.

Yesterday, in fact, Hyatt rolled out "Hyatt Vacations," a new program that enables travel agents and individual travelers to price and package a Hyatt guest's airfare, Hyatt hotel stay and entertainment reservations in one step.

The program required the creation of an interface between Hyatt's central reservations system in Chicago and an IBM Application System/400-based travel voucher application run by the technology division of MTI Vacations in Oakbrook, Ill. Hyatt's central reservations system uses AT&T's System 7000 Unix processors and a DBMS from Informix Corp.

"The interface could have been ugly if we'd still been dealing with a mainframe and a TPF system," said Kerr, referring to IBM's Transaction Processing Facility.

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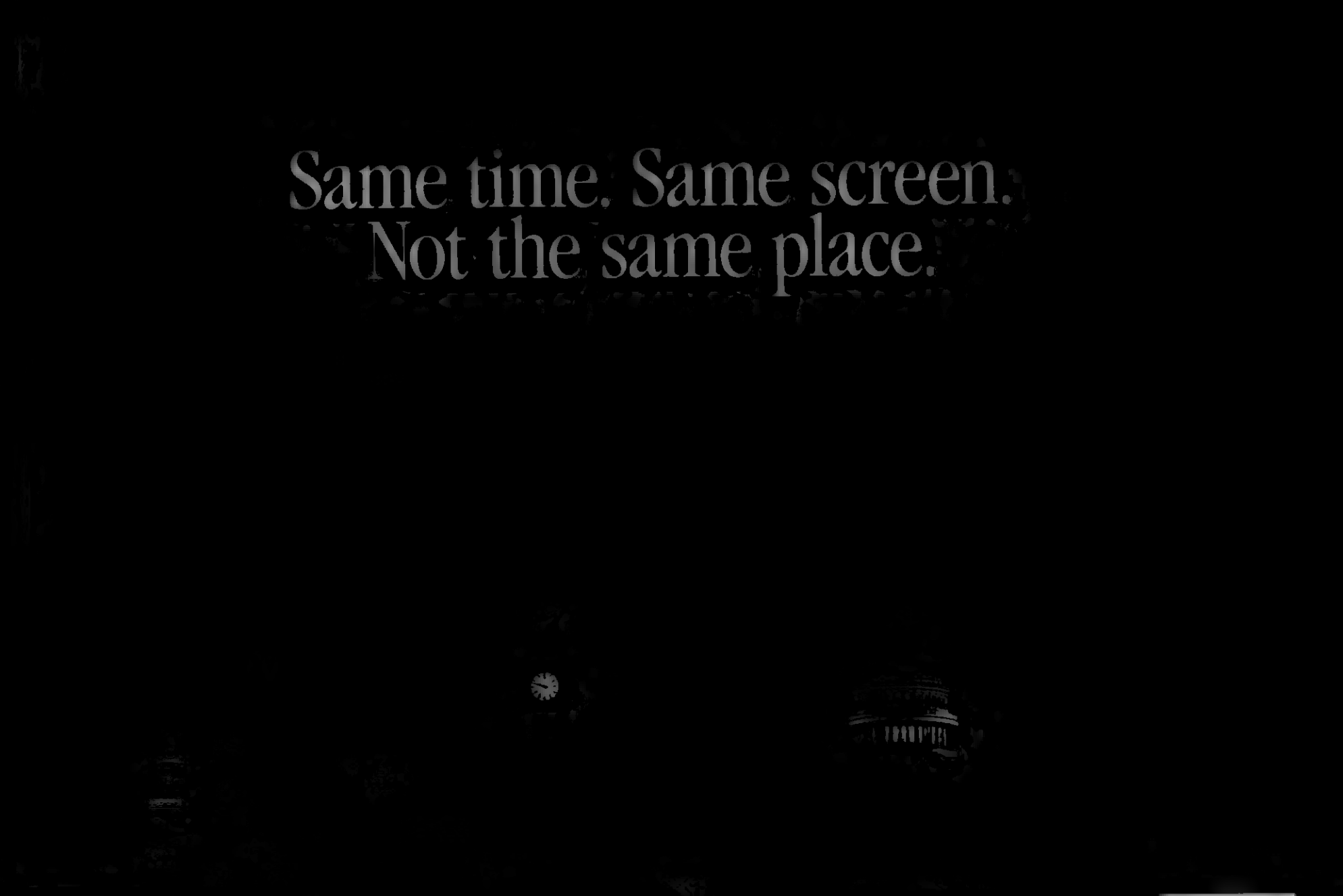
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AT&T, NCR sketch product continuity plan

Tower will go, but NCR System 3000, AT&T 3B2 among those to survive

BY MICHAEL FITZGERALD
CW STAFF

NEW ORLEANS — The Tower will fall, but few other product cuts were offered by NCR Corp. and AT&T's Computer Systems Division last week as they outlined plans for merging their product lines.

The plan, which was presented to AT&T's computer sales force, was the first concrete statement the two companies have publicly made about how their merger will affect customers.

NCR's System 3000 series will remain intact, and so will such products as AT&T's 3B2 line of minicomputers and System 7000 line of high-end parallel processors — at least in the short term.

"What we're doing to a great extent is integrating what ex-

NCR's SYSTEM 3000 strategy becomes the future direction of both companies.

ists," said Gilbert P. Williamson, NCR's president and future chief executive officer.

Analysts found no surprises in the announcement.

"They have to do it in this sort of gentle way," said Judith Hurwitz, editor of the newsletter "Unix in the Office," published by Patricia Seybold's Office Computing Group in Boston. Hurwitz cited a particular need to protect customers with recent investments in AT&T equipment.

Chris Christiansen, an analyst at Meta Group, Inc. in Westport, Conn., said he considered the announcement "very positive in that it's rare to see two computer companies come to an agreement about product consolidation so quickly and decisively."

As it stands, NCR's System 3000 strategy becomes the future direction of both companies. Among the specifics of the plan are the following:

• **Personal Computers:** NCR's Micro Channel-based machines will stay, while AT&T's Extended Industry Standard Architecture machines will go. Safari Systems, the laptop joint venture between AT&T's Computer Systems Division and Marubeni America Corp., will sell its Safari laptop as a high-end portable, while NCR's 3120 portable will remain as a low-end offering.

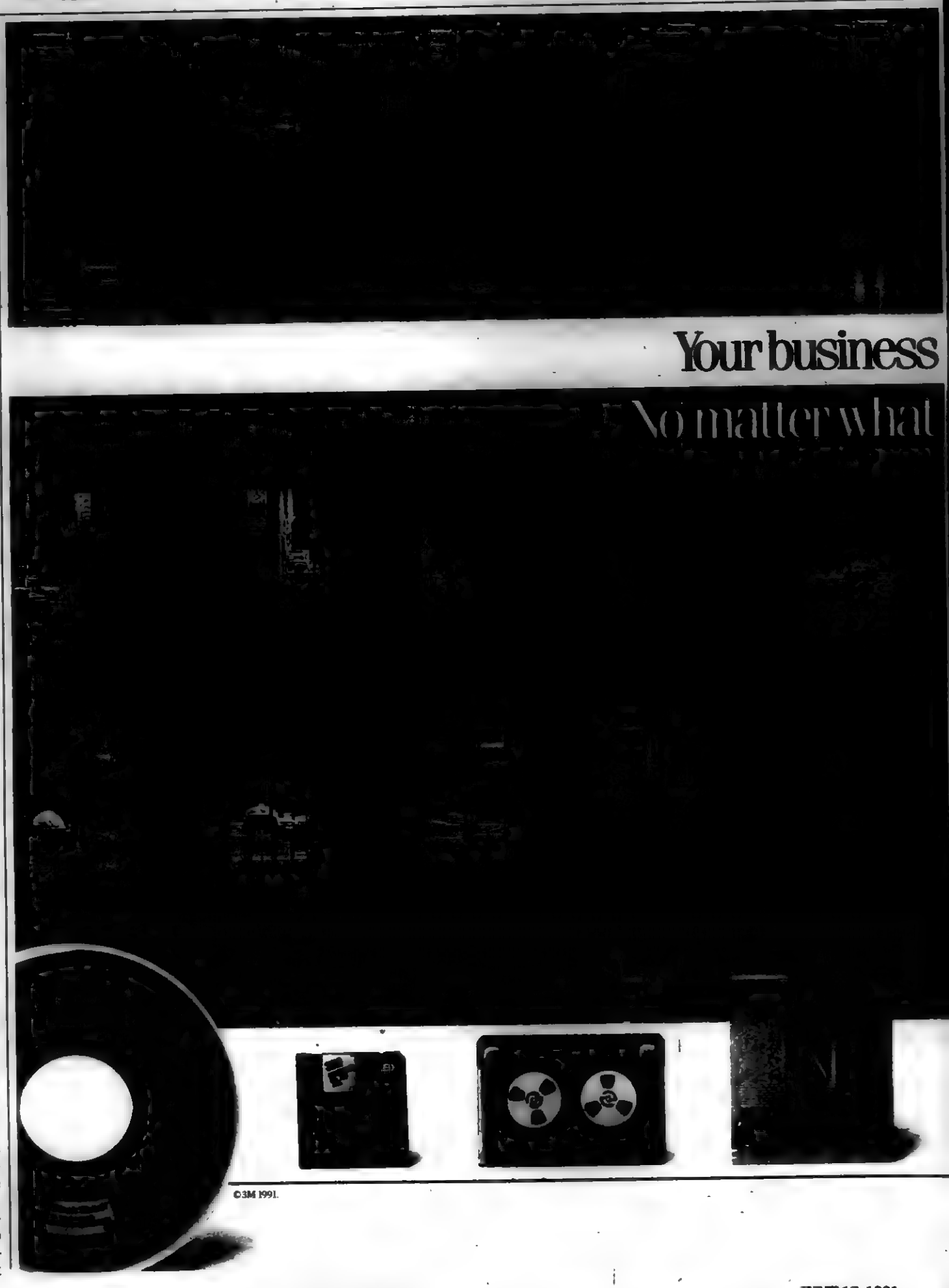
• **AT&T 3B2:** Users will be offered an upgrade in July to a chip set made by Mips Computer Systems, Inc. This will be the last upgrade for the machine. Users of AT&T System 7000s will be given one more upgrade, also to a Mips chip set (Pyramid Technology Corp. manufactures the 7000), but NCR will not add any future upgrades that Pyramid may introduce. NCR's Tower line of Motorola, Inc.'s 68000-based minicomputers will not be upgraded again, according to Williamson.

• **On-line transaction processor (OLTP):** NCR's Top End will support OLTP. AT&T's Tuxedo product will be marketed and supported by Unix Systems Laboratories, Inc.

• **Office automation environments:** NCR's Cooperation package and AT&T's Rhapsody will be merged into Cooperation 2.0 to be released late this year or early next year.

"There's no question that every time a choice had to be made on an important strategic issue, it went to NCR," said Thomas Nolle, president of CIMI Corp. in Voorhees, N.J. Nolle said, however, that the 7000 and 3B2 upgrades "may be a lurking minefield" because of their incompatibility with NCR's Intel Corp.-based strategy.

Under the plan, AT&T resellers will begin selling NCR equipment July 1.



Cabletron, Silicon Graphics form net link

BY JOANIE M. WEXLER
CW Staff

Cabletron Systems, Inc. and Silicon Graphics, Inc. said they will announce a cross-breeding of their well-received yet neophyte network management systems today. The result, users said, could be a blue-blooded system that greatly reduces headaches in managing heterogeneous, distributed corporate networks.

The size of data-laden networks snaking around the globe is growing in direct proportion to their importance to businesses' bottom lines. The result: a need for tight network control that is expected to yield a 75% boost in Fortune 1,000 network management budgets during the next two years, according to Business Research Group, a market research firm in Newton, Mass.

The two vendors appear to be addressing that trend with the intent to integrate Cabletron's Simple Network Management Protocol (SNMP)-oriented Spectrum enterprise manager and Silicon's Netvisualizer, a graphical network traffic monitor. The two vendors said they will continue to offer the systems as stand-alone products as well.

Leap forward

The integrated version "will advance network management by five years," said Dan McCormick, manager of networking and integration at GTE Contel Federal Systems, a Netvisualizer user in Chantilly, Va.

McCormick said he fully expects to purchase the integrated product. "Ironically, I almost purchased Cabletron's Spectrum instead of Netvisualizer," he said. "However, at the time, I didn't have the need for SNMP management that I have today."

Spectrum is Cabletron's Unix- and artificial intelligence-based management system, which provides a top-down view of networks and allows users to manage and reconfigure networks actively from a central workstation.

Netvisualizer is Silicon's three-dimensional network monitor that produces graphical, real-time views of network traffic but does not allow remote action. The graphical orientation eliminates the need to pore through pages of text to determine which protocols are running and what is happening to data packets, users said.

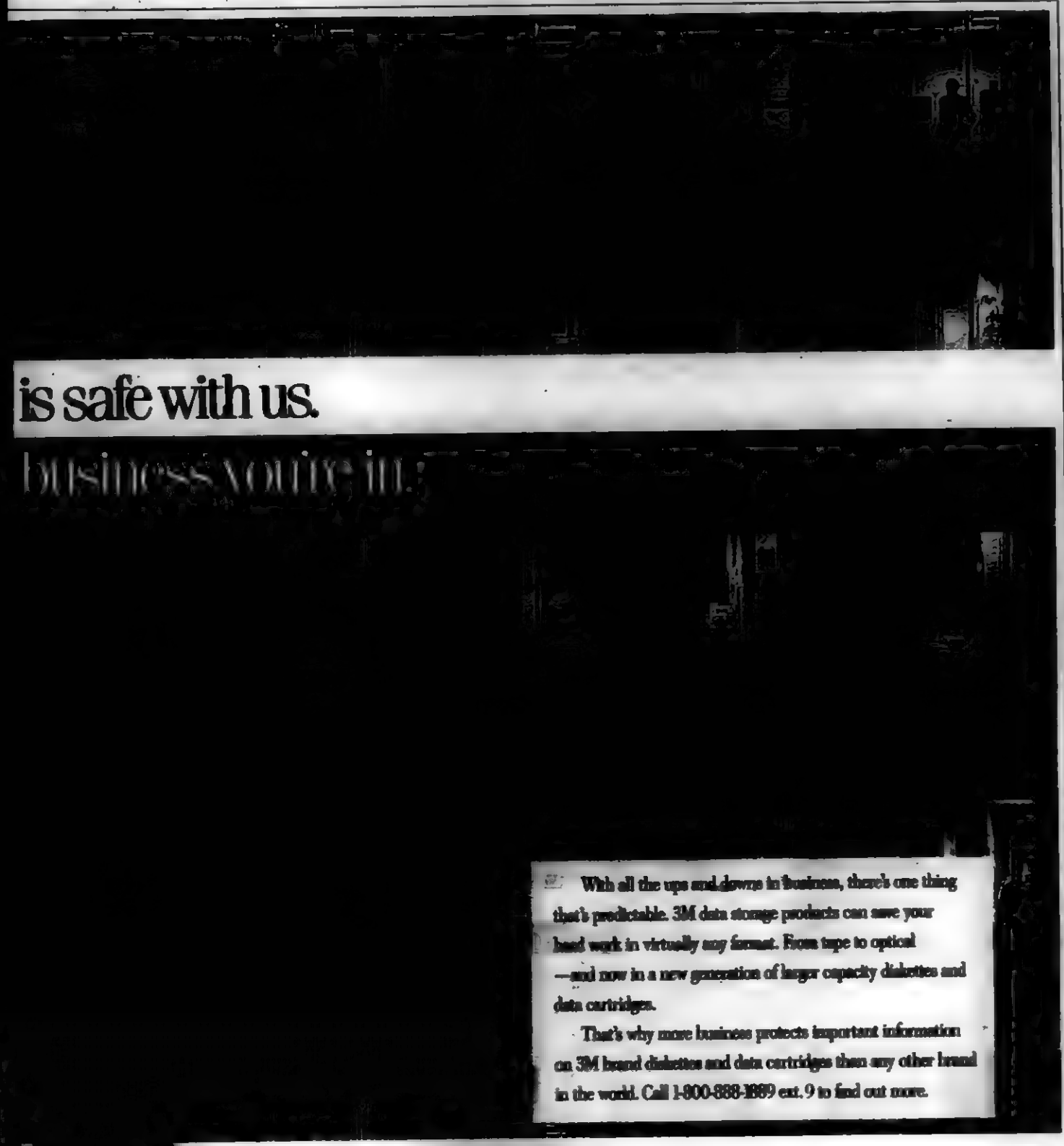
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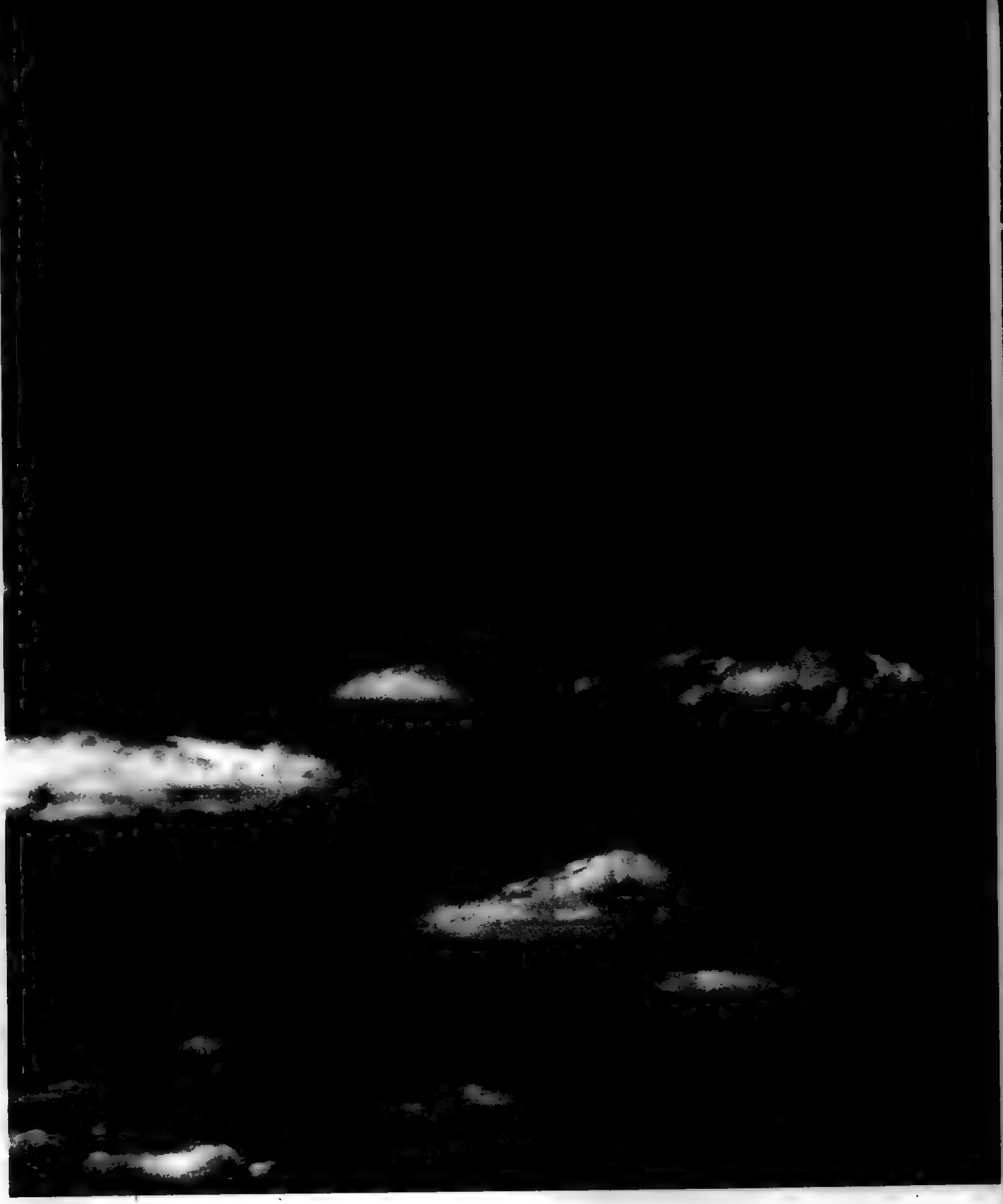
"The attractive thing about [Silicon's] alliance with Cabletron is that it brings SNMP capabilities such as remote configuration to our traffic monitor," said Netvisualizer user Rick Fairbourne, data communications specialist at Westinghouse Idaho Nuclear Co. in Idaho Falls, Idaho. "Currently, we traipse halfway across our plant and spend an hour to do five minutes' worth of work."

Lehman Brothers in New York is currently in negotiations for Spectrum. "The remote capability is important because if the network gets overloaded, the first thing you have to determine is who is on the network and what they're doing. That becomes immediately apparent with Netvisualizer," said Victor Duchovni, senior systems analyst at Lehman Brothers.

Netvisualizer data stations are stand-alone hardware/software devices that sit on and monitor network segments. They will become another item on the 40-odd list of device types managed by Spectrum. As a management device, Netvisualizer passes to Spectrum information about a whole network segment, not just about itself.

Spectrum started shipping in April. With more than 30 beta-test users, the vendor has stated sales goals of 100 systems in the first year. Netvisualizer has been on the market for approximately one year and is installed at about 100 sites.





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HEWLETT PACKARD

IBM tries PC trade-ins — again

BY RICHARD PASTORE
CW STAFF

WHITE PLAINS, N.Y. — IBM's second stab at a personal computer trade-in program, announced last week, is more liberal than its first, and it may turn out to be more popular as well. IBM's offer last week to let Personal System/2 buyers trade in older boxes and even non-IBM equipment for new PS/2s piqued the interest of users who are saddled with relic PCs that cannot adequately run new software.

IBM's dealers will offer trade-in credits for older IBM PCs when customers purchase new PS/2s through the end of the year. Reaching into the markets of its competitors, IBM will also provide trade-ins for customers' old Apple Computer, Inc. and Compaq Computer Corp. boxes — something it has not tried before.

IBM had yet to specify late last week exact trade-in pricing and products affected. The company did say it will grant a "fair market value" for the trade-in and then add on an additional amount, depending on which new PS/2 the customer intends to buy. Trade-in rebates will range from $200 to $1,200, IBM said.

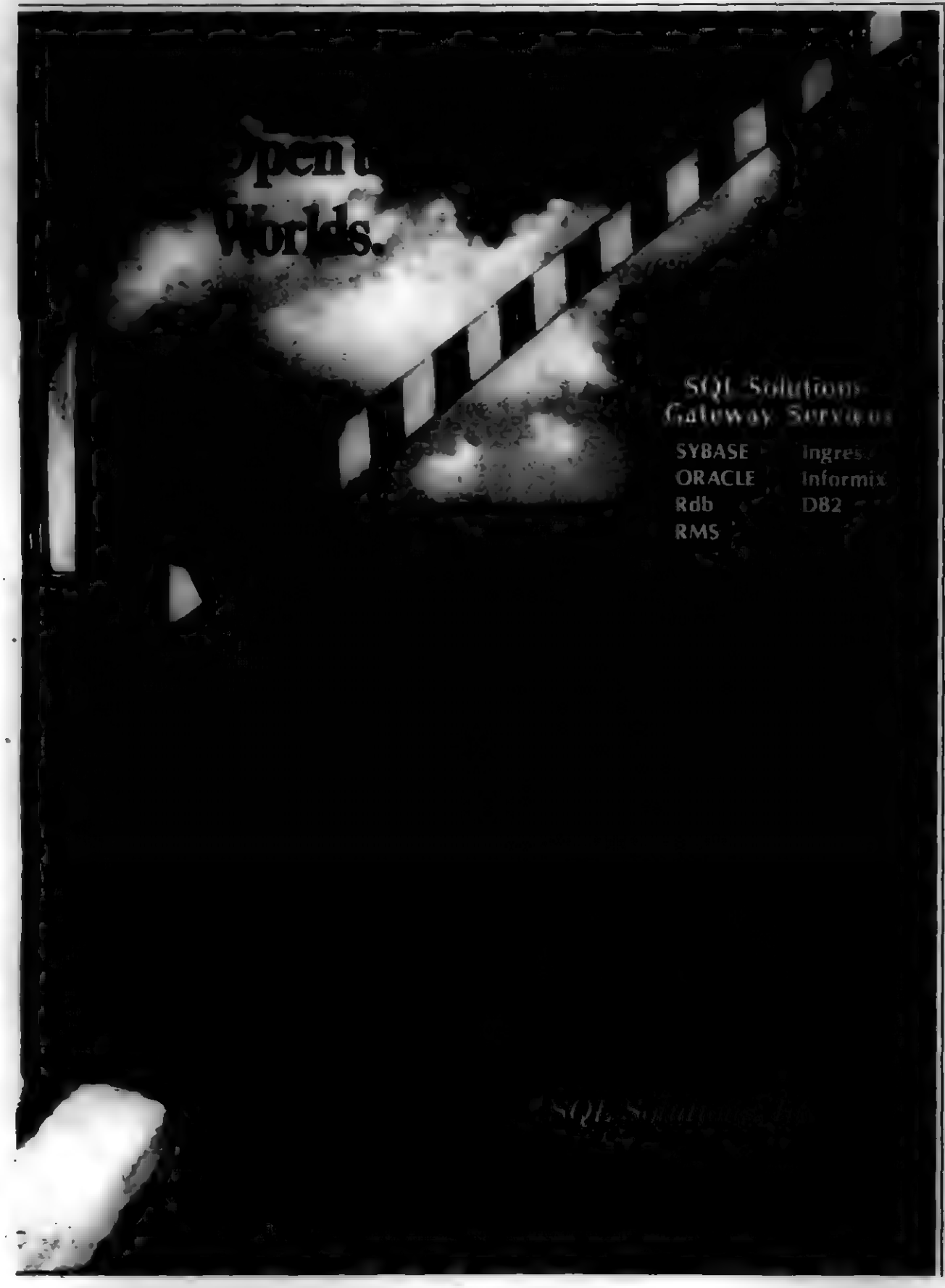
The program is more generous than IBM's trade-in attempt in 1988. That program offered customers less than secondary-market value for their old PCs and created a logistical nightmare for dealers. It was discontinued after a few months.

In the past, PC buyers have been cool toward trade-in programs [CW, Jan. 14]. Many sites have had desktops to which they could pass down older boxes. However, other users said they like the idea of a trade-in program because "antiques" such as the Intel Corp. 8088-based IBM XT are no longer serviceable. "Some of the software just won't run on XTs," said William Tignanelli, vice president at Federal Reserve Bank's Baltimore branch.

For example, it is difficult to run the latest version of Wordperfect Corp.'s Wordperfect on an XT while simultaneously maintaining an electronic mail hookup, he said. The Baltimore bank has approximately 35 XT-class boxes out of 200 PCs. Tignanelli said IBM's concept has appeal for the bank, which has found it financially difficult to upgrade older PCs on a large scale.

Even old Intel 80286-based PCs can be a problem. At County Natwest, Inc. in New York, 286s are precluded from use on the network because the network software resides in extended memory and thus requires a more advanced box, project analyst Bruce Greif said.

Some dealers are also enthusiastic about the program. "It seems impressive in terms of price, and if that's the case, it should be successful" in generating new sales, said Matt Fitzsimmons, owner of a Computerland Corp. franchise here.



Superstores win premium PCs

BY RICHARD PASTORE
CW STAFF

FORT WORTH, Texas — Discount superstores have finally succeeded in plucking the biggest plums in the personal computer industry, even as traditional dealers are forced to consolidate to stay alive. Following close behind superstore authorizations by Apple Computer, Inc. and Compaq Computer Corp., Tandy Corp. announced plans last week for a subsidiary superstore chain that will peddle not only Tandy boxes but also IBM, Apple and Compaq PCs.

Tandy's planned Computer City superstores and other recent deals between major vendors and superstores indicate that the concept has come of age. Regarded as cut-rate pushers of second-tier PCs, superstores have been slighted by many corporate buyers because they lacked premium brands and because support and service were suspect.

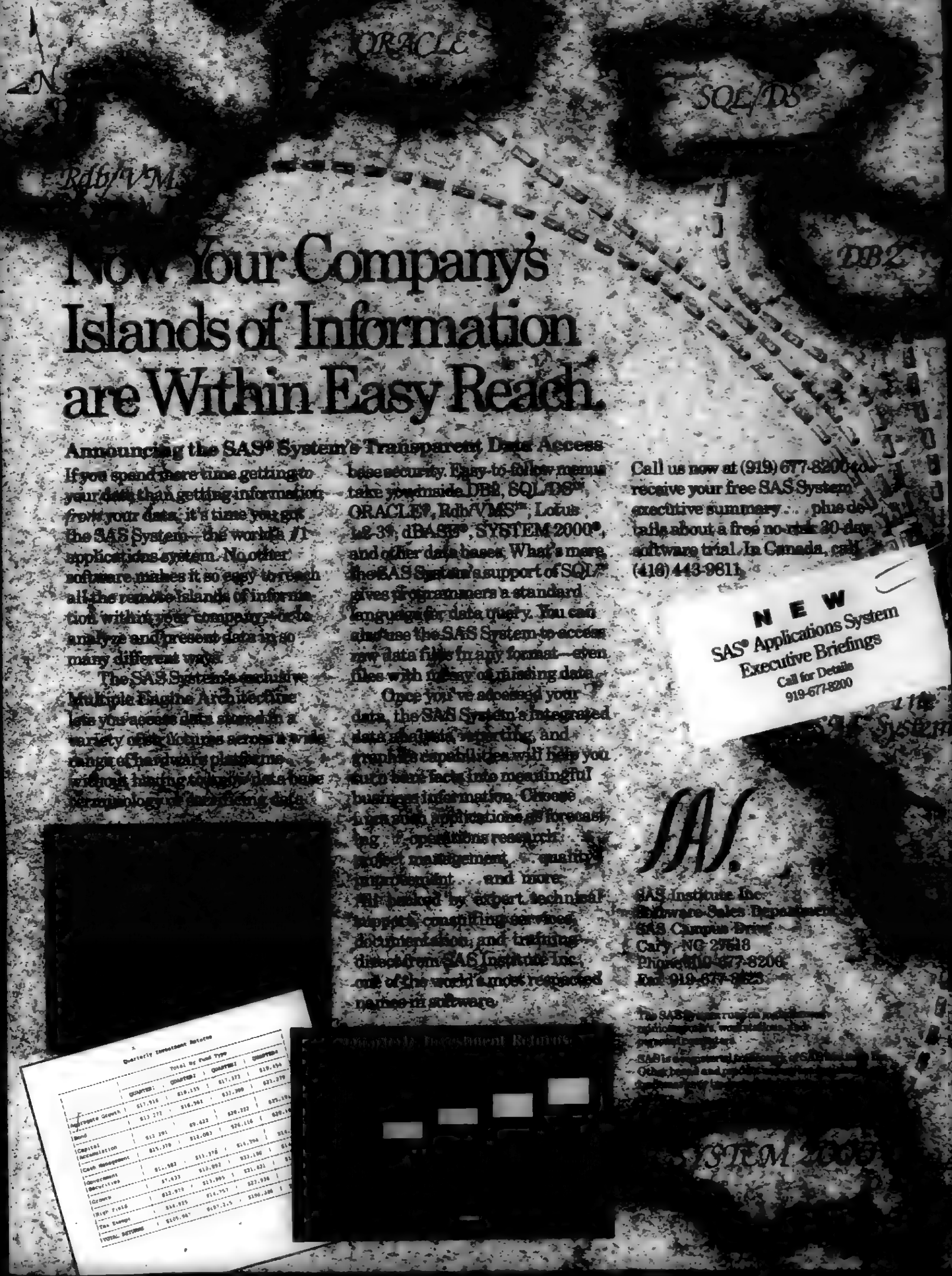
"Corporations like us are looking for a business relationship with their dealer — not a cash-and-carry relationship," said Stephen Rood, manager of microcomputer technology at Coopers & Lybrand in New York. "Support is more critical than price of the initial purchase," added Greg Faries, manager of end-user computing at Black & Decker Corp.'s corporate headquarters.

Whether big names will change this corporate opinion of superstores remains to be seen. Compaq does not expect its corporate customers to shift to superstores; it is hoping to make its products more accessible to the small business and consumer markets, said Douglas Johns, vice president of corporate marketing.

Some industry observers said they expect superstores to handle $5 billion in revenue in 1992. By 1994, these mass merchants could command nearly 20% of U.S. PC sales, while traditional dealers' share erodes to 38%, according to Dataquest, Inc.

Last month, Apple authorized national superstore chain CompUSA, formerly Soft Warehouse, to sell the Apple Macintosh Classic, LC and IISI, along with several low-end printers.

Also last month, Compaq authorized the Bizmart superstore subsidiary of Intelligent Electronics to resell the entire Compaq line, except for the Systempro and certain high-end Deskpro models.



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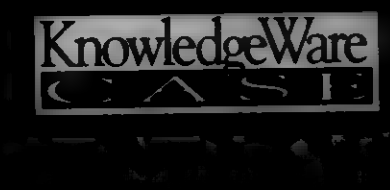
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TECH TALK

Damming the data deluge

■ Scientists at Los Alamos National Laboratory have developed a new model, called Electronic Data Publishing, for disseminating research information. Under the plan, scientific data bypasses technical journals and flows directly into a computer database, where it becomes immediately accessible to a worldwide community of researchers. Electronic Data Publishing reflects a dramatic change in the way researchers share data and will also make it possible to distribute data that is too massive in scope for conventional scientific journals. The scientists developed the plan to cope with the deluge of data flowing from efforts to decode the genetic makeup of humans and other life forms.

Interactive teaching aid

■ The U.S. Department of Education has awarded the National Science Teachers Association $400,000 to fund the production of the first compact disc-interactive (CD-I) science project in the U.S. CD-I is a multimedia technology on 4.7-in. optical disc developed by Philips Telecommunications N.V. and is slated to debut as a consumer product this year. The grant will be used to develop a disc that will help evaluate school science and math programs and improve teaching in the subject areas.

Controlled chaos

■ Chaotic behavior obeys simple laws but ones that are so complicated that events may seem to occur at random. However, chaotic behavior is not random; it is just extremely sensitive to existing conditions. If you find such reasoning, well, chaotic, then perhaps Chaos Demonstrations is what you need. The IBM Personal Computer and compatibles software package was designed to allow users to interactively explore basic concepts of chaotic dynamics. It costs $70 and is available from Physics Academic Software and North Carolina State University in Raleigh, N.C.

On the road with computer routing

Complex chips calculate efficient paths for traveling salespeople, circuitry and more

BY MICHAEL ALEXANDER
CW STAFF

Computer scientists around the world are concentrating on a mathematical challenge that may one day allow computer chip makers to produce more complex chips and save money at the same time. The challenge, called the traveling salesman problem, is slowly giving way under a combination of brute computational force and sophisticated software designed to solve the more than 150-year-old problem.

The traveling salesman problem is an attempt to find the shortest tour around a collection of cities for a traveler who has to stop only once at each location and then return home to his starting point.

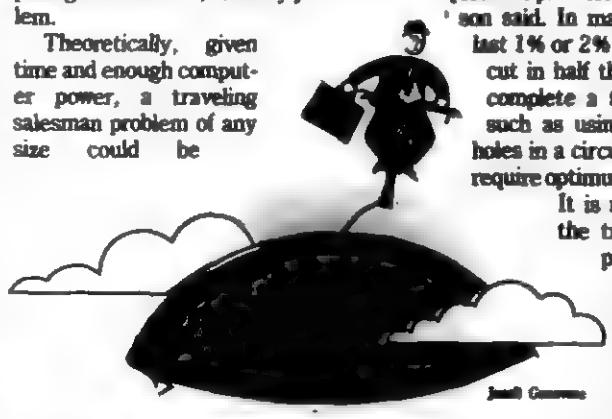
Finding the shortest possible route has practical applications in areas as diverse as the design of computer circuitry to airline route management. For example, solving a traveling salesman problem could be used to determine the most efficient way to drill thousands of holes in a circuit board to accommodate wiring and chips. Finding the quickest and shortest path to drilling the holes could save a manufacturer a substantial amount of money.

The problem is more daunting than it may seem at first: Suppose a salesperson planned to visit 10 cities on a sales tour and then return home. Because any one of 10 cities could be visited first, and any one of the remaining nine could be second, and so on, finding the route with the shortest total mileage with 100% accuracy would require multiplying 10 x 9 x 8 x 7 and so on for the possible number of tours. The product is 3,628,800.

The problem becomes increasing complex as the number of cities increases. For example, an 11-city tour would boost the number of calculations to 39,916,800 to arrive at 100% accuracy.

Computer scientists have solved problems with 2,392 cities and are preparing to tackle a 3,038-city problem.

Theoretically, given time and enough computer power, a traveling salesman problem of any size could be solved, said David Johnson, who heads the mathematical foundations and computing department at AT&T Bell Laboratories in Murray Hill, N.J. Johnson and Jon Bentley, another Bell Laboratories computer scientist, are recognized by computer scientists as experts in solving traveling salesman problems.



For example, Johnson has developed software code that will get within 1.5% of an optimal solution for a tour of 100,000 cities within 12 minutes. Bentley has solved the 1 million-city problem within 3% of the optimum in three to four hours.

To find the optimal solution to a problem would exponentially increase the complexity and time needed to solve the problem. Instead of two or three hours, the problem could take 1,000 times as long to solve, Johnson said.

Close enough

An approximate solution is often adequate for practical application, Johnson said. In many instances, the last 1% or 2% may be enough to cut in half the time needed to complete a task. Some tasks, such as using a laser to drill holes in a circuit board, may not require optimum accuracy.

It is not certain where the traveling salesman problem originated, but it is believed to have come from a handbook for salespeople published in Germany in 1832. The final chapter urged readers to schedule sales tours so as to cover as many locations as possible without visiting the same location twice.

Manford Padberg at New York University's Courant Institute of Mathematical Sciences and Giovanni Rinaldi at the Institute for Systems Analysis in Rome hold the current record for an exact solution to a traveling salesman problem. The two calculated the optimal tour of 2,392 cities in 1988 using a method developed by researchers at Bell Laboratories.

Supercomputer speed records under siege

BY MICHAEL ALEXANDER
CW STAFF

Supercomputer speed records are being set up and knocked over like bowling pins.

In March, researchers at the University of Tennessee declared a parallel computer built by Thinking Machines Corp. to be the world's fastest. Last month, an Intel Corp. Touchstone Delta housed at the California Institute of Technology (Caltech) grabbed top speed honors. Only a few days later, the record went to a newly unveiled Thinking Machines supercomputer. Last week, computer scientists at Caltech and Intel said the record was firmly back in their hands.

Supercomputers are playing an increasingly crucial role in solving so-called "grand-challenge science problems." Super-fast, high-performance machines are being used for such tasks as modeling and simulating global climate change, searching through large volumes of radio-telescope data for the faint and complex signatures of binary pulsars and visualizing scientific data returned from the National Aeronautics and Space Administration's Galileo and Magellan spacecrafts.

On June 4, Thinking Machines introduced a machine that is 50% faster than current models and can be shared by more than 100 users at one time. The CM-200 is capable of performing 9.03 billion mathematical calculations per second to solve a set of linear equations used in the Linpack benchmark. The speed is only slightly faster than that set by the Touchstone Delta, which handled 8.6 billion calculations per second on May 31.

In one recent benchmark test, the Touchstone Delta topped out at 10.2 billion calculations per second, and it will probably go to 12 billion calculations per second after initial diagnostics and other tests are completed, said Elliot Swan, manager of product and technical marketing at Intel. "It's the most powerful machine today; the record is back," Swan said last week.

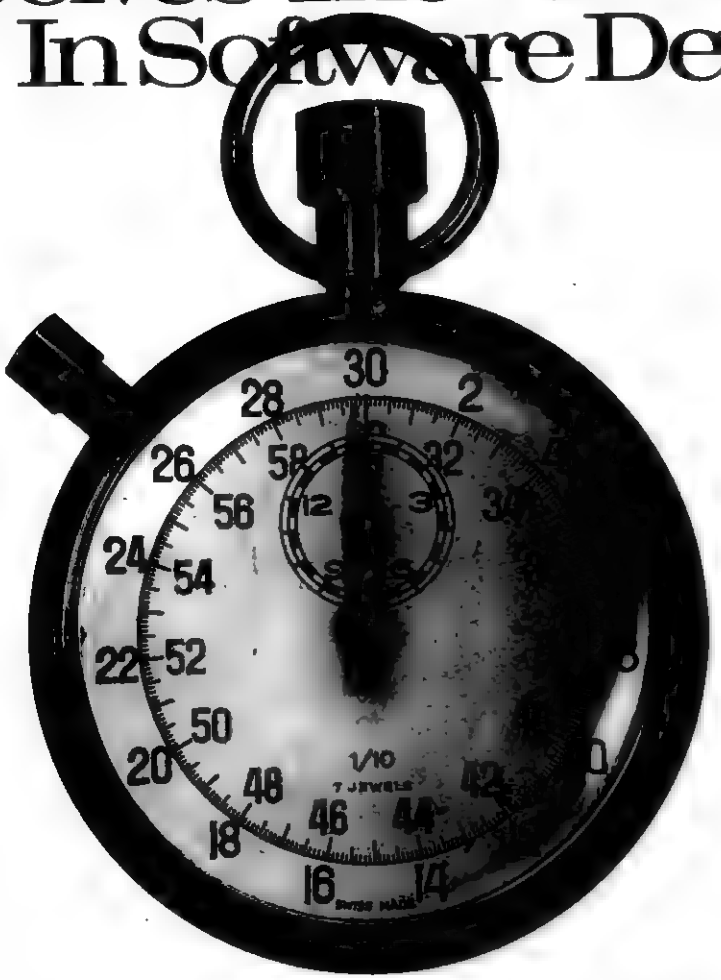
The speed of supercomputers is a topic of considerable debate among manufacturers of parallel processing and other types of high-performance computers, Swan said. For example, it is difficult to compare parallel processing machines that break a problem into pieces and work on each piece simultaneously with more conventional supercomputers that attack a problem one piece at a time.

The speed duel probably means little to potential customers, according to one analyst. The true measure of speed is how fast the supercomputer can run the customer's own code, he said.

"Benchmarking is a black art, and that is true from PCs to supercomputers," Swan said. The Linpack benchmark test is universally accepted and considered a useful measure of supercomputer speed, he said.

Although raw speed is not the sole reason customers choose one supercomputer over another, Swan said, "being able to crow about being the fastest has some value."

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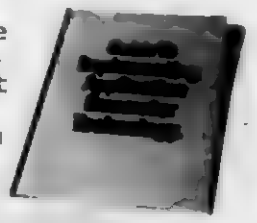


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EDITORIAL

The human side

It is very easy and common to think of information technology in impersonal and inanimate terms. We enjoy hearing and talking about the power of supercomputers with capabilities approaching one trillion calculations per second. We marvel at the exacting reports that are generated from electronic file cabinets at the click of a mouse. The computational potential being crammed onto fingernail-size chips of silicon is mind-numbing.

Very likely the same feeling of awe swept over the factory workers of a century ago when the Mechanical Age picked up a full head of steam. We wonder what feelings those workers had as the machines got so tremendously large. Today, we're awed by Information Age miracles that are microscopic.

So we often lose sight of the basic premise that these things great and tiny were intended by their inventors to improve the human condition, not to make us feel less significant.

Last week, *Computerworld* and the Smithsonian Institution honored more than a dozen individuals and organizations whose use of information technology reaffirms the correct relationship between man and computer. It is a dog-wagging-the-tail relationship in which man is master of technology for the betterment of humankind, not subjugated and beholden to it.

Simply stated, the *Computerworld* Smithsonian Awards and its search for new heroes moves the spotlight from the gee-whiz of modern machines to the dignified expression of human thought aimed at making our planet a more humane, healthy and cooperative place to live. The actual technology is only a tool.

From out of a very large group of nominees in the education award category, the winner was a program at a small school in Washington, D.C., headed by a young man who uses information technology to achieve major breakthroughs for children with learning disabilities.

From the equally large environmental achievement category, there emerged another small entrant: a company whose winning project is a decision support system that maps out emergency management before any number of natural disasters strike, minimizing the loss of life and property once they do.

And from the media category, whose nominees featured some of the biggest names and companies in media and entertainment, the winner was a nonprofit newspaper — the only four-language, computer-generated newspaper in the country — whose readership is the burgeoning Asian population in San Francisco.

These winners and the others from the third annual awards ceremony, listed on page 89 today, exemplify so much of what is right and what is possible with information technology.

For each of us, they offer a chance to step back from our blinking cursors and partitioned screens and contemplate some greater good to which we all might aspire in our work.



LETTERS TO THE EDITOR

Less regulation

I must take issue with the statements of Rep. Don Ritter [CW, May 6] concerning the need for an industrial policy to spur on the high-definition systems (HDS) effort. Once again, a congressman assumes that Congress can micromanage the economy. It has been proven again and again that Congress is the problem, not the solution. Witness the S&L crisis and the auto industry decline and the multibillion-dollar Synfuels fiasco.

He shows extreme arrogance when he says, ". . . we wouldn't have a computer industry without DOD." So, all good comes from government, and no innovation has ever occurred without congressional mandate, right?

There are some simple answers to the problem of maintaining and growing America's manufacturing base. First, eliminate the capital gains tax. How can we expect anyone to invest in risky technologies, when, if successful, their rewards are taxed away?

Second, in the particular case of HDS, let competition rip in the delivery of cable services by deregulating the communications industry, including letting phone companies build the fiber infrastructure and deliver the services.

David D. Herchenroether
Pittsburgh, Pa.

Employee rights

Regarding "Noncompete may be on way out" [CW, May 20], your readers should be aware that California is one of the few states that has a specific statute dealing with restrictive employment contracts and which prohibits noncompetition covenants in employment contracts.

This statute notwithstanding, a California court, under the guise of equity, will enjoin a former employee from engaging in competition upon a finding of unfair trade practice or unwarranted disclosure of trade secrets.

Second, while courts around the country tend to give minimal protection to customers, this protection is not absolute.

Even if protection is given to present clients, it is not extended to past or potential clients whom the employee had not solicited. The protection given to present customers lasts only as long as it takes for the former employer to re-establish the relationship with a new employee.

The mention of noncompetition agreements and lawyers is a red herring. A lawyer's profession is the only one where post-employment restrictive covenants, other than those concerning retirement benefits, are unenforceable per se. This is based on the premise that courts are only located in specified locations and that clients have the right to retain the lawyer of their choice.

L.J. Kutten
Kutish Publications, Inc.
Devon, Pa.

DBMS confusion

Regarding George Schussel's "Distributed DBMS decisions" [CW, May 6], as a relational database consultant, I feel the article further confuses the already muddled definition of client/server.

I think it improper and misleading to divide DBMSs artificially into client/server and distributed DBMS. One is a specific architecture for implementing applications, while the other is a class of database.

Mr. Schussel incorrectly characterized client/server DBMS as not supporting location transparency. I suspect he meant "in today's products," but even this would have been incorrect. SQLserver, Ingres, Oracle and RDB/VMS are all client/server-architected products supporting varying degrees of location transparency, so it is strange that he chose to cast the last three as "true distributed DBMSs." It's also strange that On-line from Informix did not appear at all and that Oracle appeared twice.

More important, client/server architecture has nothing at all to do with location transparency in the DBMS sense. The idea of client/server is that the developer or system administrator has the option of placing application-specific processing on any platform that can communicate with the server or servers.

Location transparency does not require that a full local DBMS and data dictionary reside on each node. Client-only nodes have no need for a full local DBMS or data dictionary; they need only connect to some DBMS server.

David McGovern
Alternative Technologies
Boulder Creek, Calif.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

Remember Gulliver's experience?

Size is becoming less of an advantage in the computer industry

BY WILLIAM SINES



Size used to be a major advantage for a computer vendor. When you were the biggest vendor in a particular market, you were the font from which all innovations flowed and the automatic choice of customers seeking safety and cost effectiveness. But being big doesn't mean as much as it used to.

While the big computer companies continue to dominate the headlines, the medium-size firms are fast replacing them as the engines driving the high-tech American economy.

This is not a phenomenon confined to the computer industry. Between 1985 and 1990, exports of American manufactured goods rose by more than 80% in volume. Yet only two of the nation's biggest companies significantly increased exports. The rest of the growth — the fastest ever recorded in peacetime America — was contributed by medium-size firms with sales (in 1990 dollars) of between $75 million and $1 billion. Furthermore, at least 75% of America's employment growth since 1975 has taken place in medium-size businesses.

During the past decade or two, medium-size computer companies have also become more competitive and large computer companies less so. The worldwide market for the five largest computer vendors was 85% in 1970, 60% in 1980, and by 1990, it had dropped to 36%.

The secret to medium-size computer companies' success is not hard to understand. They have given the customer what he wanted while the large companies have, in many cases, played an outdated technology game.



The rules that used to govern manufacturing and technology have changed. The old rules were that:

- Each industry had one clearly delineated technology.
- A leading company dominated the industry because it generated nearly all the knowledge needed to advance the technology.
- There was little overlap between industries.

Now, underlying technologies are no longer discrete. They overlap and crisscross each other. No industry or company can be fed out of one technology stream. IBM, for example, simply cannot generate all the software or semiconductor designs that its computers need.

Conversely, one technology no longer feeds only one industry. As a result, industry leaders, with the possible exceptions of Intel and Microsoft, are no longer in control of the rate of technological change and are, therefore, less able to extract excessive revenues through the sale of "obsolete" technology.

For over 50 years, superior technology and performance went along with being the biggest in the industry or major market segment. From now on, it will increasingly mean being the "right" size. And, in most cases, this will mean being medium-size. Open systems has changed the equation and can provide IS executives with highly cost-effective alternatives.

Big companies are good at many things, the most prominent of which is institutionalization. The dominant company sets the standards, makes the market and keeps order. The faster the market or technology change, however, the less these companies are able to cope.

The hyperflow of technology, especially in the semiconductor industry, has seriously disrupted the old market order. The small or medium-size companies have consistently reacted more rapidly to technology changes by offering customers more powerful and cost-effective products.

Before the advent of open systems standards, the selection of a smaller vendor put the corporate information manager on the "bleeding edge" of technology. It was a risky choice. The manager had to place bets not only on the success of the vendor but also on the success of the technology.

Standards promise to make the technology choice both easier and safer. The information manager may now rely on the open systems promise, which is: You get better price/performance (due to innovation and competition) and easy portability (due to standards) if the vendor fails to keep its promise.

The big proprietary vendors are not going to disappear. On the contrary, they will probably become larger as the worldwide competitive economy becomes more well-established. The challenge for the big boys will be to learn how to become more competitive despite being big.

This means becoming market-driven. It means organizing the whole business around rapid innovation. It means buying into the open systems movement and forming strategic alliances and partnerships based on industry standards. Most of all, it means recognizing that size is no longer any guarantee of success.

Sines is director of midrange systems and server research at Technology Investment Strategies Corp. in Framingham, Mass.

Honk if you love computer programming

BY WILLIAM LEVINE



The computer has been on the cover of *Time* and has been shilled at the world's most shilled event — the Super Bowl. It has produced gigabytes of junk mail; starred in movies such as *2001* and *War Games* and allowed millions of modem users to get paid for goofing off at home. Still, despite all this exposure, the computer is still not really an institution in this country. Why? Because it has never made it onto bumper stickers.

Look what bumper stickers did for babies in terms of visibility. At the height of the "baby on board" campaign, these three little words elevated babies from the depths of the Zero Population Growth era to the demographic, cultural and lucrative phenomenon they are today.

Before bumper stickers made babies fashionable, there were no movies about talking infants or three infantile men and one baby. There was no gourmet baby food, and disposable diapers weren't being blamed for threatening our ecosystem.

What was done for the baby can be done for the computer. We just need to bump up the computer's Q-factor by placing a requisite number of succinctly obnoxious slogans on the backs of cars.

Serious students of bumper stickery know that there are several genres of bumper stickers. We need to pervade these genres with bytes of wisdom from the computer industry.

Intimations of immortality

One common type deals with presumptuous assertions of immortality. A typical example is Doug MacArthur's enduring advertisement for himself: "Old soldiers never die, they just fade away." For the computer to become a major American institution, we will need to fill highways with slogans such as, "Old programmers never die, they just eternally loop," and "Old computer operators never die, they just remain on downtime."

Another genre is the very suggestive "do it" class of bumper sticker. The "do it" slogan links specific occupational and avocational proficiencies to abilities in extracurricular areas of life. An example of this type is "Lawyers do it to everybody." Binary buddies to this type of slogan would include, "Systems analysts do it by design," and "Structured programmers do it from the top down."

So far, we've discussed humorous bumper stickers, but some motorists tack their political, religious and ecological passions on the back of the car in the form of the "I'm OK, you're not" statement. The most well-known of this social impact type is, "America: Love it or leave it." The logical computer industry version of this somewhat jingoistic statement would be, "America: Log on or log off." Another possible data processing contribution to this broad-based sociopolitical category might be, "Jesus saves, and so does virtual storage."

A popular subset of this kind of serious bumper sticker pits a verb against opposing nouns. We have all spied the favorite of the no-nukes crowd, "Split wood, not atoms." Computing is definitely a serious business, so there are a lot of verb and dueling noun possibilities to choose from. A few are: "Partition data sets, not the Middle East," "Execute JCL, not animals," and "Back up tapes, not Third World dictatorships."

> THE COMPUTING INDUSTRY lends itself very well to pithy bumper sticker statements.

Bumper sticker slogans would also give computer professionals a chance to publicly proclaim their computing orientations. Network administrators' foes will probably use the space to proclaim those holding this title "LAN lubbers." Data processors who don't like old-style wandering code will be able to slap on the slogan, "Spaghetti code — go to hell," while traditionalists can counter with "Cobol II — The Next Degeneration." Not-so-user-friendly IS professionals may choose to adorn their vehicles with, "User in trunk."

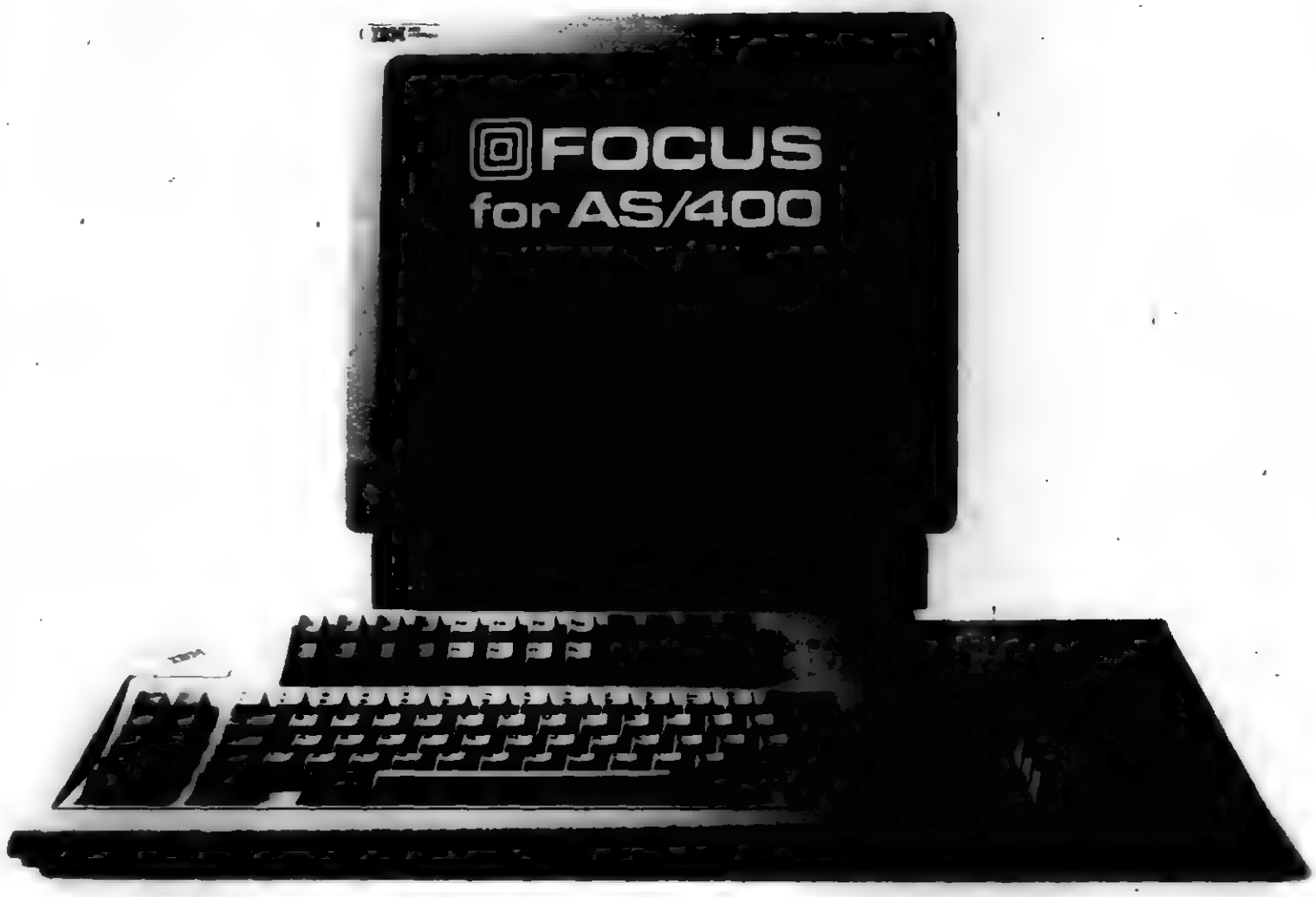
There are also a number of bumper sticker possibilities that are hard to categorize, but should still qualify as real bumper thumpers. Computing students who went down many wrong logic paths in their introductory courses might want to celebrate a passing grade with, "I survived Basic training." Project leaders who want to hand out mementos of particularly frantic systems development projects might choose to hand out bumper stickers such as "Member: U.S. Olympic four-man kluge team."

Clearly, the computing industry lends itself very well to pithy bumper sticker statements. All that's needed is a little pride and stick-to-itiveness. Once our highways are bumper to bumper with computer advertisements, we might just see a movie called *Look who's interfacing*.

Levine is an IS professional at a financial services company in the Boston area.

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SOFTWARE SHORTS

OMG finds brokers

Object Management Group (OMG) has announced two finalists in its Object Request Broker (ORB) request for proposal, and winners Digital Equipment Corp. and Hyperdesk Corp., along with Hewlett-Packard Co., Sun Microsystems, Inc., Object Design and NCR Corp., have agreed to work on combining their submissions. The ORB is the primary message delivery vehicle in an object-oriented environment. OMG, based in Framingham, Mass., is an international group of systems vendors, software developers and users dedicated to promoting object management in software development.

Targeting midsize to large regional U.S. commercial banking institutions, Stockholder Systems, Inc. (SSI), a Nynex Corp. company, and Stratus Computer, Inc., announced a funds transfer software system. Called Financial Exchange, the software runs on the Stratus family of fault-tolerant XA 2000 Continuous Processing computers. Sold and supported by SSI, Financial Exchange is available now and runs under the Stratus VOS operating system. It is currently running at the Imperial Bank, a $3 billion commercial bank in Los Angeles.

Users wait for 3600 reality

Despite NCR's boasts, massively parallel processor remains to be proven

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

"Promises made, promises delivered."

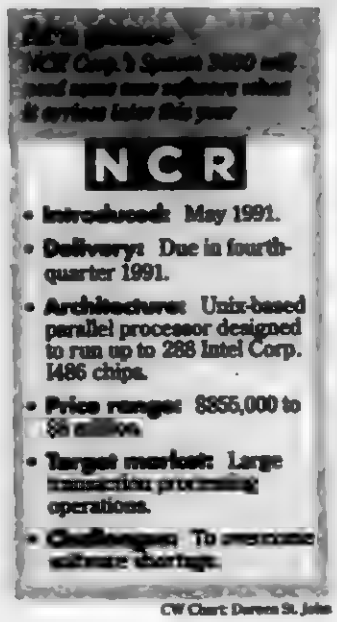
That's how NCR Corp. introduced its System 3600, a massively parallel processor, four times faster than the fastest conventional mainframes. In reality, the promise has yet to be kept: Both hardware and software exist largely in the minds of NCR employees in its West Coast laboratories, who plan for a December release. All NCR did in front of some 120 corporate users at New York's Public Library last month was tell them they could now order one, to the tune of at least $850,000.

Some users said they eagerly anticipate the 3600, a mainframe-class machine based on a scalable, massively parallel computing architecture with up to 288 microprocessors.

"I'm bullish on the whole concept of massively parallel computing," said David Karlson, vice president of MIS at Troy, Mich.-based K Mart Corp., which has invested heavily in Teradata Corp.'s parallel processing database computers, the basis for a significant piece of NCR's System 3600. But Karlson tempered his enthusiasm, saying, "The engineering problems [NCR faces] are severe."

NCR plans to combine Teradata's database engine, based on up to 32 application module processors, each with a 33-MHz Intel Corp. I486 chip, with up to 32 application processors, each with two to eight 50-MHz I486 chips for up to 288 processors. It is a tall order for any company. Most think NCR can meet its goals, although some analysts said they think it will miss its deadline on the 3600.

"There's no doubt they've got the technical talent," said Omri Serlin, head of Itom International Co. in Los Altos, Calif. But Serlin says NCR has a spotty track record with its technological development: success with the small computer systems interface, and a bust with its 9800 mainframe line. He said he wants to see the product before he predicts success, at least in NCR's ambitious development schedule.



CW Chart: Doreen St. John

While the challenges presented by the hardware could stagger NCR, the software is the true concern for users such as Karlson. NCR has to develop a multiprocessing version of Unix System V Version 4, and it is unclear that it will succeed in doing this, particularly by the fall.

"It's one thing to talk about a multiprocessor Unix for several processors, but when you talk about hundreds or thousands of processors, the environment gets a little more tricky," Karlson said.

NCR also must adapt Teradata's proprietary language to run in Unix, which could present some tricks, and the company

Continued on page 32

IBM puts off object-oriented support

BY ROSEMARY HAMILTON
CW STAFF

IBM will postpone its scheduled announcement of support for object-oriented technology in AD/Cycle until later this year, a company executive said recently.

IBM had planned to announce by the end of this month support for the Digitalk Smalltalk language in its strategic software development environment.

When it does make the announcement, IBM said, it will also provide a more substantial statement of direction for AD/Cycle and object-oriented languages as well as methodologies.

"This is not really a delay," said Cliff Reeves, IBM's manager of Common User Access, who also has responsibility for object-oriented technology in AD/Cycle. "We want to do it in concert with other announcements."

In November 1990, Reeves outlined IBM's object-oriented projects, which focus on several areas, including software development, databases and IBM internal development. At that time, Reeves said IBM would begin work in 1991 to bring object-oriented approaches and methods to AD/Cycle and would announce by June 1991 support for at least one object-oriented language in AD/Cycle.

Recently, IBM determined it would make more sense to address the larger issue of object-oriented technology as it relates to AD/Cycle instead of announcing only language support, Reeves said.

Whole focus

The AD/Cycle announcement will focus more on how object-oriented technology will affect the whole development life cycle, "rather than on an individual product," Reeves said.

Paul Hessinger, chief technology officer at the Computer Task Group, Inc., said he expects the announcement to be "more of a description of [IBM's] intent with the object-oriented area, as opposed to any sort of breakthrough."

IBM still plans to include Smalltalk in AD/ Cycle and will also recognize C++ as an AD/ Cycle language, Reeves said.

Reeves explained this postponement following an announcement earlier this month that IBM had joined Object Management Group (OMG), an industry association established to promote standards for object-oriented technology.

Reeves said he was "really pleased" that IBM had joined OMG. He said the membership will give IBM the chance to "influence and be influenced" by the future of object-oriented technology.

The company is moving ahead with plans to bring object-oriented technology to existing IBM databases, although he could not provide a time frame, Reeves said.

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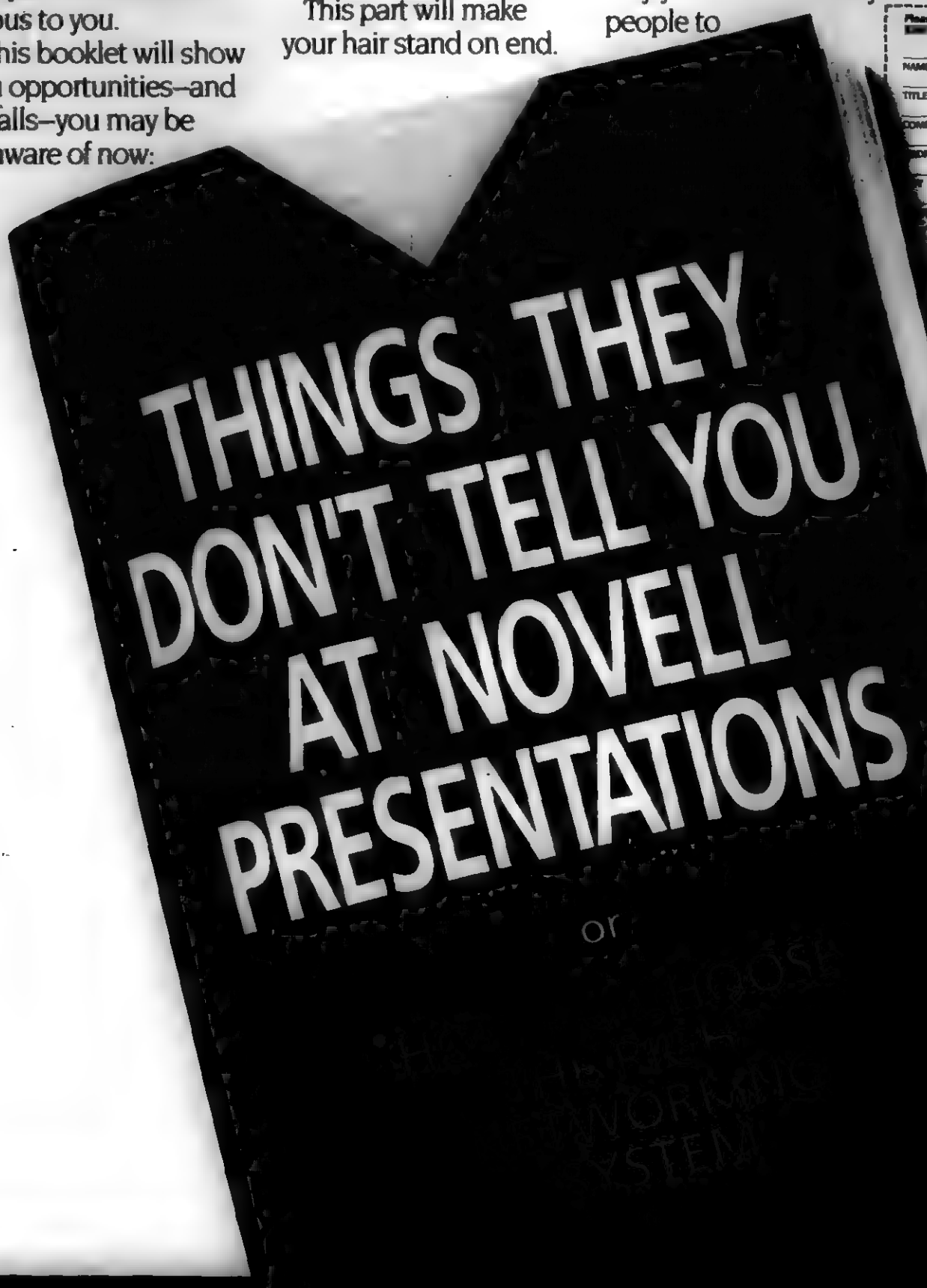
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DEC attempts new open systems feats

BY MARYFRAN JOHNSON
CW STAFF

Like a nervous audience watching a high-wire artist perform above a net full of holes, Digital Equipment Corp. customers are awaiting the next moves in DEC's open systems campaign with anxiety and anticipation.

The following are some of the gaps that users and analysts have spotted in DEC's strategy:

- The perception that the proprietary VAX/VMS line is changing too slowly to catch up with a market hurtling toward reduced instruction set computing (RISC).

"The big question for DEC is this migration to the RISC-based Alpha VAX," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. "Hewlett-Packard [Co.] did the same kind of transition, but it took them forever, and DEC ate their lunch in the meantime. This could be payback time."

- The daunting, ground-breaking task of turning a minicomputer vendor into a software/systems/network integrator.
- The knowledge that the firm's shaky profitability still leans heavily on high-margin VAXs.
- The common view that DEC's marketing efforts are inept.

"We haven't explained our 'Open Advantage' very clearly," Peter Smith, vice president of DEC marketing, admitted recently. "Customers have little patience for any computer company that is not open."

Some users are also running out of patience with the struggle over standards. "I get a little upset with these vendor-oriented standards committees forming on the fly," said Gordon Brazas, director of telecommunications at Kellogg Co. in Battle Creek, Mich. "How much is making statements, and how much real work is going on?"

Kellogg is approaching the open systems question by conducting its own technology study, calling in several computer vendors to make their pitch for open systems.

"Our struggle as a company is trying to decide which direction to go," Brazas said. "The ideal would be plug-and-play networks with any type of hardware, regardless of the vendor."

Analysts say DEC's true motivation in opening VMS with industry-standard Posix-compliant interfaces is to preserve VMS as an alternative for open systems buyers.

"DEC's heart is in the right place," said Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn. "We tell our clients looking at what open systems strategy they should have that DEC ought to be on their short list."

Bluestein said many customers already see DEC as more open these days in light of the firm's Posix compliance, its active participation in the Open Software Foundation and its newfound willingness to license products — including the Ultrix operating system and Decnet source code — to other vendors.

Another example of real change at DEC is its aggressive approach to software now that hardware margins are collapsing. David Stone, the vice president who runs DEC's software business, stresses how he plans to make a lot of money selling software on other vendor's platforms.

In addition to products running on MS-DOS and Apple Computer, Inc. Macintoshes, DEC has introduced Decwindows Motif and the Visual User Interface Tool for Sparcstations from Sun Microsystems, Inc.

Getting some Sun

"The Sun tools are a harbinger of this change of strategy from using software to make VAXs more attractive to making money on the software itself," Schay explained. "That's going to bring about a whole lot of openness that we've never seen from DEC before."

John Donovan, chairman of Cambridge Technology Group, an executive education and consulting firm in Cambridge, Mass., said, "DEC could lead the country in this open systems advantage, but they have a window of one to two years before they'll no longer be a player."

Donovan argued that DEC cannot make VMS a true open operating system by attaching Posix-compliant modules on future versions. "That's like saying you're going to standardize on the English language but still allow everyone to speak French," he said. "If you declare yourself an open systems vendor, you really have to be one."

All eyes on DEC

Some signposts to watch for as DEC journeys toward open systems:

- New software and services popping up on other vendors' platforms, culminating in Decworld 1992 with its Open Advantage theme.
- Emphasis on DEC's abilities as a systems and network integrator. A buzzword will be "Advantage-Networks," DEC's newly christened networking software.
- Greater visibility for Network Application Support, or NAS, DEC's broader, multivendor version of IBM's Systems Application Architecture.
- An escalating campaign for industry standards — or DEC standards adopted as such — focused on those blessed by the Open Software Foundation, X/Open Consortium and International Standards Organization.

Storage keeps up with Dialog growth

ON SITE

BY JEAN S. BOZMAN
CW STAFF

PALO ALTO, Calif. — If disk drive technology were not getting denser all the time, on-line database provider Dialog Information Services, Inc. would have outgrown its 12,000-sq-ft computer room a long time ago.

Fortunately for the 20-year-old firm, the dramatic increase in the amount of data that can be placed on a single disk drive has helped in its move toward replacing many of its indexed abstracts with full-text versions of newspaper articles, scientific documents and legal treatises.

"We now have 1.3T bytes of information on-line," said Robert Feinstein, manager of Dialog's data center here, "and it's in the same space as the 270G bytes we had on our IBM 3350 drives six years ago."

Dialog is adding 20G to 40G bytes of storage per month, with no end in sight, Feinstein said. Historically, Dialog has doubled its disk drive capacity every three years. The data center now has four strings of Hitachi Data Systems Corp. (HDS) 7390 disk drives, totaling 240G bytes of capacity. In addition, Dialog has more than 1T byte of capacity on 34 strings of HDS 7380 Model K and Model E drives.

The on-line database service has 120,000 customers worldwide. Among them are 1,300 U.S. government agencies, 5,000 schools and universities and scores of the world's largest industrial corporations.

New frontiers

Dialog is looking to expand its business. It is in the process of adding image databases such as those that store molecular structures for chemical firms, greatly boosting the Dialog system's storage requirements. The new services are intended to compete with database services provided by Dow Jones & Co., Inc. and Mead Data Corp.

"The customers have an expectation of having access to the data in seconds, since they're paying for the computer time," said Gordon Schick, vice president of systems and operations at Dialog.

"It's called instant gratification," said Roger Summit, Dialog's chief executive officer and founder. "People want access to the on-line files right away rather than accessing an abstract first and then sending a request for an article to a fulfillment house."

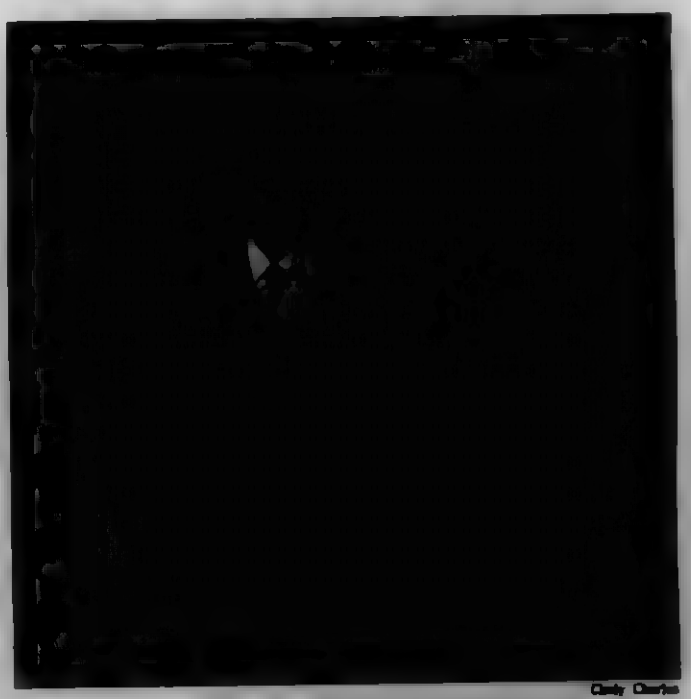
Users' data searches are guided by Dialog-proprietary commands that navigate the stored indexes. Dialog-specific indexing algorithms developed here speed on-line searches; other algorithms compress data storage into as little disk drive space as possible.

Dialog's computer room here is dominated by two HDS EX 100 mainframes and has been using HDS disk drives since 1986. Dozens of IBM-compatible tape drives and tape cartridge drives are used to archive copies of Dialog's 400-plus databases for safe-keeping. An Amdahl Corp. 4705 front-end controller routes inbound modem requests from X.25 packet-switched networks, including Tymnet and Telenet, to the HDS mainframes.

Since many information providers send in tape reels and cartridges filled with data, there is a continual need to rewrite entire databases — in some cases, several times per day. This can cause scheduling problems.

"We're reloading 50% of our storage capacity every time we update, and our average update cycle for any one database ranges from 10 days to two weeks," Summit said. Some databases are updated often, including four databases that are updated several times per day.

Even these elaborate storage facilities will be strained by future subscriber demands, Schick predicted. In time, Dialog will probably be forced to expand its computer room facilities, possibly moving into larger quarters in an adjoining building. The firm is also contemplating the construction of a second data processing facility on the East Coast, in part to ensure disaster recovery capability, Summit said.



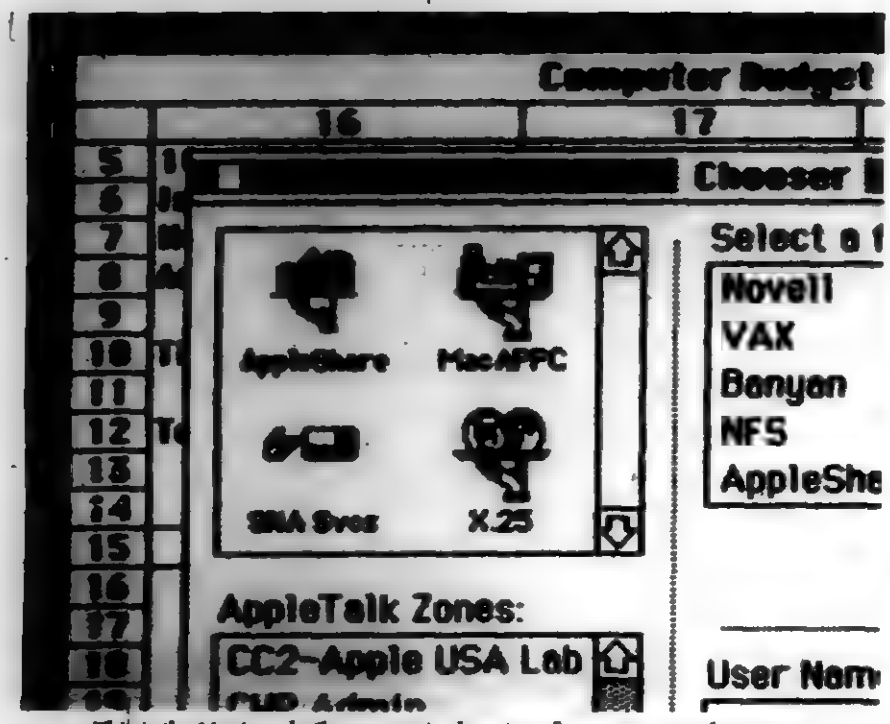
Cindy Charles

Dialog's CEO Roger Summit (right) *and Vice President of Systems and Operations Gordon Schick with Hitachi mainframe*

One way to grow the mainframe system here would be to upgrade from the current IBM VM/CMS system to IBM's VM/XA, Feinstein said, allowing the two HDS mainframes to serve as a four-way "quad" processor. The system is in operation nearly all of the time except for several hours of planned maintenance on weekends. Dialog's VM/CMS processing is boosted by the use of IBM's High Performance Option 5.0, Feinstein said.

New technologies will also offer some alternatives to the current computer room dilemma, Dialog executives said. Schick is looking into new storage options, such as redundant arrays of inexpensive disks technology, that would make Dialog's disk drives smaller in size.

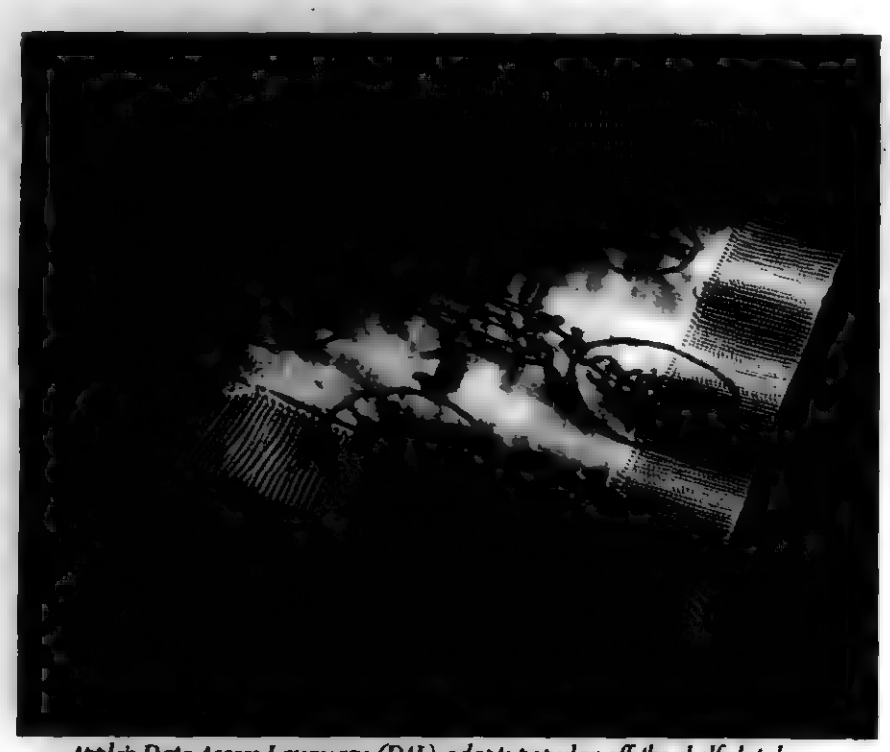
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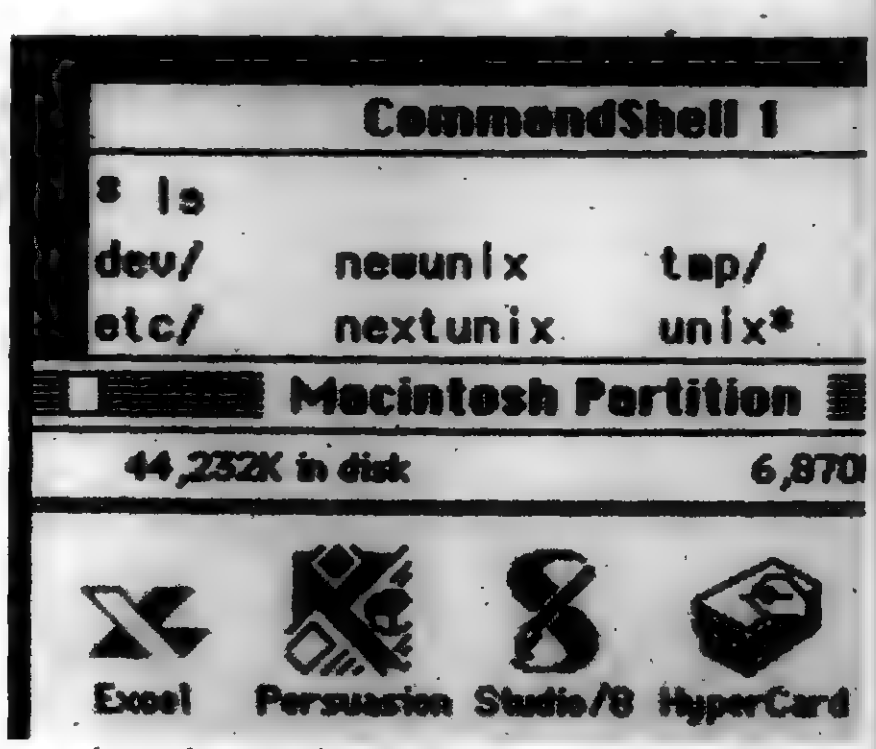
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Encore releases duo of low- and high-end products

BY SALLY CUSACK
CW STAFF

FT. LAUDERDALE, Fla. — Playing to both ends of its customer base, Encore Computer Corp. has expanded its line of Motorola, Inc. 88000-based real-time systems with two product offerings.

At the low end, the vendor rolled out the RSX System, a reduced instruction set computing (RISC)-based processor with dual operating modes for both native RISC and Encore's existing Concept/32.

Positioned as a bridge for moving Concept/32 users toward RISC technology, the RSX provides up to 16M bytes of cache memory; as many as eight RSX nodes can be connected in a cache-coherent manner to form a cluster.

Up to eight clusters can be connected via Encore's Fiber Optic Reflective Memory Systems.

Targeting high-end on-line transaction processor (OLTP) applications, the vendor unveiled the Encore 93 series, which can be configured with four to 32 Motorola 88000 RISC processors.

The system features a multithreaded real-time Unix operating system and delivers more than 5000 Digital Equipment Corp. VAX millions of instructions per second, according to the vendor.

Some enthusiasm for the clustering capabilities of the new systems was expressed by William W. Sines, director of midrange systems and server research at Technology Investment Strategies Corp., a research and consulting firm in Framingham, Mass. However, Sines said he also had concerns as to the vendor's chance of success in the OLTP market.

"They just don't have the sales and marketing in place to compete directly with companies like Harris Corp.," Sines said. "Their strength will continue to be in a real-time niche market."

Pricing on the RSX ranges from $149,400 to $249,900, depending on options selected. Upgrades to existing Encore systems begin at $99,500 and are expected to begin shipping this month.

Pricing for the Encore 93 series begins at $159,900, with volume shipments scheduled for the fourth quarter of 1991.

Real-time Unix OS for Sun, HP

BY J. A. SAVAGE
CW STAFF

LOS GATOS, Calif. — A simulated Unix operating system from Lynx Real-Time Systems, Inc. is being readied for Hewlett-Packard Co.'s and Sun Microsystems, Inc.'s reduced instruction set computing (RISC) platforms.

The operating system will run on Sun's Sparcstation 2s and will be compatible with all Scalable Processor Architecture applications for Sun's operating system V Release 4, according to a Sun spokeswoman. System V Release 4 has yet to be generally available; the spokeswoman said it should be available by early 1992.

Lynx will also run on HP's RISC machines. HP currently has a 20-year-old real-time architecture in its HP 1000 family but has said that new real-time systems from the company will be based on open systems standards, according to David Fastenau, product marketing manager for HP's data systems operations.

Unix is geared to multitasking, which does not accept the interrupt scheduling needed for real-time operations, according to Inder Singh, president and chief executive officer of Lynx. "If you're controlling a missile and it's off course, you have to correct it within milliseconds. In a normal Unix operating system, it would have to finish another system call before correcting the course, which could be too late," Singh said.

Lynx is able to get around the limitations of Unix by avoiding the Unix kernel altogether, according to Singh. The company instead simulates Unix through reverse engineering.

Real-time operating systems suffer from lack of applications, he added. "There are very few standard applications. It's like the MIS world before [IBM's] 360 came on the scene."

Lynx has been available on Mips Computer Systems, Inc.'s architecture through Control Data Corp. and on Motorola, Inc.'s 88000 chip through Data General Corp. Singh said he expects the Sun and HP moves to help spur real-time standardization.

"The only real standard is Posix.4, and that's still in draft form," Singh said. Lynx has adopted Posix.4 and the established Posix.1 interfaces.

3600

CONTINUED FROM PAGE 27

must release its Top End transaction processor, due for general availability in September.

What has users interested in the development process is the 3600's price/performance potential. NCR said the initial System 3600 models will generate a claimed 2,000 million instructions per second (MIPS), at one-tenth the cost per MIPS of an IBM mainframe ($5,000 per MIPS, as opposed to $50,000 or more).

NCR said 1992 systems will offer 10,000 MIPS and will be capable of processing 1,200 transactions per second. The benchmarks for the nonexistent machine are taken from the ratings of current Teradata products running in combination with the 50-MHz chips.

Serlin pointed out that benchmarks tend to reflect peak performance possibilities under ideal circumstances, and actual performance almost never equals benchmark possibilities.

He added that NCR could create a machine significantly faster than a typical mainframe. The problem, he said, would be its level of efficiency.

These numbers create visions of completely new and more powerful applications than exist today.

"When you can put that kind of computing power coming out of a multiprocessor-based system, it's a tremendous opportunity," said David Evans, vice president of IS at J. C. Penney Co. in Dallas. "It's going to change the way we do things in ways we don't know yet," he added.

Unanswered questions

However, the question marks remain, and the ongoing merger with AT&T's Computer Systems Division raises more, particularly since the division has had some success selling its high-end parallel processor, the System 7000, which AT&T resells from Pyramid Technology Corp.

James E. Clark, vice president of high-performance and fault-tolerant systems at the Computer Systems Division, said the 7000 will not compete with the 3600. In short, the System 3600 has promise, but people want to see the reality.

Maximum server for RS/6000s

Maximum Strategy, Inc. in San Jose, Calif., last week introduced a high-performance storage system for IBM RISC System/6000 workstations that provides scientific and technical users with supercomputing capabilities, according to the vendor.

The Strategy RS/6000 RAID (redundant arrays of inexpensive disks) Storage Server will be marketed by Maximum Strategy and IBM and will allow the RS/6000 to run storage-intensive applications usually reserved for supercomputers and minisupercomputers.

The server, available in mid-July at configurations priced from $112,000, uses as many as 40 5¼-in. hard disk drives and delivers an 18M byte/sec. sustained data transfer rate and up to 43.2G bytes of data storage capacity.

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X Window System gets a boost from vendor rollout

BY JOANIE M. WEXLER
CW STAFF

At the recent Xhibition '91 conference in San Jose, Calif., several vendors of X Window System products introduced and enhanced their offerings.

X is a public-domain protocol that is installed on intelligent terminals, personal computers and workstations to let users pull information from multiple hosts and view it simultaneously in separate windows on one screen.

- NCR Corp.'s Applied Digital Data Systems subsidiary rolled out color X terminals that bundle a local window manager and graphical user interface. They are also driven by a Texas Instruments, Inc. TMS34020 processor that NCR says boosts the performance of its existing terminals by 2.5 times.
- Network Computing Devices, Inc. demonstrated font server software slated to be a feature in the next version of the X Consortium's standard version of the X protocol. The font software aims to standardize font formats in different vendors' equipment so that applications can be displayed in a consistent way.
- IXI Ltd. announced general availability of X.Desktop 3 — its object-oriented "drag and drop" graphical environment — for Sun Microsystems, Inc., Digital Equipment Corp. and Hewlett-Packard Co. hardware platforms. The new version supports the dragging of data as objects between the desktop and other applications.
- Tektronix, Inc. added networking, security and interface enhancements to its Tekxpress family, including Motif, Simple Network Management Protocol, Local Area Transport and Serial Line Internet Protocol support.
- Silicon Graphics, Inc. has integrated the X protocol and its graphics application programming interface into its new Irix 4.0 operating system, reportedly providing a real-time three-dimensional X networking environment.
- Visionware Ltd.'s Xvision 4.0 is said to integrate a copy protection scheme to guard against software piracy.

Unix software products refined

BY JOHANNA AMBROSIO
CW STAFF

Two archrivals in the Unix software-development market have introduced new components of their respective systems while taking very different tacks.

Interactive Development Environments, Inc. (IDE) in San Francisco added reverse engineering and code generation to its C Development Environment and simplified querying the repository and navigating through the various modules.

Cadre Technologies, Inc. in Providence, R.I., enhanced its Teamwork software-development system with a tool that produces automated test cases to make testing software easier.

Tests added

"Testing has been ignored," said Ted Gary, director of marketing. "Although the debug and testing phase accounts for more than 50% of the entire development time, our studies show that only 40% of shops have standards for testing software, and only half of them really enforce those standards."

Cadre's Teamwork/Testcase generates reusable test cases for virtually every phase of software design, Gary added. Testcase is based on T, a test-case generation tool developed by Programming Environments, Inc. in Tinton Falls, N.J.

With Testcase, users can produce test cases for modules under development, integration between modules and the entire system. Testcase uses different kinds of analysis techniques and explains why it chooses a certain type of test set.

Testcase will be available in August on the Sun Microsystems, Inc. Sparcstation and in the fourth quarter on other workstations, including IBM's RISC System/6000 and the Sun 3. Prices begin at $9,995, according to Cadre.

Easier code development

For its part, IDE's C Development Environment, initially introduced in September 1990, has been enhanced with a reverse-engineering component and the ability to generate source code. Previously, developers could use IDE's Software Through Pictures, a visually oriented tool to develop software.

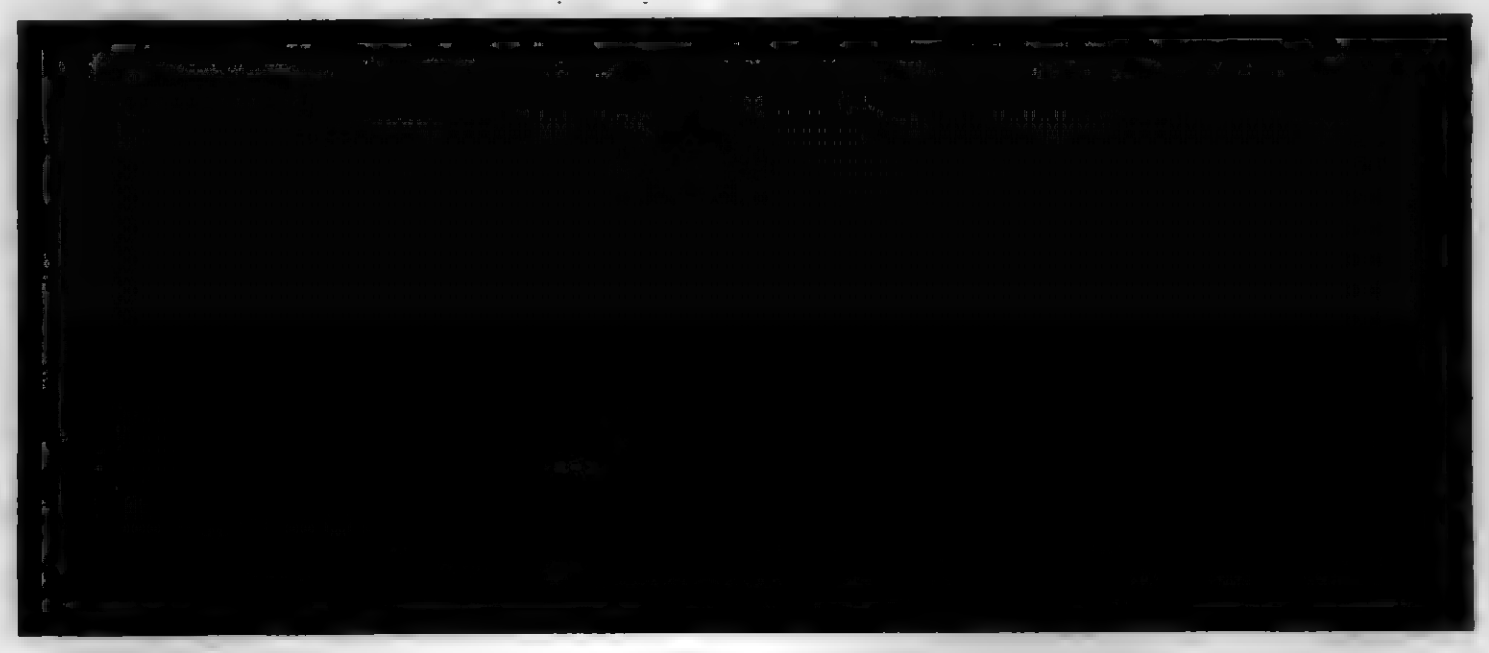
Geoff Salinger, assistant director of systems development at the Federal National Mortgage Association in Washington, D.C., said he is "looking forward to developers being able to develop code however they're comfortable. Software developers are independent and generally don't like to be told how to do things."

With the reverse-engineering and code design modules, existing source code can be engineered into designs, and new source code can be generated from those designs.

Also, consistency is now promised throughout the development process — if developers change the design, the code will reflect those changes, and vice versa.

The Code Generator and the reverse-engineering module, called the Design Generator, will be available in August on the Sun Sparcstation; versions for other workstations, including those from IBM and Hewlett-Packard Co., will be available by the end of the year. The Design Generator is priced at $6,000, and the Code Generator is priced at $3,000.

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NEW PRODUCTS — SOFTWARE

Utilities

MB Solutions, Inc. has created JCL/Convert, software that aids job control language (JCL) consolidations and conversions.

JCL/Convert includes the capabilities of the company's JCL/Cross-Reference and PDS/Manager products. It allows users to identify, document and systematically alter JCL-related data elements such as job, file, program and procedure, the company said.

An average system configuration costs $11,000.

MB Solutions
56 Steele St.
Denver, Colo. 80206
(303) 321-2205

SYSB-II, a product of H&W Computer Systems, Inc., allows CICS VSAM files to be simultaneously updated by on-line applications and batch programs.

The product maps batch updates transparently to CICS without source code alterations, according to the company. Batch changes can thus be journaled along with on-line updates.

SYSB-II is priced between $10,000 and $40,000, depending on processor group.

H&W Computer Systems
3166 Elder St.
Boise, Idaho 83715
(208) 385-0336

Database management systems

Cognos, Inc. has released its Powerhouse 4GL and Powerhouse Starbase relational database management system for Digital Equipment Corp.'s Ultrix platform.

The products retain the look and feel of the VMS environment versions, according to the company. Software generated by Powerhouse can be ported between VMS and Ultrix environments with only minor revisions.

The Ultrix version of each product costs $5,900 to $200,000, depending on hardware platform.

Cognos
67 S. Bedford St.
Burlington, Mass. 01803
(617) 229-6600

Computer-aided software engineering

Iconix Software Engineering, Inc. has announced a version of its Freeflow computer-aided software engineering (CASE) tool for Sun Microsystems, Inc. workstations.

Freeflow is a structured analysis tool incorporating a data dictionary and repository. The product runs under the X Window/Motif interface, according to the company.

Freeflow is one of of nine modules in the Powertools CASE line; the company reported that it will port all modules to the Sun platform.

The product costs $995.

Iconix Software Engineering
Suite 320
2800 28th St.
Santa Monica, Calif. 90405
(213) 458-0092

HARDWARE

I/O devices

Bit 3 Computer Corp. has announced the Model 465 Sbus to Q22-bus Adaptor, an adaptor that makes it possible for Scalable Processor Architecture workstations to use Q22 bus-based boards.

The Model 465 Adaptor comprises two connected cards. It allows Q22 bus I/O to be directly addressed as Sbus I/O and up to 4M bytes of Q22 bus memory address space to appear as Sbus memory.

Cables connecting the two cards are available up to 25 ft. in length.

The product is priced at $2,695.

Bit 3
8120 Penn Ave. South
Minneapolis, Minn. 55431
(612) 881-6955

Data storage

Qstar Technologies, Inc. has developed a line of rewritable optical storage subsystems for the IBM RISC System/6000 workstation platform.

The R650M subsystem consists of one 650M-byte drive and file system software. It is priced at $5,495.

Jukebox configurations offer a range of storage capacity from 10G bytes ($24,995) to 93G bytes ($88,995).

Qstar Technologies
Suite 202
6707 Democracy Blvd.
Bethesda, Md. 20817
(301) 564-6006

Winchester Systems, Inc. has announced Flashcluster, a product connecting small and mid-size Digital Equipment Corp. VAX systems with high-performance storage subsystems.

Up to six central processors can share storage systems via the Flashcluster's 10M byte/sec. small computer systems interface (SCSI) bus, according to the vendor.

The Flashbus can be extended to a length of 80 ft. Host adapters for BI-bus, Q-bus, Unibus and 3100 SCSI-bus CPUs are available.

Pricing starts at $7,995 with a 780M-byte disk drive included.

Winchester Systems
400 W. Cummings Park
Woburn, Mass. 01801
(617) 933-8500



Winchester Systems' ***Flashcluster permits four CPUs to share 28 disk and tape devices***

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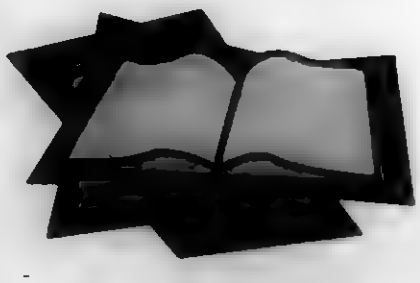


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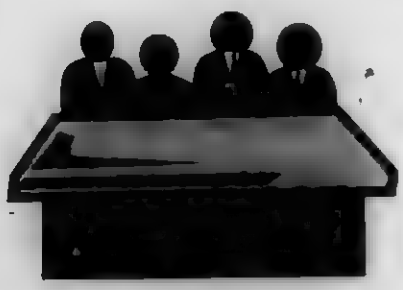
Which UNIX® RDBMS did Hewlett-Packard®, IBM®, Unisys®, Data General®, AT&T®, Sun®, and Sequent® choose to demonstrate the power of their latest UNIX Systems?

Informix.



IDC Study on UNIX OLTP

UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.



About the TPC

The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

Within the past five months, *every one* of these companies selected and used the INFORMIX-OnLine database server to demonstrate to their customers the power of their latest UNIX systems. No other UNIX database product has been this extensively benchmarked—because nothing shows performance like OnLine.

New TPC Benchmarks Used

In each case, the Transaction Processing Performance Council's rigorous TPC A and TPC B benchmarks—the new standard for comparing system and database performance—were used to highlight OLTP performance and database throughput.

The Number 1 Choice for UNIX OLTP

Informix is the number one UNIX OLTP choice. A January 1991 International Data Corporation (IDC) study shows that when it comes to UNIX OLTP applications, Informix products are installed at *more than twice as many multi-user UNIX sites* as our closest competitor. It's independent confirmation that thousands of companies worldwide rely on Informix-based OLTP solutions every day.

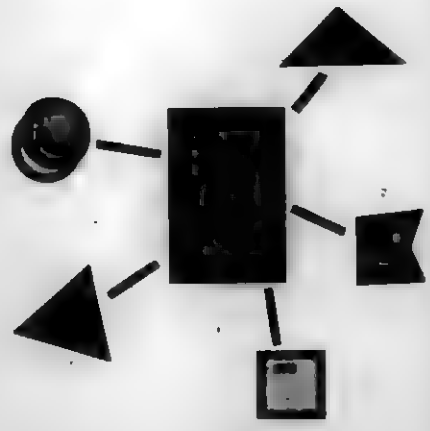
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Call us toll free: **1-800-688-IFMX, ext.2.**



INFORMIX-OnLine Database Server

OnLine was built for speed...and that's what it delivers. Developed entirely on UNIX, the OnLine server turns in optimum performance on every popular UNIX architecture—including symmetric multiprocessors, RISC, and CISC.



TP1 vs. TPC Benchmarks

The TP1 benchmark is no longer the accepted benchmark for measuring database performance. The new TPC tests establish more complete, thorough specifications than TP1, leading to more objective, verifiable results for comparing performance between hardware systems and software products. TPC Benchmark™ A measures OLTP processing performance. TPC Benchmark™ B—similiar to a batch test—focuses on database throughput.

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COMMENTARY

Patricia Keefe

Vendor vignettes



OK, OS/2 groupies. The word at Comdex/Spring '91 was that IBM has cast in iron a mid-fall ship date for OS/2 2.0, with "early final" code going out to users in August. New OS/2 development partner Micrografx reports that its work for IBM is coming along fine. Meanwhile, Microsoft is telling its accounts to expect the 32-bit Windows, also called Windows 4.0, sometime in mid-'92. Microsoft says the developer's kit is supposed to ship by the end of this year, but as one user commented, "Those guys are always six months off."

Once burned, twice shy. Every week, it seems, reveals yet another crack in the tottering IBM/Microsoft partnership. One obvious outcome of this is IBM's refusal to commit to Microsoft's portable OS/2 development project, New Technology OS/2. IBM's admission that it is looking at alternatives could once again leave developers in a quandary, wondering which way to go.

Now you might think that all of those developers who chose OS/2 over Windows might just be more inclined to pick New

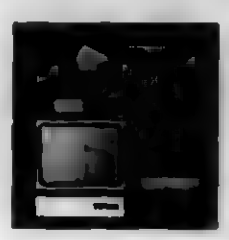
Continued on page 43

Support changes accompany System 7

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Early adopters of Apple Computer, Inc.'s System 7 may feel encircled by the whirlwind of installation and maintenance questions such a major upgrade typically engenders, but Apple promises that help is on the way.

This week, Apple will deliver two key System 7 support packages that should go a long way in taking the guesswork out of maneuvering through the new operating system. The arrival of the subscription services is part of the guiding edict of Apple Vice President of Customer Service Morris Taradalsky, who thinks Apple should pay as much attention to delivering outstanding customer service as it does to creating products.



"Performance is clearly important, but it's not the only concern," he said. His mission is "pulling all the pieces together and getting the job done."

Positive response

Apple users are pleased with the aggressive approach the firm is taking to smooth the rough spots of System 7 assimilation. "I'm hoping [the upgrade] won't be difficult and we won't even need any support, but it's good to know that they're not letting us go out on a limb if we do run into trouble," said Barry Eisenberg, senior management systems analyst at Hughes Ground Systems Group in Fullerton, Calif.

Several levels of service and support will be offered. An in-the-box training program accompanies each System 7 upgrade kit, and Apple provides 90 days of toll-free support calls with the $99 Personal Upgrade edition and 180 days with the $349 Group Upgrade package.

Apple has also established an automated question-and-answer system that lets callers listen to recorded answers to frequently asked questions about System 7 upgrades.

Apple's subscription support services are the likely next step beyond the automated system, starting with the Technical Coordinator Answerline (TCA), which is designed for institutional customers. The TCA is intended for help desk and networking support staffs of large customers. Subscribers have direct access to Apple support engineers, who provide assistance with configuring, installing, administering and other troubleshooting. Multivendor networking support will also be provided.

A one-year TCA subscription with unlimited use sells for $1,995. An edition that limits users to six calls per year sells for $495. Current subscribers to Apple N&C Answerline will be automatically upgraded to TCA.

Help for developers

Customers in the midst of elaborate in-house software development projects under System 7 are the target of the Software Development Answerline (SDA). Subscribers receive access via the Applelink electronic mail system. Apple development support engineers can provide information regarding operating system, graphical interface/front ends, languages, tools, utilities, connectivity and selected third-party products.

A one-year subscription to the SDA service with unlimited use will sell for $5,995, while a limited six-call package sells for $1,795. The service can also be ordered by calling (800) 950-2442. Questions may be submitted via Applelink at any time but will be responded to during regular working hours.

Institutional customers can also look forward to a 1992 service thrust that will provide more in-house software development, networking setup support, phone-in lines and on-line services. Next year, the company plans to introduce an instantaneous on-line ordering system.

CASE users are stuck on DOS, study reveals

BY RICHARD PASTORE
CW STAFF

Users of computer-aided software engineering (CASE) tools are principally relying on the Personal Computer-DOS operating environment and do not seem in any hurry to change, according to a study of CASE users released by Datapro Information Services Group last month.

Of the 102 users surveyed, 67% are currently running CASE tools in a PC-DOS environment. That is a margin of 2 to 1 over the next most prevalent operating environment, OS/2. Next year, 64% will continue to run under DOS, the survey showed.

CASE users' migration to OS/2 appears to be happening at a slower pace than industry pundits predicted, Delran, N.J.-based Datapro said. But next year, another 10% of the survey respondents said they intend to move to the operating system, bringing its share up to 46%.

DOS is the favored environment among finance, banking and professional services users, while computer and communications vendors more often choose Unix.

Besides PC-DOS, the other operating system that is expected to lose users will be IBM's MVS/VM, down by 2% to 30% of the surveyed population. Other operating environments represented in the survey include Unix (22%), Digital Equipment Corp.'s VMS (19%), Apple Computer, Inc.'s Macintosh OS (12%), Mainframe DOS (9%) and others (18%).



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Roger A. Peterson
Director of Information Systems
Kawasaki Motors Corporation

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"It's the one place I can go every week to find out the most current information on technologies or applications that Kawasaki might want to pursue...like relational databases, E-Mail, and that sort of thing.

"It gives me a reading on what real people are doing out there...so I know if I'm onto something that's leading edge and that has proven business applications.

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COMPUTERWORLD

The Newsweekly of Information Systems Management

Foes rise to meet Visual Basic

BY PATRICIA KEEFE
CW STAFF

Microsoft Corp.'s Visual Basic for Windows 3.0 had barely set foot under the spotlight before two competitors rushed the stage.

Within Technologies, Inc., a small development house with a core of former Microsoft employees, is already collecting accolades from some industry observers who say its Realizer applications generator will upstage Visual Basic, which was announced last month.

Hovering by the footlights is GFA Software Technologies, Inc., USA. The Salem, Mass.-based developer has ported its DOS-based GFA-Basic applications generator to Windows 3.0.

Both companies claim to offer a faster, more in-depth programming environment. The competition can only be good for developers currently struggling with programming for the often-difficult Windows environment.

"It's important for people to understand that there is no standard for what Basic should be under Windows; that standard has yet to be made," said Joseph Venuto, president of Within. "Porting Quickbasic and adding form design and a few quick commands doesn't make [Visual Basic the standard]." Still, Venuto is the first to admit that it will be hard to buck Microsoft's drawing power in large accounts.

Within, based in Laurel, N.J., introduced Realizer at Comdex/Spring '91. It is priced at $395; a runtime module is available free of charge.

Realizer reportedly enables users to develop integrated Windows applications quickly. Key pieces include the following:

- A structured superset of Basic, which includes high-level commands to simplify Windows programming. For example, Within said, Realizer can create a Window with a one-line command instead of the 50-line program needed under Microsoft's software developer's kit.

Also provided are a full range of mathematical and statistical functions, high-speed automatic array processing operations, a complete set of string commands, the ability to run Windows and DOS applications and access to DOS commands.

- Prefabricated Windows objects, such as buttons, pull-down menus and scroll bars. It also transparently handles all of the mechanics of event programming and message passing.
- Programmable Applications Tools, which allow users to add the standard elements of popular Windows applications such as spreadsheets, charts and text editors, help to eliminate the need for event programming.
- Visual Form Designer, which lets users quickly create a visual interface by simply "drawing" (resizing and moving) Windows objects, with choice of color, font and position.
- A full-featured integrated debugger and on-line context-sensitive Help. It includes a large set of sample applications, libraries and Dynamic Link Libraries.

The Realizer design team includes Steven A. Cohn, formerly on the Microsoft QuickC Presentation Manager team, and Michael Hyman, who previously worked on Microsoft's OS/2 team and wrote five books, including *Windows 3.0 for Basic Programmers*.

For another $100, users can try GFA-Basic for Windows; however, the June Programmer's Shop Catalog will offer an introductory price of $295.

GFA-Basic for Windows is said to combine the intuitive syntax of Basic with the structured programming of Pascal and C while possessing speed of execution similar to that of Assembler and compiled C programs.

In addition to 500 independent commands, GFA-Basic offers more than 400 commands related to Windows operation. The commands are said to reduce dramatically the coding required in C and totally eliminate the need for Microsoft's Software Developer's Kit.

Imaging saves money in huge bankruptcy case

ON SITE

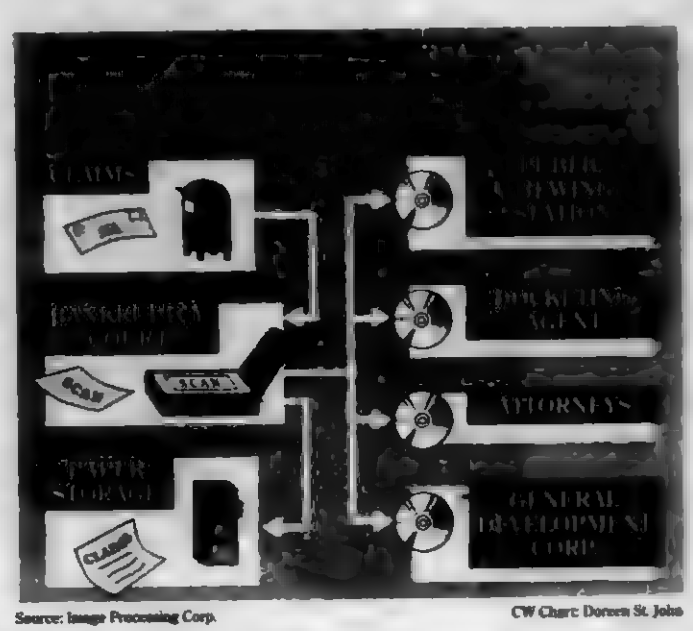
BY CHRISTOPHER LINDQUIST
CW STAFF

MIAMI — When General Development Corp., based here, filed for Chapter 11 protection last April, it was called a "mega case" in bankruptcy lingo. But in terms of processing the hundreds of thousands of documents involved in the claims process, it was going to be a mega headache. Then the firm looked at imaging.

Under one section of bankruptcy code, a court can require the debtor in large cases to pay for some administrative services normally performed by the court itself. So when the bankruptcy court in the Southern District of Florida in Miami required General Development to provide a means of handling the thousands of claims from its creditors, the $500 million construction firm considered microfiche, the traditional storage medium in such cases.

However, after seeing an imaging demonstration and performing some cost comparisons, the firm decided that storing the claims on optical disc was the best alternative, according to Joe Yanero, manager of technical systems support. General Development expects to save $116,000 by using optical discs, assuming 1.5 million documents are processed during the case.

The company decided to use an imaging system from systems integrator Image Processing Corp. (IPRO) in Phoenix. Two Intel Corp. 80386-based scanning workstations were installed at the courthouse, and General Development employees worked two shifts scanning in claims and related documents as they arrived from claimants. Claims were automatically numbered as they were scanned, and the original documents were stored at the courthouse.



Source: Image Processing Corp. CW Chart: Doreen St. John

Viewing stations for the optical platters were installed at the courthouse for public use; other viewing stations were installed at General Development, at the offices of its attorneys and at Poorman Douglas Corp., the firm creating the docket — a list of claimants — for the case.

When the discs arrived at Poorman Douglas, they were indexed only by claim number. To allow searches by other criteria, such as name, Poorman Douglas employees viewed the images and entered needed claim information into a separate database that is keyed to the claim numbers. The database was then distributed to the other viewing stations on optical disc, allowing easier searching.

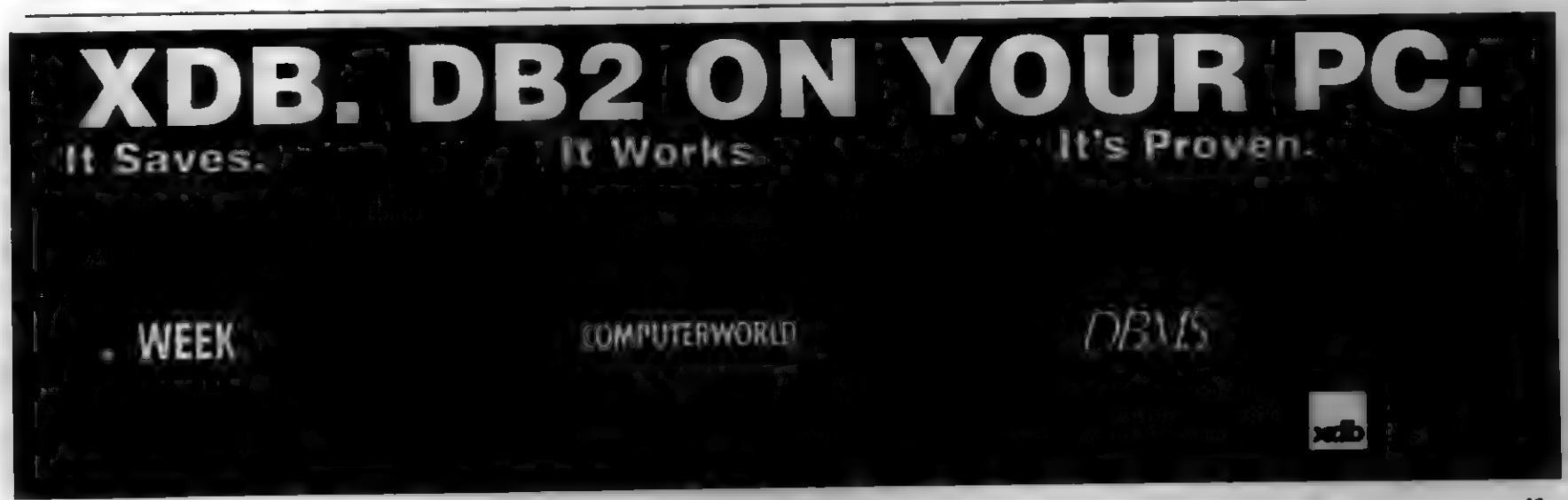
Yanero said there were no serious problems in getting the system set up and getting people trained to use the scanners, but he added that care had to be taken to ensure that the claims were scanned correctly.

He added that a quality assurance program and conscientious operators can eliminate most of the potential for errors. However, if something does go wrong, imaging provides a relatively simple solution: The document can simply be rescanned and reinserted when the optical platters are updated.

The biggest advantage over both microfiche and paper came in retrieval speed, reported several users.

According to Jeff Baker, vice president and general manager at Poorman Douglas, whenever law firms wanted a paper copy of a claim to review, someone would have to go to the courthouse, stand in line, and wait for the claim to be found and copied — an expensive and time-consuming process.

Maria Adams, systems manager at the bankruptcy court, indicated there were currently about 84,000 claims and 400,000 to 500,000 pieces of paper scanned into the system. The imaging system eliminates problems associated with dealing with paper files of that size.



Oracle unveils interface for DDE Windows

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp. recently announced the first of a series of products that will use Microsoft Corp.'s Dynamic Data Exchange (DDE) protocol to swap data with other Microsoft Windows 3.0 applications running DDE.

The product, called Oracle for Windows DDE/Toolbook Interface, is capable of retrieving data from Oracle relational databases and then pasting that information into a Windows 3.0 spreadsheet or word processing package. The product is available immediately for shipment, Oracle said last week.

The $299 product is built on Oracle's new DDE Manager Version 1.0, said Jim Reilly, a senior director of marketing at Oracle's Desktop Division.

The DDE Manager contains a Query Builder that allows users to create SQL queries without detailed knowledge of the SQL language.

A future version of the Oracle DDE Manager will be designed for use by software developers who know SQL commands, Reilly said. He gave no date for the availability of the developers' version of the product.

NEC notebook PC weighs 7½ pounds

BY MICHAEL FITZGERALD
CW STAFF

BOXBORO, Mass. — NEC Technologies, Inc. released the Ultralite SX/20, a 7½-pound, 20-MHz Intel Corp. 80386SX-based notebook computer.

Analysts said NEC, long listed among the Top 5 laptop computer makers, had slipped recently as a result of significant changes in management.

"Their ranking probably remains in fifth place, but their market share is declining," said Bruce Stephen, director of personal computer hardware research at Framingham, Mass.-based International Data Corp. In terms of product, Stephen said, NEC has "been playing catch-up. They're at the tail end of the SX notebook wave, and this gets them up to par."

The company needs to push aggressively to regain its momentum, Stephen said.

The Ultralite SX/20 includes the following: a 9½-in. Video Graphics Array-compatible screen; 2M bytes of random-access memory, expandable to 10M bytes; and a 40M- or 60M-byte hard drive. It also comes bundled with Microsoft Corp.'s Windows 3.0. The product is slated to ship this month and will retail at $4,899 for a 40M-byte hard drive or $5,399 for a 60M-byte hard drive.

While the high price drew fire from analysts, NEC tends to discount heavily, Stephen said. He added that he expects street prices to be in the "more reasonable" $3,800 range.

PC & WORKSTATION SHORTS

Open systems CD-ROMs

Philips Telecommunications N.V. recently adopted the compact disc/read-only memory (CD-ROM) technology to open systems using the X/Open Company Ltd.'s Fast Track procedure. The open specifications for Philips' CD-ROMs allow applications in open systems to have access to data stored on International Organization for Standardization 9660-compliant discs.

AST Research, Inc., lured by the potential of the consumer personal computer market and the growth of superstore and electronics chains, is developing a line of products for this market, the company said late last month. It is currently negotiating with national consumer electronics chain Circuit City Stores, Inc. to sell the line. Compaq Computer Corp. and Apple Computer, Inc. are also purportedly considering superstore sales authorizations for some portion of their current product line.

High-end workstation maker Silicon Graphics, Inc. agreed earlier this month to resell Tektronix, Inc.'s Phaser II thermal wax color printers with its Iris three-dimensional workstations. The printer's high-resolution color output is well suited to the workstation's high-end graphics capabilities, the company said. Silicon Graphics' sales force is scheduled to begin handling the printers by late summer, according to the company.

Tektronix has also entered into a cross-licensing agreement with Adobe Systems, Inc., swapping some of its desktop color printing patents for rights to Adobe's Postscript Level 2 software technology.



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Keefe

CONTINUED FROM PAGE 37

Technology over anything IBM might come up with on its own. Not so Lotus.

To be sure, Frank King, senior vice president of the Lotus Software Business Group, doesn't want a repeat of the firm's Windows experience, where it bet on the wrong horse (OS/2) in the short term, losing precious time in the Windows market.

The pragmatic King says that *if* IBM and Microsoft go their own ways on portable OS/2, you can expect Lotus to support both efforts.

Tell us how you really feel. Apple Chairman John Sculley was quite effusive in his praise for Lotus' recently unveiled 1-2-3 for the Macintosh. Not only did he say it was "extremely important" for the Macintosh, he also predicted that the latest release of 1-2-3 would be "well-used" at Apple.

Of course, he had a little more than three and a half years to polish his speech. He also pointed out that 1-2-3 for the Macintosh will be the most heavily scrutinized product of the early '90s.

Sculley rewarded Lotus rival Microsoft — which has been in the corporate trenches with Apple pitching its Excel spreadsheet for the Macintosh — by touting 1-2-3 for the Macintosh as having "more functionality than any other spreadsheet on the market."

MICROSOFT SAYS the developer's kit is supposed to ship by the end of this year, but as one user commented, "Those guys are always six months off."

He also said Apple now has "the chance to be a real player in the multivendor workplace with the most important power application [1-2-3] in the world." Bet they're still smarting in Bellevue.

Second verse (almost) the same as the first. Will Fastie, editor of the "Fastie Report," gave 1-2-3 for Windows the thumbs-up. His preliminary analysis shows 1-2-3 for Windows is "better than Excel." Why? Because little, subtle things mean a lot. Fastie suggested that users "will come to like 1-2-3/W better" than Excel for a variety of reasons, including the way Lotus handles pasting graphics onto the same page and the way it handles multidocument spreadsheets.

"Not the kind of things that come up when you look directly at a product and try to do a review," he said, explaining that they are the sort of differences you'd notice only after a longer evaluation. "I sense Lotus has a winner on their hands, and Excel will be up against the wall defending [itself]," he said.

Are you taking notes? Sculley also dropped some hints about Apple's forthcoming notebook computer, slated for a fall release. Noting that Apple was late (to put it mildly) entering the laptop market (with a BIG laptop, to boot), he asserted that Apple "does not intend to be left behind" in the notebook segment. As one wag noted, Apple had better get going. Notebooks are not new.

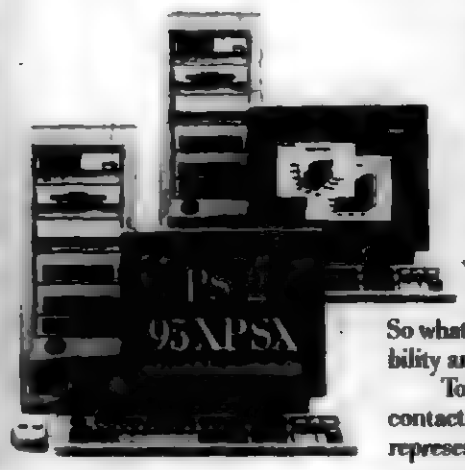
Sculley also suggested the Macintosh was always better suited to a notebook than to a desktop. Alluding to the 1-2-3 for the Macintosh announcement, he hinted that "what Lotus did with its Mac spreadsheet ties in real well" with Apple's notebook.

Consider that 1-2-3 is already available on the Poquet and HP palmtops. Why not the Macintosh? After all, according to Sculley, 1-2-3 for the Macintosh is a product whose time has come.

Keefe is *Computerworld*'s senior editor, PCs and workstations.

got a champion, the line.





33 MHz models, so challenging hurdles like multimedia are easily cleared. The 25 and 33 MHz models also include a math co-processor for improved performance in numeric-intensive applications like financial modeling and CAD/CAM.

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Microsoft Corp.'s Word for Windows Version 1.1

Reviewers	Performance	Ease of use	Editing capability	Printer support	Network support	Documentation	Service and support	Value	Score
PC Week 2/31/90	Fastest GUI word processor	Good	Good	NC	Good	Good	NC	Ideal for more demanding users	Analyst's choice
Users									
Peter Crosby, Telectronics Pacing Systems, Inc.	■	■	■	■	■	▮	■	■	Excellent
Analysts									
Scott Higgs, National Software Testing Laboratories, Inc.	▮	■	■	▙	■	▙	■	■	Needs powerful platform

Key: ■ Very good ▙ Good ▮ Fair ▪ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey.
**Infoworld* score based on 1 to 10 ratings. NC: No comment

Vendor financial ratings

Analysts	Long-term stability	Short-term performance	Outlook
W. Christopher Mortensen, Alex. Brown & Sons, Inc.	■	■	Very good

Microsoft Corp. in Redmond, Wash., reported third-quarter (ended March 31, 1991) net income of $123.8 million, compared with $75.2 million for the same period last year. Sales were $486.9 million for the quarter, compared with $310.9 million last year.

Technology Analysis — A roundup of expert opinions about new products. Summary written by free-lance writer Suzanne Weixel.

Microsoft Corp.'s Word for Windows Version 1.1 is more than a Windows 3.0-compatible word processor. Within its design are complex tools for automated document access and processing. Reviewers were impressed by this powerful combination of functions but wondered whether this is really what users want from a word processor.

Performance: In what-you-see-is-what-you-get (WYSIWYG) mode, Word for Windows is slow, and it gets slower as documents become more complex.

Minimum system requirement is an IBM Personal Computer AT or compatible with a hard disk and 640K bytes of random-access memory, but most recommended a faster processor and at least 1M byte of RAM.

Microsoft has built-in keyboard shortcuts and other conveniences.

Ease of use: Windows 3.0 users will feel right at home with the graphical user interface (GUI), reviewers reported. Even novices can get up to speed quickly on basic word processing, largely because of the "Ribbon and Ruler" features that let users choose text attributes simply by clicking on icons.

However, Word for Windows is not a simple program. According to *PC Magazine*, users may take years to master some of the more advanced capabilities.

For instance, the package's macro language includes a complete set of programming constructs. Fields can contain embedded control codes for performing calculations or automatically inserting information such as the current date and time.

The macros and fields are combined with the program's document templates, enabling users to automate document creation. However, reviewers recommended that the average user leave these features alone because they are too complex.

Editing capability: The package's basic editing tools are exceptional, reviewers said. Users can open as many as nine files at one time. Word also features column selection, rectangular cut and paste and complex search and replace.

Mail merge and outliner facilities are also strong, but the spell checker has some limitations.

Support for style sheets is strong but awkward to use, reviewers reported. Graphics support is weak because graphics are not well-integrated with the mouse-based interface.

Printer support: Printer support is integrated with Windows 3.0, which reviewers said can sometimes be slow and unreliable. For example, *PC Magazine* found a bug that causes text in tables to print with the last character of a word kicked over to the next line.

Network support: Users can open files being used by someone else in read-only mode and then save changes by storing the file under a new name. Windows 3.0 handles all the network configurations.

Documentation: The package comes with one hardcover book that is comprehensive and clearly written but not well organized, reviewers said.

Service and support: Microsoft provides a 30-day, money-back satisfaction guarantee and a 90-day money-back warranty. Telephone support, which reviewers rated as high quality, is free but not toll-free.

Value: According to reviewers, Word for Windows is the word processor most thoroughly integrated with the Windows 3.0 environment. Whether or not users ever operate the customization and development features, the basic word processing tools are complete, flexible and easy to use. Built-in shortcuts help offset the lack of speed inherent in a GUI-based program. Word for Windows 1.1 costs $495.



"WORD'S WYSIWYG capability allows a greater possibility of getting the document right the first time. Without it, you can waste a lot of time cutting and pasting and doing repeated corrections."

Ian Wallace
Systems manager
Washington State Criminal Justice Training Commission

Microsoft responds

Jon Reingold, group product manager for Word

Performance: To scroll faster in WYSIWYG mode, you can shut off certain features, such as the display of pictures.

Ease of use: The small group of people who use Word for Windows as a development environment and customization tool have experience using complex programs.

Editing capability: Our spelling checker has 130,000 words and is fast and accurate. We wanted to get the mainstream word processing basics in place before implementing many desktop publishing features.

Printer support: When Windows 3.1 is released with Truetype, the discrepancies between what users see on the screen and what prints out should disappear. There is a very nice third-party solution for printing special characters.

Documentation: The documentation is complete and accurate. We do not include the printed macro manual because we don't want the average user to be intimidated by its complexity.

NEXT WEEK

▶Ashton-Tate Corp.'s Multimate Version 4.0 has powerful features but is primarily suitable for simple documents because of its basic interface and editing, reviewers said.

NEW PRODUCTS

Systems

Advanced Logic Research, Inc. (ALR) has announced a new family of file servers with an upgrade path to Intel Corp. I486-based dual processing.

The Powerpro VM Series includes 5M bytes of standard system memory and a caching enhanced small device interface hard disk controller to achieve high I/O rates, ALR reported. Models are available with Intel 80386 and I486 processors of varying clock speeds.

With a 650M-byte hard drive, a 33-MHz system costs $10,995. A 25-MHz model costs $9,995.

ALR
9401 Jeronimo
Irvine, Calif. 92718
(714) 581-6770

Macintosh products

Go Technology, Inc. has released two new versions of Hot Keys, its function key macro system for the Apple Computer, Inc. Macintosh.

The new versions support Aldus Corp.'s Pagemaker 4.0 and Silicon Beach Software, Inc.'s Personal Press.

Hot Keys includes more than 140 predefined macros that perform common keystroke routines in the supported application; it also allows users to create custom macros. A keyboard overlay is included with the program.

Hot Keys costs $59.

Go Technology
2nd Floor
918 Northwood Blvd.
Incline Village, Nev. 89450
(702) 831-3100

Software utilities

Nu-Mega Technologies, Inc. has upgraded CV/1, its utility for the Microsoft Corp. Windows Software Development Kit (SDK) Codeview debugger.

Version 2.0 of CV/1 allows Codeview to run in a small window, leaving the program code on-screen and eliminating the need to toggle between character and graphics modes when using the debugger.

A single-user license costs $129; upgrades are available for $39.

Nu-Mega Technologies
235 Lowell Road
Hudson, N.H. 03051
(603) 888-2386

Agog, Inc. has created Squash, a file compression and floppy disk backup software utility for Next, Inc. workstations.

Squash can be operated via hot key from the Next Workspace Manager interface. Compression is automatically performed at the time of backup. A decompression program is provided for distribution with compressed files.

Squash costs $99.95 for one license and $899.50 for a 10-user license.

Agog
13780 N. River Highway
Grand Ledge, Mich. 48837
(517) 627-2186

Development tools

XDB Systems, Inc. has begun shipping the XDB-Windows Software Developers Kit (SDK) for SQL implementation under Microsoft Corp.'s Windows 3.0.

The kit consists of the XDB SQL Engine Version 2.4; a redirector that manages packetization for communications between personal computers running Windows and a network server; a C language application programming interface; and a C precompiler for embedded SQL functions.

The SDK is priced at $750.

XDB Systems
14700 Sweitzer Lane
Laurel, Md. 20707
(301) 317-6800

Aion Corp. has announced availability for Checklist Builder, a personal computer-based tool for generating checklists through custom applications.

The product features an on-line Help facility, a text editor, reporting facilities and automatic logic checks for internal consistency in generated lists. It is targeted at applications in expense authorizations, ordering procedures and project administration. It is intended for users with area-specific knowledge but limited programming knowledge, according to the company.

Checklist Builder costs $995, with an introductory price of $695 offered until June 30. Free telephone support for 90 days is included.

Aion
101 University Ave.
Palo Alto, Calif. 94301
(415) 328-9595

Database management systems

Ace Software Corp. has unveiled Acefile ($295), a database for the Microsoft Corp. Windows 3.0 environment.

Users can work on as many as 10 databases simultaneously in Acefile. The program offers what-you-see-is-what-you-get page preview and 15 types of report charts with two- and three-dimensional graphics. It includes extra features such as a mini word processor for mail merges and an autodialer.

Ace Software
Suite 680
1740 Technology Drive
San Jose, Calif. 95110
(408) 437-3456

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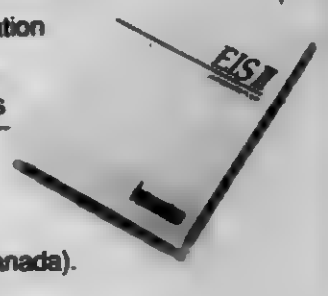
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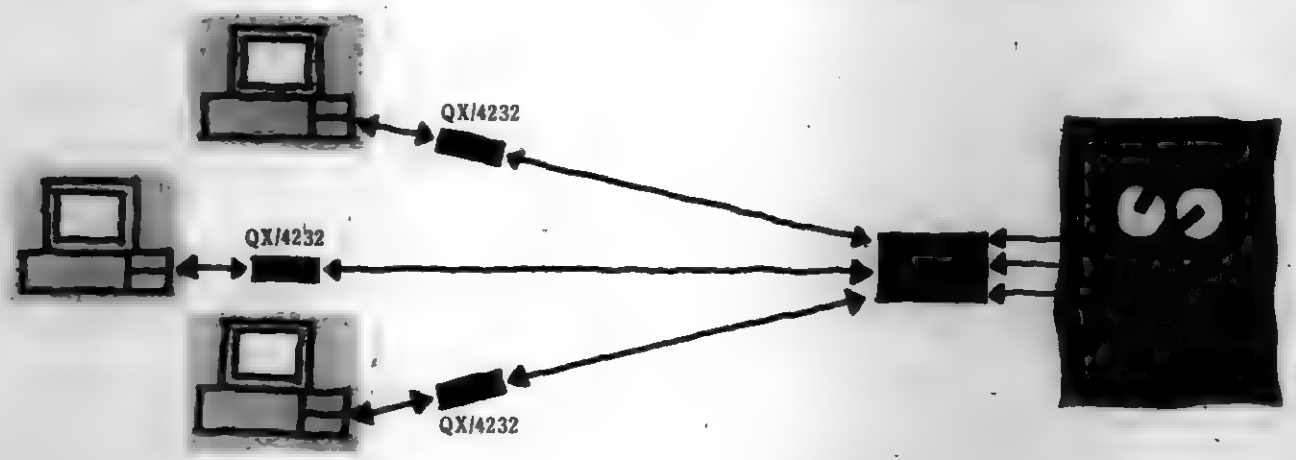
*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."

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Copper matures as FDDI alternative

BY JOANIE M. WEXLER
CW STAFF

The 100M bit/sec.-over-copper technology touted at trade shows and standards meetings during the past year is expected to materialize into products by the end of the summer.

Assuming Digital Equipment Corp. and Network Peripherals, Inc. deliver on commitments made earlier this month to ship 100M bit/sec., shielded twisted-pair network interfaces in August, users could soon save about 30% by using the copper alternative to Fiber Distributed Data Interface (FDDI) for backbone-to-desktop applications.

For example, DEC's copper offering runs about $5,200 to $5,500 per seat compared with its $7,500 to $8,000 per-seat fiber connection cost (requiring the use of a concentrator).

Network Peripherals' copper interface cards cost $1,995 to $2,795 in quantities of five or more; use of the company's concentrator brings the per-port cost to about $5,200.

Mixed feelings

Users expressed mixed opinions about the usefulness of yet another cabling decision option. "My feeling is that we'll be more interested in fiber than copper to the desktop," said Ed Riddle, head of the communications and network systems branch at the National Aeronautics and Space Administration-Langley Research Center in Hampton, Va.

The shielded twisted-pair FDDI products will probably best satisfy investment-protecting users with that medium already installed throughout their premises, such as The Naval Mine Warfare Engineering Activity in Yorktown, Va.

Ray Parcell, a computer operations specialist there, said that because his cabling plant is already wired with thin-wire coaxial cable — also supported by DEC products — and shielded twisted-pair, "my existing cabling should now see me through retirement."

The commercial sector is in less of a rush for 100M bit/sec. to the desktop. "We don't yet have applications that require 100M bit/sec., and even if we did, computer processors today aren't fast enough to keep up with the network," said Sholom Brysk, manager of distributed systems and networks at Bankers Trust Co. in New York.

"PC-oriented environments generally don't run applications requiring 100M bit/sec. to the desktop. When multimedia applications kick in around 1994, that will drive those bandwidth needs," added Marty Palka, a senior analyst at Dataquest, Inc. in San Jose, Calif.

Shipments slated

Smart-hub maker Synoptics Communications, Inc. has said it will ship its 100M bit/sec. shielded twisted-pair products in the fall. Competitor Chipcom Corp. has targeted early 1992 for its initial shipments.

Availability dates came on the heels of a move by DEC, Synoptics, Chipcom, Motorola, Inc. and Advanced Micro Devices, Inc. last month to develop a standard specification for 100Mbit/sec. over shielded twisted pair [CW, May 27]. The effort is meant to ensure interoperability among vendors' products in advance of an actual standard under construction by the American National Standards Institute FDDI committee.

Efforts are also under way at ANSI to put the high data rates over unshielded twisted pair — a significantly larger technical challenge, but a move that would be of more widespread use. Of the twisted-pair wiring currently installed within corporate walls, only about 35% is shielded twisted pair, according to In-stat, Inc., a market research firm in Scottsdale, Ariz.

Shielded twisted pair enthusiasts predict that having an alternative to fiber should drive prices down for the entire 100M bit/sec. market.

Figuring cost

To calculate your per-user costs for a 100M bit/sec. network connection, add up the following component prices:

- Network adapter card for each desktop device.
- Total cost of concentrator, if used, divided by number of ports it supports.
- Cost of installing cabling and the cable itself, if investing in a new cable plant.

Do laws protect wireless nets?

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The 1986 federal law that makes it illegal to intercept electronic messages has short-circuited. It apparently fails to cover wireless data communications, such as the traffic over wireless local-area networks, according to a report prepared for a U.S. Senate subcommittee.

The Electronic Communications Privacy Act of 1986 (ECPA) "failed to anticipate fully the expansion of the number and kinds of private communications that can and will be carried by 'wireless' systems where some or all of the communication is carried by radio link," the report said.

ECPA should be updated to protect most radio-based communications technology from unauthorized interception, the Privacy and Technology Task Force recommended in a report to Sen. Patrick J. Leahy (D-Vt.). Leahy, a principal sponsor of the 5-year-old privacy law, is chairman of the Senate Subcommitee on Technology and the Law.

Keeping up

Leahy formed the task force to assess whether ECPA is keeping up with new technologies. The law updated the 1968 Wiretap Act, which protected only voice transmissions, to include data and video traffic carried over telecommunications lines. But in the case of wireless data communications, "there is a likelihood that such communications will not be [legally] protected unless the user goes to the expense of full data encryption," the report said.

Likewise, the emerging technologies of radio-based private branch exchanges and personal communications networks are not clearly covered by ECPA, the task force said.

At Issue: PRIVACY

ECPA has done a good job of legally protecting the privacy of electronic mail, one of its primary goals, the 16-member panel said. The act covers E-mail carried by value-added network vendors but was not intended to cover E-mail on private networks because they are not publicly available.

In light of the controversy over employers reading workers' E-mail, however, the task force recommended that employers adopt clear policies describing when E-mail can be reviewed by supervisors and establish employee safeguards.

"In general, the terms on which employers can access electronic files will be the subject of policy manuals and employment agreements," so changes in ECPA are not needed at this time, the report said.

Blurred lines

The report acknowledged that the distinction between private and public E-mail systems will become blurred by interconnections between the two, so it may become more and more difficult to determine which systems are covered by ECPA.

"In addition, messages originating on tightly controlled systems may make their way through 'gateways' to E-mail systems with far less rigorous controls on access, without notice to users of the systems," the report said.

The task force also studied caller identification services and how telephone companies handle information about customers' network traffic, but it failed to reach a consensus on the need for federal legislation.

The task force, chaired by consultant John D. Podesta, included representatives from the American Civil Liberties Union, AT&T, Citicorp, Computer Professionals for Social Responsibility, the Electronic Mail Association, consumer advocacy groups and three regional telephone companies.

Users uneasy as 3Com moves to LAN Manager

BY JEAN S. BOZMAN
CW STAFF

SANTA CLARA, Calif. — Even reassurances from the chief executive officers of 3Com Corp. and Microsoft Corp. recently failed to quell user uneasiness about 3Com's migration path away from 3+Open and toward Microsoft LAN Manager.

Microsoft CEO Bill Gates and 3Com CEO Eric Benhamou addressed a meeting of the 3Wizard Council — a gathering of several hundred expert 3Com users and developers. They heard concerns about the eventual demise of 3Com's 3+Open local-area network operating system, which 3Com will maintain for up to five years.

Gary Cunningham, one of the 10 users who sits on the 3Wizard Council, said there is confusion among users about which LAN product to use — with some even considering shifts to Novell, Inc. and Banyan Systems, Inc. LANs.

"We bought our [network operating system] from 3Com and built everything around it," said Cunningham, a network administrator at GTE Corp. in Lexington, Ky. "Now, we're buying our LAN product from [Microsoft], and many of us don't know which way to go."

Even so, several users said it will be technically easier to go to LAN Manager than to any other LAN product. "It's much easier than going to Novell," said one user, who works for a utility firm and declined to be identified. "My only concerns are in the area of technical support. I wanted to hear that Microsoft was going to give us technical support."

Taking steps

Gates, for one, said Microsoft is taking several steps to ensure an easy migration to LAN Manager 2.0, including setting up Microsoft "transition" teams to distribute technical information to 3Com users and to hold user meetings.

Gates said Microsoft is also considering the placement of more LAN Manager 2.0 information on the Compuserve data service, so that 3Com users, among others, could more quickly learn of technical changes.

"We're serious about this business. That you can't question," Gates told a gathering of users after his speech here. "But only one of us [Microsoft or 3Com] could afford to carry the architecture forward. The question of how well we'll do against Novell is up to us, every day."

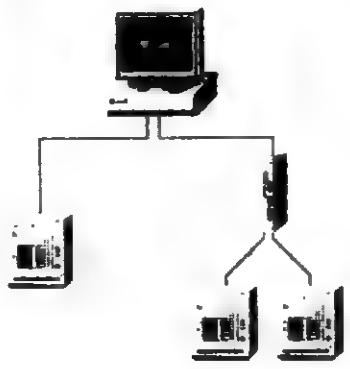
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Everybody's talking OSI at ICA

DEC, AT&T and others relate plans for support of the network protocol

BY JIM NASH
CW STAFF

ANAHEIM, Calif. — Attendees at the International Communications Association conference here recently found a growing number of exhibitors talking about frame-relay services and a renewed commitment to supporting Open Systems Interconnect (OSI) standards.

"The OSI mythology that OSI is going to solve everyone's plumbing problems is as high as it's ever been," said Craig Burton, a principal at Clarke Burton Corp., a consulting firm in Salt Lake City. That does not mean resurgent support for OSI is for show only, Burton said.

Digital Equipment Corp. outlined its OSI and Transmission Control Protocol/Internet Protocol plans for Decnet [CW, June 10]. Meanwhile, AT&T said it would publish its Accumaster Integrator alarm interface and its support documentation for AT&T's Simple Network Management Protocol, increasing the warp in which third-party network devices can send alerts to AT&T's network management platform.

Of the frame-relay announcements, Burton said, frame relay is enjoying a burst of support as vendors and users look for a wide-area networking connection that is more elegant than X.25 and less expensive than switched multimegabit data service.



MCI Communications Corp. said it will offer frame-relay services. Expected to be available in the second quarter of 1992 at 56K bit/sec., T1 and fractional T1 speeds, MCI's offering will first put the service on permanent virtual circuits. Future plans call for switched virtual circuits, offering direct-dial data transmission into the service. Pricing is being determined.

Observers noted that only Williams Telecommunications Corp. has an operating frame-relay service.

Several firms took the opportunity to announce new private branch exchange (PBX) products:

- Toshiba America Information Systems, Inc. announced its first U.S. midrange, digital PBX called Perception 4000. It can handle 960 data and voice connections at once. Toshiba has not released the product's price or expected shipment date.
- Northern Telecom, Inc. announced the July availability of a hang-on-the-wall, digital PBX that handles offices with 30 to 200 telephone lines. The product, called Meridian 1 Option 11, will cost about $41,000 when outfitted with software, 80 voice/data lines and integrated Meridian voice mail.
- A spread-spectrum radio PBX was announced by Spectralink Corp. in Boulder, Colo. The Spectralink 2000 Pocket Communication System combines small, cordless telephones with a cellular PBX system for office telecommunications.

Frame relay talk puts Bellcore in new light

BY JOANIE M. WEXLER
CW STAFF

Bell Communications Research, Inc., the research and development arm of the regional Bell telephone companies, reportedly broke its silence on frame-relay wide-area networking at the recent International Communications Association show in Anaheim, Calif.

Bellcore, which has been touting the Switched Multimegabit Data Service (SMDS) that it has been developing for the local telephone companies, conducted a frame-relay session that one analyst described as a very accurate and frank tutorial that could "make the myth that Bellcore has been anti-frame relay go away."

Steve Taylor, president of Distributed Networking Associates in Greensboro, N.C., added that Bellcore positioned frame relay as a currently available technology that "looks good for the immediate future at speeds up to T1 [1.5M bit/sec.]" and that it acknowledged SMDS "is a ways off."

H. Paris Burstyn, vice president of telecommunications at Business Research Group in Newton, Mass., said that "Bellcore has not been very vocal about frame relay in the past, and there is confusion in the industry" about whether the two technologies will ultimately be competitive or complementary.

Richard T. Aloia, assistant vice president of network access technology at Bellcore, told *Computerworld* that "frame relay fills a slot now. SMDS is the first step toward broadband [above 1.5M bit/sec.] Integrated Services Digital Network."

Frame relay — a point-to-point-oriented form of packet switching that is more efficient than X.25 because it eliminates node-to-node error checking — is dependent only on interfaces and software for existing equipment for implementation.

SMDS, on the other hand, requires a whole new switch architecture, is "connectionless" and aims to support speeds upward of 45M bit/sec., Burstyn said.

Ch



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Access to NSFnet broadened

BY ELISABETH HORWITT
CW STAFF

ELMSFORD, N.Y. — Commercial companies will now be able to take advantage of NSFnet, the National Science Foundation's 45M bit/sec. backbone, which was previously accessible only to not-for-profit research, educational and government organizations.

Advanced Networks & Services, Inc.'s commercial subsidiary, ANS CO+RE Systems, Inc., will provide the commercial services. ANS — a consortium consisting of IBM, MCI Communications Corp. and Merit Network, Inc. — operates NSFnet.

The foundation had previously kept commercial traffic off of its network. NSFnet is a service offered free of charge to nonprofit institutions at taxpayers' expense, said Steve Wolff, the foundation's director of networking.

ANS will offer commercial services on a "logically distinct" portion of NSFnet and will charge commercial users so that the new service will pay for itself, Wolff said. Indeed, profits from the service will go to upgrading the NSFnet infrastructure. For example, the foundation is thinking of funding upgrades to 45M bit/sec. for some regional networks that communicate via its backbone, Wolff added.

NSFnet said it expects to complete by Aug. 1 an upgrade of 16 nodes on its backbone from 1.5M bit/sec. to 45M bit/sec. speeds, Wolff said. However, the links are now scheduled to be upgraded by fall, according to Allan H. Weis, ANS president and chief executive officer.

The academic, research and government organizations that now use NSFnet will benefit by being able to use the same facilities to communicate with enterprises with which they do business, Wolff said. For example, government agencies can discuss design with aerospace contractors, and university users can access commercial information services.

Nonprofit organizations that use the commercial service will be charged 20% to 40% less than commercial users, Weis said. "It will be similar to the discounts most computer companies give to universities."

Service providers are likely to be one of the service's biggest customer segments, Weis added. "There are about 10 million people on NSFnet; that's one wonderful market for an information provider."

Commercial users

In addition, ANS said it expects government contractors, pharmaceuticals firms and computer and chip companies to sign up for the service, Weis said. Indeed, the service will have a special offering geared to computer conferences. This will allow a computer vendor to set up a 45M bit/sec. link between a workstation on the floor and a supercomputer or other equipment back at the home office, he added.

Customers will be able to access the new service via an IBM RISC System/6000-based router or a Cisco Systems, Inc. router attached to a local-area network, Weis said. ANS plans to incorporate Cisco routers into NSFnet under a joint agreement announced last month.

The routers will potentially allow NSFnet to support protocols other than Transmission Control Protocol/Internet Protocol and Open Systems Interconnect, Weis said.

Automotive group thwarts Edifact protocol proposal

BY ELLIS BOOKER
CW STAFF

SOUTHFIELD, Mich. — A call last month by telecommunications experts at some of the country's largest automobile makers urging the industry to migrate from U.S. standards for electronic data interchange (EDI) to an international protocol is on ice, according to officials at the Automotive Industry Action Group (AIAG).

The proposal, made in early May at the international conference of the AIAG, called for the group's guidelines to use Edifact, the EDI protocol codified by the United Nations' committee of the same name, by 1994.

"That recommendation was not accepted by the group," reported Joseph R. Phelan, a Ford Motor Co. executive and the AIAG's executive director. However, an ad hoc committee had been formed to investigate the issue "and look at what the best program would be for [moving to] Edifact," Phelan said.

Phelan conceded that the short-term costs of such a conversion could be the biggest obstacle to the AIAG's 700 corporate members.

He noted that Ford Motor Co. had only recently completed the conversion from a proprietary standard to X.12 and that General Motors Co. was still undergoing this process. The third of the "Big Three" automakers, Chrysler Corp., is an X.12 shop.

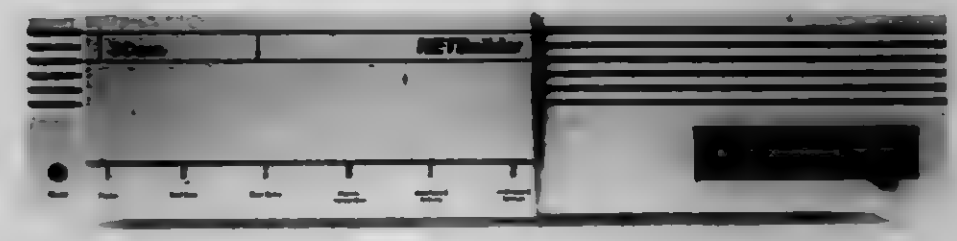
The AIAG director predicted the group will adopt a more conservative migration plan.

Today, if a U.S. firm uses a standards-based protocol rather than a proprietary scheme, it looks to the ANSI X.12 standards.

However, Europe's automotive industry body, Odette, plans to implement Edifact's standards by 1994.

Ch Changes.





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NEW PRODUCTS

Local-area networking hardware

LXE, Inc. has announced support for Transmission Control Protocol/Internet Protocol (TCP/IP) communications on its radio frequency inventory control terminals.

The addition of TCP/IP support allows users to integrate inventory data collected via handheld wireless scanners into Ethernet local-area networks.

The scanners transmit data to LXE's radio frequency terminals, which connect to thick- or thin-wire Ethernet LANs via the LXE 228NC and 280NC network controller units. Up to 64 radio frequency units can be attached to each network controller.

The 228NC and 280NC also support communications with IBM and Unix hosts.

The 228NC, which controls a single radio frequency channel, costs $9,460. The multichannel 280NC can be connected to multiple hosts and is priced at $14,560.

LXE
Suite 144
303 Research Drive
Norcross, Ga. 30092
(404) 447-4224

Local-area networking software

Software Business Technology Corp. (SBT) has announced accounting and business information software for companies downsizing from minicomputers and mainframes to personal computer networks.

The SBT Professional Series is comprised of System Manager, General Ledger, Accounts Payable and Receivable, Sales Orders and Purchase Orders modules priced at $1,295 each.

The series offers a network messaging center and hot-key access to business data, according to SBT.

SBT
1 Harbor Drive
Sausalito, Calif. 94965
(415) 331-9900

Modems

Microcom, Inc. has announced the Microporte line of portable V.42 bis modems.

The Microporte 542 ($449) offers throughput up to 9.6K bit/sec. using 4:1 data compression. It runs on a 9-V battery.

The 1042 model ($649) includes password security and achieves 12K bit/sec. transmission.

Each model weighs seven ounces and includes Microcom's Carbon Copy file transfer software.

Microcom
500 River Ridge Drive
Norwood, Mass. 02062
(617) 551-1000

Digital Access Corp. has announced the Fracdial 14x1 and 24x1 user-selectable bandwidth modems.

The Fracdial 14x1 supports dial-up bandwidths up to 768K bit/sec. in 56K or 64K increments, depending on user selection. The 24x1 model offers full T1 or 1.344M bit/sec. capacity.

The 14x1 is priced at $6,995. The 24x1 costs $11,500.

Digital Access
Suite 200
11501 Sunset Hills Road
Reston, Va. 22090
(703) 481-6900

Network management

Hughes Network Systems, Inc. has released the Graphic Network Operator Console (GNOC), a graphical management and control user interface for the company's Integrated Packet Network (IPN).

GNOC provides a graphics representation of the network with control facilities featuring configuration, event management and troubleshooting. Detailed online Help is provided.

The product is connected to IPN via a standard X.25 public network interface.

The GNOC with a 17-in. monitor costs $13,000. A version with a 21-in. monitor costs $16,500.

Hughes Network Systems
11717 Exploration Lane
Germantown, Md. 20876
(301) 428-5500

Host-to-host

Forest Computer, Inc. has created a service for program-to-program communications between IBM midrange computers and Digital Equipment Corp. VAX systems.

The service is part of the Connection System, Forest Computer's IBM/DEC connectivity product. It allows real-time data exchange and communicates with each system's standard program-to-program interface via Token Ring or Ethernet networks.

The Connection System also supports bidirectional terminal access, remote job submission and print queue redirection. Entry-level pricing, including program-to-program service, begins at $39,000.

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MANAGEMENT SHORTS

IS executive wins award

A senior executive at **Metropolitan Life Insurance Co.** in charge of information systems and other functions has received the Distinguished Alumni Award from her alma mater, Pennsylvania State University. Executive Vice President **Catherine A. Rein** joined Metropolitan in 1985.

Cause, the association for the management of IS in higher education, has appointed **Indiana University President Thomas Ehrlich** to its board of directors. His appointment is the first in a planned expansion of the Cause board.

Straight **two-week vacations** for U.S. workers are going the way of the Univac computer — obsolete. That is according to 632 respondents recently polled by the Houston-based **American Productivity & Quality Center**. A whopping 85.7% said they take vacations shorter than one week. Among reasons cited for eschewing longer getaways were "hard to get away," "too many problems to face when you get back" and "too much piled up when you return."

Companies worldwide spent $2 billion on IS education and training in 1990, according to **Ledgeway/Dataquest** in Lexington, Mass. The research firm predicted that the training market will more than double by 1995 with an annual growth rate of 15.7%. The U.S. market of $1.4 billion in 1990 will grow by 14.7%, the firm said.

DSS-92, the conference on decision support systems, has issued a call for papers for its 12th International DSS Conference to be held in May or June 1992 in Chicago. The conference theme is the impact of information technology support on individuals, groups and organizations. Proposals should be sent to Joyce Elam, program co-chairwoman, Department of Decision Science, Florida International University, University Park, Miami, Fla. 33199, (305) 348-2719.

Leaping to top of the IS world

The success of Bergen Brunswig is often attributed to the work of Anthony Vallario

BY JIM NASH
CW STAFF

When a teenage Anthony Vallario first saw his future wife Marie, he was blowing ugly notes out of a horn while standing at the rear of a Bronx drum and bugle corps. She was a white-booted majorette strutting out front.

Vallario had joined the corps during World War II to hone his organizational and leadership skills. Upon seeing Marie, however, he decided to alter his goals to include meeting and eventually wooing her.

Almost 50 years later, one can see how Vallario has repeated this pattern, leapfrogging goals like a checkers player on his way to being kinged. The veteran information systems executive has amassed a passel of successes along the way — and a few stinging lessons as well.

Vallario, 62, is at a point in his life when such retrospectives are natural. At the end of this month, he will retire from Bergen Brunswig Corp., his employer since 1949. He will leave the Orange, Calif.-based distribution firm as senior vice president. Denny Steele, who joined Bergen Brunswig in November 1989, will succeed Vallario; Steele took over as vice president of information services last January.

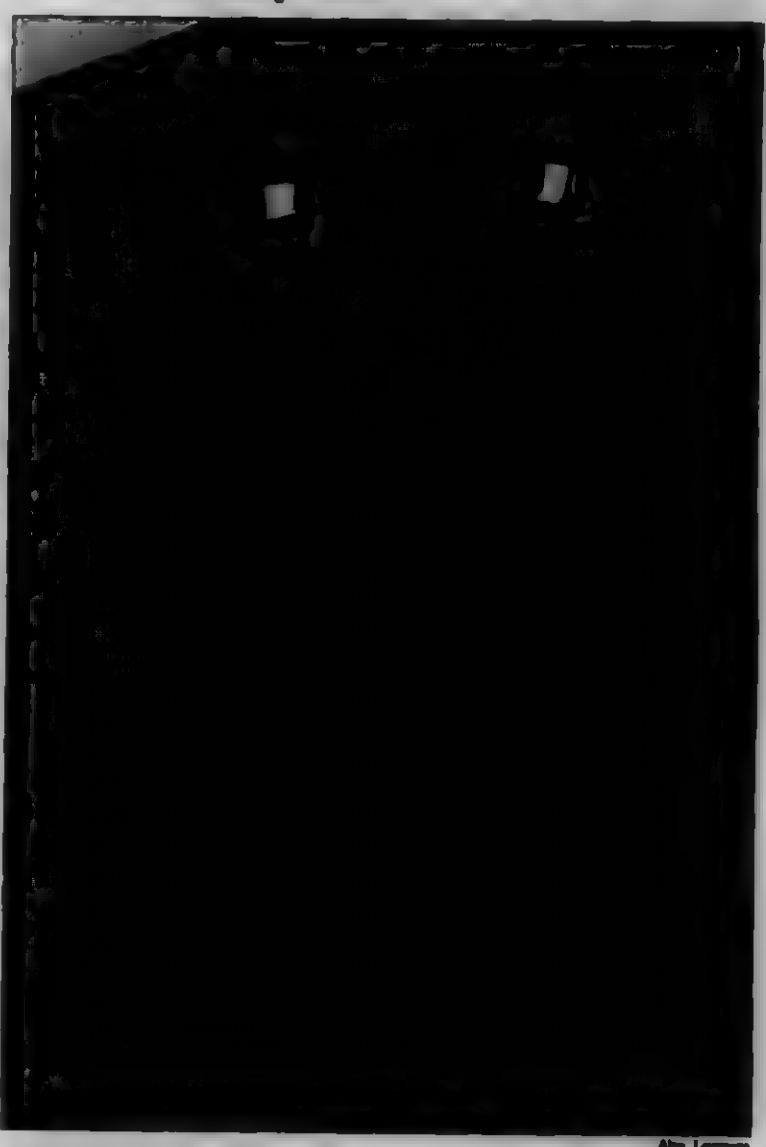
Bergen Brunswig is the No. 2 firm in the nation's $30 billion-per-year

Continued on page 55

INSIDE

▶Another veteran IS executive retiring this month, Merrill Lynch & Co.'s DuWayne Peterson, leaves behind a legacy of both personal and corporate success. Page 54.

PROFILE: Anthony Vallario



Alex Levinson

Position: *Senior vice president of Bergen Brunswig Corp. (retiring)*

Mission: *Handling the information systems needs of the $4.4 billion wholesale drug company and forging links to pharmacy retailers*

Survey: MIS likely to draw fewer MBA grads

BY ELLIS BOOKER
CW STAFF

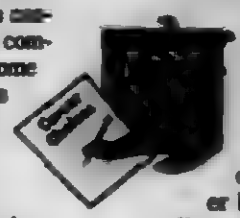
Information technology is where the jobs are, according to students considering an MBA. However, relatively few said they plan to concentrate in the MIS area, according to a recent survey.

The nationwide survey of prospective MBAs found that those students choose to study traditional business disciplines rather than areas they believe will lead to the best job opportunities for today and in the future.

The survey, sponsored by The Lake Forest Graduate School of Management in Lake Forest, Ill., involved 646 men and women aged 24 and older who had been in the work force for several years and had recently completed the Graduate Management Admission Test entrance exam.

Computer science in the lead

Topping the list of business concentrations surveyed was computer science, cited by some 55% of the respondents as the most marketable field in business today. MIS was second (of 10 business categories) at 45%.



However, while 15% of the survey participants planned to focus on MIS, less than 5% selected computer science as a focus.

Although MIS ranked second in current market opportunities, it dropped to seventh for future opportunities, beating out only finance, accounting and marketing. It was sixth in "enjoyment," ahead of energy, waste management, health and accounting.

The survey seemed to reveal a pleasure principle of sorts: Some 33% of the students planned to study subjects they felt they would enjoy, compared with only 14% who said they are choosing concentrations they consider highly marketable and that offer good pay.

Marketing was rated the "most enjoyable" career pursuit but with the least chance for career success. Only 25% said marketing offers opportunity in today's market, and only 15% said it will be a fertile field for the future.

COMMENTARY

Glenn Rifkin

Peterson won't be forgotten



This month, IS's "Million-Dollar Man" will head off west into the sunset. DuWayne Peterson, Merrill Lynch's legendary chief information officer, is retiring, and in a profession with precious few heroes, it would be shameful to let him go without a tribute.

There's no doubt that Merrill Lynch will throw a lulu of a party. Peterson himself said his greatest regret is leaving behind the wild shindigs that Merrill Lynch throws at the drop of a hat.

But how about the rest of the information systems field? How does it say good-bye to a truly memorable CIO, whose name, along with that of American Airlines' Max Hopper, became synonymous with IS success and who unabashedly touted his seven-figure annual salary just to show that anything was possible for someone in the computer world?

Let's not get all misty-eyed here. Peterson isn't dead, after all, and he isn't off on a long cruise in the South Seas.

He is a vigorous, athletic 59-year-old, and he clearly does not need the paychecks. He said he completed the five-year mission he signed up for at Merrill Lynch in 1986, and he missed Southern California too much to stay in New York. He has signed a three-year deal to consult with Merrill Lynch, and he plans to remain an audible voice in the industry.

Still, it won't be the same. IS is at a critical crossroads today. Morale in the industry is generally low, and the ailing economy has refocused sharp attention on technology spending and return on investment. IS scapegoating is an art form, and high CIO turnover continues. It had long been a comfort for anyone in IS to say, "Hey, things can't be that bad if DuWayne Peterson is making a million bucks a year as an IS guy."

It is one of the injustices of corporate America that salary is equated with success, but Peterson gave IS professionals something to shoot for, a reason to believe in themselves and their profession.

Peterson talks candidly when he speaks about IS. "The IS function is under a lot of review and stress," he said. "And a lot of guys are not making the cut."

He blames chief executive officers for not getting more involved with technology. "There are still people not being accepted in the executive suite because they're the 'computer person.' The CEO has to spend more time on this because he can't keep firing CIOs like they were managers of the Yankees," Peterson said.

Rumors abounded that Peterson was another firing casualty when he announced his retirement plans in January. But at a recent IS symposium at the University of California at Los Angeles, Peterson insisted nothing could have been further from the truth, and from this vantage point, there is little reason to doubt him. Merrill Lynch is having excellent financial results smack in the middle of the recession, and the company's IS function has been made lean and effective after a difficult turnaround.

"We took $300 million out of the IS budget, cut the number of personnel from 15,000 to 10,000, and earnings, along with the stock, have gone up," Peterson said. "Did IS make that happen? They blamed me for problems in the past, so I'll take some credit for the success now."

What Peterson did best was recognize how to best implement his IS vision. At Merrill Lynch, as at Security Pacific and Ford before that, he learned early on how to establish rapport with the people who mattered most.

When he left UCLA's graduate school of management with an MBA in 1961, he took a data processing job at Ford. "My first job was to forecast sales of a funny-looking little car called the Mustang for a guy with a brush cut named Lee Iacocca.

"I sat down and concocted a bunch of numbers and came up with a forecast of 85,000 cars sold in the first year. Iacocca looked at me and said, 'Peterson, if I don't sell more than 85,000 of these @#$$!!@# cars, I'll eat my hat.'

"So I went back and redid my forecast. This time, I came up with 200,000 cars. That first year, they sold 475,000 cars, and one day, when I passed Iacocca in the hall, he turned to me and said, 'The next time I need a forecast, I'm not coming to you.' "

He admitted that his job was made easier at Merrill Lynch because he was hired by a group of people "who wanted me to succeed." He suggested that CIOs considering new positions take a close look at the management team.

"Check out the lineup," he said. "See who's in place and how long they've been there. It will give you a good idea of the stability of the situation by knowing how long they plan to be there. If the CEO is getting ready to retire, forget it, because the power structure goes into chaos whenever the chairman steps down."

This time, Peterson is stepping out before any new chaos can engulf him. Undoubtedly, new heroes will emerge in the IS field, but it will be a long time before anyone worth his code will forget IS's "Million-Dollar Man."

Rifkin is a free-lance writer and a former *Computerworld* features editor.

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Vallario

CONTINUED FROM PAGE 53

wholesale drug business, and it is hard to find a trade journal story or *Wall Street Journal* analysis that does not attribute the $4.4 billion company's success in large part to Vallario's IS department.

His long and sometimes stormy tenure as IS leader began not long after Vallario realized he could not live out his days as "just another worker at a drafting table." Until then, he had focused on becoming an aeronautical engineer.

Vallario had attended an aviation trade school, joined the U.S. Marine Air Corps and graduated from the Academy of Aeronautics in New York. While working a day job at Cody Cosmetic Co. in New York after the war, however, he found himself fascinated by the office machines and organizational principles. "I was in awe of it," Vallario says. "What did all these people do? My focus was drafting, but all this held an intrigue for me."

Cody had just started a primitive data processing department — or tabulating department, as it was known in the punch-card era — and he transferred to it, Vallario recalls. Although the department was little understood and lacked leadership, it gave him a taste for computing.

"Tabulating was new," he says. "It had a lot of tie-ins to other industries." Just as important, it offered him the chance to become a leader. He saw what went wrong at Cody and thought about how he would use the technology and run a department of his own differently.

That was the groundwork for a career choice that would last more than 40 years. Vallario still remembers the exact wording of Bergen Drug Co.'s want ad seeking a tabulation supervisor in Hackensack, N.J.: "Looking for an assistant supervisor for a young, aggressive company for the development of our tabulating department."

Although he interviewed with Bergen President Emil Martini Sr., it was with Emil Martini Jr. that Vallario built a four-decade partnership that has become as legendary in IS circles as Hope and Crosby in movie musicals.

Vallario "certainly is a leader," says Martini Jr., who started as a Bergen Brunswig buyer in 1953 and today is chairman of the board.

The mutual admiration has not gone unnoticed. Vallario and Martini shared a Partners in Leadership award last year from the Society for Information Management and were cited for their relationship as much as their "coupling of information technology with business strategy to achieve corporate objectives."

Not that there have not been creative tensions. "Tony gets noisy and excited," says Joseph Izzo, a veteran IS consultant who has worked on an occasional basis with Bergen Brunswig for a decade. "He's got a volatile personality."

Izzo, now vice president of information technology at Chicago-based A. T. Kearney, Inc., says Vallario can be "difficult to work with ... very argumentative and opinionated." His saving grace is that he is unendingly loyal to Martini and capable of compromising for the good of Bergen Brunswig, Izzo says. "If they had to be a little tolerant of Tony, he was very unselfish in return," he says.

In 1973, Vallario's team developed the Pharmacy Automatic Systems Entry, a handheld order-entry terminal for pharmaceuticals retailers. With the machine, each retailer could couple the terminal with a phone at the end of each day, type in a command, and order new drug supplies. A backup system would be needed in case a pharmacist's terminal went down, Martini said.

Placing a second device at each store was too expensive. However, Vallario suggested a system that would allow retailers to order using their Touch-Tone telephones alone, Martini recalls.

"I said I wanted that system up in 90 days, and it was up in 90 days," Martini says. Martini and Vallario have reduced paper-based orders to less than 10%. Bergen Brunswig is now building a series of distribution plants that take, stock, process and load customer orders without [illegible].

Coping with rough times

Vallario may be outspoken, but he has been able to delegate responsibility when necessary. The company went through at least one rough period in the 1960s, trying to carry out current innovations while watching the horizons for the next move.

"Those were the noisiest, stormiest meetings," says a source who participated in Bergen's operating team and asked not to be identified. Nothing was getting done amid the rancorous debates. "Tony knew he was part of the problem," the source says. "And even though he thoroughly disliked the notion of calling on consultants, he suggested one be hired to point [the team] in the right direction."

The success born in this contentious process cannot be dismissed, not even by competitors. Jon d'Alessio, staff vice president and chief information officer for drug distribution market leader McKesson Corp. in San Francisco, says that Bergen Brunswig "is a real tough competitor. They've been nipping at our heels the whole time; if we had a couple more competitors like them, we'd be in trouble."

In his retirement, Vallario plans to write a book aimed at newcomers to IS. Despite the current hubbub about the CIO position as a potential chief executive officer breeding ground, Vallario says he is not disappointed that he never rose to the leadership of Bergen.

"I achieved the heights of what I wanted to attain," he says.



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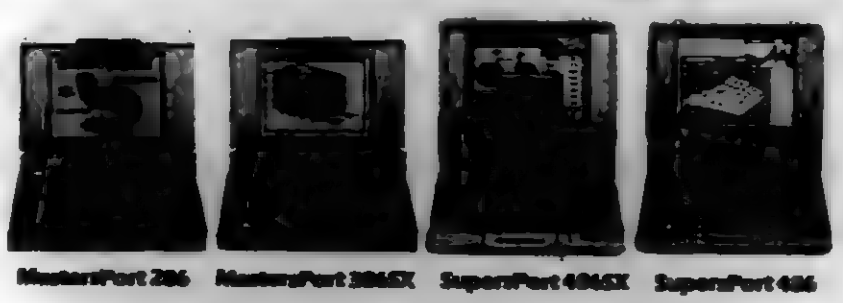
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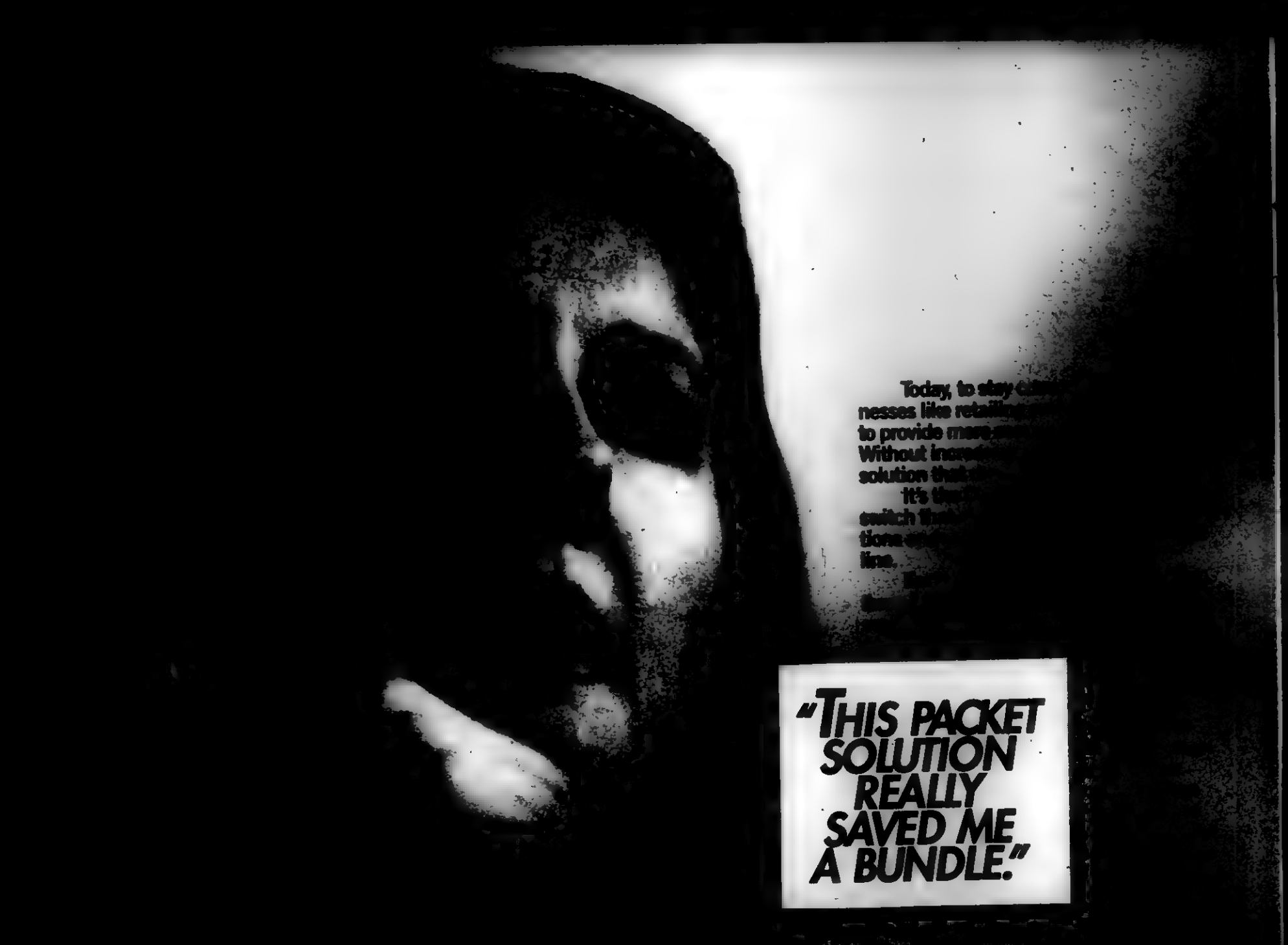
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Processor – Speed	286 – 12/16MHz	386SX – 20/40MHz	386SL – 20/5-40MHz	486SX – 20-40MHz	486 – 25-33/50MHz
Co-Processor	80C287 socket	80387SX socket	80387SX socket	Upgradable to 486-20MHz	Integrated
Memory (Std./Max.)	2MB/20MB	2MB/40MB	2MB/8MB (64K cache)	4MB/16MB	4MB/16MB
Hard Disk Drive	30MB	60MB	60MB	120MB	120MB
LCD/Size	Backlit/8.85"	Backlit/8.85"	Backlit/8.85"	Edgelit/10.7"	Edgelit/10.7"
Video/Gray Scales	VGA/16	VGA/16	VGA/32	VGA/64	VGA/64
Power Management	• Suspend/Resume • Sleep mode • Low battery operation	• Suspend/Resume • Sleep mode • Low battery operation	Premier System Management™ • Standby Resume • Rest/Resume • Panic Save • Unattended communications	Intelligent Power Management™	Intelligent Power Management
Software	MS-DOS® included	MS-DOS included	MS-DOS pre-installed, Microsoft® Windows™ v 3.0 included	MS-DOS and Microsoft Windows v 3.0 pre-installed	MS-DOS and Microsoft Windows v 3.0 pre-installed
Weight (with battery)	6.6 lbs.	6.6 lbs.	6.8 lbs.	15 lbs.	15 lbs.

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Here come the hybrids

The latest shape for IS organizations is a mix of centralization and decentralization



Stan Wakeshi

FMC's Gannaway *freed divisions from worrying about routine IS tasks by 'recentralizing' certain operations*

BY ALICE LAPLANTE

Twenty years ago, 3M Co. in St. Paul, Minn., was like most other information systems shops: a centralized glass house. "Everything was done there," recalls Carl Kuhrmeyer, chief information officer and vice president of administration at 3M.

As the firm diversified and operations grew more and more decentralized, however, IS followed suit. Today, 3M boasts a complex matrix of business and technology functions spread out among its more than 50 operating divisions.

Although each division handles its own information processing, 3M never decentralized its main data centers. "I think we were looking far enough ahead to understand that would be utter chaos," Kuhrmeyer says. "We . . . never decentralized further than was absolutely necessary."

As it turns out, 3M was right on the money.

After years of frenzied decentralizing — spinning off data centers, applications development teams and end-user support staffs for various business units — many IS shops are reconsidering the shape of their organizations.

Although most companies have no desire to recreate the traditional IS fortress, an increasing number are now looking to a combination of decentralized and centralized IS to get the biggest technology payoffs.

"Firms now realize it is absolutely critical to strike the right balance between those activities that can best be done centrally, such as architectural or infrastructure functions, and those that should be integrated into the business units," says Dudley P. Cooke, a veteran IS manager and president of The Executive Insight Group, a consultancy in Bryn Mawr, Pa.

Indeed, a poll of 1990 *Computerworld Premier 100* winners — firms chosen as the most effective users of information technology — found that 60% have adopted a hybrid IS structure that combines centralized and decentralized elements (see chart page 60).

Big names such as Sears, Roebuck and Co., AMR Corp., Caterpillar, Inc., Baxter International, Inc. and Xerox Corp. are among the growing number of U.S. corporations that have chosen the hybrid approach. Many IS consultants say they believe that the percentage of firms employing such flexible new structures will increase in coming years.

Cooke, a former CIO at Sun Co. who engineered an IS restructuring, says he sees dozens of companies that have taken decentralization too far and are now "recentralizing."

While fewer companies are restructuring their IS operations compared with one year ago, still nearly one in four companies polled are doing so, according to a recent survey by Index Group, Inc., a Cambridge, Mass., consultancy.

Among the recentralizers is FMC Corp., a Chicago-based contractor and manufacturer now moving to cut costs by consolidating several divisional computer operations.

"We want the divisions to retain as much local control as possible without having to worry about computer operations and other things that are irrelevant to their business," explains Randall Gannaway, director of the corporate data center at FMC (see story page 59).

Paine Webber, Inc. in New York has devised an innovative structure that mixes technology-savvy business people and business-smart technologists. The process fosters "healthy contention," says Robert Benmosche, executive vice president and director of systems operations and administrative services (see story page 58).

Even 3M is still evolving. The diversified manufacturer is instigating a centralized "IS strategic review" process that will attempt to better coordinate and manage technology in its highly autonomous divisions (see story page 59).

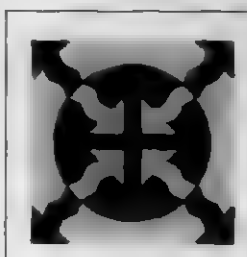
Urge to reverge

The criticisms against highly centralized IS groups are widely known: sluggish response to rapid business changes and indifference to end-user needs.

"The demand for decentralization was a very healthy sign," says N. Dean Meyer, president of NDMA, Inc., an IS management consulting firm in

Continued on page 58

LaPlante is a free-lance writer based in Palo Alto, Calif.



Centralization
Decentralization

Key points

▶After years of decentralizing, many information systems shops are re-examining and recentralizing operations.

▶Hybrid mixes of decentralized and centralized IS groups are gaining popularity. Some 60% of 1990 *Computerworld Premier 100* winners use this structure.

▶Small and medium-size companies face many of the same tricky organizational questions that larger organizations face (see story page 60).

▶More senior IS executives (35%) now report to top business officers, such as the chief executive officer, president and chief operating officer, than to the chief financial officer (33%), according to an Index Group, Inc. study (see story page 59).

▶Case studies of Bankers Trust Co., Paine Webber, Inc., FMC Corp., Union Texas Petroleum Corp. and 3M Co. begin on page 58.

▶QUOTABLE:

"Users don't want to manage techies or run computer service bureaus."

N. DEAN MEYER
NDMA, INC.

Continued from page 57

Ridgefield, Conn. Meyer says the push to decentralize meant users were beginning to appreciate the value IS could bring to their day-to-day work lives.

Yet there is an emerging realization that decentralization is not a panacea for IS management woes. Big cost overruns from multiple data centers in business units, skyrocketing software site license fees and duplicated services helped burst the bubble. So did the many difficulties in managing decentralized personnel, including unequal pay scales, isolated workers and lack of career paths.

Add to those problems poor communication between business units, parochial thinking and end users who often got bogged down in routine IS operation issues, and it's easy to see why many companies began looking for a better way. The last point is ironic. In the name of efficiency, business units demanded control of IS functions. Yet many became less efficient at carrying out responsibilities. "Users don't really want to manage groups of techies or run computer service bureaus," Meyer says. "Yet that's what many of them ended up doing."

New centralization

As a result, centralization is now popular again. The new centralization takes several forms: consolidating data centers, setting up centralized strategic planning and architectural committees and setting up complex "dotted-line" matrices for overseeing hiring, training, promotion and purchasing for operations scattered around the nation or even the globe.

No one is getting too carried away, though. Part of the hybrid movement is to keep many functions decentralized.

Applications development teams, for example, are now frequently placed in the business units they serve. In such instances, project priorities and budgets are set by the business community. True, big-systems decisions are still being made by central IS, but the explosion of personal computers, local-area networks and departmental computers is increasingly being managed by business departments.

Needless to say, such changes require careful overseeing at several different managerial levels. "To make this work, IS must have discipline," says Norman Weiser, a senior consultant at Arthur D. Little, Inc., a Cambridge, Mass., consulting firm.

Weiser says many hybrid companies are creating executive committees and management teams made up of business and IS managers. The idea is to ensure that a critical cross-pollination of ideas and efforts takes place throughout the organization. Such idea sharing is increasingly happening at lower levels in the organization, Weiser adds — a good sign.

Consultants and IS managers are also quick to point out that there is no recipe for the perfect hybrid: Each business must find its own balance based on its overall corporate organization, industry competitiveness and market challenges.

Moreover, flexibility remains a key word: What works today won't necessarily work tomorrow or next week.

"It's going to continue being an evolutionary process," says Bill Strapko, a senior consultant at International Data Corp. in Framingham, Mass. "Of course, IS will continue facing the age-old problem of giving users what they want, not necessarily what they ask for. Some things will never change." •

Winning shapes

Many companies that started down the road toward decentralization in the 1970s and 1980s are now pausing to think.

Some have changed direction, others have kept moving ahead, and still others have taken two different paths.

Computerworld recently asked five 1990 *Premier 100* firms a simple question: "How is your IS department organized and why?" Their illuminating answers follow.

— ALICE LAPLANTE

Bankers Trust trusts users to control bottom line

Tired of complaints that slow response was hurting the bottom line, the information systems staff at Bankers Trust Co. made business managers put their money where their mouths were. Literally.

Six years ago, the New York-based financial institution decentralized its IS operations and gave individual business lines complete control over its systems operations and decisions. The bellyaching quickly ceased.

"We no longer hear from business managers that they can't meet their goals because centralized IS didn't deliver," says company Vice President Arish Mathai.

Other benefits became apparent. Besides a drop in complaints, the applications backlog was eliminated. The business groups were also able to more quickly embrace emerging technologies appropriate to their specific needs.

Today, Bankers Trust retains a small centralized IS staff that employs 120 of the bank's 1,400 IS employees. Mathai has no doubts that the choice was correct.

"Bankers Trust has such a broad range of widely divergent services that we knew the only effective way of doing this was to put the technology as close to the business line as possible," Mathai says.

Each of Bankers Trust's three business groups is further subdivided into more than a dozen business lines, each of which runs its own IS operations.

IS staffers in each business unit work for the unit and report to the head of that particular organization. "We wanted our applications developers to live and breathe the very specific business issues of each particular line," Mathai explains.

A small Technology Strategic Planning Group sets broad policy standards and runs the telecommunications facilities. Through it all, there is "constant communication" between the centralized architects and their counterparts in the business units. However, it's clear the businesses are in the driver's seat.



Joyce Rossi

Mathai: *'We wanted our applications developers to live and breathe the very specific business issues'*

A key goal of the approach is to shorten development cycles. "We found from experience that the longer the deliverable time frame, the higher the probability that an application won't meet user requirements at the time it is delivered," Mathai says.

The careers of IS workers in Bankers Trust's decentralized structure don't suffer because each IS department is large enough to offer opportunities, he adds. "If you only had five or 10 IS employees in each unit, that might be a problem, but there are hundreds."

Resources widely stretched

Mathai also disagrees with criticism that a decentralized organization "dilutes" the technical specialization of IS staff members. On the contrary, the centralized IS groups are more likely to employ "jacks-of-all-trades," he says.

"A great deal of our ability to implement effective solutions is that we have excellent technical specialists in each business department," he says. "It's very unlikely that a centralized group would have that kind of expertise."

It's also unlikely that a centralized group would be able to get its priorities totally in sync with the business line it supports, he adds.

Getting it all together can be a problem, Mathai acknowledges, but he also notes that Bankers Trust has no need for a central corporate database or repository.

Mathai says he expects Bankers Trust will continue to refine its organizational structure as domestic and international strategies change. "I expect we will nearly always be in a state of flux," he says. •

Paine Webber's silent credo: Conflict is good — to a degree

At Paine Webber, Inc., the unofficial IS credo might be summed up as: "Conflict is good." Robert Benmosche says he believes a certain amount of conflict helps an information systems organization thrive.

"You want healthy contention," says Benmosche, executive vice president and director of systems operations and administrative services. "You want to make sure that both sides are pulling in slightly different directions.

"It's a balancing act, and there is no necessarily right solution other than [that] you have to keep focused on the future," he continues.

To help keep creative tensions optimally high, Paine Webber has developed what Benmosche calls a team-oriented, "push-me/pull-you" organizational structure in the IS department.

Each line of Paine Webber business — finance, human resources, capital markets and investment banking — has individuals who look after the technology needs of that particular division, Benmosche says.

However, the actual applications development takes place in central IS and is handled by technologists who specialize in a particular line of business. The two groups of specialists are cast together and told to devise the best solutions for each business unit, Benmosche explains.

Through it all, there is strong central control. "I feel very strongly that we need to eliminate data redundancies and that we require a great deal of centralized synergies," he says. "At the same time, you need to be responsive to the business units. This is what works for us."

Benmosche says he sees the question of IS structure as less of an organizational issue and more of a knowledge issue. It's no surprise that he is an avid believer in cross-training in both technology and business for all IS employees. He says he considers it imperative that mainframe programmers learn about the personal computer world and vice versa.

"If you create an organization that is flexible enough, then people can solve any problem," he says.

Part of this philosophy includes putting the entire IS staff through an intense series of courses on the brokerage business.

Participants are taken to the stock exchange floor and taught to perform trades, and then they are shuttled to branch offices to see how brokers interact with clients.

There's more to come. "We're just starting what is going to be a very thorough educational process for everyone concerned," Benmosche says. •

Centralized Union Texas successfully flexes

Union Texas Petroleum Corp. doesn't believe that centralization means being unresponsive.

Indeed, MIS director Richard White says the Houston-based oil company has gone to great lengths to counter the real dangers of a centralized information systems department.

"We have a highly involved user community," he says, "and I believe we've been successful at staying very close to our business." The IS structure at the company reflects the larger corporate structure: simple, straightforward and highly centralized.

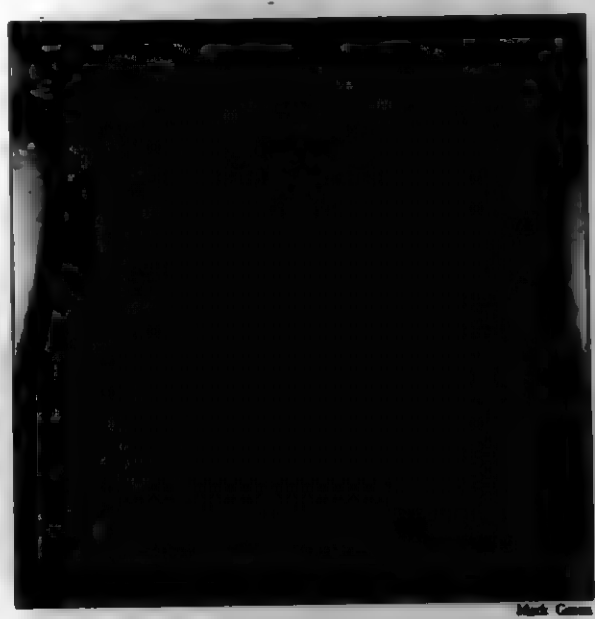
Union Texas has approximately 1,800 employees, 900 of which are located at headquarters. The rest are scattered throughout oil exploration and manufacturing sites around the world. Because most key executives are based in Houston, strategic business planning decisions are made there, White says.

Unlike many corporations, White explains, Union Texas never diversified from its original business as an oil and gas exploration and production company. Thus, a tightly focused structure makes sense, he says.

White says it didn't make financial sense to locate data centers or permanent IS departments in remote sites — even when the rest of the IS community was rushing to decentralize such operations. "It simply wouldn't be economical," he says.

Instead, IS workers are sent when necessary on short assignments to different locations to install new technologies developed at headquarters or to troubleshoot operational problems.

Other remote assignments — particularly those involving international travel — can last up to nine months. But White always rotates workers into such positions, encouraging everyone on his staff to take turns at such jobs. "We do a lot of cross-training because we like to have as fully rounded and knowledgeable a staff as we can," he says.



Mark Green

White bucks *the trend toward decentralization by bringing users into IS instead of bringing IS to users*

Still, White bucks the trend of decentralizing applications by keeping developers at IS headquarters.

Acknowledging the need to stay as close as possible to the business, developers are organized into dedicated teams serving the firm's domestic, international and hydrocarbon businesses.

White says there is another good reason for centralization. "We have a centralized database that holds geological and geophysical data, which is something that a lot of our technical folks need access to," he explains. Moreover, applications often require coordination between the various business lines.

Involving users

Even so, Union Texas is continuing to take steps aimed at further involving the user community. A non-IS project leader is assigned to each development project, for example.

The approach is consistent with White's philosophy of bringing users into IS instead of bringing IS to users.

Union Texas has also established a user committee to improve communication between business and IS groups. Called the MIS Operation Committee, the group is headed by the company chairman. It oversees all IS projects and sets IS priorities and development schedules.

Besides White, the group includes the vice presidents of the three business units, who take active roles in defining the part technology plays in their organizations.

Each business unit also has its own "super users" — people assigned to keep track of emerging technologies that relate to particular businesses. •

3M Co. means matrix, matrix and more matrix

With a product line that includes Post-it notes, Scotch Tape, paint stripper, medical diagnostic equipment, floppy disks and hundreds of other items, 3M Co. officials say the only structure that makes sense is a classic matrix.

"We have so many different customer groups and classes and our product lines are so diverse that we need to be organized this way," says Chief Information Officer Carl Kuhrmeyer.

Practically speaking, that means Kuhrmeyer routinely meets with the business head of each operating unit, as well as the [illegible] to solve any IS problems. What gets worked on is left up to divisional business management, however.

Each divisional IS manager has an ample degree of autonomy and reports to the head of the business unit, he explains.

Built into the matrix approach is frequent interaction with other departments. A dedicated human resources person, for example, looks after IS human resources issues, making sure pay scales and promotion policies are consistent in IS organizations throughout 3M.

Such cross-pollinating also works whenever Kuhrmeyer or other senior 3M managers see an application at one plant that could be used at another.

Even so, 3M still struggles with a problem often faced by decentralized companies: how best to leverage independent technology efforts taking place in separate operating businesses.

Last month, the company instituted a way to improve coordination among the massive IS operations at 3M sites around the world.

The plan revolves around a strategic review process for all IS functions in the corporation. IS directors from each division were brought in and asked to review their strategic plans for the coming year.

Equally important, IS directors had a chance to look for opportunities to work together, Kuhrmeyer says. •

Power to the people at FMC

Management philosophy puts power in divisions' hands

FMC Corp., a $3.4 billion diversified manufacturer, has a complex corporate structure and an information systems organization to match.

The company's chief information officer is located at corporate headquarters in Chicago and is directly responsible for corporate technology planning and coordination.

The data center and telecommunications functions are located in Dallas, where network architecture standards are also set.

Yet FMC has more than 30 divisions in a range of businesses, including chemical, defense and gold mining, with a total of hundreds of offices worldwide. Each division has its own local applications development organization, operations staff and IS manager.

Divisional IS managers report to a group IS manager, who in turn reports to the CIO.

"FMC's management philosophy in general is to put power in the hands of the divisions," explains Randall Gannaway, director of the corporate data center.

The IS staff in each division is employed by that division; there is a dotted-line relationship between each divisional IS manager and the CIO in Chicago.

Although the CIO has an influence on general directions, Gannaway says, each division is fairly autonomous. This freedom, he adds, is tempered by economic considerations and concern about overall architectural issues.

Mainframe still centralized

Largely because of the expense, FMC never decentralized its mainframe operations. More recently, after years of having each business division install and maintain its own computer operations, the company decided to combine larger minicomputer and midrange systems in its corporate data center in Dallas.

"This is primarily driven by economies of scale and cost-reduction goals," Gannaway explains. "But there are also a number of other benefits."

Foremost is that divisions will be able to refocus on applications development instead of routine IS operations, according to Gannaway.

Then there are the cost savings. "With the advent of distributed processing, we realized there was a virtual hole in the dam," Gannaway says. "A lot of processing was going on in the divisions that could more effectively be done here."

The company decided to consolidate Hewlett-Packard Co. and Digital Equipment Corp. systems while leaving personal computers and local-area networks under divisional control.

FMC officials are hoping the move will not only yield economies of scale but also permit the company to "follow a newer technology curve," reduce unit and service costs and boost overall efficiencies, Gannaway explains.

"We're trying to eliminate the amount of time [users] have to worry about routine operations so they can focus their energy on what really matters," he says. •

Who's the boss?

While philosophical debates rage over the best shape for an IS organization, one fact remains unquestioned: Computer professionals must still report to a higher authority.

Increasingly, the chief information officer is no longer entirely under the thumb of the chief financial officer, according to Index Group, Inc. In fact, the Cambridge, Mass.-based consulting firm says, more senior IS executives (35%) now report to top business officers such as chief executive officers, presidents and chief operating officers than to CFOs (33%).

According to a recent Index Group survey of 394 top IS executives, IS reporting relationships break down this way:

CFO	33%	Vice chairman	4%
Chairman/CEO	23%	Vice president (other)	4%
CEO/President	12%	Vice president, corporate services	2%
Executive vice president	7%	Corporate vice president	1%
Senior vice president	6%	Other	4%
Vice president, administration	6%		

Note: Percentages rounded off to nearest whole percent.

Following the striped line

Noted IS academic's hybrid model enhances decentralized centralization

BY JOSEPH MAGLITTA

If there is a single, influential document that cemented the popularity of the hybrid information systems structure, it is undoubtedly "The Centrally Decentralized IS Organization."

The now-classic manifesto was written by Ernest M. Von Simson, a senior partner at the Research Board, a New York think tank, and appeared in the July/August 1990 issue of *Harvard Business Review*.

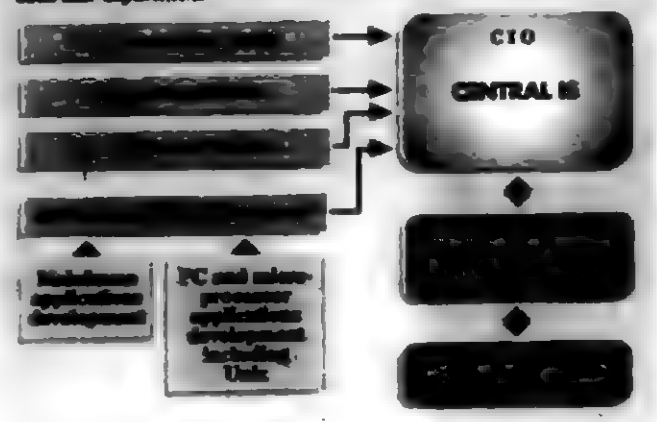
Many consultants and academics have written about the best structures for IS effectiveness. But the author's reputation, coupled with the article's appearance in the hallowed business journal, helped Von Simson's ideas gain a credence enjoyed by few other theorists.

Today, nearly one year after the publication of the article, the author is mum about new perspectives on the work. A request made to his New York office for an update on the work was politely declined. "Mr. Von Simson has said everything he'd like to say in the [*Harvard Business Review*] article," said an assistant, who added that the author was finishing new research on the subject.

Maglitta is a *Computerworld* senior editor, executive report/integration strategies.

The hybrid organization

A model from the Research Board centralizes IS functions such as applications development while assigning a decentralized IS group to each user department



CW Chart: Doreen St. John

Until the new work is made public by the Research Board, a secretive private organization sponsored by 80 large users of information technology, the IS community will have to be content with chewing over the previous piece.

Hybrid model

For his earlier work, Von Simson and his colleagues visited 30 member companies: 10 in manufacturing; 10 in finance; and 10 in transportation, retail and engineering. Researchers interviewed IS senior executives as well as chief executive officers and corporate end users.

Von Simson devised a hybrid model of an IS structure that combined the best features of decentralized and centralized approaches (see chart at left). By adopting elements of the approach, Von Simson wrote, IS organizations could get the best of both worlds.

In his model, a central IS group selects hardware standards, operating systems, database systems, networks, computer-aided software engineering strategies, applications development systems and other tools. Human resources issues such as recruiting, training, promoting, transferring and firing are also handled by central IS.

However, user departments also play a key role, setting IS priorities and establishing cost ceilings, functioning as a kind of substitute chief information officer. An account executive acts as a liaison between central IS and the user department.

"If a solid line symbolizes reporting relationships in the traditional centralized IS organization," Von Simson wrote, "and a dotted line those of the decentralized alternative, then this new model requires what might be called 'striped-line reporting,' with genuine power sharing between IS managers and users."

IS efforts would be supported by special groups to handle applications integration and development, data center operations, telecommunications and systems support. These groups would report to IS.

Organizations that implemented these ideas could expect the cost savings and control of centralization plus the user responsiveness and flexibility of decentralization.

In presenting the model, Von Simson emphasized that the findings apply to multibillion dollar corporations but not necessarily to smaller corporations.

Today, an increasing number of IS organizations resemble Von Simson's model. Many organizations that were moving toward a hybrid structure have continued doing so, while others were prompted to begin experimenting with the new approach.

Other recent publications of interest include the following:

- *The Corporation of the 1990s: Information Technology and Organizational Transformation*. Edited by Michael S. Scott Morton. Oxford University Press, $24.95. The 331-page result of MIT's Sloan Business School's "Management in the 1990s" program contains nine essays that can impact IS structure.
- *Strategic Alignment: A Model for Organizational Transformation via Information Technology*. By John Henderson and N. Venkatraman. MIT Center for Information Systems Research, Working Paper, 1990. Another MIT effort that states using IS for competitive advantage requires, among other things, a careful examination of IS and business unit structure. ●

Small firms not immune to structural wrangling

BY MARTY LEVINE

Life in a small-company information systems department would be idyllic and largely free from troublesome wranglings over organizational structure, you might think. Unfortunately, the exact opposite is often true.

While many large corporations have made significant progress in resolving structural tensions between IS groups and end users, the struggles continue unabated in many small and medium-size organizations.

In many cases, control over information services often remains a political tug-of-war, pitting user departments eager for technological autonomy against the "big picture" objectives of centralized IS departments.

"The capabilities and use of technology have evolved at a faster pace in user groups than in central data processing groups," says Ron Pharis, an IS consultant at Boise, Idaho-based Prodata, Inc. He sees the growing independence of small-company users as the root of many structural disputes.

While the struggle sounds familiar to any large-company IS manager, it may be more intense in small organizations, which can trail their larger counterparts in instituting reforms.

Levine is a free-lance writer based in Forest Hills, N.Y.

Some small-company IS managers have struck a compromise between centralized and decentralized operations. This means individual user groups control function-specific applications such as accounting but adhere to strict standards for commonly shared information.

A good mix

"We have a mixture," says James Dean, director of MIS at Cooper Energy Services Group in Mt. Vernon, Ohio. Cooper manufactures large engines and compression equipment for the gas and oil industries.

At Cooper, some desktop applications such as shop floor control, computer-aided design and manufacturing and office systems are distributed. "But they all send data to the mainframe," Dean explains.

Some very small companies have managed to avoid structural problems. A good example is R. S. Tipton, Inc., a 15-employee software consulting firm in Littleton, Colo.

The five Apple Computer, Inc. Macintoshes that form the core of the company's data processing system are linked over one local-area network. Each department handles its own data processing, and there is little interaction or information sharing among groups.

Regardless of what structure is used, some small-company users say the dynamics between IS and end users won't change much. "This is still a struggle between the need of individual user groups to solve their own needs and the larger requirements of the corporation," Pharis says. ●

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Facing an age-old dilemma: Who to put where, and why

BY JOSEPH E. IZZO

No single structure is right for every information systems group — needs vary greatly from enterprise to enterprise. But factors such as company size and complexity of product line can be big determinants for arriving at the most effective approach.

One of today's most popular structures is a mix of centralized and decentralized structures. Who is a good candidate for a hybrid structure?

For starters, companies that have multiple, independent product lines but common support functions are in a good position to combine elements of both approaches.

For example, a company that has a common sales force, distribution group and warehouse but has 10 different products might do well to use both a centrally managed mainframe and separately managed minicomputers in the independent business units.

Because data is shared, centralized planning and leadership for standards and common systems is critical in hybrid companies. Each individual product unit can build its own systems with minicomputers to operate autonomously, however.

The bottom line is this: When it comes to IS structures, one size doesn't fit all. Regardless of the current trend, it also pays to look carefully. ●

Izzo is vice president of the information technology group at A. T. Kearney, Inc., a consulting firm in Chicago.

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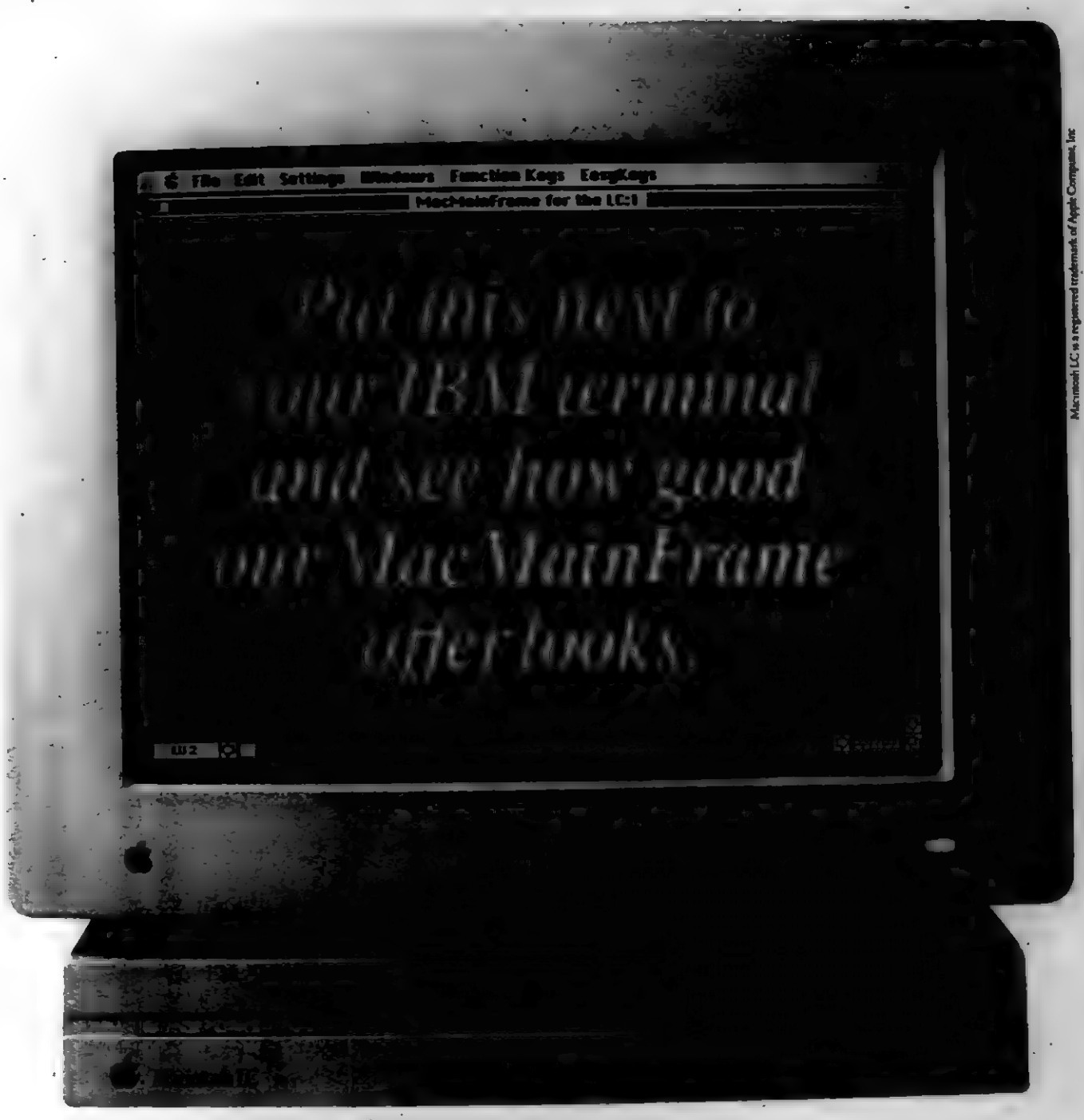
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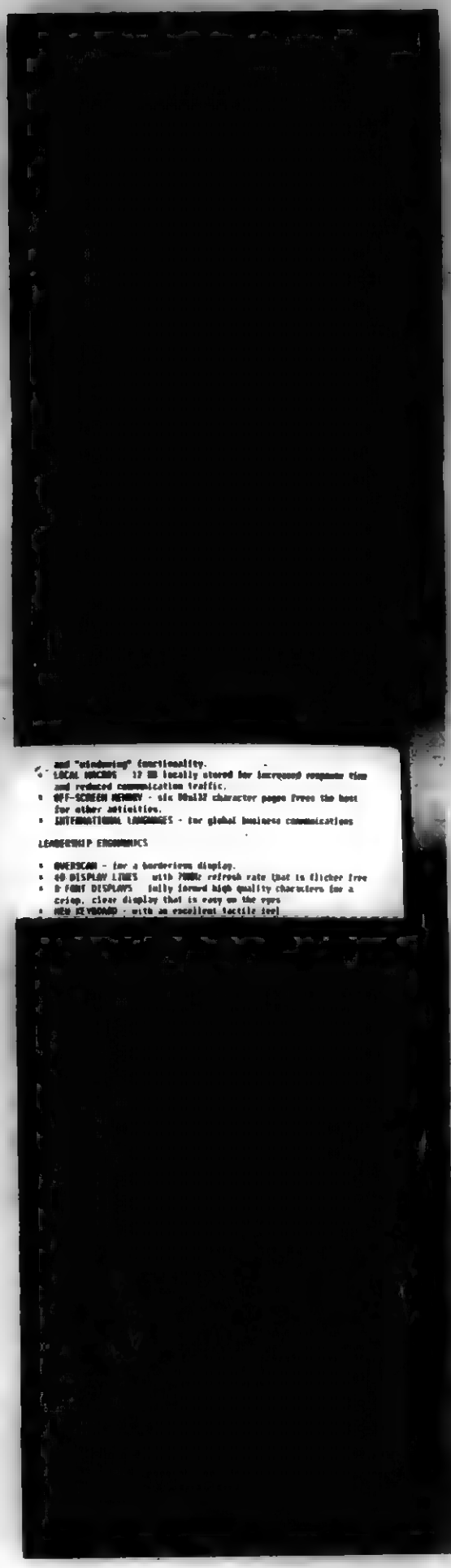
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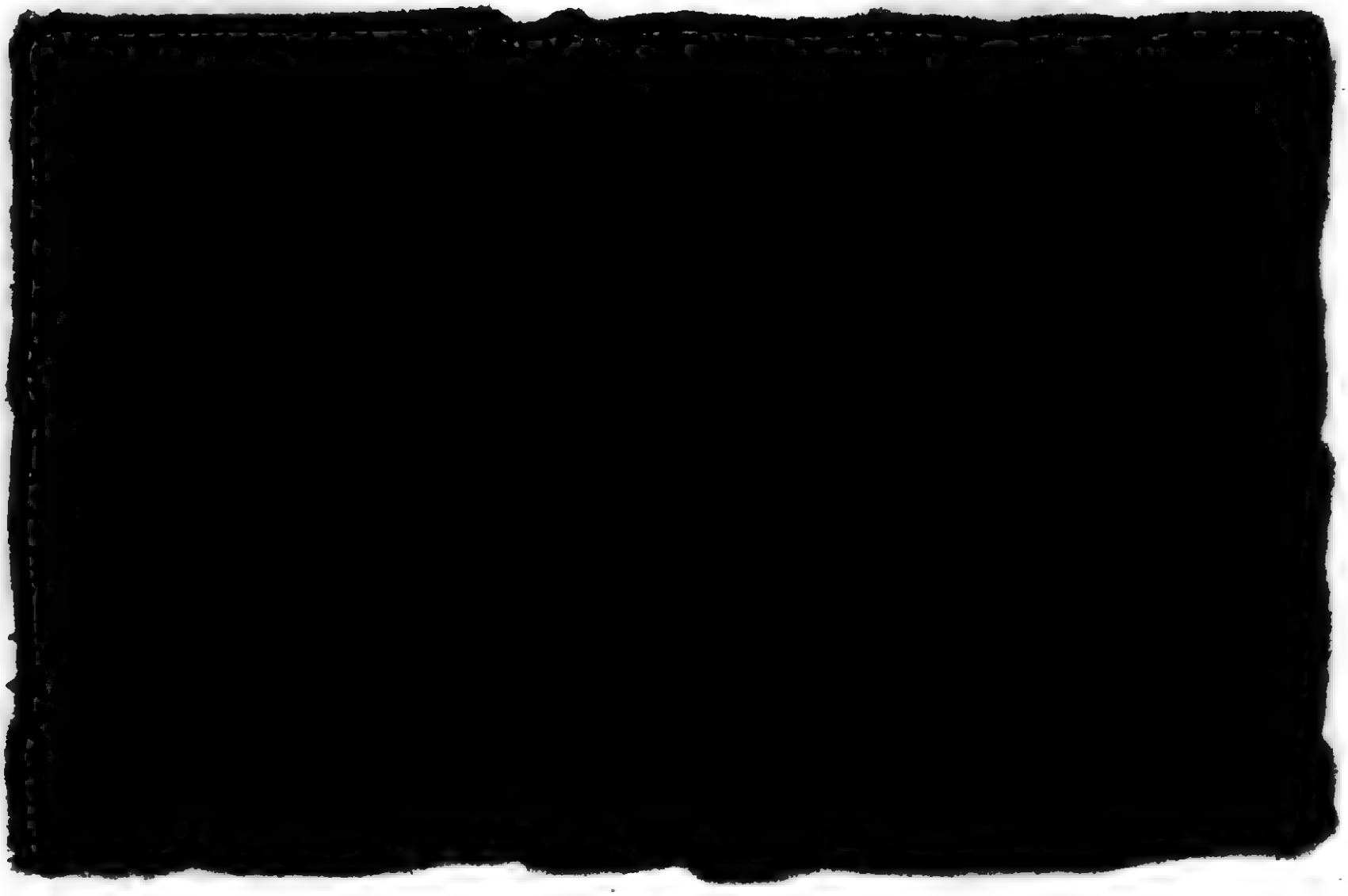
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Legal writes

Issues such as data sharing, vendor alliances and code reuse will change the face of computer law in the next decade. Here's what to expect.

BY MARK RADCLIFFE

The development of computer technology over the next decade will present important challenges to the development of computer law. The next 10 years will bring network growth and increases in the customization of systems and software. There will be more vendor alliances, greater standardization and an upsurge in the sharing and reuse of previously developed program code.

These trends are already beginning and, even at this early stage, are creating legal quandaries the computer industry and legal profession must deal with. How these issues are resolved will determine users' rights as well as vendors' responsibility in cases in which their products fail to perform.



Legal complexity: The networked software environment. As software moves off stand-alone machines and onto networks, the issues of ensuring a reasonable return for software vendors and establishing costs for networked software users are becoming thornier. For example, at this point, it is difficult to determine a reasonable royalty for network licenses.

The addition of another user to the network does not necessarily require the delivery of another program copy, and psychologically, few users will be willing to pay the same amount for additional use without a new copy of the program.

Furthermore, no satisfactory legal definition now exists of what a copy is in this networked environment. To be subject to copyright law, a copy must be "fixed" in a tangible medium of expression. Yet the fleeting existence of a copy on a network may test the meaning of "copy" and "fixed" under copyright law.

In fact, some systems do not create a copy of the entire program. Rather, they use a single copy of the program but allow multiple individuals simultaneous use by making only part of the program available to each person. How does the vendor recover the value of such use? Does that arrangement violate the vendor's exclusive rights under copyright law of reproducing or creating derivative works?

The use of networks raises difficult questions as well about the consequences of the interaction among different vendors' programs.

A recent court decision suggested that interactive programs may require a license from the copyright owner of the base program. In that particular case, Galoob Toys attempted to sell its Game Genie cartridge, which permits Nintendo players to alter certain features of the game, such as the number of lives of the main character. The court found that such alterations were an infringement of the copyright in the Nintendo game and that Galoob needed a license from Nintendo to sell its product.

This decision could permit vendors of major spreadsheet and word processing products to have much greater control over third-party add-on products, such as dictionaries or thesauruses that interact substantively with the base product. If the decision is correct, the vendors of the base product could prevent the distribution of such products or force the third parties to pay a royalty to the base product vendor.



Legal complexity: Vendor alliances and joint development projects. Customers are increasingly demanding software tailored to the way in which they do business. In response, vendors are forming alliances to provide more complete offerings. The Santa Cruz Operation's Open Desktop software is an example of software by alliance: It's a business package for the Unix operating system that combines the programs of several vendors.

Vendors are also responding by creating open-ended products that the customer may customize.

These changes in the methods used to develop, market and deliver connected systems are bringing about changes in today's standard software user licenses.

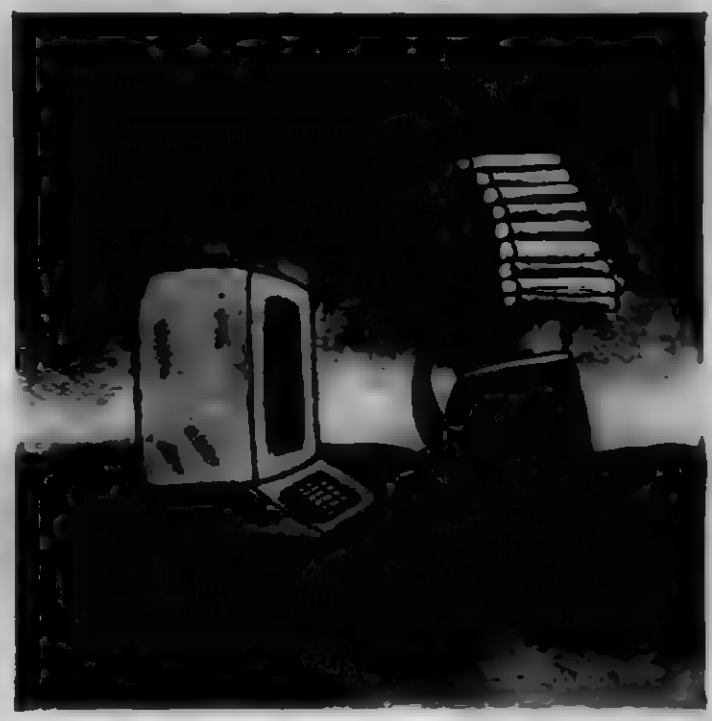
Most current user licenses cover a standard product that is the same for all customers, such as Lotus Development Corp.'s 1-2-3 or Wordperfect Corp.'s Wordperfect programs. Development agreements, on the other hand, are used in instances when users require modifications.

As more products become "open-ended," standard user license agreements will begin to resemble development agreements.

However, users must take special care in situations in which multiple vendors are involved in the creation of a complex, customized system. One critical legal question that arises concerns the liability for the reduced performance or even failure of a system that results from changes to a part of it. Which vendor is responsible if a revision to the software controlling a network analyzer doesn't work with existing bridge software?

Users can avoid problems by carefully drafting contracts that clearly assign responsibility and liability for changes.

Ownership of copyrights and other rights becomes even more complicated when the user gets involved in the alliance. In the U.S., the author (or, if he is a full-time employee, his employer) usually owns the copyright in a modification. Who owns the copyright in cases in which a vendor and a user work together to modify software? Where do you draw the line on ownership in the case of user-definable software a customer modifies without vendor involvement?



James Yang

These issues are important to the user because they determine how the user may use such modifications as well as who else may use them.

Another difficult challenge is deciding which development partner is liable for defects in a jointly developed product. In other words, how much participation in product

Continued on page 66

Radcliffe is a partner at Ware & Freidenrich in Palo Alto, Calif. He specializes in computer law.

Continued from page 65

development and manufacturing is sufficient to make a computer vendor liable?



Legal complexity: Reusable code. The use of standard modules or reusable software objects in creating products is a breakthrough for developers, but it is also a legal problem. The trend toward code reuse has been accelerated through the distribution of tool kits for developing software and the rise of object-oriented programming, in which significant parts of a new program can be created from pre-existing software objects.

The incorporation of modules from such tool kits or objects into software raises legal issues regarding intellectual property and liability. These issues will be important for users because they will be using tool kits to create their own programs. For example, program developers might use tool kits to create common devices such as windows and scroll bars in new programs. They do not have to write all the code themselves. What kind of license grants does the third-party developer need? For example, Apple Computer, Inc. permits the use of its tool kits solely to create programs for the Macintosh environment. Once developed, these programs may not be ported to a DOS environment.

The use of these tool kits may also make difficult the determination of copyright infringement. Two vendors may use the same tool kit to develop a program with similar functionality (for example, a financial analysis package). Because each had the right to base its program on the tool kit, suing would be difficult.

The idea of derivative works also has a bearing on reusable objects. Under copyright law, a derivative work is that which is based on another work and incorporates a substantial part of the expression (not ideas) of the underlying work. But is the arrangement of objects in an original way a derivative work? Or do objects themselves actually have to be modified?

Liability is also an issue with reusable objects. For example, a software object may function properly by itself but not when used in a particular combination in an application developer's program. The question, then, would be whether this malfunction arose from the application developer's error or the object developer's error. If the object does not work properly in the application developer's program, it may cause considerable damage. If this damage is imposed on the object developer, it could easily exceed the royalties the object developer receives from licensing the object.

In fact, legal problems involved in object-oriented programming, such as ownership, liability for use of objects and definition of derivative works, have in part delayed Japan's Sigma project, an effort to develop a national software object library.



Legal complexity: The rise of standards. Customer demand for standardization and the desire to increase market potential are leading a number of companies to open their proprietary technology.

This shift to open standards raises many questions involving legal protection and control. What form of legal protection is available to standards developers for a standard that may consist of a list of microprocessor commands or a description of an application program interface? Who controls and determines changes to the standard, both initially and as it develops? Who enforces it against third parties falsely claiming compliance?

These questions will be answered differently for different types of standards. What is certain, however, is that with the increasing use of combinations of products from multiple vendors and with the growth of standards, claims of compatibility are increasingly important to users. The legal meaning of the term "compatibility" is just beginning to be defined.

Three types of standards exist: public open, private open and private closed.

Public bodies such as the American National Standards Institute develop public open standards. Such standards may be used by any vendor. However, no organization has the responsibility (or, more importantly, the resources) to police vendors' misstatements about their compliance with standards. Any such enforcement must be undertaken by third parties, such as competitors.

Private open standards are owned or developed by private parties but are licensed to any third party. The DOS/Intel Corp. architecture, Sparc International's Scalable Processor Architecture (Sparc, derived from Sun Microsystems, Inc. work) and Motif user interface are examples of such standards.

The Sparc standard and Motif user interface represent a new trend in the computer field: They are developed, controlled and licensed by industry consortia specifically created to establish standards; compliance is determined by third parties.

Trademark law will play an increasingly important role in establishing standards compatibility. For example, the Sparc trademark designates compliance of products with the Sparc standard. Rather than individual vendors claiming to be compatible with a standard, standards-setting organizations provide neutral testing to determine whether a particular product meets the standard. If the product successfully passes the test, its manufacturer may then use the trademark identifying it as compatible with the standard.

A private closed standard is controlled by a private party and is not licensed to third parties. Examples include Lotus' 1-2-3 user interface and Apple's operating system. The *Lotus Development Corp. v. Paperback Software, Inc.* and *Apple Computer, Inc. v. Microsoft Corp.* cases suggest that attempts to achieve compatibility, or even comparability, with these standards will be challenged by their owners for the foreseeable future.



Legal complexity: The scope and type of intellectual property protection for computer software. For the last decade, the computer industry and legal profession have held that copyrights and sometimes trade secrets were the appropriate forms of legal protection for computer software. Computer programs were viewed as similar to copyrightable works such as books and films. Patents were rarely, if ever, granted to computer software because such programs did not easily fit into patentable categories.

Patents in the U.S. are only issued for inventions that meet the stringent patent requirements of novelty, utility and nonobviousness; the invention must be new and useful and should not be obvious to one skilled in the technical field at the time of its discovery. The nonobviousness requirement screens out inventions that are only minor or obvious improvements on prior work in the field.

In recent years, there has been a growing number of patents issued in the U.S. to protect program-related inventions. However, using patents to protect computer software is problematic for several reasons, including the fact that the patent application process can't keep up with rapid product development and short product life cycles. The process is also hindered by the U.S. Patent and Trademark Office examiners' limited experience with existing technology in the computer field.

Furthermore, the frequent use of secrecy to protect commercially valuable computer software means it is difficult to determine what is truly original and novel in this field. The patent process, because of its complexity and expense, tends to favor large, well-funded companies.

If this trend toward patent protection continues, computer attorneys must address the interaction of patent and copy-

Patents vs. copyrights vs. trade secrets

There's a difference between these forms of intellectual property protection

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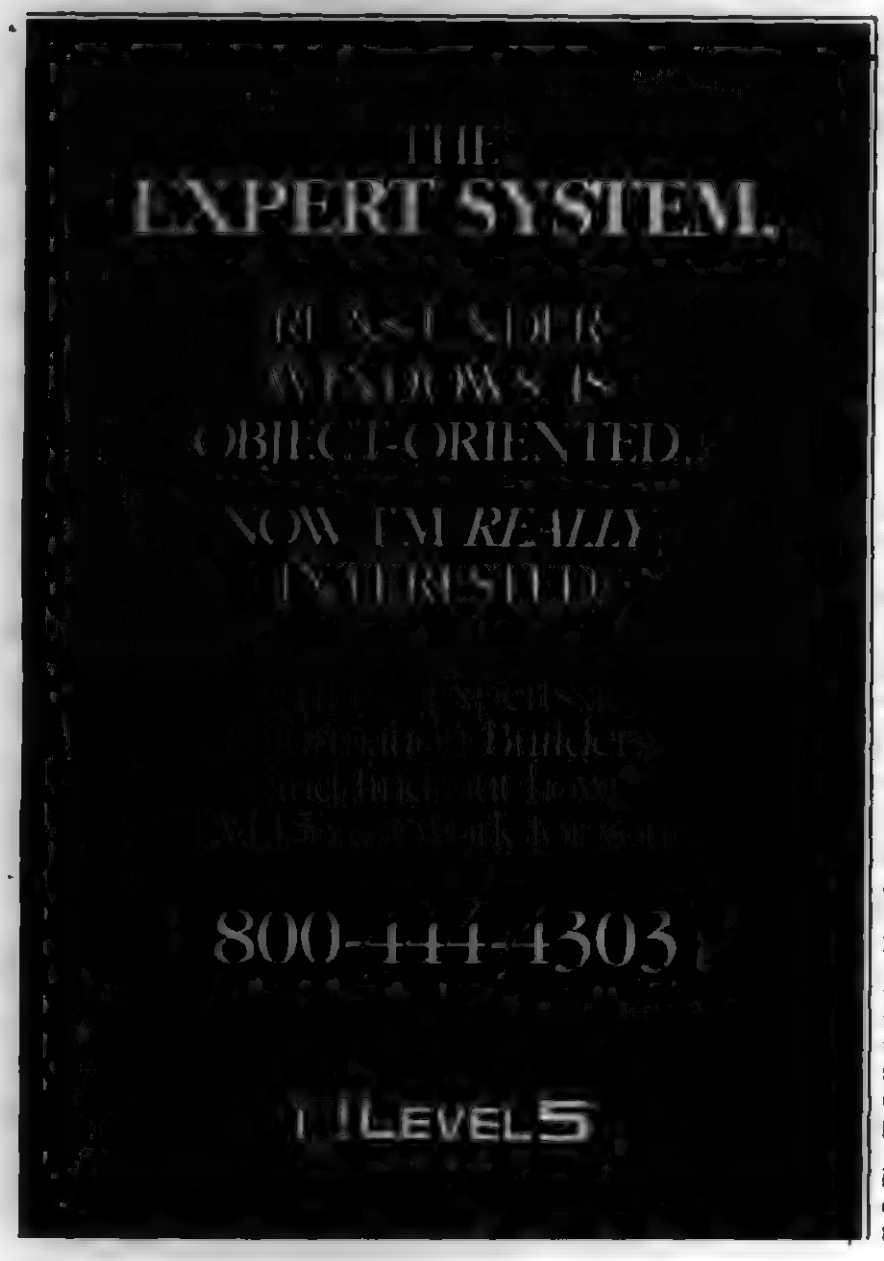
- Protection is not obtained automatically; software patent process is an adversarial one in which Patent and Trademark Office examiners review the application and existing technology to determine if the application meets legal criteria of novelty, nonobviousness and usefulness.
- Protect the invention in a machine process.
- Have a limited term of protection (17 years) in return for complete disclosure of the invention in the patent application.

COPYRIGHTS:

- Protection is automatic — no need to apply for it, although the work must meet standard of originality.
- Protect expression, not ideas. For programs, protect only against *substantially similar copies.*
- Longer term of protection (minimum of 50 years) that provides return to creator that is sufficient to encourage disclosure of work to the public.

TRADE SECRETS:

- Any formulas, patterns or information used in business that confer an advantage because competitors do not know or use them.
- Trade secret owner must use *reasonable efforts to maintain* secrecy.
- Protection lasts until trade secret becomes known.



right protection for computer software. This is not a simple task; these two forms of legal protection guard different rights. Patent law focuses on the invention in a "machine" or "process" while copyright protects a "writing" and focuses on "expression," which can include structural elements (see chart page 66).

Copyright law, with its longer term of protection (a minimum of 50 years), might undermine one of the most basic policies of patent law: a limited term of protection in return for complete disclosure of the invention.

Without legislative or other guidance, courts will resolve these issues on a piecemeal basis. Yet the resolution will be important to decisions about how to commercialize products. A vendor might be reluctant to create a product if he believes it is patented because reverse engineering, which is permitted by copyright law, is forbidden under patent law.



Legal complexity: The growing importance of databases. Revenue for database vendors exceeds $6.5 billion per year, yet the scope of legal protection of databases is unresolved. The courts have employed conflicting theories to justify protection of such compilations: "sweat of the brow" vs. "selection and organization."

The sweat of the brow theory holds that copyright protection should be based solely on the amount of effort that was expended in collecting data. Prior to a recent Supreme Court decision, telephone companies were successful in preventing other parties from copying their white pages based on this theory.

The selection and organization theory provides that collections of data can be protected only if the collections demonstrate some minimal level of selection and organization of individual components of data.

Under this theory, the white pages of a telephone book would not be protectable under copyright law because they consist of all of the individuals in a particular area (no selection) arranged alphabetically (no organization).

The U.S. Supreme Court has adopted the selection and organization theory as the basis of copyright protection for collections of data. Its application to databases will be difficult because database organization can differ markedly, depending on the particular database used.

The use of databases and other on-line services, including electronic mail, also raises new and different challenges in the area of vendor liability. The Supreme Court suggested in a recent case that it would not give information providers the First Amendment defense against liability accorded newspapers and other traditional media.

The increase in the amount of data collected about individuals and the ease of collating and distributing such information has raised significant database privacy concerns.

For example, after 30,000 complaints, Lotus and Equifax, Inc. recently announced the termination of their Lotus Marketplace database of consumers' credit history.

It is still unclear, however, what level of responsibility an on-line service provider has regarding defamation and copyright infringement by its users. No real guideline exists to determine the appropriate allocation of risk among the service providers (such as Dialog Information Services, Inc.) and the information providers (such as the Dow Jones News Service).



Legal complexity: Protecting and exploiting new kinds of works. Some new computer products do not easily fit in the traditional legal categories. One current example is a programmed array logic device. The product incorporates characteristics of both hardware and software. Should it be protected by copyright or patent law? What scope of legal protection should it receive?

The growth of multimedia products also introduces unique challenges. The vendor that tries to assemble the rights to a multimedia work that includes movie clips, still pictures and sound recordings will have to negotiate with many different parties for licenses to use these different elements.

The legal and administrative costs of negotiating this complex network of unique agreements to obtain the necessary rights may inhibit the development of such products for all but the very largest markets. One approach to the reduction of these transaction costs would be the development of a standard agreement for exploiting these rights.

The next decade will see the continued evolution of computer law. Nonetheless, statutes and judicial decisions are certain to lag behind technology. This reality imposes a special burden on computer lawyers and their clients to find creative solutions to these challenges, both contractual and statutory.

These issues are too important and too far-reaching to be left in the hands of the legal community, however. Those most affected — the users — must also have a hand in developing a new body of law to deal with these new realities.

Users can be a part of the process by dealing with problems as they arise in their own use of computer products.

Proactive users will discuss potential legal issues and problems in advance with their legal counsel as well as act through industry organizations such as the Software Publishers Association and the Computer Business Equipment Manufacturers Association. ●

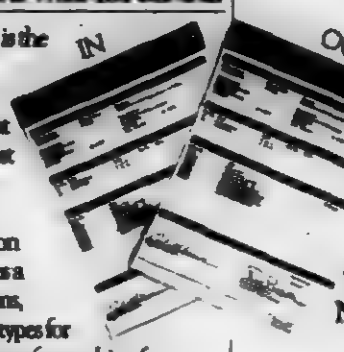
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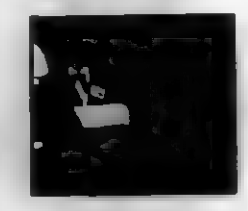
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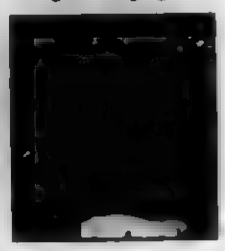
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Featured Presentations

Keynote Address
Wednesday, August 14
9:00-10:00 am



Sheldon Laube
National Director, Information & Technology, Price Waterhouse
"Desktop Directions: How New Desktop Technologies Will Further Empower People"

Lotus Technology Briefing
Wednesday, August 14
1:00-2:00 pm

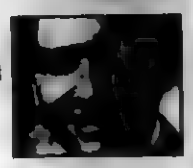


Dr. Frank King
Senior Vice President, Software Business Group
Lotus Development Corp.
"Software Applications for Working Together in the 90s"

OS/2 Strategy Briefing
Thursday, August 15
8:30-10:15 am



Lee Reiswig
Asst. General Manager, Programming, Personal Systems, IBM



Joe Guglielmi
General Manager, Marketing & Business Development, Personal Systems, IBM
"Personal Systems Software Directions"

Developers' Keynote
Friday, August 16
9:00-10:00 am



Paul Brainerd
President, Aldus Corporation
"Secrets to Building Successful Cross-Platform Applications Software"

The Exposition

The Windows & OS/2 Conference boasts an exhibit floor packed with the latest Windows and OS/2 software applications programs and development tools from more than 250 top exhibitors. In addition, you'll have unlimited access to these special exhibit floor attractions:

- **Live Shoot-Outs,** sponsored by PC Week Labs
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- **The MultiMedia Showcase,** presented by *Windows and OS/2 Magazine*



- **Strategic Applications Seminars,** from *Computerworld* Magazine
- **Hands-On Training,** by PC Concepts
- **The Windows Resource Center,** presented by WUGNET, publishers of *The Windows Journal*
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NATIONAL BRIEFS

RSVP — and step on it

▶ More than 50% of the 400-plus information systems professionals who were recently surveyed by Deiran, N.J.-based technology market research firm **Datapro Information Services Group** named response time performance as one of the three most critical criteria in choosing a service firm. Price and technical expertise emerged as the second- and third-ranking factors. **IBM** and **Digital Equipment Corp.** showed up in the survey as the two most frequently used service providers.

Big score at small sites

▶ **Borland International, Inc.** carried off top honors in personal computer applications software customer satisfaction in a recent nationally syndicated computer study conducted by market research firm **J. D. Power and Associates.** The Scotts Valley, Calif.-based software house led second- and third-place entries **Wordperfect Corp.** and **Claris Corp.** in the study, which was based on a national random sample of 1,784 small and medium-size businesses at sites with fewer than 500 employees. The respondents pointed to software capability, ease of use and support as the factors most likely to yield end-user satisfaction.

Bigwig, littlewig

▶ The founder of router bigwig **Cisco Systems, Inc.** in Menlo Park, Calif., has spun off a "32-bit computer" company called **XKL Systems Corp.** in Redmond, Wash., according to a Cisco spokesman. The source said **Leonard Bosack** will remain with Cisco through the end of the year as a consultant and will continue to sit on the firm's board of directors.

Search for tomorrow

▶ In search of streamlined operations, tightened focus and heightened productivity, Santa, Cruz, California-based Unix vendor The Santa Cruz Operation earlier this month formed the following four product line business units: Distributed Corporate Computing, General Business Systems, Complementary Products and Services. The new Distributed Corporate Computing unit will focus on the recently formed Advanced Computing Environment consortium.

Ada making its mark at commercial sites

BY GARY H. ANTHES
CW STAFF

After 10 years, Ada — conceived by and for the U.S. Department of Defense as the programming language to end all programming languages — is finally catching on at the Pentagon, aided by mandates from the brass and from Congress.

As a result, Ada product vendors, beginning to see some payback on their investments, are increasingly training their sights on the commercial sector. So far, Ada has made tiny inroads in the commercial market; however, it has won enthusiastic support from some sophisticated users, including several winners of the Malcolm Baldrige National Quality Award.

Despite these successes, there is still no consensus as to whether the language will take off like Unix or fizzle like PL/1.

Too many options

Encumbered and confused by the more than 400 programming languages and dialects its employees and contractors were using, the Defense Department adopted Ada as a standard in 1983. During the ensuing years, it mandated Ada use in an expanding array of applications.

The rich and powerful language was designed to complement modern software engineering practices, thereby leading to increased programming productivity and more error-free and reusable code.

However, reaction in the trenches was underwhelming, ranging from fierce resistance to simple noncompliance. Waivers of the Ada mandates were routinely granted whenever software developers claimed Cobol, Fortran or something else would be more cost-effective.

In the last two years, however, the tide has turned as Ada's shortcomings have been overcome — at least in part. Waivers are now rare and may become nearly nonexistent; on June 1, a federal law became effective ordering the use of Ada at the Defense Department.

In 1989, according to Focused Ada Research Corp. in Falls Church, Va., users spent $144 million on Ada software products, bought or used $831 million in hardware for Ada development and paid an additional $1 billion in direct salaries to Ada programmers.

Meanwhile, the value of Ada-based systems development projects, most of them for the Defense Department, ran into the tens of billions of dollars. At that time, there were 25,000 programmers and engineers using Ada to develop software, the company said.

Focused Ada Research and the major Ada product vendors predict a 20% growth rate for the Ada market over the next few years. However, they say growth could be much higher if the language catches the fancy of the nondefense world.

Increasing approval

Much of the criticism that greeted the introduction of Ada has faded as compilers and tools have improved. Users no longer pay huge performance penalties for using Ada, according to many industry observers, nor must they scrape by with primitive development environments.

Moreover, while critics say these deficiencies have blocked the soaring popularity predicted by Ada's early advocates, the language's defenders point out that it took more than 15 years for Cobol, another Pentagon-sponsored language, to really catch on.

It is the attendant software engineering disciplines required in order to use Ada, more than the language itself, that result in low error rates and a high percentage of reusable code. One major obstacle to Ada's penetration of the commercial world, according to vendors, is user resistance to adopting these disciplines and, in some cases, failure to see the need for them.

Rational, a $30 million vendor of Ada products in Santa Clara,

Continued on page 70

Are we there yet?

After a decade of trying, the U.S. Department of Defense's Ada programming language may be cracking the commercial market



1989 U.S. Ada product market (revenue in millions)

Software	
Compilers	$101.5
Tools	$34.0
Target software	$8.7
Total	$144.2
Hardware	
Development	$741
Target	$90
Total	$831
Total hardware and software	$975.2

Source: Focused Ada Research Corp.

Worldwide distribution of Ada use by application type

Defense systems Weapons, command and control, avionics	50%
Space programs U.S., Canada, Europe, Japan	20%
Air traffic control U.S., Canada, Europe	10%
Other Communications, factory automation, financial, administrative	20%

Source: Rational

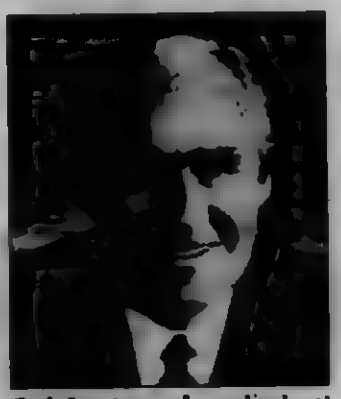
CW Chart: Doreen St. John

Motorola exec decries government regulations

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — "I'm going to be radical here today," Robert W. Galvin, chairman of the executive committee at Motorola, Inc., recently told a luncheon audience at the Armed Forces Communications and Electronics Association convention. He was not exaggerating.

The downfall of communism and of Saddam Hussein notwithstanding, Galvin said the U.S. must maintain a very strong defense in the face of severe budget cuts. He suggested that the daunting task could be achieved by streamlining — in fact, largely eliminating — the government/vendor interface.



Galvin turned *radical at AFCEA convention*

Galvin pooh-poohed a long succession of blue-ribbon panels that have studied the process by which the government procures computer and communications systems, only to propose incremental improvements that never go anywhere. "Take a clean sheet and forget everything going on in Washington," he said.

Congress, Galvin said, should adopt a policy of zero micromanagement: no hearings, no audits and almost no regulations. "Give the budget to [the Department of Defense] and let it do its mission. That will eliminate all sorts of mischief and inefficiency."

Motorola was a Malcolm Baldrige National Quality Award winner, a feat Galvin said was made possible by efforts to improve product quality and reduce production delivery cycle times.

He said the factors that improve quality also tend to shorten cycle times. By streamlining the procurement and postprocurement development cycles, quality can be improved and costs cut, Galvin suggested.

He said there is so much waste, redundancy and friction in government/industry relations that a wholesale streamlining of these processes could improve quality as much as 100%, reducing costs to the government by 50%.

Galvin acknowledged that Congress is not ready to count itself out just yet. "People will laugh, and it won't happen this year," he said, "but say it again next year, and maybe people won't laugh so hard."

Galvin said the typical company pays a 20% to 30% cost penalty for poor quality in its operations. He said would-be Baldrige Award winners should hold their suppliers' feet to the quality fire. "You should say to your suppliers, 'If you don't go for Baldrige also, we won't buy from you.'"

Galvin said Motorola could never have won the Baldrige award without that kind of approach to its suppliers.

NATIONAL

BRIEFS

Lives of their own

▶ The winding down of the **AT&T/Sun Microsystems, Inc.** alliance will do nothing to dampen the fervor of either the **Open Software Foundation (OSF)** — the consortium founded to safeguard the market from being unfairly wrenched toward AT&T's Unix System V — or **Unix International, Inc.**, which sprang up to bolster Unix System V against the competitive efforts of the OSF, according to industry observers. Both organizations, analysts said, have grown well beyond their original raisons d'etre. Late last month, the analysts appeared on target as Unix International opened for business in **Singapore**. The Unix group chose Singapore as the site from which to launch its expansion throughout the Pacific Basin not only for its strategic location but also for its strong telecommunications facilities, according to Unix International Chief Executive Officer Peter Cunningham.

Royal welcome

▶ Here is one more advantage of the global marketplace: Without it, a San Diego-based business software products purveyor to the personal computer market — **Software Products International**, for example — would not be likely to be honored by the **King of Spain**. Just ask Software Products President John Bowne, who traveled to Madrid last month to attend a ceremony at the Palace of the Zarzuela, at which His Royal Highness Juan Carlos de Borbon y Borbon recognized the software company for the instrumental role it played in the computerization of his country's businesses.

Software industry bucks trend

BY NELL MARGOLIS
CW STAFF

Recession notwithstanding, the U.S. software industry is going full steam ahead — and is looking to increased productivity fueled by flexible work terms to maintain its upward trend in the future, according to two reports issued late last month.

Some 500 chief executive officers from a cross section of the nation's software firms responded to the Software Industry Business Practices Survey conducted by consulting and accounting firm Price Waterhouse for the Massachusetts Computer Software Council, Inc. The respondents indicated expected 1991 software sector employment growth around 15%.

The anticipated expansion, according to the survey's findings, will be driven by mounting pressure on software companies to support "multiple everything."

Meanwhile, a second survey commissioned by the Massachusetts Software Council — its fourth Annual Survey of Compensation, conducted by the accounting and consulting firm of Coopers & Lybrand — shed some light on how the companies plan to fund their optimistic growth estimates.

"Employee productivity and competitiveness of pay are projected to be top issues in attracting a qualified work force in the 1990s," said Coopers & Lybrand compensation consulting director Davis T. Gallison III. Mounting popularity of annual bonus programs and long-term incentive plans, he said, reflect this concern.

Please sir, may I have some more?

Although the slowing economy in 1990-1991 caused salary freezes at some 16% of the 258 software firms surveyed, the average annual pay for top software jobs increased across the board

Area	Chief executive officer	Director of marketing	Director of sales	Chief scientist
[illegible]	13%	[illegible]	12%	[illegible]
Mid-Atlantic	7%	11%	[illegible]	11%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
South	13%	8%	5%	[illegible]
[illegible]	11%	[illegible]	5%	[illegible]

Source: Coopers & Lybrand

CW Chart: Doreen St. John

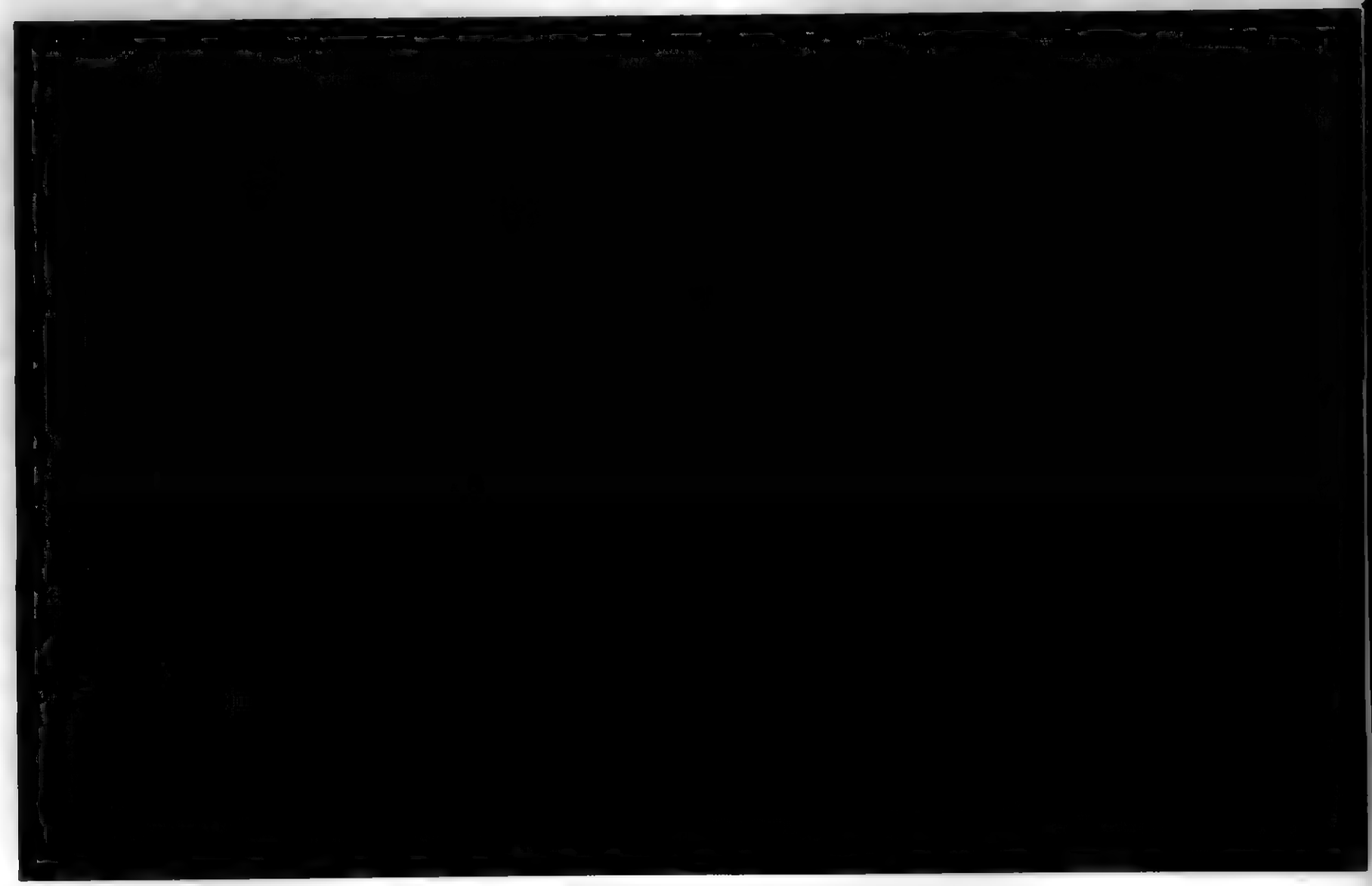
Ada

FROM PAGE 69

Calif., got into business in 1981 to "productize" software engineering techniques, according to Executive Vice President Bob Bond. The firm's decision to base its products on Ada was a secondary and less important one, Bond said. "We like Ada — we've had a lot of success with it — but Ada is not our business."

Rational sells Ada compilers, development tools and hardware geared for developing large Ada systems. Last year, IBM bought a significant equity stake in the company and is now using Rational tools in the $3.6 billion overhaul of the U.S. Air Traffic Control System. The Federal Aviation Administration's (FAA) Advanced Automation System will be a showcase for Ada one way or the other: The FAA says its 2 million lines of Ada code must not fail more than three seconds per year.

Until recently, Bond said, no good alternative to Ada existed. Now, AT&T's C++, another object-oriented language, rivals Ada for the affections of software engineers. Although Ada has the advantage of being more mature and more standardized, development shops with a lot of



C and Unix experience may prefer C++ for smaller projects, Bond said. Nevertheless, he added, "Ada is best for large-scale development."

Digital Equipment Corp. has invested more in Ada during the past 10 years than in any other language and has more than 10,000 Ada users worldwide, said Ada product manager Pat Bernard. Defense contractors such as General Electric Co. and Westinghouse Electric Corp. are beginning to leverage their Ada tools and know-how into nondefense lines of business, she said.

However, Ada penetration of the U.S. commercial sector will be slow, with faster growth occurring in Europe, Canada and the Far East, Bernard added.

Ada is especially well-suited to real-time, embedded applications — and not just those in weapons systems, said Steven Deller, business development vice president at Chantilly, Va.-based Verdix Corp., which sold $13.5 million worth of Ada products last year. Automobiles will someday roll off of assembly lines with one million lines of software code under their hoods — a natural application for Ada, he added.

A new version of Ada, called 9X, is being defined to include functions specifically for business, Deller said. For example, Ada 9X will be able to accept the binary-coded decimal data format common in many financial applications and will be able to support the 64-bit fixed-point arithmetic needed to represent large dollars and cents figures.

Moreover, Ada may be advancing further into the commercial sector than it appears. Ralph Crafts, president of the Ada Software Alliance, said commercial use of Ada is hard to measure because users often guard their success stories as closely as trade secrets. For instance, he said, four Fortune 500 firms slated to speak at a 1988 trade show canceled when top management chose to keep their Ada experiences under wraps.

What auditors see

The traditional short-term financial orientation of U.S. firms works against the adoption of Ada and its attendant software engineering disciplines. Getting into Ada may cost hundreds of thousands of dollars in software and more in training, according to industry analysts. The savings in reusable code and reduced software maintenance may be huge, but they might not show up for years.

"Software contractors have no financial incentive to develop reusable code," said Ralph Crafts, Ada Software Alliance president. They would need to spend from 15% to 25% more time designing in order to maximize reuse, a penalty that could knock millions of dollars from the bottom line of large projects.

In addition, standard accounting principles, in most cases, do not allow carrying the value of the resulting software on the company balance sheet, Crafts said.

Crafts urged firms to argue with their auditors to allow the capitalization and depreciation of reusable software. A change in the way accountants view investments in software would encourage the use of Ada and other languages geared for the development of low-maintenance, reusable software, he said.

GARY H. ANTHES

Where is Ada?

• The Radio/Telephone Systems Group of Motorola, Inc., a Malcolm Baldrige National Quality Award winner, used Ada to develop a tool for testing mobile telephone systems. No member of the project team had any experience with either Ada or object-oriented design; nevertheless, Motorola reported greater productivity, lower error rates and more reusable code than it realized from a comparable C project.

• Later this year, Reuters Information Services, Inc. is scheduled to deliver two Ada systems that will support real-time global futures and options trading and currency exchange for the Chicago Mercantile Exchange. Based on positive results in using Ada for a prototype, a Reuters spokesman said, management decided to go with Ada over incumbent language Pascal for use in the full systems, each of which will have some 250,000 lines of code.

• Genesis Software, Inc. in Kansas City, Mo., developed Prompt Paymaster — a contracts administration, accounts payable and payments package — in 250,000 lines of Ada. A Genesis spokesman estimated that it would have taken 2.5 million lines of code and cost 10 times as much to develop the system in Cobol. The company devotes less than one full-time employee's working hours to maintenance; a Cobol version of the product, the spokesman said, would require Genesis to put five to six people on the job.

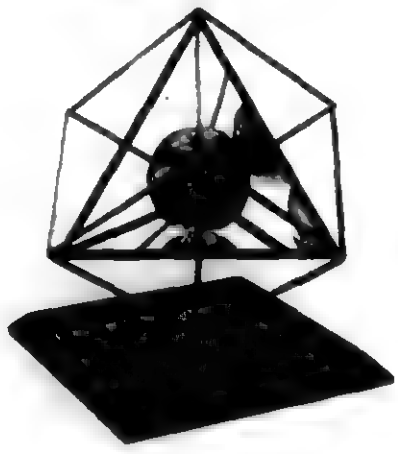
• Xerox Business Products and Systems, another Baldrige Award winner, has chosen Ada for control software for copiers. It evaluated a C/C++ combination and two internal Xerox languages as well as Ada and found Ada best in quality of language, quality of tools and return on the investment required to move to the new language.

GARY H. ANTHES

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The Computerworld Smithsonian Awards program searches out and publicly honors men and women who are applying information technology to make our planet a more humane, healthy and cooperative place to live. On June 10, 1991, these heroes were celebrated at the National Building Museum in Washington, D.C.

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Fin. Automation Corp./ Data Processing Div.
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First Citizens Bank
Security Pacific Bank-Washington
Merchants National Bank
CIGNA, Group Pension Division

Government & Non-profit Organizations

De Anza College
Bay Area Coalition for Employment of Persons with Disabilities computerized its job placement process via a customized bulletin board system. BAC-NET *is used to share employment* opportunities with the more than 2,000 job seekers with disabilities.

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*US Office of Personnel [redacted]
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Ill. Dept. of Revenue
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The Church of Jesus Christ of Latter-Day [redacted]
LU Dept. of Public Safety & Corrections
County of Merced Human Services Agency
Alberta Workers' Compensation Board
The Met. Toronto Housing Co., Ltd.
Federal Reserve Board
Social Security Admin.
Friends of the Vietnam Veterans Memorial
US Geological Survey
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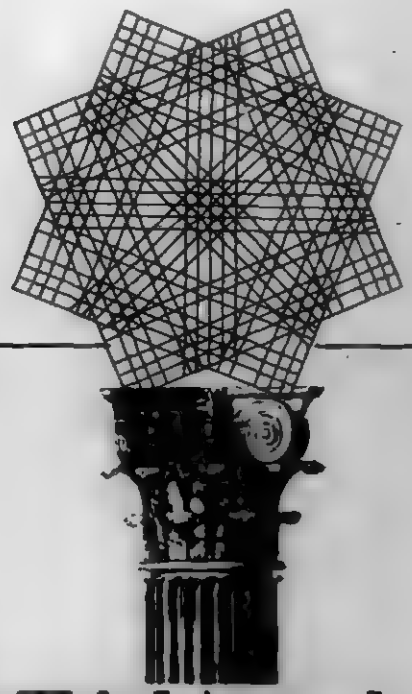
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Nokia acquisition is just the first step for ICL

Company denies a rumored merger with Olivetti but affirms its commitment to Europe

BY RON CONDON
IDG NEWS SERVICE

LONDON — International Computers Ltd. (ICL) has signaled that last month's purchase of Nokia Data Systems [CW, June 10] will not be its last in Europe.

The Fujitsu Ltd.-owned company denied rumors that a merger with Italy's Ing. C. Olivetti & Co. would be the next step. An ICL spokesman said the idea was "wildly grandiose." However, "For the last four years, we have been saying we wish to grow in Europe by mergers, acquisitions and collaborations and will continue that policy," he added.

Olivetti is reported as saying it would fight any deal with ICL. The two companies have had merger talks in the past, but Olivetti Chairman Carlo De Benedetti has said he would fight bids from Japanese companies, as ICL is now 80% owned by Tokyo-based Fujitsu.

However, a spokesman for Olivetti was slightly ambiguous, saying, "De Benedetti has said that any type of arrangement in which a Japanese company assumes majority control is out of the question. But defining what is a Japanese company is becoming increasingly difficult."

Joint actions

ICL's relationship with Fujitsu is also getting closer, despite both firms' claims to an arm's length arrangement. The two firms recently made a joint bid for a British university contract, and now ICL Australia is bidding Fujitsu's MVS-compatible mainframes with Woolworth Australia.

"We bid in conjunction with many companies. We are a systems integrator and will supply whatever hardware the customer requires," the ICL spokesman said.

The $391 million purchase of Nokia Data is expected to be finalized in three months, resulting in a company that employs some 24,000 people and has joint revenue of about $4 billion — making it the fourth-largest computer firm in Europe. It will be known as ICL Nokia Data in Scandinavia and as ICL elsewhere.

With Nokia Data's manufacturing plant in Finland, ICL's annual personal computer output alone is now set to increase to approximately 250,000 units. However, more significantly, the acquisition will give ICL access to Nokia Data's expertise in PC local-area networks and workstations, while also strengthening ICL's open systems product portfolio.

Nokia Data's key vertical markets in Scandinavia and Europe include the retail, financial and local government sectors, providing systems to interface with IBM, Digital Equipment Corp., Unisys Corp., Siemens Nixdorf Informationssysteme AG and Groupe Bull hosts, among others.

Speaking at a conference in London recently, ICL Chairman Peter Bonfield insisted that funding for the takeover had come entirely from within ICL. Although Fujitsu was aware of the transaction, it had no financial involvement, he said.

Melding the companies

Speaking at the same conference, Nokia Data President Kalle Isokallio revealed that the ICL deal could lead to more collaboration in other fields of electronics between Nokia Data and Fujitsu.

Meanwhile, a question mark hangs over how Nokia Data's work force, manufacturing facilities and product range will be integrated with ICL's own. ICL currently relies substantially on Taiwanese computer manufacturer Acer Technologies, Inc. for the supply of its PCs. But with Nokia Data's plant in Finland now available, there is a strong possibility that some of this production could be switched to that site.

Bonfield also acknowledged there would probably be "some rationalization" of the two companies' products, although it was too early to be specific.

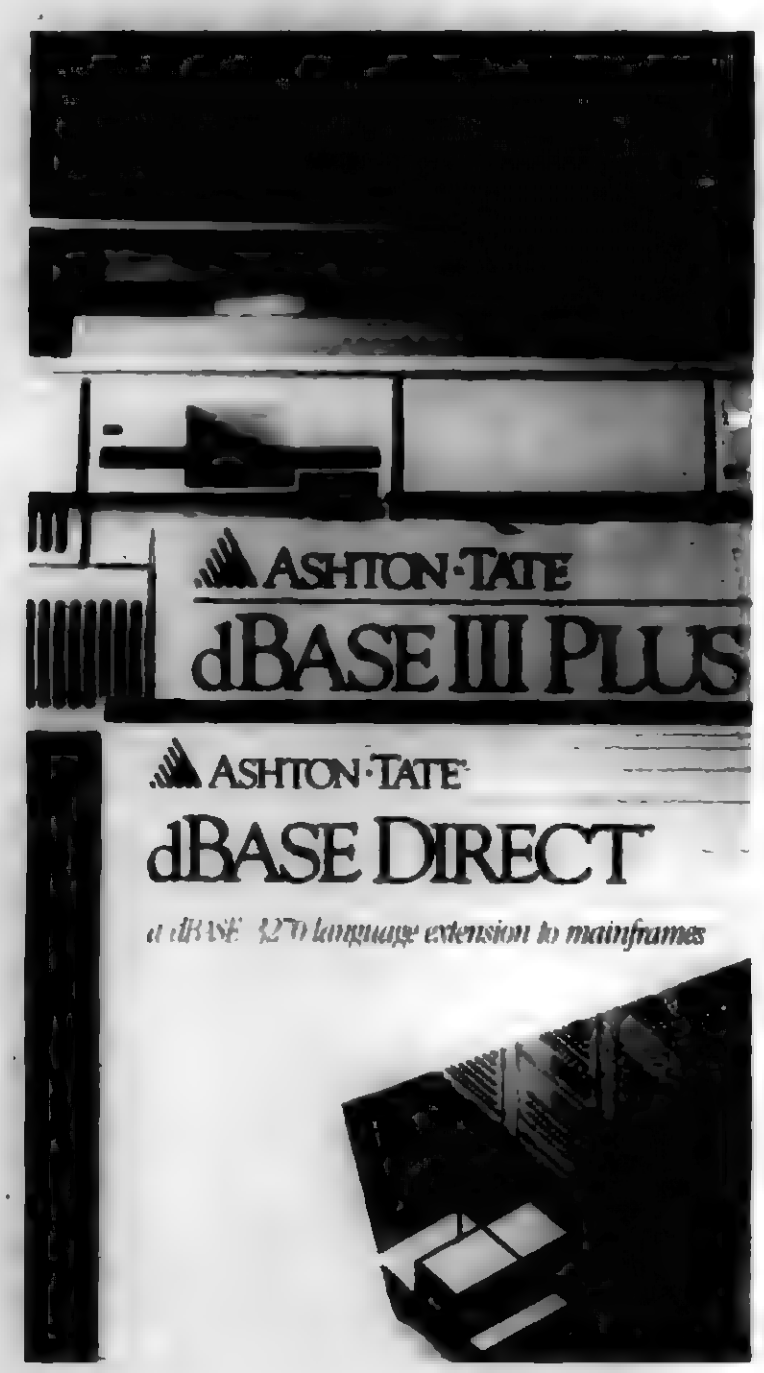
He maintained that expanding ICL's range of software and services across Europe was one of the main reasons for acquiring Nokia Data, especially as its product portfolio was, to a large extent, complementary to ICL's.

Quizzed on whether any jobs were threatened as a result of Nokia Data's 7,000 employees now being added to his company's payroll, Bonfield pointed out that despite the pressure on profit margins, his company was still expanding. He claimed the attrition rate for a company of ICL's size would normally account for the shedding of some 3,000 jobs per year.

On the question of whether he anticipated any objections to the Nokia Data takeover from within the European Economic Community, Bonfield was similarly phlegmatic. "I can't see why anyone should object, apart from our rivals," he said. "The deal not only increases our research and manufacturing capability across Europe, but it also means we now have a [$1.7 billion] operation on the continent. That's good for our customers, good for our employees and good for competition in general — and I think that's what we're supposed to be doing."

Condon is a London correspondent for the IDG News Service.

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Job rotations grease long-term IS wheels

BY ALAN J. RYAN
CW STAFF

Evan Wride became a believer in job rotation when he was moved from the information systems department at restaurant chain Denny's, Inc. into the company's assistant controller position.

While formal college degrees and technical prowess are on Wride's list of career development must-dos, "If I have to single out one thing, I can't think of anything more beneficial" than job rotation, he says. "It exposes you to new technologies, new applications, new business areas and new people."

Since his days at Denny's, Wride has moved on to become director of IS at Nissan Motor Corp. in Carson, Calif. He says job rotation makes for well-rounded employees with better cross-departmental communication skills.

Job rotation "cuts across every area of development a person needs to get," Wride says, "and there is direct correlation between how broad you are to how high you can go."

For employees, there are several advantages to rotating jobs and responsibilities:

- The employee learns new skills, including people skills.
- IS workers have the opportunity to expand technical proficiency by working on different types of hardware and software.
- Rotated employees have more interaction with a greater number of people.

Useful rotations

Professionals who plan to make their career in IS and who see job rotation as a useful way to gain business experience will find that some rotations make more sense than others. Experts agree that the most useful rotations are in the functional areas that most closely relate to the IS professional's current role.



For instance, a programmer who writes financial applications will usually find that a job in the finance department will be easier to adapt to than one in marketing. Once the rotation is completed, he can go back to IS with a new appreciation of the user perspective.

Fortune 500 companies are the most likely to offer this type of career development plan, job placement specialists say. The benefits for employees are greater at these large firms, where without such programs, IS workers can sometimes become compartmentalized into one area.

However, for managers, moving a company into job rotation mode is not without its challenges, says Rob Graven, owner and president of PFC, Inc., an executive search firm in San Francisco. But, he adds, the long-term benefits outweigh the initial problems.

"Any kind of transition costs time and money," Graven says. By taking a business analyst from one area and moving him to another, the company will have two workers in transition: the worker learning a new area and the worker filling the business analyst's post. Both may take up to six months to get up to speed in their new jobs.

Nissan is still in the early stages of the job rotation process, Wride says. It is a companywide program, but he can take credit for starting the process in the IS area.

Wride agrees that the initial investment period into a job rotation process shows few quantifiable paybacks. "The company might not get payback for four to six years," Wride says. But as each year passes, the company will have a greater percentage of employees who have a broader understanding of all aspects of how Nissan works, he adds.

Another issue to grapple with when starting any type of new program is fear of the unknown, Wride says. "If you're moving into a job you've never done before, you probably ought to be a little apprehensive," he says. "But after six or 12 months, you figure out that you can pretty much do any job" if you've got good business sense.

Some companies, such as Xerox Corp., offer formalized rotation processes for entry-level employees, whereby workers selected for the program will rotate through various jobs every three to six months, explains Carol Jones, manager of human resources strategy for corporate information management at Xerox's Rochester, N.Y., office.

The quick rotations give the IS workers a window on the company as a whole and on the kinds of departments they will be supporting, she says. The program has been in place since 1989, but results have yet to be measured, she says. "That can't really be assessed until those people move further along in their careers."

At other firms, the rotations may last two years or longer: Many firms say that the first three to six months in a new job is the "breaking-in" period and that a worker should remain in the job for at least 18 months to contribute to that business.

Moving in, moving out

For many companies, the most common types of job rotations are interdepartmental. IS workers may rotate through several IS positions, acquiring new skills as they go. Less frequent are instances where employees from the IS department are rotated to jobs outside of that department. And even less frequent are rotations that involve bringing non-systems workers into the IS department.

However, if Levi Strauss & Co. is an example, the norm may be changing. At the San Francisco-based apparel manufacturer, the shift toward IS workers gaining more business skills and business workers gaining more analytical skills means that the cross-departmental flow of workers is likely to increase.

To date, there have been more employees rotated from business areas into IS than vice versa, says Donna Rund, director of information engineering. One way to make that happen, she says, is by first giving people a "dotted-line" responsibility to IS for their respective business areas.

In the last two years, she says, two director-level business managers have moved into the IS environment. One, a former merchandising manager, is now director of end-user support. "They bring a balance and perspective that if you just had pure technical, you don't quite get."

That is not to say IS people do not have a chance to move as well, Rund adds, citing an IS business analyst who moved to merchandising and is now one of the highest officials in that area.

Ryan is a *Computerworld* senior writer, features.

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Demand for Unix C programmers soars

BY ALICE LAPLANTE
SPECIAL TO CW

Programmers who can write applications for Unix in the C language are getting the red carpet treatment. A strong demand for these professionals has been created for two reasons: Unix is becoming more popular in the commercial sector, and C is overwhelmingly the language of choice on Unix because of its portability across a wide variety of platforms.

Four years ago, Unix was confined mainly to scientific and engineering shops. But the increasing acceptance of IBM's AIX and Sun Microsystems, Inc.'s Sparcstations — coupled with the downsizing of mainframe-based applications onto minicomputers and local-area networks — has accelerated interest in Unix in the commercial sector.

Brokerage firms, manufacturing facilities and even banks are moving to take advantage of both the portability and cost savings inherent in a Unix-based, smaller systems environment.

"Unix is becoming a ubiquitous platform, displacing traditional IBM mainframe environments in a number of key industries," says Richard Wonder, national director of the information systems division at recruitment firm Robert Half International, Inc.

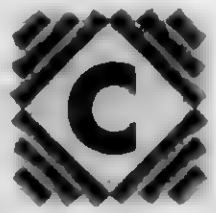
Because of this shift, Wonder says, there's a short supply of C programmers who can build corporate applications and communications systems.

"Good C programmers are hard to find," says Joe Hawkins, technical director of the advanced systems group at Pacific Bell in San Ramon, Calif. He is currently looking to hire C experts for internal expert systems development.

Improved education

Other IS managers say the shortage of Unix C programmers is beginning to ease — thanks in large part to the fact that IS and computer science departments at universities now teach C as a regular part of the curriculum. "Schools began incorporating C a few years back, so we are now seeing relatively young people with a good grasp of the language," says Frank Panella, director of systems development at Dow Jones & Co. in Princeton, N.J.

The benefits of C in the Unix environment are many. C can be a very productive language in a business environment because of its portability, Panella says. He can leverage those IS workers who know C across a number of different hardware platforms. For this reason, Dow Jones — which currently does not use C on its IBM systems — has initiated a program in which IBM software developers are being introduced to C in classes and seminars, with an eye toward making them more versatile. "This will enhance productivity as well as ultimately make programmers more upwardly mobile," Panella says.



In addition, companies with heavy number-crunching or statistical processing needs have taken to Unix and C wholeheartedly. That's why brokerage house LBI Trading, Inc. in New York is currently developing C-based applications on Sun Sparcstations, says Jo Bette McCann, vice president of systems development.

Even in regions hurt by the sluggish economy, experienced C programmers can have their pick of jobs at a time when workers with other technical skills are being laid off.

"We haven't experienced a slowdown in demand for Unix C programmers at all, even though openings for IBM mainframe programmers have dropped off considerably," says Bob Rich, associate director of the southwest region of Source EDP, who sees a lot of local firms building departmental applications around Unix minicomputers, particularly in the financial services industry.

Increasing salaries

Because of the overall demand, Unix C programmers are commanding higher salaries. "Unix C programmers can get between $5,000 and $10,000 more than programmers in the IBM world," says Dave Flansbaum, managing director for the Northern California office of Source EDP.

However, while the response to C in the Unix environment is overwhelmingly favorable, some IS managers shun it, saying the much-publicized trend toward C in mainstream IS shops is overstated.

"It's a difficult language, and there are too many ways to get yourself in trouble with C," says Dale Heller, assistant vice president of IBM systems and programming at Service Merchandise Corp. in Nashville. Heller compares the current rage about C with the excitement about PL/1 a few years ago.

"It supposedly was building up a tremendous momentum, but a year or two later, people woke up and it never really caught on," he says.

LaPlante is a free-lance writer based in Palo Alto, Calif.

Opportunities knock for DOS, too

The enormous popularity of Microsoft Corp.'s Windows has boosted C to become the language of choice in the DOS world.

But IS shops building Windows applications do not hire Unix C programmers — they look specifically for people who have C expertise within the DOS operating system.

"Knowing C in general does not in itself make you marketable," says Richard Wonder at Robert Half International. "It's knowing the language within the context of a certain operating environment — either Unix or Windows — that matters."

Because of key differences between the two environments, there is virtually no overlap in personnel between Unix C and Windows C programmers, IS managers and recruiters say. "Although the language is the same, there's a strong dichotomy in overall skills," says Wonder, who is recruiting Windows programmers for corporations that have recently established Windows as their desktop standard and have a host of internally developed DOS applications to bring up to date.

The reason for the high demand is that "the learning curve for a good C programmer in the Windows environment is from six to nine months, and Windows has only been out a little over a year. That makes it tough for companies to find people with expertise," says Chris Porch, head of Ocean Consulting in Escondido, Calif., which specializes in writing custom Windows applications for large corporate customers.

Still, recruiters say Windows C programmers don't command as high salaries as do Unix C programmers.

"We're still seeing more demand for Unix programmers than DOS C programmers, and companies seem willing to pay more for the Unix expertise," says Dave Flansbaum, managing director for the Northern California region of Source EDP.

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Diversified region weathers manufacturing slump

BY JILL VITIELLO
SPECIAL TO CW

At first glance, Detroit and Cleveland, the No. 1 and No. 2 American cities for car manufacturing, would seem to be the last places where an information systems professional would find work. In the last quarter of 1990, Chrysler Corp., Ford Motor Co. and General Motors Corp. lost a record $2.1 billion. Topping that, last year's unemployment rate in Detroit climbed to 7.5%, while Cleveland's hit 4.8%.

But despite sobering statistics, IS professionals and recruiters say Detroit and Cleveland are still good places to live and work. Both cities have economic bases diverse enough to keep most currently employed IS professionals busy — and happy. The cities have worked hard to turn around their tarnished images by sprucing up their downtown areas with shops and restaurants.

In addition, Detroit and Cleveland offer a variety of entertainment opportunities, as well popular professional sports teams and sporting events, such as the Grand Prix in Detroit. In fact, recruiters say most IS professionals are reluctant to relocate because they find the cities familiar and comfortable.

Ironically, many of the thriving companies in Detroit are Japanese. In fact, according to a recent report in *The Wall Street Journal*, the Detroit Chamber of Commerce figures that without the Japanese hiring Americans to run their nearly 300 factories and laboratories — many of which are auto-related — employment in the eight counties surrounding Detroit would have declined seriously as the recession began last year.

Popular industries

Healthy American companies in Detroit and Cleveland can be found most readily in industries such as banking, insurance, hospitals and medical supplies, where companies are generally maintaining or adding IS staff.

"We're working six days a week to fill jobs in these hot industries," says Joy Carroll, supervisor of IS and placement manager at Robert Half International, Inc. in Troy, Mich.

The not-so-hot areas are largely in the American automotive business. GM, Chrysler and Ford were not available for comment on the outlook for IS professionals in their organizations. Other companies that are doing poorly are auto-related, such as companies that supply parts or provide services to these American auto-making giants.

Yet the non-auto-related companies that are downsizing in these industrial centers aren't cutting back on IS. Blue Cross/Blue Shield of Michigan, for instance, recently downsized its operations after installing several new technologies but added 10 positions to its IS staff of 280 developers last year, according to John Higbee, vice president of IS.

Talent show

IS employers say skills that will give IS professionals the most mileage in both cities are those related to IBM mainframes or Application System/400s. Next on the list, they say, are DB2 and computer-aided software engineering.

But the profile of an ideal job candidate goes beyond technical expertise. Employers are becoming increasingly selective in their hiring procedures. Cleveland and Detroit employers say they are looking for "value-added" employees: people who bring a mix of technical and business skills to the bargaining table.

Corporations' demands are much more specific than in previous years, says Joe Greco, president of Innovative Resources Corp., a search firm based in Rocky River, Ohio, a suburb of Cleveland. "Firms understand that they're in the driver's seat, and they're looking for intangibles above and beyond a super technician. Today, companies want employees with enthusiasm and good business bearing."

Most observers believe this call for a blend of business and technical skills is a bellwether trend for the nation. Of all the IS job descriptions, "business systems analysts should have the strongest, most viable future as opposed to those who are strictly technicians," says Eric Hollenbach, director of IS at Lucas Aerospace, Inc. in Aurora, Ohio.

Even in situations where companies are forced to lay off IS workers, some departments are being permitted to bring business systems analysts on board.

For example, John Clegg, vice president of information services at Cleveland-based Standard Products Co., a supplier of extruded vinyl and rubber parts to the auto industry, reports that this spring, he had to lay off two staff members. Yet, in order to replace other staff members who resigned, he intends to fill four positions, one of which will be a business systems analyst with experience in finance and manufacturing.

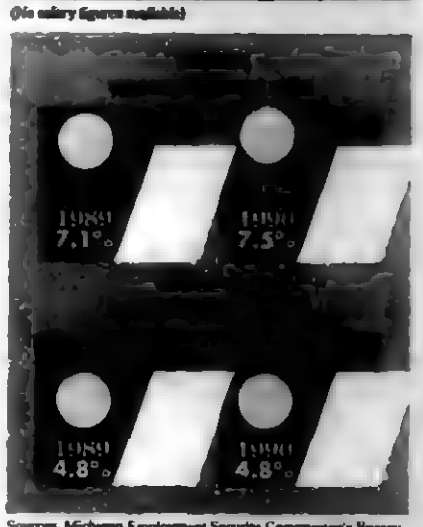
The outlook in Detroit is just as competitive. People vying for senior-level systems analysts jobs are expected to have advanced degrees, preferably MBAs, according to Carroll.

Corporate executives and recruiters leave IS professionals in the Detroit and Cleveland areas with this advice: Increase your skills through education. Read industry publications frequently, take courses at community colleges or enroll in advanced-degree programs.

Vitiello is a speech writer and free-lance writer based in East Brunswick, N.J.

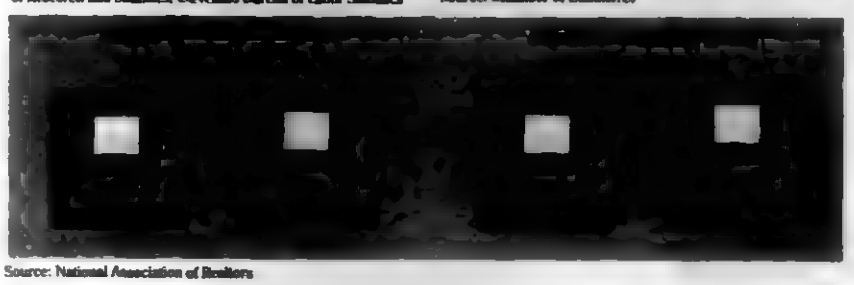


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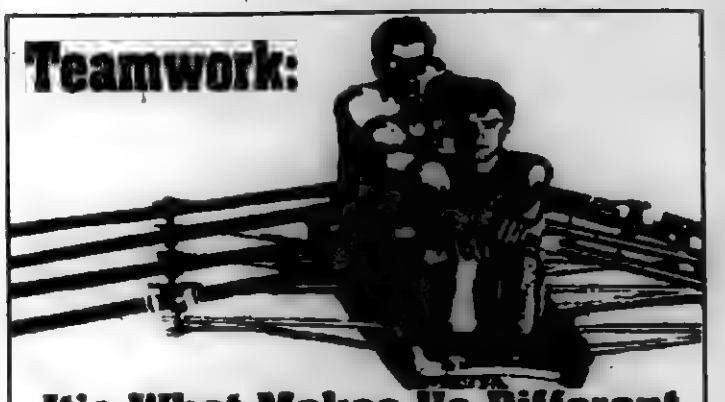


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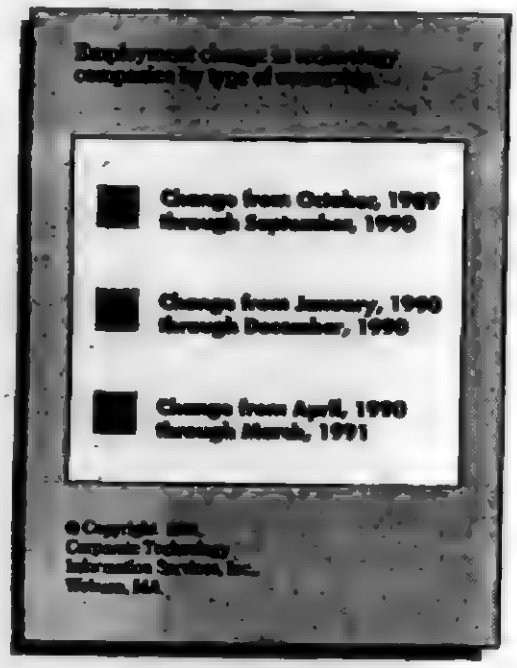
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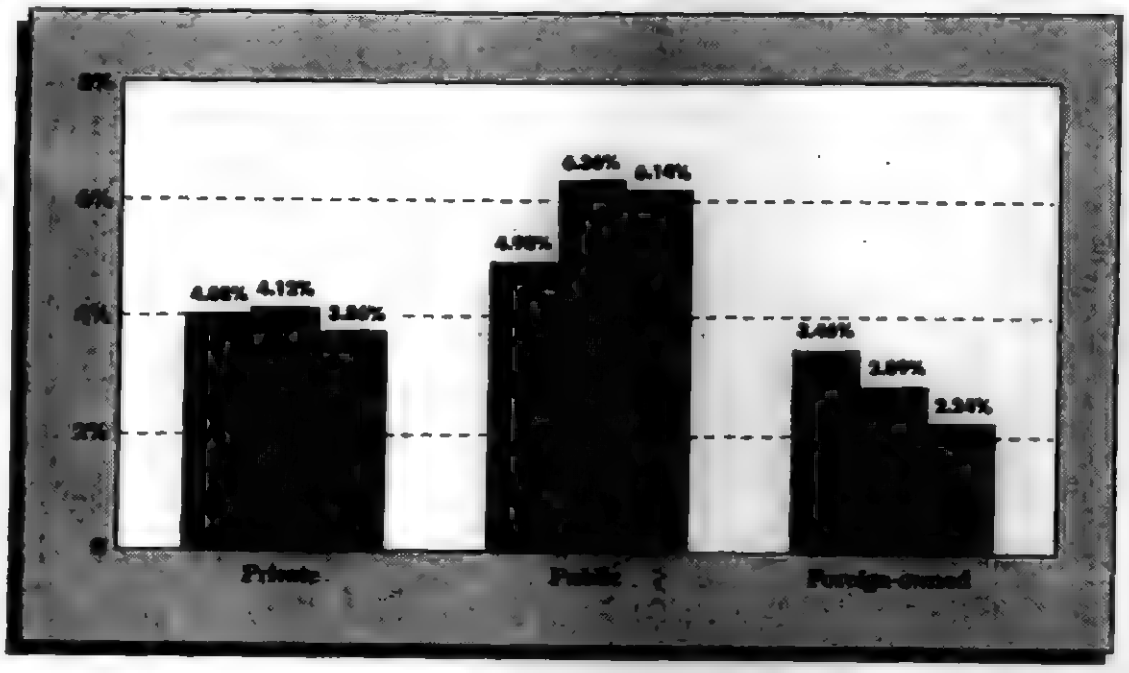
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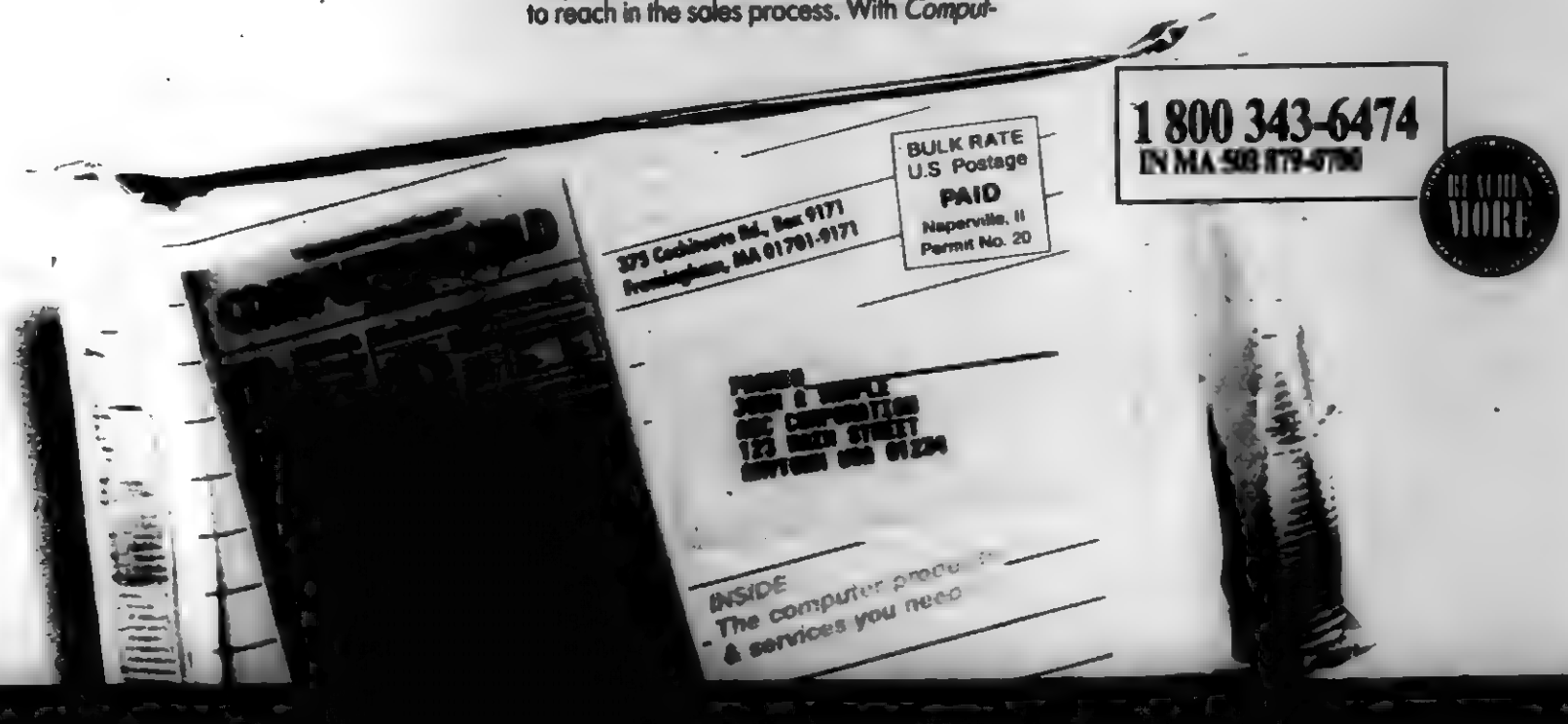
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Avoiding electronic mail legal hassles

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY BENJAMIN WRIGHT
SPECIAL TO CW

In the past, if a customer wanted to lease equipment from Texaco, Inc., the negotiation process was awkward. Texaco would mail its lease form to the customer, who would cross out some clauses, add new ones and mail the lease back. This process could continue for weeks.

Now, Texaco has a shortcut. It has developed a Lease/Purchase Information Trading System to permit leases to be negotiated electronically. Texaco and its customer sign a trading agreement that sets the general rules for negotiation. Thereafter, as specific lease contracts are needed, Texaco and its customer negotiate and finalise them via electronic mail messages.

Through the advent of computer messaging technology, many business transactions are being handled in this paperless fashion. But skeptics fear that electronic contracts are not legally effective. Information systems professionals may find legal issues to be unexpected roadblocks to the implementation of electronic trading systems. However, the truth is that the legal issues are more manageable than the skeptics think.

A contract comes into being whenever an offer meets an acceptance. Many companies today form contracts through electronic data interchange (EDI), a popular form of computer-to-computer messaging.

An IS buyer, for instance, might send a vendor an EDI purchase order offering to buy 10,000 floppy disks for $3,000. At this point, no contract exists. But if the vendor responds with an EDI purchase order acknowledgment accepting the offer, a contract is born. Buyer and seller become legally bound to the terms of their E-mail messages.

Legal skeptics raise three fears about electronic contracts that IS professionals should take note of: writing requirements, signatures and evidence.

• **Writing requirements.** The "statute of frauds" (a law in almost all states) requires that many types of contracts be evidenced by a "writing" to be enforceable. Traditionally, a writing means ink on paper, so there is some question whether a computer message is considered a writing. No court has specifically ruled on the issue.

Nonetheless, the statute of frauds is an outdated law that now has so many exceptions it has virtually no effect. Moreover, a convincing argument can be made that a recorded E-mail message is a writing. Like a paper document, such a message is an intelligent arrangement of symbolic data, memorialised in a medium that is more reliable than human memory.



Still, to preclude any disagreement on the issue, companies can easily enter special contracts in advance of trading to stipulate that their electronic messages are written.

• **Signatures.** The statute of frauds also denies legal recognition to some contracts that lack a signature.

However, the law defines a signature very liberally. The Uniform Commercial Code, for example, defines a signature as "any symbol" adopted by someone intending to approve a writing.

Thus, a simple string of electronic characters ("ABCD") could constitute a signature if that is the sender's intent. To eliminate any question about signature legality, parties can enter a trading partner agreement that acknowledges specified electronic codes as effective signatures.

• **Evidence.** Skeptics are afraid that computer messages cannot readily be admitted as evidence in court. But the fear was discredited in March 1990, when E-mail messages were admitted into a high-stakes criminal trial — the Iran/Contra prosecution of former National Security Adviser John Poindexter. The case demonstrated that messages need not reside on paper to be admissible into evidence.

In a formal sense, judges refer to certain esoteric principles of law — such as the hearsay rule and the best evidence rule — to determine whether a specific bit of computer evidence can be admitted to trial. But in substance, what judges really want to know is whether the evidence is reliable.

For computer professionals, this means that if they want their records of messages to be admissible in court, they need to make the records reliable: In data processing terms, they need to place "controls" over the records.

The Poindexter case illustrates the types of controls that can be built into commercial computer systems. First, a competent professional maintained the E-mail network. Second, secure passwords restricted access to the system. Third, the network automatically time-stamped messages. Finally, the computer operating program and the E-mail records were under the exclusive control of a neutral system operator.

As the legal taboos against electronic contracts disappear, companies are finding new and profitable ways to employ messaging technology.

Take the movie industry, for example. Today, when a movie distributor negotiates with a local theater on the marketing of a particular film, the parties strike an agreement by telephone and then formalise it with a paper contract. Now the industry is developing an EDI message to replace the paper contract.

Indeed, as computer professionals gain experience with computer contracts, they can see that the legal issues confronting them can be tamed with appropriate techniques. For IS managers implementing electronic transaction systems, legal issues need only be considered, not feared.

Wright is an attorney in Dallas and author of The Law of Electronic Commerce: EDI, Fax and E-mail.

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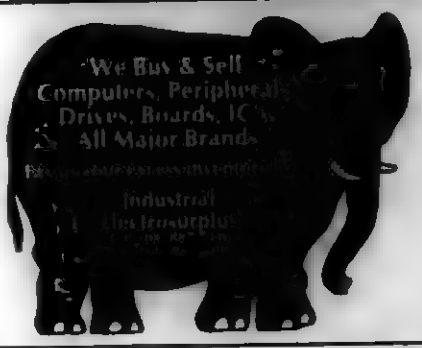
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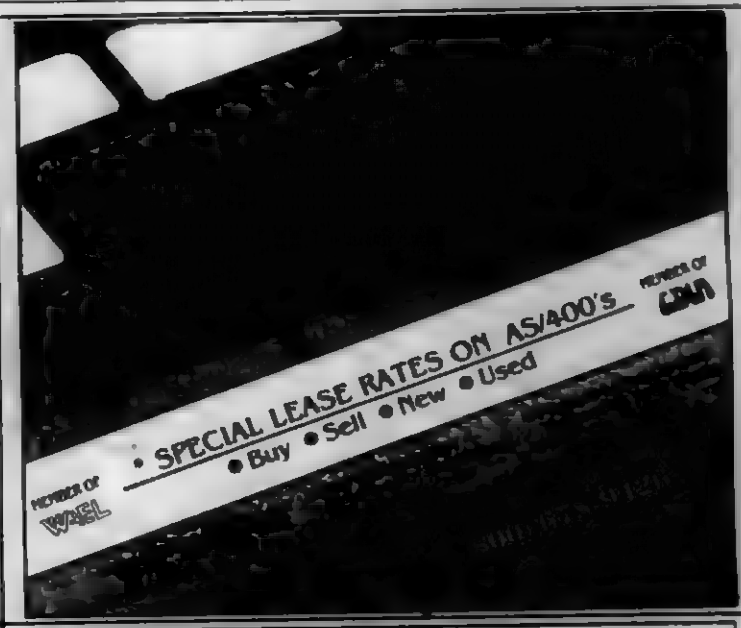
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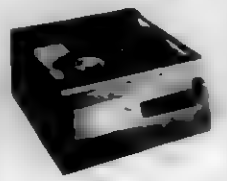
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INVESTMENT FOCUS: PC SOFTWARE

Personal computer software vendors have not been struck by the recessionary 18-wheeler that has mowed down other technology sectors, according to a recent survey conducted by New York-based Bear Stearns & Co. and accounting firm Goldstein, Golub, Kessler & Co.

The poll of 300 U.S. microcomputer managers found that 20% have cut PC budgets this year, but 34% have increased spending on PCs and related products. Meanwhile, many PC software stocks are now trading at or near 52-week highs. Microsoft Corp.'s Windows 3.0 — and the applications coming out to support it — is partly responsible for the current good health of the sector, said Louis Giglio, software analyst at Bear Stearns. Just under 78% of the respondents said they are using Windows 3.0 right now, with 15.5% currently evaluating the graphical user interface.

While companies selling Windows-compatible packages may gain market share and profits in the coming quarters, the here and now may be tumultuous for some firms as customers defer buying decisions while they wait for new products, Giglio said.

Software Publishing Corp. A Windows version of Harvard Graphics is expected to go into beta testing within three months, which means that a market-ready product will not be available until late this year or early 1992, Giglio said. This tardiness does not bode well for Software Publishing stock, which he rated a hold. Shares have slipped nearly 14% in the past six weeks, from 21⅛ to 18⅛ as of last Wednesday.

Borland International, Inc. "An ideal software company would have not only leading market share but also increasing share," Giglio said. Borland's product diversity means it does not depend on a single market to drive sales. It continues to gain share in the spreadsheet arena, he said. However, Borland now trades at the high end of its valuation, so Giglio recommends holding the stock.

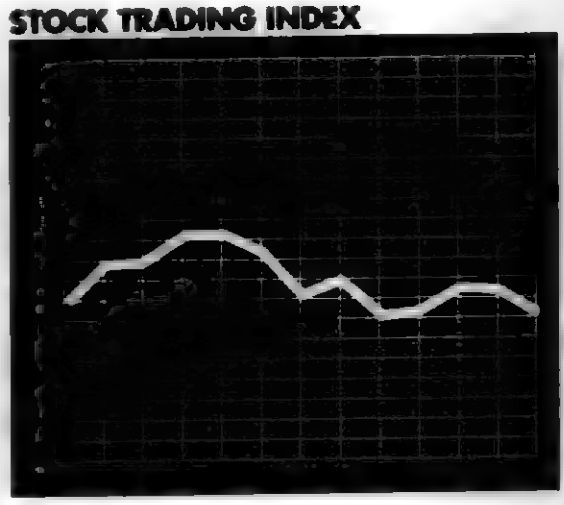
Scott Smith, an analyst at Donaldson, Lufkin & Jenrette Securities Corp., disagrees. "We now look for Paradox for Windows in late 1991, not 1992" as was formerly estimated, he said, adding that new products should ensure continued momentum, making Borland moderately attractive. Investors seem to agree, boosting Borland 3% in recent weeks, from 49¾ to 51⅝.

Lotus Development Corp. Lotus gets 70% of its sales from its 1-2-3 spreadsheet, which makes it overly dependent on one product, according to Giglio. To its credit, however, Lotus is trying to pierce the markets for different platforms, including Digital Equipment Corp. minicomputers and IBM mainframes. However, the various versions of 1-2-3 are functionally limited because developers have not exploited the best features of each platform, said Giglio, who rated the company a hold.

Others are more optimistic. Lotus will outperform other PC software stocks, according to David Bayer, an analyst at Montgomery Securities, Inc. in New York. Strong sales of 1-2-3 for Windows, scheduled to ship in August or September, will bolster earnings in 1991 and 1992, he said, adding that Lotus will take 29% of the Windows-compatible spreadsheet market next year, compared with Borland's 10%. Lotus stock has slipped 5% since the beginning of May, from 33¼ to 31⅝.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Financial news from Unisys Corp. preceded a ⅝-point stock slide last week to end up at 4 by Thursday. Unisys, which may be close to paying about $190 million in penalties for fraud in vying for U.S. government contracts, also said it will sell its Timeplex, Inc. unit.
- Microsoft Corp. unveiled DOS 5.0, a new version of its operating system. Its stock slid ⅛ of a point to close Thursday at 111. Lotus Development Corp. also declined, dropping ½ of a point to 32.
- Chip stocks fell as the cyclical downturn in semiconductor orders began to show up in the sector's most recent book-to-bill ratio. Intel Corp. dropped 4¾ points to 48¾; Motorola, Inc. lost 3⅝ to finish at 64⅝; Texas Instruments, Inc. stumbled 3½ points to 35⅛.
- Long-distance carrier United Telecom, parent company of U.S. Sprint Communications Co., gained ⅜ of a point to 28½, while MCI Communications Corp. stayed even at 29½.

Computerworld Friday Stock Ticker

PRICES AS OF 2:30 P.M., FRIDAY, JUNE 14, 1991

TOP PRICE WINNERS

Information Int'l	43.94
MAI Systems Corp.	25.00
Television Systems	18.02
Datapoint Corp.	16.67
Computer Associates	12.00

TOP PRICE LOSERS

Micropolis Corp.	-31.76
Pyramid Technology	-30.10
Gleason Systems	-18.67
American Mgmt. Systems	-16.67
Ansil Communication Corp.	-15.79

MOST ACTIVE WINNERS

Information Int'l	3.69
Adobe Systems Inc.	3.50
Computer Sciences	2.75
Southwestern Bell Corp.	2.25
Harris Corp.	2.00

MOST ACTIVE LOSERS

Pyramid Technology	-7.75
Apple Computer Inc.	-4.88
American Mgmt. Systems	-4.25
Sun Microsystems Inc.	-4.00
Novell Inc.	-3.75

	Exch	52-Week High	52-Week Low		June 14 Price	Wk Net Change	Wk Pct Change
Communications and Network Services							Off 0.17%
3COM Corp.	OTC	19.88	5.38	3COM Corp.	8.13	-0.75	-8.45
American Info Techs	NYS	69.75	52.38	American Info Techs Corp.	58.00	1.13	1.99
AT&T	NYS	44.13	25.00	AT&T	37.00	0.63	1.72
Ansil Communication	OTC	5.63	0.88	Ansil Communication Corp.	2.00	-0.38	-15.79
Bell Atlantic	NYS	56.25	39.50	Bell Atlantic Corp.	48.25	1.63	3.84
Bellsouth	NYS	56.25	47.00	Bellsouth Corp.	48.00	0.63	1.32
Cabletron Systems	NYS	44.00	13.13	Cabletron Systems	37.38	1.63	4.56
Compression Labs	OTC	25.88	8.25	Compression Labs Inc.	16.38	1.13	8.52
Data Switch	OTC	5.13	2.75	Data Switch Corp.	3.25	-0.38	-10.34
Digital Comm. Assoc.	NYS	26.13	8.88	Digital Comm. Assoc.	15.63	-0.75	-4.58
Dynatech	OTC	25.25	12.25	Dynatech Corp.	18.75	-1.88	-9.09
Fibronix Int'l	OTC	12.88	5.50	Fibronix Int'l Inc.	8.88	0.25	2.90
Gandalf Technologies	OTC	3.88	1.75	Gandalf Technologies Inc.	3.50	0.25	7.69
General Datacomm	NYS	4.13	1.63	General Datacomm Inds.	2.13	0.00	0.00
GTE	NYS	53.38	23.50	GTE Corp.	29.63	0.25	0.85
ITT	NYS	63.00	40.25	ITT Corp.	60.00	-1.50	-2.44
MCI Communications	OTC	42.88	17.88	MCI Communications Corp.	30.00	0.38	1.27
Microcom	OTC	10.50	2.75	Microcom Inc.	6.25	0.13	2.04
Network Equipment Tech.	NYS	10.38	4.00	Network Equipment Tech.	8.63	0.13	1.32
Network General	OTC	14.63	4.00	Network General	9.25	0.25	2.13
Network Systems	OTC	15.50	8.13	Network Systems Corp.	13.25	-0.50	-3.64
Northern Telecom Ltd.	NYS	37.88	22.13	Northern Telecom Ltd.	37.88	0.63	1.68
Novell	OTC	58.50	17.25	Novell Inc.	48.50	-3.75	-7.94
Wang Labs	NYS	85.13	67.00	Wang Labs Corp.	70.63	1.63	2.38
Pacific Telesis Group	NYS	47.50	36.25	Pacific Telesis Group	40.50	1.88	2.53
Pairel	ASE	15.38	4.75	Pairel Corp.	14.50	0.00	0.00
Scientific Atlanta	NYS	28.00	8.88	Scientific Atlanta Inc.	13.63	-0.13	-0.91
Southwestern Bell	NYS	57.50	47.25	Southwestern Bell Corp.	52.00	2.25	4.52
United Telecom	NYS	40.50	29.63	United Telecom	38.88	1.88	3.59
US West	NYS	48.75	32.38	US West Inc.	36.50	-0.13	-0.36
Computer Systems							Off 0.62%
Alliant Computer Sys.	OTC	8.50	0.96	Alliant Computer Sys.	1.13	0.00	0.00
Amdahl	ASE	16.88	10.00	Amdahl Corp.	15.88	-0.38	-2.31
Apple Computer	OTC	73.25	24.25	Apple Computer Inc.	41.25	-4.88	-10.57
Archive	OTC	11.13	4.25	Archive Corp.	6.88	-0.25	-3.51
AST Research	OTC	32.75	7.50	AST Research Inc.	22.88	-0.13	-0.54
Bolt, Beranek & Newman	NYS	9.38	4.00	Bolt, Beranek & Newman	7.88	-0.50	-5.97
Commodore Int'l	NYS	21.63	4.50	Commodore Int'l	14.63	-0.88	-5.65
Compaq Computer	NYS	74.25	34.13	Compaq Computer Corp.	34.13	-2.63	-7.14
Computer Automation	OTC	2.13	0.13	Computer Automation Inc.	1.88	-0.13	-11.11
Control Data	NYS	19.75	6.75	Control Data Corp.	11.50	0.00	0.00
Convex Computer	NYS	20.88	8.38	Convex Computer	17.13	0.13	0.74
Cray Research	NYS	48.75	20.00	Cray Research Inc.	35.38	-1.00	-2.75
Data General	NYS	14.13	3.88	Data General Corp.	15.75	-0.50	-3.08
Datapoint	NYS	3.25	0.75	Datapoint Corp.	1.75	0.25	16.67
Dell Computer	OTC	30.63	8.25	Dell Computer Corp.	25.13	0.00	0.00
Digital Equipment	NYS	87.50	46.50	Digital Equipment Corp.	85.38	-1.63	-2.43
Harris	NYS	38.13	13.75	Harris Corp.	28.50	2.00	7.55
Hewlett-Packard	NYS	56.13	34.88	Hewlett-Packard Co.	51.50	0.13	0.24
IBM	NYS	139.75	96.25	IBM	180.25	-1.75	-1.72
Information Int'l	OTC	13.50	7.75	Information Int'l	11.88	3.63	43.94
Intergraph	OTC	31.50	10.50	Intergraph	28.75	-0.50	-1.71
MAI Systems	NYS	2.25	0.50	MAI Systems Corp.	0.63	0.13	25.00
Motorola	NYS	149.75	114.00	Motorola Inc.	119.50	1.00	0.84
Mentor Graphics	OTC	23.88	9.00	Mentor Graphics Corp.	17.88	1.00	5.93
NCR	NYS	105.88	44.50	NCR Corp.	105.38	0.50	0.48
Pyramid Technology	OTC	31.75	11.00	Pyramid Technology	18.00	-7.75	-30.10
Sequent Computer	OTC	33.25	9.75	Sequent Computer Sys.	14.00	-0.25	-1.75
Silicon Graphics	NYS	47.25	18.00	Silicon Graphics	32.38	-0.88	-1.89
Stratus Computer	NYS	37.25	14.63	Stratus Computer Inc.	30.50	-1.88	-5.78
Sun Microsystems	OTC	38.63	15.00	Sun Microsystems Inc.	32.25	-4.00	-11.03
Tandem Computers	NYS	24.75	8.88	Tandem Computers Inc.	15.38	-0.63	-3.91
Tandy	NYS	39.50	22.50	Tandy Corp.	32.00	-1.00	-3.03
Teradata	OTC	29.50	8.75	Teradata	14.63	-1.50	-9.30
Ultimate	OTC	7.88	1.38	Ultimate Corp.	5.13	-0.13	-2.38
Unisys	NYS	14.63	1.75	Unisys Corp.	4.00	-0.13	-3.03
Wang Labs Inc. (b)	ASE	5.75	2.00	Wang Labs Inc. (b)	3.75	0.25	7.14
Software & DP Services							Up 0.36%
Adobe Systems Inc.	OTC	63.00	17.00	Adobe Systems Inc.	51.75	3.50	7.25
Alcorp	OTC	13.50	6.75	Alcorp	6.75	-0.75	-10.00
Aldus Corp.	OTC	30.88	20.25	Aldus Corp.	46.75	0.25	0.55
American Mgmt. Systems	OTC	28.50	12.00	American Mgmt. Systems	21.25	-4.25	-16.67
American Software Inc.	OTC	18.25	7.50	American Software Inc.	13.50	-0.63	-4.42
Anacomp Inc.	NYS	4.63	1.38	Anacomp Inc.	3.50	0.25	7.69
Analysts Int'l	OTC	23.50	10.00	Analysts Int'l	16.75	0.75	4.69
Ashton-Tate	OTC	13.25	4.88	Ashton-Tate	11.25	0.13	1.12
ASK Computer Sys.	OTC	10.25	4.00	ASK Computer Sys.	8.25	-0.13	-1.49
Auto Data Processing	NYS	37.00	22.63	Auto Data Processing	32.00	0.00	0.00
Autodesk Inc.	OTC	60.50	32.00	Autodesk Inc.	28.75	1.75	3.62
BBN Systems Inc.	OTC	31.50	18.50	BBN Systems Inc.	27.25	-0.75	-2.68
BMC Software Inc.	OTC	43.88	17.75	BMC Software Inc.	38.75	-0.50	-1.27
Boole & Babbage Inc.	OTC	21.50	10.25	Boole & Babbage Inc.	10.25	-0.75	-6.82
Borland Int'l	OTC	64.25	14.50	Borland Int'l	51.25	0.63	1.23
Businessland Inc.	NYS	8.50	0.44	Businessland Inc.	1.13	0.00	0.00
Cognos Inc.	OTC	20.88	6.13	Cognos Inc.	14.88	-0.63	-4.03
Computer Associates	NYS	19.88	4.38	Computer Associates	10.50	1.13	12.00
Computer Horizons	OTC	17.75	9.50	Computer Horizons	10.75	0.25	2.38
Computer Sciences	NYS	73.25	38.75	Computer Sciences	68.50	2.75	4.18
Computer Task Group	NYS	11.50	6.63	Computer Task Group	8.38	0.00	0.00
Comshare Inc.	OTC	25.25	13.00	Comshare Inc.	18.75	0.13	0.84
Corporate Software	OTC	16.00	3.75	Corporate Software	10.25	-0.13	-1.20
General Motors E (EDS)	NYS	48.00	27.88	General Motors E (EDS)	47.13	-1.63	-3.35
Gold Systems Int'l	OTC	10.75	7.25	Gold Systems Int'l	14.00	-0.25	-1.75
Hogan Systems Inc.	OTC	7.00	1.38	Hogan Systems Inc.	5.81	-0.06	-1.06
Information Resources	OTC	23.88	7.75	Information Resources	21.25	0.63	3.03
Informix Corp.	OTC	17.50	2.63	Informix Corp.	6.08	0.25	4.26
Intellicorp Inc.	OTC	7.88	1.38	Intellicorp Inc.	1.81	0.19	11.57
Interleaf Inc.	OTC	8.25	2.50	Interleaf Inc.	4.38	0.00	0.00
Intersolv	OTC	15.88	6.88	Intersolv	9.00	-0.25	-2.70
Knowledgeware Inc.	OTC	43.25	10.00	Knowledgeware Inc.	28.88	0.75	2.75
Legent Corp.	OTC	46.00	16.75	Legent Corp.	31.38	-0.88	-2.71
Lotus Development	OTC	38.00	12.50	Lotus Development	32.75	0.50	1.55
Microgrids	OTC	32.50	13.00	Microgrids	18.50	1.50	10.00
Microsoft Corp.	OTC	117.50	50.75	Microsoft Corp.	111.75	1.50	1.36
On Line Software Int'l	NYS	10.50	4.50	On Line Software Int'l	9.75	-0.13	-1.27
Oracle Systems	OTC	34.00	4.88	Oracle Systems	9.13	-0.13	-1.35
Paradox Systems	NYS	14.63	7.50	Paradox Systems	12.25	0.13	1.03
Phoenix Technologies	OTC	9.25	1.25	Phoenix Technologies	7.50	0.00	0.00
Policy Management Sys.	NYS	62.00	33.38	Policy Management Sys.	48.00	0.75	1.56
Reynolds & Reynolds	NYS	23.13	11.50	Reynolds & Reynolds	21.50	-1.13	-4.97
SEI Corp.	OTC	27.25	14.75	SEI Corp.	28.50	0.75	2.91
Shared Medical Systems	OTC	82.75	12.50	Shared Medical Systems	20.00	-0.38	-1.84
Software Publishing Corp.	OTC	35.25	12.00	Software Publishing Corp.	19.50	0.00	0.00
Sterling Software	NYS	14.63	5.50	Sterling Software	13.00	-0.00	-3.70
Sungard Data Sys.	OTC	28.00	9.50	Sungard Data Sys.	17.25	-0.25	-1.43
Symantec Corp.	OTC	56.88	17.75	Symantec Corp.	49.00	1.63	3.63
System Center Inc.	NYS	22.63	4.50	System Center Inc.	9.00	0.13	1.41
System Software Assoc.	OTC	37.25	12.50	System Software Assoc.	15.13	0.13	0.83
Wang Labs	OTC	24.13	4.75	Wang Labs	11.50	0.25	2.22
Semiconductors							Off 3.89%
Advanced Micro Devices	NYS	14.25	2.88	Advanced Micro Devices	12.75	-0.25	-1.92
Analog Devices Inc.	NYS	12.50	5.50	Analog Devices Inc.	10.13	-0.13	-1.22
Chips & Technologies	OTC	21.75	5.25	Chips & Technologies	8.13	0.25	2.86
Intel Corp.	OTC	59.25	28.00	Intel Corp.	48.63	-3.63	-6.94
LSI Logic Corp.	NYS	13.00	5.13	LSI Logic Corp.	8.00	-0.63	-6.49
Micron Technology	NYS	19.13	6.75	Micron Technology	14.25	-1.38	-8.88
MIPS Computer Systems	OTC	20.88	7.25	MIPS Computer Systems	14.50	-0.88	-5.69
Motorola Inc.	NYS	68.38	45.75	Motorola Inc.	65.25	-1.38	-2.08
National Semiconductor	NYS	8.38	3.50	National Semiconductor	6.50	-0.13	-1.89
Texas Instruments	NYS	47.63	22.50	Texas Instruments	35.88	-1.88	-4.97
VLSI Technology	OTC	12.25	3.50	VLSI Technology	9.38	-0.25	-2.60
Western Digital Corp.	ASE	14.25	4.00	Western Digital Corp.	4.25	-0.38	-8.11
Peripherals & Subsystems							Off 3.47%
Apertus Technologies	OTC	2.75	0.88	Apertus Technologies	1.88	-0.06	-3.25
Banctec Inc.	OTC	22.63	7.50	Banctec Inc.	13.00	-0.25	-1.89
Cambex Corp.	OTC	17.50	4.25	Cambex Corp.	12.75	0.88	7.37
Cognitronics Corp.	ASE	11.75	4.13	Cognitronics Corp.	8.25	-1.00	-10.81
Conner Peripherals	NYS	31.25	14.63	Conner Peripherals	17.75	-1.50	-7.79
Datarem Corp.	ASE	22.00	7.00	Datarem Corp.	10.88	-1.00	-8.42
EMC Corp.	NYS	13.00	4.25	EMC Corp.	11.25	0.38	3.45
Eastman Kodak Co.	NYS	47.25	38.75	Eastman Kodak Co.	41.88	-0.88	-2.05
Emulex Corp.	OTC	11.25	4.75	Emulex Corp.	8.38	-0.50	-5.63
Evans & Sutherland	OTC	32.25	14.00	Evans & Sutherland	18.75	-0.75	-3.85
Iomega Corp.	OTC	8.50	2.88	Iomega Corp.	5.50	0.00	0.00
IPL Systems Inc.	OTC	28.25	6.75	IPL Systems Inc.	22.00	-1.75	-7.37
Maxstor Systems	OTC	1.50	0.13	Maxstor Systems	0.69	-0.13	-16.67
Maxtor Corp.	OTC	15.88	2.63	Maxtor Corp.	3.88	-0.38	-8.82
Micropolis Corp.	OTC	18.00	4.38	Micropolis Corp.	7.25	-3.50	-31.76
3M Corp.	NYS	95.63	73.00	3M Corp.	94.88	1.88	2.02
Pinnacle Inc.	OTC	13.63	6.00	Pinnacle Inc.	8.25	-0.25	-3.85
Qlogic Inc.	NYS	24.75	8.50	Qlogic Inc.	21.63	1.88	9.48
Quantum Corp.	OTC	18.25	8.25	Quantum Corp.	10.00	-1.25	-11.11
Recognition Equipment	NYS	7.63	4.38	Recognition Equipment	7.25	-0.13	-1.69
Rexon Inc.	OTC	11.50	4.00	Rexon Inc.	9.25	-0.25	-2.63
Seagate Technology	OTC	18.88	5.63	Seagate Technology	9.38	-1.13	-10.71
Storage Technology	NYS	47.00	11.00	Storage Technology	40.50	-3.00	-6.90
Tandon Corp.	OTC	4.75	1.25	Tandon Corp.	3.31	-0.06	-1.84
Tektronix Inc.	NYS	26.38	11.63	Tektronix Inc.	25.88	2.00	8.38
Telemation Systems	OTC	0.53	0.19	Telemation Systems	0.41	0.06	18.02
Xerox Corp.	NYS	80.13	29.00	Xerox Corp.	84.25	0.88	1.17
Leasing Companies							Off 2.11%
Amplicon Inc.	OTC	18.25	7.00	Amplicon Inc.	18.00	-1.25	-7.69
Comdisco Inc.	NYS	28.38	14.63	Comdisco Inc.	24.25	0.50	2.02
LDI Corporation	OTC	18.25	9.25	LDI Corporation	14.50	-0.13	-0.85
Sunbelt Corp.	OTC	5.75	2.25	Sunbelt Corp. Inc.	3.75	0.00	0.00

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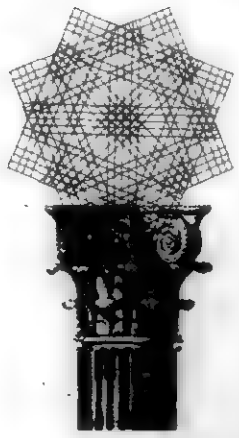
Awards praise the human touch

CW, Smithsonian honor high tech's heroes

BY NELL MARGOLIS
CW STAFF

CBS news correspondent Ed Bradley ventured beyond *60 Minutes* last week to co-host the Third Annual *Computerworld* Smithsonian Awards in Washington, D.C. The gala affair attracted some 650 members of the technology, business, academic and government communities, who gathered to honor technological achievements best measured not in benchmarks but as landmarks in humanity's effort to make the world a safer, saner place.

"It's good to see so many executives of leading companies here, while Mike Wallace is at your corporate headquarters seeking targets of opportunity," Bradley kidded.



On a more serious note, Bradley underscored information technology's seminal role in the sweeping changes that have literally remapped the globe since last year's awards were handed out. When people — enabled by real-time media coverage of major news events — "can really see what it's like to live in a free country," he noted, "they begin to want it. And once that genie is out of the bottle, it can never be put back in."

Nominations for the awards are made each year by the Chairmen's Committee, a group composed of the heads of leading technology companies. Nominees — whose number has grown from approximately 100 in the competition's first year to almost 300 in 1991 — are judged on their positive impact on society, their success in meeting the goals of their targeted niches and the degree of technological innovation they demonstrate. Winners are chosen by judges that this year included technology guru Alan Kay, American Airlines' information systems head Max Hopper and journalist Judy Woodruff.



The Third Annual CW Smithsonian Awards *took place in Washington, D.C.'s National Building Museum*

"What really gets to me about the Smithsonian awards," said Philip Conkling, executive director of 1991 finalist Island Institute, "is that here is a room full of movers and shakers and incredible applications — but the most amazing thing is the effect at the community level."

That community impact spirit was brought home repeatedly throughout the evening. North Carolina junior high school teacher Gail Morse roused a cheer from the audience when she asked her two teenage daughters to rise and help her accept the second annual Siemens Information Technology Leadership Award for Science Education (see page 91). Washington, D.C., teacher Paul Kaiser drew applause when he said he was taking his school's *Computerworld* Smithsonian Education trophy (see story below) back home "to my students, because this belongs to them."

"These people are heroes," Patrick J. McGovern, chairman of International Data Group, Inc., *CW's* parent firm, said of the nominees, "not just for what they achieve but for what they inspire others to achieve."

The 1991 CW Smithsonian winners

Business and Related Services

Frito-Lay, Inc.

There are many reasons why Frito-Lay, Inc. rings up almost half of the $9.8 billion annual retail sales of snack chips in the U.S. But one of the main reasons, observers say, is the company's use of technology to support a total restructuring of the way the snack foods giant does business.

"What they've done indicates how other organizations will be run in the future," says James Cash, a professor at the Harvard School of Business.

In less than six years, the Pepsico, Inc. subsidiary dismantled its highly centralized management structure, distributing decision-making to the regional level. Technology helps top executives maintain control by giving them up-to-the-minute information about the business.

A key part of Frito-Lay's information system are handheld computers used by each of the company's 10,000 sales representatives to track sales and pricing data. This data from 400,000 weekly sales calls is fed



nightly into minicomputers at 215 distribution centers. The minicomputers send the data to the firm's Dallas headquarters, where a central IBM mainframe DB2 relational database holds sales data about competitors.

More than 250 managers and executives use decision support systems applications to access that database. They can get information on sales, profits, promotions and competitors divided by region, type of store and product line. "The key benefit is maintaining service at the field level," says Charles Feld, vice president of MIS.

Specific payoffs include the following:

- Management saves $20 million annually from better inventory control and can track the competition and respond immediately.
- Sales reps save three to five hours weekly, make fewer errors and use hard data to negotiate for shelf space.
- Stores get fresher products, more efficient deliveries and more data about which products sell best. — *Susan Nykamp*

Education and Academia

The Lab School of Washington

The inner world of a learning-disabled child is, quite often, all that child has.

Getting through to that inner world is most of a teacher's job; getting a child to link his world to the life around him is the rest. So when Paul Kaiser, a teacher at The Lab School of Washington, D.C., discovered Apple Computer, Inc.'s Hypercard in 1988, he thought he had a tool that could help him do both.

Three years later, more than 50 of Kaiser's learning-disabled students have become more adept at expressing themselves and are learning by designing stories using self-authored Hypercard stacks — series of

Continued on page 90

Continued from page 89

images employing such diverse techniques as animation, scanned photography and writing. The equipment was donated by the students' grandparents and parents.

Kaiser has each student describe his story, then make a physical model of some of the scenes using clay, sticks and other materials.

When the model is complete, the students proceed to building the Hypercard stack, deciding as they go



which techniques to use. Some prefer animation; some, straight text; and some, photography, Kaiser says.

The variety of multimedia choices enables students to select the method of expression they are most comfortable with. Meanwhile, the authoring process forces them to understand how others will see the story, Kaiser says.

"With this [technology], we can focus on what the kids can do, which is a much more positive approach. And we can also sneak in the back door and address some of the things they can't do." — *Donald St. John*

Environment, Energy and Agriculture

Research Alternatives, Inc.

When thousands of gallons of oil spilled into Pennsylvania's Monongahela and Ohio rivers in 1989, the Emergency Information System was there. When Hurricane Hugo barreled into the Puerto Rican coastline, the Emergency Information System was there. When Jamaicans began rebuilding their lives after the fury of Hurricane Gilbert, the Emergency Information System was there.

Since 1983, emergency workers in these disasters — and hundreds more — have used Research Alternatives, Inc.'s personal computer-based Emergency Information System software to plan, coordinate and



track evacuation and relief efforts.

Research Alternatives President James W. Morentz, holder of a Ph.D. in crisis management, founded the Rockville, Md.-based firm on the idea that information is the critical component in saving lives and protecting the environment during disaster. By combining geographic and demographic data with sophisticated computer modeling of the effects of a disaster, the Emergency Information System acts as the command-and-control center for emergency efforts.

The software is used by more than 100 major chemical and petrochemical companies to do emergency and evacuation planning. Johnson & Johnson has installed the product at most of its manufacturing plants in New Jersey and is in the process of bringing it to Europe.

"We use Emergency Information System for . . . vulnerability assessment, emergency training and as an important tool in a potential emergency," says Lawrence Mondschein, Johnson & Johnson's manager of chemical information and control.

Although a small company with 30 employees, Research Alternatives now boasts more than 1,000 installations of Emergency Information Systems in the U.S. and 13 other countries. — *Clinton Wilder*

Finance, Insurance and Real Estate

SWIFT

If you're on the supplicant's side of the loan desk, a bank's internal procedures can seem interminable. But worldwide message processing and communications for financial institutions are handled by a system that's positively SWIFT.



The Society for Worldwide Interbank Financial Telecommunications (SWIFT) has put together a computerized global system, also called SWIFT, that handles a vast amount of the essential information banks exchange daily. The 125 standard messages the SWIFT network deals with range from buy-and-sell stock orders to confirmation of deposits in an account.

On-line since 1977, the system is available to major financial centers, such as London, Zurich and New York, says Richard Metcalfe, spokesman for the society. It is operational in 72 countries at 3,000 institutions, such as banks and stock exchanges. Users pay a yearly fee as well as a charge for each message sent.

SWIFT's system runs out of two operating centers in Virginia and in the Netherlands. Processors at the centers store and forward messages received from processors in the 72 countries. These machines are connected to user terminals at specific institutions.

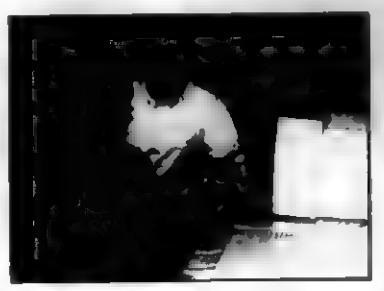
The artificial intelligence-based system control processor monitors operations in real time, operating nonstop. The program responds to systems problems, alerting network operators only of those problems that need human intervention.

Security is important, so the system uses authentication of message origin, encryption and decryption and message integrity verification. To ensure uptime, the system is redundant. — *Carol Hildebrand*

Government and Nonprofit Organizations

De Anza College

Finding a job is tough during this recession, but it's even tougher if you are disabled. The Bay Area Coalition for Employment of Persons with Disabilities (BACED), formed in 1987 from 11 San Francisco-area government and private placement agencies, uses a 2-year-old computer network to help the disabled overcome the obstacles of distance and time that often prevent them from getting jobs before nondisabled people get them.



Frustrated with a slow, unreliable job placement system that ran on telephones, index cards and coffee, BACED founder Deborah Stern, a senior employment specialist at De Anza College, a Cupertino, Calif., community college with a special education division, hit upon the idea of electronically posting the job listings pooled from member agencies.

To make it happen, Stern applied for a grant from Apple Computer, Inc. for networked computers to link the job agencies. By 1988, Apple had donated 11 Macintosh SEs, including a central-site node with 40M bytes of main memory at De Anza.

Fifteen placement agencies now share the BACED job postings, communicating with De Anza via donated, dial-up 1,200 bit/sec. modems. Job applicants register with one of the placement agencies for a fee that's approximately $3.50 for 12 weeks at De Anza.

Job counselors now have access to 10 times as many listings than were known to any placement agency before.

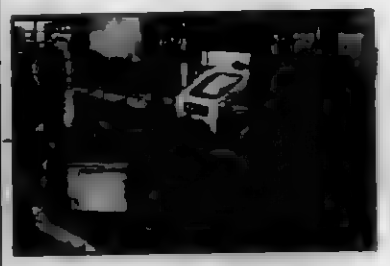
The jobs network went into full swing in 1989. Since then, some 1,400 job listings and notes have been posted electronically. Hundreds of jobs are filled through the network yearly; at De Anza alone, roughly 70 disabled people are placed into new jobs each year. — *Jean S. Bozman*

Manufacturing

Raychem Advanter

As the first of Raychem Corp.'s manufacturing plants to adopt plantwide computer-integrated manufacturing (CIM), Raychem Advanter has become a showcase for paperless, automated production systems.

Managers at the Richmond, British Columbia, facility have been able to carve out a market niche in filling small, custom part orders. Advanter



makes and assembles special aluminum adapters used in wiring harnesses. The adapters attach connecting devices to the harness, sealing against moisture, contaminants and interference from electromagnetic or radio frequencies.

Raychem Advanter enables customers to purchase in lot sizes as small as 15 units, instead of hundreds or thousands, says Jim Balcom, a manufacturing consultant at Coopers & Lybrand in Vancouver, British Columbia. Furthermore, lead time is weeks, not months.

The plant hardware consists of 14 Sun Microsystems, Inc. workstations that run computer-aided design (CAD) machining and intelligent documentation systems from Synix Computer Systems, Inc. and Cimlinc, Inc.

With Cimlinc's Integration Product Process tool, Advanter's different manufacturing systems, databases and applications packages interoperate without paper.

For example, an order is faxed and received by the Sun Sparcstation, triggering the Synix CAD system for the job part and quantity. That begins the computer-aided manufacturing (CAM) sequence, which moves the job into a CAM file and then releases it to the shop floor. The order appears in a Cimlinc intelligent documentation form at the tool presetting station, where a technician schedules the task. — *Maryfran Johnson*

Media, Arts and Entertainment

The Tenderloin Times

The Tenderloin is one of the toughest neighborhoods in San Francisco. An inner-city, low-income community of 25,000 mostly elderly, disabled and immigrant residents, it has all of the problems — drugs, crime, illness, homelessness — that plague similar areas in the U.S.

But thanks to a core of crusading journalists armed with desktop publishing systems from Apple Comput-

er, Inc., the Tenderloin also has a growing measure of dignity, unity and clout. In short, it has *The Tenderloin Times*.

This 14-year-old neighborhood news monthly, which is distributed free of charge to some 15,000 readers, is a quadrilingual paper that is available in English, Laotian, Cambodian and Vietnamese.

In 1986, the tiny and underfunded *Tenderloin Times* staff was able to produce its then-new Southeast Asian section only by hand-calligraphing the Laotian and Cambodian pages; Vietnamese text was typed, with diacritical marks added by hand.

Apple's donation of two Macintosh SEs and a laser printer let the staff typeset all four languages in-house. Today, says *Tenderloin Times* editor Sara Coln, an entire desktop publishing system is in place — and in constant use by editors, ad designers and translators.

Always a figurative lifeline to its polyglot community, *The Tenderloin Times* is often a literal one as well. During the 1988 San Francisco earthquake, many Cambodian Tenderloiners, who were unfamiliar with quakes but familiar with war, thought they were under attack and fled their homes.



The paper rushed an earthquake extra to press, giving its readers not only their first explanations of what was occurring but also critical medical and safety information.

Going electronic has had a positive business effect as well, Coln says. It has streamlined production, cut costs and given the product a professional appearance that attracts advertisers. The computers have even made it possible for the nonprofit paper to develop a translation service that is kicking in $14,000 to support the newspaper. — *Neil Margolis*

Medicine

Joint Center for Radiation Therapy

Slicing off tiny tumors growing near someone's brain stem is tricky business for even the most adept neurosurgeon. Accidentally nicking a nerve that connects the spinal cord to the brain can paralyze the patient.

For the past two to three years, some cancer specialists have opted



instead to use stereotactic radiosurgery, which disintegrates tumors with radiation beams. No cutting is required.

Like surgery, this procedure is risky. If the radiation stream is too big, or if it bounces off the tumor onto healthy tissue, nerve or brain damage can occur. But a software application that combines imaging with high-speed computations makes the process a little less worrisome for patients in Boston's Stereotactic Radiosurgery Program at the Joint Center for Radiation Therapy. The center is sponsored by Brigham and Women's Hospital and Harvard Medical School.

Based on a graphics applications development utility from Stardent Computer, Inc., Xknife turns computerized scans of a patient's head into three-dimensional models showing the brain tumor and the surrounding area. The point-and-click application, which runs on a Stardent Vistra 800 desktop visualization system, pinpoints a patient's specific tumor type and location.

Xknife then uses 12 million floating-point operations per second of computing power to calculate treatment specifics such as the width, intensity and angle of penetration of the radiation beam.

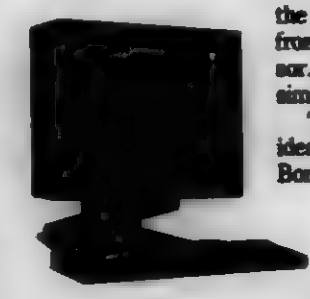
Xknife has already been used in treating 30 cancer patients at the Joint Center, some of whom had tumors so small or so close to sensitive areas that they would have been untreatable by traditional surgery, says Dr. Hanne Kooy, who co-developed the program with software engineer Marc Dopheide. — *Kim S. Nash*

Science

Next Computer, Inc.

Godzilla is alive and well in Tokyo today. He also lives in London, Boston, Washington, D.C., Redwood City, Calif., and other places.

This tamed Godzilla; or Zilla for short, lives on Next Computer, Inc. workstations in all of these cities, transformed from destructive force to number cruncher for Next as well as some 90 beta-test sites.



Zilla is an application designed by Dr. Richard Crandall, Next's chief scientist, to run the kind of CPU-intensive problems normally done on supercomputers but using the idle CPU power of unused workstations. At Next, a Zilla unit consists of 100 Next machines, which run the Zilla application in background. So far, Zilla has been used by Crandall to work on several high-level math problems and by Pixar, Inc. to create animated films, which can require 100 hours of computer time per second of motion and can be done in weeks instead of years using Zilla.

Zilla is actually not a new concept. It essentially works as a loosely coupled parallel processor, and other vendors sell systems with similar abilities to distribute applications to a variety of machines. What it has that others do not, Crandall says, is a feature that recognizes when users are on a system. At that point, the program backs away from their microprocessor. It is also relatively simple to use, he says.

"It's a very clever idea," says Robert R. Borcher, associate director of computing at the Lawrence Livermore National Laboratory in Livermore, Calif., a Zilla beta-test site. Borcher says Zilla's capacity is best for loosely coupled applications such as number factoring, transaction processing or "Monte Carlo" — a statistical procedure used to investigate problems such as how neurons interact with matter.

Zilla was co-developed by Josh Doenias, a scientific programmer at Next. — *Michael Fitzgerald*

Transportation

United Parcel Service, Inc.

After Gaylord Evans started using United Parcel Service, Inc.'s international delivery instead of air freight, he never looked back. His company, MCM Distributors, Inc. in Costa Mesa, Calif., sells miniature car kits made in Europe. By using UPS, he shaved 6% off shipping costs and cut delivery time from 10 days to two.

UPS would credit Evans' satisfaction to its International Shipment Processing System (ISPS), which automates all facets of international package transport and delivery. The system enabled UPS to expand to 180 countries in three years, reports Steven Heit, information services planning manager.

ISPS is built around an IBM mainframe 35G-byte DB2 database for on-line transactions and batch processing that is linked to remote personal computers, local-area networks and bar-code scanners.

By automating accounting, scheduling and tracking functions and streamlining customs and brokerage tasks, the system lets UPS offer cost-effective, fast international delivery — usually within 48 hours, Heit says. ISPS stores data on customer shipping patterns, automatically generates required forms and schedules optimal use of aircraft.

For exporters and importers,



ISPS automates billing, tariff classification and tax and duty calculations.

In addition, customs processing is expedited by two ISPS features: a prealert notification system, which gives agents detailed shipping information before a package arrives, and electronic data interchange, which allows customs agents to enter data directly into government systems. — *Susan Nykamp*

Benefactors Awards



MCI Communications Information Technology Leadership Award for Innovation: Erich Bloch. Bloch was head of the National Science Foundation (NSF) for six years, where he was charged with strengthening national scientific and engineering research and education. While at NSF, he created the national centers for computing competence and received the National Medal of Technology and the IEEE 1990 Founders Medal.



Price Waterhouse Information Technology Lifetime Achievement Award: Robert Noyce (posthumous). Sometimes called the father of Silicon Valley, Noyce (1927-1990) was a seminal influence in the electronics industry. He was co-inventor of the integrated circuit, as well as co-founder of Fairchild Corp. and Intel Corp., two of the electronics industry's most influential companies. Noyce was chairman of Sematech at the time of his death.



Siemens Information Technology Leadership Award for Science Education: Gail Morse. Morse, a seventh-grade science teacher at J. M. Alexander Junior High School in Huntersville, N.C., has brought technology to bear on a whole new business-oriented approach to working with at-risk students. Use of computers and project teams has resulted in drastic reductions in dropouts and absenteeism while increasing language and math scores.

NEWS SHORTS

Lotus Realtime rises for Sun

Lotus Development Corp. gave 1-2-3 for Sun Microsystems, Inc. users real-time access to financial data last week. In so doing, it picked up an endorsement from EJV, a consortium charged with creating a standard computing platform for the six Wall Street information firms. A Lotus spokesman said Lotus Realtime will be extended to Digital Equipment Corp.'s Ultrix, adding that an upgrade to 1-2-3 for AT&T's Unix System V is on the way. Version 1.1 of 1-2-3 for Sun's Scalable Processor Architecture systems is based on core 1-2-3 for DOS technology and incorporates support for the X/11 Release 4 Windows environment for Lotus' Realtime and for Lotus' C add-in tool kit. Also bundled in is a Sybase, Inc. SQL Server Database driver and improved network licensing management.

Split decision for Apple

Last week, U.S. District Judge Vaughn Walker refused to reconsider an earlier ruling that absolved Apple Computer, Inc. of misleading federal authorities about the nature of some of its copyrighted visual display elements. This setback in Microsoft Corp. and Hewlett-Packard Co.'s defense against Apple's charge of copyright infringement was accompanied by the judge's indication that he would allow Apple to amend its complaint to encompass Microsoft's Windows 3.0. The charge previously applied only to Windows 2.03 and HP's New Wave. However, Walker rejected Apple's move to add fraud charges against Microsoft and HP.

IBM a step ahead on chips?

IBM has the lead in 16M bit-memory chips — but products using the chips are still about one year away. According to a published report last week, IBM is a few months ahead in its production of the high-density chips compared with Japanese competitors such as Hitachi Ltd., NEC Corp. and Toshiba Corp. However, an IBM spokesman said the chips will not be used in commercially available products until mid-1992.

Peterson joins Parallan board

Retiring Merrill Lynch & Co. information systems chief DuWayne Peterson (see story page 54) wasted little time in taking on a new responsibility. He was named last week to the board of directors at Parallan Computer, Inc., a Mountain View, Calif.-based file server vendor headed by former MAI Basic Four Chief, Inc. Executive Officer William B. Patton Jr.

Ford to expand network

AT&T announced last week it would extend Ford Motor Co.'s corporate private voice and data network to 5,500 Ford and Lincoln/Mercury dealers nationwide. Terms of the contract for Ford Net were not disclosed. AT&T implemented the original Tariff 12 custom network for Ford in 1988.

AT&T offers VSAT E-mail

AT&T Easylink electronic mail customers will now have the option of satellite delivery under an agreement announced last week between AT&T Easylink in Basking Ridge, N.J., and Mainstream Data, Inc. The option, slated to be available later this year, will use very small-aperture terminal technology. The service is targeted at the petroleum industry's oil wholesalers and retailers, which will be able to receive daily petroleum price quotes in the oil fields.

Court win for Microsoft

Microsoft and Everex Systems, Inc. won a 13-month-old civil counterfeiting/copyright and trademark infringement case against eight California defendants and will receive approximately $4.3 million in damages. A U.S. District Court jury in northern California found that J & S International, JIP Design, American Multisource, Inc., Manufacturing Service, Inc., Joe Folk, Benny Lee and Norman and Susan Chan made and used fake versions of Parcorp, a trademarked version of MS-DOS that Everex licenses from Microsoft.

IBM, Apple consider technology exchange

BY PATRICIA KEEFE
CW STAFF

Industry speculation ran rampant last week about a reported pending alliance between IBM and Apple Computer, Inc. that would give IBM's RISC System/6000 chip set to Apple and allow IBM access to System 7.0 features.

The bottom line, according to industry sources, is that the two companies are talking about technology exchanges around Unix and reduced instruction set computing (RISC).

A source close to executives in both companies confirmed that IBM and Apple have been talking and that an agreement is nearly hammered out.

A user at a large IBM site added that in a recent conversation with an IBM executive, it was "strongly hinted" that IBM would shortly announce an alliance "that will rock the industry."

Another source, citing contacts at both IBM and IBM said that at a meeting last Monday, the two firms talked about several things: some kind of RISC chip set agreement, interface technology, operating systems and Apple's Quicktime multimedia software. IBM is "real interested" in licensing part or all of the recently unveiled Quicktime, the source said.

There are unconfirmed reports of a proposed joint venture to develop an operating system. Sources said both vendors are looking at improving their Unix offerings, IBM's AIX and Apple's AUX. Apple already has a project under way, called Pink, to port a superset of System 7.0 into AUX, sources said.

IBM is said to be interested in adding similar technology to AIX, with some carryover into OS/2's Presentation Manager. Because Pink is a portable operating system, there could be repercussions for IBM's portable OS/2 efforts as well.

"The two companies realize that there are some rather significant market realities that are shaping the industry," one industry observer said.

Police

FROM PAGE 1

generally announce themselves to the top executive in the firm and ask that all work being done on personal computers at the time be stopped immediately.

"They adamantly requested an on-site inspection of the software, and we had two choices: We could either cooperate, or they would line people up against the wall and go look at the computers that way," said a source at a New York publishing firm that was raided by the SPA early last year.

Users added that SPA representatives have dealt with them fairly, and many said that in the end, they were relieved that the raid had forced company management to take piracy seriously.

"It was a company policy to distribute software freely and have only one license copy," said Michael Fitzpatrick, computer technician at Versatron Corp., an aerospace design firm in Healdsburg, Calif. Fitzpatrick said he disagreed with the policy and had recommended to company management that they license all pirated software.

Anyone listening?

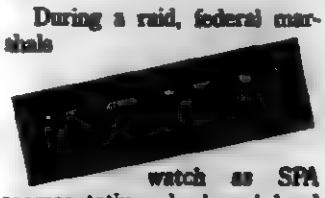
The recommendations fell on deaf ears, and Versatron was raided last December by a team of seven federal marshals and SPA representatives.

The auditors strode in and told Versatron employees to save their work and immediately step away from their PCs. They then audited each of the company's 30 PCs, a process that took most of the day.

"They were real hard-nosed when they came in," Fitzpatrick said. "They weren't rude, but they were certainly pushy. After a couple of hours, when they saw we weren't trying to cover up, they lightened up."

Versatron ended up paying a $60,000 fine and was required to buy copies of Autodesk, Inc.'s Autocad, Lotus Development Corp.'s 1-2-3 and Manuscript, Ashton-Tate Corp.'s Dbase and other software at full retail price. Fitzpatrick said he has no regrets that the SPA raided his firm. "I'm glad they did," he said.

During a raid, federal marshals



watch as SPA representatives check each hard drive using an SPA product called Spaudit [CW, Dec. 10, 1990]. They print out lists of the *.EXE files on each hard drive.

Then the SPA puts together a list of its findings and challenges the company to prove that it owns the software on its hard drives. "We do our best to work with management under the circumstances," an SPA spokeswoman said. "We are not there to be disruptive or adversarial in any way."

No hardware or software is impounded or restricted — although a suit is filed against the company accusing it of violating copyright laws, and an injunction is installed that forbids the company from removing programs from its hard drives or erasing the drives.

Not all of those contacted by *Computerworld* said they knew their companies were violating copyright laws, but several said they did. Fitzpatrick said his board of directors had even asked him what he thought the chances were of being raided. "I gave it a one-in-10 chance," he said.

Eyes focus on Trueimage

BY JAMES DALY
CW STAFF

The future of Microsoft Corp.'s efforts to grab a chunk of the printer software industry turned to uncertainty last week after the quiet departure of its leading evangelist and the restructuring of the group's business unit.

General Manager Cal Bauer had spent nearly the past two years crusading for Microsoft's Trueimage page description language as an alternative to Adobe Systems, Inc.'s entrenched Postscript. The Redmond, Wash.-based giant, however, has found rough sledding in the market. Only a few smaller firms have agreed to license the technology since it was co-announced with Apple Computer, Inc. in September 1989.

Despite the turbulence, Microsoft officials said their page description language efforts will continue unabated. Trueimage code has been going out to printer manufacturers since October.

The Trueimage engineering team, which had been located in Taiwan, will be consolidated at company headquarters in Redmond, Wash.

Although Microsoft's declaration of war on Adobe had caused some industry soothsayers to predict the demise of Adobe, the Mountain View, Calif.-based company has held firm.

In recent months, Adobe has lured back Apple and inked important licensing agreements with firms such as IBM, Digital Equipment Corp. and Silicon Graphics, Inc.

"[Microsoft] has not taken any business away from us," Adobe President Charles Geschke said. "It's one thing to say you want to be in the business; it's another thing to go out and actually do it."

Low-priced IBM 386SXs debut

BY RICHARD PASTORE
CW STAFF

WHITE PLAINS, N.Y. — The four IBM Personal System/2 models introduced last week drew less attention for what they did have than for what they did not have — namely, IBM-style high prices and the Micro Channel Architecture (MCA).

As expected, IBM unveiled models based on the Intel Corp. 20-MHz 80386SX microprocessor. The diskless Model 35 LS and Model 35 SX are now the firm's low-end 386 entries.

The new Model 40 SX offers more expansion and storage than the Model 35, while the higher end Model 57 SX comes with the 32-bit MCA bus and a new 2.88M-byte floppy disk drive.

Users and analysts called pricing for the Model 35 SX and 40 SX, in particular, unusually aggressive for IBM.

Framingham, Mass.-based Technology Investment Strategies Corp. rated the PS/2 Model 40 SX as a 40% price/performance improvement over the PS/2 Model 30 286. The Model 57 SX is a 20% price/performance improvement over the older Model 55 SX.

Price relief

At New York Life Insurance Co., the list prices, coupled with the typical corporate discount, are a relief from internal price pressure.

"Our agents have been coming to me with the newspaper and pointing to ads for Dell, ALR and AST and asking how I can justify these [IBM] prices," said Thomas Casey, senior applications project specialist at New York Life's Boston office. Aggressive pricing on IBM's part should make justification easier, he said.

Coupled with recent price cuts and a new IBM trade-in program (see story page 16), the low-priced rollouts are a necessary response to market pressures, observers said.

"With Compaq's aggressive pricing posture now, IBM needed to do something," said James Miller, vice president of information systems at James River Corp. in Richmond, Va.

Users said they are also glad to see three of the machines leave out the expensive and underutilized MCA bus. "I haven't seen any benefit from the Micro Channel at all," Casey said.

"Anytime you buy a Micro Channel board, it costs you $200 more. And there aren't a lot of people making those boards," said Bruce Greif, project analyst at County Natwest, Inc. in New York.

Base configurations	Model			
	57SX	40SX	35SX	35LS
Processor	20-MHz 386SX	20-MHz 386SX	20-MHz 386SX	20MHz 386SX
Bus	Micro Channel	AT	AT	AT
Memory	4M bytes	2M bytes	2M bytes	2M bytes
Hard disk	80M- or 120M-byte	60M- or 80M-byte	None or 120M-byte	None
Floppy disk	2.88M-byte	1.2M- or 1.44M-byte	1.2M- or 1.44M-byte	None
Graphics	16-bit VGA*	16-bit VGA	16-bit VGA	16-bit VGA
Price	$3,695 - $4,195	$2,925 - $3,195	$1,995 - $2,525	$2,695

Source: IBM

CW Chart: Doreen St. John

Users call DOS 5.0 well-crafted

ANALYSIS

BY CHRISTOPHER LINDQUIST
CW STAFF

MS-DOS 5.0's new features offer plenty of improvement over previous versions, but there are some hitches corporate users should watch for in order to smooth the transition.

DOS 5.0 features an enhanced DOS shell, much-improved memory management, a task switcher and more. Electronic bulletin board chatter and interviews with early users indicate that Microsoft Corp. did this DOS right. And most users report having no problems whatsoever installing the upgrade.

However, some users should be prepared to perform a few minor modifications to get DOS 5.0 up and running.

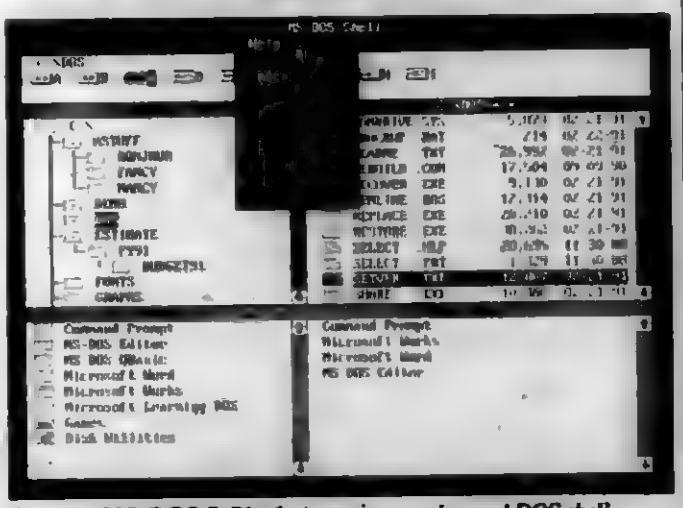
Despite Microsoft's attempts to make DOS 5.0 compatible with the wide range of software currently available for DOS, there are some conflicts with third-party disk partitioning software and device drivers.

Eric Rintell, vice president of Purchase Ltd. in New York, said he ran into a problem with On-track Computer Systems, Inc.'s Disk Manager on some Advanced Logic Research, Inc. and AST Research, Inc. systems. Fortunately, he said, Microsoft distributed many replacement software drivers with the upgrade package, saving him from having to contact the original manufacturer for an update.

Also, users of Logitech, Inc.'s mouse will need to have Version 5.01 or later of the mouse driver software. Microsoft mouse users will need driver Version 6.21 or later. Some systems will also require that software switches be used with the new HIMEM.SYS driver.

Microsoft supplies README.TXT and APPNOTES.TXT files, which detail incompatibilities and document solutions for many of them. Checking the files could save time on the 90-day free support lines.

Users can also get information specific to their systems by using the GO MSDOS command on Compuserve.



Among MS-DOS 5.0's *features is an enhanced DOS shell*

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DOS upgrade

FROM PAGE 1

DOS 4.0, Windows 3.0 and OS/2 2.1 upgrades. There is also a conviction among OS/2 2.0 advocates that a DOS 5.0 upgrade would be redundant given OS/2's anticipated features.

Some would-be users of IBM's OS/2 2.0 have put the brakes on DOS 5.0 migrations. Two such users, Montreal-based Royal Bank of Canada and Price Waterhouse in New York, are waiting to see if IBM delivers on its OS/2 2.0 promises.

According to George Oliver, manager of information delivery technology at Royal Bank, there is no need to upgrade his DOS users because OS/2 2.0 with its multiple virtual DOS machines will provide him with the same and more advantages.

Sites that use IBM's OS/2 LAN Server said they will probably opt for IBM's DOS 5.0 version. LAN Server requires a specific driver for each version of DOS, said Ron Adinolfi, vice president of network information services at Swiss Bank. Brad Chase, DOS product-line manager at Microsoft, said Microsoft has worked a way around that problem. Adinolfi, meanwhile, is trying to find out if IBM will match Microsoft's 100% upgrade program.

John Guyer, director of systems at Financial Guaranty Insurance Co., recently downsized his business to a Novell, Inc. Netware-based PC network. He is having a problem getting his Netware drivers to run in the upper memory block of DOS 5.0, and until that and a few other network snags are resolved, he will not upgrade his 175 users.

Other users, such as Bob Holmes, a senior computing analyst at Southern California Gas Co., fall somewhere in between. Holmes, who claimed DOS 5.0 "is even better than Microsoft says it is," nonetheless plans to continue testing for a little while longer to avoid any "gotchas."

DOS 5.0 does have its enthusiasts. Several users reported waiting in lines last week to purchase upgrades.

The product is widely touted for boosting speed, easing memory constraints and simplifying installation, in part by eliminating the need for the clumsy Edlin text editor. Other attributes include a DOS shell, task-switching and context-sensitive Help (see story at left).

Some enthusiasts, such as New York Life, Ortho Pharmaceuticals and Swiss Bank, will engage in massive upgrade programs. Victor Mutnick, a corporate vice president at New York Life, said the easy thing is deciding to go with DOS 5.0. The hard part, he added, is getting it done smoothly.

Early feedback indicates that a greater percentage of users will purchase Microsoft's upgrade ($99) than will purchase IBM's ($85) because Microsoft's will work with multiple brands of PCs. And the bigger the account, the more likely it is to be negotiating a volume purchase deal with Microsoft.

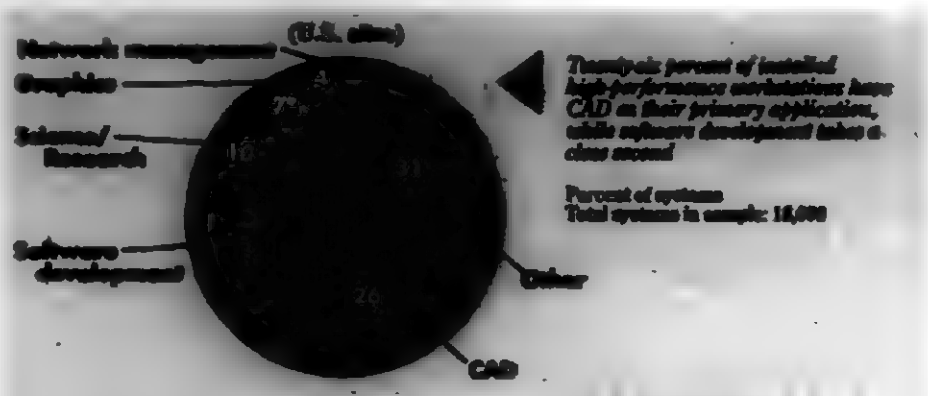
Pacific Gas & Electric Co. in San Francisco, for example, hopes to upgrade all 18,000 of its PCs to DOS 5.0 during the next three years and said it wants to hammer out a purchase plan that covers the installation. Microsoft's 100% upgrade program for large sites prices DOS 5.0 as low as $37 per unit.

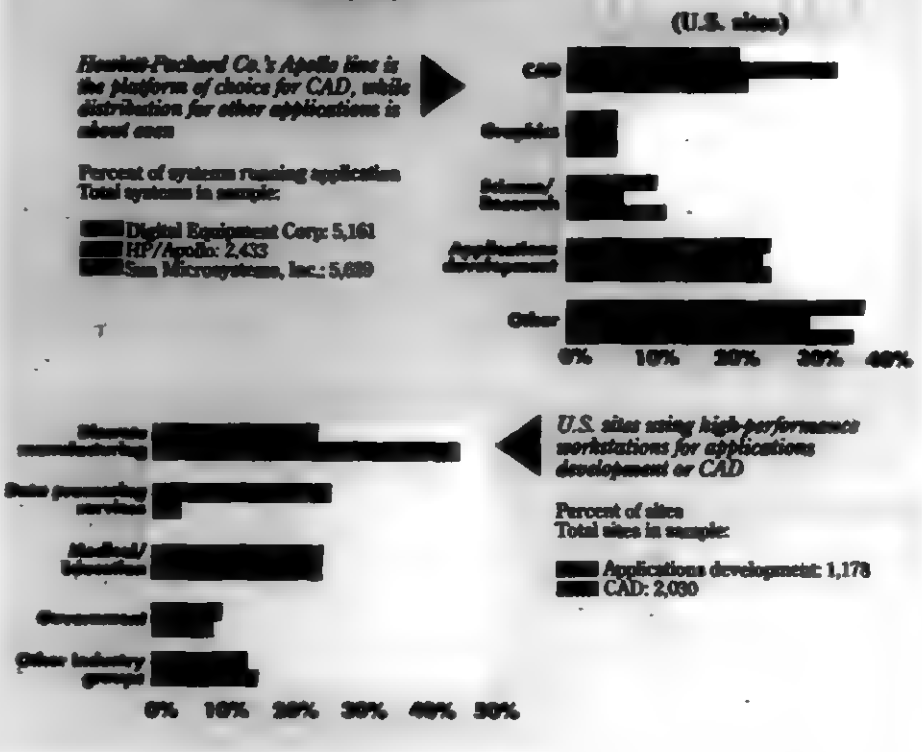
Elsewhere, DOS can be had for approximately $50 in many retail outlets, dropping as low as $39.95 at Egghead Discount Software and $29.50 at one East Coast reseller.

TRENDS

High-performance workstation applications

Workstations move [illegible] the mainstream as the availability of applications increases





Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Janell Genovese

NEXT WEEK

Through an IBM-sponsored program called Writing to Read, young children are using personal computers to read and write more effectively. The program was a finalist in the **Third Annual *Computerworld* Smithsonian Awards**, which honor technology applications that have benefited society. Ten of the finalists will appear in In Depth.



Du Pont Co., an information systems leader in many areas, is attempting to step out front on open systems implementation. Although still in its formative stages, Du Pont's Open Systems Program Office is expected to play a leading role in making seamless data sharing an integral part of the $40 billion firm's global strategy. See Manager's Journal.

INSIDE LINES

Cold shoulder

▶ Although Intel says things are still cool, the maker of a device that chills Intel 1486 33-MHz chips to boost their performance is not so sure. A source at Velox Computer Technology, Inc., developer of Icecap, says Intel may sue to stop Velox from selling a board with an Icecap-equipped 33-MHz 1486 chip as a 50-MHz board. Cooling the chip pushes clock speed to about 50 MHz but violates Intel warranties. Intel people say there are no plans to sue, but Velox says Intel has indicated that the Icecap board would compete directly with its chips.

Just when the Dodgers start winning . . .

▶ The steady relocation of many Ashton-Tate employees from their Los Angeles-area headquarters north to the Silicon Valley area has some industry watchers speculating that a full-fledged corporate move could be in the works. In recent months, the trek has been made by President Dave Proctor, Marketing Vice President Max Toy and dozens of sales and marketing reps. Chief Executive Officer Bill Lyons has never moved his family or primary residence out of northern Palo Alto, Calif.

Go figure

▶ Rumors are surfacing that Apple will use software from Foster City, Calif.-based Go Corp. to develop a pen-based computer that recognizes handwriting. Apple is now working on three notebook computers, at least one of which is expected to include handwriting-recognition capabilities. Go also enjoys tight links with Apple: William Campbell, Go president, is a former Apple executive who once ran Apple software subsidiary Claris Corp.

Poqet change

▶ Poqet Computer watchers who wonder what happened to an expected spring product announcement can wait till next year, according to one former Poqeteer. New CEO Bobb Wilmot has wrought big changes at the once fast-growing company, including killing as many as seven new products. Wilmot has also replaced a number of vice presidents, and Poqet's personnel count has dropped from 200 to approximately 90 employees.

Addressee known

▶ Hewlett-Packard's electronic mail cohort, Uniplex Integration Systems, Inc., let slip an announcement slated for July 8 that it has ported HP's Openmail E-mail system to the IBM RISC System/6000 and DEC DecStation 5000 Model 100. HP Openmail is a mail server that provides an Open Systems Interconnect X.400 standard-based mail service.

Do they know what the 33 means?

▶ Data General has been quietly demonstrating a new 33-MHz, dual-processor Aviion system workstation at various industry conferences during the past few months. The workstation turns in more than 60 million instructions per second. Reportedly code-named Rolling Rock, it is said to have high I/O capacity and is aimed at number-crunching workstation-based applications.

Bowling a few frames

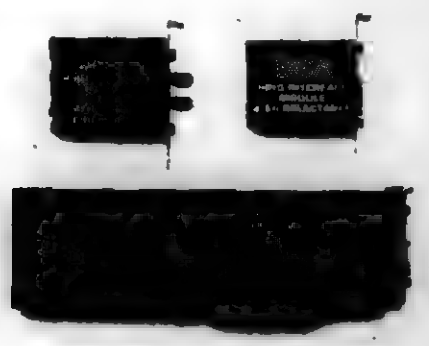
▶ When IBM told *Computerworld* in April that "the industry wouldn't have to wait for the cold weather" for an IBM frame-relay interface announcement, it was apparently giving itself plenty of elbow room. Water cooler chatter among analysts has it that the announcement will be made tomorrow and that the initial interface will run on the router's 2745 Establishment Controller. IBM is rumored to have teamed up with fast-packet pioneer Stratacom on the project.

▶ ***What do you think Apple and IBM are talking about? No one's saying for sure, but that hasn't kept the business press from amassing the biggest batch of speculation and anonymous quotations we've seen since Gary Hart pulled out of the political race. We're not proud. Find a home for your juiciest Apple-IBM rumors with News Editor Pete Bartolik at telephone (800) 343-6474, fax (508) 875-8931 or Compuserve 70537,2412.***



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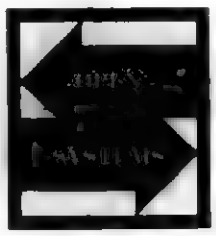
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COMPUTERWORLD

Chaos, then freedom

Shift from proprietary systems isn't smooth



BY JOHANNA AMBROSIO
and J. A. SAVAGE
CW STAFF

First in a three-part series.

The walls of division will fall and chaos will reign for a time, but ultimately, freedom of choice will come to all. That is not a description of what has occurred in Eastern Europe but rather what many observers said will occur on the road to open systems.

With customers demanding computers that no longer lock them into one supplier, competing vendors and industry consortia said they are trying to meet that need by bringing out different products that incorporate, to varying degrees, some generally agreed-upon standards such as Posix.

However, there is nothing available today that is considered completely "open," observers said. Indeed, even products that are written to the same basic set of specifications can have massive incompatibilities — witness the many variations of Unix and the problems users have in getting them all to communicate.

"Openness is a continuum," said Al Hankinson, chief of the systems and software technology division in the computer systems laboratory at the National Institute of Standards and

Continued on page 123

Wang opts for reseller role

BY [illegible]
CW STAFF

LOWELL, Mass. — Customers of Wang Laboratories, Inc. were caught off guard and left anxiously awaiting further details after the company's announcement last week that it will provide a conversion path from its VS minicomputer line to IBM's Application System/400.

IBM will invest $25 million in its cash-strapped competitor as part of an agreement in which Wang will resell the AS/400 midrange system under the IBM label and IBM's RISC System/6000 and Personal System/2 products under its own label. The companies said they will jointly develop conversion centers that will assist VS users in migrating to the AS/400.

Most VS users contacted last week expressed little or no interest in migrating to AS/400 technology, but several customers applauded the choice of the RS/6000 platform for imaging and office automation applications.



Source: Wang Laboratories, Inc. CW Chart: Doreen St. John

"The AS/400 would not be of value to us," said John T. Crawford, vice president of information management at ITT Hartford. The insurance company has 52 VS 7000 and 8000 series machines in offices throughout the U.S. and is piloting a Wang-based imaging system.

Crawford said his interpretation of Wang's action "is that they are not going to be in the hardware business for the long term."

Richard Miller, president and chief executive officer of Wang, reiterated Wang's commitment to delivering the next-generation VS platform.

VS customers will have the opportunity to migrate to AS/400 platforms via soon-to-be-established conversion centers

Continued on page 8

IBM stung by market shifts

BY ROSEMARY HAMILTON
CW STAFF

IBM's disclosure last week that it is unlikely to achieve any revenue growth this year shows how damaging product transitions can be during a weak economy, according to analysts.

Some industry observers also suggested that the computer giant's financial woes may reflect a far more serious and longer term problem that all hardware manufacturers now face. With customer demand shifting toward smaller and less expensive platforms, computer manufacturers are struggling to maintain high margins from proprietary large systems.

A company spokesman said IBM is expecting second-quarter earnings per share to fall below a 50-cent industry estimate — about $285 million — and "while we do not anticipate a loss, it depends on revenue production." He also said IBM is expecting a "few thousand more"

Continued on page 125

MINI-RISC

▶ Hewlett-Packard to raise minicomputer stakes with overhaul of RISC-based HP 3000 and 9000 lines. Page 4.

Laptop satisfaction

COMPUTERWORLD BUYER'S SCORECARD

Users rate products and vendors

See Buyers' Scorecard page 90

Product	Score*
Response base: 50 users per product	
Compaq Computer Corp.'s SLT/286	7.9
Toshiba America Information Systems, Inc.'s T1600	7.4
Zenith Data Systems' Supersport 286	6.8

*Scores are based on a 1 to 10 scale where 1 is very dissatisfied and 10 is very satisfied.

DEC costs swamping sales

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. is fighting dragons on every front these days as it prepares to lay off thousands more employees while managing the daunting transition to a new computer architecture.

The company is feeling heat from industry moves toward commodity hardware platforms and open systems, along with shrinking user budgets and stalled capital spending for high-end systems. A competitive gap between its current product line and better midrange price/performers from IBM and Hewlett-Packard Co. are other challenges to overcome.

In an interview with *Computerworld* last week, Jack Smith, DEC's senior vice president of operations, confirmed that the firm may have to lay off as many as 8,000 more employees over

Continued on page 4

Lotus Notes to aid Officevision LAN?

BY PATRICIA KEEFE
CW STAFF

IBM was attempting late last week to finalize an agreement to incorporate Lotus Development Corp.'s Notes work-group application into the much delayed IBM Officevision LAN 2.0 release, according to sources close to both companies.

With an update on Officevision 2.0 and OS/2 slated for today, the sources said that discussion between the two companies had bogged down over whether IBM would merely use technological elements of Notes or resell the product and thus provide it with added prestige as Lotus attempts to create a broad market for its work-group concept.

IBM would like to put pieces of Notes under Officevision without making wholesale changes to the Officevision interface, said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "Officevision doesn't have a very good work-group automation product, which is one of the things that NCR Corp. has with Cooperation," Dzubeck said.

IBM, on the other hand, is after specific pieces of technology, including Notes' database engine, asynchronous terminal support with network security and a graphical front end to the Notes client, according to a source close to IBM.

If IBM agrees to resell Notes,

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Legion of Doom hackers go commercial, offering to educate corporations on keeping hackers out. Page 124.

Gates warns of strategic challenges facing Microsoft. Page 6.

AT&T sued over PBX as Mitsubishi experiences security woes. Page 12.

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8 IBM looks for ways to boost sales of its RISC System/6000 product line.

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125 Analysts are underwhelmed by several networking gestures made last week by **IBM**, calling the firm's noncommittal ship dates and limited product scope disappointing.

Quotable

"There are very few things that are either completely open or totally closed. The majority of the things are in-between."

AL HANKINSON
NATIONAL INSTITUTE OF STANDARDS

On the state of open systems. See story page 1.

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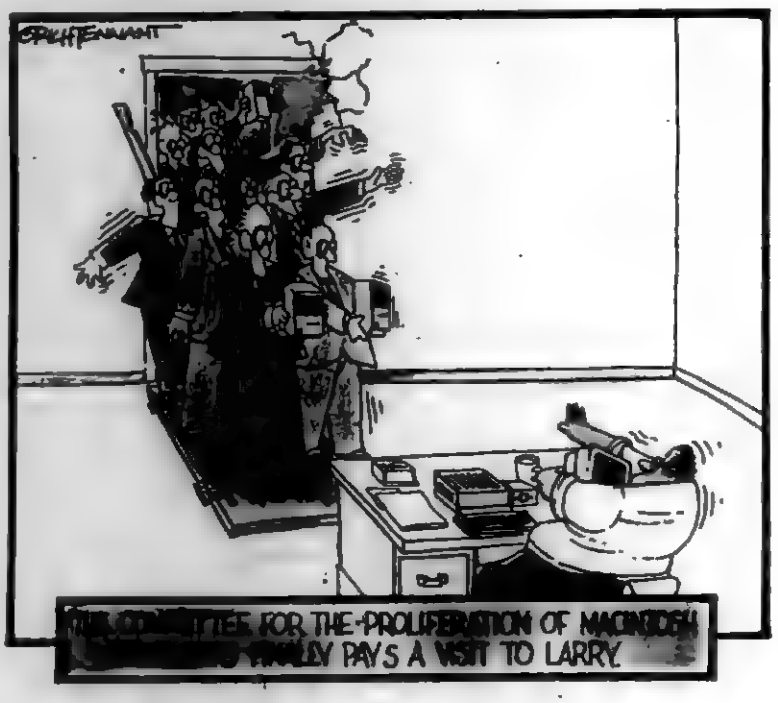
IN DEPTH

97 *Computerworld* Smithsonian Award finalists use technology to do good.

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The 5th Wave



EXECUTIVE BRIEFING

■ **IBM's $25 million in aid to troubled Wang turns Wang into both a software developer** and an IBM AS/400 and RS/6000 reseller and stuns Wang users, who nervously await migration details. Meanwhile, analysts speculate that Wang's imaging technology could help clear IBM's clouded Officevision strategy. **Page 1.**

■ **Notebook computers are hot, all right: Analysts predict that 912,000 units will be sold in 1992,** compared with 610,000 this year. But next year's notebook user will still have to contend with a three- to four-hour battery life, 2,400 bit/sec. internal modems and awkward file transmission back to the home office — all for twice the price of a desktop machine. **Page 83.**

■ **When experienced IS professionals calculate the cost** of installing new PCs, they don't stop at the price of the machines. There is more: PC installation includes everything from peripherals to furniture to training. **Page 116.**

■ **Users clamor for open systems,** and the result of vendors' rush to supply them is a chaotic landscape in which 'open' is a relative term. **Page 1.**

■ **Open systems is critical** to Du Pont's growth strategy, IS head Raymond E. Cairns Jr. says. That is why the $40 billion chemicals giant is relying on a small, select group — the Open Systems Program Office — to guide it from its DEC- and IBM-based present into an open future. **Page 75.**

■ **An already confused networking market grows** murkier still, as Microsoft chairman Bill Gates warns his top managers that funding for the LAN Manager network operating system will be cut — a move that could send users shopping for competitors' wares. **Page 6.**

■ **IBM is headed for another sorry quarter,** it says, writing off plummeting earnings and flat revenue (possibly for the rest of the year) as the high cost of a product transition during a weak economy. **Page 1.**

■ **Technical recruiting networks** made up of managers who share resumes and information about candidates are slashing costs and aiding companies that are helping laid-off workers find jobs. **Page 109.**

■ **The computer industry isn't always driven by profits.** Sometimes, its motives are more humanitarian. Profiles of 10 *Computerworld* Smithsonian Award finalists, companies whose applications have had a positive impact on society, reveal this kinder, gentler side. **Page 97.**

■ **IBM's latest networking moves underwhelm analysts,** who find the firm short on ship-date commitment and product scope. Some say the most promising products are too pricey for comfort. **Page 125.**

■ **With the competition mounting on all sides,** DEC plans to work through a tough product transition by slashing expenses and prices. Industry observers remain wary; price cuts and layoffs alone won't shelter DEC from the PC/open systems onslaught, they say. **Page 1.**

■ **On site this week:** No more scrabbling through files or scrambling through the halls for the Merrill Lynch accounting staff: Aided by 4GL software, more than 600 users at the Wall Street firm can plumb a general ledger database on-line. **Page 31.** CSX Technology IS Chief Arthur Masson tracks some 150,000 train cars across 21 transportation centers, courtesy of a Macintosh-to-VAX client/server network. **Page 47.** The U.S. Federal Court system is about to link up via a Unix-based network collection that could end up being one of the world's largest. Featuring IBM as general contractor, the project will give some 26,000 judicial personnel access to one another. **Page 59.**

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HP to heat up multiuser systems market

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. is expected to announce 15 multiuser systems today that early users said will command a price/performance advantage over systems from Digital Equipment Corp. and other competitors.

The new machines overlap with the existing entry-level and midrange HP processor lines, providing what HP claims is more speed at lower cost. New models in the HP 3000 and 9000 lines use reduced instruction set computing (RISC) chip technology that was first introduced on its workstations in March. The chips reportedly deliver up to 76 million instructions per second (MIPS). The company declined to divulge MIPS ratings for the new machines last week.

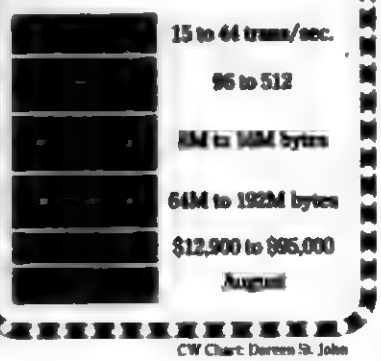
"The price/performance got me," said James Fitchell, director of information services at Harvard Medical School in Boston. Fitchell said he will migrate applications off of his two HP 3000 proprietary operating system computers onto one of the new Unix-based HP 9000 models. Although retaining a DEC MicroVax 3300, he said he has no plans to upgrade that system.

"DEC is fighting this war with words; HP is fighting the war with iron," said Michael Goulde, an analyst at Open Systems Advisors, Inc. in Boston. He added that DEC has announced a "good strategy, but when it comes to building and delivering high-performance, attractively priced systems, HP has it."

Andy McKenna, senior vice president of information services at Home Depot, Inc. in Atlanta, said the price/performance lured his company into evaluating HP's Unix-based computers as possible replacements for Data General Corp.'s minicomputers in its 150 stores, as well as for new systems in another 250 stores expected in the next five years.

Coming attractions

To revamp its minicomputer lineup, Hewlett-Packard Co. is introducing six RISC-based HP 9000 systems with new chip technology



CW Chart: Doreen St. John

The software, developed in-house, has run on the new machines, according to McKenna. He is receiving two more machines for further evaluation.

Pricing starts at $12,895 for the HP 9000 Model 807 with 15 transaction/sec., a 208-user Unix system. The most expensive model is the $170,000 HP 3000 Series 967, with the company's proprietary operating system. That machine is rated for 600 users and more than 50 transaction/sec.

Migration from HP's earlier RISC computers requires a box swap, according to Bernard Guidon, general manager for HP's commercial Unix systems. He said the company will provide the new machine in the field. With the new machines, there is an entry-level box and a midlevel box. Between the two, a customer can keep memory and other boards and slide them into the larger box with increased power.

The Unix-based systems are slated to ship in August and September. Proprietary systems delivery is scheduled for October.

DEC costs

FROM PAGE 1

the 1992 fiscal year, which begins July 1.

Smith stressed that while no exact numbers will be tallied until the end of next month, he intends to move swiftly on the layoffs to end the uncertainty of the roughly 116,000 employees remaining. "Our cost structure and expense structure is too high," he said.

Sales of DEC's most expensive hardware lines — the VAX 9000 mainframe and VAX 6000 midrange — are eroding, and a long-promised overhaul of software pricing and licensing schemes is nowhere to be seen.

"I hear they're looking at pricing, but there's nothing in front of me yet," said John Braucksieker, MIS director at Protein Technologies, Inc. in St. Louis. Continual growth in his applications base costs so much in additional fees that "it's keeping me from upgrading to the next plateau in VAX/VMS," he said.

"This is a very tenuous time for DEC," said William White, president of Vienna, Va.-based Infotech Data Resources, Inc., which provides computer services to United Press International and NBC's Consumer News and Business Channel. "The pricing and capabilities of PCs and Unix systems have gotten to a point were it's difficult to justify minicomputers. We're all reacting to the same economic pressures."

Potential customers for the mainframe VAX 9000 seem to be eyeing the high-end VAX 6000s — recently cut in price by 18% to 37% — as possible substitutes. "Overall, the pricing doesn't make any sense," said William Anderson, chief information officer at Prudential Securities, Inc. in New York. "It looks like two [VAX 6000 Model 560s] would run 15 simultaneous jobs as quickly for us as a 9000."

Some industry observers said they believe DEC will emerge in leadership form once the recession wanes and capital spending budgets fatten up again.

"DEC is doing more of the right things now," said Barry F. Willman, a senior research analyst at Sanford C. Bernstein & Co. in New York. "They started later than IBM, but they're moving more quickly. They seem to be navigating through this with a greater sense of purpose and better defined goals."

Smith emphasized that cost-cutting alone is not the answer to DEC's business dilemma. The chief corporate goal is building revenue and gaining market share through services, software and systems integration.

Like most hardware vendors, DEC overbuilt its manufacturing capacity by at least 30% in the 1980s and now faces the task of scaling down to a cost-efficient point, said Joseph Payne, an analyst at Alex. Brown & Sons, Inc. in Baltimore.

"DEC is changing, but will that be enough to reverse the trend toward Unix? I doubt it," said David Wu, an analyst at S. G. Warburg & Co. in New York. "I don't think DEC is coming back the way it did in the mid-1980s, but things will get better as the Alpha VAX gets implemented."

Looking toward a busy future

DEC will not stand idly by while its engineers put the final flourishes on Project Alpha — the next-generation VAX with a reduced instruction set computing (RISC) heart and 10 times the price/performance of today's models.

What customers can expect to see during the next several months are VAXs that double or triple in performance as intense competitive pressure from IBM and Hewlett-Packard Co. drives VAX prices continually downward.

DEC officials have confirmed that there will be another generation of VAX 6000s, the Model 600s, which industry analysts said they expect to be out this fall. A midlife kicker for the mainframe VAX 9000 is also in the cards, along with faster models of every other VAX model in the product line.

"Before the end of this year, DEC will put out an enhanced VAX 9000 offering 25% better performance than the existing line, and they'll be priced aggressively," said Terry Shannon, an analyst at International Data Corp. in Framingham, Mass.

DEC will double the VAX 6000's price/performance with a fourth-generation CMOS chip set, Shannon said.

The VAX 4000 is reportedly selling briskly these days, but its current price tag puts it at a 20% to 35% price disadvantage against comparable IBM Application System/400s, according to a study by Technology Investment Strategies Corp. in Framingham, Mass.

Although the mainframe VAX 9000 fell far short of DEC's hopes in fiscal 1991, the company did ship at least 325 systems in the product's first year, said William Askins, marketing manager for the VAX 9000. Askins said he is counting on at least 100 mainframes to be shipped this quarter. "That is much higher than we expected," he said.

MARYFRAN JOHNSON

CORRECTIONS

Contrary to a May 20 story on Keegan Management Co., Keegan is not forming an accounting subsidiary. Matthews Accountancy, Inc. will be independent of Keegan. The story also stated that Keegan was valued at $30 million in 1989. Total value of the company is not available.

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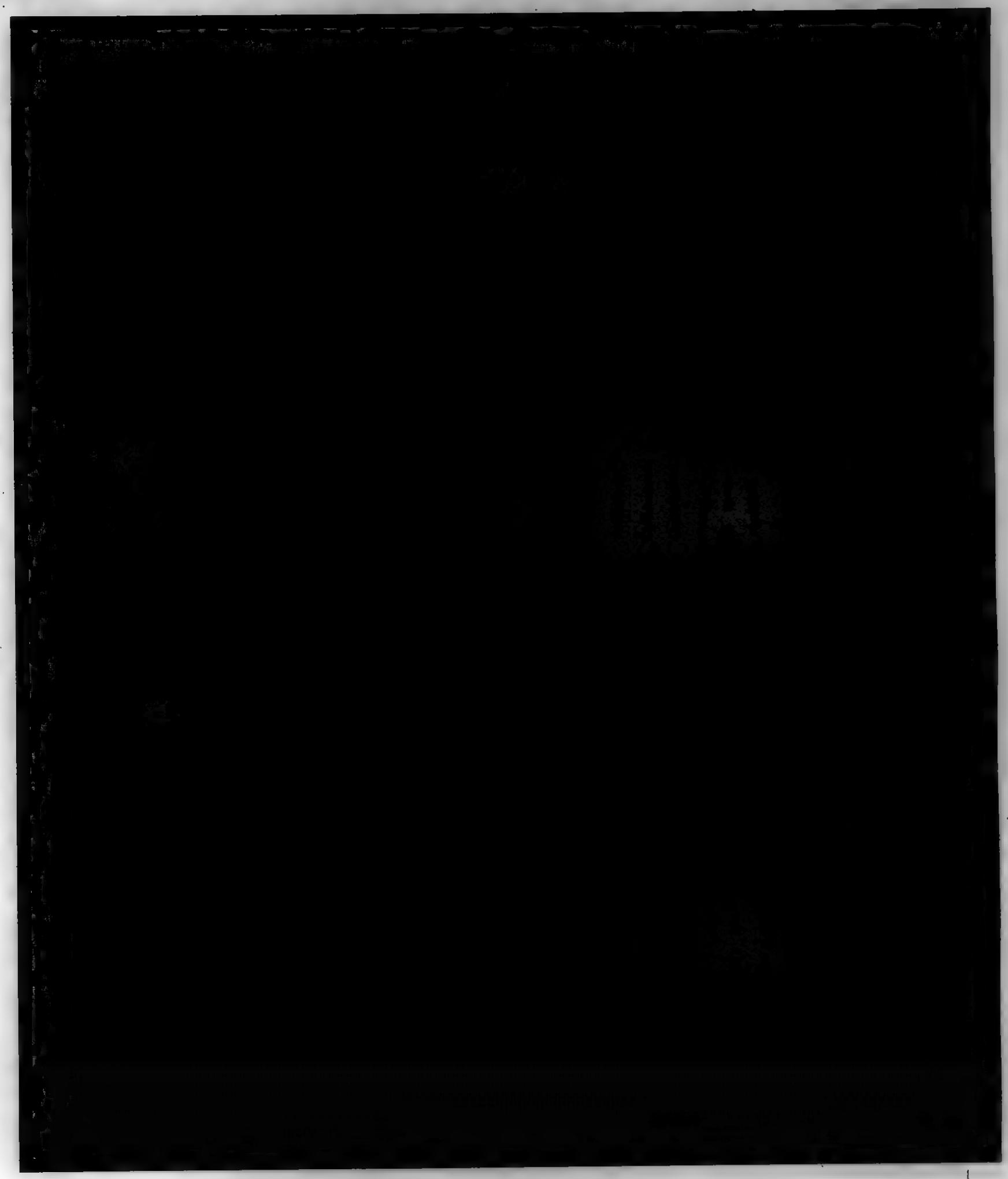
Scott Foster, president of Crystal River Engineering and designer of the Convolvotron sound system, was incorrectly identified as Scott Fisher in the June 10 issue.

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NEWS SHORTS

DEC to add to CASE lineup

Digital Equipment Corp. will pack more tools into its Cohesion line of computer-aided software engineering (CASE) products this week, including the CDD/Repository for Ultrix, DEC's Unix variant. The data storage repository, available so far only for VAX/VMS, allows users to manage and integrate a variety of tools for building applications. Analysts said DEC will announce new project management capabilities with Decplan Version 1.0 and a number of third-party relationships.

Westinghouse to sell DEC gear

The advanced product division of Wesco, a business unit of Westinghouse Electric Corp., has signed on as a national distributor of DEC personal computers, workstations, networking and PC integration products and services. The move expands DEC's PC-based business into a new market, offering customers in the electrical industries "one-stop shopping" for computer integrated energy management products and industrial plant floor data projects, DEC officials said.

Timeplex adds switched service

Timeplex, Inc. has become the first customer for Software Defined Data Network (SDDN) 384, the switched, high-bandwidth service AT&T announced last year. SDDN allows a customer with a private network to dial up a circuit over an AT&T Integrated Services Digital Network Primary Rate Interface and allocate bandwidth to a variety of AT&T services. Timeplex is currently using the switched 384K bit/sec. service for an on-demand videoconferencing link.

Pansophic, Realia to merge

Pansophic Systems, Inc. and privately held Realia, Inc. have announced a letter of intent to merge. Pansophic, which offers a broad variety of software packages, recently said it planned to "serve" its customers' evolving needs in cooperative and workstation-based applications development. Realia is a supplier of workstation software. The merger would provide Pansophic with a "key component" in its cooperative processing strategy. Realia would gain access to Pansophic's broad international distribution and support network.

Vice chairman named at IDG

Robert A. Farmer was chosen last week as vice chairman of International Data Group, succeeding Axel Leblois, who recently became chairman of Bull HN Information Systems, Inc. Farmer is currently vice chairman of the Washington, D.C.-based government relations firm Cassidy and Associates and treasurer of the Democratic National Committee and the Democratic Governors Association. IDG, parent company of International Data Corp. and World Expo Corp., operates more than 150 concerns.

DEC, AST sign pact

AST Research, Inc. announced last week it had signed an agreement with DEC that represents a sales potential of $100 million for AST. Under the agreement, DEC can select current and future AST Bravo PCs and Premium servers to fulfill contracts for government and commercial accounts. DEC has already chosen AST's Premium 486 servers as part of a $140 million PC integration contract with the U.S. Navy.

Call blocking clears committees

U.S. House and Senate panels unanimously passed separate bills last week to require telephone companies to allow customers to prevent their telephone numbers from being revealed to the parties they are calling by caller identification services. The bills require carriers to offer the feature, called call blocking, free of charge on a call-by-call basis. A number of businesses now use caller ID services to identify customers calling their 800 numbers and to allow the service representative taking the call to automatically call up a customer's electronic file.

More news shorts on page 124

Memo raises doubt on LAN Manager

BY JIM NASH
CW STAFF

An electronic memo from Microsoft Corp. Chief Executive Officer Bill Gates to his managers has cast new doubt on a section of the networking market that is already murky with uncertainty.

A May 16 memo on strategic issues, released by the company last week, indicated that Microsoft will throttle back the funding for its LAN Manager network operating system. For some network managers, significant budget cutbacks for LAN Manager could be the deciding factor in opting for competitors' software.

Gates addressed several topics in the wide-ranging memo (see story at right), but it is the networking reference that may have the greatest impact on information systems managers.

"We knew it wasn't going to be easy, but it has been even harder than we expected to build a position in networking," Gates wrote. "You will see us backing off on some of the spending level, but don't doubt that we are totally committed to the business."

David Thatcher, Microsoft's product manager for LAN Manager, said last week that the company has built the infrastructure to sell and support its networking software. "We have spent a huge amount on LAN Man," Thatcher said. It can continue to grow without as much money, while retaining Microsoft's "complete commitment."

For some, the memo was a nonevent. "I'm not concerned at all" that Microsoft will substantially pull back from LAN Manager, said Gary Cunningham, a leader in the 3Com Corp. 3Wizard network engineer group. Gates, who spoke to a group of 3Wizards recently, "left me with a completely different impression," Cunningham said.

He said he sees no negative impact from a leveling off of funding, given the burst Microsoft gave LAN Manager during this past fiscal year.

No one contacted last week would guess how much Microsoft would reduce its LAN Manager spending. Thatcher said budgets are still being finalized and will not be made public.

Since last August, Microsoft has made a show of its commitment to LAN Manager, spotlighting, for example, its plan to hire 500 new employees for network development and marketing teams. Industry analysts and resellers have estimated Microsoft's investment in the LAN Manager program at $60 million to $90 million so far.

"This could mean serious problems," said Tedd Booth, network manager at Quotron Systems, Inc., a maker of financial software. "With what [Gates has] spent so far, he hasn't caught the market."

According to Gates' memo, Microsoft's strategy is to build networking features and services into operating systems releases, relying on its Windows product as a strength.

Gates' words of caution

Microsoft Corp. Chairman Bill Gates last month sketched out for his senior staff a broad array of strategic challenges ahead and pitfalls to avoid.

"Our nightmare — IBM 'attacking' us in systems software, Novell 'defeating' us in networking and . . . competitors getting their Windows act together is not a scenario but a reality," Gates wrote in the memo, copies of which were provided by the company last week following disclosure of its existence.



Gates: Apple suit could be 'disastrous'

Among other issues Gates addressed were the following:

• **The company's relationship with IBM.** "IBM is proposing to take over the definition of PC desktop operating systems . . . The barriers to their success are not only technical but structural. Why are they willing to lose so much money on systems software? The answer is that they have a plan to design the operating system so that their hardware [Micro Channel Architecture] and applications are tied in . . . Eventually, we need to have at least a neutral relationship with IBM. For the next 24 months, it may be fairly cold."

• **On Apple Computer, Inc.'s lawsuit.** "If the judge rules against us without making it clear what we have to change or asks us to eliminate something fundamental to all windowing systems [such as overlapping windows], it would be disastrous."

• **Outside resentment.** "We need to have visible events on a regular basis where we solicit the input of anyone who wants to influence our future direction . . .

"Unix has [the Open Software Foundation] and X/Open — we also need clear ways for organizations of all types . . . to feel like they have something invested in our approach and can affect our course."

The next wave rides on NCR's notepad PC

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — NCR Corp.'s planned release of its System 3125 stylus-based notepad here today may indeed spark the beginning of a new era of computing, some analysts said. Others said they think the potential of the machines has a long way to go before it gets developed.

"It's kind of like multimedia — a zero billion dollar market," said Dan Ness Jr., microcomputer analyst at Computer Intelligence, a market research firm in La Jolla, Calif. "I love new technology, but as with anything new, these things just don't happen overnight," he added.

NCR executives have said they expect the 3125 — a 3.9-pound, Intel Corp. 80386SL-based computer with up to a 4-hour battery life — will be used initially for purposes such as insurance adjustment and airline duty-free sales. The machines will be beta-tested by several users, including NCR's own service group, until a general release in August.

NCR, Microsoft Corp., Go Corp. and Slate Corp. said they envision pen-based computers being used for many tasks. NCR plans to support both Go's Penpoint operating system and Microsoft's Penwindows system.

IBM's declared intention to ship a stylus-based notepad in 1992 has also helped generate interest in the pen-based market. One analyst said he expects to see as many as 40 million to 50 million pen-based systems sold annually by the mid-1990s — if they are marketed effectively.

"It's kind of a tough sell as a general-purpose computing tool, but if you come at it as an information appliance — like a calculator is — the key thing is that the pen brings an entirely new level of ease of use and intuitiveness to the computer," said Gib Hoxie, head of Booz, Allen & Hamilton, Inc.'s information industry practice in San Francisco.

Shape of things to come at PC Expo

BY CAROL HILDEBRAND
and CHRISTOPHER LINDQUIST
CW STAFF

NEW YORK — Ashton-Tate Corp. will jump into the client/server market Wednesday, when it is slated to unveil at PC Expo a version of its Dbase IV database designed to work as a front end for Microsoft Corp.'s SQL Server.

The introduction promises to become an important component of Ashton-Tate's cross-platform strategy because it opens up both DOS and OS/2 database server environments to Dbase IV.

SQL Server is a multiuser relational database management system that supports high-volume transaction processing, such as on-line order entry, as well as less demanding decision support applications, such as sales analysis on personal computer-based local-area networks.

Microsoft licenses SQL Server technology from Sybase, Inc. When Microsoft first announced the product, Ashton-Tate was a participant in the venture and was responsible for retail distribution, which it later ceded back to Microsoft.

Another DBMS company, Oracle Corp., will unveil several products for the desktop, including Oracle for 1-2-3 Datalens, an interface allowing data transfer between Oracle Version 6.0 and Lotus Development Corp.'s 1-2-3.

Also at PC Expo, Hewlett-Packard Co. will be demonstrating New Wave for OS/2 running under IBM Presentation Manager, which will reportedly allow users to migrate from New Wave for DOS to New Wave for OS/2 while maintaining an identical interface.

Ahead of PC Expo's Tuesday kickoff, NCR Corp. will take the podium here today to unveil and demonstrate a stylus-based notepad computer. The less than 5-pound machine will reportedly be able to run both Go Corp.'s Penpoint and Microsoft's Penwindows operating system.

Another announcement should come from Apple Computer, Inc., which will reportedly discuss its Enterprise Systems Division today. Blyth Software, Inc. will take part in the Apple announcement concerning a Data Access Language update that will allow access to multiple databases on host machines regardless of host, network type or application.

Once the Expo is under way, the Advanced Computing Environment consortium — made up of such luminaries as Mips Computer Systems, Inc., Compaq Computer Corp. and Digital Equipment Corp. — is slated to announce hardware standards for prospective developers for the reduced instruction set computing-based machines. The CPU is expected to be either Mips' R3000 or its R4000 microprocessors, with a minimum of 8M bytes of memory.

Ashton-Tate to offer Unix gear

BY JAMES DALY
CW STAFF

TORRANCE, Calif. — Ashton-Tate Corp. added breadth to its aggressive cross-platform strategy last week with the introduction of a version of the Dbase IV Version 1.1 database management system geared for the low-end Unix market.

Dbase IV for 386 runs on any Intel Corp. 80386- and I486-based microcomputers running any of five desktop Unix systems: The Santa Cruz Operation's (SCO) Unix System V/386 and SCO Xenix 386; AT&T's Unix System V/386; Interactive Systems Corp.'s Unix System V/386; and Everex Systems, Inc.'s Esix System V. Ashton-Tate also shipped a Dbase for Sun Microsystems, Inc.'s Unix-based product line in January.

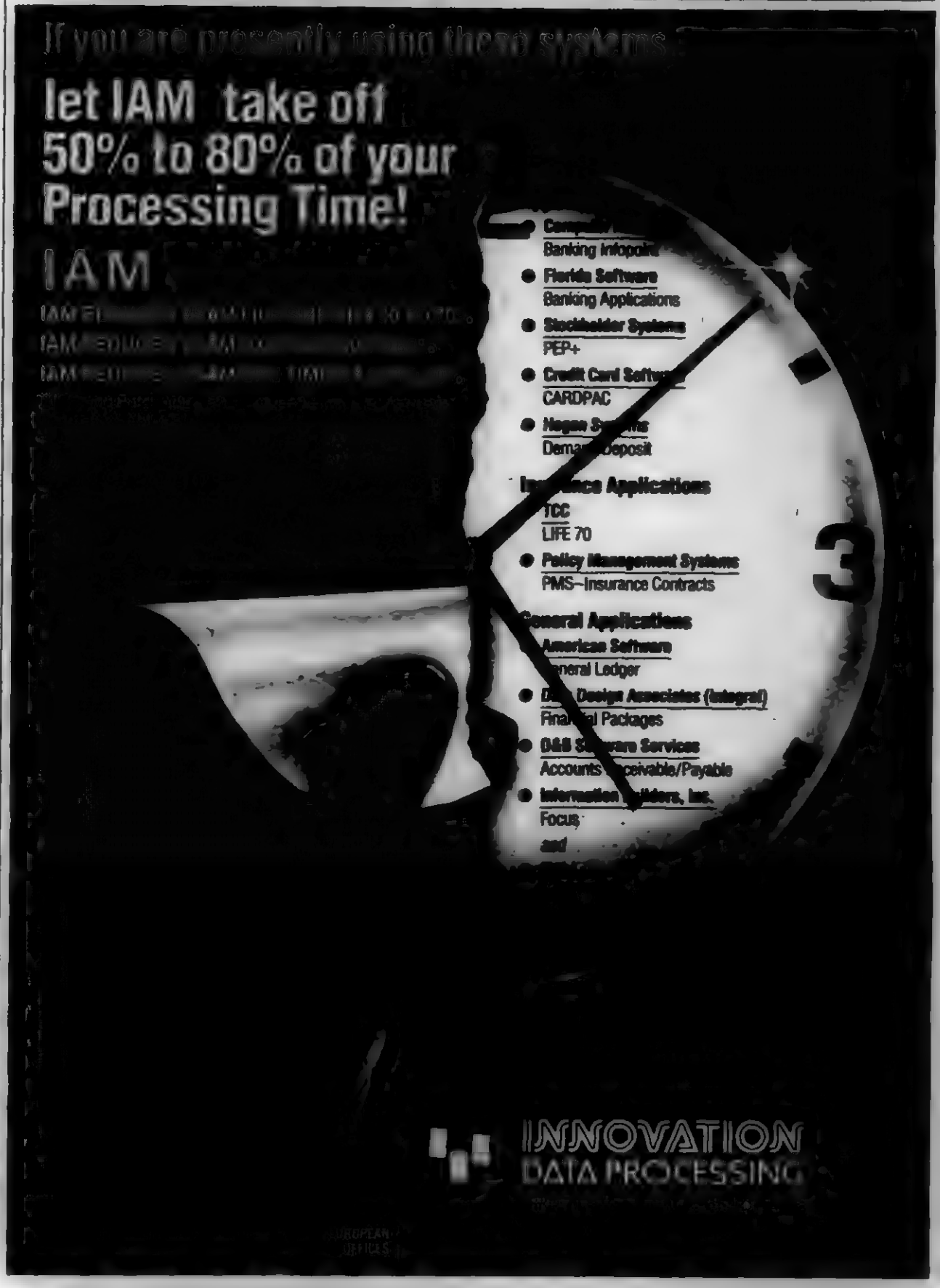
Although Unix was once regarded as a bewildering operating system aimed at technicians, its ability to multitask and its open environment are beginning to be a potent lure for traditional personal computer environments. "There are only so many Ph.D.'s out there," product manager Ken Rhie said. "We see much of the new Unix growth coming at the low end."

Minimal training needed

Because Dbase IV for 386 has a feel similar to the DOS version's, Dbase IV users will need a minimum amount of training when they move to Unix, Rhie said. Additionally, thousands of existing Dbase applications can be used on Unix systems with little or no modification, he added.

The Unix version continues the company's push to port the Dbase line to many platforms. Until six months ago, users and developers could take advantage of Dbase IV only on DOS. Today, Dbase IV is available for Apple Computer, Inc. Macintoshes, Digital Equipment Corp. Microvaxes and Sun platforms.

Dbase IV for 386 Unix is available for $995 with a single-user license. A license for unlimited users on a single computer with a single CPU costs $1,895. Runtime licenses cost $295 for a single user and $595 for a uniprocessor version.



Bills could boost manufacturing

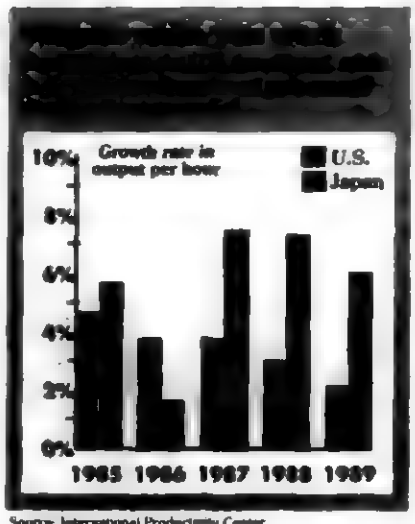
BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Four U.S. senators introduced a package of bills last week intended to shore up the competitiveness of U.S. manufacturing. The proposed legislation calls for a more coherent federal technology policy, significantly stepped-up federal and private funding in manufacturing research and education and improved monitoring of foreign technology developments.

The bills are sponsored by Ernest Hollings (D-S.C.), Al Gore (D-Tenn.), Sam Nunn (D-Ga.) and Jeff Bingaman (D-N.M.), Democratic chairmen of four technology-oriented committees. Anticipating Republican opposition to anything hinting at "industrial policy," Hollings said, "We have written these bills to fit the administration's concept of 'generic, precompetitive technologies,' and I hope the president will support them."

The bills would include the following aspects:

- Require the White House to put together a five-year plan to strengthen U.S. competitiveness in 22 areas, including information processing and communications.
- Establish regional, industry-specific centers to help small- and medium-size businesses develop advanced manufacturing methods. Industry would put up 40% of the cost, with the balance provided by federal and state governments and universities.
- Set up an industry/government program to develop prototype computer-controlled manufacturing systems and manufacturing communications networks.
- Create an industry-led National Quality Laboratory affiliated with the U.S. Department of Commerce's Malcolm Baldrige National Quality Award program in which firms would share quality manufacturing techniques.
- Establish within the U.S. Department of Commerce a clearinghouse for monitoring foreign technology development.



Source: International Productivity Center, U.S. Department of Labor

IBM pushes RS/6000, tries to up RISC appeal

BY PATRICIA KEEFE
CW STAFF

IBM is looking for ways to boost sales of its RISC System/6000 product line and at the same time broaden support for its reduced instruction set computing (RISC) chip set.

IBM's pact last week designating Wang Laboratories, Inc. as a value-added reseller of the RS/6000 and Personal System/2 lines follows on the heels of reports that the computer giant is discussing an RS/6000 license with Apple Computer, Inc.

Analysts said last week that IBM is particularly worried about the Advanced Computing Environment (ACE) RISC consortium and wants to counteract it before it gets too far.

"They need to counter Mips [Computer Systems, Inc.] with ACE," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "As big as IBM is, they can't afford to go it alone," added Bill Sines, an analyst at Framingham, Mass.-based Technology Investment Strategies Corp.

"IBM fears being relegated to third in the porting schedules of software vendors," said Tom Kucharvy, an analyst at Summit Strategies in Boston.

IBM has probably realized that in order for the RS/6000 to be a market standard, it will have to get the support of other vendors in some form of a consortium, according to Tim Bajarin, an analyst at Creative Strategies Research International, Inc. "If IBM and Apple did produce a sophisticated operating system based on the RS/6000, it might pull some [other vendors] into their corner."

Motivating force

Despite recent claims by IBM that it has never ruled out licensing of its chip set, Kucharvy said ACE is the motivating force behind IBM's apparent sudden interest in shopping around its proprietary technology.

"The rules have changed since the announcement of ACE. Just before that, I was speaking [with IBM's Jeff Mason], and he was adamant that IBM was not interested in licensing or OEMing its RISC to others. It's a dramatic reversal," he added.

The general theory among analysts is that IBM will anoint Motorola, Inc. — Apple's chip supplier — as its second source, both to satisfy government contract requirements and to provide a go-between for potential licensing and OEM arrangements. The Motorola connection makes sense because IBM is not in the business of selling chips, according to Dzubeck.

West Coast Senior Correspondent J. A. Savage contributed to this report.

Wang

FROM PAGE 1

that will be staffed and operated by Wang personnel, Wang said. A conversion software tool will be developed to aid customers in AS/400 migration.

Despite the stated commitment to the VS, the clear endorsement of the IBM platforms left users anxious and skeptical. In London, Steve Primarolo, president of the 600-member Wang Users Group in the UK, said the key decision will be whether Wang goes ahead with the introduction of a new top-end VS system, code-named Mercury. "If they go ahead and launch it, then it will add three to five years to the life of the VS range," he said.

If Wang could move applications, particularly the PACE database product, to the RS/6000 platform in a timely way, this could be a positive move, Crawford said. "But from a product standpoint, I still have a lot of questions," he added.



CW Chart: Doreen St. John

One VS manager at a large VS installation on the West Coast noted, "The RS/6000 system addition seems to be good news, but I want to know more before I stand up and clap."

IBM will initially invest $25 million in Wang in the form of debt securities that may be converted to Wang Class B common shares. Additional funding of up to $75 million could be provided, based on fulfillment of other — as yet undisclosed — terms of the agreement.

Wang's imaging software will be configured to run on the IBM RS/6000 platform. Acknowledging that there is product overlap between the two vendors in several areas, IBM spokesman Jim Ruderman said, "We look at the bigger picture in terms of benefits and broader market channels."

Casey Stern, managing director at Starr Securities, Inc., a financial consulting firm in New York, hailed the joint venture as beneficial to both companies: IBM will gain an important imaging value-added reseller and access to the VS base, and Wang will be able to eliminate manufacturing costs while migrating customers to open platforms.

However, Wang customer Jim Holsopple, manager of data processing at Goshen Rubber Co. in Goshen, Ind., said he has no desire to move to IBM. His company uses a VS 10000 for all computer applications. "I can't say I won't — it may be the best choice — but I am going to think seriously of PC LANs."

In a separate statement last week, Miller said Wang will be announcing further cost reductions in the next few weeks that "are likely to result in significant restructuring charges."

Some industry observers have suggested that Wang will decimate 40% of its existing 17,500 member work force.

William Sines, director of midrange systems at Technology Investment Strategies Corp. in Framingham, Mass., summed up Wang's position as "embarking on the last, final, desperate move to transform itself into a software company."

Sines projects that within two years, Wang will most likely emerge as a software supplier of both office automation and imaging products.

Wang-to-IBM converts call changeover a success

NEW YORK — While some Wang VS users hesitate to implement a conversion from Wang Laboratories, Inc.'s VS to IBM's Application System/400, several sites have already successfully completed the task, according to Mark Gross, president of the Data Conversion Laboratory in Fresh Meadows, N.Y.

An IBM business partner, the Data Conversion Lab has been working with Wang customers for the past two years to convert 30 Wang VS sites to AS/400 systems.

While VS-to-AS/400 conversions occur primarily in manufacturing and distribution, Gross said other industries are represented, too.

For example, the Data Conversion Lab was instrumental in helping Nashville-based St. Thomas Hospital convert several VS systems to AS/400 platforms and has participated in conversions at several government sites.



Source: Computer Intelligence

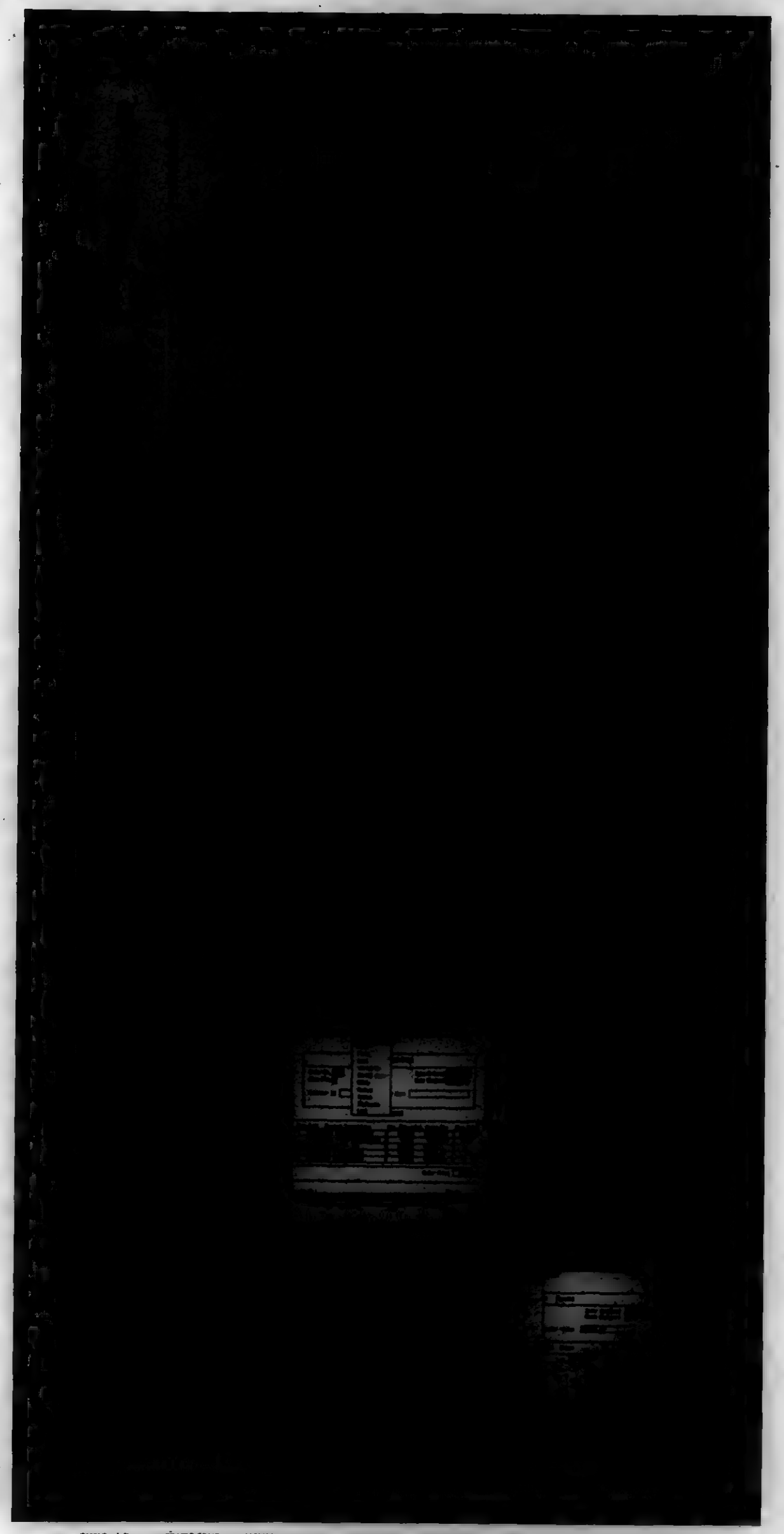
"A large conversion typically takes between six and eight weeks, but most of that time is devoted to the document review cycle," Gross said.

Using Data Conversion Lab conversion software, customers mount Wang backup tapes directly onto an AS/400 equipped with a 9-track tape drive. The conversion software reads the backup tape and reassembles it for the AS/400.

Gross said converting word processing applications requires more time than converting traditional database applications does. "Text cannot be done on a strict, code-to-code translation. It must be reviewed on a document-by-document basis, taking into consideration just what the code was intended to do in each case," he explained.

Within the past two years, the Data Conversion Lab has converted about 100 Wang word processing installations to IBM Personal System/2 local-area network environments, and the company has also conducted some conversions from Wang to IBM RISC System/6000s.

SALLY CUSACK



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Amadeus: Ready to fly?

BY ELLIS BOOKER
CW STAFF

Two years late and $130 million over budget, Europe's largest computerized reservations system (CRS) seems at last to be taking off.

The gigantic Amadeus Global Travel Distribution System, believed to be Europe's largest commercial systems project, has endured delays and cost overruns. The project will have soared beyond the original $400 million budget to cost $530 million by the end of this year, a spokeswoman said.

Amadeus is undeniably late to market. It was scheduled to go on-line in mid-1989, but the cutover of the various countries' CRS systems will not be completed until December, with the addition of hotel and car rental subsystems coming early next year.

The problems have caused finger-pointing among the four European airlines that originally sponsored it and the companies, including IBM, that were hired to build it.

However, the Amadeus spokeswoman in Madrid told *Computerworld* last week that Amadeus' main data center in Erding, Germany, is up and running. The facility has been beta testing the flight availability and scheduling portion of the CRS since June 17, she said.

Next month, the first national CRS will be cut over into Amadeus, the spokeswoman said, and by the end of July, all of the regional airlines should be connected to the system.

By December, some 60,000 terminals will be linked, and next year, travel agents will begin using a common Amadeus database instead of separate national ones, the official said. "Amadeus will handle 120 million bookings a year, and by the end of the year 2000, we expect to double this," she said. "Amadeus and IBM underestimated the complexity of the project ... We had to specify additional functionality," she added.

Founded in 1987, Amadeus grew from a partnership of Air France, Iberia Airlines of Spain, Lufthansa German Airlines, and the Scandinavian Airlines System. The four airlines awarded an overnight systems contract to IBM Europe, which in turn selected System One to develop the core CRS software. System One is a subsidiary of Continental Airlines Holdings, Inc.

The original plan was simply to enhance existing System One software, according to Al Lenza, vice president of planning and administration at System One. "[But] the design is now radically different ... We've done it from scratch," he said.

The end result was that development time grew from the expected 60 man-years to 500 man-years, Lenza said.

Further complicating the situation, a marketing pact with AMR Corp.'s Sabre CRS strained the relationship between Amadeus and System One, which viewed Sabre as a direct competitor last year.

Sources familiar with Amadeus said its problems have less to do with technology and the performance of System One and IBM and more to do with the project's shifting requirements.

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IBM closer to XGA standard

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — IBM will take another step this week toward turning Video Graphics Array into an old standard.

IBM will take a seat on the Video Electronics Standards Association's (VESA) Extended Graphics Array (XGA) subcommittee in an unusual response to requests from board makers anxious to ensure a third-party standard that is compatible with IBM's XGA specification.

VESA Chairman James A. Anderson, director of marketing at Headland Technologies, Inc./Video Seven, said he thinks this move by IBM will make it more likely for an XT/AT bus version of XGA to be outlined by Comdex/Fall '91, when VESA holds its next meeting.

For users who may eventually wish to buy XGA boards for XT/AT bus machines, it will mean less fear of incompatible hardware.

Anderson said a VESA XGA standard that was not compliant with IBM's would result in a fragmented market and would limit the possibility of XGA becoming "a pervasive standard."

Such cooperation on a hardware development is unusual for IBM, acknowledged Jon Vitello, manager of graphics subsystems product management at IBM. Vitello termed the move a sign of IBM's efforts to be more responsive to customers.

"In my opinion, IBM wants to see XGA become a standard, and it's the silicon houses that ... create that market," said Fred Dunn, vice president at graphics research firm Jon Peddie Associates in Oakland, Calif.

XT/AT bus XGA boards could appear in the second quarter of 1992 if the committee meets its internal deadlines and is able to address ways to remove XGA's bus-mastering capabilities so that it can work on the XT/AT bus.

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Mitsubishi blames AT&T for security breach

BY MICHAEL ALEXANDER
CW STAFF

NEW YORK — In only two months last summer, computer hackers rang up $430,000 in unauthorised telephone charges on a private branch exchange (PBX) belonging to Mitsubishi International Corp.

Last week, Mitsubishi sued AT&T in U.S. District Court for allegedly failing to warn it of the risk of fraud and for not responding quickly enough to identify and combat the source of the problem. Mitsubishi filed the suit in response to threats of legal action by AT&T seeking payment for the unauthorised charges.

The PBX, an AT&T System 85, was installed in the summer of 1988, according to a Mitsubishi spokeswoman. In July 1990, hackers began attacking the system in an attempt to make calls using a remote-access feature that allows employees anywhere in the country to charge calls using a personal access code. From July to September, the hackers, who remain unidentified, made more than 1 million attempts to break into the system, the spokeswoman said.

Mitsubishi had issued a request for proposals, "emphasizing the importance of a secure and cost-effective system," the spokeswoman said. "We bought the system with the understanding that it met those needs."

Some employees at Mitsubishi began experiencing problems accessing the PBX in the summer, but it was not until the firm received a "huge" telephone bill that it became aware of a problem with the system, the spokeswoman said.

An AT&T spokesman declined to discuss the Mitsubishi case in detail, saying the suit was without merit. "Under the law, customers are responsible for calls that originate from their system," the spokesman said. "AT&T has conducted itself properly and not in any negligent way in manufacturing, sale, presentation or description of the product."

The security features in the PBX are well-documented, the spokesman said.

Estimates of losses as a result of PBX fraud vary widely, but experts agreed that the figure amounts to many millions of dollars per year.

"PBX fraud is a closely guarded, dirty little secret by many companies," said William Cook, assistant U.S. attorney in Chicago. "The highest figure that I have run into is $1.4 million, lost by one company over a four-day holiday weekend."

The fraud is perpetrated when hackers get hold of an extender code that controls the remote-access feature, "hit the PBX as hard as they can and drive up the loss figure in a matter of days," Cook said.

Who is responsible for picking up the tab when fraud occurs is often a matter of dispute, unless the liability for charges resulting from a security breach is spelled out in a contract, said Brian Moir, legal counsel for the International Communications Association in Washington, D.C. "The carrier, the systems integrator if there was one, the equipment vendor and the customer should know ahead of time the warrants and responsibilities if there is a problem."

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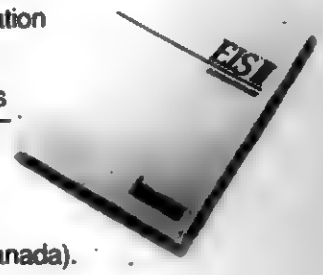
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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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Microsoft hot line feeling the heat

BY CHRISTOPHER LINDQUIST
CW STAFF

Two weeks after the release of its MS-DOS 5.0 upgrade package, Microsoft Corp. is already reaping the benefits — and the strains — of success.

Brad Chase, group product manager for MS-DOS at Microsoft, said sales of the upgrade were "even better than our wildest expectations." He added that Microsoft had 1 million orders for the upgrade before it was announced.

It is not uncommon for a 2% to 5% range of an installed base to rapidly upgrade to a new version of a software product, said Bill Higgs, director of software research at Computer Intelligence/Infocorp. "In the U.S., there are probably 25 million or 30 million installed-base DOS systems out there that could be upgraded."

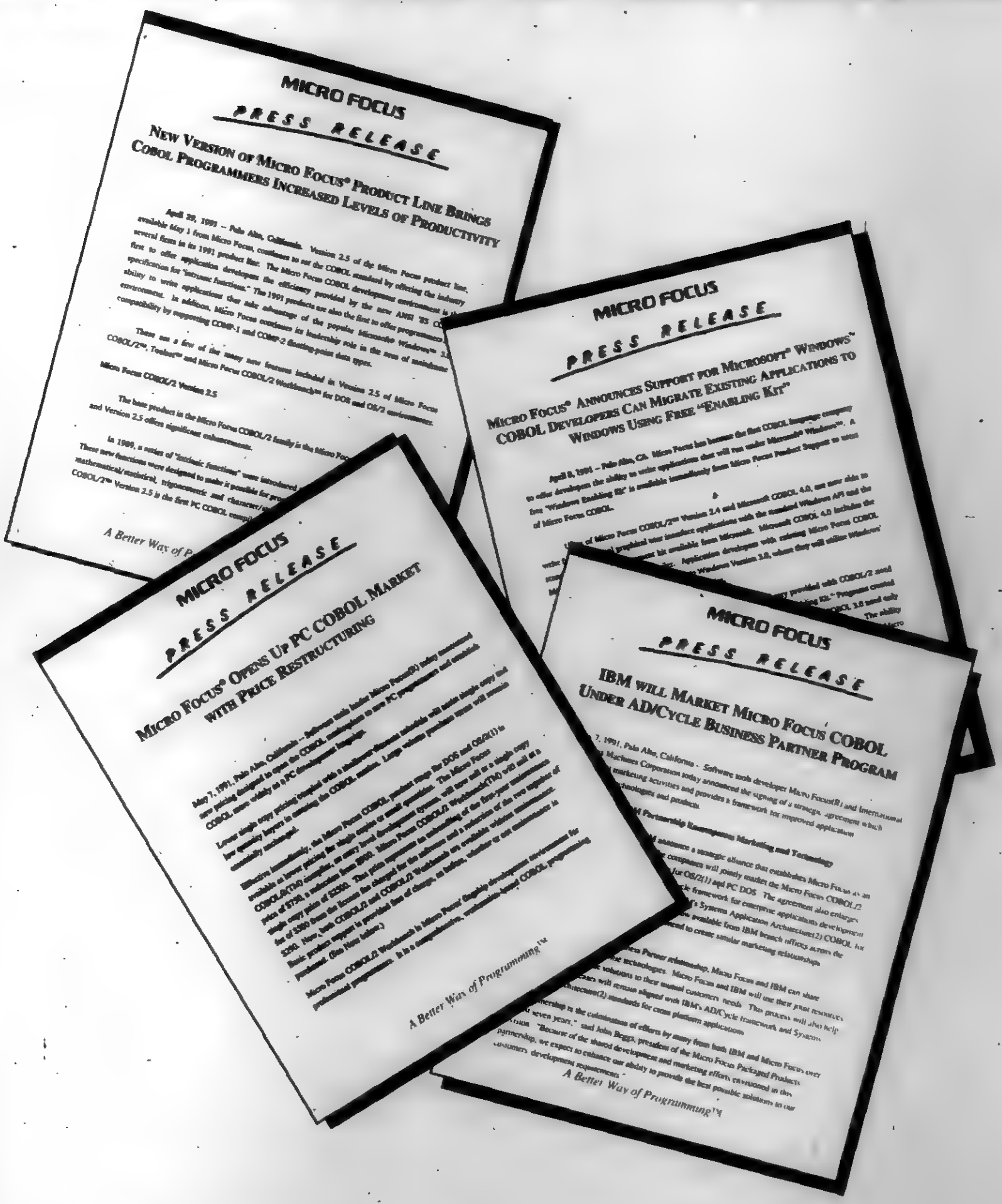
However, one of the prices for the success of the DOS upgrade has been a tremendous increase in the number of users requesting support.

The Compuserve MS-DOS forum received such a large number of messages that some were being "scrolled" off the forum before the operators had a chance to respond to the questions. A bulletin on the forum indicated that the systems operators were having trouble keeping up with the traffic.

Simultaneously, Microsoft's 90-day free support lines were ringing off the hook. One technician contacted by *Computerworld* said some of the MS-DOS support people were suffering a bit from "shell shock" when the number of calls went from 90 to 1,000 per day.

Chase said the support lines and Compuserve forum were receiving more traffic than the company anticipated because of the higher than expected sales. He added that the company will be evaluating the need for more support technicians.

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Wallington to lead SIM

Xerox CIO will be first woman president in group's history

BY CLINTON WILDER
CW STAFF

CHICAGO — Patricia M. Wallington, the high-profile vice president and chief information officer at Xerox Corp.'s U.S. marketing group, will become the first female president of the Society for Information Management (SIM) next year.

Wallington was recently voted president-elect of SIM for the year beginning July 1, 1992. She will serve as president until June 1993. She has been active on the SIM board of directors for several years and has served as the association's vice president of finance for the past year.

A Philadelphia native, Wallington was a director at Sun Co. and senior vice president at Massachusetts Mutual Life Insurance Co. before joining Xerox in her current position in October 1989. She holds a bachelor's degree in accounting and finance from the University of Pennsylvania's Wharton School and a master's degree from Drexel University.

John W. Owens, vice president of information systems at Carrier Corp., will take over as SIM president July 1. He succeeds Laurance T. Burden, whose year as SIM president was marked by his resignation as CIO at S. C. Johnson & Son, Inc.



Wallington *is VP, CIO of Xerox's U.S. marketing group*

New positions

The slate of SIM officers for 1991-92 includes a new position, vice president of chapter relations. John M. Hammitt was named to the position, which was created to promote active relations between SIM's local chapters and the national organization. He was president of SIM two years ago.

There are two other new officers for the coming year: James R. Kinney, vice president of distribution IS at Kraft General Foods, Inc., succeeds Wallington as vice president of finance. Robert M. Rubin, vice president of information services at Atochem, Inc., takes over as vice president of communications from Madeline Weiss at Weiss Associates, Inc.

James A. Senn at Georgia State University will serve another year as vice president, international, and Ross Ahntholz, director of MIS and telecommunications at Olin Corp., continues as vice president of programs and products.

SIM also elected four at-large directors: Richard D. Koeller, vice president of information technology at Whirlpool Corp.; John F. Rockart, director of MIT's Center for IS Research; Thomas L. Pettibone, senior vice president at New York Life Insurance Co.; and Susan Mersereau, vice president and general manager of IS at Weyerhaeuser Co.

Cincom Systems to widen scope

BY ROSEMARY HAMILTON
CW STAFF

CINCINNATI — Cincom Systems, Inc. mapped out additional plans last week to broaden its product line, and several customers interviewed said they believe the company is making the right moves.

Dennis Howes, a database administrator at Pierce County Medical in Tacoma, Wash., said that although his shop is mainframe-based now, the Cincom strategy gives him options in case his company's information systems plan changes in the future.

He is particularly interested in Cincom's move to the desktop because "we added about 100 PCs last year," Howes said. "I'm impressed with their strategy. Sometimes they give us so many choices I almost wish they were more limited."

Multiplatform strategy

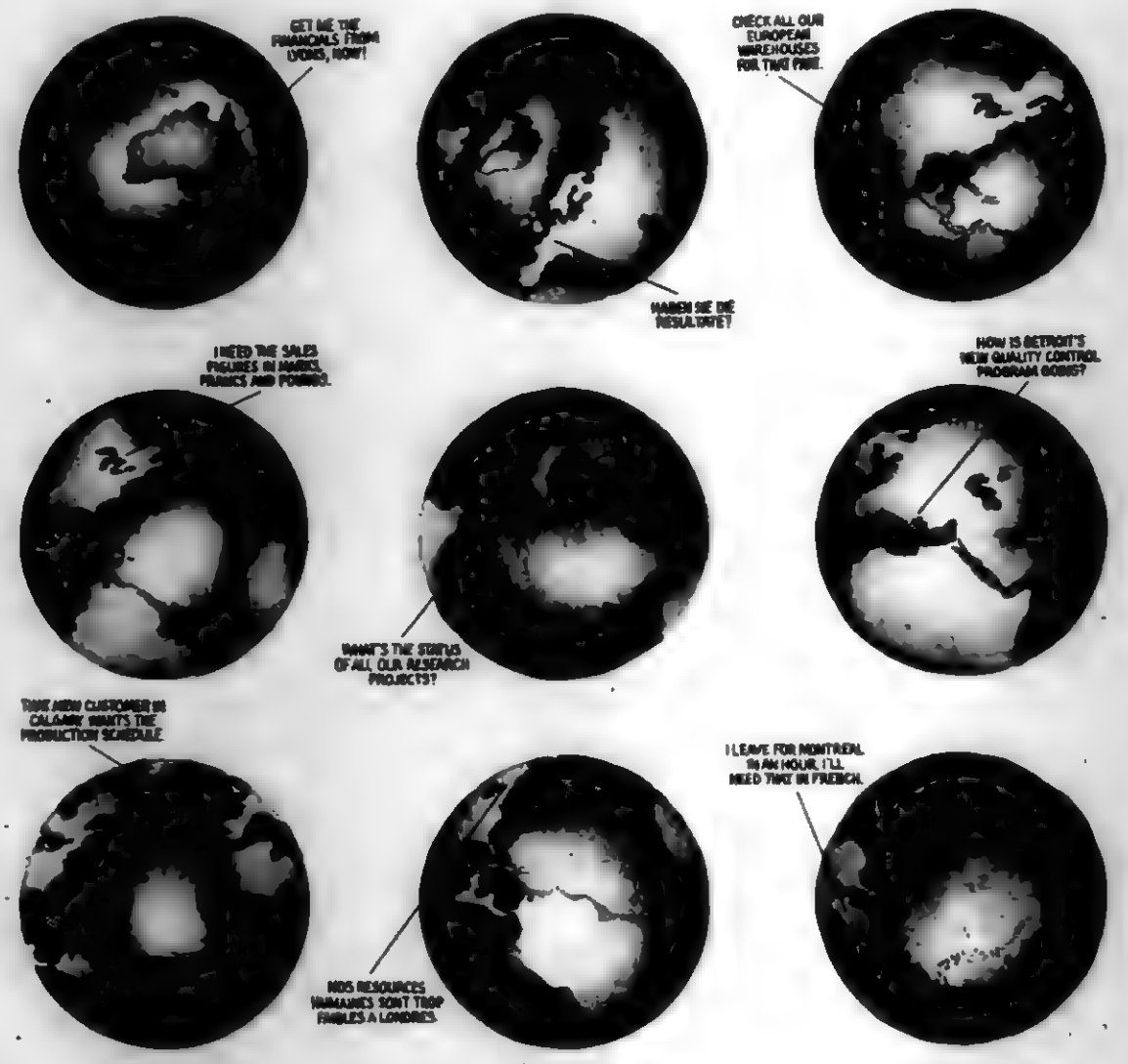
At the annual Cinteract user conference held here last week, company executives pushed the concept of a multiplatform, multiproduct strategy.

This included several announcements, such as additions to its recently announced applications development environment, AD/Advantage, as well as support for new platforms for its mainline software.

Cincom introduced Metastar, a key software piece in its applications development strategy that is designed to integrate other vendors' repositories and data dictionaries. The company said it intends to provide a repository component to AD/Advantage at a later date.

Last week, Cincom said a Supra version for the IBM Personal Computer and Personal System/2 is in beta testing and will be generally available later this year.

The company has an ongoing strategy of moving its key products, the Supra relational database management system and the Mantis fourth-generation language, to Digital Equipment Corp. VAXs and Unix platforms.



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HDS' first Summit class takes off at Delta Air

BY JEAN S. BOZMAN
CW STAFF

ATLANTA — The first of a new generation of mainframes has landed at Delta Air Lines, where Hitachi Data Systems, Inc. (HDS) installed its first IBM Enterprise System/9000-compatible EX 420.

Installation of the 150 million instructions per second (MIPS) machine came June 8, within the third-quarter goal HDS had promised last fall. It also came several months before competitors IBM and Amdahl Corp. are to begin general delivery of IBM Summit-class mainframes.

"The main purpose for this HDS EX 420 is to run a crew-scheduling application in our MVS/ESA environment," said Ron Eubanks, director of information services operations at Delta. The system was installed in the MVS/ESA test system and then switched into three separate MVS production systems, one at a time, Eubanks said. "That's just the way we're phasing it in," he said. "We want to test it against each of our software systems." He declined to comment on any specific performance benchmarks.

The EX 420 is priced at $14.4 million for a minimum configuration of 256M bytes of main memory and 64 channels, with each channel running at 4.2M byte/sec. HDS took one EX 100 in trade for the upgrade, Eubanks said.

Another of Delta's four HDS EX 100s is scheduled for upgrade to an HDS 420 sometime this fall, Eubanks said.

Delta's flight-crew scheduling application was selected as the target system for the HDS 420 because of the need to keep response times low. "When we set up a new schedule, all the flight attendants get to type in their bids for the routes they want to fly," Eubanks said. "That's a real number-cruncher, and that's why we need the MIPS." The scheduling application runs on Software AG of North America, Inc.'s Adabas database.

Industry analysts said HDS did get its Summit-class machine installed in advance of its mainframe competitors but added that the marketing move may not make any practical difference in sales.

"The good news is the EX 420 is the first of the new Summit generation to ship, but the bad news is they'll be very limited on the supply coming out of the factory for the rest of the year," said Frank Gens, vice president at Technology Investment Strategies Corp. in Framingham, Mass. Gens estimated that fewer than 20 EX 420 systems will be shipped by HDS before 1992.

When IBM ships its ES/9000 Model 900 this August, it may pack as much as 220 MIPS instead of the announced 202 MIPS, Gens said. That could blunt HDS' lead, unless HDS announces a bigger, faster processor next month, as some analysts said they expect.

Amdahl and IBM are expected to make their high-end systems — the Amdahl 5995 M and the IBM ES/9000 Model 900 — generally available by year's end, according to analysts.



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Lotus bags third copyright win

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Three down; one to go. Lotus Development Corp. wrapped up its third straight copyright infringement win last week, when The Santa Cruz Operation (SCO) agreed to cease production of its Unix-based clone of Lotus' 1-2-3 spreadsheet.

Lotus won previous suits against Paperback Software International, Inc. and Mosaic Software, Inc. All three companies were accused of copying the look and feel of 1-2-3's menu.

A fourth case, still pending against Borland International, Inc., differs slightly in that Borland's Quattro Pro spreadsheet features a Borland-designed interface with an optional 1-2-3 menu.

The settlement with SCO is not expected to affect the Borland case.

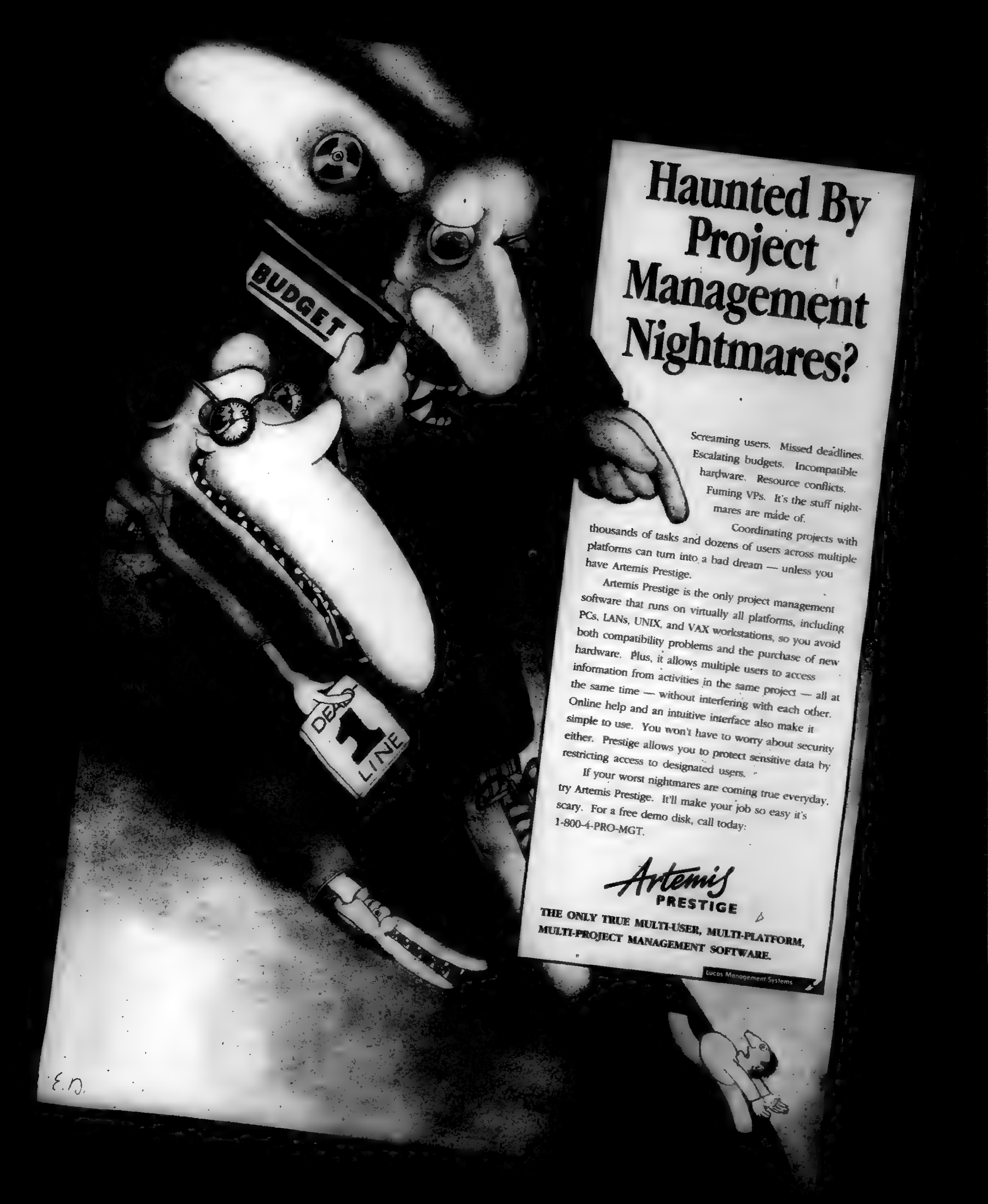
Under the terms of the out-of-court settlement, SCO will stop manufacturing, distributing and licensing all versions of SCO Professional by Aug. 15. SCO will continue to support Professional users. In return, Lotus will drop its suit.

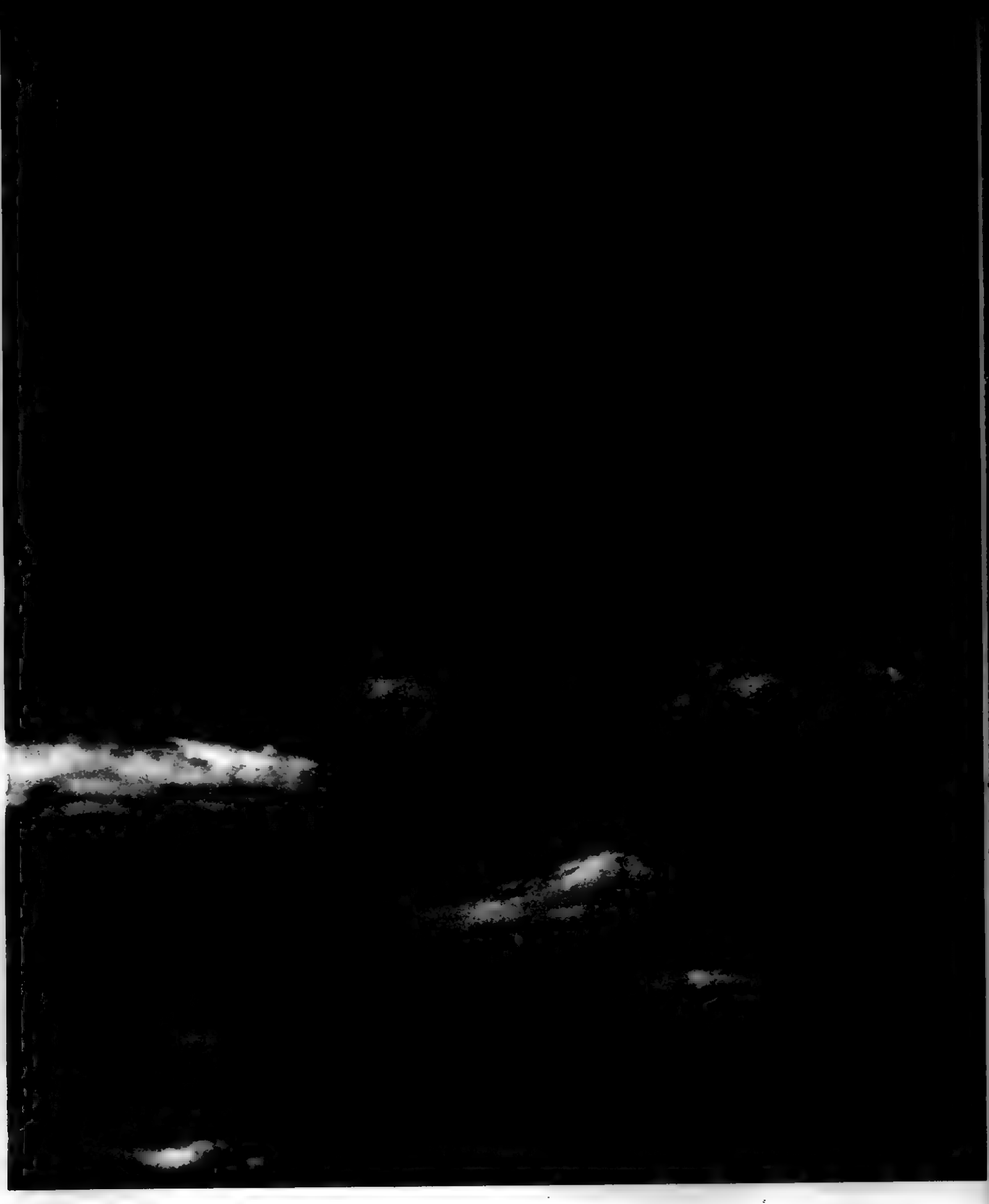
SCO Professional users are being urged to migrate to Lotus' 1-2-3 for Unix System V, which supports SCO's Open Desktop, Xenix 386 and Unix System V/386.

To encourage migration, Lotus is offering Professional users a $200 price break on the multiuser version of 1-2-3 for Unix System V.

Although Lotus said Professional does not have a large installed base, David Rome, Lotus' director of Unix products, said that by 1995, Unix could represent as much as one-third of new desktop operating systems worldwide.

Separately, Lotus and Borland traded words over the outcome of a pretrial conference held last Tuesday. U.S. District Judge Robert Keeton delayed ruling on Lotus' request for a summary judgment, while giving Borland until Sept. 30 to submit a brief outlining factual matters that it proposes to submit to a jury.


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More multimedia money

■ IBM has extended its funding of multimedia research projects at MIT's Media Lab. A three-year contract for $1.5 million will be applied in four areas: using movies and still images in multimedia computer applications; sharing digitized images among workstations; analyzing the effectiveness of color in computer displays; and developing personalized newspaperlike interfaces to information for computer users. The Media Lab, founded in 1985, has spawned such futuristic inventions as computer-generated three-dimensional holograms.

Collider computer

■ Engineers at the Superconducting Super Collider Laboratory (SSCL) have selected the Intel Corp. IPSC/860 parallel supercomputer to help design the world's largest particle collider. The collider, part of a multibillion-dollar project funded by the U.S. Department of Energy, will be built over the next eight years to investigate the fundamental forces and building blocks of the universe. The Intel supercomputer delivers the dedicated processing power equivalent of seven mainframes or four conventional supercomputers at a fraction of the cost, said George Bourianoff, diagnostics section leader at the SSCL.

Pack of publishers

■ Some of the top publishers of multimedia applications on compact disc/read-only memory (CD-ROM) have banded together to form the Multimedia Publishers Group (MPG). The trade group will promote sales of software on CD-ROM, especially to consumers. Charter members include Grolier Electronic Publishing, The Software Toolworks and Warner New Media. MPG members will display an MPG Seal of Quality on their packaging and product displays. The organization will be administered by Advanced Strategies Corp. based in Great Neck, N.Y.

Virtual reality still unrealistic

To succeed, technology must eliminate physical barriers to everyday office use

BY MICHAEL ALEXANDER
CW STAFF

Virtual reality technology goes a long way toward removing the psychological barriers between humans and computers, but ironically, the electronic gear needed to create three-dimensional worlds can itself be a physical barrier between humans and computers.

The virtual reality systems developed by VPL Research, Inc., the National Aeronautics and Space Administration and other leaders in the field consist of a cumbersome headset with goggles and a data glove with fiber-optic cables connected to a computer like umbilical cords. The headset can weigh five pounds or more, too much for extended wear. A user who wants to be completely immersed in a virtual reality world must don a data suit that envelops him from the neck down.



Fake Space Labs' *BOOM, a stereoscopic viewer, is as easy to use as a telephone*

Virtual reality, even if perfected, is too impractical for everyday use, according to Mark Bolas, president and founder of Fake Space Labs, a Menlo Park, Calif.-based product design and engineering firm specializing in virtual reality technology. For the technology to take off in a big way, it will need to take into consideration the realities of the business world, he said.

"Having to wear a headset — to suit up — is invasive," Bolas said. "You don't want to impose devices on somebody. You want them to be able to gradually leave this world and go into the virtual reality world. It's like talking on the telephone; you don't pick it up and you're instantly talking to someone. You gradually enter into conversation and you choose how involved or uninvolved you want to be. In virtual reality, that [awareness] seems to be missing."

The company markets a stereoscopic viewer for virtual reality systems called a Binocular Omni-Orientation Monitor, or BOOM for short. The viewer is mounted at the end of a floor-standing, 2.5-ft-long arm that bends and swivels. The viewer consists of a pair of 4.5-in. CRTs with a fish-eye lens over the front of each picture tube.

This design makes the stereoscopic viewer as accessible and easy to use as a telephone, Bolas said. "Say you're working behind a computer. You can reach over and grab it with one hand and pull it toward your face and look around in a 3-D world," he said. It is a convenient interface, and it can be used for everyday real-life applications, he added. Also, the viewer can be easily passed between users, allowing an architect to show a client a work in progress, for example.

Scientists in the computational fluid dynamics group at NASA's Ames Research Center are using BOOM in a virtual wind tunnel to test space shuttle design. When wearing data gloves, the scientists can create virtual smoke that flows over the shuttle surface to provide visual clues as to its aerodynamics.

Bolas opted to use CRTs in the viewer instead of the LCDs that are typical of virtual reality headsets because the tubes deliver images with higher resolution.

The arm has optical encoders — sensors — on each of its six joints to indicate how much the joint is rotated. The head gear in other virtual reality systems use magnetic trackers, which do not respond as quickly, Bolas said. As a result, BOOM images are more stable and free of the jitter and electronic noise that plague head-mounted systems, he said.

BOOM 2, Fake Space's current model, sells for $27,000.

Bellcore's superconducting breakthrough

BY MICHAEL ALEXANDER
CW STAFF

Researchers at Bell Communications Research, Inc. (Bellcore) in Red Bank, N.J., have discovered a new process for making high-temperature superconducting devices that could help pave the way for ultrafast telecommunications switches and powerful computer circuits.

When cooled, superconducting materials are free of the electrical resistance that can generate heat and cause a loss of power. Both heat and power loss are especially important concerns as computer chips become smaller and switching speeds increase.

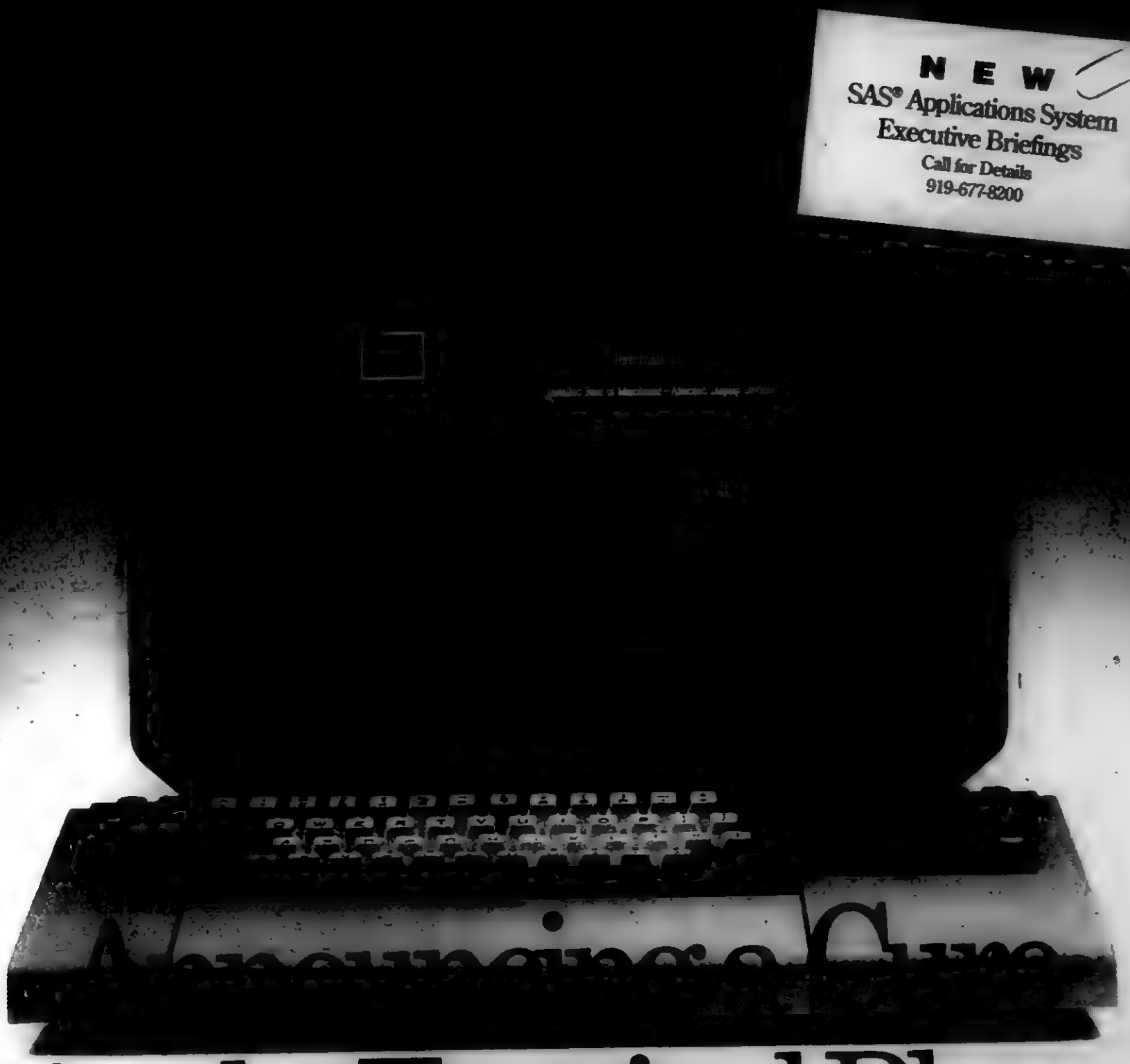
The researchers, Arun Inam, Chick Rogers and R. Ramesh, have found a way to layer extremely thin films of superconducting and nonsuperconducting materials. Individual atoms in the two materials are aligned precisely so that electrical connections between the layers are greatly improved.

Using a technique developed at Bellcore called pulsed excimer laser deposition, Inam and his colleagues grew prototype devices made up of atom-thin layers of superconducting and nonsuperconducting copper oxides. Within each layer are compounds of linked copper and oxygen atoms, which carry most of the electrical current.

"The key to our breakthrough is that we were able to make the copper-oxide planes within each layer stand up vertically and line up end to end," Inam said. "This alignment, making the planes perpendicular to the surface of the chip, allows for the best flow of electrical supercurrents through various layers."

The research has led to higher quality Josephson junctions, a critical link between superconducting and nonsuperconducting materials. Existing Josephson devices have limited performance, and their locations on a chip cannot be controlled. Bellcore's new technique does not have these limitations and may make it possible to someday mass-produce superconducting devices.





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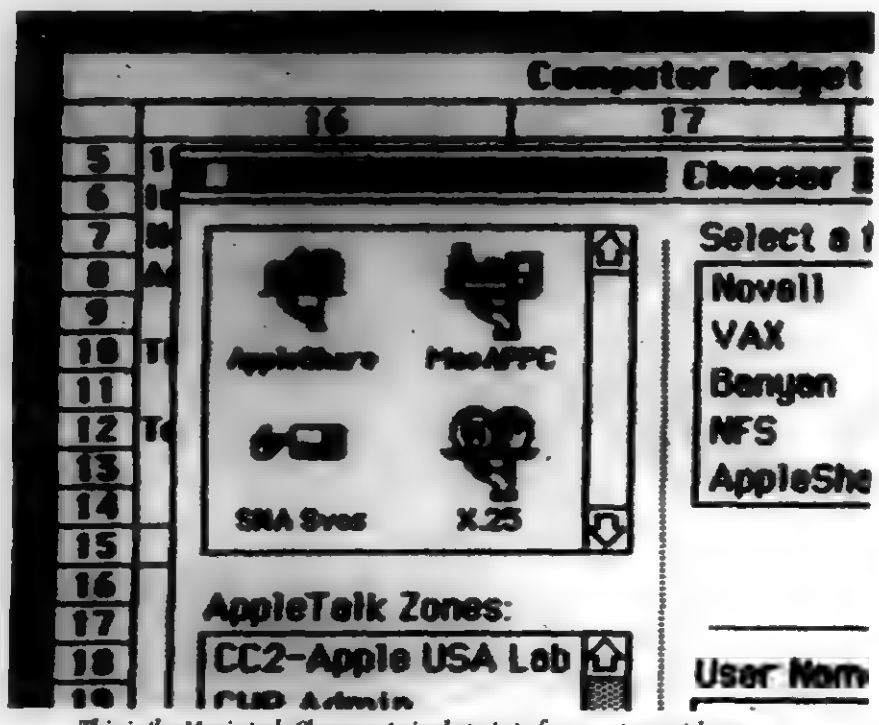
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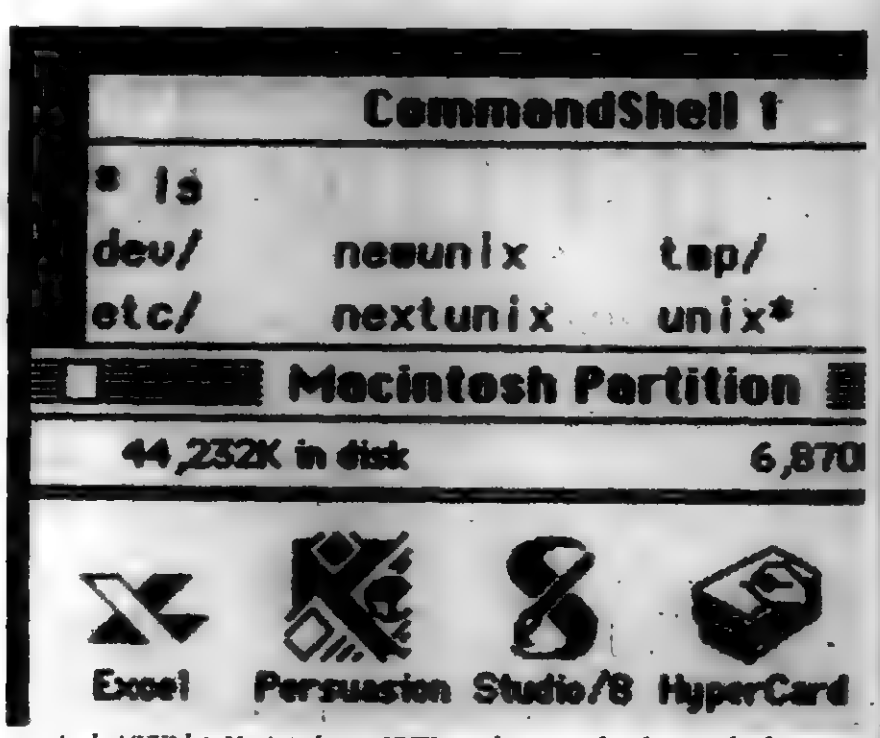
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EDITORIAL

Apocalypse now

There's a bloodbath coming.

At least that's the way the CEO of one major computer maker put it to us — almost prophetically — one week ago today in summarizing his vision for the computer industry.

That was just a day before IBM and Wang announced a deal that seemed to presage Wang's exit from the computer hardware business. It was that same day that news broke about an anxiety-provoking memo penned by Microsoft founder Bill Gates. And three days before IBM dropped a thermonuclear egg declaring that revenue growth for the current year is not a likelihood for the world's biggest technology company.

In the minds of many economists, the recession is grinding to a halt, and some are even talking about an aggressive expansion to follow, especially given that 1992 is a presidential election year.

For the computer industry, however, IBM might be signaling the start of the bluest period in the industry's history, at least for several major players. If this is the case, the ramifications for the customer base are profound, to say the least.

The employment ranks of several major players in the industry are destined to be thinned, perhaps greatly so. At Wang, for example, where employment peaked at just over 30,000 a couple of years back, the likelihood of that company's exit from hardware manufacturing could result in half of the remaining 17,000 workers losing their jobs during the next 18 months. Some observers feel DEC could be overstaffed to the tune of 25,000 workers. And could IBM be staring down the maw of tremendous overcapacity and tens of thousands of pink slips?

That's one phase of the bloodbath.

The other is already under way in the marketplace. Facing flat demand in key markets and overcapacity on their factory floors, vendors are slashing prices in a heated market-share game. Margins erode, profits fall, cost-cutting pressure rises and layoffs mount.

Even a robust economic rebound will not do much to stanch the fiscal hemorrhaging. Why? Because the very nature of the computer industry is undergoing fundamental and irreversible changes. The commodity nature of PC hardware has taken away the premium-price advantage formerly enjoyed by Compaq and IBM. How long before this wave of change moves upstream and sweeps over the workstation market — and markets beyond? And as the shrink-wrap PC software market has demonstrated, the commodity nature of things is not confined to hardware.

But there is such good news for the customers, particularly once the economy gets going again and they have some money to spend. Because when that time comes, they will find deals like they've never seen before. They will also be facing a vendor landscape that will be changing in structure almost kaleidoscopically before their eyes.



LETTERS TO THE EDITOR

Volume problems

The article "Distributed DBMS decisions" [CW, May 6] calls client/server DBMSs "best for high-performance, high-transaction-rate computing."

Experience shows that programs that divide client and server at the level of database calls (where client workstations send SQL statements to a remote database server) are not well-suited for on-line transaction processing (OLTP) — let alone high-volume OLTP — because frequent SQL calls between client and server inhibit performance. Some DBMS vendors address this deficiency by providing stored procedures.

But, few, if any, of their products integrate this facility with a transaction-processing monitor to help configure and manage the application. High-volume OLTP systems must manage hundreds or thousands of devices that generate transactions and, potentially, hundreds of processes that manage transactions.

Management is a concern in all OLTP applications because today's low-volume application can become tomorrow's high-volume application.

Robert D. Holbrook
Tandem Computers, Inc.
Cupertino, Calif.

Missed the point

Regarding "Distributed DBMS decisions" [CW, May 6], I found George Schussel's comments on distributed databases timely but inaccurate and in conflict with Chris Date's original distributed database guidelines, published by *Computerworld* in 1987.

In that article, Date pointed out that location independence must apply to the management and administration of data as well as its use. Current DBMSs are unable to provide database administrators and programmers with true location transparency of distributed data during an inset, update or delete. Referential integrity must be enforced manually for each data relationship across locations through the use of database triggers or program code.

Despite some vendor claims, none of the products touted by Schussel as true distributed database managers can automatically enforce referential integrity in a single location, much less across multiple locations.

There is almost no chance of distributed update technology maturing by 1993, as implied in Schussel's article. It is time that industry media took responsibility to clarify the facts before some information systems departments find out the hard way about the current impracticality of true distributed databases.

Garland Favorito
Norcross, Ga.

Pay your own way

In "Fresh faces give FCC new views" [CW, May 13], Sherrie P. Marshall of the FCC is quoted, "At some point, we'll all have a computer on our desk and a phone in our shoe. But who will pay for it?"

I submit the following questions to Ms. Marshall: If I want a pencil, who should pay for it? If I want a car, who should pay for it? The obvious answer is that I should! So if Ms. Marshall wants a computer on her desk and a telephone in her shoe, who should pay for it? She should!

Anyone confused enough to ask the original question will find the only sensible answer quite beyond understanding, so I imagine it is Ms. Marshall's intention to arrange for me (and other taxpayers) to pay for her computers and phones. I can only hope that I am wrong.

C. W. Kriel
The Boeing Company
Wichita, Kan.

Value pricing

Your story, "Changes coming for graduated pricing" [CW, June 3], may leave the impression that significant changes in our software pricing are imminent.

Our current software pricing approach is based on the value the product provides. One element of software value is derived from processor capacity and performance. Graduated software pricing enables us to reflect that value.

My comments concerning potential software pricing modifications were made in reference to changes in future technology. All future changes will continue to reaffirm our dedication to the principle of pricing for value and total systems competitiveness.

R. H. Goldberg
Software Marketing
IBM
White Plains, N.Y.

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Cobol: The successful failure

People keep counting it out, but Cobol is still the language of business

JOHN M. BRADLEY



It's not often that a computer programming language is pronounced dead before it is even born. That, however is precisely what one person implied about Cobol while it was being designed in the 1950s.

The gentleman in question disagreed with a number of design decisions and believed that Cobol was doomed as a computer programming language. To make his point, he presented the committee with a tombstone engraved "Cobol — R.I.P."

Retrospectively, it seems that this gesture was somewhat premature, since Cobol is currently the most widely used commercial computer programming language in the world. Nevertheless, it also appears to have been an omen, since Cobol has been declared dead more often than any other programming language in the history of computer science.

The first postbirth announcement of Cobol's death came in the late 1960s, when IBM started predicting that it would be replaced by PL/1 within a few years. As it turned out, of course, the vast majority of the computing world stayed with Cobol, and within 10 years, PL/1 was largely dead as a commercial programming language (at least outside of IBM).

Later, the academic community took its turn, pushing its ill-fated favorite, Pascal. Then, in the early 1980s, panic over the Japanese fifth-generation computer project spurred the development of another class of contenders, the so-called fourth-generation languages (4GLs).

A long way to go

The computing world is still awash with hype about 4GLs and their cousins, the computer-aided software engineering (CASE) tools. It is clear that these products hold much promise in the long term. However, it is also clear that there is still a long way to go before any of these products can be standardized.

One of the most formidable recent challengers to Cobol is the C language, which is currently advancing under the banners of Unix and open systems.

Despite its strong lobby, the idea of C as the dominant commercial programming language is clearly pure fantasy. Most computer scientists acknowledge that there are some obvious flaws in Cobol and that working on some 100,000-line Cobol programs can be very distasteful. However, any seasoned C programmer knows that the only thing worse is working on most 100,000-line C programs. Moreover, although C is a very good scientific and systems programming language, it is very weak in the areas of numerical accuracy, range and I/O, which are somewhat important in commercial programming.

All this talk about "open systems" is humorous because Cobol has been an open systems programming language from the very beginning. Moreover, this is one of the main reasons why it has been so successful. Veterans of commercial programming remember how much effort and expense went into converting systems from assembly language to Cobol and how they swore at the time that they would never do anything like that again. They also remember why they chose Cobol — so they wouldn't have to do it again.

As the price/performance ratio swings away from mainframes and toward open systems, it is likely that companies will start to move their Cobol systems into the open systems arena in droves. This will not weaken Cobol but will strengthen its position.

There are several reasons why I say this. One is that institutions will not rewrite their software unless there is a commercial benefit to doing so, such as greater portability, reduced maintenance or improved future development options. Wise customers who have resisted the extensions and proprietary Job Control Languages offered by the larger computer vendors in an effort to lock sites into their product lines still have all of these benefits in Cobol.

Furthermore, Cobol's portability will become increasingly important as the trend toward open systems brings about increased competition and lower profit margins. In the long run, the weaker suppliers will almost certainly go bankrupt, leaving some customers high and dry. Under such conditions, portability will become vital.

It is probable that improvements in technology will ultimately render Cobol obsolete. At this time, nobody knows exactly what event will cause this or what the replacement will be. It may turn out to be a 4GL, a CASE tool, a new form of programming or something else.

One thing is certain though: Cobol will be declared dead several more times before it really dies. Even when it is finally killed off, a lot of people probably still won't believe it.

Bradley is president of Ryan McFarland Corp., a provider of Cobol-based programming tools. He participated in the development of RM/Cobol-85.

What year is this?

READER'S PLATFORM

JERRY SITNER

If data were available to measure average time needed to implement new programs and maintain production programs today, we would find very little difference compared with the time needed back in 1965. This should be quite shocking, given the advances made in hardware and software during that time.

In 1965, data processing was still using 80-80 card source program decks. Computers were much slower. There was no such thing as on-line submission of program test runs. An average programmer day would allow around three submissions of program tests (compared with 10 or 12 today).

So why, with everything so much faster and easier, aren't we more productive? The answer is quite simple.

In 1965, the time spent between test submissions was used for desk-checking the programs to verify the validity of the test submitted. When the desk checking uncovered a flaw in the test, the programmer spent the remaining time analyzing and preparing for the next test. Now there isn't enough time between tests to do the same kind of desk-checking, which leaves the programmer with two choices: He can reduce the number of test submissions to allow for productive desk-checking, which means his test submission frequency resembles that of 1965, or he can use a trial and error approach — not a happy thought.

No matter how many technology advances are made to permit quicker test-submission turnover, there will be little improvement in programming productivity or maintenance costs.

So how can we improve programming productivity? It's fairly simple. Since program analysis is the biggest time consumer in programming, our efforts should be directed at reducing analysis time by making sure that code is understandable.

This should be a top priority in every data processing installation, but I don't know of even one where clarity of code is a priority at all, let alone the top priority. Somewhere, someday, some data processing manager has to take a stand and refuse to allow a fully tested program into production because the coding is not clearly understandable. That's the only way we'll find a route to programming productivity.

Sitner is president of Clarity Concept Systems, a software and consulting firm in New York.

Elvis lives, but he avoided computers

JOE PANEPINTO



Ergonomic and low-level radiation warnings aside, the latest word from a very reputable supermarket checkout tabloid is that computing may be dangerous to your health.

Yes, folks, despite the shrill warnings and voluminous data cast by highly paid computer security experts into the marketplace about the health threat posed by computers, it took *The Weekly World News* to finally tell the truth in a stunning headline — "Man Catches Computer Virus!"

It seems program-infecting viruses, worms, Trojan horses and logic bombs common to loose hard drives and wayward applications have been communicable to humans all along, according to a supermarket tabloid that is better known for its weekly Elvis sightings. As a result of the story, individuals accused of having a love affair with their computers have one more thing to worry about.

After all, the number of identified computer virus infections has risen from 3,000 in early 1988 to more than 30,000 today, according to Adapso. Maybe now, with the very real prospect of data-destroying infections jumping from computer to programmer and back again, users will take the safe computing tips of the experts more seriously. We wouldn't want to lose any of the personal data stored in the old gray matter, now would we?



Security experts agree that the problem of computer viruses starts with the sharing of programs and too much free interaction across networks. Who knows what a computer with a wandering eye and a penchant for downloading strange software will bring home from a late-night snoop around a public on-line bulletin board?

Buried in *The Weekly World News* story are some words of wisdom about on-line behavior from Dr. Mark Fordland, the man who reportedly treated the Pennsylvania programmer infected with the computer virus.

Borrowing software programs from friends and strangers is high-risk behavior, Fordland warned. When you borrow someone's software program, you're connected to everyone who has ever used that program."

No highly paid computer virus expert could have said it better.

Like everything else, there is a downside to being careful. Clifford Stoll, author of *The Cuckoo's Egg*, a pop primer on computer security, told me recently that too much security or suspicion on open computer networks could serve to choke the free exchange of ideas that has been the lifeblood of the software industry.

Stoll is right about the dangers of going overboard with security measures. There are anti-virus remedies readily available to individuals who have computers that are already infected, and you know what they say about an ounce of prevention. Recent issues of *Spy* magazine have advertised vinyl computer prophylactics for monitors and CPUs; however, they will do little to battle the type of communicable infections most users worry about.

Nope, Fordland's advice is the best — be careful about bringing home programs you don't know very well. And remember where you read it first.

Panepinto is a senior writer at *Digital* [illegible]



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SOFTWARE SHORTS

Compiler serves OSF

The Open Software Foundation (OSF) has chosen TDF technology, a compiler intermediate language from the Electronics Division of the Defense Research Agency in the UK, to serve as the core technology of the OSF Architecture-Neutral Distribution Format (ANDF). By providing a hardware-independent software, ANDF facilitates the creation of highly portable, high-performance applications for the open systems marketplace. The initial release of the ANDF core technology will support ANSI C, Posix and XPG3.

Tandem Computers, Inc. and Progress Software Corp. have announced that Progress will provide software for the Tandem Integrity S2, an AT&T Unix-based fault-tolerant system. The Progress fourth-generation language and relational database management system is used to create high-performance transaction-processing applications. More than 2,000 applications based on Progress are commercially available for the government and the business and manufacturing industries.

DECtp helps build Mormon database

BY MARYFRAN JOHNSON
CW STAFF

SALT LAKE CITY — Of all their worldly goods, information ranks among the most precious to members of the Church of Jesus Christ of Latter-day Saints, whose vast collection of genealogical records have made them the world's largest consumers of microfilm and microfiche.

Now a beta-test user of new Digital Equipment Corp. software, which delivers transaction processing capabilities to MS-DOS desktop computers, the Mormon Church's information systems department hopes to extend user access to historical records and save money in the process.

The church, with 7.5 million members worldwide and an expanding network of nearly 70 VAXs, is one of a handful of early users of DECtp Desktop for ACMS, which stands for Application Control and Management System (see chart).

"Desktop for ACMS will enable us to use PCs instead of terminals to access applications on the big VAXs, so we can offload those more expensive cycles and get more user capacity as well," said David McRae, a development manager for the church.

"What is really attractive to us is the ability to sit at a PC and call up part of the historical database or summon other applications from other departments within the church," added Larry Yurth, a technology analyst in charge of Desktop for ACMS development for the church. The layered software product lets application programs running on MS-DOS, Apple Computer, Inc. Macintoshes or Microsoft Corp.'s Windows 3.0 access ACMS applications via a built-in desktop programming interface.

The Mormon Church is working with DEC on a joint client/server project, designing applications under ACMS that will make it possible to distribute its massive historical database and other information on the church's multivendor computer network. The project's main task is to establish better ways to track and then automate

Continued on page 40

Desktop tool

DEC's DECtp Desktop for ACMS (Application Control and Management System) has the following features:

- Layered software product that enables users of Apple Computer, Inc. Macintoshes and PCs with MS-DOS and Microsoft Corp.'s Windows 3.0 to access commercial transaction processing applications on a multivendor network.
- Will eventually support Unix and VMS on desktop machines.
- Available now, priced at $245 per client license.
- Increases user capacity and saves money by offloading work from larger VAXs to PCs, according to beta-test user, Church of Jesus Christ of Latter-day Saints in Salt Lake City.

CW Chart: Doreen St. John

Application builder reaches user sites

BY ROSEMARY HAMILTON
CW STAFF

AI Corp. began shipping an expert system environment this month designed to build cooperative processing applications, and at least one beta-test site gives the system a thumbs-up.

London Life Insurance Co. in London, Ontario, is using Cooperative Processing for KBMS to develop a taxation expert system, said Terry Wood, the firm's manager of expert systems.

While Wood said the software is still in a test period, it has also "met our expectations."

The taxation system will be used by insurance representatives to provide expert tax advice. It will use a three-tiered architecture consisting of an IBM mainframe, a Digital Equipment Corp. VAX server and personal computers. The AI software was well-suited for this structure, Wood said, because it allows the systems components to be stored on different tiers.

The raw data and some intelligence is stored at the high end, so the mainframe acts as a database server. The knowledge-based processing component resides on the workstation. The VAX acts as a messenger between the database server and the workstation. It provides data to the workstation, where it can then be manipulated and used by the knowledge base.

KBMS advantage

"One of the advantages with [knowledge-based management systems] is you can put some intelligence at both sides," Wood said.

It will likely be another year before the taxation system is ready for a production environment, he said. In the meantime, Wood said, he plans to use Cooperative Processing for KBMS on some more simple projects that would require only two of the three platforms. He said he is also looking to apply the software to administrative applications.

The software was designed to allow customers to design applications that make the best use of each platform in their computing environment, according to the company. AI also makes expert systems for IBM mainframes, DEC VAXs and PCs. Cooperative Processing for KBMS will be licensed based on the host platform. License fees will range from $5,000 to $37,000 for VAX platforms. The IBM mainframe license fee is $37,000.

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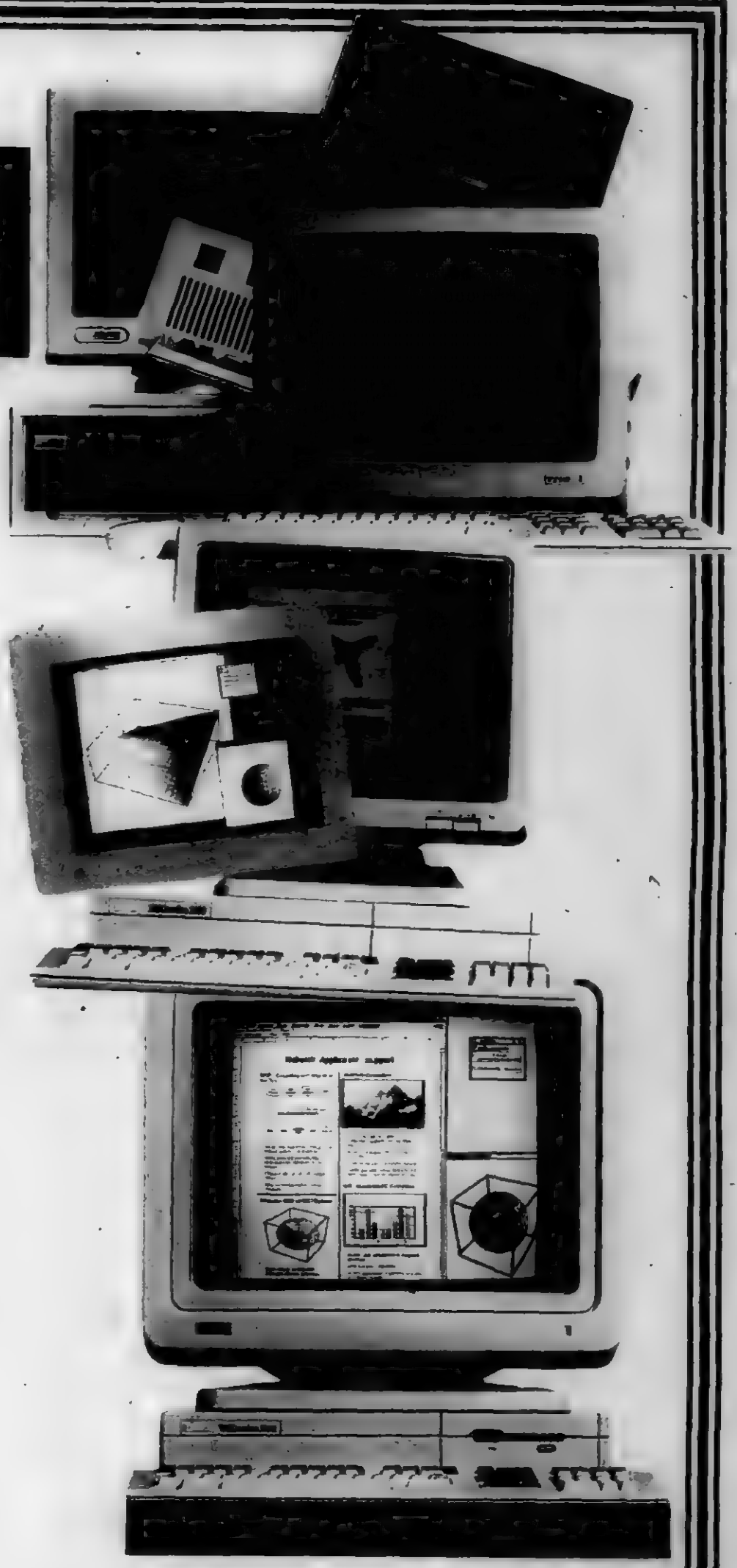
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PROGRESS

The Usual Limits Don't Apply.

Wall Street firms try shared technology

BY JOHANNA AMBROSIO
CW STAFF

Some user organizations are discovering that it is better to hold hands crossing the Street — Wall Street, that is. In a spate of recent initiatives, securities firms are pooling resources to save money.

Among the cooperative efforts by securities firms that are just now getting off the ground are the following:

- A project to gather a broader range of closing prices and other types of market data.
- A disaster recovery site with space for up to 1,000 traders.
- A joint venture of five firms that are combining and distributing their analytics libraries.
- An initiative involving a shared electronic data interchange network.

Another project gearing up is called the Securities Industry Network, which would help firms standardize on modems and other telecommunications gear [CW, June 17]. John Compitello, chairman of the Telecommunications and Information Management Committee of the Securities Industry Association (SIA), outlined the project during an SIA-sponsored conference held recently in New York.

The plan is in its early stages, Compitello said, and IBM is conducting a requirements study. "We'll know in the next four to five months whether it makes sense to proceed. It's gaining more and more momentum."

"Two can live as cheaply as one" by sharing some common infrastructure costs, said George F. Adam Jr., a partner at Goldman, Sachs & Co. in New York. "We all have a lot of duplication and, very likely, significant overcapacity." Savings can range between 40% and 50% yearly, he added.

He suggested that companies combine resources as they look to upgrade their computer systems for the 1990s. During the past decade, Adam said, many securities firms had to rebuild their computer systems — at a cost of between $25 million and $150 million — to go from batch to on-line and to accommodate longer trading days.

> TWO OR THREE firms can get together and build a common core computing environment.

"We're now looking to overhaul again because of [local-area networks], Unix, OS/2, PS/2s" and other factors, he said, "and we're looking at another $50 million to $125 million to overhaul these brokerage and investment systems. It's not always the most popular visit to your management committee, to ask if they have an extra $125 million around."

To reduce those costs, he suggested that two or three firms can get together and build a common core computing environment and then look to other areas to differentiate and to gain competitive advantage.

Still, persuading companies that are fierce competitors to cooperate can be difficult. Some securities firms have been discussing joint ventures along these lines for two or three years, but so far, "There have been no successes," Adam said.

Yet the economic incentive remains a powerful one. Information technology expenditures account for 15% to 20% of security firms' expenses, said Thomas D. Steiner, a partner at McKinsey & Co. in New York. At the same time, he said, the number of employees at securities firms is coming down 2% to 3% each year.

While technology "is replacing work done by a broad section of people" and securities firms are getting more efficient, Steiner said, it remains unclear whether that efficiency is ever really transferred to the bottom line. In fact, although technology can help a particular company realize some savings over a short period, over the long term, information systems "reduce the aggregate profitability of the [securities] industry as a whole," he said.

What happens is that information technology creates significant capacity, he explained. But if the business volume does not keep up with capacity — as has happened recently in the securities industry — too many firms are vying for too few customers, even though they still retain the fixed costs of their computer systems. This leads to price wars, including reduced margins for everyone, and some competitors fall by the wayside.

4GL package puts info on-line for accounting staff

ON SITE

BY SALLY CUSACK
CW STAFF

PRINCETON, N.J. — Instead of struggling with a file cabinet or running to find a particular person, the accounting staff at Merrill Lynch & Co. now just logs on whenever it needs information.

The staff calls up on-line screens created with a fourth-generation language (4GL) development package from Dun & Bradstreet Software, which delivers data via personal computer from its host-based general ledger software system.

Dubbed Systems Development Tool (SDT), the 4GL software is used to translate data from an 8-digit general ledger subsystem into a 16-digit system in an IBM 3090 MVS/XA environment.

Saving days

Using SDT to develop an on-line screen that would show the mapping structure for translation, "We've probably saved a couple of days' time for the accounting people," said Patricia David, department manager of financial systems at Merrill Lynch & Co. "Now they just call up a screen. They don't have to look up the information in a book or wait for someone to be in work on a particular day," she added.

Merrill Lynch is using the VSAM version of SDT, and the software integrates well with other D&B Software programs, according to David.

Merrill Lynch originally purchased several Millenium accounting and financial software packages from McCormack & Dodge in the 1980s, including Fixed Assets, G/L, Accounts Payable and Purchase Order.

Operating in both IBM and Digital Equipment Corp. VAX environments, SDT allows user-designed applications to be defined on-line and in real time using a prototyping approach. Users define applications by creating database records for files, records, screens, queries and search fields.

The SDT VSAM product modifies G/L screens on an individual basis, and it can write code behind the screens for error-checking and other intelligent capabilities, David said.

The firm has also purchased SDT DB2, a configuration of the software tailored specifically for the IBM DB2 relational database computing environment.

"We are building a financial database that uses DB2, and we wanted to utilize the existing D&B Software products," David said. "Using SDT, we have been able to query against the database."

Merrill Lynch realized a savings in implementing SDT because the company "didn't have to retrain the accounting staff in a new software environment," David added.

More than 600 end users are currently capable of accessing information from the general ledger program. David indicated that when the DB2 financial database is complete, the company will be more restrictive with the number of people qualified to access data.

The majority of end users access the mainframe via IBM's Personal System/2s and Intel Corp. 80286-based PCs over leased lines. In addition to the D&B Software products, the company relies on customized software for its budgeting and stock record applications.

For now, David said she is pleased with the capabilities of SDT, particularly its ease of use.

NEW DEALS

Unisys scores double

Despite the troubled economy both here and abroad, Unisys Corp. recently scored some hits in the mainframe sales arena. The Suncoast Schools Federal Credit Union in Tampa, Fla., has purchased a mainframe-based financial system from Unisys. The $2 million contract calls for the installation of a Unisys A12 mainframe computer system and 100 Unisys Financial Systems Architecture (FSA) Finesse workstations. Suncoast Schools Federal Credit Union is the 70th largest credit union in the U.S., with approximately $650 million in assets and more than 113,000 members. On the international front, Banco Internacional of Venezuela has installed a Unisys A16 mainfram . An existing A series customer, the commercial banking institution is expanding its branch services through a network of 400 CTOS-based workstations running the Unisys FSA Finesse branch automation software. The contract for the A16 was estimated at $3.8 million.

The NASA Langley Research Center in Hampton, Va., recently took delivery on a Convex Computer Corp. real-time supercomputer. The system will be used to support flight simulation research programs.

Mumps establishes itself in the USSR

BY SALLY CUSACK
CW STAFF

NEW ORLEANS — The Kremlin has Mumps.

The annual meeting of the Mumps Users Group had a different makeup last month, as the convention hosted first-time attendees from the Eastern Bloc countries.

Among the 1,800 users gathered from around the globe were representatives from the Soviet Union, Bulgaria and Czechoslovakia.

Mumps is a high-level language and database management system originally developed for the health care community by a technology team at Massachusetts General Hospital in Boston. The acronym stands for Massachusetts General Hospital Utility Multi-Programming System.

There are some 1,000 installations of Mumps-Diams in the Soviet Union, said George Krutov, commercial director of the Soyuz-Diams Association in the USSR.



Diams, the name Soviets use for the Dialog Multiuser System, runs on systems similar to Digital Equipment Corp.'s PDP-11 computers that are manufactured in the Eastern Bloc.

Mirroring its progress in the U.S., Mumps first appeared on the Soviet scene in the early 1970s and was initially used in hospitals before branching out into other industries such as transportation and manufacturing.

The Soyuz-Diams Association includes 155 organizations, most of which act as distributors of the software system. According to Krutov, the most prestigious contract awarded to Mumps was for the Supreme Soviet of the USSR.

Allowing for the difficult economic times, Krutov said he still anticipates modest growth for Diams installations in the next year.

The nonproprietary Mumps language and DBMS runs on a variety of platforms.

Candle tools save storage space, money

BY JEAN S. BOZMAN
CW STAFF

Beta-test site users of Candle Corp.'s DB2-DASD management product said the software tool maker's latest release, delivered to users earlier this year, enabled them to save precious space on their site's high-priced, high-end disk drives.

Burton Speed, a database administrator at The Williams Companies, a Tulsa, Okla.-based energy firm, said he expects to save more than $12,000 in the first year of using the Candle tools. "We reduced the size of our DASD pool enough to justify the expense of the product."

However, postponing new storage purchases was the more commonly cited benefit. His firm's four IBM DB2 relational database systems now pack their data into 25% less disk space than was used before, Speed estimated.

The Bank of Montreal is saving about 50% of the space formerly allocated to DB2 tables, said Terry Mason, who manages the use of database products at the bank's Toronto and Montreal offices. "We run the program every few months, after the [new] DB2 applications are stable, so that we can allot the right amount of disk space to them."

Candle's DB2-DASD Version 2, released earlier this year, works by showing users how much of the disk-drive space "allocated" to DB2 storage by database administrators is actually being used. The data on storage patterns is displayed on standard IBM 3270 screens, but pop-up windows, pull-down menus and color have been added to ease navigation through the program. Often, DB2 tables containing hundreds of empty rows are stored because of improper planning, longtime DB2 users said.

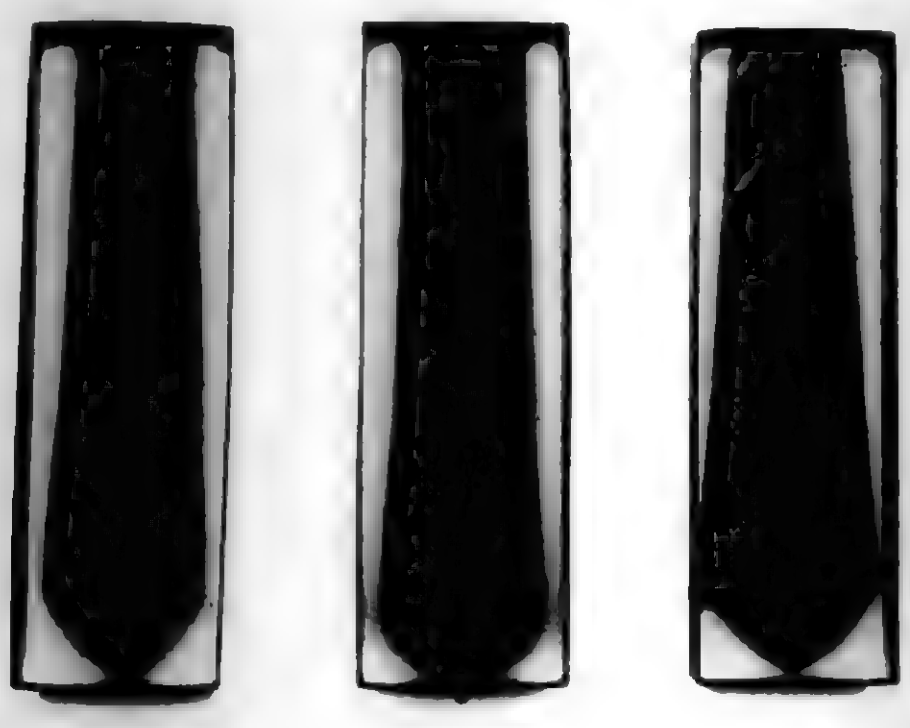
By following system prompts, users can "filter" out normal storage patterns and find the inefficient ones. "We have many thousands of DB2 data sets," said Hank Ahlgrim, manager of database administration at Levi Strauss & Co. in San Francisco. "This tool permits us to isolate the 50 to 60 tables that we'll want to change." Ahlgrim said the software will show both the absolute amount of used disk space and the percentage of allocated space that is used to store DB2 data sets.

The Candle products are licensed from the small Houston firm of CDB Software, Inc., which sold a number of DB2 utility products under the name of CDB WorkBench since 1987. The Candle DB2 management software was licensed in late 1990 from CDB Software, which remains an independent software firm with about 15 employees. However, Candle now has the right of first refusal to distribute any new product CDB Software develops. The DB2-DASD Version 2 product is priced from $10,000 to $42,000, depending on mainframe configuration.

Reserving too much disk space for DB2 is one way that many database administrators cope with user pressure for uninterrupted data access. "Any time you're working with a database, you're looking at it from the outside, as if it were a big, black box," said Bill Strapko, a senior consultant at International Data Corp. in Framingham, Mass. "You can't see what the database is doing while it's operating. It's always going to be much easier to tie up another spindle [of the disk drive] than it is to tie up a couple of hundred users who are trying to access the database from the network."

Industry analysts said the $151 million Candle is looking at the CDB Software products, sold through Candle's Database Tools Division, to help it compete with other IBM systems-software utilities firms.

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A supercomputer first is claimed

BY KIM S. NASH
CW STAFF

RICHARDSON, Texas — Convex Computer Corp. recently claimed that it has developed the first real-time supercomputers.

Based on the company's C2 and C3 supercomputers, the new Preemptor 5000 series reportedly can run at up to 800 million floating-point operations per second (MFLOPS) and incorporates features such as internal real-time clocks, user-programmable interval timers and the ability to send timer output signals to users in response to events and computations inside the machine.

The Preemptor 5500, which is slated to ship this year, performs at 50 to 800 MFLOPS, with an I/O rate of up to 200M byte/sec. Prices start at $495,000. The smaller Preemptor 5300, with a base price of $349,000, can operate at 50 to 200 MFLOPS, with an I/O bandwidth of 80M byte/sec.; it is scheduled to ship during the first quarter of 1992.

Convex also announced ConvexRTS, a new real-time, multitasking operating system that includes four separate packages: a real-time kernel, a time-sharing Unix development environment, a system debugger and a performance analyzer.

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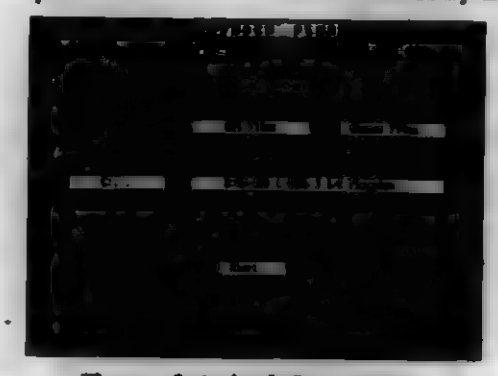
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- Optional password protection with DES file encryption capability
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And these are just a few of Fastback Plus 3.0's new features. Now more than ever, there's really no excuse not to back up your data. Because if you don't want to do it, this program will do it for you. Automatically. For more about Fastback Plus 3.0, call the toll-free number below.

FIFTH GENERATION SYSTEMS, INC.

800-933-0108

Fifth Generation Systems • 10049 N. Reiger Road • Baton Rouge, LA 70809
(504) 291-7221 Fax: (504) 291-5453

*U.S. destinations only. Fastback Plus 3.0 will not restore backups made with versions 2.09 or earlier.
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Sometimes sharing will slow you down.



Now there's a new LaserJet fast enough and smart enough to keep the whole group happy. The LaserJet IIISi printer. A 17ppm powerhouse designed for high volume. And multiple users.

With the LaserJet IIISi, your users are up to speed the moment they give the "print" command. HP's RISC-based formatter and the PCL5 printer language, with vector graphics and on-the-fly typeface scaling, yield fast results. Even on the most complex documents.

The LaserJet IIISi meets the demands of your shared work groups with two 500-sheet input trays, an output capacity of 500 sheets, and a monthly duty cycle of 50,000 pages. HP includes a job offset feature, a tray-full sensor, and software-selectable language switching between PCL5 and optional Adobe® PostScript.® For added versatility, you can choose an envelope feeder and two-sided printing.

HP sets a new standard for I/O performance with optional Ethernet or Token Ring Interface cards that support Novell or



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The HP LaserJet IIISi printer.

3COM 3+OPEN. The LaserJet IIISi comes with standard parallel and serial I/Os.

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If you're ready to hook your users up without slowing them down, call **1-800-752-0900, Ext. 2134** for more information on the LaserJet IIISi and the name of your nearest authorized HP dealer.

HP Peripherals
When it's important to you.

HEWLETT PACKARD

*Suggested U.S. list price. © 1991 Hewlett-Packard Company PE 12106

Insurance software introduced

Enterprise Solutions adaptable to various applications

BY ROSEMARY HAMILTON
CW STAFF

AUSTIN, Texas — Continuum Co. has introduced a software series that takes a different approach to insurance applications than its previous lineup did.

Enterprise Solutions by Continuum is based on a set of modules of selected procedures and technologies that can be used across insurance application areas, according to Michael Long, Continuum's president.

When developing Enterprise Solutions, Continuum's strategy called for identifying several processes that are common across different pockets in the insurance industry, such as life and property and casualty. These modules were then created to manage the generic operations across a company and to work in conjunction with the specific applications.

In addition, the Enterprise Solutions series includes a workstation platform module that will help customers set up a client/server structure to process applications.

The company also sells applications that are targeted at specific segments in the insurance industry. The new series consists of several modules that can either replace certain functions in existing applications or provide the applications with new capabilities.

For example, one procedure module handles client management, which can be applied across the life insurance and property and casualty insurance groups within an insurance company. One technology module provides imaging capabilities that can be interfaced to existing Continuum applications.

The software is compatible with IBM's Systems Application Architecture (SAA) and IBM's evolving Insurance Application Architecture, an offshoot of SAA. Continuum is also an IBM business partner.

Information technology is supposed to make your people more productive, your company more competitive. The operative words being, *supposed to*. Because many computer systems never come close. (If yours did, would you be reading this ad?) At Bull, we open the locks that isolate computers and get in the way of people using and sharing the information they need. And because we're a global company, we've opened them across borders, time zones and languages. The key? We develop a system that gets all your desktops, minicomputers, mainframes, what have you, working together. We take what you have and combine it with what you need. Protecting your investment, eliminating waste, controlling costs. Giving you the freedom and flexibility to meet future challenges. Because once we open the locks, the locks stay open. By solving the problems of our customers, by improving the performance of big companies and small companies and governments everywhere, we've become one of the largest suppliers of information technology in the world. For information call 1-800-233-BULL, ext. 2200. Or in Canada 1-800-268-4144. Because an open door is always better than a closed one. Unless, *of course*, you happen to live in New York City.

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Court computers may be seized if supplier fails

BY DON RADOLI
SPECIAL TO CW

OSLO — It is rare that a bankruptcy court is directly affected by its own actions. But if Tinglysingsdata A/S goes bust, it may take the computer systems in Norway's bankruptcy courts with it.

The firm is in the process of installing computer systems in the country's courts, including the bankruptcy courts.

Tinglysingsdata, which last year lost $9.3 million on revenue of $5.7 million, badly needs an infusion of public funds. The snag is that the ultraconservative Progressive party is threatening to block the government's plans to pay $38.2 million to invest in the financially plagued company.

The Progressive party's representative on the parliament's justice committee, Vidar Kleppe, said he wants to declare the firm bankrupt. That would lead to the seizure of all the computer equipment in the country's courts — including the bankruptcy courts.

Tinglysingsdata is a systems integrator that is installing 175 NCR Corp. Tower minicomputers, an NCR System 3000 server and 1,300 workstations in the court system.

Tinglysingsdata President Per Christian Selmer said he is confident that the politicians will find a way to finance the company and that the company is safe through 1992.

The company has invested $21.3 million in the conversion of land and property registration documents to a new computer-based system, Selmer claimed. The company's financial problems stem from the fact that the government still charges just $12.20 for information from the land and property registry — the same price as before the costly conversion.

Radoli writes for Computerworld Norge, *an IDG publication.*

New materials allow faster chip

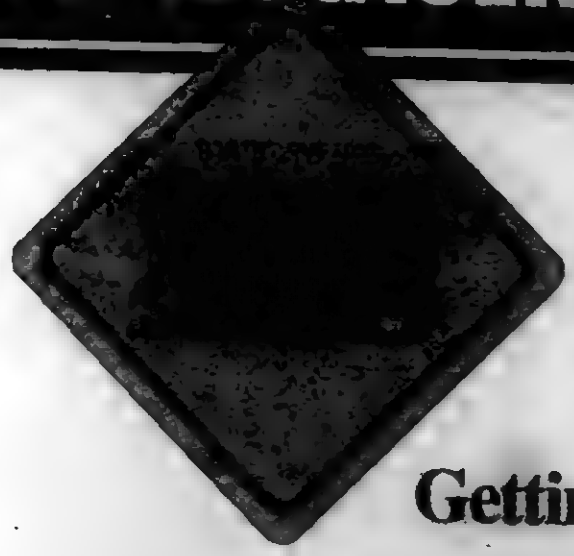
OESO, Japan — IBM scientists have doubled a critical performance factor for the type of transistors widely used in memory chips and high-density logic chips, the company recently announced. The advance could lead to faster computer chips for laptop computers, personal computers and workstations.

The tiny transistor, known as a "p-channel" metal oxide semiconductor field effect transistor (Mosfet), is less than one micron wide — a fraction of the width of a human hair.

The IBM researchers combined a novel design with new materials to build the experimental transistor, improving its performance with an ultrathin channel of silicon-germanium alloy under the silicon surface of the Mosfet transistor.

The alloy helps reduce the scattering of the charged particles that carry electrical current through the device.

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1 800 841-2031.

IBM Business Partner

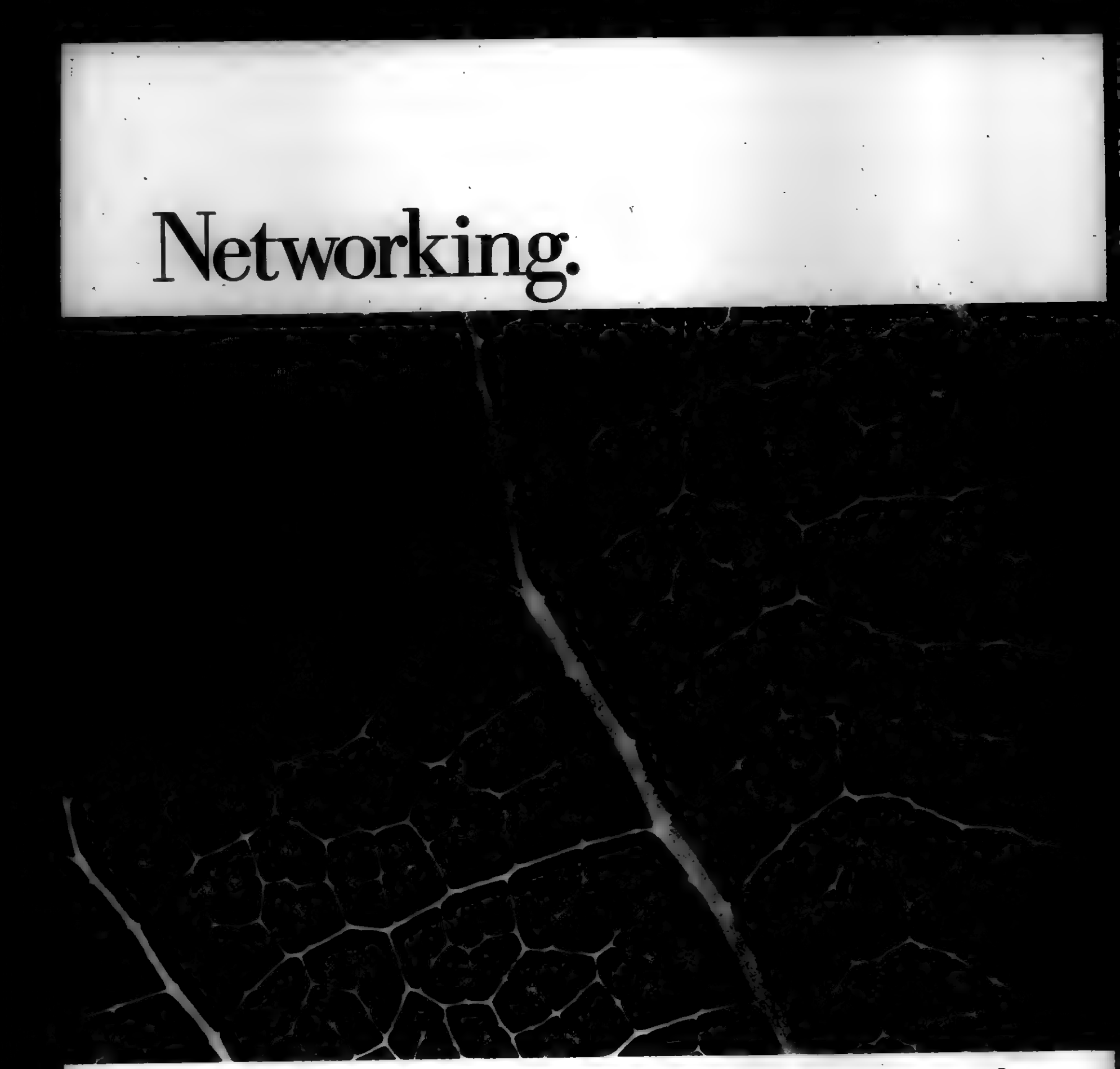
BMC SOFTWARE

Internationally, contact one of BMC's offices in:

Australia	Canada	Denmark	France	Germany	Italy	Japan	Spain	United Kingdom
(61)3 819 6733	800 841-2031	(45)44 68 22 0	(33) 1 48 77 77 77	(49) 89 964060	(39) 2 58112141	(81) 3 3437-8651	(34) 1 639 30 62	(44)276 24622
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Networking.



Without fresh informati

Some say "the network is the system," but we say your network is your *business*. In fact, without a good network you could be out of business.

Unfortunately, for too many companies, networking is not working. Or, not well enough.

Often it's because computer systems once chosen to solve problems are now causing them, because they can't communicate.

To pull things together takes a broad perspective, plus real knowledge of enterprise systems. Which makes IBM an ideal networking partner, especially since we're not just committed to open, multivendor environments, we're delivering.

For example, we're now helping UCLA build

on flowing freely, companies wither and die.

a campus-wide network that will connect 15,000 people using Apple,® DEC® and IBM systems, tied together by TCP/IP and SNA protocols.

We're also a leader in OSI, with OSI offerings across all IBM platforms. And our SNA networks are open to a wide variety of non-IBM systems.

What's more, IBM's network management systems are the industry's most robust, which is why Santa Fe Railway is using IBM NetView® for automating operations and to control not just their LANs but costs as well.

You can also tie into the IBM Information Network for worldwide communications with customers and suppliers. And you can use voice-enhanced solutions like IBM CallPath™ to greatly improve customer service.

But technology aside, the point is to get information flowing more freely around your company. And it's no longer just a good idea, it's an absolute business imperative.

Networking shouldn't be done piecemeal; you have to consider all the pieces at once—no matter who made them—and IBM has the resources for helping you do that.

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Mormon

CONTINUED FROM PAGE 27

historical data — now stored on microfilm or fiche — about the church's organization at the local and regional levels.

"We are trying to create a development environment that responds to the needs of the church, and we really want to develop systems that preserve our investment," Yurth said. "We believe client/server technology promises fairly scalable systems, so we can build small and grow larger, without a lot of application rewrite."

For users, he likens the project's end result to a Timex watch: "So easy to use, because all the complexity is under the faceplate."

While the church has come to rely on VAXs more heavily over the past six years, an Amdahl Corp. mainframe is still the main processor for financial, accounting and research needs at the church's main genealogical library, the Family History Center here. A DEC Vaxcluster may eventually take over Amdahl's role as the church unifies its computing environment over the next five years, but Yurth said no final decisions had been made.

> "DESKTOP FOR ACMS will enable us to use PCs instead of terminals to access applications on the big VAXs, so we can offload those more expensive cycles and get more user capacity as well."
>
> DAVID MORAN
> MORMON CHURCH

Last year, the Mormons began distributing CD-ROM discs — spun off of the mainframe database — to their 1,100 family history centers in the U.S. The discs include the *Family History Library Catalog* and the *International Genealogical Index*, which has data on more than 150 million Mormons and their ancestors. Also available is an *Ancestral File*, which collects and links the lineages of more than 6 million people.

Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn., said Desktop for ACMS is really "just the tip of the iceberg" in DEC's unfolding strategy for client/server computing.

"Putting Decforms on the PC is where DEC is really going," Schay said, explaining that Decforms is a screen formatting package for on-line transaction processing. "It does the layout of forms on the screens, the fill-in-the-blank stuff that takes a lot of expensive VAX cycles today."

Corporate users of ACMS are also watching the product with interest, particularly because DEC is promising to move the next major release of the desktop version to VMS workstations and Unix-based platforms.

"We would like to be in a situation where a user who needs more than a dumb terminal could offload ACMS applications off the VAXs onto workstations," said Ingvar Petursson, chief information officer at McCaw Cellular Communications, Inc. in Kirkland, Wash.

EIS gains European following

BY SALLY CUSACK
CW STAFF

AMSTERDAM — Executive information system (EIS) technology is garnering strong interest among European computer users, according to reports from the annual SAS Institute, Inc.'s European User Group meeting, held here recently.

More than 700 users attended the conference, representing the banking, insurance, government, manufacturing and pharmaceuticals industries.

Hannes Hilmarsson, manager of statistical information at Iceland Air, said the airline sent representatives to the show to gather information on EIS options and graphics capabilities for the SAS application development systems software.

Iceland Air currently uses SAS for OS/2 to extract monthly demographic sales figures from its IBM mainframe; it then compiles the data into monthly reports.

Flying high for the airline

The EIS system would be a valuable tool for the airline, Hilmarsson said. The product features point-and-click technology and drill-down capabilities.

Originally previewed at the SAS User Group meeting in New Orleans last February, the system was demonstrated for European users via dumb terminals on an IBM 3090 platform. The mainframe, also located in Cary, was linked to the conference by satellite.

Attendence was up 15% over last year, said Art Cooke, managing director of SAS Institute in Europe. He estimated that more than half of the attendees were using SAS in an IBM mainframe environment.

The SAS EIS system would most likely be competing directly with products from Comshare, Inc., Cook said. While SAS EIS for IBM mainframes and Digital Equipment Corp. VAX computers will be available in September, versions for OS/2 and Microsoft Corp. Windows platforms will be delivered by the end of the year.

THE POWER THAT MOVES YOU...

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MasterPort 386SL
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NEW PRODUCTS — SOFTWARE

Applications packages

Newgeneration Software, Inc. has begun shipping upgrades of its financial software for the IBM midrange-system market.

Release 5.3 of the General Ledger package includes four new budget report forms and updated spreadsheet and query facilities. Release 5.3 of the Accounts Payable segment offers nine new standard reports and increases user control of invoice reversing.

Release 4.2 of the company's Accounts Receivable software provides new on-line inquiries.

Pricing for the General Ledger ranges from $12,500 to $58,000, depending on system. The Accounts Receivable and Accounts Payable packages cost from $7,000 to $28,000 each.

Newgeneration Software
Suite 195
1010 Hurley Way
Sacramento, Calif. 95825
(916) 920-2200

Access Technology, Inc. has begun shipping Forwords, a text retrieval software package for Digital Equipment Corp. VAX/VMS systems.

Forwords supports a number of word processor file formats as well as ASCII files. A simple window interface and everyday syntax offer significant ease of use, according to the company. Forwords is also available for DEC's All-In-1 Office Software platforms.

The product costs from $600 to $30,000, depending on system size.

Access Technology
Two Natick Executive Park
Natick, Mass. 01760
(508) 655-9191

Advanced Systems Concepts, Inc. (ASC) has enhanced Sequel, an information retrieval and report writing software package for IBM midrange computers.

Sequel generates SQL queries and reports without creating or requiring permanent files. The current version adds multiple windowing capability, dividing the display screen into as many as 10 distinct queries. Pricing ranges from $4,200 to $24,000, depending on the system.

ASC has also announced instruction courses for Sequel users, ranging from introductory to advanced technical concepts. Courses are held at the vendor's offices.

ASC
Suite 310
1300 Woodfield Road
Schaumburg, Ill. 60173
(708) 605-1311

Wordperfect Corp. has released Wordperfect 5.0 for NCR Corp. Tower systems.

The upgrade allows users to import and integrate numerous graphics formats, including Autodesk, Inc.'s Autocad DXF files. Printer support and macro editing functions have been enhanced, and common document formatting codes can be filed and inserted automatically into documents.

A single-user license costs $495; multiuser version pricing starts at $995. Upgrade pricing depends on the number of users.

Wordperfect
Unix Division
1555 Technology Way
Orem, Utah 84057

Development tools

Interactive Development Environments, Inc. (IDE) has announced improvements to the C Development Environment.

Reverse engineering and code generation modules have been added, as well as facilities for code and design synchronization. The environment runs on Unix workstations and servers.

The C Development Environment costs approximately $10,000 per user in a small work group configuration. The Design Generator reverse engineering module costs $6,000, and the Code Generator module costs $3,000 per license.

IDE
10th Floor
595 Market St.
San Francisco, Calif. 94105
(415) 543-0900

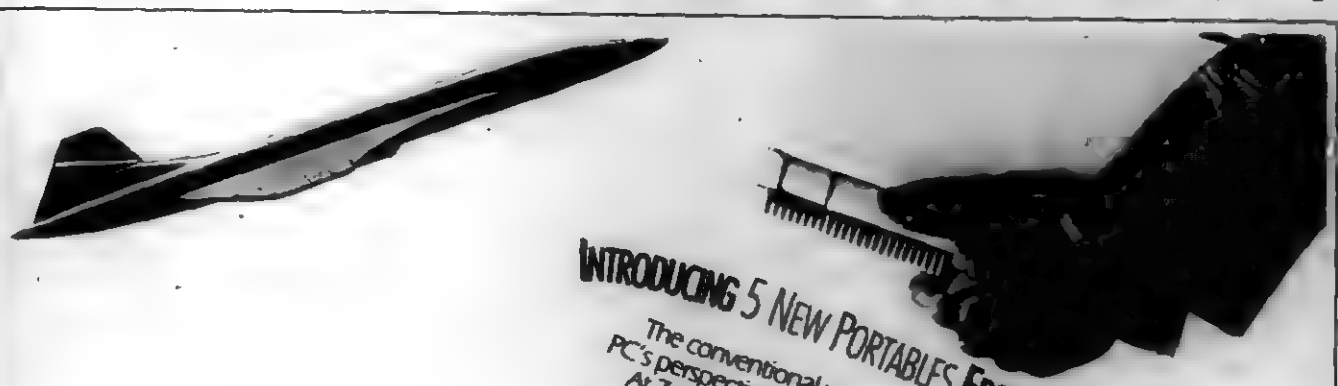
Neuron Data, Inc. has announced availability of Nexpert Object for the Hewlett-Packard Co. Apollo 9000 Series 700 workstation.

Nexpert Object is a development tool for expert systems. It provides a graphical user interface for interaction with a rule-and-object based inference engine.

The development version costs $12,000.

Neuron Data
156 University Ave.
Palo Alto, Calif. 94301
(415) 321-4488

Continued on page 42



Processor – Speed	286 – 12 MHz	386SX – 20 16MHz	386SL – 20 25MHz	486SX – 20 16MHz	486 – 25 12.5MHz
Co-Processor	80C287 socket	80387SX socket	80487SX socket	Upgradable to 486-20MHz	Integrated
Memory (Std./Max.)	1MB/2MB	2MB/4MB	2MB/8MB (64K cache)	4MB/16MB	4MB/16MB
Hard Disk Drive	40MB	60MB	60MB	120MB	120MB
LCD/Size	Backlit/8.89"	Backlit/8.89"	Backlit/8.89"	Edgelit 10.4"	Edgelit 10.4"
Video/Gray Scales	VGA, 16	VGA, 16	VGA, 32	VGA/64	VGA/64
Power Management	• Suspend/Resume • Sleep mode • Low battery operation	• Suspend/Resume • Sleep mode • Low battery operation	Premier System Management® • Standby Resume • Rest Resume • Panic Save • Unattended communications	Intelligent Power Management®	Intelligent Power Management
Software	MS-DOS® included	MS-DOS included	MS-DOS pre-installed; Microsoft® Windows™ v 3.0 included	MS-DOS and Microsoft Windows v 3.0 pre-installed	MS-DOS and Microsoft Windows v 3.0 pre-installed
Weight (with battery)	6.6 lbs.	6.6 lbs.	6.8 lbs.	15 lbs.	15 lbs.

ZENITH data systems
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Utilities

Systar, Inc. has entered the IBM mainframe software market with capacity and performance management packages for MVS, CICS and DB2 environments.

The On-Line Graphic Analyzer (OLGA) offers a graphical statistics display integrating system performance data for MVS, CICS and DB2. Real-time and recorded monitoring are included.

The Business Oriented Reports on Information Systems (BORIS) package creates bar graphs showing system workload evolution as well as service quality and resource use trends.

Pricing for OLGA and BORIS together ranges from $12,240 to $30,240, depending on the processor group.

Systar
Suite 350
205 Van Buren St.
Herndon, Va. 22070
(703) 834-5510

Unix software

Modern Office Systems Technology, Inc. (MOST) has announced Menuagent Manager Release 2, an upgrade combining several Unix applications into a single package.

Menuagent provides dialog boxes, pop-up menus and paging windows on any standard character-based terminal. Intelligent Access offers controlled access to files and directories through a system of dialog boxes. Another element of the package, Formagent, designs forms and includes data validation features.

Pricing ranges from $695 for a personal computer version to $2,495 on IBM's RISC System/6000. The product is available on other platforms including NCR Corp.'s Tower systems.

MOST
6606-B Mechanicsville Pike
Mechanicsville, Va. 23111
(804) 730-1467

CEG Systems has announced a version of Laboriogic for the Unix operating system.

Laboriogic is an automatic labor scheduling software package. It analyzes sales forecasts, manpower requirements and employee availability data to generate efficient employee work schedules.

The product comprises a time/attendance module for payroll use and a scheduling module. Each module costs approximately $1,000.

CEG Systems
302 Worcester Road
Wellesley, Mass. 02181
(617) 431-7755

HARDWARE

Data storage

Memorex Telex has announced an 8mm helical scan cartridge tape subsystem for the low-end IBM Application System/400 market.

The Memorex Telex 5411 is offered in 5G-byte single-drive or 10G-byte dual-drive models. A 1M-byte data buffer is included. Sustained data transfer speed for the product is 500K byte/sec.

According to the firm, the 5411 offers search speeds at up to 75 times the nominal tape speed.

The subsystem is priced at $14,000.

Memorex Telex
8929 N. Lakewood Ave.
Tulsa, Okla. 74117
(918) 627-1111

EMC Corp. has introduced new hard disk and tape backup systems for IBM's Application System/400 computers.

The EMC SL/936 models are direct-access storage device hard disk drives. The Model 10 has 18.8G-byte storage capacity and 8.7 msec average data access time. The Model 20 stores 34G bytes and offers 11.5 msec access time.

The Model 10 is priced at $22,000; the Model 20 costs $29,000.

EMC
171 South St.
Hopkinton, Mass. 01748
(508) 435-1000

Gigatrend, Inc. has announced its Super Safedat 4mm-tape drives for the IBM Application System/400.

The Super Safedat line features proprietary Non-Stop streaming technology for increased speed, the company reported. Storage capacity for the line is 5G bytes/4mm cassette.

Installation is plug-and-play on all AS/400 models. The product uses standard commands under the AS/400 operating system.

Super Safedat pricing begins at $15,950.

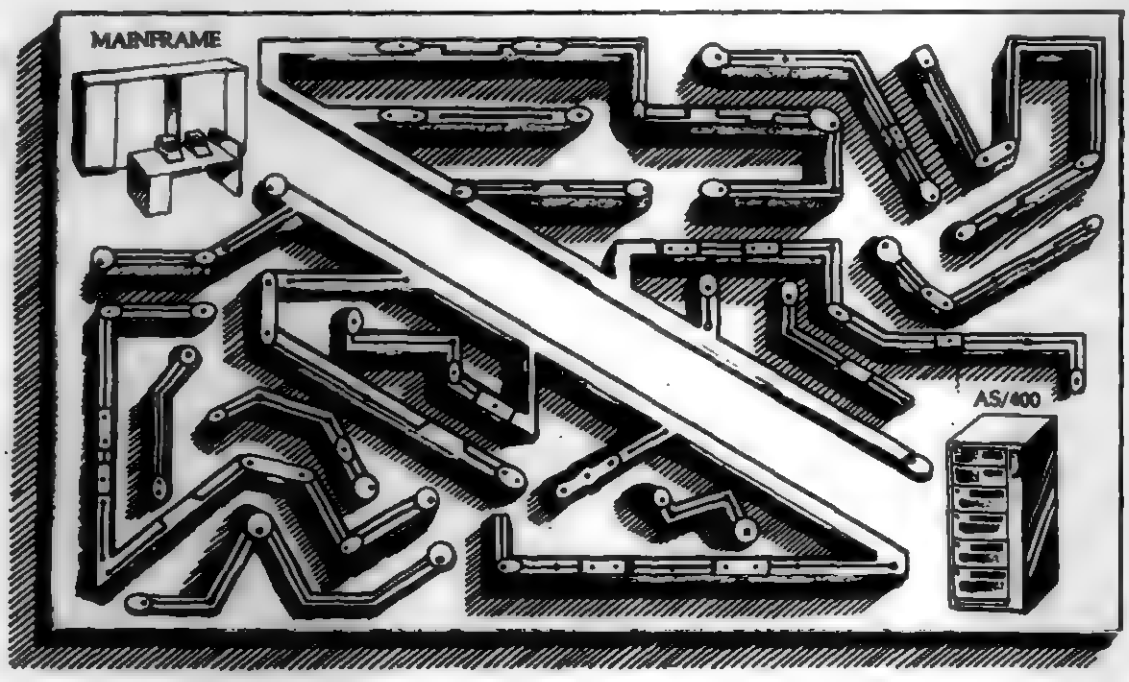
Gigatrend
2234 Rutherford Road
Carlsbad, Calif. 92008
(619) 931-9122

Megatape Corp. has announced the Megatape 3486, a tape drive subsystem for VAXBI bus-based systems.

The 3486 is compatible with IBM 3480 systems and offers 1.1G- and 2.2G-byte storage models with cassette stackers. The 3486 accepts data at rates up to 2M byte/sec. It attaches directly to the VAXBI bus via Megatape's MBI-102 tape coupler, which also connects 4mm and 8mm backup tape drives.

A single-drive 3486 with 2.2G bytes available storage costs $35,950.

Megatape
1041 Hamilton Road
Duarte, Calif. 91010
(818) 357-9921



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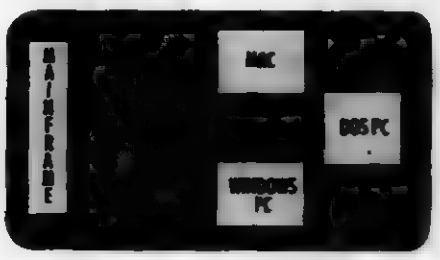
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So now that there's only one gateway decision, just call DCA at 1-800-348-DCA-1, ext. 70E, to receive free information with further details on connecting your mixed LAN environments to the mainframe.

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COMMENTARY

Patricia Keefe

Rumor mill vacation?



What dog days of summer? The announcement mill is just cranking out new products and zippy rejoinders at every turn, and it looks like PC Expo will only accelerate the noise level.

The big buzz, of course, is the reportedly pending alliance between IBM and Apple. This duo will never be mistaken for two peas in a pod. Nonetheless, industry observers are all aquiver over what this could mean for Microsoft in the long term and what it would mean for IBM and Microsoft in the short term.

The conventional wisdom says that any remaining shreds of civility and appearance of a partnership will cease to exist. An alliance with Apple, they say, will be the silver bullet that finishes off the tattered IBM/Microsoft relationship.

We won't mention any names. Without wasting any time, Microsoft Chairman Bill Gates strode to the podium on the big DOS yacht and took several thinly veiled shots at development partner IBM during a speech that emphasized quality control and stick-to-itiveness. Gates said he has learned a new operating system "must be

Continued on page 54

DOS 5.0 takes on memory managers

BY PATRICIA KEEFE
CW STAFF

Frustrated DOS users have spent years struggling to wring more random-access memory out of the cramped 640K-byte confines of Microsoft Corp.'s popular operating system. Until two weeks ago, their only recourse was a third-party memory expander or extender. There is now another option — DOS 5.0.

The much heralded and recently released DOS 5.0 is supposed to alleviate the memory crunch, but to what extent seems to depend on the system on which it runs. As such, the jury is still out on what this means for third-party providers of memory expanders and extenders, but early indications do not bode well for these vendors.

The stock line from Microsoft and third parties, such as Qualitas Corp., maker of 386/Max, is that although DOS 5.0 provides some relief from RAM cram, it will not put third parties out of business. Instead, users can expect their memory extenders and providers to expand the level of services and value that they provide.

When these next-generation improvements will appear is not clear. Some micro managers, meanwhile, have already made the determination that all or most of their user base will be able to shed their memory packages after migrating to DOS 5.0.

"My overall feeling is that people will flock to DOS 5.0 for one reason: RAM cram," said Julian Horwich, executive director of the Corporate Association for Microcomputer Professionals (CAMP) in Northbrook, Ill., after attending a CAMP meeting where several beta-test users discussed their experiences with DOS 5.0.

"I don't need third-party utilities anymore," said David Blumenstein, a spokesman for the New York PC Users Group, explaining that DOS 5.0's built-in memory-management features allow users to load many programs into high memory.

"I don't know when I've been able to say I had 623K free of conventional memory," he said.

A predicted 'boon'

Blumenstein predicted DOS 5.0 would be a "boon" to a lot of corporations because it will also enable them to dispose of utilities that take up space on the hard disk.

The added lure of having one less package to worry about is very compelling to many of these accounts. This is because many memory managers are difficult to install and use, claimed Michael Mazzei, vice president for sales and marketing at V Communications, Inc., which markets a memory manager called Memory Commander.

Jude Gartland, a senior vice president at Lehman Brothers, Inc., said that most of his 500 users are running at least one memory enhancer, and he expects that almost all will strip their systems of that software.

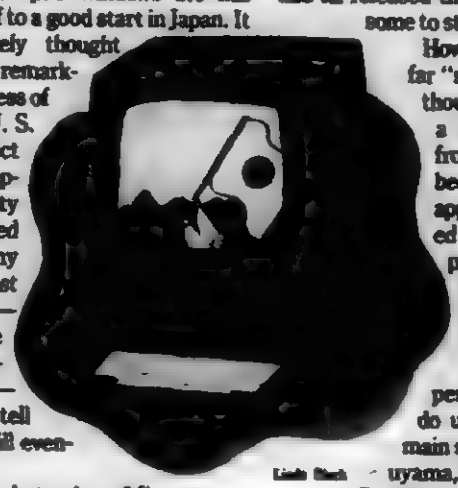
Continued on page 48

FEATURE: FOREIGN MARKETS

Windows wide open in Japan

BY COMPUTERWORLD JAPAN STAFF

Microsoft Corp.'s Windows 3.0 has gotten off to a good start in Japan. It was widely thought that the remarkable success of Windows 3.0 in the U. S. would have some effect on the product's reception in Japan, but reality is turning out to exceed all expectations. Many uncertainties still exist in Japan, however — particularly the scope of Windows' acceptance by business — and it is still hard to tell just how big a hit it will eventually be.



Linda Sharp

Unlike the U.S. market, where Microsoft is the sole maker, several Japanese firms have licensed their own versions of Windows 3.0. By the end of April, NEC Corp., Fujitsu Ltd., IBM Japan Ltd., Toshiba Corp., Seiko Epson Corp., Mitsubishi Electric Corp. and Sony Corp. had all released their versions of Windows 3.0, some to strong sales.

However, the primary users so far "seem to be personal users, although we haven't yet completed a detailed analysis. Reactions from large business users have been favorable, though, and it appears those users have started looking into adopting the product," said Katsuichi Tomita, general manager of the personal computer sales promotion division at NEC.

"Windows is mainly for personal use. When businesses do use it, it's external to their main system," said Tsutomu Maruyama, director of PC operations at IBM Japan, which is strong with large business users. Only Fujitsu, which is shipping Windows 3.0 exclusively for

Continued on page 50



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Client/server setup targets tracking maze

CSX embarks on a three-year journey to rein in decentralized Mac environment with VAX 9000s

ON SITE

BY JAMES DALY
CW STAFF

JACKSONVILLE, Fla. — How do you lose a locomotive? Try hacking your way through a labyrinthine tracking system sprawled in 21 data hubs across half of the U.S., and suddenly, it would be no problem at all to misplace several hundred tons of chugging steel and smoke.

Arthur Masson ought to know. As director of transportation system development at CSX Technology, the IS unit of $8 billion transportation giant CSX Corp., Masson tries to keep track of nearly 150,000 locomotives and freight cars spread across 21 transportation centers from the Great Lakes to the Gulf of Mexico.

Although it was designed as an interlocking net, the web had degenerated, and each transportation site now acts as an independent island rather than part of a greater whole. A dispatcher sitting in Rocky Mount, N.C., therefore, might have a devil of a time trying to negotiate through the electronic maze and determine if a shipment of tractors has been waylaid in Birmingham, Ala.

"All the information was there somewhere if you were willing to go through enough screens to figure it out," Masson said. The result, however, was a potentially disastrous, inefficient system for CSX Technology. "Sometimes we were working only two or three minutes in front of a crisis," Masson said.

Something seemed ready to give — but Masson was not about to let that happen. His solution has been to rein in the decentralized Apple Computer, Inc. Macintosh desktop environment and rework it into a centralized client/server setup based at the home office here.

The project will take three years to complete, but its payoff could be substantial: Each 1% improvement in locomotive utilization produces an $8 million annual expense savings, Masson said.

Masson's layout offers the best of two worlds: The Macintoshes provide an easy-to-understand graphical interface as well as local applications and increased user control. A two-unit Digital Equipment Corp. VAX 9000 cluster provides the arrangement's computational heart and offers high-volume throughput, scalability and access to transaction processing.

While the crossover might seem like a big move for most firms, CSX has a history of taking apart its IS infrastructure in the name of efficiency. Last year, the firm opened a $22 million data center at headquarters, stocking the digs with $70 million worth of new equipment, from mainframes to tape drives. CSX also recently finished in the *Computerworld Premier 100*, a ranking of the most effective users of IS.

Visual tracking

With the new locomotive tracking setup, dispatchers are presented with a highly visual display that pulls together assorted maps and graphs as well as information on the various centers. Each transportation hub provides a running list of which trains have arrived and departed. Dispatchers have only to pull up a map of the network and click on a transportation hub to figure out which trains are sitting on the tracks and what they are carrying.

The goal, Masson said, is to deliver a single system image that covers the whole country. "The amount of data we are gathering and hope to have available mandated that the new system was simple," he said.

Follow-up needs will also be extrapolated from the data gathered at each site. Maintenance logs, car scheduling assignments and other optimization strategies will be forged to provide a five- to seven-week view of locomotive assignment needs, Masson said.

Masson has plans to extend the consolidation setup to other areas of the company, including the shipping and customer service departments. The customer service project, for instance, will replace a confusing web of scattered customer service centers with a single center here that offers one telephone number to call 24 hours per day. The efficiency program will reduce 530 employees, sharply improve customer service and provide the ability to more effectively train employees.

"We're boiling everything down," Masson said. "For the next few years, at least, less is going to mean a lot more."

Service calls

The CSX Technology customer service consolidation project will provide the customer with one number to call 24 hours per day . . .

What it will do

- Reduce personnel by 530 employees
- Consolidate Jacksonville, Fla., headquarters functions
- Relocate 21 Transportation Service Centers to Jacksonville
- Sharply improve customer service
- Provide ability to more effectively train employees
- Give a 24.3% return on investment

Source: CSX Technology
CW Chart: Doreen St. John

Braille-based portable PC unveiled

BY CHRISTOPHER LINDQUIST
CW STAFF

MOUNTAIN VIEW, Calif. — Telesensory, Inc. recently announced a portable computer designed for the visually impaired. The Braillemate can reportedly fit in a coat pocket and can be used as a calculator, notebook, clock, address book, calendar or telephone book.

The 1-pound computer consists of a speech synthesizer, an electronic braille cell, a braille keyboard and 100K bytes of internal memory — enough for approximately 128 braille pages. A slot for external 64K-, 128K- and 512K-byte memory cards to increase storage is also included.

The computer can be used both in educational settings as a teaching tool and as a true portable computer for taking notes in meetings or while on trips, according to the company.

Power is supplied by either a rechargeable battery pack or AC outlet.

As a user types in information, the Braillemate speech synthesizer responds with vocal feedback, helping prevent input mistakes. Grade 2 braille can automatically be translated to text for printing.

The Braillemate can also be attached to Telesensory's Navigator braille display, which supplies a 20-, 40- or 80-character braille format and can be attached to either the Braillemate or an IBM Personal Computer or compatible.

The $1,595 Braillemate is scheduled to begin shipping by the end of June.



Telesensory's Braillemate *weighs 1 pound and features a speech synthesizer, an electronic braille cell and a braille keyboard*

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SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 even displays the same status indicators.

SPF/2 has features not available on the mainframe. For example, SPF/2 supports 48 PF keys, automatically adapts to the various OS/2 video modes (full-screen or text-window), and scrolls the file as you move the cursor. In addition, SPF/2 has virtually instantaneous response time, 100% system availability, and no connect-time charges.

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MS-DOS 5.0 taught via video

BELLEVUE, Wash. — Just when it seems Microsoft Corp. may have run out of incentives and tools for migrating to MS-DOS 5.0, Microsoft University has introduced a training video for support personnel.

The course was developed in order to meet the needs of support engineers and anyone else who is responsible for installing and maintaining DOS 5.0 for a work group.

Upon completion of the course, students should be prepared to handle the following tasks:

- Install the MS-DOS 5.0 upgrade on networked personal computers.
- Optimize systems to allow the best possible use of available memory and machine resources.
- Automate the installation for multiple machines on a network.
- Customize the MS-DOS 5.0 shell to meet their organization's needs.
- Show end users how they can take advantage of the new features of MS-DOS 5.0.

The video costs $149 plus $5 for shipping and handling and can be ordered through Microsoft University, MS-DOS 5.0 Video Course, 10700 Northup Way, Bellevue, Wash. 98004-1447.

Arche to announce 12 new models

FREMONT, Calif. — Personal computer maker Arche Technologies, Inc., is expected to announce at PC Expo New York this week its strategy to become a bigger player in the U.S. market.

Arche is set to introduce five new versions of its Legacy line of PCs and seven models of its new Master series. Both lines will feature PCs based on Intel Corp. chips ranging from a 20-MHz 80386 chip to a 33-MHz 486 and on Advanced Micro Devices, Inc.'s AMD 386DX-40 processor, a 40-MHz clone of Intel's 386DX. Arche will not introduce machines using Intel's recently announced I486SX chip.

"We believe [the 486SX] is puff marketing, especially when the 40-MHz 386 is available," said Michael Bruzzone, director of communications at Arche. Bruzzone added that Arche cannot get significant quantities of the Intel chips, nor is the price as low as Intel has publicized.

The new Master series of machines will range in price from $1,999 for a 386SX/20 to $5,199 for a 33-MHz I486 box. All Masters come standard with Microsoft Corp.'s DOS 5.0 and Windows 3.0.

The Legacy lines will range from $1,830 for a new, small-footprint 386SX/20 to $4,595 for the tower version of the 486/33. The Master series will start at $1,999 for a 386SX and top out at $5,199 for a 486/33. Within the Master series, Intel 386DX machines will be upgradable to 486 machines. All 12 models are available immediately.

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DOS 5.0

CONTINUED FROM PAGE 45

With DOS 5.0, Microsoft is providing much of the breathing space usually available through specialized memory managers, Gartland said. "I don't know if it is half or three-quarters [as much memory], but [the extra memory] is free, and it's less hassle," he added.

Actually, DOS 5.0 ensures that users have the full 640K bytes to play with. Some memory managers provide 730K bytes, while at least one, V Communications, Inc., will stretch it to 900K bytes.

Networked applications are the most likely to come up gasping for air. Kent Duke, an analyst at Pacific Gas & Electric Co. in San Francisco, said he expects his networked users to save 40K to 50K bytes of memory. That, he said, is sufficient to warrant tossing aside memory managers. "Probably a large percentage of our networked users can drop their memory extenders."

In a networked environment, the memory relief provided by DOS 5.0 is "significant," said Bob Holmes, a computer technology research analyst at Southern California Gas Co. in Los Angeles.

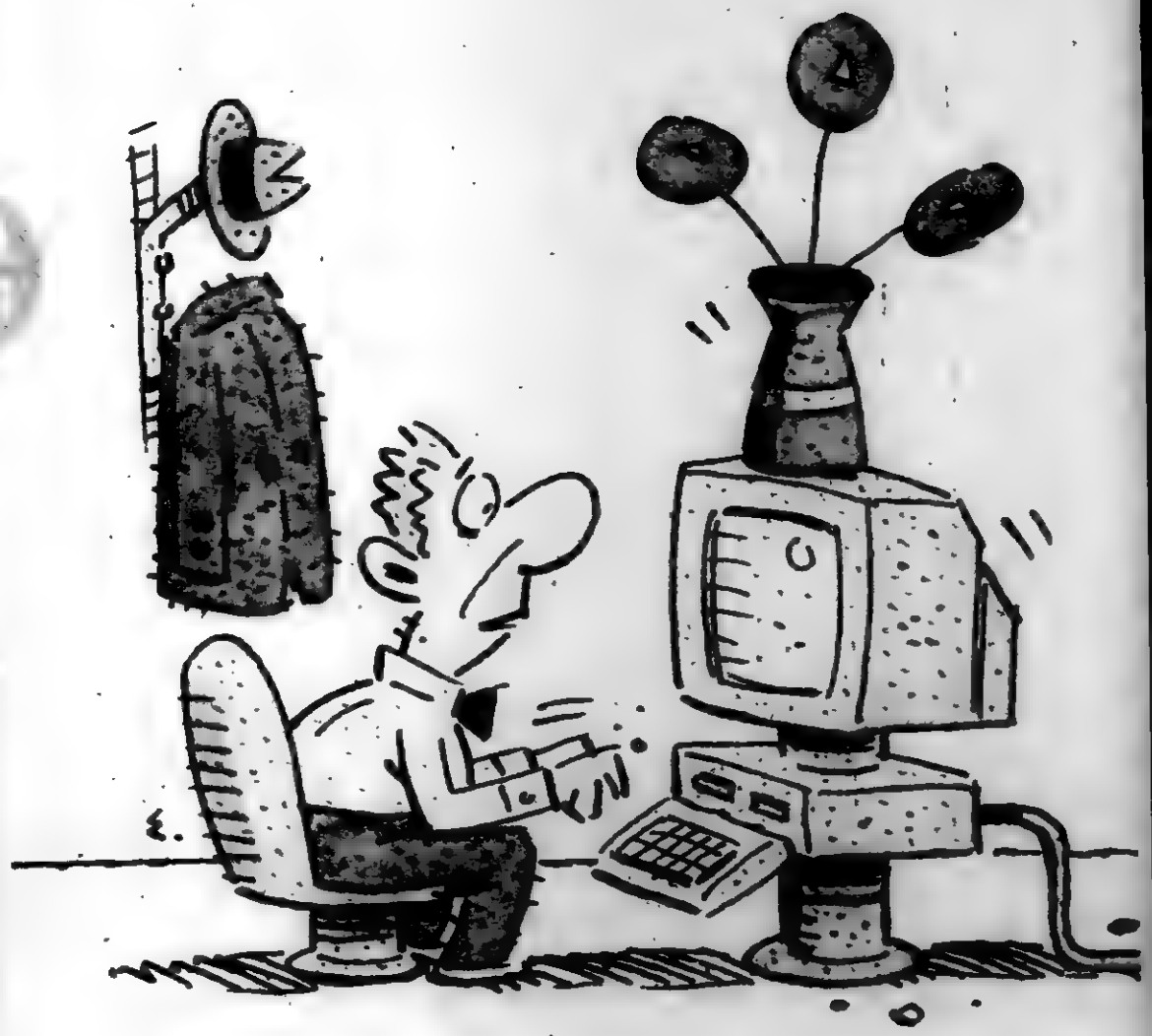
Especially impacted are networked Windows users, he said, adding they will gain more room in which to run their DOS applications. "If [a networked user on an Intel Corp. 80386] spent a full hour optimizing DOS 5.0, you could get well over 500K extra," Holmes claimed. Conversely, he estimated that running under the latter DOS 4.0 without "any special memory-management software to let me stuff software high," he'd wind up with almost 100K bytes.

The bottom line, some said, is that DOS 5.0 should be a concern to third-party providers of memory managers. "DOS 5.0 is really nibbling away at their effectiveness," Gartland said.

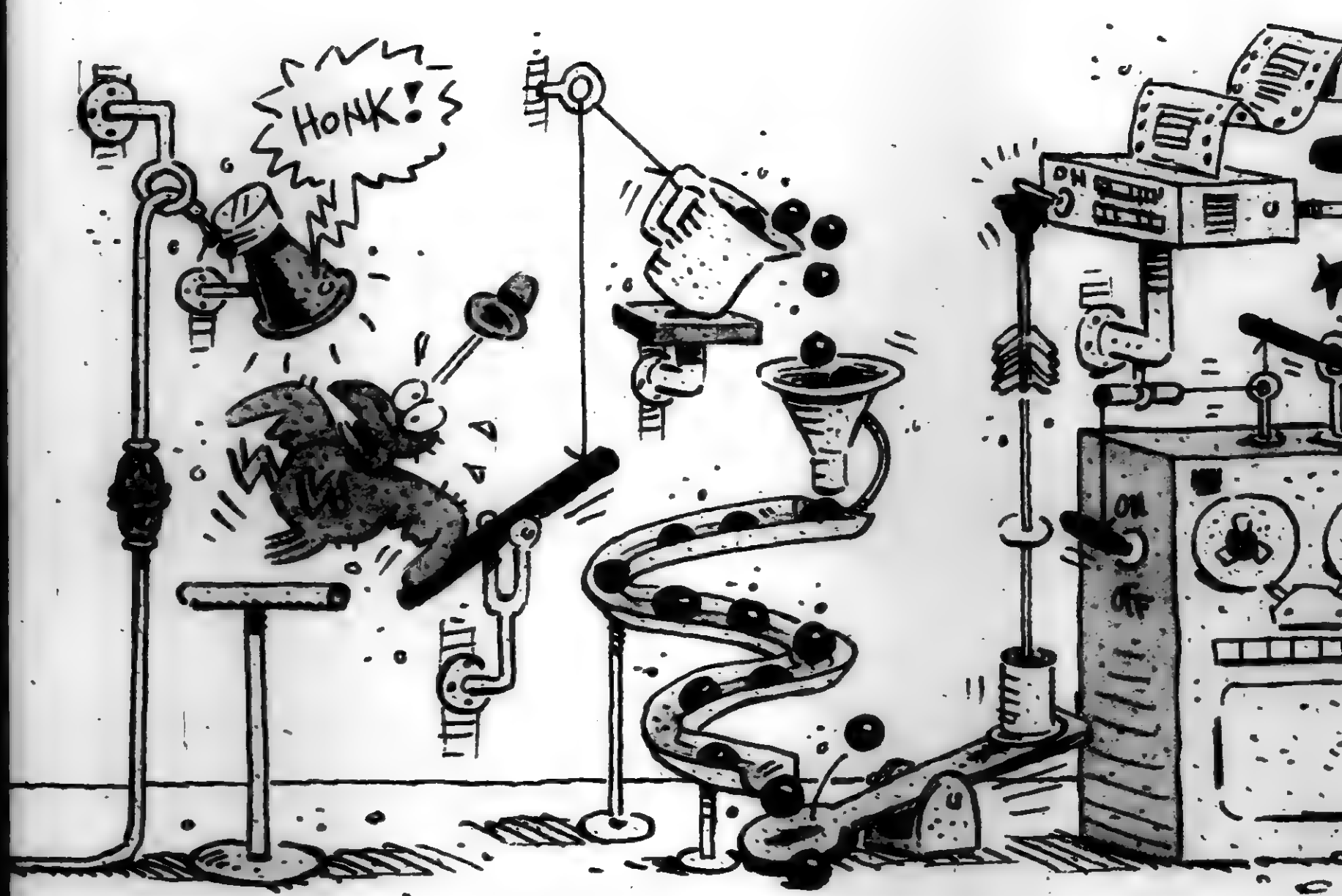
Other users shrugged off DOS 5.0's improved memory-management features, saying that if you give users an extra couple 100K bytes of memory, they'll try and take one megabyte or more.

"I think it will affect memory extenders a little bit, but not as much as people might expect," Holmes said. The reason, he explained, is that there is still a lot of extra capacity in memory managers such as Quarterdeck Office Systems' Desqview that DOS 5.0 does not address.

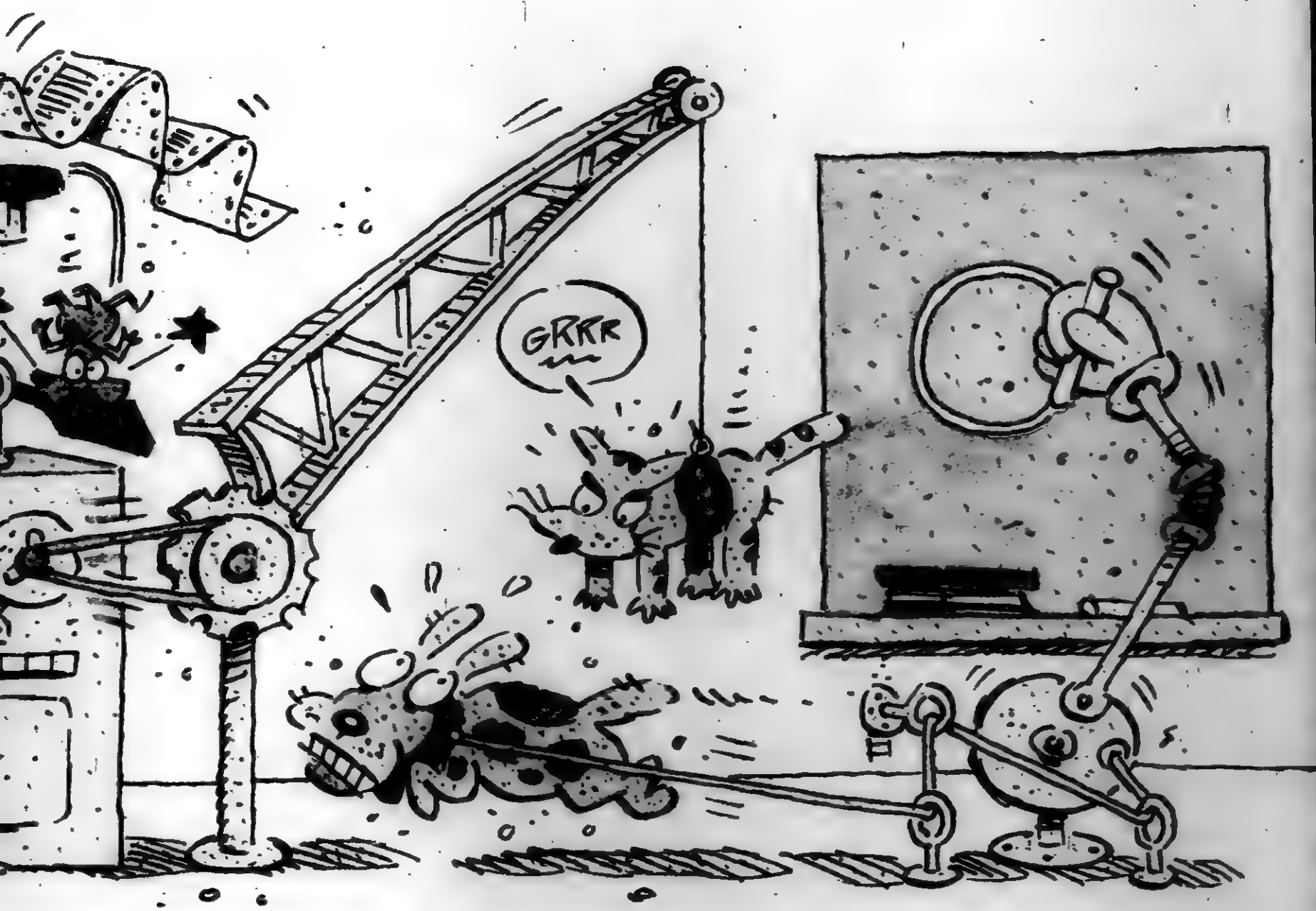
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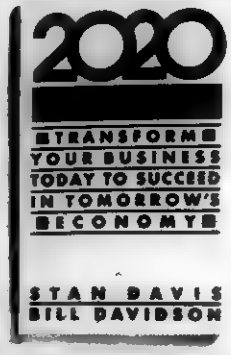
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Multimate 4.0 dated despite added features

Ashton-Tate Corp.'s Multimate Version 4.0

Reviews	Performance	Ease of use	Editing capability	Printer support	Network support	Documentation	Service and support	Value	Score
PC Magazine 12/11/90	Slow, awkward	Flat-footed interface	Single-screen editing only	Weak	NC	NC	NC	Suitable for simple documents	Welcome upgrade, difficult to use
Users									
Eddie Townsend, Norfolk Southern Corp.	Good	Good	Good	Good	Very good	Very good	NC	Very good	Powerful mail merge
Analysts									
Scott Higgs, National Software Testing Laboratories, Inc	Fair	Poor	Fair	Good	Very good	Good	Good	Poor	Unsophisticated

Key: Very good Good Fair Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey.
**Infoworld* score based on 1 to 10 ratings. NC: No comment

Technology Analysis — A roundup of expert opinions about new products. Summary written by free-lance writer Suzanne Weixel.

Ashton-Tate Corp.'s Multimate 4.0 was designed to simplify text entry and editing in the days when that was all a word processor was supposed to do. Since then, the package has been enhanced, with the current version offering strong general correspondence facilities that include a grammar checker and an electronic mail module. But reviewers reported that Multimate still lacks certain modern conveniences, such as style sheets and macro programming.

The package's outdated interface and the absence of sophisticated editing and formatting tools mark it as an antique, reviewers said.

Performance: Multimate is big and slow. Although the minimum memory requirement is only 384K bytes, users need 6.7M bytes of free disk space. The import and export facilities are comprehensive and transparent, but importing text into an existing file can be frustrating because the procedure will abort if there is more text than can fit on one page. There is a multilevel "undo" for deletes and backspaces, and the program writes pages to disk frequently, but it has no timed backup facility.

Ease of use: Reviewers said users of earlier versions of Multimate will be comfortable with the keystroke commands. The poorly integrated add-on modules, which use different menu systems, can be confusing, but for basic tasks, the interface is fairly straightforward. To format and print proportionally spaced documents, lengthy dialog boxes must be used. Reviewers said they found this and other interface conventions awkward and complex. On-line Help is minimal and not context sensitive. There is no mouse support.

Editing capability: According to reviewers, Multimate is useful for simple, general office correspondence only. Basic functions such as cutting and copying rectangular columns can be performed, but search and replace, formatting and layout features are weak. Users can only edit one page at a time, which means that when they insert text on a full page, the system does not automatically reformat the document. Centering and justification can only be done on an entire document. There are no windowing or split-screen capabilities, no support for style sheets or recorded styles, no outlining capability and only minimal sorting. On the plus side, Multimate has a powerful mail-merge facility, a spell checker and an elaborate grammar and style checker.

Printer support: One of Multimate's biggest problems, reviewers reported, is that it is still designed to print "fixed pitch fonts" on dot matrix or daisywheel printers. The "Proportional Laser Print" add-on is supposed to handle proportional fonts on laser printers, but reviewers said it is hard to use and inflexible.

Network support: There is no read-only access to files that are in use. However, group editing features are strong, including revision marking, document summaries, red-lining and annotations. Users can store configurations and dictionaries in their private directories.

Documentation: The documentation is clear but contains few examples, *Infoworld* said.

Service and support: Basic technical support is free but not toll-free. Expanded service programs are available for a fee.

Value: Multimate is best for handling a high volume of office correspondence or mass mailings that do not require special layout or sophisticated graphics. However, reviewers said, the program is out of date, and unless Ashton-Tate delivers soon on promises of an overhaul, even long-time users may do well to consider a change. Multimate 4.0 costs $495.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance	Outlook
W. Christopher Mortensen, Alex. Brown & Sons, Inc.	Fair	Fair	Fair

Ashton-Tate Corp. reported net income of $3.1 million for the first quarter of 1991, compared with a $979,000 loss last year. Sales increased 10% to $62.9 million, from $57 million. Ratings are based on telephone survey of analysts who follow the company.



"MULTIMATE IS FINE, as long as you don't want to do more than type a letter or get a memo out. It doesn't inhibit productivity, but it is very difficult to support."

Deborah Lasser
PC Coordinator
Swinerton & Walberg Co.

Ashton-Tate responds

Terry Smail, director of word processing:

Performance: Multimate includes a lot of options that can be removed from the hard disk, such as the 50 conversion file formats. We plan to offer selective installation to save disk space. Add-on modules that provide useful features will be more fully integrated in the next version, so performance will not appear slow.

Ease of use: The next version, which we expect to release within a year, will offer a modern, industry-standard menu interface and an alternate default interface.

Editing capabilities: We will address some of the more significant layout issues in the next version. We will also address the issue of single-page orientation. There will be a variety of tab leader characters to select from, and you will be able to sort whatever you want, including across pages.

Printer support: Once you learn how to fine-tune the "Proportional Laser Print," it provides outstanding quality.

NEXT WEEK

▶Lotus Development Corp.'s Ami Pro Version 1.2 is one of the easiest graphical user interface word processors to use, according to reviewers. It also offers strong editing and graphics capability.

Windows

CONTINUED FROM PAGE 45

high-resolution applications at present, said it is seeing mostly business adoption of its product on a trial basis.

"Japanese businesses like to spend more time than their American counterparts studying something before it's adopted," said Hidetoshi Kawai, section manager of systems product planning at Microsoft. "I think the standard use of Windows 3.0 by businesses in Japan is still about a year away." The time for making changes will likely be the beginning of the fiscal year (next spring), he added.

> "I THINK THE standard use of Windows 3.0 by businesses in Japan is still about a year away."
>
> HIDETOSHI KAWAI
> MICROSOFT

Even without full business participation, there is no question about the product's strong initial showing. NEC led Japanese domestic vendors by starting shipments in mid-February; by mid-April, it had already shipped 45,000 and received orders for 60,000 copies. "These figures are really extraordinary, considering that sales of the previous versions, Windows 1.1 and 2.1, totaled only 15,000," Tomita said. "Sales have run considerably over our initial projections, and we've been unable to keep up with orders even after increasing production." Early on, NEC doubled its initial sales target for the year from 100,000 to 200,000 packages.

Following NEC's lead, Fujitsu started shipping its Windows 3.0 at the end of February and had shipped 5,000 copies in the space of about one month. "Many of our users are businesses which take time to make decisions, but we've had numerous inquiries about Windows 3.0, and there is enormous user interest. Also, 5,000 copies in one month is quite a lot in comparison to past shipments of system software products," said Tatsuya Yoshikawa, general manager of the marketing division at Fujitsu.

Like the other companies, IBM Japan said it cannot keep up with the orders. "We've never seen a start like this with any other software product," Maruyama said.

Most vendors agreed that the early surge of interest will spur development of Windows-compatible packages. "Development Plans for Japanese Language Microsoft Windows V. 3.0" and other existing MS-DOS resources were used with Windows 3.0 following the start of shipments in February, according to Fujitsu's report. By the end of the year, the key words will be "circulating applications for Windows 3.0" and "local-area network." Furthermore, the first half of next year should bring big business use incorporating on-line support, the report said.

Last step is hardest

What kind of Windows 3.0 market expansion can Japan provide?

Japanese vendors said they feel Windows growth in Japan will follow the same three-stage pattern as Windows acceptance did in the U.S. The first of these steps consisted of the three-month period immediately following the start of shipments last May. The same circumstances that NEC's Katsuichi Tomita noted in Japan existed in the U.S., with people using Windows to switch DOS applications by memorising simple mouse operations. Trends in business saw those in charge of PC purchasing using Windows for the purpose of evaluating it, followed by gradual expansion of use within companies.

Stage two occurred during the latter half of last year, with the full-scale appearance of applications for Windows 3.0 and an increase in the number of users. Since the Windows applications had more advanced functions than DOS applications did, users quickly bought two or three applications each, and the Windows 3.0 applications market expanded rapidly.

The third stage, which started this year, involves serious business use of Windows. According to Microsoft, extremely fast paced penetration into the business user group is expected, and particularly strong growth will occur with the appearance of best-selling DOS applications such as Lotus Development Corp. 1-2-3 and Wordperfect Corp. for Windows 3.0.

"There is no question but that the next step for Windows 3.0 will occur due to increased applications. Our activities in this connection will be brisk from this fall through the beginning of next year, and a year from now we expect to see over 150 Windows 3.0 applications," Tomita said.

Microsoft's Hidetoshi Kawai concurred, saying, "At this fall's Data Show, we expect to see applications made especially for Windows 3.0 and Windows 3.0 versions of best-selling DOS applications."

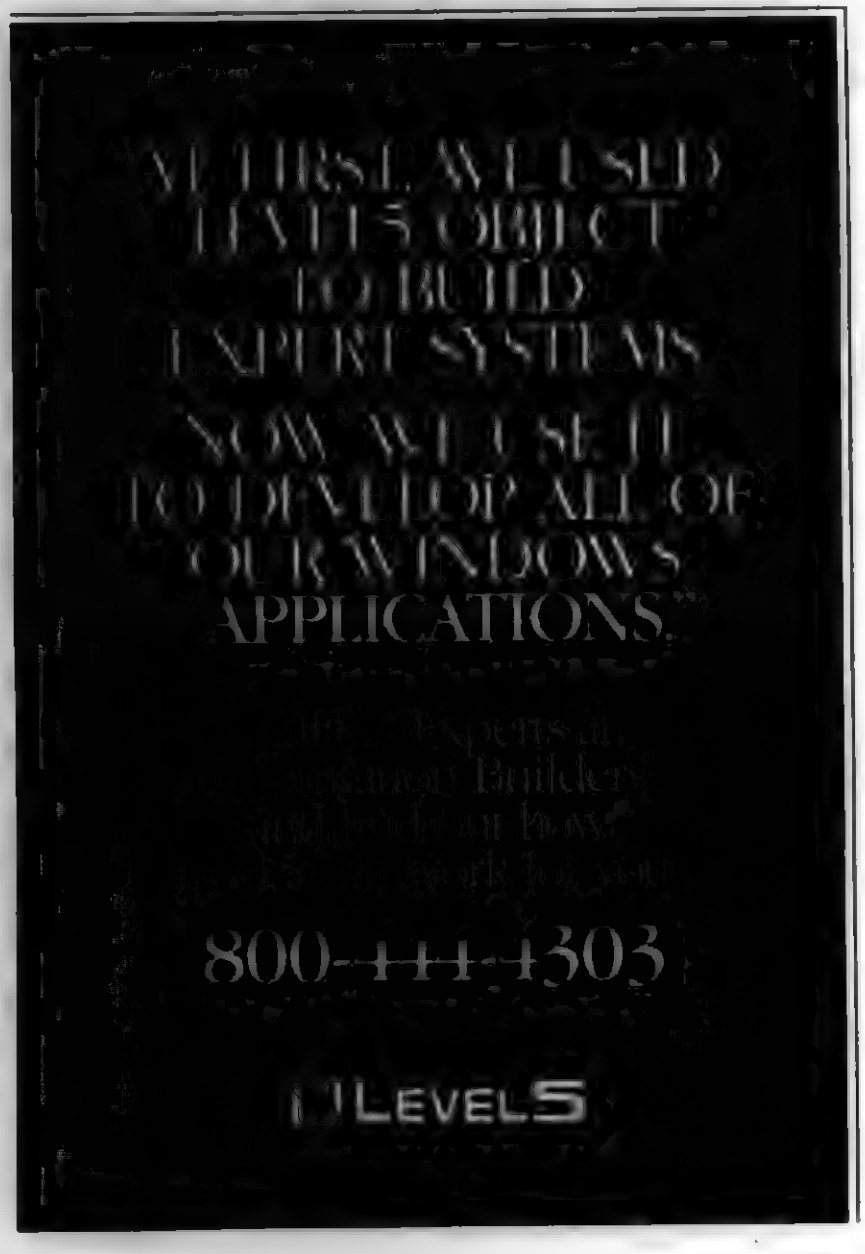
LAN applications will be key to business interest; NEC and Fujitsu consider them necessary if Windows 3.0 is to infiltrate the business user market. "Many obstacles exist to the widespread use of LAN, but it is generally recognized that Windows 3.0 is the optimum client environment for LANs. We should see the use of Windows 3.0 more and more as a prerequisite for future LAN environments," Tomita asserted.

"For us, full-scale business adoption of Windows 3.0 will be the point at which we make or break it. We are looking at two or three packages per business at present, but by the latter half of this year we will definitely see widespread business use. Windows 3.0's strength will be that it can be a multitask client environment for LAN," Yoshikawa stated.

IBM Japan said it feels a little differently. While it is good to have more applications for Windows 3.0, that is not a necessary condition for its popularization. "Existing DOS applications can be used as is, so I don't think users will feel inconvenienced. I think users will appreciate the functions they can get for 25,000 yen [the cost of Windows 3.0] and the Windows 3.0 market will definitely expand," Maruyama said.

Concerning full-scale introduction at the business user level, IBM Japan said it has its own ideas because it wants to keep the markets for Windows 3.0 and OS/2 separate. IBM Japan's Windows 3.0 supports 3270 emulation and can be used as a host terminal. "As a basic business applications platform, OS/2 is [still] the choice for high reliability," Maruyama said, stressing the difference between Windows 3.0 and OS/2.

On the question of realizing common applications in the future for OS/2 and Windows, Maruyama stressed the difference in target markets, saying, "[Regardless of whether applications can be shared,] OS/2 is still unique in that it provides an environment where customized applications can be developed."



PC & WORKSTATION SHORTS

Firms to distribute Mac tools

Eastman Kodak Co. and Radius, Inc. agreed earlier this month to co-distribute color management products for Apple Computer, Inc.'s Macintosh under both of their logos. Some of the products, which will combine Kodak and Radius color management technology, include a color-manipulating hardware transformation engine.

Beyond, Inc., a Cambridge, Mass.-based maker of networked electronic-mail software, announced a distribution agreement with Merisel and Ingram Micro D, Inc. Beyond just released @Mail, an E-mail package for users of Lotus Development Corp.'s 1-2-3 and Symphony spreadsheet products.

Major computer vendors and resellers put $1 million behind a campaign to enhance the image of the reseller channel, under the auspices of ABCD: The Microcomputer Industry Association.

The campaign is a one-year effort, which began at Comdex/Spring '91 to improve the image of the reseller channel.

Major components of the campaign include a study of end users at small companies by the Gallup Organization to gauge the end users' satisfaction with the channel.

The results will be out at the end of July. The rest of the campaign will focus on publicity and advertising on both a national and regional level.

Geography challenges IS staff

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

ANCHORAGE, Alaska — Two to three times per year, Arco Alaska, Inc.'s information systems department braces for sunspots, acts of God that will shut it down temporarily. They always hit with plenty of advance warning, so their effects are minimal.

"People can actually tell you that the phones and the Macs will not work from 1:04 p.m. to 1:11 p.m. next Wednesday," said James Porter, manager of administrative services at Arco Alaska, a subsidiary of Los Angeles-based Atlantic Richfield Co. "It's quite easy to predict, and we're very prepared for it."

The out-of-the-ordinary IS challenges presented to Arco Alaska — sunspots, hiring and keeping capable employees and establishing vendor relationships — have become nearly routine for Porter and his staff of 175, which allows them to address the usual IS issues, such as intense deadlines on complex projects or maintenance of a variety of vendors' machines.

Arco Alaska runs machines from many vendors and may mix several of them for its next IS project, a $6 million to $7 million investment in computer-aided design (CAD).



Arco's Porter: *'We're prepared.'*

The project will involve more than just designing, according to Porter, who said it is CAD with three Ds since it will integrate design, drafting and documentation when complete.

The first step of the CADDD project would be to automate some 500,000 existing engineering documents that detail Prudhoe Bay and Arco Alaska's projects there.

"When it reaches its production state, we'll be able to hook drawings into request for quotes and send them into vendors, and we'll be able to use this system to combine drawings and material so we can look at a facility or a subfacility and do material takeoffs with that drawing," Porter said. "That'll be a major enhancement in our environment."

Porter's department is evaluating two "largely different" approaches for the CADDD project, he said. One would mix DOS-based 386 and 486 workstations and Apple Computer, Inc. FX machines with an IBM 3090 mainframe as a storage device/server. The other would be a decentralized use of Digital Equipment Corp. workstations.

The relative cost of the mainframe vs. that of a large server environment is his main consideration, Porter added.

Porter said he plans to have the CADDD system up and running in 1992.

Eventually, the CADDD system will hook into a project currently under way at Arco Alaska, an electronic data interchange (EDI) program (CW, Jan. 29, 1990).

Porter is currently in the midst of rolling out a plan to get 50 of Arco Alaska's suppliers to do EDI with it by year's end. At the moment, four suppliers do EDI with Arco. The goal is expected to be reached before the end of the year, according to Porter, in part because 30 of its vendors already use EDI, and 110 attended a conference Arco Alaska co-sponsored with IBM to outline the advantages of EDI.

Software sales withstanding recession

BY RICHARD PASTORE
CW STAFF

Contrary to many expectations, software sales in the U.S. have not felt the pinch of recession, according to the Software Publishers Association's quarterly survey of 150 software vendors.

Released earlier this month, the survey showed North American software sales increased 18% to $1.2 billion retail for the first quarter of 1991 vs. the corresponding quarter last year.

"For nearly a year, the software industry has been bracing itself for recession that never materialized," SPA Director of Research Ann Stephens said. The healthy growth shows that vendors are successfully tempting users with "cost-effective, innovative new software and upgrades."

A major sales driver in the packaged applications market continues to be Microsoft Corp.'s Windows 3.0. Windows-based products grew 221.6% in the quarter and now constitute 15% of North American sales, 18% of worldwide sales and have, for the first time, passed Apple Computer, Inc. as the second largest software platform.

DOS-based applications remain the largest-selling category, growing 5.8% in the quarter. Apple Macintosh sales grew nearly 17%, according to the survey. OS/2 applications grew more than 100% but make up only about 2% of the market.

The education market grew at an unexpectedly healthy rate of 52.3%, followed by desktop publishing sales, which rose 50.3%. Word processing packages continue to be the largest software category, with $233 million in quarterly sales.

International sales for U.S. software firms jumped 48%. Overall, domestic and international sales averaged a 28% gain over the like quarter in 1990.



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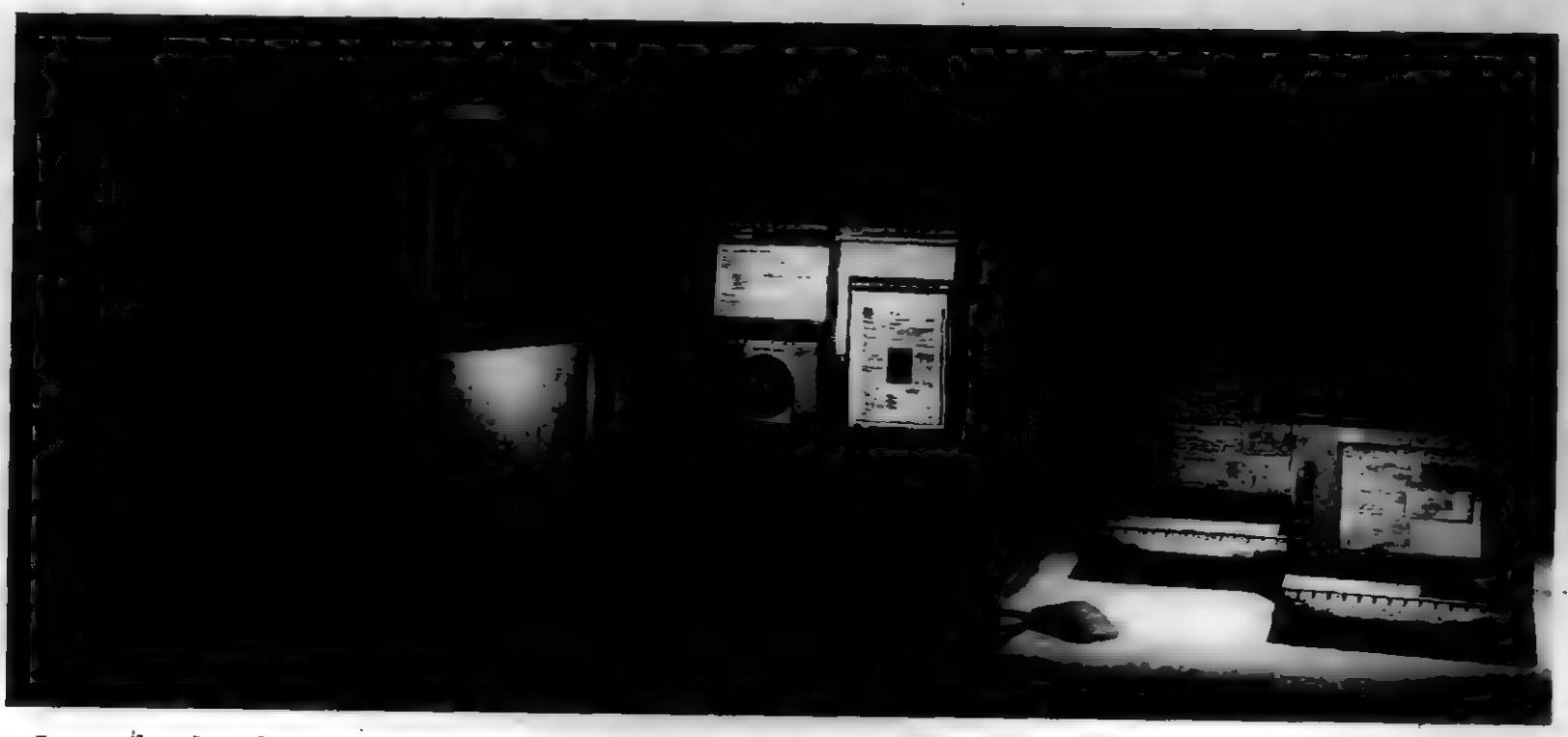
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Keefe

CONTINUED FROM PAGE 45

compelling" to get people to switch. They also need "a direct test" to make sure their applications work, much as Flight Simulator has functioned.

That said, DOS 2.0's introduction was a piece of cake compared with Microsoft's experience with DOS 4.0. Migration to DOS 4.0 didn't go as well, according to Gates, because "we didn't control the testing and development as directly as we should have."

Gates was alluding to IBM's decision to go ahead and release DOS 4.0 before many people thought it was ready. In particular, because of outsized memory requirements, the market "quickly formed a negative opinion" that "marked it for all time," he added.

IBM can see for miles and miles. Afterwards, no sooner was Microsoft asked to react to IBM's concurrent DOS announcement than a sudden wave strongly rocked the still-anchored boat before Vice President Steve Ballmer could respond. The timing broke up the crowd.

Send those cards and letters. Bob Carberry, vice president of systems at the Entry Systems Division in Somers, N.Y., took time out at the IBM low-end PC announcement two weeks ago to offer a very quick look at the 5-pound laptop IBM recently introduced in Japan. Basically, he opened and shut the compact black box just long enough to note the absence of a floppy drive.

It seems the Japanese can live without a floppy drive. IBM isn't so sure of the U.S. market. Carberry said the laptop will not be introduced here until IBM determines U.S. customer requirements.

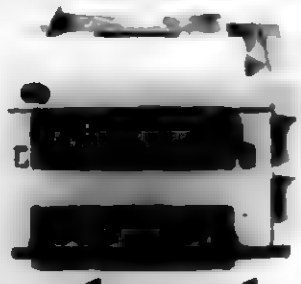
Pay no attention to that bit of information high up in the press release. IBM took pains two weeks ago to position itself as the first to announce product plans for Intel's 50-MHz I486 chip, noting it was the first to offer products based on the earliest version of the 486. Since Intel wasn't supposed to announce the chip until today, it looked a bit like IBM was stealing some of Intel's thunder. Not so, IBM said. A hastily issued press release noted in IBM-speak that IBM's product announcement was "not intended to be a product announcement." The deal with Intel, it turns out, was that IBM could not provide price or delivery dates for its offering.

My DOS is better than your DOS. A war of words erupted last week after Digital Research, Inc. responded to the introduction of Microsoft's DOS 5.0 by releasing a technical comparison of DR DOS 5.0 and MS-DOS 5.0. Naturally, DRI came out on top, and as you might also expect, Ballmer and Brad Chase, Microsoft's product line manager for DOS 5.0, blew a gasket. "This is so bogus," exclaimed Chase, asking how DRI can pick apart MS-DOS 5.0's task switcher when DR DOS 5.0 doesn't have one.

The two companies also battled over whose product was easier to install, the better place to stick EMM386 and whether Microsoft offers a number of features that DR does. Microsoft says almost all of these will be available in a read-only memory-executable version, slated for release in about two months. DRI officials insisted those features aren't here now, and neither is the ROM version.

DRI President Dick Williams claims that DR DOS 5.0 is more compatible with Windows 3.0 than is MS-DOS 5.0. Asked how that could be since Microsoft is obsessed with Windows, which it developed, Williams suggested, "Perhaps we care more." Than Bill Gates?

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LED printer for tabletop unveiled

BY CAROL HILDEBRAND
CW STAFF

Siemens Nixdorf Printing Systems, a joint venture between Siemens Nixdorf and Storage Technology Corp., has jumped onto the desktop with the introduction of an LED printer for the tabletop.

The 2030 LED Printing System represents the company's first attempt to crack the personal computer printer market, according to company spokeswoman Susan Storer.

"Siemens has normally been in the 100 to 200-plus page/min. printer range — the big ones for your data center. This is addressing a whole different office environment," she said.

The printer comes in two models, both of which print at 24 page/min. or 12 page/min. double-sided, the company said.

The Model 1, which prints at 300 dot/in., offers Adobe Systems, Inc.'s Postscript emulation as well as Hewlett-Packard Co.'s page description language for the Laserjet.

The Model 2, a floor-standing model, offers compatibility with IBM's Advanced Function Printing and Intelligent Printer Data Stream functions. The Model 2 prints at 240 dot/in.

Networking options include Ethernet and Token Ring for Model 1 and communications compatibility with the IBM 3820 for the Model 2.

Pricing for the printers ranges from $19,800 for the Model 1 to $36,000 for the Model 2.

NEW PRODUCTS

Systems

Fujitsu Systems of America, Inc.'s Acutote 3000, a 16-bit handheld computer, offers full AT/XT bus compatibility, the company has announced.

The 1.7-pound system ($1,995), based on the Motorola, Inc. 80C88 processor, runs standard personal computer applications and can upload and download data to a host via modem.

It runs on nickel-cadmium batteries for eight to 10 hours before recharging, according to the vendor.

Fujitsu Systems of America
12670 High Bluff Drive
San Diego, Calif. 92130
(619) 481-4004



I Corp.'s *tower systems run the Intel Corp. 1486 chip at higher clock speeds*

I Corp. has introduced personal computer systems based on the Intel Corp. 1486 chip running at 42 MHz, 46 MHz and 50 MHz.

The I Corp. tower systems include 4M to 456M bytes of dynamic random-access memory for disc caching, allowing disc access speeds appropriate for the high processor speed, according to the firm. The computers also come with Winchester and rewritable optical disc drives, a high-performance 17-in. display with 300 dot/in. effective resolution, built-in uninterruptible power supply and shock absorbers for the disc drives.

The 42-MHz model costs $18,900; the 46-MHz version, $21,900; and the 50-MHz machine, $25,900.

I Corp.
Suite 395
398 Columbus Ave.
Boston, Mass. 02116
(617) 262-4615

Database management systems

Mostly Mice Software, Inc. has announced products for adding mouse support to Ashton-Tate Corp. Dbase applications.

The Db Mouse Patch Toolkit, available for Dbase III Plus and Dbase IV, provides mouse support routines for pull-down menus and dialog data entry windows.

The Dbase IV Toolkit costs $159.95. The Dbase III version costs $119.95.

Mostly Mice Software
125 Gates Ave.
Montclair, N.J. 07042
(201) 746-9256

Software applications packages

Zsoft Corp. has released Publisher's Paintbrush Version 2.0 for Microsoft Corp.'s Windows 3.0 environment.

The upgrade allows users to retouch up to eight image files on screen at one time. Publisher's Paintbrush offers 24 predesigned special effects filters — including Blend, Equalize and Mosaic — and supports custom filters.

Tools for cloning images and creating three-dimensional effects and texture patterns are also provided. Up to 16.8 million colors and 256 gray shades are possible. The program costs $495.

Zsoft
Suite 100
450 Franklin Road
Marietta, Ga. 30067
(404) 428-0008

Primavera Systems, Inc. has begun shipping Version 4.1 of the Primavera Project Planner.

The product integrates scheduling, resource allocation, cost control and presentation graphics capabilities. The company reported that Version 4.1 calculates schedules up to 10 times faster than previous releases. It also adds multiuser features such as simultaneous updating and record locking. It costs $4,000.

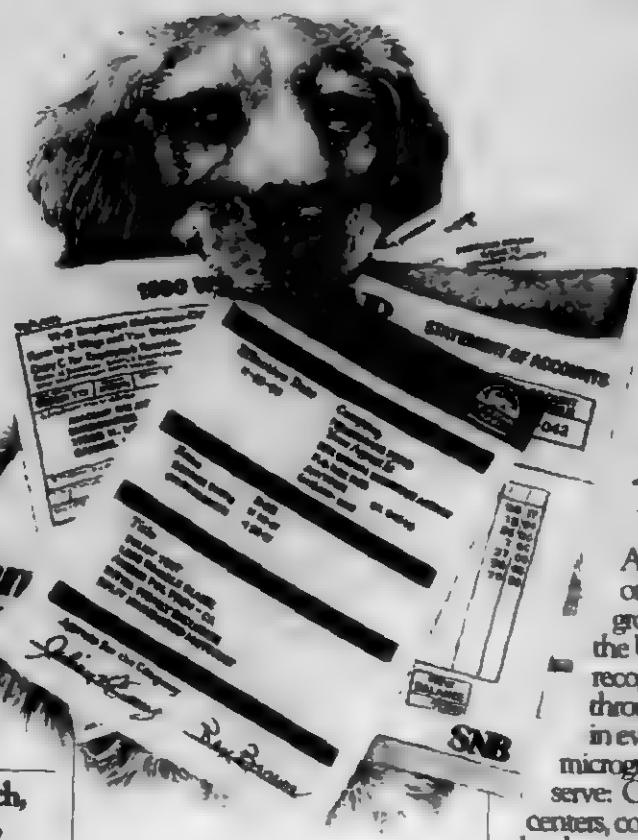
Primavera Systems
Two Bala Plaza
Bala Cynwyd, Pa. 19004
(215) 660-5830

RG Software Systems, Inc. has updated its Vi-Spy antivirus software.

Version 6.0 includes a memory-resident option that automatically inspects diskettes when first accessed in a drive. It also records the system's Memory Map, Partition Table and Boot Sector on the hard disk, comparing the recorded and current values and alerting the user to discrepancies.

Continued on page 56

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Continued from page 55

The $250 price includes a year of free updates and full support.
RG Software Systems
6900 E. Camelback Road #630
Scottsdale, Ariz. 85251
(602) 423-8000

Board-level devices

Hercules Computer Technology, Inc. has announced production of its Superstation 3D, a real-time graphics accelerator board based on Intel Corp.'s i860 processor and Texas Instruments, Inc.'s TMS34020 processor.

Superstation 3D offers 16.7 million displayable colors and a 72-Hz refresh rate. Resolution is 1,280 by 1,024 pixels. Software drivers are included for the following: Autodesk, Inc.'s Autocad, 3D Studio and Autoshade and Microsoft Corp.'s Windows 3.0. The system is targeted at computer-aided design, three-dimensional rendering and multimedia applications.

The product costs from $4,495 to $5,895, depending on memory configuration.
Hercules Computer Technology
921 Parker St.
Berkeley, Calif. 94710
(415) 540-6000

Software utilities

Edco Services, Inc. has released the Letrtuck+ type editing package for Microsoft Corp.'s Windows 3.0.

The $99 Letrtuck+ software utility enables users to modify output character pair spacing on-screen using a mouse. Kerned pairs can be translated from one font to another.
Edco Services
12410 N. Dale Mabry Highway
Tampa, Fla. 33618
(813) 962-7800

Macintosh products

Supermac Technology has announced a series of digital-video products compatible with Apple Computer, Inc.'s Quicktime media integration system.

Included are the Videospigot, a $499 video-capture card for the Macintosh LC and IISI; the Videospigot Pro, a $1,899 card for large-screen, 24-bit video display; and Reeltime, a digital-video editing software package bundled free with the hardware products.

According to the vendor, the products use image compression technology capable of putting 1,700M bytes of data into less than 85M bytes of storage space.
Supermac Technology
485 Potrero Ave.
Sunnyvale, Calif. 94086
(408) 245-2202

CMS Enhancements, Inc. has created the Platinum PST600 streaming tape device for Apple Computer, Inc. Macintosh systems.

The small computer systems interface subsystem offers 600M-byte backup storage. It is currently shipping and costs $1,899.
CMS Enhancements
2722 Michelson Drive
Irvine, Calif. 92715
(714) 222-6000

Data storage

Addstor, Inc. has announced Superstor, a software product that increases available storage for personal computers.

Superstor removes redundancies from data on hard and floppy disk drives. The product is transparent to the user and reduces file sizes by as much as 66%, according to Addstor.

The product costs $129.
Addstor
2905 Bohannon Drive
Menlo Park, Calif. 94025
(415) 688-0470

Core International, Inc. has announced 60M- and 120M-byte hard drive upgrades for IBM Personal System/2 personal computers.

The MC60 ($1,299) offers an average seek time of 27 msec. The MC120 ($1,949) averages 23 msec.
Core International
7171 N. Federal Highway
Boca Raton, Fla. 33487
(407) 997-6055

Peripherals

NEC Technologies, Inc. has introduced a 16-in. color monitor with reduced electromagnetic emissions.

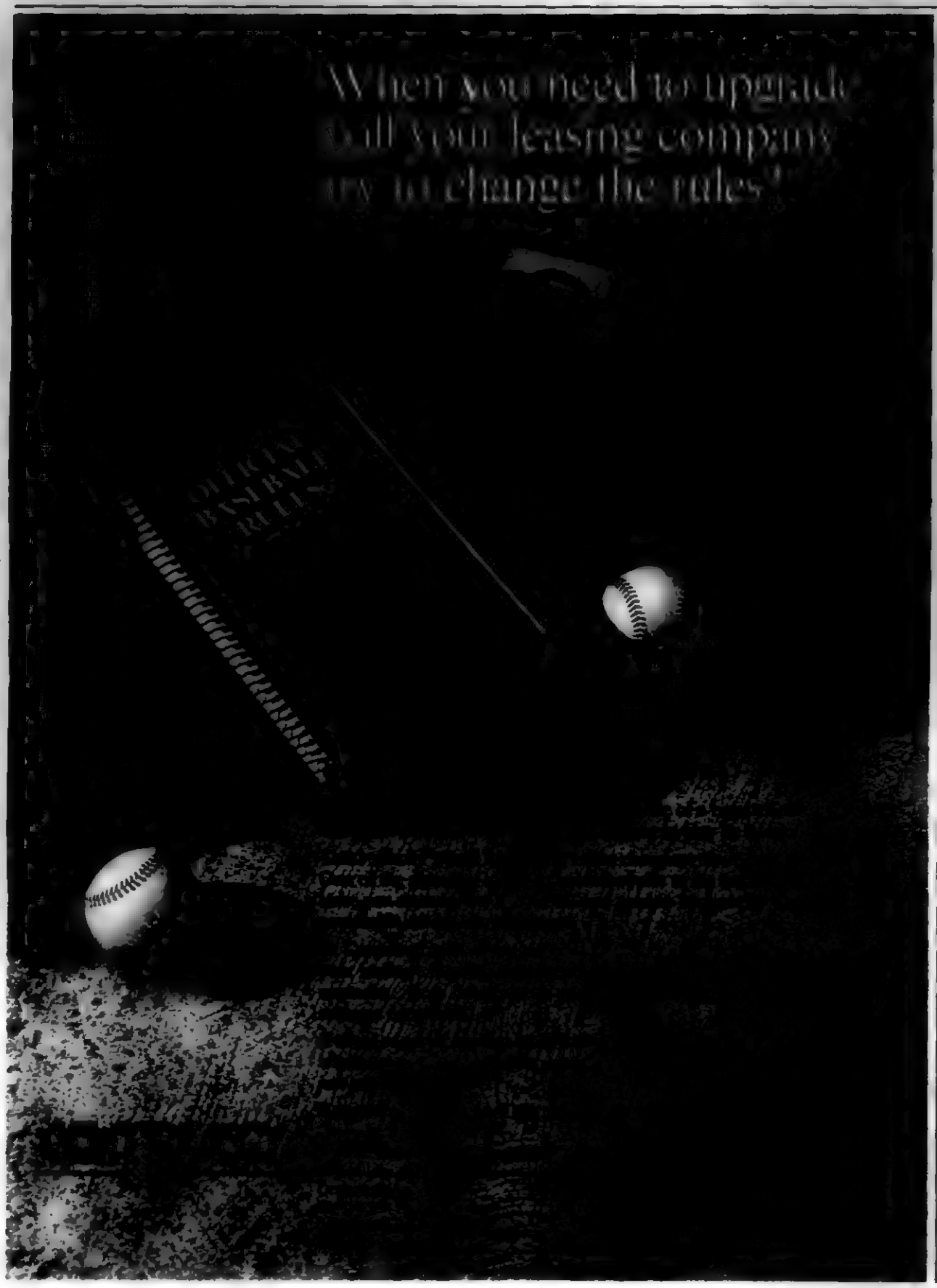
The Multisync 4DS provides 1,024- by 768-pixel interlaced and noninterlaced resolution with a refresh rate of 70 Hz. The display costs $1,499.
NEC Technologies
1255 Michael Drive
Wood Dale, Ill. 60191
(708) 860-9500

Computer Market Place, Inc. has announced the CAD Race VGA graphics card, a low-cost Video Graphics Array adapter that displays up to 800,000 colors simultaneously.

The product automatically fills in shading and blending effects and smoothes jagged graphics edges, according to the company.

Autoboost software is included with the card to increase display performance under Autodesk, Inc.'s Autocad design software.

The CAD Race VGA card costs $379.
Computer Market Place
1101 Sussex Blvd.
Broomall, Pa. 19008
(215) 690-6900



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COMMENTARY

Joanie M. Wexler

Tangled in cable options



If I were trying to construct a corporate network these days, I'd probably feel the IS equivalent of writer's cramp. The intimidating torrent of alternatives available at the very first juncture — the cabling plant — is enough to provoke that paralyzing eyeball glaze so symptomatic of technology overload.

This is physical-layer networking we're talking about. Such lofty issues as which network operating system to install, the omnipotent "I" word (interoperability) and how to manage huge companywide networks can't even rear their heads until you decide which physical medium will connect all the darn equipment.

Gray hair No. 1: Today's spaghetti bowl of cabling choices hinges on several "ifs" and "whens" surrounding such innovative technologies as 100M bit/sec. data rates over copper and wireless local-area networks. Question marks include how closely the emerging products will jibe with the official standards under construction, timing of stopgap product availability vis-a-vis lower prices for fiber, internodal distance limitations and security and reliability concerns.

The other part of the cabling equation is the degree of clairvoyance that network planners have with respect to their future bandwidth needs.

Gray hair No. 2: Do you

Continued on page 70

Bellcore spec nudges industry toward ISDN usage agreement

BY JOANIE M. WEXLER
CW STAFF

The counterpart step to February's National ISDN-1 initiative took place earlier this month when Bell Communications Research, Inc. issued a document specifying how Integrated Services Digital Network (ISDN) terminal equipment should be designed to interoperate with central office switches.

The specification bumps the user community a notch closer to the industrywide cooperation and infrastructure revamp needed for ISDN to widely kick in and offer big benefits to users.

In February, switch vendors AT&T, Siemens-Nixdorf and Northern Telecom, Inc. agreed to design their telephone company switches to a common ISDN standard implementation slated to make them interoperable by mid-1992. The resulting interconnection has been dubbed the National ISDN-1 network.

This month's move by Bellcore — the research and development arm of the regional Bell operating companies (RBOC) — dictates how the equipment on user sites, such as personal computer terminal adapters, should be designed to plug into National ISDN-1. The goal is to allow equipment on the user side to mix and match with any central office switch. Now, users must purchase equipment that specifically interfaces with the switch their telephone company's central office happens to be using.

> "THERE IS A large chunk of work to be done to bring National ISDN-1 into the 1992 time frame."
>
> RICHARD T. ALOIA
> BELLCORE

That limitation, plus the lack of interoperability between telephone company switches, has resulted in "islands" of ISDN networks, which runs counter to the idea of ISDN as a public-switched digital network that lets users communicate with virtually anyone using dial-up voice, data and video services.

Richard T. Aloia, assistant vice president of network access technology at Bellcore, said that "there is a large chunk of work to be done to bring National ISDN-1 into the 1992 time frame."

The work, he said, requires the cooperative efforts of all industry players, including local and interexchange carriers, central office and user equipment vendors and users.

"ISDN has suffered too much from an 'if only' syndrome: if only there wasn't lack of RBOC deployment, if only there wasn't lack of RBOC-interexchange carrier links, if only there wasn't a lack of industry leadership and applications . . . National ISDN-1 means we're going to stop chasing our tail."

Aloia said that upgrading the nation's telecommunications structure to ISDN includes not

Continued on page 66

Wide-area net to link federal court system

ON SITE

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The federal judiciary has embarked on an ambitious project to link courthouses across the U.S., allowing judges and 26,000 other court employees to exchange electronic mail and files nearly instantaneously. According to prime contractor IBM, the Unix-based network will be one of the largest centrally managed open systems networks in the world.

The network, really a collection of nets connected by modems, gateways and switches, could encompass up to 2,000 small local-area networks, 150 large LANs and 14 E-mail nodes all connected to the government's nationwide communications backbone, Federal Telecommunications System 2000 (FTS-2000). The network will also tie together more than 15,000 existing DOS-based personal computers and terminals and 100 host minicomputers from various vendors.

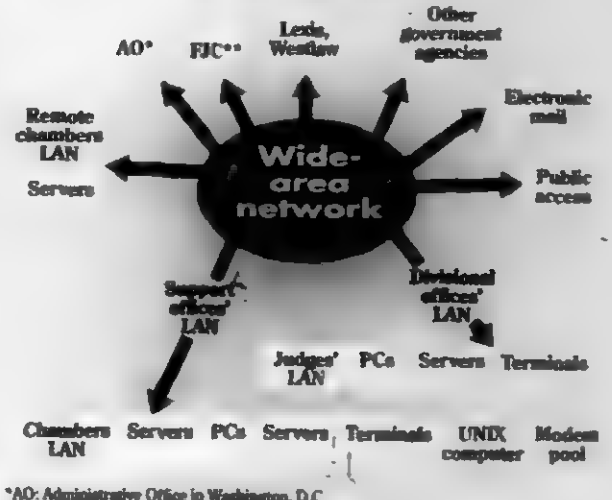
In January, the U.S. Courts awarded IBM's Federal Sector Division in Manassas, Va., a five-year systems integration contract worth $25 million with options that could boost the total

Continued on page 62

Going on line

Federal judges, their staffs and the public will soon be using one of the largest centrally managed open systems networks in the world

JURIST NETWORK



*AO: Administrative Office in Washington, D.C.
**FJC: Federal Judiciary Center in Washington, D.C.

CW Chart: Janell Genovese



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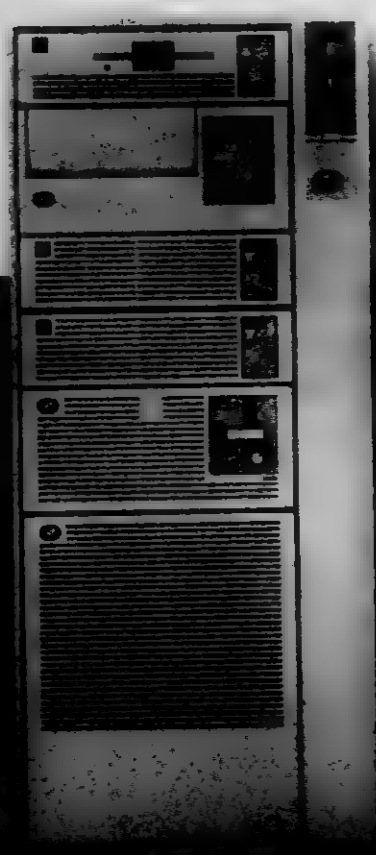
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NETWORK SHORTS

Network forum created

U.S. and Canadian communications firms have reportedly formed the Switched Digital Service Applications Forum in order to promote the development of switched digital products and services. The neophyte forum, which comprises carriers, equipment manufacturers and resellers from 60 organizations, announced that it aims to increase user awareness about applications and benefits available from switched digital services and to iron out equipment interoperability glitches.

The Kresge Foundation has reportedly awarded a $500,000 grant to the Woods Hole Oceanographic Institute. The grant, which will be matched by the National Science Foundation, will enable the institute to refurbish its research vessel, the *Knorr*. An upgrade of the *Knorr*'s fiber-optic-based undersea robotic systems is planned. For example, a traction winch system will be put into place to handle remotely operated vehicles, allowing a fiber-optic cable to transmit high-quality color images from the ocean floor to the surface and then by satellite to laboratories located around the world.

A $30 million agreement between Secure Data Network, Inc. and Pactel Meridian Systems will reportedly allow Secure Data Network to provide unattended backup services for stand-alone personal computers or PC networks over the Integrated Services Digital Network (ISDN). The three-year agreement calls for Pactel Meridian Systems to provide the terminal adapters to link Secure Data Network equipment to the public ISDN network.

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Court system

CONTINUED FROM PAGE 59

project to $233 million over nine years. Subcontractor Computer Sciences Corp. will install, operate and maintain the network, and Arix Corp. will provide minicomputers for network control and E-mail management.

According to Pamela B. White, chief of the Integrated Technology Division of the U.S. Courts Administrative Office here, the 180 circuit, district and bankruptcy courts have traditionally operated as autonomous units, with judges having their own employees, caseloads and ideas about office automation and communications. As a result, the courts tend to be islands of nonstandard automation, exchanging information by telephone, U.S. mail and fax.

"Now, for the first time, the judiciary will be linked together, allowing the sharing and exchange of information electronically," White said. "The information would be exchanged in any case; this will make it a lot faster and easier."

One of three legs

The data network is one leg of a triad called JURIST (for Judiciary Users Requirements for Integrated Systems Technology), which also includes data processing and office automation projects. Automation of the U.S. courts has become a pressing priority because of the exploding number of bankruptcy and probation cases and the general trend toward litigation. "Caseloads and the number of people handling cases are growing by leaps and bounds," White said.

Each judge will have a small — accommodating up to eight users — 10M bit/sec. Ethernet LAN with an IBM Personal System/2 Model 80 server running IBM's AIX implementation of Unix. Larger LANs with two servers and up to 32 users will be installed for each court's administrative offices. Multiple LANs in a building will be connected by a backbone that will attach to the FTS-2000 X.25 network via a gateway or switch. Users can choose FTS-2000 service ranging from 2.4K bit/sec. to 1.544M bit/sec.

There will be an E-mail node and a network control center for each of 12 regions and the administrative office.

Users will include judges, law clerks, staff attorneys and administrative personnel. They will exchange E-mail messages as well as files of financial, case-management and other administrative data. Users will have easy access to commercial information services such as Lexis and [illegible].

Customsoftware

Nancy Vesper, manager of federal systems integration at IBM, said IBM will develop custom software for the user interface that will make it "easy to access network resources without coming into contact with DOS or AIX." Users will see a menu offering E-mail, file transfer, print services and access to local, remote-host and commercial applications, she said.

The public will have access to court data via a separate computer available by dial-up at each court. White said those computers may or may not be on the network, pending resolution of some security [illegible].

In any case, for user security, E-mail nodes and file servers will offer an encryption option via the federal Data Encryption Standard algorithm.

Britain, Europe open markets to competition

BY ELISABETH HORWITT
CW STAFF

The ideal of trans-European, or even transglobal business networking services, has been taking on substance of late, with aggressive moves by overseas carriers to offer services to and within other countries.

Recently announced services take advantage of the slow but steady loosening of regulations against foreign competition by various overseas governments.

European countries that are members of the European Community have become more and more responsive to the European Commission's initiatives to open up its markets to competition, according to Leonard Elfenbein, president of research firm Lynx Technologies in Little Falls, N.J. "The [European Commission] has a growing clout, but it is not legislative or legal — rather, it is public pressure."

Great Britain effectively opened up its former two-carrier system to all comers earlier this year, becoming a test case for the concept of a fully competitive telecommunications market in Europe.

"England is now available to everyone irrespective of race, nationality or religion," said David Armitage, sales and marketing director for France Telecom's subsidiary, Transpac SA. "So everyone is here: the Dutch, the Americans, the Japanese are looking around" for possible market niches.

Transpac, France's domestic packet-switching service company, made its own move into Britain earlier this month. The firm is building a network to offer X.25-compliant packet-switching services in the UK — in direct competition with the UK's current packet-switching service from British Telecommunications PLC. Transpac has a ready-made customer base in the UK because so many British firms already use the service to connect their French sites, Armitage said.

"BT [North America] generally welcomes competition, as long as it's fair competition," company spokesman John Mockridge said. "There is always the argument that we would like reciprocal agreements," which would, for example, allow BT North America to provide the same type of domestic service in France that France Telecom proposes to offer in Britain, he added.

A French government official recently said that France sees no reason to end France Telecom's monopoly of domestic services.

Belgium's carrier, Regie des Telegraphes et Telephones (RTT) recently introduced a satellite service that connects very small aperture terminal (VSAT) users in other countries to a hub in Belgium. In order to provide those links, however, RTT will have to negotiate with the individual European carriers to set up bilateral agreements in which either country can act as the hub for the other's satellite connections, according to Susan Mirbach, president of RTT-Belgian Telecom USA.

RTT's service will be operational by the end of the month, the carrier said. So far, RTT has finalized one such agreement with Germany's postal telephone and telegraph (PTT) authorities, Deutsche Bundespost.

Finalizing agreements between RTT and other European carriers may be "easier said than done," Elfenbein said. While PTTs say they allow VSAT services, most such services support domestic and/or one-way links, rather than two-way international connections, he added.

RTT also announced a direct videoconferencing connection between the U.S. and Belgium via U.S. Sprint Communications Co.'s Meeting Channel Service.

Data Switch adds Escon FX

BY KIM S. NASH
CW STAFF

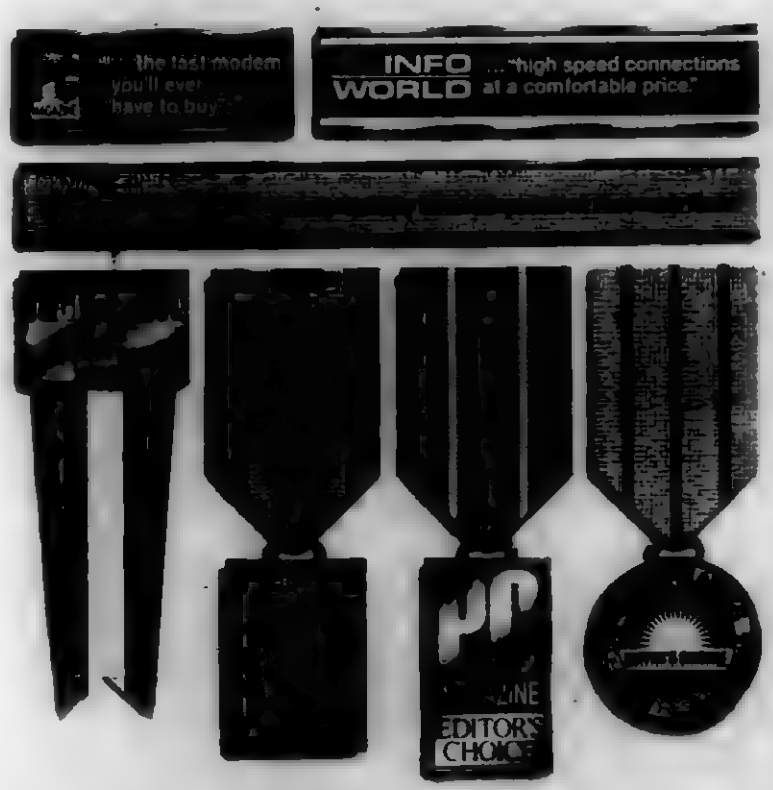
SHELTON, Conn. — Data Switch Corp. recently added a feature to its matrix switches and host network devices that lets users shuttle data from IBM mainframes with Escon fiber-optic architecture to IBM computers and peripherals based on the older bus-and-tag scheme that uses copper wiring.

Data Switch is marketing Escon FX as a bridging tool for users planning to migrate to IBM's Escon architecture, which IBM announced in September as part of its new Enterprise System/9000 mainframe line, expected to be delivered late this summer. Escon FX converts the serial fiber channel communication protocol to the parallel bus-and-tag protocol.

A bridging plan may be important to "companies that do not have the time or money to quickly convert their operations to Escon," said Roland Strolis, manager of systems engineering technology at Vienna, Va.-based Boeing Computer Services, which plans to test Escon FX.

However, bridging hardware is a sunken cost, Strolis said. "Once you complete migration, it becomes throwaway hardware," he said. Escon FX upgrades for Data Switch's Model 2400 and 1800 matrix switches and Model 9088 and 9089 host networking devices are currently available for $14,000 per channel.

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From the day of its introduction, UDS' V.32 modem has gathered honors from leading computer publications and other industry watchers!

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The modem is particularly useful for bit-intensive data transfers, such as engineering graphics, image processing and complex financial operations. Data Rate is automatically adjusted to 9600, 4800, 2400 or 300 bps (CCITT V.32 and V.22*bis*). At the 9600 bps rate, trellis coding gives the FasTalk V.32/42b an exceptionally high tolerance for noisy lines.

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American Express integrates network

LAN-based scheme offers a cohesive database as well as independent functions for subsidiaries

BY ELLIS BOOKER
CW STAFF

OMAHA — When it came time for American Express Information Services Corp. (ISC) to replace the mishmash of standalone human resources and payroll systems at its nine operating units, it wanted a local-area network-based, decentralized scheme that still retained a core corporate database of its 9,000 employees.

"We needed the system to offer each operation the chance to be independent and do its own [human resources], payroll and benefits but send common demographics up to the corporate office," senior director of human resources Richard O'Gara explained.



Dick: *Mainframe was overtaxed*

Why an integrated system instead of a single-vendor solution?

The rationale was twofold, according to O'Gara. First, he contends, the best payroll, human resources and benefits packages come from different vendors.

Second, and more interestingly, the integrated approach fulfilled top management's instructions that "software could not stand in the way of an acquisition or divestiture," O'Gara said.

Ten and a half months later, at a software cost of $2 million, the multivendor system, called HR Express, was up and running. At the same time, the company put into place new pension, 401(k) and flexible benefits plans for its employees.

Now in 22 locations, the system, which uses Novell, Inc. LANs, depends on a homegrown interface that automatically takes data from the unit systems and updates ISC's centralized human resources database.

The genesis of the integrated package was the 1989 overtaxing of a mainframe system, according to Kenneth Dick, director of MIS at ISC.

"It'd been set up for a business unit with 5,000 people, and it was running 12,000," he said. Toward the end, he added, the horror of horrors was happening: Paychecks were getting fouled up.



O'Gara: *Infrastructure in each unit to build upon*

Another problem in 1989 was that corporatewide data was nonexistent.

The Human Resources Information System rectified this failing with 102 data elements that are fed via electronic mail to the corporate system.

V.42 modems

The company uses 9.6K bit/sec. asynchronous lines for the E-mail transfers. According to Dick, the file transfers average 25K bit/sec. to 30K bit/sec. throughput, thanks to the use of V.42 modems.

The system uses IBM Personal System/2 Model 80s as servers and predominantly uses PS/2 55SXs equipped with math coprocessors at the desktops.

The largest LAN has 65 users; the smallest has two.

HR Express ensures data integrity at the corporate level by not allowing changes to the core data, although it does contain software "hooks" that the larger business units can access to feed information into locally maintained subsystems.

A final benefit to the integrated LAN strategy is that it gives ISC "an infrastructure in each unit to build upon," O'Gara said.

Several vendors participated in the system development, including Control Data Corp., which supplied its Human Resources Management System and Signature Payroll Services, and SBC Systems Corp., with its 401(k) pension and flexible benefits program.

Bellcore

FROM PAGE 59

only technology adjustments but also sweeping changes to fundamental carrier business practices, such as how customers order service and how billing and maintenance are handled.

Such procedural changes have been hampered, he said, by AT&T's 1984 divestiture, when competition fragmented any cohesive leadership in upgrading the U.S. telecommunications infrastructure.

The competing switch vendors made their February peace after an ISDN Executive Committee formed by the Corporation for Open Systems International stepped in and provided some executive-level leadership.

Bellcore and its seven telephone company owners will spearhead an equipment and applications ISDN forum in Washington, D.C., July 9 and 10 to educate industry players on keeping ISDN on its timetable.

National ISDN-2's release is slated for late 1993, Aloia said. It will include enhancements such as on-demand "B" channel packet-switching. National ISDN-3 will be industry-driven and will "plug the holes left by ISDN-1 and 2," he added.

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Other V.32 modems

A

T1600

A

ISDN pricing puzzle

Richard T. Aloia, assistant vice president of network access technology at Bellcore, said that the RBOCs should begin filing National ISDN-1 tariffs during the second half of this year and that "the general feeling among RBOCs is that an ISDN line should cost about two times the price of POTS [plain old telephone service]."

While users will be getting multiple services over one line where they previously had to order several lines, one industry analyst said that such a pricing schedule "would mean that the RBOCs haven't learned their lesson."

Steve Sanegari, senior analyst at Dataquest, Inc., advocates ISDN tariffs at POTS rates or cheaper to inspire ISDN use. "The RBOCs are in no position to fiddle with pricing and alienate users," he said.

"They shouldn't try to make money on the access; they should get the price as cheap as possible and make money on the applications. To a user, an access line is an access line. Users aren't going to invest in the premises equipment plus the extra transport costs unless they can see a clear benefit."

Sanegari pointed to Japan, where ISDN access costs the same as POTS and is much further along than in the U.S.

Both Sanegari and Bruce Egan, a consultant at the Center for Telecommunications and Information Studies at the Columbia University Business School, advocate contract ISDN pricing.

"The RBOCs have every incentive to upgrade to ISDN but are limited by the bottom line by having to file tariffs with the state public utility commissions," Egan said. He said he would like to see the RBOCs deregulated to relieve them from the catch-22 of having to justify tariff rates for services that can have no demand until they are available.

"Nobody is buying tariffed ISDN," Sanegari added. "They're only getting it through under-the-table contracts."

JOANIE M. WEXLER

Hard work made war network possible

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — According to a panel of U.S. military officers, communications systems in the Persian Gulf war worked heroically — but only because of the heroic efforts of those who scrambled to put them together and keep them running.

The officers, speaking to a standing-room-only crowd at the Armed Forces Communications and Electronics Association convention here, avoided direct criticism of the technology used in Operation Desert Storm, but their calls for future research and development offered some clues about things that may not have worked so well.

One officer called the Desert Storm communications infrastructure "the largest, most complex and dynamic deployment of communications systems in the world."

On Aug. 2, 1990, when Iraq invaded Kuwait, there were two satellite terminals available to Allied forces within what was to become the theater of operations. By Jan. 17, 1991, there were 117 of the 8-ft antennae moving 150,000 messages per day to and from four satellites.

Although the terminals could not operate when in movement, they had to be shifted constantly to meet the needs of moving forces. At the height of the war, there were 115 terminal moves in 100 hours, according to Air Force Brig. Gen. Roscoe Cougill, who was director of command, control, communications and computer systems at U.S. Central Command in Saudi Arabia. "We built the network, modified it and rebuilt it on a daily basis. We had a different network every day," he said.

First in line

Nevertheless, Cougill described Desert Storm communications as "the first large-scale, completely interoperable, tactical message- and voice-switching system, [allowing communications] from the foxhole to national command authority."

Air Force Brig. Gen. Phillip Bracher, Cougill's counterpart in Turkey, said there were not enough satellite terminals to support traffic demands. "Placement of the terminals had to be managed carefully. It was a management nightmare."

But apparently Yankee ingenuity won the day. One of Bracher's slides showed a soldier operating a receiver whose antenna had been augmented by barbed wire.

Bracher said U.S. military communication capacity in Turkey was increased 200% in just a few weeks, in part by laying "miles and miles" of fiber-optic cable and by borrowing or leasing added satellite capacity from Allied and commercial sources.

Several officers cautioned that the U.S. cannot always count on having six months to prepare for war. When asked how well communications and computer technology would have worked had the war started on Aug. 2, Cougill said, "How well would a three-wheeled car do without a motor?"

Navy Capt. Robert Brown, an intelligence specialist at the Defense Intelligence Agency, said the U.S. often underestimated the damage it had done to Iraqi assets. He called for better sensor and communications technology to do battle-damage assessment and quickly feed the results — by high-quality reconnaissance photographs, for example — to tactical commanders.

integrated support for UNIX UUCP, Kermit, Xmodem, and Ymodem protocols.

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privately-owned transatlantic fiber optic cable completed. 1990 *Sprint announces first commercial video services to the Soviet Union. Sprint introduces first nationwide ISDN capabilities.*

Wexler

CONTINUED FROM PAGE 59

foresee your company getting into bandwidth-gobbling imaging applications? Videoconferencing? Multimedia? In two years or five? Is 100M bit/sec. to the desktop important enough in the near term to rig up interim copper cabling ahead of standards and in place of fiber?

Many tout fiber as the ultimate conduit for your burgeoning bandwidth needs. However, fiber's current $8,000-and-up per-seat price tag could break your piggy bank if you run it all the way to the desktop. So vendors are putting the 100M bit/sec. speeds of Fiber Distributed Data Interface on copper wiring from backbone to desktop.

Gray hair No. 3: There are many kinds of copper. Witness the recent pledges of Digital Equipment Corp., Network Peripherals, Inc. and others to roll out 100M bit/sec. interoperable network adapter cards and concentrator modules for shielded twisted-pair wiring starting in August. The products bring the 100M bit/sec. per-connection price to about $5,200. A nice investment protection if that high-grade wire is already in your walls.

If it isn't, is it worth it to install what vendors agree will never surpass 100M bit/sec.? Perhaps. One user advised that "if you get five years out of any cabling plant, you're justified."

If you already have twisted pair in your walls, however, there's a 65% chance, according to market researcher In-Stat, Inc., that it's unshielded twisted pair, for which there are no announced products but for which a 100M bit/sec. standard is under construction.

Gray hair No. 4: If you have unshielded twisted pair, what kind do you have? There's still much debate about the technical feasibility of running 100M bit/sec. over unshielded. But most pundits agree that a high grade of unshielded twisted pair will certainly be required. Is yours a candidate?

If so, and if you believe the talk that there will be a standard for 100M bit/sec. over unshielded within 18 months (slated to run over shielded wiring as well), you have to determine whether your applications will allow you to wait, demand that you install shielded or bite the budgetary bullet and jump straight to fiber, whose bandwidth limits are restricted only by the speed of light.

Gray hair No. 5: Time to play economist. The copper alternatives to fiber are touted as competitors that will provide vendor incentive to drop fiber prices. However, could the copper products dilute the demand for fiber itself, prolonging the inflated fiber connection price? Consider the political election in which votes divvied up among the Democratic and independent candidates usher the Republican into office.

For users overwhelmed by these wiring issues, there's always the emerging wireless LAN alternative. Wireless accommodates companies that do lots of adds and changes, because the medium — air — moves quickly and easily with the user.

Gray hair No. 6: If you embark on a wireless LAN technology, which one do you use: infrared, spread spectrum or microwave? Each has its advantages and pitfalls. There are a few security and health-hazard public relations issues to overcome, but bandwidth-wise, wireless capacity is potentially as limitless as fiber, according to a Yankee Group analyst.

Gray hair No. 7: If you're in a rush for high speeds to the desktop — say you have a population of scientific users running network-munching modeling applications — you could probably justify a 100% fiber cabling plant. The rub is that the workstation will then become the bottleneck, because workstation processors aren't fast enough to keep up with 100M bit/sec. network speeds anyway.

Ever wish for your childhood days when two paper cups with a string in the middle were the center of your high-tech world?

Wexler is a Computerworld senior writer.

NETWORK SHORTS

BICC, Datability join forces

BICC Communications and **Datability, Inc.** have reportedly penned an agreement to integrate Datability's VCP terminal server architecture into BICC's Isolan Etherconnect System, a structured wiring hub. BICC, also a pioneer in wireless LANs, announced that it has begun shipping its 4M bit/sec. Token Ring, infrared-based Infralan product to wiring systems supplier **Anixter Bros., Inc.**

Networking vendor **Banyan Systems, Inc.** last week announced that 10 Banyan channel partners have met criteria to become Banyan Premier Resellers of Banyan Virtual Networking System networks. Premier reseller requirements include two full-time certified Banyan engineers, a dedicated Banyan product manager and 24-hour customer service. Among the resellers that have met these and other criteria are **Alliance Infonet/Valcom** and **Data Systems Network Corp.**

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Stars cool. Volcanos fizzle. Even suns burn out. But the IBM RISC System/6000™ family of POWERstations and POWERservers is no flash in the pan. In the year or so since we introduced it, it's only gotten hotter—offering performance ranging from 9 to 25 MFLOPS and from 33 to 72 SPECmarks. All at prices that won't even make you break into a sweat.

	Hardware Price	MFLOPS	SPECmarks™
POWERserver 550	$62,000	25.2	72.2
SPARCserver™ 470	$77,800	3.8	19.4
DECsystem™ 5500	$74,700	4	21.5

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MFLOPS are LINPACK double-precision where n=100. AIX XL FORTRAN Version 2.1 and AIX XL C Version 1.1 compilers were used for these tests. SPECmark is a geometric mean of the ten SPECmark tests. All prices current at publication.
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NEW PRODUCTS

Front ends, multiplexers

Lemcom Systems, Inc. has introduced a configurable data communications platform for front-end processing and remote concentrator functions.

The DNP 9000 platform serves as a front end for Synchronous Data Link Control, Binary Synchronous Communications and ASCII terminals, supporting synchronous data transfers at 2,048M bit/sec. It offers an interactive console for network configuration, network status display and system diagnostics.

The DNP 9000 costs from $25,000 to $80,000, depending on the number of protocols and communications lines supported.

Lemcom Systems
2104 W. Peoria Ave.
Phoenix, Ariz. 85029
(602) 944-1543

Network management

Nynex Corp. has released the Allink Operations Coordinator Sampler, a prepackaged integrated network management system.

According to Nynex, the product is intended to help users determine the usefulness of a customized Allink management solution. Users can integrate element management systems including IBM's Netview, Network General Corp.'s Watchdog and any T1 or modem management system. It consolidates information from the element managers in a Unix workstation environment.

The Operations Coordinator Sampler is available on a rental basis for a nonrecurring fee of approximately $20,000 plus monthly fees of approximately $12,000.

All fees paid can be applied toward the purchase of a customized Allink management package.

Nynex
1113 Westchester Ave.
White Plains, N.Y. 10604
(914) 644-7704

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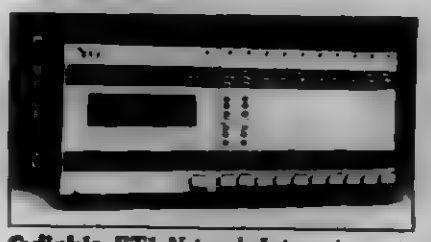
To find out how you can harness the power of the RISC System/6000 family, call your IBM marketing representative or Business Partner at: 1 800 IBM-6676, ext. 845. Sorry, marshmallows not included.



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Customer premises equipment



Cylink's *FT1 Network Integrator supports T1, E1 and ISDN networks*

A multiport channel service unit/data service unit that integrates cross-connection and security functions has been introduced by Cylink Corp.

The FT1 Network Integrator includes eight ports and interface modules for the following: T1, fractional T1, E1 and Integrated Services Digital Network Primary Rate Interface networks. Data transfer modules with rates of up to 1.9M bit/sec., in increments of 56K or 64K bit/sec., are supported.

Pricing ranges from $4,000 to $15,000, depending on configuration.

Cylink
[illegible]
Sunnyvale, Calif. 94086
(408) 735-6800

Host-to-host

Systems Center, Inc. has announced Network Datamover-400 (NDM-400), a software product for IBM Application System/400 to MVS mainframe communications.

NDM-400 automates data transfer functions and links to unattended applications, batch jobs and job schedulers. It also provides audit trails and statistical analysis for all activities. Data compression capability is included. NDM tasks can be directed through familiar interfaces.

The product is available immediately and costs from $1,000 to $12,000, depending on system size.

Systems Center
1800 Alexander Bell Drive
Reston, Va. 22091
(703) 264-6000

Chi Systems, Inc. has introduced a programmable interface for connecting Motorola, Inc.'s VME workstations with supercomputer High Performance Parallel Interface (Hippi) ports.

The Hippi-VME Intelligent Interface Board ($16,500) connects to 100M- and 200M-byte ports, supporting 32- and 64-bit data paths. Transfer protocols including Transmission Control Protocol/Internet Protocol and IPI-3 are supported.

Chi Systems
Suite 25
5860 W. Las Positas Blvd.
Pleasanton, Calif. 94566
(415) 463-2322

Micro-to-host

Go/ISDN, a software and hardware product connecting personal computers to IBM midrange systems, has been announced by Trisystems, Inc.

The product offers 5250 and 3270 emulation to PC users over the Integrated Services Digital Network.

It emulates multiple displays and printers as well. Transmission speed is up to 64K bit/sec.

Go/ISDN software costs $895; the ISDN adapter card for PCs costs $1,395.

Trisystems
74 Northeastern Blvd.
Nashua, N.H. 03062
(603) 883-0558

Local-area networking software

PC DOCS, Inc. has released a new version of its Document Organization and Control System.

PC DOCS 4.0 manages an increased number of file formats, including popular spreadsheet and word processor files, and offers enhanced global network search facilities.

PC DOCS costs $225 per workstation or $295 with full text editing options.

PC DOCS
Suite 203
124 Marriott Drive
Tallahassee, Fla. 32301
(904) 942-3627

Trellis has produced Timetalk, its calendaring software package, for multiserver networks.

The server version divides processing between client and server systems for increased performance, the company reported.

Export features are enhanced, as are multiple printer support options. The product is integrated with Banyan Systems, Inc.'s Virtual Networking Software.

Licensing costs $1,495 per server, with an unlimited number of users, according to the vendor.

Trellis
85 Main St.
Hopkinton, Mass. 01748
(508) 435-3066

Wide-area networking software

Plantronics Futurecomms, Inc. has released Verification Host X.25, a public network access security system.

The Verification Host software runs on any personal computer. It provides a database of 3,000 user identification passwords and facilities for call and alarm tracking. Several user-definable parameters for denying network access are also included.

The software price ranges from $11,000 to $16,000 for a redundant system. A $1,995 packet assembler/disassembler from Plantronics, connecting the host PC to the network, is required.

Plantronics Futurecomms
7450 New Technology Way
Frederick, Md. 21701
(301) 662-5926

Micom Communications Corp. has released the Featurepak software enhancements for its X.25 network communications products.

The cartridges can be installed directly into the company's MB3 and MB300 packet switch hardware. Featurepak increases control over public network access and also transmits High-Level Data Link Control traffic over leased X.25 protocol lines.

This function allows voice and fax signals to share lines with X.25 traffic at 56K bit/sec., avoiding tolls on public lines, according to Micom.

Pricing for base configurations of Micom packet switches starts at $2,555.

Micom Communications
4100 Los Angeles Ave.
Simi Valley, Calif. 93063
(805) 583-8600

Links

Interlink Computer Sciences, Inc. has unveiled Datastore for Transmission Control Protocol/Internet Protocol (TCP/IP), a software package allowing Unix systems to back up and restore data on MVS mainframe tape drives.

Datastore for TCP/IP runs in conjunction with the firm's SNS/TCPaccess and SNS/API software products. It allows Unix systems users to use highly reliable existing backup resources. Unix storage utility commands work unmodified.

The product costs $9,950. Introductory pricing incentives are offered.

Interlink Computer Sciences
47370 Fremont Blvd.
Fremont, Calif. 94538
(415) 657-9800

Electronic mail

Mustang Software, Inc. has updated its Wildcat Bulletin Board System software.

Version 3.0 features point-and-shoot message entry and file transfer procedures. Word processor capability has been added for message editing. System operator functions have also been enhanced, and gateways to MCI Communications Corp.'s MCI Mail and Compuserve, Inc.'s Information Service are included.

The professional version costs $499. Low-end versions are available.

Mustang Software
1915 17th St.
Bakersfield, Calif. 93303
(714) 395-0223

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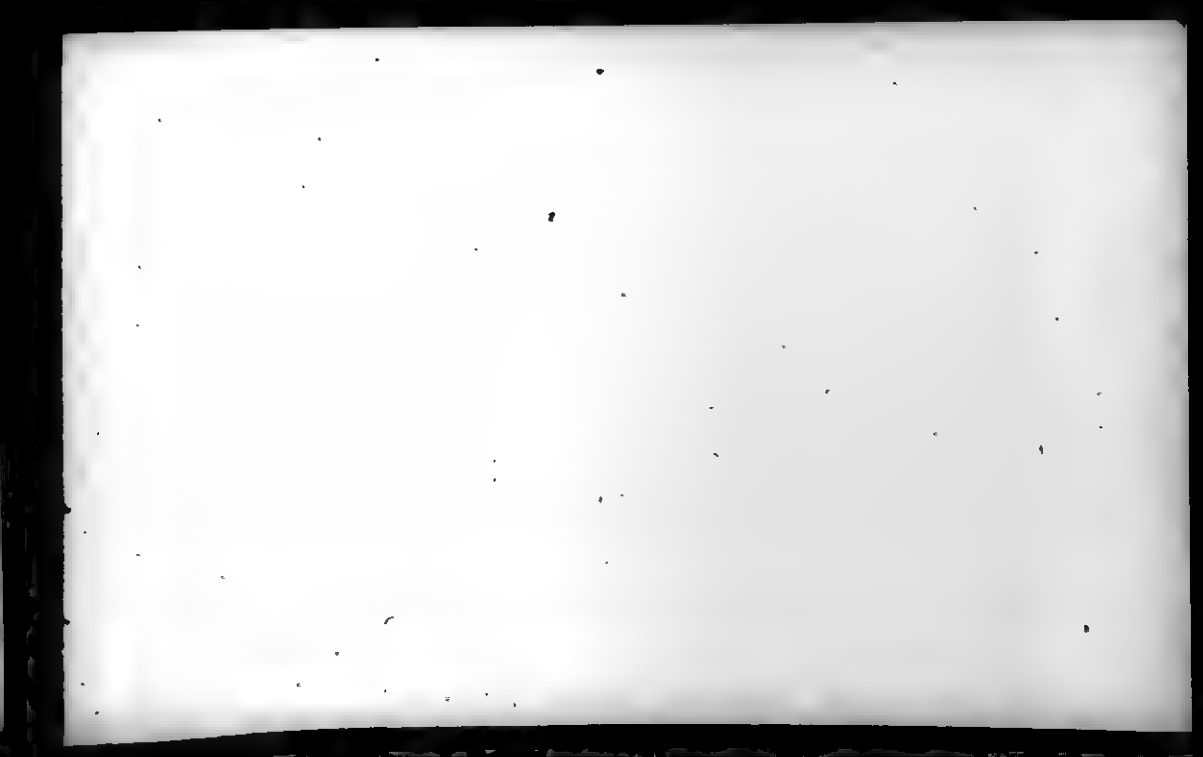
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Roger A. Peterson
Director of Information Systems
Kawasaki Motors Corporation

"I can't remember when I didn't read *Computerworld*. It's been at least ten years now.

"It's the one place I can go every week to find out the most current information on technologies or applications that Kawasaki might want to pursue...like relational databases, E-Mail, and that sort of thing.

"It gives me a reading on what real people are doing out there...so I know if I'm onto something that's leading edge and that has proven business applications.

"When I get *Computerworld*, I don't just let it sit. I open it up and scan the table of contents to quickly find the articles I want to read. And sometimes I'll flag a story I know somebody else on the staff will be interested in, attach a little post-it note, and send it on.

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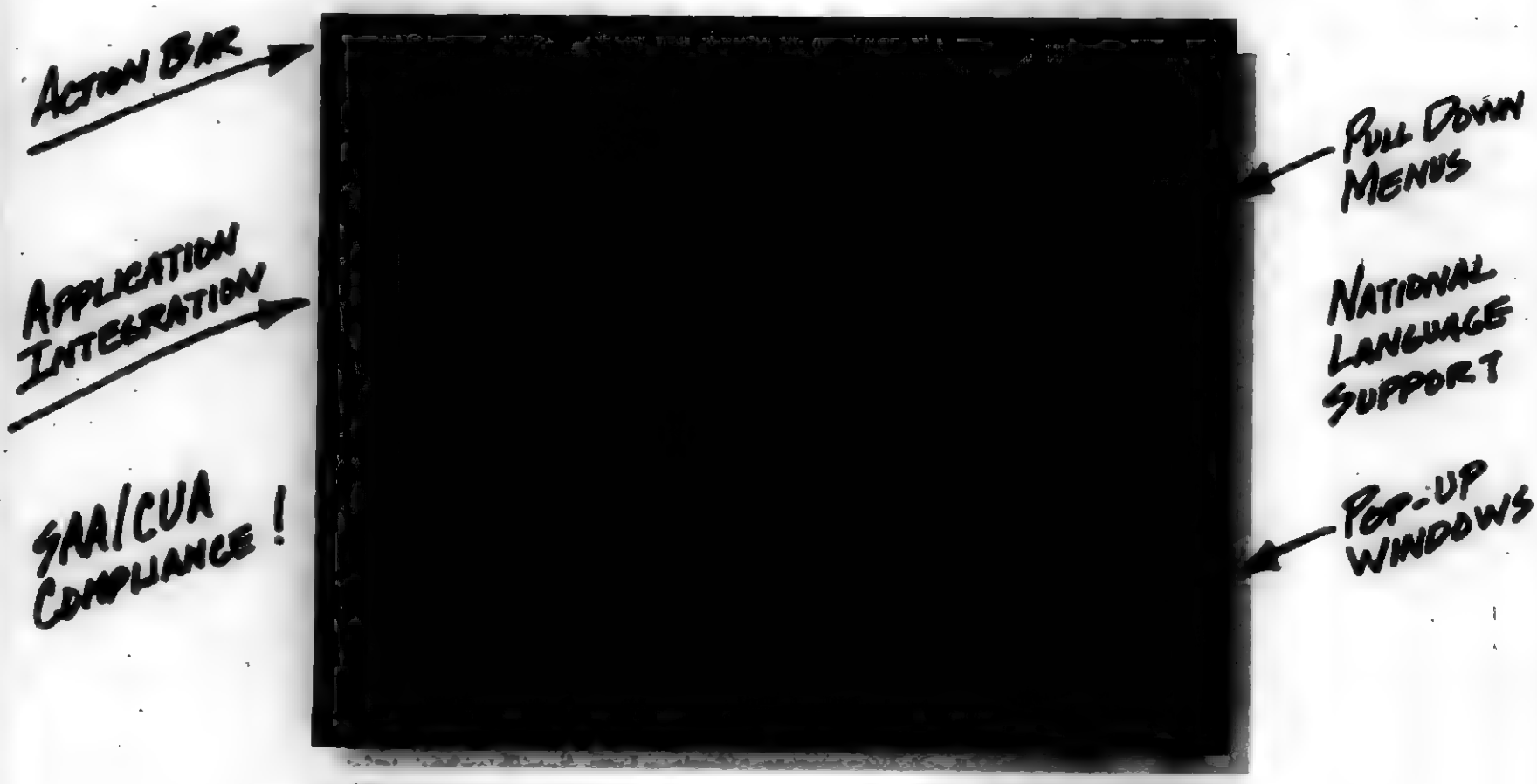
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COMPUTERWORLD

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MANAGER'S JOURNAL

EXECUTIVE TRACK



John R. Mohr has been elected executive vice president at the New York Clearing House Association, the nation's oldest and largest bank clearinghouse, with 12 member banks. He succeeds William L. Walsh, who died in November 1990.

Mohr, 43, is responsible for overseeing paper-based exchange and settlement processes and the clearinghouse's two electronic funds transfer systems.

Mohr was formerly executive vice president at the Bank of New York. He had been executive vice president at Irving Trust Co. since 1987, responsible for funds transfer and deposit, trade and credit services, and he continued in the post after Bank of New York acquired Irving Trust in 1988.

Mohr spent 17 years at Irving Trust, beginning his career as an assistant secretary in the securities processing group. He is a graduate of Fordham University.

.....

After hiring Mohr, the New York Clearing House Association announced two promotions in information systems management, both to newly created positions.

Joseph S. Pawelczyk was promoted to vice president of systems development. He has been manager of systems development since 1981.

Pawelczyk, 44, was a systems manager at the former Burroughs Corp. from 1974 to 1981, responsible for systems engineering support of large systems in the New York metropolitan area. He is a graduate of St. Peter's College in Jersey City, N.J.

Albert Wood was promoted to vice president of technical services. He has been manager of data communications at the clearinghouse since 1981.

Wood, 38, was also formerly employed at Burroughs, working as a senior systems representative from 1977 to 1981. Before that, he was a programmer/analyst for Suffolk (N.Y.) County. He is a graduate of Long Island University.

Opening systems to span the globe

Du Pont sets up standards group to support worldwide business activity

BY JOHANNA AMBROSIO
CW STAFF

Open systems are a lot like the weather: Many people talk about them, but few actually do anything about them.

If Du Pont Co. cannot yet change the weather at will, it is doing something about open systems. Last year, Du Pont established a small but formalized group — the Open Systems Program Office — to help shepherd the introduction of open systems throughout the global organization.

"Over the long term, open systems is fundamental to our strategy," says Raymond E. Cairns Jr., senior vice president of Du Pont Information Systems in Wilmington, Del. "We're running worldwide networks, and we're continuously striving to connect all this capability. Open systems is one major way we're going to accomplish that."

The company plans to deploy widespread open systems by the middle of the 1990s, although Du Pont's existing systems — chiefly the IBM mainframes and Digital Equipment Corp. minicomputers — will be around until at least the year 2005, Cairns says.

Du Pont, with some 100 businesses and 1,200 different products, achieved a first in 1990: More than half of the company's revenue was derived from customers outside the U.S. The corporate IS function is working hard to help increase that global reach.

"In order for us to be a really great global company, we need to leverage Du Pont's resources to create a high degree of synergy across the corporation," says James Collins, manager of the Open Systems Program Office. "Any information should be available to anyone in the corporation that needs it to do his or her job."



Katherine Lambert

Du Pont's Collins: *'Any information should be available to anyone in the corporation that needs it to do his or her job.'*

Other driving factors behind open systems at Du Pont include scenarios that are common to many types of businesses: closer partnerships with suppliers and customers, a burgeoning tide of government regulations and paperwork and the need to respond more quickly to market needs.

"The technology infrastructure must change to satisfy those business drivers," Collins says. "We need to create an integrated Du Pont information environment worldwide. And we can't do that with proprietary solutions."

Those traditional proprietary systems, Collins says, "tend to be more costly and more complex and introduce delays in delivering solutions to our businesses."

Translators and gateways must be built to connect proprietary systems, "so you can't effectively respond in that kind of environment," he adds.

To build that interconnected worldwide network of open systems, Du Pont wants technology based on international standards. "But we're pragmatic," Collins says. "International standards take time to develop and be formalized."

In the meantime, he says, Du Pont will work with national and de facto standards such as the X/Open Portability Guide and the Open Software Foundation's (OSF) Distributed Computing Environment. Du Pont, working with about a dozen other user organizations, is expected to announce next week

Continued on page 78

States lauded for innovation in hard times

BY CLINTON WILDER
CW STAFF

For some state government information systems staffs experiencing budget cuts and layoff notices, there is reward amidst the pain.

The National Association of State Information Resource Executives (NASIRE), based in Lexington, Ky., recently chose seven state government systems across the country as particularly innovative and productive. The winners will be honored at NASIRE's annual meeting in Kailua-Kona, Hawaii, Aug. 5-8.

Massachusetts, one of the hardest-hit states economically, was honored for developing a plastic "smart card" system for the state's 580,000 Medicaid recipients.

Each of the state's 30,000 health care providers has a card reader that dials into the state's eligibility database, thereby providing quick verification of Medicaid coverage for a particular service.

The following states also won awards:

• **Kansas.** Using optical disc storage and other technologies, the Kansas Department of Health and Environment automated its Office of Vital Statistics. The project included an "electronic birth certificate" now used to report 77% of births across the state.



• **Pennsylvania.** The Pennsylvania Emergency Management Agency, which is located in Harrisburg, uses a local-area network of 50 personal computers to run its Emergency Operations Center. The center runs on Emergency Information System software from Rockville, Md.-based Research Alternatives, Inc., which received a *Computerworld* Smithsonian Award two weeks ago.

• **Delaware.** Most U.S. companies are incorporated in Delaware, meaning lots of paperwork for the state's Division of Corporations. A Wang Laboratories, Inc. imaging system has automated much of that paper.

• **Arkansas.** The state developed standard applications for administering county government; the County Management Information System is used by 15 counties.

• **Washington.** The state's Homicide Information and Tracking System collects murder information from 274 law enforcement agencies in order to help detectives track and convict killers.

• **Wisconsin.** The state's IS staff decided to take a dose of its own medicine, implementing a series of Automated Production Control techniques to automate the state's IS operations.

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THE OPEN ADVANTAGE.

Du Pont

FROM PAGE 75

which standards it expects vendors to build systems on.

Du Pont's journey toward open systems began around 1988 when the Du Pont fibers group started scoping out its IS requirements for the 1990s. Out of that work, an interdepartmental open systems task force was formed to define the strategy behind open systems, and the Open Systems Program Office was born in early 1990.

The man chosen to lead the open systems charge was Collins, a 28-year Du Pont IS veteran most recently in charge of managing the IS function for Du Pont's engineering organization. Collins reports to Thomas Holmes, director of the architecture and planning group, who in turn reports to Cairns.

Cairns is so convinced of open systems' strategic importance to Du Pont that he accepted the OSF's invitation to join its board as its first, and thus far only, user organization among all of the vendor members. "I'm willing to spend the time to help them understand Du Pont's open systems needs," he says.

The current priority at Du Pont is making existing systems interoperate as opposed to implementing new open systems such as Unix-based applications, Collins says. But there are some pilots and other applications going on in the fibers, engineering and research and development groups in areas such as Unix-based client/server applications.

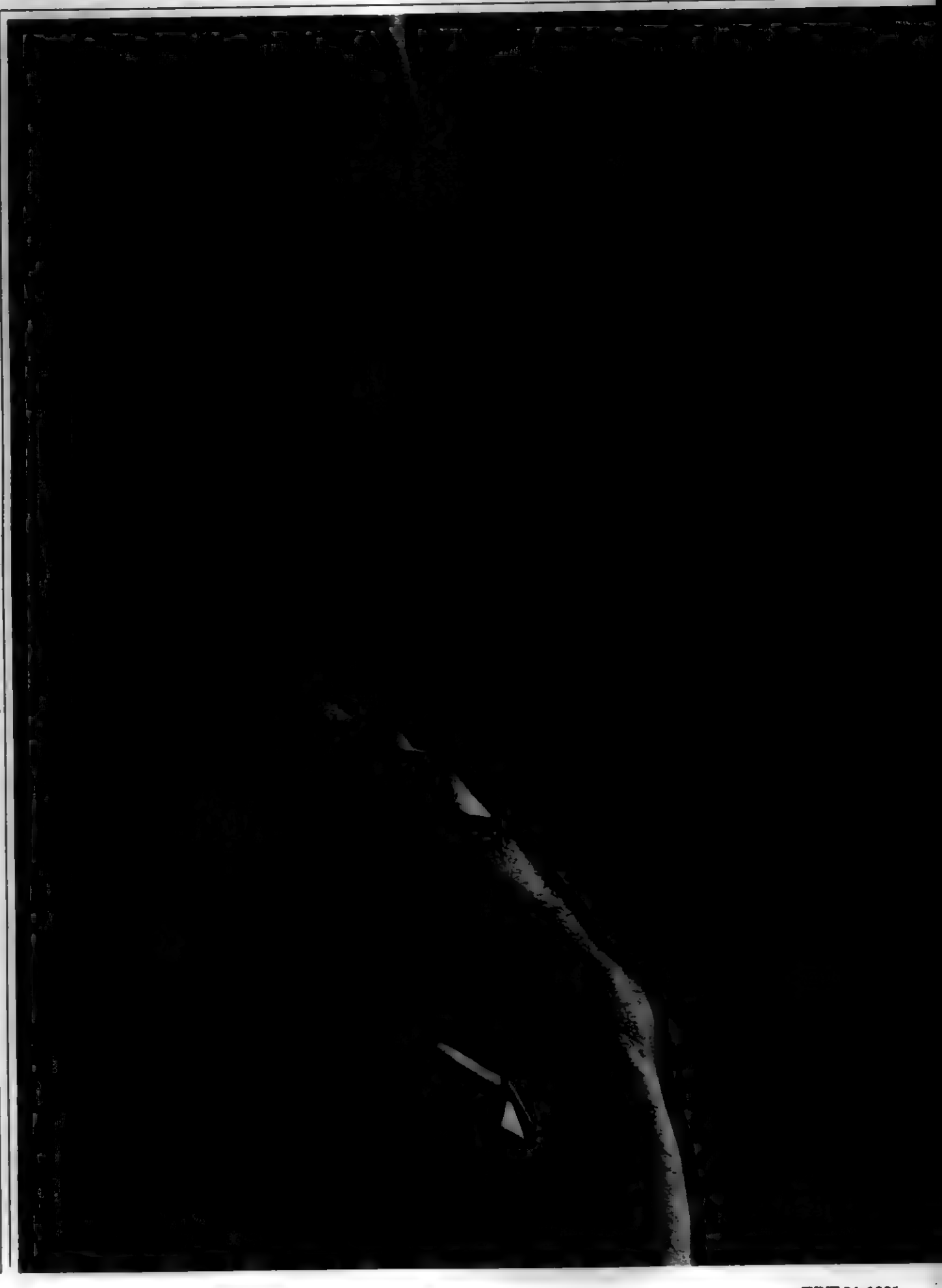
One group, for example, replaced its mainframe production scheduling system with a Unix system. "This saved the users their chargeback costs and freed up the mainframe for other applications," Collins says.



Cairns: *Open systems fundamental*

The biggest challenge, however, will be managing the human transition as IS staff members learn new ways to build and think about building systems. "We are change agents for this new type of computing that will be important to Du Pont as we move ahead in the '90s," Collins says. "We're focusing on what we need to do to change the culture — to develop an open, distributed mind-set in our IS people. And that's going to be a significant challenge, probably more so than the functional objectives that we're after."

Open systems is a long-term



A full plate

Among the responsibilities of Du Pont's Open Systems Program Office are the following:

- Develop processes to help the line organizations understand and implement open systems.
- Identify people in the line organizations to work on open systems projects.
- Work with people in the line organizations to help identify and implement open systems projects that have short-term payback and solve some immediate business need.
- Establish criteria for measuring the value of open systems.
- Act as a clearinghouse for information about open systems, including products and support requirements.
- Work with vendors to help them understand Du Pont's open systems needs and to understand the vendors' plans.
- Work with outside groups such as X/Open, the Corporation for Open Systems, the User Alliance for Open Systems and the OSF to try to establish standards so that open systems products get to market as quickly as possible.

effort at Du Pont, and the activity is not being flooded with resources quite yet. So far, the Open Systems Program Office consists of only Collins, a senior technical staffer and an administrative support person. Additionally, several dozen people in the line organizations are working to help implement specific open systems projects.

"There are many activities competing for a scarce resource pool," Collins admits, "and we have to balance the short term with the long term." He says Du Pont will try to leverage its existing IS personnel to get them to adopt open systems.

The key to that effort is educating Du Pont's 6,000 IS professionals worldwide about the benefits of open systems.

"Change can be threatening to people," Collins says. "By having this central resource available, it will help ease them through the change."

Du Pont will build its open systems implementation and expertise over the next decade. "It's a long-term commitment, but we believe we have to start now because of the investment that's required in developing the skills we need," Collins says.

Op'-en sys'-tems

An open system, as defined by Du Pont, is an integrated computing environment consisting of components whose functions and interfaces comply with widely implemented, vendor-neutral standards.

It provides interoperability, applications portability and scalability as well as encompassing many different components, including the user interface, operating system, development tools, networking services and database access.



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MANAGEMENT REPORTS

U.S. hiring on rise?

There may be a pickup in U.S. corporate hiring in the third quarter, according to the most recent survey by **Manpower, Inc.** Manpower's quarterly survey of hiring intentions found that 22% of the 15,000 firms polled plan to expand their work forces in the third quarter, while 10% plan reductions. That contrasts with second-quarter intentions, which found 18% of the firms planning to hire and 13% intending to cut back. Those figures, resulting in a hiring strength factor of only +5%, were the most pessimistic since the recession of 1982.

A national search for the best computer applications to help the disabled was announced by **Johns Hopkins University, the National Science Foundation and MCI Communications Corp.** Johns Hopkins conducted a similar search 10 years ago, honoring three winners chosen from 8,000 entries. Atlanta and nine other major U.S. cities will hold regional competitions, and the top 30 winners will exhibit at the Smithsonian Institution Feb. 1-2, 1992. The grand prize winner will receive $10,000. Application forms and information are available from The Johns Hopkins National Search, P.O. Box 1200, Laurel, Md. 20723.

The three consulting and research firms owned by the Paris-based parent of **Cap Gemini Sogeti** have allied under the umbrella name of **Gemini Consulting: The Mac Group** in Cambridge, Mass.; **United Research** in Morristown, N.J.; and **Gamma International** in Chicago.

COMMENTARY

Christine Comaford

New technology: One step at a time



Most information systems managers don't ask for much. They're reasonable people. When making new technology decisions, they really want only three things: to buy technology that truly provides the features and functionality the vendor says it will, to avoid mistakes in selecting new technology and to keep the costs of new technology within their budget.

Most Fortune 1,000 firms like to get their feet wet by getting evaluation copies of a few products and buying a few hours' worth of consulting expertise.

The following suggestions are geared toward IS professionals who want to implement new technologies successfully:

• **Assessing new technology.** Before you make a tentative commitment to a new software tool, for example, evaluate your options. Isolate a reasonable number of products (five, for example) and decide up front that your goal is to limit the possibilities to three products.

"Real world" feedback is priceless in product evaluations. Take advantage of the significant number of free consultants available to you: peers who have implemented or are in the process of implementing the technology you are considering. As long as they aren't direct competitors, you'll often find that they'll be happy to discuss what did and did not go well in their use of new technology.

Ask what happened after the honeymoon with the new computer-aided software engineering tool ended. Did they hit a brick wall? If so, did the vendor help them to get back on track?

Remember that hindsight is 20/20 vision. Learn from someone else's valuable experiences. All it will cost you is a phone call or, at most, lunch.

In addition to peers, talk to consultants — but beware of the consultant who is a reseller of a particular product. You want objective input. Someone who works with corporations of your size or with IS issues similar to yours can provide a lot of behind-the-scenes information in a one-hour meeting.

• **Rapid prototyping.** Once you have screened out a few products, the next step is prototyping. Assuming you have fairly well-defined specifications, a rapid prototype can assist in "selling" technology changes to upper management.

But remember to set expectations realistically. Other people who are not intimately involved in a prototype will see a demo and assume the new application is nearly ready for a production environment. This perception is dangerous because it can trivialize a project and negatively affect the desired amount of funding.

Training in new technologies can be costly and time-consuming. Get the vendor involved. You may be able to get free training or free prototype development assistance.

• **Introducing new technology in stages.** Sweeping, expensive changes are not necessary initially. If the prototype suggested above is a success, take the next step. Select a low-risk (not mission-critical) application for a pilot site. The success of the pilot will be a crucial factor in determining whether the technology is to be deployed companywide.

So start off on the right track. Start small, get all of the players involved, continue to manage expectations and get external expertise if required.

Your pilot will be used as a role model, so be sure it is standards-compliant. If you don't know what the current and de facto standards in a particular area are, find out. A little extra money spent here can save a significant amount later.

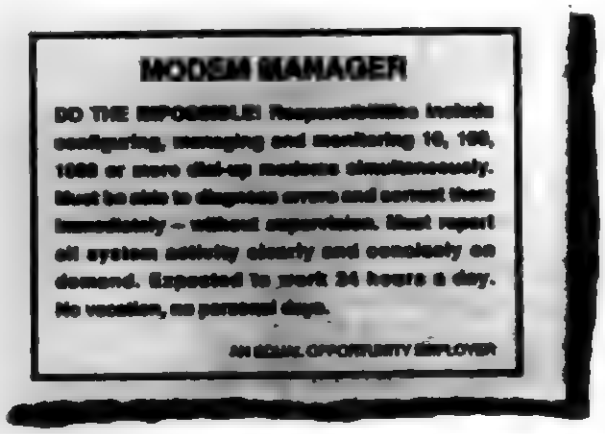
> YOU WANT OBJECTIVE input. Someone who works with corporations of your size or with IS issues similar to yours can provide a lot of behind-the-scenes information.

Also bear in mind your long-term corporate strategy. The pilot application may need to integrate with existing or new applications, so stay involved with end-user computing. Stay in touch with vendors so that you'll know what products are forthcoming.

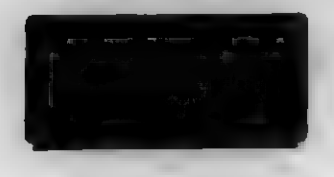
There is a lot of pressure on corporations to make their systems more efficient — faster, more secure, easier to use, more "modern" and less costly. This is the long-term goal, and you can start taking steps toward it today.

Read articles about how other firms are implementing successful technology changes. Talk to your peers, attend conferences, interview a consulting firm. Technology mistakes won't happen if you draw on the experiences of others and carefully chart your course on the road to the leading, and not bleeding, edge.

Comaford is president of Corporate Computing, Inc., a consulting firm based in Sausalito, Calif.



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CALENDAR

JULY 14-20

Guide 90. Boston, July 14-19 — Contact: Guide Headquarters, Chicago, Ill. (312) 644-[illegible].

American Association for Artificial Intelligence National Conference on Artificial Intelligence. Anaheim, Calif., July 14-19 — Contact: AAAI-91, Menlo Park, Calif. (415) 328-3123.

TQM '91 Conference. Washington, D.C., July 15-17 — Contact: Paula Harrington, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-0777.

Communication Networks West Conference and Exposition (Comnet West). San Francisco, July 15-18 — Contact: IDG Conference Management Group, Framingham, Mass. (508) 879-6700.

Video Expo. Chicago, July 15-19 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Computer Technology and Military Planning Symposium and Exhibition. Arlington, Va., July 16-18 — Contact: Automated Missions Planning Society, Palmyra, N.J. (609) 829-7823.

Information Engineering/RAD. Washington, D.C., July 16-18 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Getogether '91. Silverdale, Wash., July 19-21 — Contact: Turbo User Group, Poulsbo, Wash. (206) 779-9508.

JULY 21-27

IPO Quarterly Meeting. Pittsburgh, July 21-26 — Contact: National Computer Graphics Association, Fairfax, Va. (703) 698-9600.

Downsizing Corporate Computing. Chicago, July 23-25 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Macivity '91: The Macintosh Connectivity Conference. Santa Clara, Calif., July 23-25 — Contact: Wincbouse Computer Co., Los Gatos, Calif. (408) 345-2500.

Software World. Toronto, July 23-25 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-0526.

Artificial Intelligence and the Help Desk. San Francisco, July 23-26 — Contact: Help Desk Professionals, Colorado Springs, Colo. (719) 531-5138.

JULY 28-AUGUST 3

International Management Graphics User's Group Meeting. Las Vegas, Aug. 1-4 — Contact: MGI, Minneapolis, Minn. (612) 854-1220.

Insourcing vs. Outsourcing: Innovation Without Headcount. Hilton Head, S.C., July 30 — Contact: Betsy Gray, The Yankee Group, Boston, Mass. (617) 367-1000.

AUGUST 4-10

Subaru Technologies Conference. Seattle, Aug. 4-7 — Contact: Andy Rebele, The Westwater Group, Boulder, Colo. (303) 440-3410.

Software Maintenance and Re-engineering. Washington, D.C., Aug. 5-9 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

CASE World. Boston, Aug. 6-8 — Contact: Digital Consulting, Inc., Andover, Mass. (508) [illegible]

Implementing Re-engineering: Process, Tools, Techniques. Boston, Aug. 6-8 — Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

Landex '91. San Francisco, Aug. 8-10 — Contact: Local-Area Network Dealers Association, Elmhurst, Ill. (708) 279-2255.

AUGUST 11-17

Information and Technology: Gateway to Solutions. San Francisco, Aug. 11-15 — Contact: URISA, Washington, D.C. (202) 289-1685.

Manufacturing Networks Conference. Chicago, Aug. 12-13 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Electronic Data Interchange for Government. Washington, D.C., Aug. 12-15 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

The National Conference on Computing. New Haven, Conn., Aug. 12-16 — Contact: The Research Center on Computing and Society, Southern Connecticut State University, New Haven, Conn. (203) 397-4423.

Windows and OS/2. Boston, Aug. 14-16 — Contact: CM Ventures, Emeryville, Calif. [illegible]

AUGUST 18-24

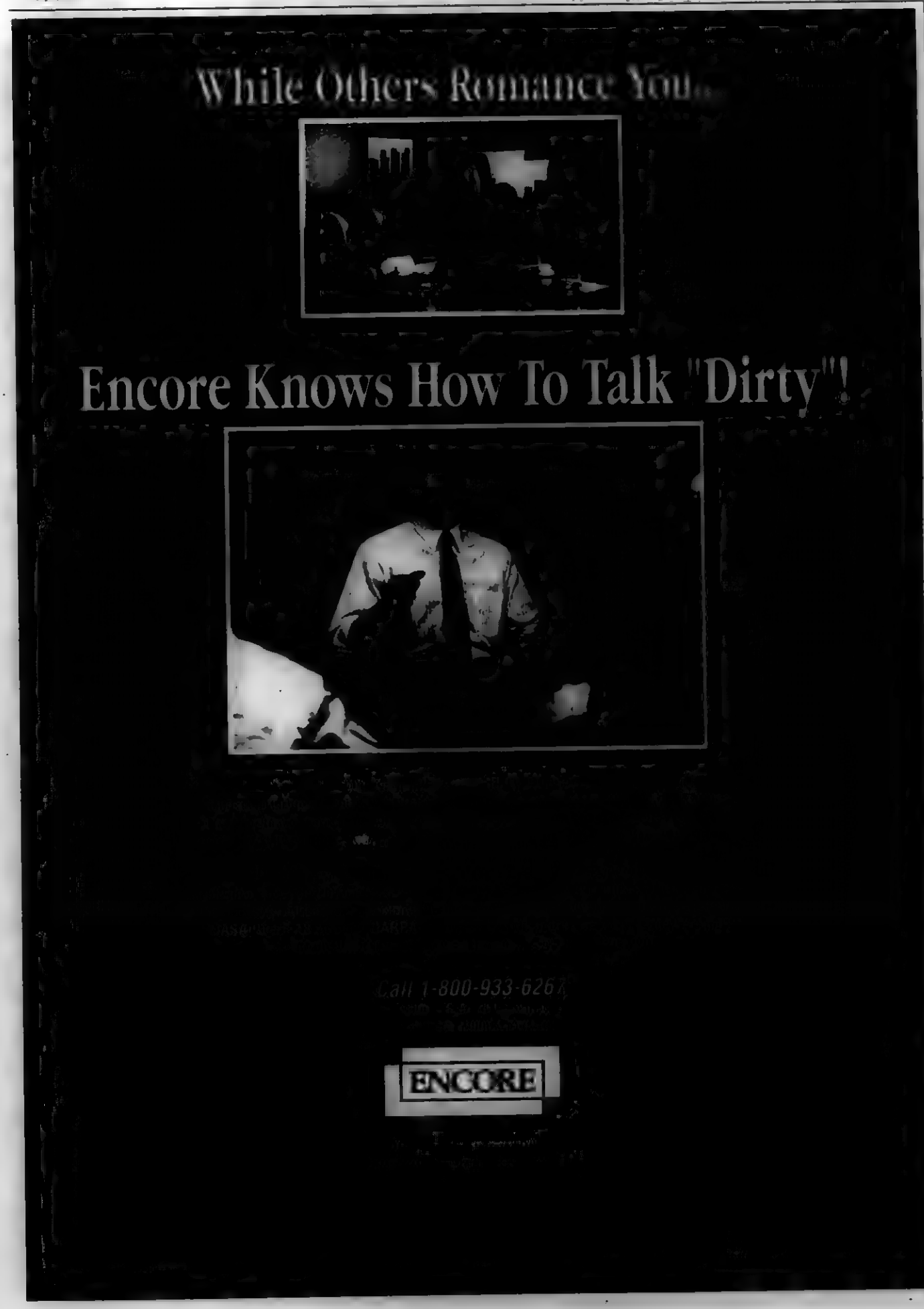
Share 77. Chicago, Aug. 18-23 — Contact: Share Headquarters, Chicago, Ill. (312) 644-6610.

MIS Training Week West '91. San Francisco, Aug. 19-23 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. [illegible]

The Santa Cruz Operation Forum '91. Santa Cruz, Calif., Aug. 19-23 — Contact: The Santa Cruz Operation, Santa Cruz, Calif. (408) [illegible]

Fed Micro. Washington, D.C., Aug. 20-21 — Contact: National Trade Productions, Inc., [illegible]

Fuse CD-ROM Conference and Exhibition. Washington, D.C., Aug. 20-21 — Contact: Sylvia Griffiths, National Trade Productions, Alexandria, Va. (703) 683-8500.



BOOK REVIEWS

Fact-based thriller raises questions of computer security

Terminal Compromise
By Winn Schwartau
Inter.Pact Press, $19.95

For light summer reading with weighty implications, Winn Schwartau's fact-based novel, subtitled *Computer Terrorism: When Privacy and Freedom Are the Victims*, is thought-provoking, sometimes chilling and sometimes hokey.

The author weaves a complex tale of a Hiroshima survivor who plots the downfall of the U.S. by dismantling its public and private computer systems.

Readers who can follow the antics of a long cast of characters through the 570-page book will get a taste for how vulnerable computer systems are to those who are determined to penetrate them. They will also get a feel for the kinds of devastation some well-placed computer sabotage could have on everyday computer-driven conveniences, such as automated teller machines and airline computer reservation systems.

The Japanese character, Homosoto, assembles a band of international computer thugs to execute the various pieces of his destructive plan. The thugs concoct an elaborate blackmail scheme to lead the FBI away from the real problem: thousands of time-bomb computer viruses that have been planted in popular software packages and on public bulletin board systems.



There are twists and subplots along the way, and even a government conspiracy thrown in for good measure. But Schwartau's characters are not always believable. Most notable is the book's main character and hero, an engineer-turned-reporter who somehow lands a job at a major New York City paper. The rookie reporter manages to ingratiate himself with everyone — from editors to hackers to FBI agents. He then writes about his experiences in poorly constructed articles that are sprinkled throughout the book.

Schwartau knows about networks and security and creates an interesting plot that will keep readers turning the pages. It is unfortunate his characters are not as realistic as the chilling scenarios he paints.

ALAN J. RYAN

Going Public: Mips Computer and the Entrepreneurial Dream
By Michael S. Malone
Edward Burlingame/HarperCollins, $22.95

When a relatively small technology company nestled in Silicon Valley sells its first public share of stock, it is a success story about as routine as the U.S. hockey team in the 1980 Olympics.

Michael S. Malone's 279-page book depicts the triumphs and tribulations of Mips Computer Systems, Inc. as it matured from a start-up firm spearheading a new technology to its climactic initial public offering in the final section of the book, simply titled "The Day." The author's writing consistently recalls all possible pitfalls on the road to Wall Street, but also the perks that make the pains worthwhile.

Going public is the day when entrepreneurship is rewarded for its sacrifices and risks, and through interviews with everyone from top executives to secretaries, Malone illustrates how that pivotal day changed the way Mips and its employees would do business forever.

KEVIN BURDEN

High-Tech Ventures: The Guide for Entrepreneurial Success
By C. Gordon Bell
with John E. McNamara
Addison-Wesley Publishing Co., $29.25

C. Gordon Bell, creator of the VAX architecture for Digital Equipment Corp., has been involved in 20 start-up companies during his career. But this 367-page book explores more than just how to become a successful entrepreneur. Many of his observations on management — including discussions of firing or not hiring those programmers who do a net negative amount of work for you — apply to anyone leading technically skilled people.

Readers may find his discussion of the rates of improvement in the memory and power of systems a useful guide to the types of new equipment to consider when buying systems. For instance, will microprocessors be more powerful than mainframes by 1996?

Another interesting point is whether or not IS departments should consider exporting programming jobs to other countries. Compared with American programmers, for example, programmers in Japan create twice as much code per programmer with only 10% of the errors.

JOHN STURM

Sturm is president of Productivity Research in Melrose, Mass., and founded the Consultants and Entrepreneur's Group of The Boston Computer Society.

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PORTABLES AND LAPTOPS

Notebooks are selling like hotcakes — but look again, and you'll see room for improvement in connectivity, availability and power issues

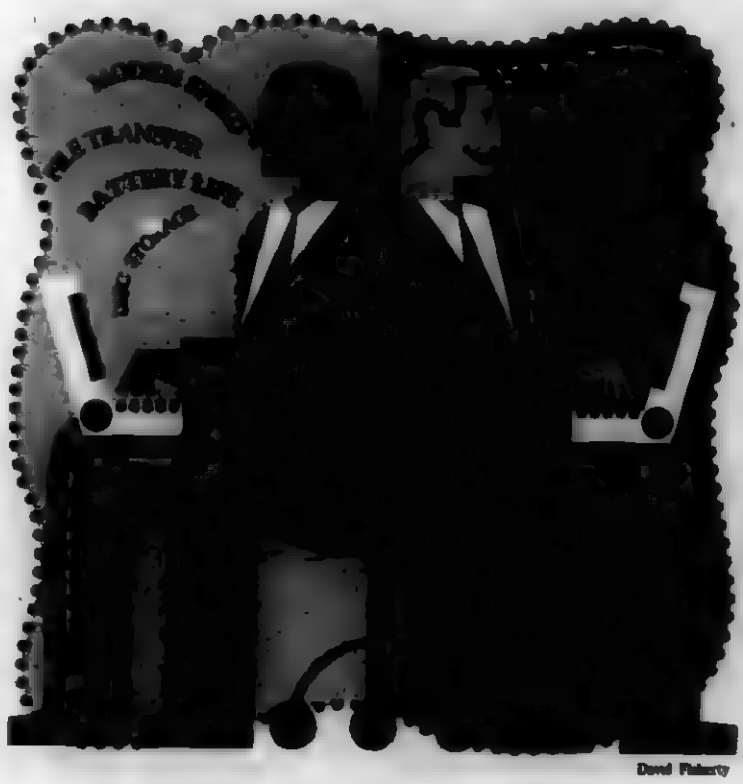
BY WILLIAM BRANDEL

The scene is the dining room of an average young couple, reviewing insurance possibilities with a Prudential sales agent. The man and woman shift nervously in their chairs, overwhelmed by the decisions they have to make. Reassurance is theirs, however, when the agent draws their attention to the numbers glowing on the screen of a Supersport SX, a laptop computer from Zenith Data Systems.

The 16.8-pound Supersport played its role well, but it probably won't find its way into the next round of television commercials from The Prudential Insurance Company of America.

According to a Zenith Data spokesman, Prudential has shed about 10 pounds in the portable area by placing an order for Zenith Data's recently announced Mastersport, a 6.6-pound notebook computer.

Prudential is not the only company being wooed by the lighter, higher performance machines. Shipments of notebook computers will jump from an estimated 610,000 at the end of 1991 to an approximate 912,000 in 1992, while heavier laptops will show only a slight rise from 579,000 to 597,000 during the same period, according to International Data Corp., a Framingham, Mass.-based market research firm.



David Flaherty

Behind the camera

Commercials seldom tell the whole story, however. When the camera disappears and the lights fade, what viewers don't see is the agent actually using the system to interact with the home office to get the new account in gear.

To do this, the agent would have to ask the young couple for permission to use their asynchronous telephone jack to upload the information to the home office, then ask them to send her the bill for the telephone call. Or the agent could wait until she gets back to the office, where she would hook the portable into the local-area network with an adapter card, or she could hand a disk to someone else who would set up the account.

The trouble is that there is currently no seamless, trouble-free way of getting the data from the portable to headquarters (see story page 89).

Other problems associated with mobile computing are more closely related to notebooks themselves, including supply shortages, battery power limitations, compatibility problems arising from nonstandard ports and keyboards and the typical (albeit diminishing) complaints about poor screens.

"Right now, it's still a trade-off," says Bruce Arbonies, director of information systems in the District Agencies Department at Prudential Insurance in Newark, N.J. "These laptops are wonderful for point-of-sale, but they're not for everybody. You wait for hard drives; you even wait six to eight weeks to get evaluation units."

In terms of transmitting files to headquarters, modem manufacturers such as Microcom, Inc., the Portable Products Division of U.S. Robotics (formerly Touchbase Systems, Inc.) and Megahertz Corp. have made the process more subtle by designing standards-based data modems and fax modems that can either be placed inside the portable itself or carried along separately in a 6- or 7-ounce package.

More and more manufacturers are including either third-party or their own internal modems as a standard feature on their systems.

However, while external modems transmit data up to 9.6K bit/sec. — and even 12K bit/sec. in Microcom's case — internal modems transmit at 2,400 bit/sec.

The slower speeds are a problem for executives such as Sheldon Laube, chief information officer at Price Waterhouse in New York. Laube's staff of accountants and auditors needs to transmit large amounts of data to the home office from remote sites to expedite the database polling activity involved with their Lotus Development Corp. Notes application.

Although Laube uses a U.S. Robotics external unit, he says he'd prefer internal modems for his staff. "We need [9.6K bit/sec.] modems, and we can't get them," he says.

Too hot to handle?

According to Jerry Caron, an analyst at Faulkner Technical Reports in Pennsauken, N.J., there is a good reason for this. He speculates that a notebook computer could not withstand the heat generated by the 3.3 watts of power required to send data at 9.6K bit/sec. By comparison, travel at 2,400 bit/sec. requires a small fraction of that power — just 550 milliamps.

One manufacturer insists the speedier internal modems will be out next year. "Companies are working on it, and they should be out next year," says Bob Goligoski, marketing communications manager at Grid Systems Corp.

Much-talked-about cellular modems don't do much to increase internal modem speed, but they do eliminate the awkward hookup to telephone lines.

The problem is that they represent "a little less than one-tenth of a percent of modems

Continued on page 84

Brandel is a free-lance writer based in Boston.

INSIDE

Cost of Ownership
Portables still cost twice as much as desktop machines. Page 84.

How to Phone Home
It's not always easy to transfer files back to home base. Page 89.

Buyers' Scorecard
Compaq SLT/286 scores highest in laptop segment. Page 90.

True costs of portable computing

BY ANDREW M. SEYBOLD

The good news is that prices are dropping on portable computers — and dropping fast. In the fourth quarter of 1990, when more than 43 different shapes and sizes of Intel Corp. 80386SX-based notebook computers were introduced, list prices went from a Compaq Computer Corp. high of about $6,800 to a low of $2,200 from a slew of offshore vendors over a period of only six weeks. Even Compaq prices have dropped 30%.

The bad news is that after adding up what you pay for the unit itself plus all of the necessary add-ons, it will still cost you nearly twice as much to buy a portable computer as it would to buy a similarly configured desktop machine. This situation probably won't change for the next few years.

One reason for the price difference is that many of the components for portable computers have higher prices than their desktop brethren. LCD display panels, low-power memory and processors, batteries and even the plastics that house the units all cost more, pushing street prices for portables $1,000 to $2,000 higher than similarly configured desktop machines.

The street price for the basic unit doesn't tell the whole story, however. Add-on products and other accessories also have high premiums attached to them. These higher prices can be traced to the fact that unlike desktop systems, most portable computers do not have slots or standard expansion buses; they only have room for the addition of a modem and/or additional memory modules.

Because each vendor — and in fact, different models within a product line — uses different types of slots, costs for add-ons such as modems and memory are pushed up, sometimes by 50% more than for a desktop system.

Nonstandard slots also make it important for users to select a unit that meets most of their needs out of the box. Adding on as time goes by is not an easy task — or even a possible one, in some cases.

A third cost consideration that does not typically enter into the desktop equation is that of spare batteries and a sturdy carrying case. Spare batteries run in the neighborhood of $100, depending on the vendor, and carrying cases can cost anywhere from under $50 to well over $300, depending on the type of case and design.

You'll also have to assume that service and repair costs will be higher for portable equipment — sometimes by as much as 50%, depending on how the portable is treated in the field.

A more ambiguous cost factor often overlooked by purchasers is the potential for data loss. Information residing on a portable computer is more exposed to loss, theft and misuse. In fact, several large companies do not yet permit the use of portable computers by staff members simply because the companies have not yet devised a consistent policy regarding systems backup and data security. •

System type	Spring '90	Fall '90	Spring '91
8080 family, no hard disk	$2,000	$1,600	$1,100
80286, hard disk	$4,100	$3,600	$2,300
80386SX, hard disk	N/A	$5,200	$3,400

Source: Faulkner Technical Reports — CW Chart: Eric Cormier

Seybold is associate director of the Microcomputer Systems Group at Datapoint, Inc. in San Jose, Calif.

Continued from page 83

used in laptops," says Ken Bosomworth, director of research at International Resource Development, Inc. in New Canaan, Conn. In addition, "all four or five vendors in [the specialized cellular market] have the same set of problems."

The biggest of these problems are inherent in the cellular networks, which were designed with car telephones and voice transmission in mind. Those types of transmissions can withstand higher noise than digital transmissions, which have a good chance of being corrupted on current cellular networks, says John Dunkle, an analyst at Workgroup Technologies, Inc. in Hampton, N.H.

The technology needed to make portable users truly mobile — able to transmit clean data without a hard-wire connection — will most likely be based on radio frequency networks. IBM and Motorola, Inc.'s Ardis network will eventually allow digital transmissions, but the commercial hardware and software products that enable this type of communication will not hit the market for about two years. Until then, users must be near a telephone jack.

Because there is currently no ideal way to interact with databases in the home office, people are trying to carry much of their data around with them instead. As a result, users are calling for higher capacity storage disks on the portables.

Manufacturers have started to offer 60M- and 80M-byte hard disks. But even with 60M bytes, it's difficult to get hold of a portable that actually contains one.

At Comdex/Fall '90, "there were all those great new 386SX machines announced . . . and then they come out four to six months after the announced ship date," says Mike Sterling, systems development manager at General Foods, USA in White Plains, N.Y.

The slew of notebook announcements is making it difficult for peripheral manufacturers to meet the demand for parts.

"About a month ago, we bought about 40 Toshiba 3200SX machines," says Stephen Rood, manager of microcomputer technology at Coopers & Lybrand in New York. "The gas-plasma screens were generally not available. With the new machines, one or two accessory items generally are not available."

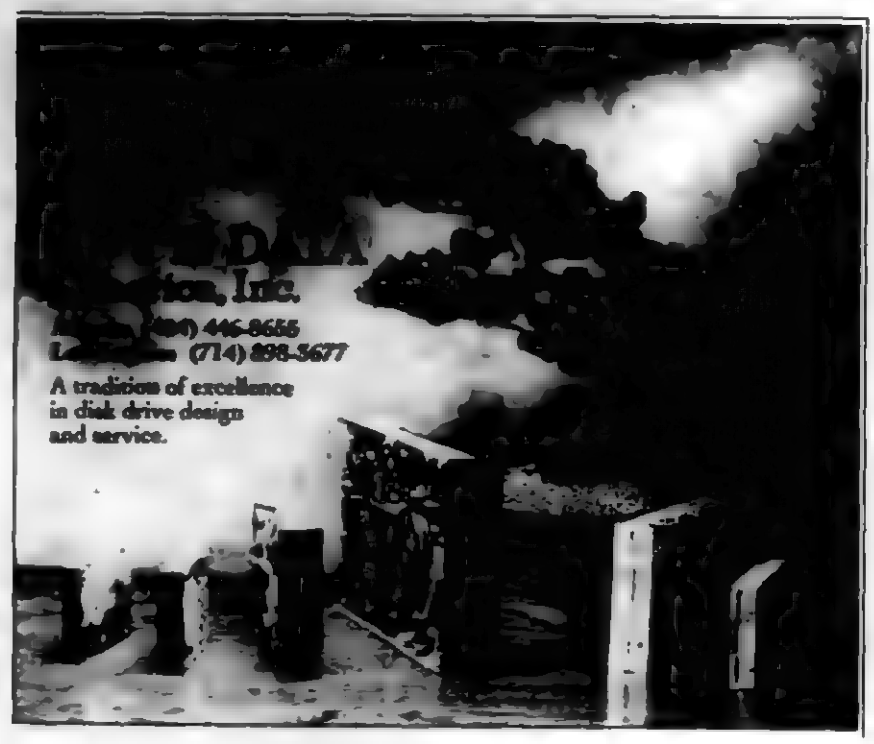
While the production and quality issues of many peripherals have subsided somewhat, it will not be until later this summer that purchasers will see volume deliveries, according to analysts.

> "I HAVE TO accept that they can deliver the drives if they put it down in writing. But I will still consider who the company is . . . and when they will get the first 60M-byte drive off the line."
>
> AUDREY ALLOPENNA
> ADP

Meanwhile, buyers are starting to demand proof of a vendor's ability to deliver. It is no less than a No. 1 priority at Automated Data Processing, Inc. (ADP) in Roseland, N.J., which is trying to secure hundreds of notebooks to replace the 13½-pound Toshiba America Information Systems, Inc. 3100SX portables sales representatives currently use for sales demonstrations and linking back to the home office.

Audrey Allopenna, project manager at ADP, has a long list of requirements that vendors must meet, but the most challenging is a 30-day delivery commitment — in writing.

"I have to accept that they can deliver the drives if they put it down in writing," she says. "But I will still consider who the company is, how long they have been in



Perfection is relative

Highly mobile employees make up the largest base of portable computer users, but there are actually three basic groups, according to Peter Tyige, an analyst at Computer Intelligence/Infocorp in Santa Clara, Calif., and each looks for very different things in equipment.

Employees who work in the field use portable equipment outside the office and increasingly do not have a desktop unit at headquarters. The people in this group require the utmost in portability and look for several characteristics in their machines:

- Reliability.
- Light weight.
- Long battery life.
- Ruggedness.
- Features that facilitate field applications — for instance, a "resume" feature that allows the user to stop the machine (in the middle of a presentation, for example) without having to reboot.

A smaller but fast-growing group includes people whose primary machine is their desktop unit but who use portables for meetings or working at home. These people want a machine that pairs well with what they use as a desktop machine. For this group, the following features are important:

- Enough power to run desktop applications, such as Microsoft Corp.'s Windows 3.0. This rules out anything lower than an Intel 80386SX-based machine.
- A lot of memory.
- A display adequate for gray shades and graphical user interfaces.
- Low price.
- Minimum size and weight.

The smallest group of portable users consists of people who are replacing their desktop machines with portables. These people may not have enough space for a desktop personal computer or may travel often enough to want a portable but be unable to justify purchasing two machines. This group requires the following:

- Desktop-equivalent performance.
- Large disk storage capacity.
- Expandability, especially for network and memory.
- Superior display quality.
- Desktop-comparable keyboard.

the laptop industry, how strong their pull is in the industry, what channels they are using and when they will get the first 60M-byte drive off the line."

Once you get your hands on a high-density disk, there is still the problem of having enough power to support it. Large hard drives, high-powered CPUs, modems and especially screens require a lot of battery power.

"That's why you don't see any 386 notebooks," Faulkner Technical Reports' Caron says. "The electrical requirements would be too much."

With average battery life hovering around the 3- to 4-hour mark, extra power demands are



CW Chart: Doreen St. John

sometimes not so practical, especially when you consider that recharge time can be three to four hours.

The Intel Corp. 80386SL chip, designed specifically for portable computers, promises to cut down on battery power consumption; in fact, the recently announced Zenith Data Mastersport 80386SL promises eight hours of battery life.

Such a prolonged power supply does come with a price premium, however: Zenith Data's system costs $5,000.

There are similar "gotchas" when it comes to hooking up portables to keyboards and other peripherals. Notebooks contend with standardization issues. Connector pins on serial ports, which allow the machines to hook up to printers, display terminals and other peripherals, vary from nine to 25 pins.

In addition, portable computer keyboards differ not only from each other but also from desktop personal computer keyboards, with the exception of IBM's new portable. While that machine is in the weight category of a notebook, it is approximately 1.3 inches longer and twice the price of other notebooks.

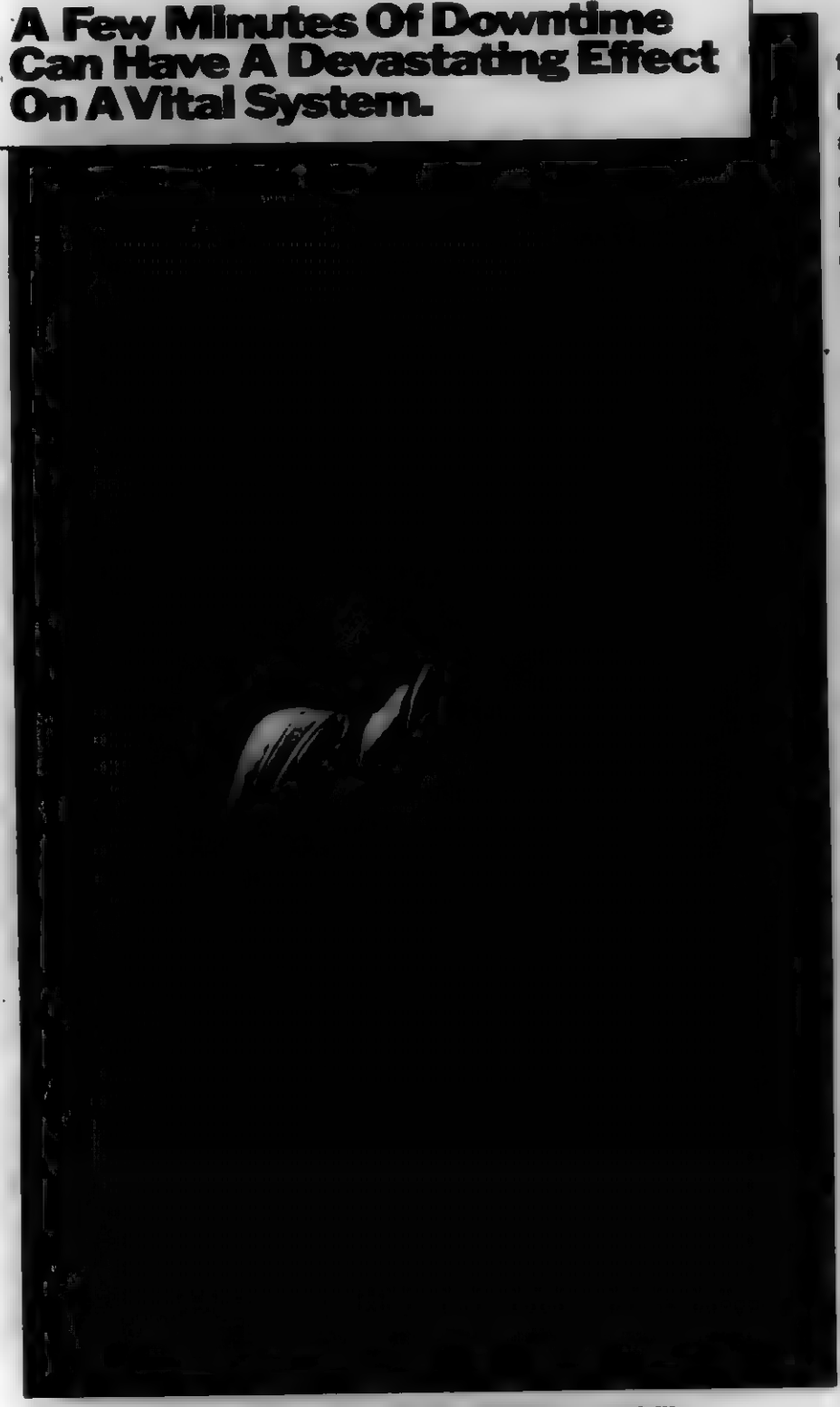
With other keyboards — such as the Compaq LTE — "our auditors have found that if you want to do things like page up, page down or use the home key, you have to hit 'Alt' and a function key at the same time," Rood says. "It just makes it more awkward than it should be."

Despite all the niggling problems, the benefits of laptops ultimately outweigh the shortcomings. Manufacturers have done a good job of getting 386SX systems into 6- and 7-pound clamshells and on the market at competitive prices, which is becoming increasingly important as more companies move to Windows and OS/2.

While the preferable gas-plasma screens — which are said to alleviate eye strain — are not yet available on notebook computers, LCD screens with IBM's Video Graphics Array are shipping on these systems. In a short time, notebooks will most likely fulfill their promise.

"I've followed a lot of the industry trends, including the new ones like palmtop computers," Sterling says, "but I think the notebooks and laptops represent what computers are supposed to be all about." •

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Despite his wealth Phinnias Pritchard lived in a small hovel within the bowels of London. For had he allowed his crusty wealth to be seen by the unwashed [illegible]

Rather than spend a half penny for new candles like everyone else, Phinnias would make the rounds of local establishments, scrape the tallow drippings from old candleholders into a sack, and later melt the contents to make new candles. On one particularly productive evening he collected six scrapings from a pub, four from a butcher's shop, twelve from a church abbey, eight from a neighborhood inn, ten from a local

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cockfighting hangar and nine from a cobbler's shop. Query: If it takes the remains of seven candles to make one new candle, and if one candle lasts an entire night, how many full nights of light was he able to create from this trip?

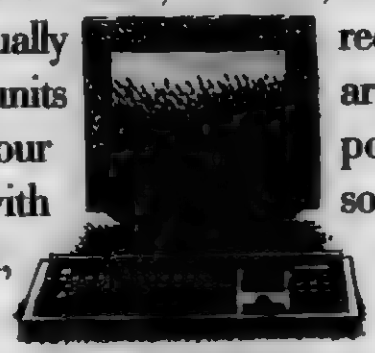
Certainly it's hard to quarrel with Mr. Pritchard's motives. Especially in this era of revered recycling. But, one could legitimately question whether he was receiving an adequate return for all the effort he expended. (Though it did yield in excess of seven candles.)

One could also question what all of this has to do with Wyse.

Believe it or not, quite a bit.

Because—in the interest of ergonomic reform—we are conducting a sort of recycling effort of our own. From May through August we are paying $50 for any antiquated terminal traded in on a new Wyse WY-150, WY-160, WY-185 or WY-370.

Obviously, we don't actually recycle the parts into our new terminals. But we will see that the old units are properly dismantled and disposed of, then recycle $50 into your pocket. A nice return for very little effort. So if you are still cursed with some ergonomically archaic terminals, here's your chance. After all, having shipped over three million terminals worldwide in the past decade, we know a little about how to build new ones. Which helps explain why we are able to offer such a broad line of industry-standard terminals with a combination of features and ergonomics unsurpassed by competitive terminals. User-comforting ideas like our unique detachable keyboards with light-touch keys and high tactile feedback. Tilt & swivel monitor bases and higher refresh rates plus overscan video for flicker-free images. All at price/performance ratios that are controller-comforting.



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Besides being the largest independent terminal company in the world, today Wyse is also recognized for its broad line of PCs as well as its multiprocessing advanced systems. Probably because we provide the same kind of ergonomics, performance and aggressive pricing that has made us so strong in terminals.

For more information about Wyse terminals, call your local distributor or call us at 1-800-GET WYSE. We'll send you our new Ergonomics Handbook and a poster of more mind-stretching Cerebral Aerobics. Just to help keep your brain flicker-free.

By now the attentive reader has learned two things: Mr. Pritchard's recycling program netted him more than seven candles and Wyse's recycling program can net purchasers several hundred dollars towards the industry's finest terminals.

Don't stop now.

WYSE

The answer to Pritchard's problems can be found on page 102.
The answer to terminal replacement problems can be found on our coupon. $50 trade-in offer.

Portable speed, security, color at issue

BY DEREK SLATER

Portable computers are giving their desktop counterparts a run for their money by adding chip speed as well as new features for I/O and security.

• **Hot chips:** While vendors spin their wheels to get Intel Corp. 80386SX notebooks into users' hands, 1486-based notebooks are scheduled for shipment this month. Houston-based Notebook Computer Co. has already announced its entry into this area.

• **Pretty pictures:** Portable computers with color LCDs have been around for close to two years. Rather than enthusiasm, however, these models have generated complaints about cost, weight and low-quality displays. Although the expense and weight issues have not been solved, at least two vendors have been working on quality.

Toshiba America Information Systems, Inc. introduced its T3200XC in March. This 17-pound, $9,000 machine uses thin-film transistor technology to supply constant power to each pixel instead of running row-by-row power refreshes, which result in higher readability.

Modgraph, Inc., based in Burlington, Mass., is touting the first portable with 256-color Ultra Video Graphics Array display with a resolution of 1,024 by 768 pixels on an 8½-in. screen. The Intel 80386-based machine costs $6,995.

"There's no immediate need for every vendor to have a color model in their line," says Mark Levitt, personal computer analyst at International Data Corp. in Framingham, Mass.

• **Of mice and trackballs:** As portable processing power increases, so does the possibility of using graphical user interfaces such as Microsoft Corp.'s Windows 3.0. However, because most laps lack space for a mouse pad, the trackball is becoming an input option for laptop users.

Trackballs that are specifically designed to clip onto portable computers are made by Microsoft and Logitech, Inc. According to Levitt, trackballs emulate mouse control "fairly effectively" and are priced between $140 and $170.

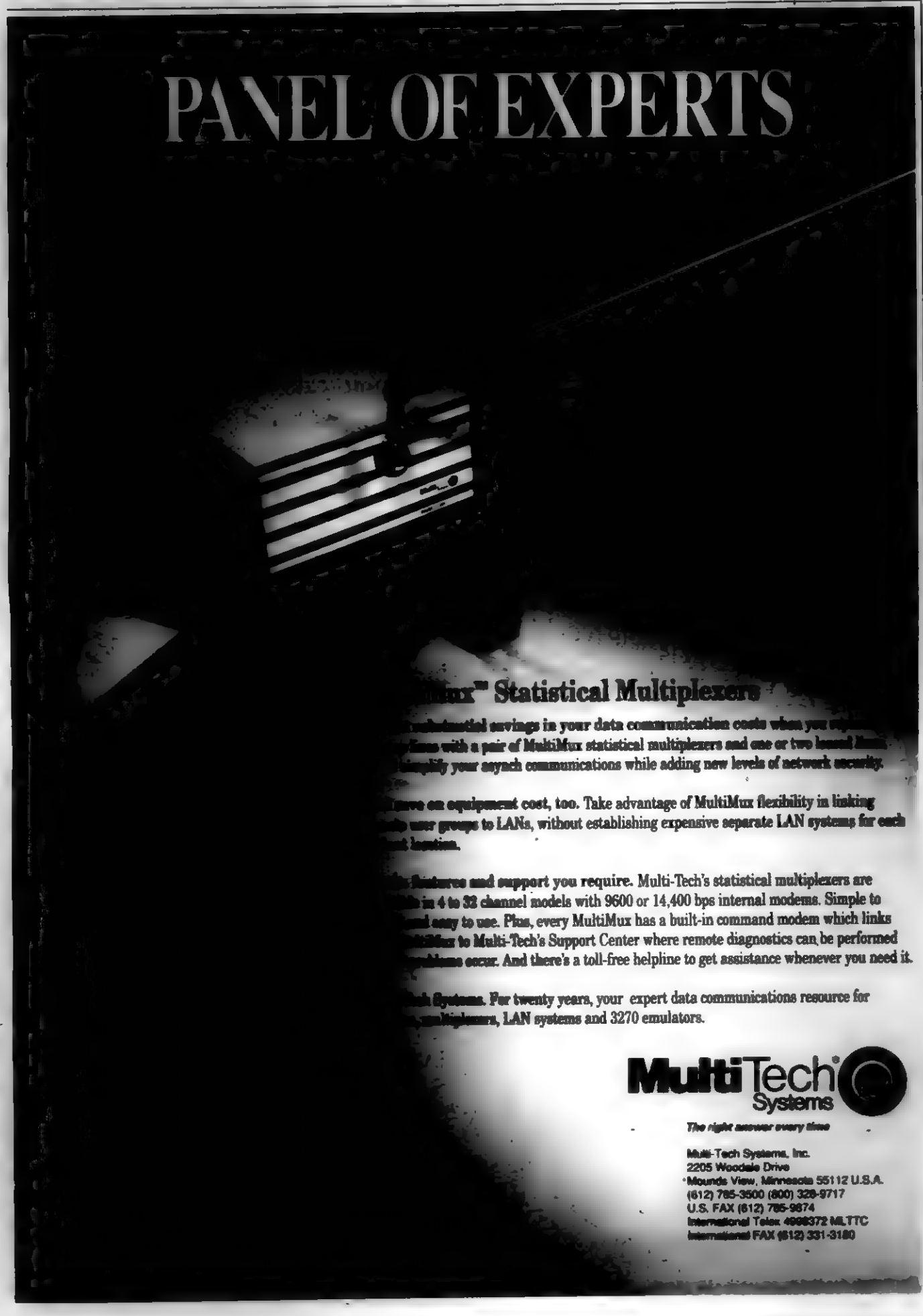
Another input option is Culver Research's Isopoint, a directional-key device located on the keyboard below the space bar. Both Grid Systems Corp. and Zenith Data Systems have integrated the Isopoint for mouse emulation. Compared with trackballs, Isopoint is a useful but pricey option, Levitt says.

• **Safe storage:** When sensitive data is stored on a PC, mobility may be more of a curse than a blessing. A disk that acts as a key to the system is one solution.

Personal Computer Card Corp.'s Lapguard requires users to insert a key 3½-in. floppy disk into the portable and enter a password.

The product also locks the screen when access is attempted without the correct disk. •

Slater is *Computerworld*'s new products writer.



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The challenge: Hooking up portable computers and LANs

BY ANDREW M. SEYBOLD

It is certainly possible to connect a portable computer with a local-area network, but it is not easy or always reliable, and it tends to be costly.

Nevertheless, most people do need to access the LAN regularly to download and upload files, send and receive electronic mail and update their traveling computer files.

Currently, the least expensive and simplest method is to hook up the portable and the LAN via a LAN adapter card and a piece of cable. Of course, this assumes the user is on the same site as the LAN.

These portable LAN adapters — such as those from Megahertz Corp. in Salt Lake City, Xircom, Inc. in Woodland Hills, Calif., and IQ Technologies, Inc. in Bothell, Wash. — are about the size of a pack of cigarettes and hook up to the portable computer's parallel port.



Versions for Ethernet, Arcnet and Token Ring networks are available in a variety of speeds. Pricing ranges from a few hundred dollars to almost $900 for the recently announced 16M bit/sec. unit from Xircom.

The problem is that most portables do not have industry-standard bus connections, so each adapter also comes with software that convinces the portable that its parallel port is a LAN port.

Late 1992 will likely see portables featuring standard small computer systems interface (SCSI) ports. There is already a series of SCSI-to-LAN adapters available from companies such as Adaptec, Inc. in Milpitas, Calif.

Several companies, including Toshiba America Information Systems, Inc., offer internal LAN adapter cards that fit inside the portable itself, sometimes in place of the modem card.

Docking stations are another way to establish an on-site hookup. A docking station is essentially an external chassis that the portable computer can be plugged into to provide automatic links to external power and video, full-size keyboards and industry-standard XT/AT bus expansion slots.

Compaq Computer Corp., Toshiba, Zenith Data Systems and soon IBM all sell proprietary docking stations. The connection essentially turns the portable into a full-blown desktop unit, so not only is there no special software required, but the same network card used in desktop systems can also be used for the portable.

Docking stations are still expensive, however — sometimes as costly as a complete Intel Corp. 80386SX desktop system.

With either a docking station or a LAN adapter card, the network architecture needs to be configured to support not just fixed but also temporary floating nodes that are connected and disconnected, added and deleted at the user's whim.

Of course, it's not always practical to head back to the office everytime you need to upload or download information. Some people are remotely located or always on the road.

In these cases, a remote-control communications package can be loaded onto the portable to interact with either a given desktop personal computer or a network server via a built-in or portable modem.

Making connections

The network must be set up with a modem as well as a copy of the same software so the portable user can dial in and make a connection.

Remote-control packages, which are available from many vendors (see chart at left) also allow users to substitute the portable's keyboard and screen for that of a desktop PC.

This type of connection is not nearly as easy to configure or use as the physical link, but once installed, it can provide remote network access not only from portable computers but also from desktop units located in remote offices or an employee's home.

On the other hand, remote connections permit only one user per modem to remotely access the system at one time. In addition, precautions must be taken to ensure that the system is not accessed by unauthorized users.

Remote LAN connections will become easier in the next few years as more hardware and software vendors enter the portable market and figure out that the world of portable computing is more than a small, battery-operated desktop PC. ●

THE SECRET OF SUCCESS IS BEING SEEN TO CARRY OUT EVEN COMPLEX TASKS WITH EASE.

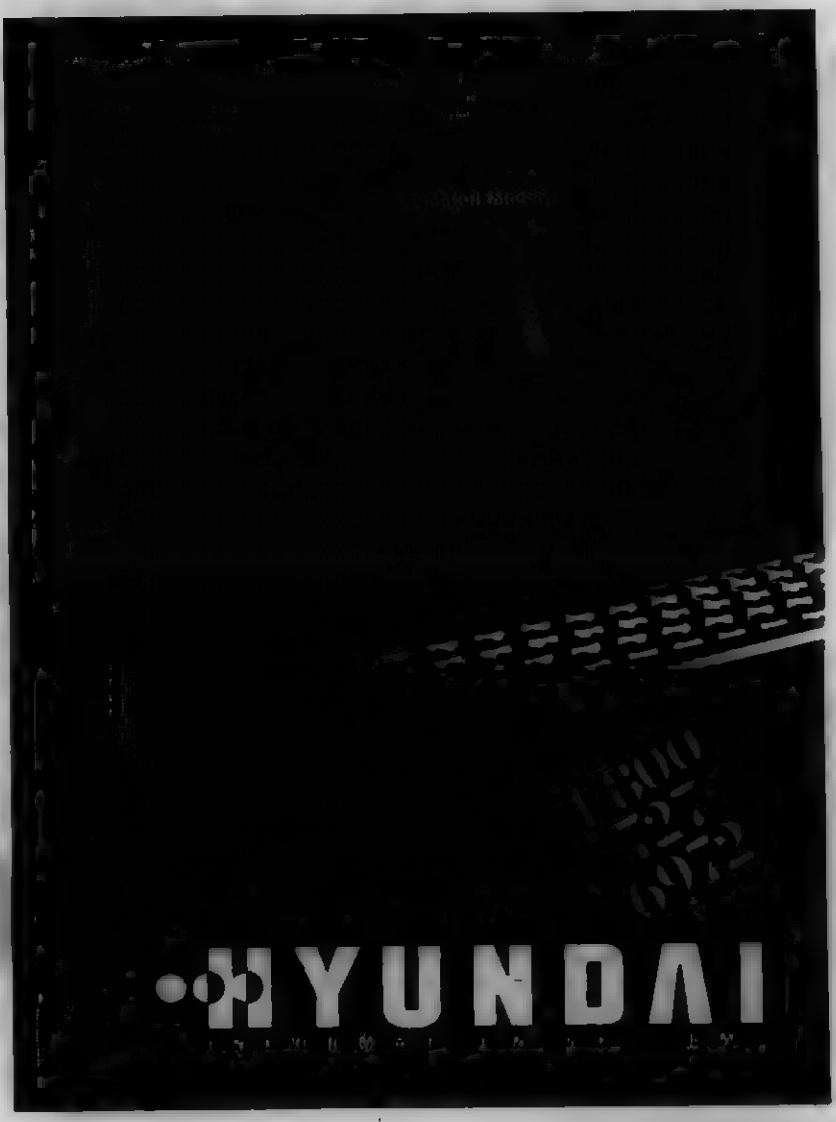
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BUYERS' SCORECARD

Compaq edges out Toshiba in laptop ratings

COMPUTERWORLD BUYERS' SCORECARD

Laptop PCs

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base for all products: 50

Product	Highest ratings	Lowest ratings
Compaq Computer Corp.'s SLT/286 SCORE 55	Compatibility with current software Quality of system durability and ruggedness Processing performance	Providing a reasonable price Keyboard ease of use Networking capability
Toshiba America Information Systems, Inc.'s T1600 SCORE 54	Compatibility with current software Quality of system durability and ruggedness Processing performance	Capability of battery Networking capability Providing a reasonable price
Zenith Data Systems' Supersport 286 SCORE 51	Compatibility with current software Processing performance Hard disk performance	Networking capability Screen readability Quality of system weight and balance

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Like Bo Jackson balancing careers in baseball and football, personal computer makers are repackaging their talents to become players in the fast-growing laptop market.

Compaq Computer Corp., a leader in the PC field, is also one of four laptop market leaders. *Computerworld*'s Buyers' Scorecard on Intel Corp. 80286-based laptops reveals that Compaq is successfully carrying its strengths in compatibility, quality and performance over to this new arena. Users of Compaq's SLT/286 gave it the highest score overall.

However, the competition is very different in the two fields. While IBM and a host of smaller companies dominate the PC industry, Japanese companies such as Toshiba America Information Systems, Inc. provide different challenges in the laptop market based on new technology and price.

Following on the heels of the Compaq machine in market share and scorecard user ratings was Toshiba's T1600, which achieved the highest user ratings in three categories and placed second in all but one of the remaining categories.

Zenith Data Systems' Supersport 286 did not fare as well, achieving the highest user rating for only one attribute — price — and placing last in all but two other areas.

NEC's Prospeed 286, which is presented separately because of the small number of users available, received its highest user ratings for hard disk performance, variety of peripherals available and compatibility with current software. Users gave it the lowest ratings for quality of system weight and balance, networking capability and screen readability (see ratings next page).

Each user group rated only its own product across the 16 categories. The ratings are the averages of user responses. All users also assigned importance ratings to each category. Reported are the averages of these ratings.

Overall scores are also based on the averages of all categories, combining both user and importance ratings. Response base for the three products included in the scorecard was 50 users per product.

Compaq users gave their product the highest rating in the survey (9.1) for compatibility with current software, which all users surveyed rated as the most important category.

Toshiba users rated their product highest (8.3) in the second most important category — quality of system, durability and ruggedness — but Compaq was just a whisker behind at 8.2. Zenith Data was well behind with a 7.0 rating.

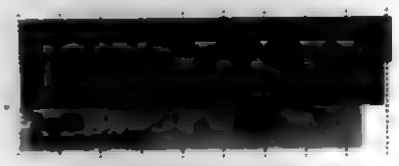
The group lined up in the same order for the third most important category, screen readability, although the scores were much lower. Zenith Data traded positions with Compaq, topping the category of providing a reasonable price with 6.5 compared with Compaq's 5.5, while Toshiba received a 6.3 rating. •

KEY RATINGS

Compaq Computer Corp.'s SLT/286 achieves the highest ratings in six of the nine categories most important to laptop users, including software compatibility, screen readability, size and processing performance. Toshiba America Information Systems, Inc.'s T1600 users rated it highest for system durability and keyboard ease of use. Zenith Data Systems' Supersport 286 users rated it highest for providing a reasonable price. Compaq rated last in that category.

User importance rating:

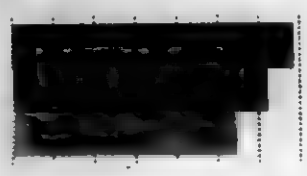
9.1 Compatibility with current software



8.9 Quality of system in terms of durability and ruggedness



8.6 Screen readability



8.2 Size of system and ease of use as a portable



8.1 Providing a reasonable price



8.1 Processing performance



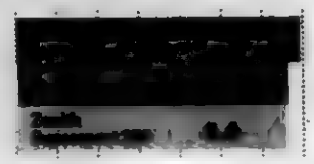
8.1 Hard disk performance



7.9 Keyboard ease of use



7.7 Ease of maintenance

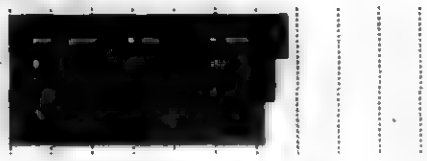


A CLOSER LOOK

Compaq Computer Corp. continued to achieve the highest ratings in six of seven closer-look categories, placing second to Toshiba America Information Systems, Inc. in quality and thouroughness of documentation. Zenith Data Systems' Supersport was rated lowest in six categories and placed second in battery capability. Toshiba finished last in that category but otherwise maintained second position.

User importance rating:

7.5 Quality of system weight and balance



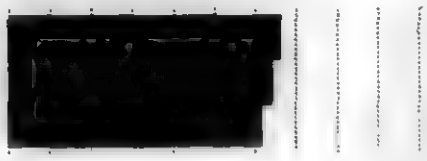
7.0 Quality and thoroughness of documentation



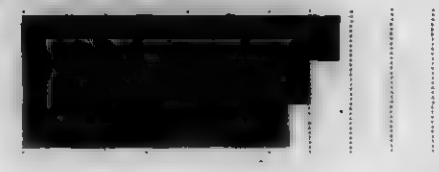
6.8 Variety of peripherals available



6.5 Number of expansion options



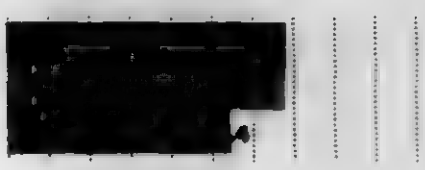
6.4 Number and quality of power supply options



5.9 Networking capability



7.5 Capability of battery



Verbatim

What is the major strength/weakness of this product?
(Responses are based on the most frequently stated answers)

[redacted]

Likes
Light weight
Quality and durability
Speed and reliability

Dislikes
Keyboard design
Too heavy
Screen readability

[redacted]

Likes
Quality and durability
Light weight
Speed and reliability

Dislikes
Screen readability
Poor battery system
Too heavy

[redacted]

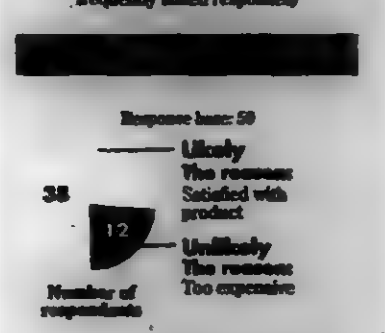
Likes
Quality and durability
Light weight
Price

Dislikes
Screen readability
Too heavy
Keyboard design

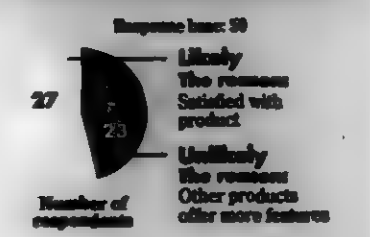
Loyalties

How likely would you be to purchase this product again if you were making the decision today?
(Reasons based on most frequently stated responses)

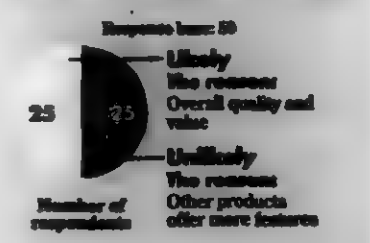
[redacted]



[redacted]



[redacted]



Vital statistics

Total number of respondents: 100

What is your position?

Manager	100
Staff	33
Director	24
Other	12

How long have you been using this product?

More than two years	51
19 months to two years	57
One year to 18 months	39
Seven months to one year	15
Less than six months	7

How much memory is available on your system's hard disk?

20M bytes	78
40M bytes	70
30M bytes	6
10M bytes	4
Don't know	7
More than 50M bytes	3
50M bytes	1

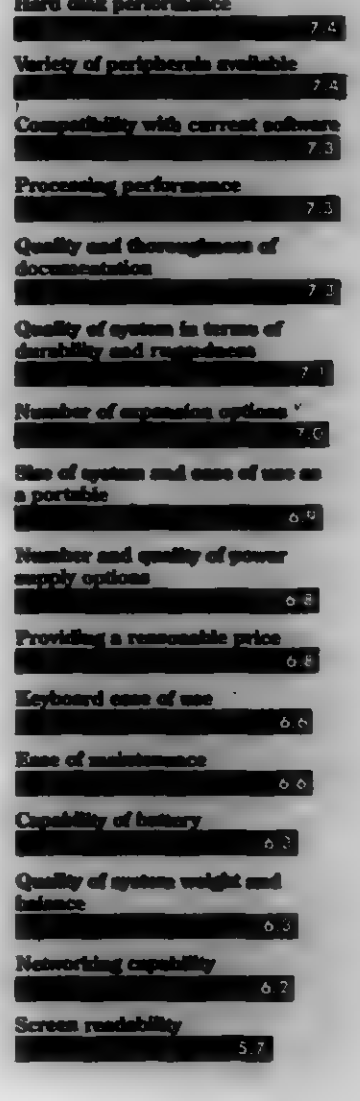
How much RAM is available on your system?

1M to 1.5M bytes	80
Less than 1M byte	37
1.5M to 2M bytes	19
2M to 3M bytes	12
Don't know	11
4M to 5M bytes	6
More than 5M bytes	4

NEC ratings

NEC Corp.'s Prospeed 286 offers a strong set of features, as reflected in the Buyers' Scorecard user ratings. A higher than average data transfer rate helps the laptop rate high in hard disk performance.

Users also gave the variety of peripherals a top rating because of options such as an IBM Video Graphics Array-compatible display.



METHODOLOGY

To qualify for *Computerworld*'s Buyers' Scorecard on laptop computers, a vendor had to be one of the top companies in market share in terms of installed base.

Comparable Intel Corp. 80286 laptops were selected from each of the vendors because they are the most widely installed systems.

The minimum number of respondents was 50 users per product. NEC Corp. ratings are presented separately because the response base of 19 was below the minimum.

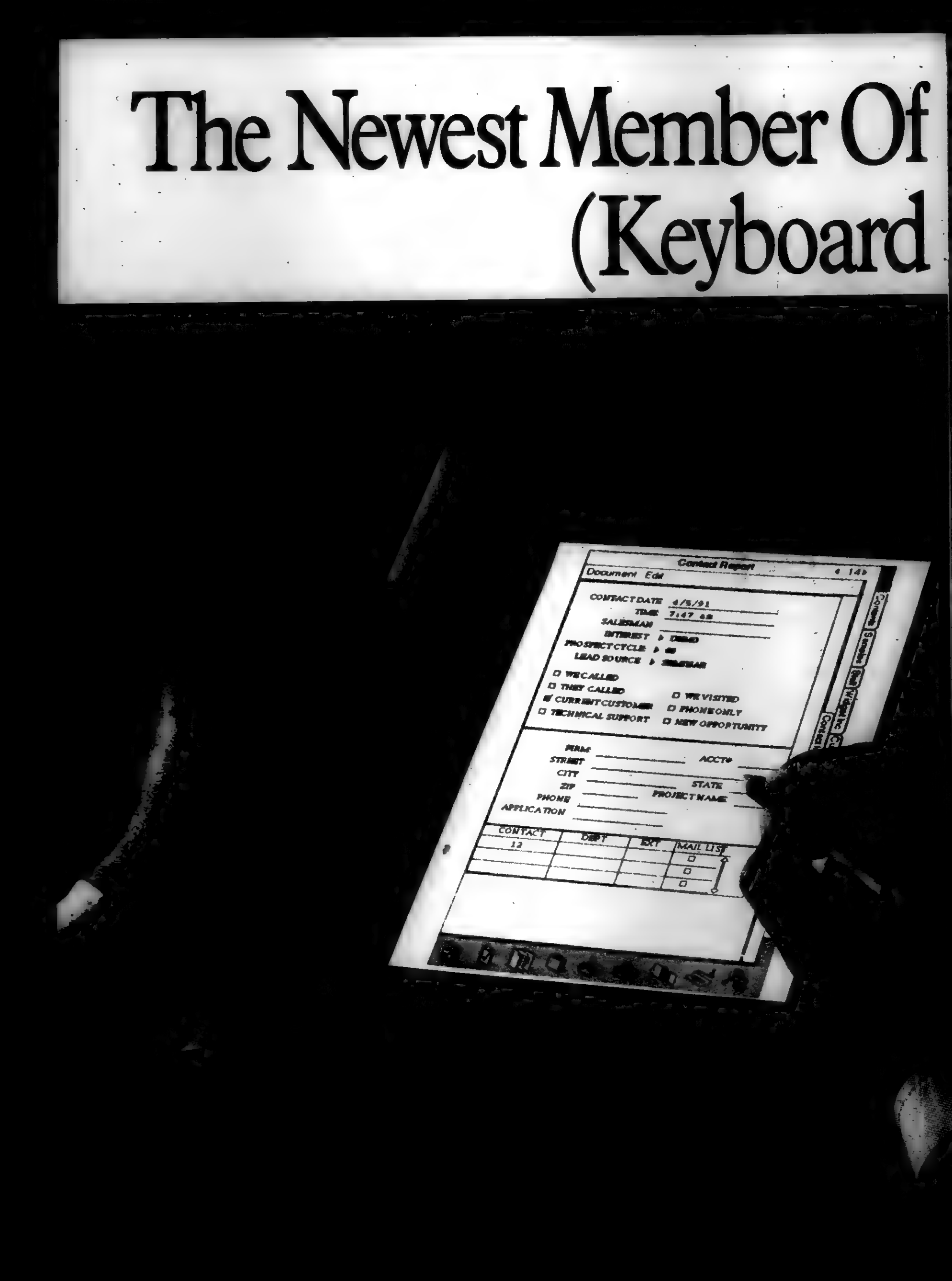
The survey was conducted and tabulated by Austin, Texas-based First Market Research. Random lists of users were surveyed from non-vendor sources.

Total scores were computed by multiplying mean scores assigned all criteria by mean scores each group gave its own product.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and companies for their assistance in preparing this Buyers' Scorecard: Computer Intelligence; JoeAnn Stabel, Storeboard; Peter Teige, Infocorp; Installed Technology International.

The Newest Member Of
(Keyboard



Our Computer Family. Not Included.)

The NCR 3125™ Uses Handwriting Recognition Technology To Make Truly Mobile Computing Possible.

The latest advance in our strategy of providing open, enterprise-wide computing solutions uses a centuries-old technology—handwriting.

The NCR 3125 is the first to bring computing power to a new class of users—mobile sales forces, service professionals, field service technicians, anyone whose job regularly takes them out of the office. It can help increase their productivity and improve data accuracy by automating forms and allowing data to be processed locally instead of reinput and processed at a central location.



The system also has the unique ability to capture graphic information such as signatures and drawings, automating many applications that currently are done manually. And since it can both send and receive information via modem, it can be integrated into any enterprise-wide computing environment.

The NCR 3125 is built around the powerful Intel386™SL microprocessor. It supports both leading pen-based operating systems from GO Corp.™ and Microsoft.™ All in a small package (11.88″ H x 9.75″ W x 1.1″ D) weighing just 3.66 pounds.

The 3125 is part of the world's most complete, end-to-end computer line—NCR System 3000. An open, scalable family from portables to desktops to servers to future massively parallel systems that will reach performance levels of more than 100,000 MIPS.

For more information, phone 1-800-CALL NCR.

NCR

Open, Cooperative Computing.
The Strategy For Managing Change.

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PRODUCT SPOTLIGHT

Notebook computers (6 to 8 pounds)

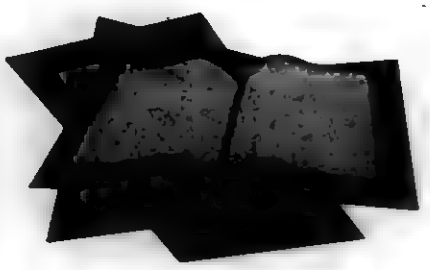
VENDOR/PHONE	PRODUCT	CLOCK SPEED (MHz)	WEIGHT WITH BATTERY (POUNDS)	AVERAGE BATTERY LIFE	DIMENSIONS, H x W x L (INCHES)	SCREEN DIMENSIONS, W x L or DIAGONAL (INCHES)	DISPLAY TYPE	STANDARD RAM/ MAXIMUM RAM (BYTES)	NUMBER OF KEYS	HARD DISK DRIVE RAM STANDARD/MAXIMUM	SOFTWARE PACKAGES INCLUDED	HARDWARE FEATURES INCLUDED	PLUGS INTO FULL-SIZE KEYBOARD/MONITOR	OTHER OPTIONS AVAILABLE	BASE PRICE	LENGTH OF WARRANTY/ TYPE OF SUPPORT INCLUDED
AST Research, Inc. (714) 727-4141 (800) 876-4278	AST Premium Exec 4/25C20	20	7.1	2 hours	2.5 x 11.4 x 8.0	8.0 diagonal	Backlit triple-supertwist CSTN LCD	2M/8M	82	20M/60M	ASTERM, ASTCmds, AST VGA Video Manager, Battery Watch, Fast Disk RAM, Logitech III, MS-DOS 4.01, Shadow RAM, Superspool	NP	Yes/Yes	Data modem, docking unit, mouse, battery charger, car adapter, carrying case, numeric keypad	$3,995-$5,795	1 year/toll-free phone support, on-line technical bulletin board, AST fax line, technician-to-technician training
AT&T Computer Systems Dedicated (800) 247-1212	AT&T Safari 7020/20	20	7.3	Up to 6 hours, with dual batteries	1.8 x 12.0 x 9.5	8.0 x 6.5 (10 diagonal)	LCD	2M/6M	82	40M/80M	AT&T Access Plus for Windows, MS-DOS 4.01, Windows 3.0, AT&T Mail, utilities, tutorial	1 serial, 1 parallel, 1 external keyboard and mouse ports, 2,400-bit/sec. modem, 2 batteries and charger, coprocessor support, mouse, AC adapter	Yes/Yes	Windows Mailbox electronic mail software, Safari CD-ROM	$5,599	1 year/toll-free phone support
Advanced Logic Research, Inc. (714) 581-6770 (800) 444-4257	Notesery/20	20	7.5	2 hours	2.1 x 12.2 x 8.6	8.5 diagonal	Backlit supertwist	1M/6M	82	20M/60M	ALR Utilities Pak, DR-DOS 5.0	None	Yes/Yes	9600-byte external fax/data modem, 1M- or 4M-byte memory module, AC adapter, battery pack, carrying case, D-Link Modem, LAN Adapter, pocket fax/modem, modem adapter	$2,795-$5,395	2 years/technical support, parts and labor, docking service
Akiton Systems, Inc. (410) 356-6000 (800) 356-6000	Akiton 1320	20	6.3	2.5 hours	2.0 x 11.0 x 8.6	8.5 diagonal	Backlit supertwist LCD	1M/5M	80	40M/60M	MS-DOS 4.01	NP	Yes/Yes	NP	$2,899	1 year/toll-free phone support
Apollon, Inc. (800) 443-3000 (800) 225-2355	Apollon 286 Ultralite	20	6	1.5-2 hours	1.3 x 10.3 x 8.3	8.5 diagonal	Backlit supertwist	1M/6M	79	40M/80M	Client management package, DR-DOS 5.0, Pentium file transfer utilities	AC adapter, carrying case, internal battery	Yes/Yes	Docking station, external battery, Pentium modem	$6,000	1 year/parts and labor, 24-hour replacement of parts, additional year optional
Austin Computer Systems (512) 339-2000 (800) 752-1977	Austin 386SX/16 Notebook	16	7.9	Up to 7 hours	2.1 x 12.2 x 9.5	10 diagonal	Backlit	2M/8M	83	20M/60M	Power management package	Carrying case	Yes/Yes	Car adapter, Ethernet card, fax modem, internal modem	$2,295	1 year/manufacturer warranty repair or replace
Bus Computer Systems, Inc. (603) 889-6088 (800) 451-8979	Bus 386SX/20 Ultra Thin Notebook	20	6.5	2-3 hours	1.5 x 10.3 x 8.3	6.8 x 8.3	Backlit supertwist	1M/6M	79	40M/80M	MS-DOS 4.01 or DR-DOS 5.0	AC/DC adapter, mouseport	No/Yes	Fax modem, battery pack, carry case	$3,850	1 year/toll-free phone support
CAF Technology, Inc. (818) 358-8288 (800) 288-8288	CAF Squadron 386SX/16 Notebook	16	7.7	3 hours	2.2 x 12.9 x 11.1	7.0 x 8.3	Backlit supertwist LCD	1M/5M	83	20M/60M	GW-Basic, MS-DOS 4.01	None	Yes/Yes	Data modem, 1.2M-byte external floppy, battery pack and charger	$2,145	1 year/provided by reseller
Compaq Computer Corp. (713) 370-0670 (800) 231-0900	LTE 386/20e	20	7.5	3 hours	2.2 x 11.8 x 8.5	7.2 x 8.4 (9 diagonal)	Edge/supertwist LCD	2M/10M	86	60M/80M	Display, power conservation, and audio utilities	1 serial, 1 parallel and mouse ports, AC adapter, battery charger	Yes/Yes	2M- and 10M-byte RAM cards, data modem, MS-DOS ROM, numeric keypad, car adapter, carrying case, spare battery, desktop expansion base, 80-Mb floppy	$4,599	1 year/toll-free phone and authorized dealer support
Compudd Corp. (512) 250-2660 (800) 627-2627	Compudd Companion SX	20	5.7	2-3 hours	1.8 x 11.0 x 8.5	8.0 x 8.0	Edge/supertwist LCD	2M/8M	79	20M/60M	MS-DOS 4.01	Carrying case	No/Yes	Data modem, 2M-byte RAM expansion card, math coprocessor, numeric keypad	$2,899	1 year/toll-free phone support
	Compudd 316SX	16	7	2-3 hours	2.1 x 11.0 x 8.5	6.5 x 8.4	Backlit LCD	1M/5M	80	30M/30M	MS-DOS 4.01	Carrying case	No/Yes	Data modem, 2M-byte RAM expansion card, math coprocessor, numeric keypad, quick charger	$2,495	1 year/toll-free phone support
Dauphin Technology, Inc. (508) 657-6604	Dauphin 316-SX Notebook	20	7	3 hours	2.0 x 11.7 x 8.5	7.1 x 8.9	Edge/supertwist LCD	1M/8M	84	30M/60M	DR-DOS 5.0	AC/DC adapter, SCSI interface	No/No	Data and fax modems, math coprocessor	$4,695	1 year/toll-free phone support
	Dauphin 1600 Explorer	20	6.8	3 hours	2.3 x 12.8 x 11.5	7.6 x 8.7	Edge/supertwist LCD	1M/8M	79	80M/80M	DR-DOS	AC/DC adapter, file transfer cable	Yes/Yes	Data and fax modems, expansion bay, math coprocessor, network card	$5,895	1 year/toll-free phone support
Dell Computer Corp. (512) 338-4400 (800) 426-5150	Dell System 320N	20	6.4	3.5 hours	2.0 x 11.0 x 8.5	6.9 x 5.2 (8.6 diagonal)	Triple supertwist LCD	1M/5M	85	40M/60M	Diagnostic, setup and other utilities	AC adapter, battery, carrying case	Yes/Yes	5¼-in. floppy, MS-DOS, OS/2, Windows, car adapter, carrying case, Dell data/fax modem, math coprocessor, memory expansion cards, numeric keypad, pocket network adapter	$3,300	1 year/toll-free phone support, next-day on-site service with optional system replacement
Epson America, Inc. (310) 782-0770 (800) 289-3776	NOTE	16	5.8	2-3 hours	1.7 x 11.8 x 8.8	6.8 x 5.1 (8.5 diagonal)	Edge/supertwist	1M/6M	82	20M, 40M or 80M/60M	MS-DOS 4.01	2 batteries, AC adapter, carrying case	Yes/Yes	Data modem, expansion card, removable hard drive	$3,800-$4,700	1 year/800 number and authorized dealer support
Everex Systems, Inc. (415) 498-1111 (800) 821-0806	Tempo LX/16, LX/20	16, 20	6.9, 7.1	3 hours	2.0 x 12.0 x 10.0	9.8 x 6.8 (10 diagonal)	Backlit supertwist LCD	1M/5M	82	20M/40M for LX/16; 40M/60M for LX/20	MS-DOS 4.01, Windows 3.0	Carrying case, mouse	No/Yes	Data modem, 2M-byte memory modules, AC adapter, quick charger and stand, math coprocessor, spare battery, carrying case	$2,899 for LX/16; $3,295-$3,895 for LX/20	1 year/phone and on site support, bulletin board, 48-hour repair policy
Fora, Inc. (408) 944-0808 (800) 367-3672	NBC-386/16	16	6.4	3 hours	2.0 x 11.0 x 8.0	7.9 diagonal	Backlit supertwist LCD	1M/6M	82	20M or 40M/60M	GW-Basic, MS-DOS 4.01, file transfer package with virus scan	1 serial and 1 parallel port, AC adapter, carrying case, internal modem, socket for math coprocessor	Yes/Yes	1M-, 2M-, 4M-byte memory expansion cards, 2,400-bit/sec. modem with fax capability, 1.2M-byte floppy, numeric keypad	$2,995	1 year/parts, warranty, toll-free support

*Not currently available; scheduled to ship in July.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

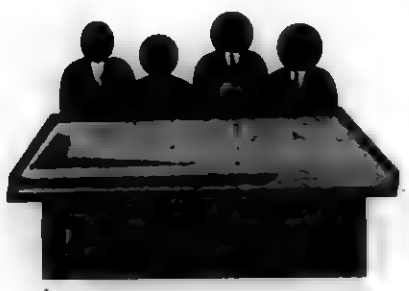
Which UNIX® RDBMS did Hewlett-Packard®, IBM®, Unisys®, Data General®, AT&T®, Sun®, and Sequent® choose to demonstrate the power of their latest UNIX Systems?

Informix.



IDC Study on UNIX OLTP

UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.



About the TPC

The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

Within the past five months, *every one* of these companies selected and used the INFORMIX-OnLine database server to demonstrate to their customers the power of their latest UNIX systems. No other UNIX database product has been this extensively benchmarked—because nothing shows performance like OnLine.

New TPC Benchmarks Used

In each case, the Transaction Processing Performance Council's rigorous TPC A and TPC B benchmarks—the new standard for comparing system and database performance—were used to highlight OLTP performance and database throughput.

The Number 1 Choice for UNIX OLTP

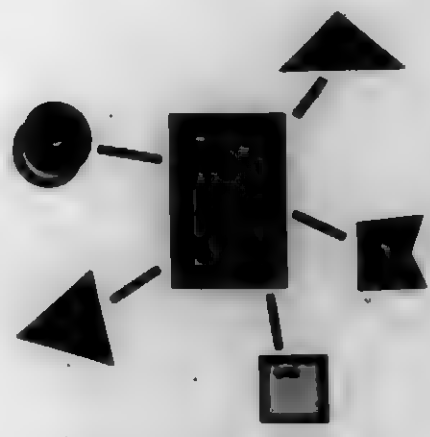
Informix is the number one UNIX OLTP choice. A January 1991 International Data Corporation (IDC) study shows that when it comes to UNIX OLTP applications, Informix products are installed at *more than twice as many multi-user UNIX sites* as our closest competitor. It's independent confirmation that thousands of companies worldwide rely on Informix-based OLTP solutions every day.

A Decade of Innovation

Informix has been a UNIX RDBMS technology leader for over 10 years. Continuous innovation has resulted in advanced application development languages, distributed client/server computing, gateways to other computing environments, and multimedia flexibility you can take advantage of today.

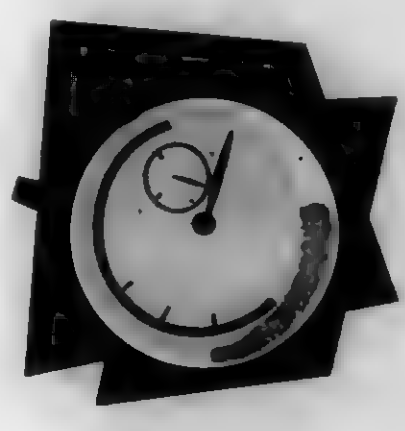
Find Out More

We'd like to send you benchmark specifics—and information about how Informix products can meet your data management needs.
Call us toll free: **1-800-688-IFMX, ext.2.**



INFORMIX OnLine Database Server

OnLine was built for speed...and that's what it delivers. Developed entirely on UNIX, the OnLine server turns in optimum performance on every popular UNIX architecture—including symmetric multiprocessors, RISC, and CISC.



TP1 vs. TPC Benchmarks

The TP1 benchmark is no longer the accepted benchmark for measuring database performance. The new TPC tests establish more complete, thorough specifications than TP1, leading to more objective, verifiable results for comparing performance between hardware systems and software products. TPC Benchmark™ A measures OLTP processing performance. TPC Benchmark™ B—similiar to a batch test—focuses on database throughput.

INFORMIX

Data management for open systems.

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PRODUCT SPOTLIGHT

VENDOR/PHONE	PRODUCT	CLOCK SPEED (MHz)	WEIGHT WITH BATTERY (POUNDS)	AVERAGE BATTERY LIFE	DIMENSIONS, H x W x L (INCHES)	SCREEN DIMENSIONS, W x L or DIAGONAL (INCHES)	DISPLAY TYPE	STANDARD RAM/ MAXIMUM RAM (BYTES)	NUMBER OF KEYS	HARD DISK DRIVE RAM STANDARD/MAXIMUM	SOFTWARE PACKAGES INCLUDED	HARDWARE FEATURES INCLUDED	PLUGS INTO FULL-SIZE KEYBOARD/MONITOR	OTHER OPTIONS AVAILABLE	BASE PRICE	LENGTH OF WARRANTY/ TYPE OF SUPPORT INCLUDED
Wyse, Inc. (Cont.)	WSC-[illegible]	20	4.5	1.5 hours	1.4 x 11.0 x 8.5	7.8 diagonal	Backlit supertwist LCD	1M/6M	82	30M/60M	1 serial, 1 parallel, MS-DOS 5.0, GW-Basic, file transfer package with virus scan	AC adapter, internal modem, mouse port	Yes/Yes	2M-, 4M-byte memory expansion cards, data modem, carrying case, mouse port, PS/2 mouse ports, second serial port	$3,499	1 year/parts, warranty, toll-free support
Grid Systems Corp. (415) 691-4700 (800) 222-4743	Grid 1750	20	6.7	2.5 - 3 hours	1.7 x 12.0 x 10.0	8.0 x 6.0 (9 diagonal)	Triple backlit supertwist	1M/5M	84	60M/60M	Diagnostic and setup utilities, MS-DOS, extended memory manager, color mapping utility	None	Yes/Yes	Fax/data modem, math coprocessor, spare battery, auto-sensing power supply	$3,795	1 year/toll-free phone support, parts and repair from Grid centers
Hyundai Electronics America (408) 432-8888 (800) 227-6972	Super-286 286IC	20	7	2 hours	1.8 x 11.7 x 8.2	7.8 x 4.9	CPL backlit	1M/5M	83	20M/60M	Pentium file transfer utilities, GW-Basic, MS-DOS 4.01	None	Yes/Yes	Data modem, 1M- or 4M-byte RAM card	$2,995	18 months/ authorized dealer support
Kaypro Technologies, Inc. (415) 875-6720 (800) 323-5707	Kaypro Notebook	16	7.1	2 - 3 hours	2.0 x 12.0 x 8.5	9 diagonal	Backlit supertwist	2M/5M	84	20M/40M or 60M	MS-DOS 4.01, Microsoft's Windows 3.0	Carrying case, Logitech Series 14 mouse	Yes/Yes	Canon BJ-10E printer, D-Link Ethernet adapter, fax modem	$2,995	Either 2 years (parts) or 18 months (labor), 45-day return policy
	Kaypro Monitor	20	8.4	2 - 3 hours	2.1 x 11.0 x 8.7	9 diagonal	Backlit supertwist	2M/16M	84	40M/60M	MS-DOS 4.01, Microsoft's Windows 3.0	Carrying case, Logitech Series 14 mouse	Yes/Yes	Canon BJ-10E printer, D-Link Ethernet adapter, fax modem	$3,395	See above
Leading Edge Products, Inc. (800) 874-4329 (800) 874-3329	Model [illegible]	16, 20	6.9	2.5 hours	1.8 x 12.0 x 10.0	7.8 x 5.3	Triple-edgelit supertwist	1M/5M	84	40M/60M	MS-DOS 4.01	None	Yes/Yes	Carrying case, extra batteries, fax/data modem	$2,595, $2,995	1 year/optional on-site service
Libretto Computer Systems, Inc. (408) 441-0860	Libretto 300SX Notebook	20	6.6	1.5 hours	2.0 x 11.7 x 8.4	7.9 x 5.9	Backlit LCD	4M/4M	82	20M/60M	MS-DOS 4.01, Ultrabot	1 parallel, 2 serial and math coprocessor ports	No/Yes	Car adapter, carrying case, fax/data modem, quick charger	$4,200	1 year/24-hour replacement during first 100 days
Micro Express (714) 455-1660 (800) 635-7681	[illegible] Notebook PC	20	7	2 hours	2.0 x 11.0 x 8.5	7.5 x 5.5	Backlit supertwist	2M/6M	83	20M/60M	Diagnostic package, MS-DOS 3.3 or 4.01	Carrying case	Yes/Yes	1M- and 4M-byte RAM cards, external floppy, data modem, numeric keypad	$3,995	18 months/ unlimited toll-free phone support
NCR Corp. (513) 445-5000	NCR 3120	20	5.6	3 hours	1.7 x 17.0 x NP	NP	Backlit LCD	1M/4M	NP	30M/60M	NP	NP	NP	Fax modem	$3,995 - $4,395	NP
NEC Technologies, Inc. (800) 284-6322 (800) 626-4632	Ultralite SX20	20	7.5	2.5 hours	2.4 x 11.6 x 8.6	8 x 6	Backlit supertwist	2M/16M	78	40M/60M	DOS 4.01, Windows 3.0	AC adapter, trackball	No/Yes	Carrying case, data modem, fax modem, 2M-, 4M-byte RAM cards, battery pack and charger, car adapter, CD-ROM reader	$4,899	1 year/parts and labor, depot
Northgate Computer Systems, Inc. (800) 548-1993	Shadow	20	6.1	2 hours	1.9 x 11.7 x 8.3	6.9 x 5.1	Edgelit LCD	2M/5M	84	40M/40M	Northgate Stacker, Corsair Magic	1 parallel, 1 serial port, sockets for external keypad and monitor	Yes/Yes	Data modem, numeric keypad, battery charger	$3,199	1 year/24-hour toll-free phone support
Opcom Technologies, Inc. (818) 727-9339 (800) 351-3494	Intensity SX/20	20	7.8	2 hours	2.0 x 12.9 x 10.0	7.8 x 8.9	Backlit supertwist LCD	1M/9M	82	20M/60M	MS-DOS 4.01, utility package	2,400-bit/sec. modem, 2M-byte RAM expansion cards, math co-processor, spare rechargeable batteries	No/Yes	AC adapter, battery recharging stand, carrying case	$2,249	1 year/parts and labor
PC Enzo, Inc. (708) 634-0515	HB-8000	16	4.5	2 hours	1.4 x 11.0 x 8.6	6.9 x 5.3	Backlit supertwist	1M/4M	79	20M/60M	DR-DOS 5.0, file transfer utility	1 serial, 1 parallel and mouse ports, external VGA, file transfer cable	No/Yes	Send/receive fax and data modems, second serial port	$3,355	1 year/parts and labor, unlimited technical support
Panasonic Communications and Systems Co. (201) 348-9090 (800) 742-8086	CF-[illegible] Ruggedized Notebook	20	6.8	3 hours	1.7 x 12.8 x 10.0	7.8 x 4.7 (9 diagonal)	Triple backlit supertwist	1M/5M	84	60M/60M	CIM 4.0-compatible BIOS driver, GW-Basic, MS-DOS 4.01	2,400-bit/sec. modem, SIMM RAM expansion cards, spare battery	Yes/Yes	None	$4,799	1 year/9 a.m. - 6 p.m. EST toll-free phone support, parts and labor
Philips Consumer Electronics Co. (615) 521-4316	Magnavox MavisNOTE	16	6.8	3 hours	2.0 x 11.0 x 8.5	6.9 x 5.2 (8.7 diagonal)	Edgelit supertwist LCD	1M/5M	79	40M/40M	Geoworks Ensemble, GW-Basic, MS-DOS 4.01	2,400-bit/sec. internal fax/data modem, carrying case, mouse pen	Yes/Yes	Mouse, floppy disk drive and expansion bus ports	$3,199	1 year/toll-free phone support
Gateway Information Systems America, Inc. (800) 424-6400 (800) 424-6969, ext. 800	Telemaster 2000/16 1000	16	7	3 hours	2.1 x 11.0 x 8.5	7.8 x 5.3	Edgelit supertwist CSTN LCD	1M/6M	89	20M/60M	GW-Basic, Logitech III, MS-DOS 4.01, Windows 3.0	AC adapter, battery, carrying case	No/Yes	Data modem, fax modem, 2M-, 4M-, 6M-byte memory cards, carrying case, numeric keypad, quick charger	$2,799	1 year/toll-free phone support, Gateway Smart exercise support program
Tandon Corp. (800) 378-6166 (800) 800-7978	Tandon Notebook 386SX	20	6.5	3 hours	2.0 x 11.0 x 8.5	9 diagonal	Backlit supertwist LCD	2M/16M	101	30M/60M	MS-DOS 3.3 or 4.01	40M-byte hard drive, 2M-byte RAM, battery, carrying case	Yes/Yes	60M-byte hard drive, 16M-byte RAM, Windows 3.0, car adapter, external monitor and keyboard, expansion chassis, fax/data modem, math coprocessor, mouse, numeric keypad	$3,495	1 year/24-hour toll-free phone support
Texas Instruments, Inc. (512) 250-7497 (800) 527-3500	TravelMate 3000	20	5.7	2 - 3 hours	1.8 x 11.0 x 8.5	8.0 x 8.0	Edgelit supertwist LCD	2M/6M	79	20M/60M	Battery Watch, Logitech utilities, file management system, MS-DOS 4.01	None	Yes/Yes	Data modem, 2M-byte RAM card, printer cables, math coprocessor, Logitech III, numeric keypad, carrying case	$2,199	1 year/phone and fax support
Toshiba America Information Systems, Inc. (714) 583-3000 (800) 334-3445	T2000SX	16	6.9	3 hours	1.9 x 12.2 x 10.0	6.0 x 5.1	Edgelit LCD	1M/9M	86	20M/40M	MS-DOS 4.01	None	Yes/Yes	Data modem, 1M-, 2M-, 4M-, 8M-byte memory cards, floppy, Toshiba Basic 3.0, MS-DOS, battery recharger with AC adapter, carrying case, car adapter, numeric keypad, tape backup	$3,399 - $3,799	1 year/parts and labor
Zenith Data Systems (708) 808-5000 (800) 553-0331	Master-sport 286SX	20	6.6	3 hours	2.0 x 11.0 x 8.5	7.1 x 5.3	Edgelit supertwist LCD	2M/4M	80	60M/60M	MS-DOS 4.01	Battery	No/Yes	Data modem	$3,000	1 year/carry-in, parts and labor
Zeos International Ltd. (612) 633-4591 (800) 423-5891	Zeos Notebook 386	16	7	2.5 hours	2.0 x 12.0 x 10.0	7.8 x 5.8 (9.5 diagonal)	Edgelit supertwist LCD	1M/5M	82	20M/60M	None	None	No/Yes	Data modem, 5¼-in. floppy, carrying case, charging stand, DC converter, math coprocessor, MS-DOS	$2,295	1 year/30-day money back guarantee, 24-hour, 365-day per year toll-free phone support

High-tech heroes

Ten finalists for* Computerworld *Smithsonian Awards used technology to take on disabilities, illiteracy, environmental problems and other challenges

Business and Related Services

Catalina Marketing Corp.

If you spend part of your Sunday mornings clipping coupons from the newspaper, Catalina Marketing Corp. has a way to let you get a little more sleep. Not coincidentally, Catalina's tactic also provides vendors with high-technology target-marketing techniques.



Called Checkout Coupon, the turnkey system offered by Anaheim, Calif.-based Catalina uses proprietary hardware and software to link to a supermarket's point-of-sale scanning system.

Each participating store has a personal computer that monitors every product via its universal product code (UPC) as it passes through checkout. Catalina's database of UPCs triggers the delivery of a coupon based on brand purchases. The PC sends a message to a thermal printer installed at the cash register, and the customer is handed a freshly printed coupon as he leaves.

For their part, vendors purchase product categories such as soap powder or frozen breakfasts. Catalina sells categories on a first-come, first-served annual contract basis, which guarantees the vendor exclusivity in the given category.

"We get feedback on very specific items," says George Loesch, business director at Campbell Soup Co. in Camden, N.J., which uses the system. "For example, if we purchase the frozen breakfast category, we have a record to show how frequently consumers are purchasing direct competitors' products." Loesch adds that coupons are generated for Campbell's products based on which competitor's product is scanned into the system.

Checkout Coupon works on the premise that traditional mass marketing media is subject to waste. According to Loesch, only 3% of a company's targeted customers use newspaper coupons. — *Sally Cusack*

Environment, Energy and Agriculture

Institute for Global Communications

Every day, environmentalists from around the world confer about such pressing topics as the destruction of the rain forests in Brazil, the water quality in Leningrad and the erosion of the ozone layer over Antarctica. The site of this "conference" is a Sun Micro-



systems, Inc. Sparcstation computer at the San Francisco offices of the Institute for Global Communications (IGC).

The IGC's Econet electronic bulletin board system allows 2,100 users to post environmental news, international resolutions and bulletin board-style comments that can be read from any personal computer that has a communications package.

Users dial into Econet's California hub from a variety of X.25 public packet-switched networks, including Telenet. Users can also gain access to affiliated environmental networks in Canada, England, Sweden, Australia and Brazil. The monthly access fee for Econet is about $10, which does not include fees for computer time.

Econet is making its presence felt among environmentalists. It is a collection point for documents submitted for the United Nations Conference on Environment and Development in Brazil, set for June 1992. "There's a tremendous exchange of information, and all the original documents relating to that conference are being posted on the network," says William Leland, Econet director and head of technical programs at the IGC.

Econet's Sparcstation, outfitted with 2G bytes of storage, also hosts IGC's Peacenet, an international peace network, and Carnet, a Central American information service.

Econet's operational funding, supported by foundation contributions and user fees, was about $100,000 in both 1989 and 1990. — *Jean S. Bozman*

Education and Academia

IBM

In Daytona Beach, Fla., kindergarten and first-grade students are creatively writing and illustrating their own stories — often at a second- or third-grade level — using an interactive, personal computer-based teaching system.

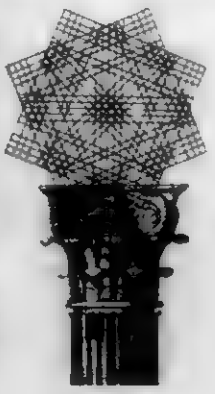
Called Writing to Read, the PC-based system is offered by IBM's Education Systems center. It lets students write anything they can say and then read what they write.

In an effort to help children learn more effectively, Dr. John Henry Martin, teacher and author, developed the computer-based instructional learning system in the early 1980s. Writing to Read gives children a phonetic spelling methodology that permits them to write anything they can say, making a natural transition from phonemic spelling to standardized spelling.

Writing to Read provides a multisensory



presentation enabling children to see, hear and interact with the story as they write it. It tutors students using individual learning stations. In addition to a PC station, there is a work journal station, a writing and typing station, a listening library station equipped with cassettes and recorders, and a station for making words out of clay.



"The computer will repeat phrases and instructions and prompt the students as much as is necessary," says Phyllis Shalvey, program administrator for Writing to Read in Atlanta.

Writing to Read is installed in 8,491 U.S. schools. The average $15,000 setup includes nine IBM Personal System/2s, software, work journals, tape cassettes and recording equipment. — *Sally Cusack*

Finance, Insurance and Real Estate

United Technologies Corp.

United Technologies Corp. is a mega-entity, incorporating more than 500 firms and spanning 100 countries. In a major demonstration of personal computer and local-area network technology, United Technologies threw out 13 mainframe applications in favor of a PC-based financial system that is being used by 3,000 employees worldwide.



The new system, the Consolidation and Reporting System (CARS), is used by company accountants, analysts, managers and executives in treasury, tax, consolidation accounting and financial planning departments at United Technologies' subsidiaries.

It allows them to collect, analyse, report and distribute financial and operating data formerly found on the mainframe.

Users can now access intercompany foreign currency balances, critical tax planning data and consolidated product line information in a PC environment using a common tool and methodology.

Developed using Micro Control, a PC-based financial consolidation and management reporting package from IMRS, Inc., CARS uses customized communications software to allow users to access and transmit data on a 24-hour basis.

Mark S. Coran, vice president and controller at United Technologies, says the mainframe-based program was not a popular, user-friendly system. "The operating units did not use the system; they just fed data into it," Coran says. "We decided to replace it with a product people would actually use."

CARS incorporates a distributed database operating over 16 LANs connected over a wide-area network. It includes more than 2,000 workstations in over 450 locations. Purchased last year, the final CARS installation will be completed by the end of 1991. — *Sally Cusack*

Government and Nonprofit Organizations

U.S. Office of Personnel Management

Manual application processing for federal jobs used to take months, forcing qualified candidates to accept other offers long before a government job became a reality.

Now, thanks to an automated staffing network put in place in 1984 at the U.S. Office of Personnel Management, the application process takes less than two days, saving the federal government more than 1,000 man-years and the country approximately $50 million compared with prior processing methods.

Established under the oversight of the Office of Personnel Management's Staffing Service Center, this distributed system is based on Hewlett-Packard Co.'s HP 3000. It accepts scanned applications and grades and rates them according to qualification. The Staffing Service Center says it has processed about 20 million documents to date without losing one.

Once an application is processed, it is submitted into the Automatic Application Referral System and distributed to federal agencies. "As soon as the application hits the system, potential employees can be interviewing in days," says Ken Mayhew, Staffing Service Center director.

Using the automated staffing network as a base, the Staffing Service Center has launched other innovations.

One user-friendly innovation, the Job Information 2000 system, is a one-stop contact for federal jobs, Mayhew says. People can call, listen to information about available jobs, leave a message and receive an application within days.

Job hunters can also go to any of the Office of Personnel Management centers around the country and use touch screens, he adds.

Combining personal computers and synthetic voice and touch-screen technologies, the system makes federal job information publicly available. — *Jodie Naas*

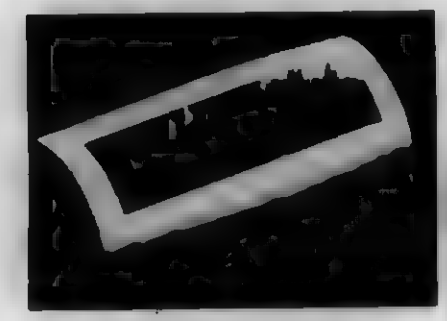


Manufacturing

Sverdrup Technology, Inc.

Jet engines are so large and their designs so intricate that even the most powerful supercomputers are too puny to model what goes on inside of them.

But at the NASA Lewis Research Center, the propulsion arm of NASA, a computer has been put to work reducing an engine design cycle process that can take as long as 15 years and cost as much as



several billion dollars to complete.

A Cray Research, Inc. Y-MP supercomputer at NASA Lewis simulates air flows between alternating rows of stationary and rotating blades, or stages, that make up the core of a jet engine's compressor. Compressor design is critical to engine performance because even small imbalances in air flow can greatly reduce the engine's efficiency and range.

NASA senior aerospace scientist John J. Adamczyk developed the "average passage" flow model, which greatly reduces the computational complexity of simulating multistage turbomachinery. Sverdrup Technology, Inc. research analyst Richard A. Mulac implemented the model in a code called "MSTAGE," which exploits the Cray's multiprocessor.

Prior to computer modeling, compressors were designed through a repetitive process of building, testing and correction. A single test and rebuild could take from six months to a year to complete.

"We can now obtain information on an initial design through computer simulation, which allows the designers to make refinements before the experimental rig is built," Adamczyk says. "This has reduced part of the design process from years to several days."

Previous models could simulate the air flow through just one stage of a compressor, which can contain as many as 12 stages or 24 rows of blades. But with the eight-processor Cray Y-MP and the multiprocessing MSTAGE code, NASA has been able to simulate four different stages in the time previously required to simulate one blade row.

Mulac says the advent of massively parallel systems will allow much larger simulations to be done in the near future. — *Paul Gillin*

Media, Arts and Entertainment

Capital Cities/ABC, Inc.

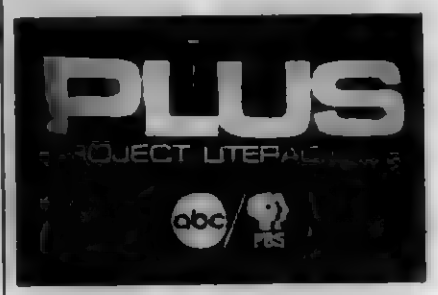
When it comes to promoting the cause of literacy in the U.S., a little name-dropping goes a long way for ABC's local television affiliates. With the aid of specialized software developed by Capital Cities/ABC, Inc. and a third-party vendor, local stations can automatically insert their own logos into national network promotions for Project Literacy U.S. (PLUS).

That capability has given the local stations a much-welcomed visibility in the daunting task of reaching millions of illiterate Americans with information about local hot line numbers and resources.

"The ability to key into the local community so the person viewing gets the closest and most available hot line number in the area is absolutely vital," says Anabel Newman, chairwoman of the National Coalition for Literacy and a professor at Indiana University at Bloomington.

PLUS, a joint public service campaign of Capital Cities/ABC and the Public Broadcasting Service, began in 1985 as an 18-month pilot program. Now entering its sixth year, the project's themes have expanded to include civic and youth literacy, family reading and literacy for the future work force.

Through the Master Key system, jointly developed by ABC and Paramus, N.J.-based Dubner Computer Systems, Inc., affiliate identification is inserted into ABC network promotions. These identifications encourage and enable the stations to use network Public Service Announcements that give PLUS a local spin.



The software encodes the public service announcements with a special signal, and when the spot is aired on the network, that signal is picked up by decoder software at the local station. This interaction automatically triggers the station logo and a local literacy hot line number.

The National Literacy Hot Line has logged in more than 750,000 calls on the 800 number managed from a Lincoln, Neb., contact center. PLUS has 527 local task forces, with endorsements from 138 organizations. The U.S. Department of Education credits PLUS with more than 1 million new students in adult literacy programs. — *Maryfran Johnson*

Medicine

Dragon Systems, Inc.

Laura Harris was born without fingers on her left hand. In her right, she has carpal tunnel syndrome, a painful degenerative disease of the wrist's small bones and muscles. Unable to write or type, she once worried that these disabilities might hinder her education.



Tell that to the 20-year-old Harvard University junior now. Tell it to her Intel Corp. 80386-based personal computer, too. It's loaded with Dragon Dictate, a $9,000 voice recognition system from Dragon Systems, Inc. in Newton, Mass.

Without ever touching a keyboard, Harris produces everything from letters to research papers to agendas for the several campus organizations to which she belongs. Dragon Dictate listens to, verifies and enters her words.

As a user talks to Dragon Dictate, pausing for a quarter-second between words, the screen shows what the system has "heard." If it's right, the user dictates the next word. If it's wrong, the user says, "Scratch that," then enters the correct word by spelling it out loud, typing it or choosing it from a menu of the system's best guesses.

The program, which requires 8M bytes of memory, remembers the sounds in words, not the letters. It guesses at new words by matching sounds to those it already knows.

The program runs in the background of word processing, spreadsheet and database packages. It has a library of the 25,000 most common English words, with an additional 80,000-word dictionary. It can learn 5,000 more user-defined words.

Available since March 1990, it has also found a market among poor typists and hands-busy workers. — *Kim S. Nash*

Science

Wistar Institute

Small virus. Big problem.

For years, the structure of the human adenovirus has baffled researchers because of its size — relatively large for a virus — and complexity.

The adenovirus is not just a laboratory matter; its effects are traceable in maladies from conjunctivitis to dysentery, and it poses potentially life-threatening dangers to victims of acquired immune deficiency syndrome.

Now, scientists using a three-dimensional imaging application have mapped much of the adenovirus and have found areas of protein structure that may be a target for drugs designed to combat the virus' ability to reproduce itself.

Researchers at the Wistar Institute in Philadelphia and the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany, teamed up to create the first 3-D model of the adenovirus using Stardent Computer, Inc.'s Application Visualization Software on a Digital Equipment Corp. VAX to put together a graphics model of the virus.

"The virus has 11 different proteins, and with the protein copies, there are more than 3,000 different protein molecules. We could never handle all that without graphics," says Dr. Phoebe Stewart at the Wistar Institute. "The technology is really a big leap forward."

The project grew out of 17 years of adenovirus study by Wistar's Dr. Roger Burnett, Stewart says. Burnett and Stewart used X-ray crystallography to begin mapping the virus, then compared those results with scans done by an electron microscope.

The two then collaborated with Dr. Stephen Fuller at EMBL, who wrote programs to handle the large amounts of data gathered in the studies. He turned to the Stardent application to convert the information into graphics form.

The research team will continue to employ the imaging technology to map any remaining undiscovered parts of the virus and better assess which areas may be most susceptible to attack by anti-viral drugs, Stewart says.

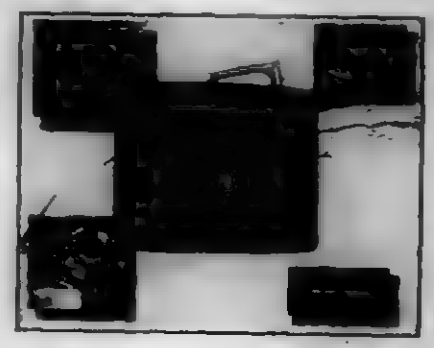
Although the adenovirus is less dangerous than many other viral infections, the work on the virus still has implications for broader studies of viral effects, he says. "One hope is that others can take this to work on other viruses, using the basic principles we've uncovered here." — *Donald St. John*



Transportation

Bechtel Group, Inc./ Parsons Brinckerhoff, Inc.

When George Jackson talks about information systems putting him in the hole, it's actually a good thing. That's because Jackson is manager of technical computing for Boston's Central Artery/ Tunnel Project, a 10-year undertaking by Bechtel Group, Inc. and Parsons Brinckerhoff, Inc. that will revamp Boston's clogged Central Artery roadway as well as add a third car tunnel across Boston Harbor.



Jackson is using a combination of computer-aided design (CAD), automated mapping, three-dimensional modeling and image processing to speed construction under a tight schedule and budget.

The $4.9 billion tunnel project, the largest effort of its kind in the U.S., is further complicated by the fact that it is under construction in a densely populated, historically significant urban area. Its design requires numerous changes to satisfy the concerns of residents and regulatory agencies.

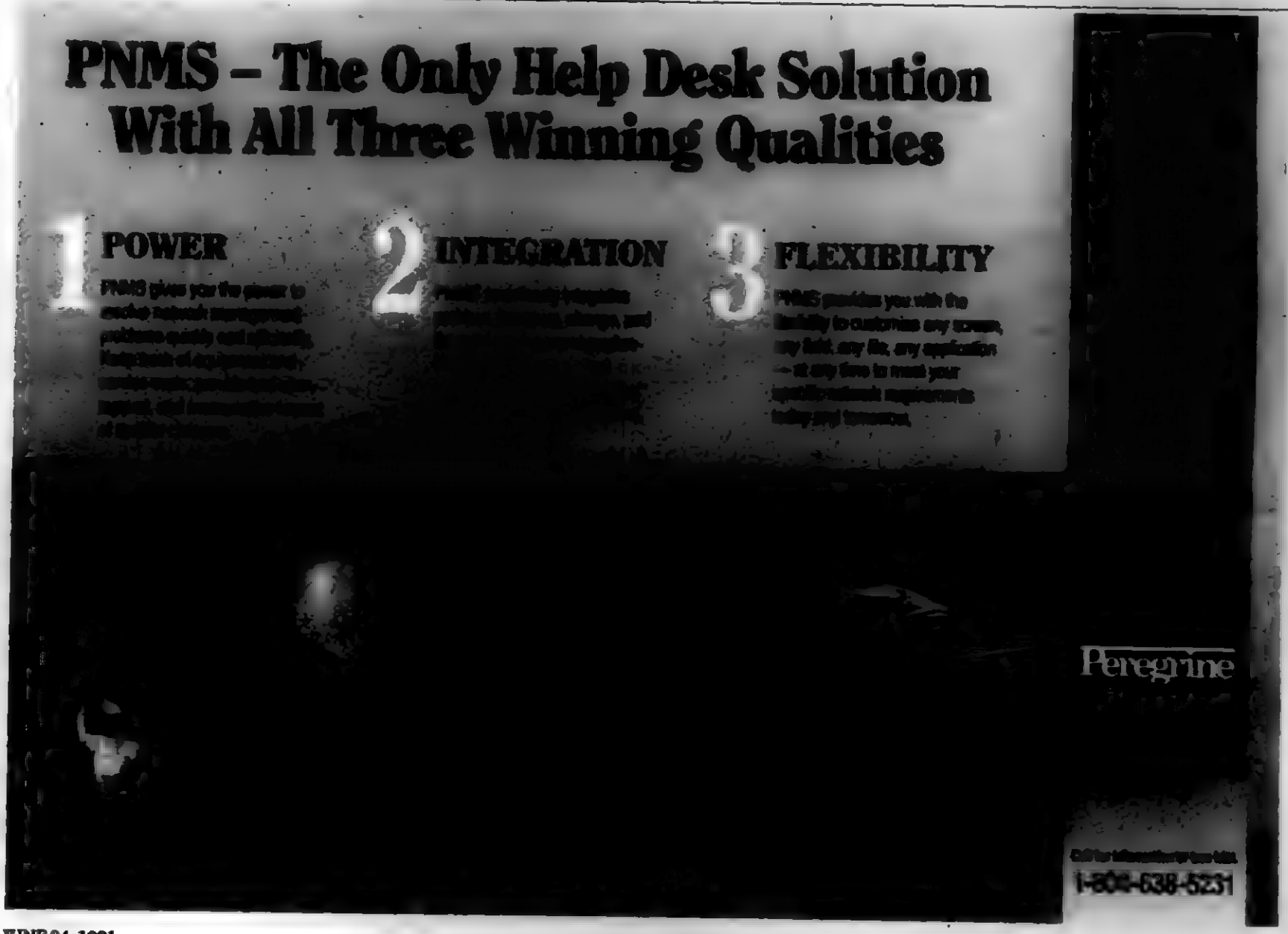
Jackson's team turned to Graphics Design System, an object-oriented CAD system from McDonnell Douglas Systems Integration Co. that helped create a base map of the projected construction area. The system allows engineers to update and transfer the latest design information automatically.

Imaging, combined with the automated mapping, provides engineers with access to more than 30,000 historical reference drawings. An engineer can use them to check electric, sewer and water lines or foundations of nearby buildings, Jackson explains.

The 3-D modeling has been integrated with Bechtel's own "walk-through" software, enabling planners to computer-simulate a stroll through the completed project before a single brick is put in place.

Jackson says designers used the walk-through feature to persuade federal agencies to modify sign size and placement requirements for the tunnel. The agencies wanted the group to adhere to normal above-ground highway regulations, which would have caused problems in a tunnel.

The system runs in a networked client/ server environment from Digital Equipment Corp. A Microvax 3600 and a 3900 stand as servers hooked to about 60 workstations and about 30 personal computers. — *Carol Hildebrand*



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NATIONAL
BRIEFS

Deflated expectations

▶ The recession has battered **Control Data Corp.**'s computer group's hopes for a 10% revenue growth this year into a flat line, James E. Ousley, president of CDC's Computer Products Group, said last week. On the plus side, however, Ousley said, CDC is investigating a strategic partnership with a networking company, similar to the company's relationships with workstation maker **Silicon Graphics, Inc.** and RISC player **Mips Computer Systems, Inc.** Last year, Ousley's Computer Products Group contributed $589.7 million of CDC's $1.691 billion bottom line. Ousley also said the time it will take **AT&T** and **NCR Corp.** to work out a merged infrastructure could give CDC and others developing Unix multiprocessor and reduced instruction set computing-based systems "a two-year window of opportunity."

Search for tomorrow

▶ In search of streamlined operations, tightened focus and heightened productivity, Unix vendor **The Santa Cruz Operation** earlier this month formed four product line business units: Services, Distributed Corporate Computing, General Business Systems and Complementary Products. The new Distributed Corporate Computing Unit will focus on the recently formed Advanced Computing Environment consortium.

More briefs on page 103

IBM rallying to clear muddy software name

BY PATRICIA KEEFE
CW STAFF

Personal computers are rapidly becoming the platform of choice on which a good chunk of many corporate strategic imperatives will rest. And while longtime information systems partner IBM may appear to be in good shape here, in actuality it is not.

That is because application software, not hardware, is what drives long-term client/server planning.

Nowhere is it more obvious that IBM is driven by hardware than in the desktop market. IBM continues to reign on the desk as the undisputed market share leader in DOS-based PCs. However, it is so lacking in presence on the applications side of the house that what it has can barely cast a shadow on a hot day.

Outside of Displaywrite, which played to a captive audience of IBM users for years before sales started dropping off, only in the last few years has IBM begun to amass any respectable market share in any applications segment.

According to analysts, IBM's most recent entries — the as-yet-unreleased Signature word processing package, just-shipped Hollywood graphics program, toddling personal information manager Current and multimedia application Storyboard Live — hold the most promise for bulking up its anemic market presence.

All in the family

After two years, IBM's Desktop Software Group has built a stable of seven packages covering word processing, multimedia, graphics, accounting and personal information management

Product name	Date shipped	Price	Development partner
Displaywrite	April 1984	$495	Internally developed
[redacted]			
Storyboard Plus	April 1987	$455	Internally developed
[redacted]			
Storyboard Live	Nov. 1990	$495	Krepec Publishing, Paradise Island, Bahamas
[redacted]			
Platinum Series	March 1990	Average $725	Advanced Business Microsystems, Camarillo, Calif.
[redacted]			

CW Chart: Doreen St. John

IBM is the first to acknowledge that it may have already lost out in some markets. "As good as we hope to become and will be in some areas, some customers will already have made some investments [in other products]. They want to pick and choose from among the market

Continued on page 104

Fujitsu open for business in Canada

Analysts see the move as a possible play for U.S. computer market share

BY JEAN S. BOZMAN
CW STAFF

Fujitsu Ltd., one of the world's largest computer manufacturers, is setting up shop in Canada in what some industry analysts said is a trial run at the U.S. computer systems marketplace.

Fujitsu Canada, Inc., which is a wholly owned subsidiary of the $20 billion Japanese computer and communications giant, made its debut in late April with the opening of a 30-person sales and support office in Toronto. But the Canadian move is seen as part of a global thrust to prove that Fujitsu can sell systems under its own label as well as through resellers.

Preparing for U.S. entry

"The seeds are being planted," said Frank Gens, an analyst at Technology Investment Strategies Corp., a Framingham, Mass.-based market research firm. "With the purchase of ICL [Ltd.] in Europe and the recent activity in Canada, all the pieces of Fujitsu's world puzzle indicate that they're creeping, step-by-step, into the U.S. systems market."

Back home, Fujitsu owns about 25% of the Japanese domestic computer market, outpacing IBM Japan, Hitachi Ltd. and NEC Corp., analysts said. However, direct sales of Fujitsu large systems outside Japan occur in only a few places: Australia, Spain, Germany, the Philippines, Singapore, South Korea and China.

In Canada, Fujitsu had been selling small systems, such as personal computers, disk drives and cellular telephones, until a small marketing team with experience selling Fujitsu systems in Australia and Japan arrived last August. Recently, Fujitsu Canada hired as its new president David Sowerby, a former IBM Canada executive with 13 years of experience in selling systems to large end-user sites. "They're looking very much to be a full-service supplier," said Maureen Mottonen, an analyst at IDC Canada Ltd. in Toronto. "Rather than making a straightforward box sale, they're interested in making a partnership with the user to encourage sales of a broader product line."

Continued on page 102

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Fujitsu

CONTINUED FROM PAGE 101

Fujitsu Canada said it is willing to sell a broad variety of systems, initially targeting the banking and insurance industries, government agencies and utility companies. Toward that goal, Fujitsu has almost doubled its Canadian work force: Some 30 new salespeople staff the new systems group, in addition to the 45 employees who were already selling and servicing computer peripherals.

The company already has roots in U.S. soil: San Jose, Calif.-based Fujitsu America, Inc. sells PCs, peripheral devices and communications gear to the U.S. market. With few exceptions, it has not attempted to sell midrange computers or even large-scale mainframes and vector processors to U.S.-based companies — at least, not so far.

However, analysts and sources at Amdahl Corp., in which Fujitsu owns a 44% stake, said there are no marketing agreements that would prevent Fujitsu from selling Unix-based servers and workstations directly to U.S. customers.

That is precisely what the company is doing in Canada. Fujitsu's file servers, workstations and mainframes will be sold in just two flavors, Unix and Fujitsu's proprietary MSP operating system, said Manuel Cerilles, marketing director at Fujitsu Canada.

"They don't want to miss out on the open systems wave," noted Bob Djurdjevic, president of Annex Research, Inc. in Phoenix. "The Unix environment doesn't carry as much baggage as the IBM/MVS world. Customers are free to consider Unix for new systems, increasing the size of the potential customer base."

Adhering to Unix System V standards would ensure Fujitsu a ready supply of off-the-shelf Unix applications, several analysts said. Fujitsu's mainframe version of AT&T's Unix, UXP, is slated for shipment later this summer.

Fujitsu has been very active in Unix International, an association of firms allied with AT&T's Unix System V Release 4 operating system. In April, Fujitsu Ltd. purchased a small piece of Parsippany, N.J.-based Unix System Laboratories, Inc., an AT&T spin-off.

"Fujitsu has made a conscious decision as to which countries to proceed in," Cerilles said. "The main reason we came to Canada is that our computer peripherals group has been marketing printers, cellular phones and disk drives here for five years, and we've been fairly successful," he added. "We said, 'All right, this is the next progression of our presence in Canada — to sell our systems products here.'"

Fujitsu Ltd. will avoid selling IBM-compatible systems in North America, in part to avoid sales conflicts with Amdahl's Canadian subsidiary.

"There is no relationship at all between Fujitsu Canada and Amdahl Canada," Cerilles noted. "They are completely separate companies."

INTERNATIONAL

BRIEFS

Trilateral transmission

▶ Japanese long-distance telecommunications firm **Denni-Dendeu, Inc.**, U.S.-based **US West** and Canada's **Rogers Cantel, Inc.** said they plan to cooperate in offering cellular telephone rental service in one another's headquarter countries, the Japanese company announced earlier this month. Under the agreement, the firms also plan to exchange technical personnel and know-how.

Going Japanese

▶ Minneapolis-based network server manufacturer **Tricord Systems, Inc.** last week announced the opening of a Japanese subsidiary: **Nihon Tricord Systems Kabushiki Kaisha (Tricord KK)**, headed by Japanese computer industry veteran **Masatoshi Fujino**, will market its parent's superservers through a series of niche-specific master distributors in which each will develop its own highly targeted reseller network, according to Tricord. The wares sold by Tricord KK will be manufactured by **Kubota Corp.**, the Japanese industrial firm that recently made a $3.4 million equity investment in Tricord and provided $3.5 million in debt financing support for Tricord and Tricord KK.

Dandy for Tandy

▶ Personal computer and consumer electronics vendor **Tandy Corp.** is about to open its first European manufacturing and repair plant — a $4.6 million facility in East Kilbride, Scotland. The new Tandy plant, which is the firm's 30th plant worldwide, expects to employ as many as 250 people when it is in full production — manufacturing, distributing, servicing and repairing PCs for the European market. Production of Tandy's Victor line of PCs will start up before the end of the calendar year.

NTT in Germany

▶ Aiming to strengthen its German business base, Japan's **Nippon Telegraph and Telephone Corp. (NTT)** said it has applied to establish a new subsidiary, **NTT Deutschland GmBh**, in Dusseldorf, Germany. Capitalized at $769,231, the company will be headed by Nobuyuki Sakuma and will be looking to grow its employee roster to five or six people, including locals.



EXECUTIVE CORNER

Canadian firm names Oltman CEO

Ottawa-based systems integration firm SHL Systemhouse, Inc. earlier this month named John Oltman, manager of worldwide integration services at Chicago-based Andersen Consulting, as its new chairman and chief executive officer. The 21-year Arthur Andersen Worldwide Organization veteran replaces Roderick Bryden, who announced his resignation last January.

As of this month, The Ultimate Corp. has two new presidents. Geoff Bowerman has been promoted to president of International Operations at the East Hanover, N.J.-based systems company in recognition of his key role in the firm's expansion into Europe and the Soviet Union, according to Chairman and CEO Michael O'Donnell. In addition, John D. Smith, senior vice president of Ultimate's Customer Support Division, has been promoted to president of that division. Smith will continue to oversee all customer service operations and will also take on responsibilities with regard to corporate strategic plans and programs.

Akio Morita, co-founder and chairman of the board at Sony Corp., has been elected honorary member of the board of directors of The Institute of Electrical and Electronics Engineers, Inc. (IEEE). Morita, whose honorary membership was bestowed earlier this month at the 1991 IEEE Honors Ceremonies in San Francisco, is being recognized "for his distinguished leadership of Sony Corp. and the integration of emerging technologies into consumer electronics products," according to the organization.

Alan B. Salisbury is the new executive vice president and chief operating officer of The Microelectronics and Computer Technology Corp. (MCC) Salisbury, who served as president of the advanced technology research and development division of Contel Corp. (now a part of GTE Corp.) prior to joining the Austin, Texas-based consortium, will share responsibility for MCC's day-to-day operations with CEO Craig Fields and Marketing and Services Vice President Barry H. Whalen.

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NATIONAL
BRIEFS

Continued from page 101

More less is more

▶ International player Fujitsu Ltd. is looking to "push the limits of electronic component technology" by packing "maximum processing power into a smaller package," Yoshio Honda said. To achieve the lofty goal, Fujitsu recently opened a new wholly owned subsidiary in San Jose, Calif., and named Honda its president. Fujitsu Computer Packaging Technology, Inc. expects to have 20 scientists on staff engaged in basic electronic interconnect research by fall.

Whoops

▶ The information services industry is growing — but not as fast as it used to, according to Mountain View, Calif.-based market research firm Input. While average annual growth during the 1980-1988 period was better than 19%, a recently released Input report said growth in 1990 came in just under 12%. Overall industry revenues in the $100 billion ballpark did not save 1990 from showing the slowest year-to-year growth that the industry has experienced in the past 15 years, the report said.

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IBM rallying

CONTINUED FROM PAGE 101

loaders," said David Cassano, director of product management at Stamford, Conn.-based Desktop Software Group and the right-hand man of its vice president, Fernand Sarrat.

In fact, the last decade has left IBM with such a spotted reputation in PC software development that when it appeared Microsoft Corp. and IBM might go separate ways on OS/2, some users cautioned IBM not to do it alone.

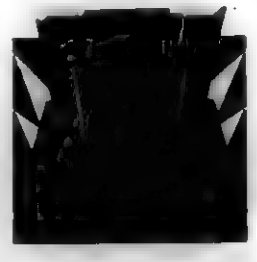
"If I see a shrink-wrapped box with IBM's name on it, I know one of two things: It either doesn't work, or they got it from someone else," one user quipped.

Changing this perception will take some work. The prescription offered by Tim Bajarin, an analyst at Creative Strategies Research International, Inc., will not provide overnight relief.

"They have to come out with as many innovative products as they can," Bajarin said. "They have to replicate that with as much third-party creativity as they can, and they have to establish their own lab because the profits lie in internal development."

IBM, to a great extent, has bought into this theory. In 1988, it launched as an autonomous unit the Desktop Software Group. The group spent most of its first year just getting organized and scoping out product deals.

Its existence is touted as evidence that IBM finally understands that desktop software represents big bucks and that its development must be freed from the constraints of IBM's hardware strategy and overbearing bureaucracy (see story page 105).



As such, the Desktop Software unit and its head, Sarrat, are thought by many analysts to represent the one shining ray of hope IBM has for achieving some measure of recognition and leadership in PC application software. Sarrat and the unit are drawing raves in early reviews for its vision, strategy and potential.

"Desktop Software is commendable humility," observed Esther Dyson, editor of the "Release 1.0" newsletter. "It means they are serious about [software]."

In the short term, the laboratory is charged with quickly getting IBM into specific market niches, mostly through joint ventures with third parties. Once there, the goal is to stay competitive, Cassano said.

"We do not have today a 'start from scratch' effort in any major software segment," Cassano said. "We want products in the market now, rather than having to wait for long-term programming efforts."

The idea is to marry IBM marketing and the company's sense of family architecture to good third-party talent. So far, this approach has produced Current, Storyboard Live and Hollywood. All were purchased in various stages of development from external developers.

As a separate business unit, Desktop Software is able to avoid internal IBM wars over which technology is the "right" one. As evidence, Cassano said, users can expect his unit's applications to run under both OS/2 and Windows.

He also outlined the "major product segments" of greatest interest to IBM: word processing, presentation graphics, personal information managers, cross-industry accounting and, eventually, databases. "We are still looking to come out with a line in the database area," he said. In the long term, analysts said, Sarrat is building the foundation for what Cassano has called a "world-class" programming group that will service IBM applications customers into the next century. This group also plans to more closely integrate the Desktop Software applications family via similar menus and commands.

Necessary leadership

Sarrat's appointment as head of the unit is critical, analysts said. Industry veteran Stewart Alsop, editor of the "P.C. Letter" newsletter, said: "He is what IBM calls a 'wild duck.'" Sarrat recognized that IBM had little to leverage from a technical standpoint and that its development procedures are too bureaucratic and oriented toward system software, Alsop said. "He recognizes that IBM was wrong and Microsoft was right."

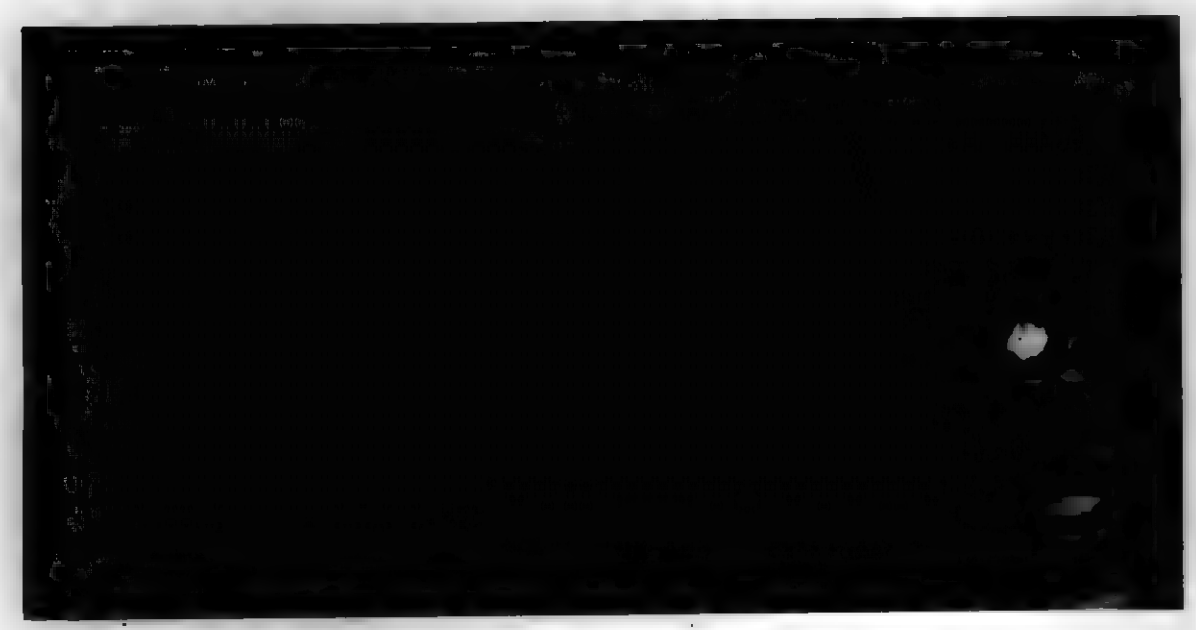
This time, IBM is spending time listening to users. "We are focusing on what users want and starting with that as the design point," Cassano said.

Observers such as Alsop also said Microsoft's success with Windows was a strong motivator behind IBM's willingness to let Sarrat go his own way.

"Microsoft has succeeded in scaring the hell out of IBM and turning it into a decent software company," Alsop said, explaining that Microsoft forced IBM to change the way it specs products. "IBM feels for the first time that it is subject to someone else's whims, and it scares them. There is nothing like fear to motivate you to do the right thing."

IBM's PC software efforts also have a specially trained and organized sales staff and marketing force. One of the first things marketing did was revamp the packaging to focus more on product information and less on the IBM logo, Cassano said. After all, he noted, "We are only measured on our profit and loss, and a key measure [in determining that] will be customer satisfaction."

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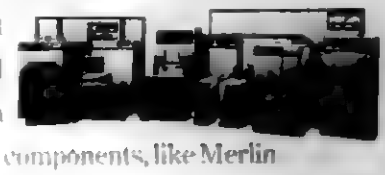


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Desktop unit IBM's best shot

Smarting from a string of failed or non-descript efforts in the microcomputer software arena, IBM finally got serious and launched the Desktop Software independent business unit in 1988.

The group has been pegged by many industry observers as IBM's last and best shot at achieving a presence in desktop software. David Cassano, director of product management at Desktop Software and a 16-year IBM veteran, recently spoke with Computerworld Senior Editor Patricia Keefe about the group.

Was personal computer software ever a priority for IBM? Is it now?

We never really tried [before]. Our application software efforts in the past many times were done to complement the hardware strategy. What's different about the approach with Desktop Software is that we look at it as a [separate] business. We made that decision because PC software was a good business — a fast business — and we wanted to participate.

Why a separate business unit?

We were given independence so that we could operate a little quicker on our feet and not be encumbered with things that would slow us down. We want to work aggressively with groups in and out of IBM. We have a specialized sales force as well as the leeway with marketing to operate in the market the way we want.

How reliant is IBM on third parties in its desktop software efforts?

A large part of why this unit was created was to come out with exciting new applications, and our approach has been to work with creative outside developers. Developing products from scratch is not a priority. We want products in the market now.



Cassano says *his independent unit is quicker on its feet*

How tied are you to Patriot Partners' development shell?

Not at all at this point in time. We're tied to [specific] application markets and getting into them ... Right now, we're just like any other developer, looking at that and other options.

Does it matter in the long run if IBM becomes a force in the PC market?

It's hard to say. It's very important for IBM to participate. Customers who buy solutions from us would like to buy both applications and hardware from IBM. And [given downsizing trends], the customer is saying, "What does IBM have to help us with this transition?"

IBM needs dose of software Rx

BY PATRICIA KEEFE
CW STAFF

It does not take much looking to find specific examples of where IBM has stumbled in the software market, nor is it hard to find opinions as to why the computer giant has fallen flat on its face so far in desktop software. Until recently, industry veterans and other observers said, IBM has lacked the desire, the drive and the right combination of "stuff."

To be fair, IBM has barely taken a crack at desktop software. The company owes much of its Personal Computer software infamy to a two-year effort to pitch Topview, a character-based graphical icon environment announced in 1984 that IBM was never able to sell.

Until about two years ago, other IBM PC software offerings have been mostly ho-hum efforts, industry observers said.

"They never put any resources into developing their own software," said industry veteran Vern Rayburn, chairman of Slate Corp.

"IBM completely missed the software boat at the height of the mid-1980s, when there was a tremendous surge in creativity," said Tim Bajarin, a vice president at Creative Strategies Research International, Inc. IBM is now trying to get back on board with its Desktop Software group (see story above).

"Here's this gigantic, sprawling hardware organization, and you might say, 'Why are they so stupid?' But the fact they have even [any] market share is amazing. No other hardware company has been successful in applications," said Stewart Alsop, editor of "P.C. Letter" newsletter.

Moreover, IBM'sefforts underscored that money is not everything. The starting point for most successful PC software firms was a garage, a beat-up computer and a handful of obsessed programmers. IBM has never come close to this model, former executives and analysts said.

"IBM isn't a force in any software market" because the best software springs from entrepreneurial environments, said Dale Kutnick, president of Meta Group, Inc. in Stamford, Conn.

Other successful applications software ventures have been launched by companies with a major presence in ancillary markets, such as Microsoft Corp. in operating systems and Borland International, Inc. in languages, Kutnick said.

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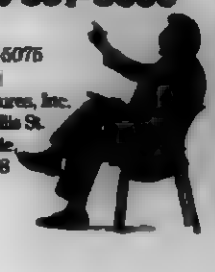
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National Director, Information & Technology, Price Waterhouse
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Lotus Technology Briefing
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1:00-2:00 pm
Dr. Frank King
Senior Vice President, Software Business Group
Lotus Development Corp.
"Software Applications for Working Together in the 90s"



OS/2 Strategy Briefing
Thursday, August 15
8:30-10:15 am
Lee Reinwig
Asst. General Manager, Programming, Personal Systems, IBM
Joe Guglielmi
General Manager, Marketing & Business Development, Personal Systems, IBM
"Personal Systems Software Directions"





Developers' Keynote
Friday, August 16
9:00-10:00 am
[illegible]
President, Aldus Corporation
"Secrets to Building Successful Cross-Platform Applications Software"



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1991 Editorial Calendar
(July-December)

Product Spotlights/Buyers' Scorecards

PC Presentation Graphics Software	July 8	June 21	June 28
Executive Information Systems *(Featuring Buyers' Scorecard)*	July 22	July 5	July 12
Storage Systems *(Featuring Buyers' Scorecard)*	Aug. 19	Aug. 2	Aug. 9
PC Spreadsheets	Sept. 2	Aug. 16	Aug. 23
Imaging Systems *(Featuring Buyers' Scorecard)*	Sept. 16	Aug. 30	Sept. 6
TCP/IP	Oct. 7	Sept. 20	Sept. 27
PCs and Workstations *(Featuring Buyers' Scorecard)*	Oct. 21	Oct. 4	Oct. 11
Distributed DBMS	Nov. 4	Oct. 18	Oct. 25
Mainframes *(Featuring Buyers' Scorecard)*	Nov. 18	Nov. 1	Nov. 8
LAN Operating Systems and Applications *(Featuring Buyers' Scorecard)*	Dec. 2	Nov. 15	Nov. 22
Client/Server Application Development	Dec. 16	Nov. 29	Dec. 6

Editorial Contacts: **Mary Brandel (Spotlights)** (508) 879-0700 ext. 175 **Michael Sullivan-Trainor (Buyers' Scorecards)** ext. 229

Integration Strategies

Integrating New Technologies	Aug. 12	July 26	Aug. 2
Integrating Manufacturing Systems	Oct. 28	Oct. 11	Oct. 18
Working with Commercial Systems Integrators	Dec. 9	Nov. 22	Nov. 27

Editorial Contact: **Joe Maglitta** (508) 879-0700 ext. 192

Industry Closeups

Industry Closeup: Information Systems in State and Local Government	Aug. 12	July 26	Aug. 2
Industry Closeup: Information Systems in Pollution Control	Oct. 28	Oct. 11	Oct. 18
Industry Closeup: Information Systems in Media	Dec. 9	Nov. 22	Nov. 27

Editorial Contact: **Lory Zottola** (508) 879-0700 ext. 236

Special Reports

Special Report: 10th Anniversary of the IBM PC	Aug. 5	July 19
Special Report: Annual Salary Survey	Sept. 2	Aug. 16
Special Report: Annual Job Satisfaction Survey	Sept. 9	Aug. 23
Special Supplement: Premier 100 magazine	Sept. 30	Aug. 16
Special Edition: Forecast '92 (combining Computerworld's Dec. 23 and Dec. 30 issues)	Dec. 30	Dec. 9

Editorial Contact: **Joanne Kelleher** (508) 879-0700 ext. 157

COMPUTERWORLD



"...Our recruitment advertisements in Computerworld cost less than in other newspapers and produce higher quality responses."

- Joel A. Adams
President
Devon Consulting

For almost 10 years, Devon Consulting has been staffing large data-processing shops in the Philadelphia area with temporary high-tech programming professionals. As President Joel Adams explains, the firm essentially provides programmers, technical writers, and DP specialists like systems programmers, software engineers, and database administrators to companies on a contractual basis as needed. Looking at the specialized computer skills required by their ever-expanding client base, he knows their recruitment message must reach the most qualified audience available. So, like fellow NACCB members who report favorable results, he, too, advertises in *Computerworld*.

"Our clients - banks, insurance firms, pharmaceutical and chemical companies, and software developers - typically require seasoned professionals with unique, hard-to-find skill sets. However, professionals with a minimum of three years' experience in specific technical areas are often few and far between. To fully satisfy our clients' objectives, I need to target an audience with very technical expertise. With its highly qualified readership, *Computerworld* is crucial in helping us make that match.

"As we began to expand outside the immediate area into New Jersey and Delaware, our need to reach a wider technical base grew as well. Unlike our advertisements in Sunday editions of local metropolitan newspapers, our recruitment advertising in *Computerworld* draws qualified candidates not only from New Jersey and New York but also from all around the world. It's by far our single most-effective vehicle for reaching our target audience. Clearly, our recruitment advertisements in *Computerworld* cost less than in other newspapers and produce higher quality responses. In the past two weeks, for example, nearly 20% of the resumes we received came from *Computerworld* alone.

"In our business, recruitment results like these are key. In 1990 we placed about 135 new starts in addition to the employees we already had in place. This year we expect that number to total 165 or possibly higher. To ensure that Devon Consulting continues placing the right professionals in the right jobs, we fully intend to run an ongoing recruitment advertising schedule in *Computerworld*. When it comes to advertising, we believe that consistency is just as important as the size, message, and vehicle.

"Overall, our *Computerworld* recruitment advertising fulfills a threefold purpose. First and foremost, it's invaluable in recruiting all the top technical talent we need. It also helps us gain share of mind among a highly qualified base of readers. Finally, we know our clients read *Computerworld* and view its advertisers as significant players in the industry. When they read our advertisement, then, they see Devon Consulting as an advertiser in the industry's trade journal. That kind of presence only enhances our company image."

Computerworld. It's where serious employers - like Joel Adams - reach qualified candidates with key computer skills. Every week. Whether you use computers, make computers, or sell computer products and services, *Computerworld* can help you recruit the experienced professionals your business demands. For all the facts, call John Corrigan, Vice-President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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COMPUTER CAREERS

Networks aid hiring searches

BY CHRISTINE CASATELLI
SPECIAL TO CW

As companies try to lower hiring costs and improve the chances of finding a candidate who is the right fit for a job, information systems managers are dropping their competitive tradition and working together in regional networks.

Within these informal groups, hiring managers share resumes they've received and trade tips on finding good candidates. The networks offer a host of time-saving benefits to job seekers and managers alike.

These networks are especially useful in today's buyers' market. The tight economy and high unemployment rate place more stress on the companies' search process, and the networks provide very useful ways to move candidate selection along.

In addition, technical job networks can offer companies substantial savings.

For example, Harvey Daniels, president of the Technical Recruiters Network in Chicago and manager of human resources at the Federal Reserve Bank, says he and other members find they can hire specialized professionals at a fraction of the usual $17,000 it could cost to find each person on their own.

The drop in spending results from eliminating headhunter fees and from splitting advertising and career-fair expenses with other companies, Daniels says.

"With this economy, we don't have a $1 million or $2 million recruiting budget, so the network became a necessity," says Nancy Thompson, executive director of the Southeast Employment Network in Atlanta and personnel recruiter at Cap Gemini America.

A new twist

Technical recruitment networks offer a new twist: outplacement services that help workers who have been laid off find jobs in other companies.

"Right now, we're using the network to place workers rather than to hire them," says Fred Rodriguez, corporate manager of staffing programs at Hughes Aircraft Co. in El Segundo, Calif., and a member of the Technical Personnel Committee in Los Angeles.

The network offers tremendous advantages for job seekers. A single telephone call to a member recruiter can put a candidate in touch with every other member, Thompson says. "You talk to one company, and you're virtually talking to 75."

One person who found a job as an information technology consultant through the Southeast Employment Network says that timing is everything.

First, Rosie Russell spoke to a recruiter at Georgia Pacific Corp., a member of the network, who passed her resume on to Thompson at Cap Gemini.

It turned out that Russell's experience in systems analysis and methodology was a better fit for Cap Gemini at that point. "The network is a good way to find out what other companies need at the same time," she says.

The network, however, could work against some job applicants who are not as qualified as they claim to be, says Richard Bell, a member of the Southwest High-Tech Cooperative and a contract recruiter.

"If you are not very good, it is entirely possible that your reputation will spread faster through the network than it would otherwise," Bell says.

Hiring managers involved in job networks say one major benefit that they have realized is the ability to find highly specialized professionals. "We've become so specialized over the years, it's difficult to find individuals that exactly fit our needs," Thompson says.

But one drawback to job networks is that they really only help place midlevel personnel. Bell says 95% of his network referrals are for midlevel computer staff positions, such as senior systems analysts or project managers. Companies typically recruit at colleges for entry-level jobs, and executive search firms usually help with senior management positions, Bell said.

Costelli is a free-lance writer based in Washington, D.C.

Network contacts

- **Northeast MIS Network Group**, New York, New Jersey, Connecticut — Contact: Robert Lobman (516) 221-3665
- **Pittsburgh High-Tech Council**, Pittsburgh — Contact: Holly Mauer-Klein (412) 682-2066
- **Private Industry Recruiter Association**, Southern California — Contact: Sam Ouaki (408) 993-4715
- **Southeast Employment Network**, Atlanta — Contact: Nancy Thompson (404) 395-5400
- **Southwest High-Tech Cooperative**, Dallas/Ft. Worth — Contact: Richard Bell (214) 462-8807
- **Technical Personnel Committee**, Los Angeles — Contact: Bill Tidebeck (805) 967-5511
- **Technical Recruiters Network**, Chicago — Contact: Harvey Daniels (312) 322-5497
- **Washington Technical Personnel Forum**, Washington, D.C. — Contact: Mike DeBruhl (202) 966-5627

How they work

High-tech job networks started to appear in big cities in the mid-1980s, when computer positions were plentiful and qualified people were scarce.

The networks are run by groups of IS hiring managers from firms in the same metropolitan area, which meet regularly to announce technical openings and to pass along information about available candidates.

Job seekers with at least two years of experience in computers or communications are added to the network when managers who were not able to hire them submit their names.

Some candidates are snatched up quickly in the network, while others can circulate for months. For example, in the Southeast, people experienced in computer-aided software engineering and DBase II are always hot commodities, says Southeast Employment Network's Nancy Thompson.

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Research before relocating

Fast Track is a twice-monthly column dedicated to answering questions on career directions.

BY NORM SANDERS
SPECIAL TO CW

Q I am 42 years old with more than 20 years of experience in information systems. I've been trying to find a job in the Reno, Nev., area with little response. What are my prospects?

C. C.
Richton Park, Ill.

A Let's face it. While Reno is a true hotbed, it is not exactly the hotbed of IS users. There are fewer than 25 substantial IS users in the "vicinity" of Reno, so your pickings will, at best, be slim.

Slim pickings suggest that you will have to do significant homework. In this case, research is your best answer.

Get hold of the *Directory of Top Computer Executives* or a similar publication that lists large computer users and the hardware and software they use. See if there is any match between your expertise and those Reno-based users' needs, and then write a letter to those places relating your appropriate experience.

You might indicate that you will be visiting the Reno area during a specific time period and ask that an introductory meeting be set up for that time. When companies know of your actual visitation schedule, they tend not only to be accommodating, but they also become more convinced of your seriousness.

Q I have a master's degree in computer IS and more than 10 years of experience working at the U.S. Department of Defense in programming and systems analysis.

I would like to obtain a position with an international company as an IS manager but am not sure I have the right experience. Where can I find this kind of information?

Initials and town withheld

FAST TRACK
CAREER ADVICE FOR THE '90s

A In Texas, they say "Go with what brung you." You've been "brung" by the defense industry, and there are lists of defense contractors available to you that provide names of the international companies most likely to have the requirements to match your talents.

A librarian at the Department of Defense could be your best career counselor.

Q I have 25 years of experience in computer systems development as a manager, analyst and programmer, but I do not have a college degree. I have been out of the business for three years. What is the best method of reentering the field?

R. A. S.
Bradenton, Fla.

A Your task is not an easy one. What you do have going for you is 25 years of business experience. Concentrate on your ability to apply technology to business problems in your areas of expertise.

An alternative might be to look for an organization seeking maintenance expertise using technology you are familiar with — either in a consulting or full-time employment role.

Also, call some organizations in your area and ask them what skills and areas of expertise they are looking for. Having their answers will give you all the direction you'll need to get your skills up-to-date.

Systems and tools that offer the greatest potential for employment demand are, unquestionably, local-area networking and computer-aided software engineering tools.

Sanders is president of Norm Sanders Associates in Hazlet, N.J., a senior-level IS executive search firm.

We welcome your questions. Send them to Cathy Duffy, Careers Fast Track, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Letters may be edited for brevity and clarity. Your initials and town will be printed unless you request otherwise.

TIP of the MONTH

What do you look for during an interview?



• Resourcefulness: I target questions so that candidates have to demonstrate the ability to be adept and inventive.
• Problem-solving abilities: I ask what types of problems they have encountered — technically and administratively — and how they have overcome them.

Timothy A. Kenney
Manager, Information Services
Systemetrics/McGraw-Hill
Santa Barbara, Calif.

• Personality, to gauge how they will interact with peers.
• Verbal and written communication skills.
• Reaction under pressure by asking questions and seeing how people respond: Do they answer right away? Do they think about it? Do they fire back additional questions?

Robert Houch
MIS Manager
Sunsweet Fruit International
Sanger, Calif.

• Articulation: They have to have the ability to communicate verbally and in writing. My employees have to deal with customers to determine what their requirements are.
• Background: They have to have some general business background and know-how.

Charles Dietz
Manager, Data Administration, Pensions Department
Metropolitan Life Insurance Co.
New York, N.Y.

• Quality of experience: Some people with 20 years of experience really have only one year repeated 20 times. I look at the complexity of the applications the person has worked on and the depth of his involvement with those applications.
• Appearance: I expect a solid, businesslike demeanor that will be appropriate when dealing with all levels of the company.

Michael G. Barnes
Manager, Computer Applications/Telecommunications
Atlantic Energy, Inc.
Pleasantville, N.J.

DIRECTOR ACADEMIC COMPUTING

West Virginia University seeks applications and nominations for a newly created position of Director of Academic Computing to initiate and coordinate computing support for instruction and research. The Director of Academic Computing is one of three directors reporting to the Assistant Vice President for Computing and Information Resources. Major mainframe computing is provided by an independent, off-campus, state supported facility. This Director will serve as an advocate for and provide leadership in the use of computers and multimedia technology in the educational process, and provide liaison between the academic and administrative computing functions.

QUALIFICATIONS: Experience in academic computing, both large-scale and micro-computing, and in telecommunications networking in a multifaceted environment. Doctorate preferred, but a Masters degree will be considered. Senior level administrative experience desirable. Demonstrated knowledge of computing, telecommunications, multimedia, and information system capabilities and techniques which support instructional and research computing. Ability to interact with the deans and faculty of the sixteen colleges in the development of innovative computing for teaching and research.

SALARY: Competitive. STARTING DATE: January 1, 1992 or as soon as possible after the conclusion of the selection process.

APPLICATIONS: West Virginia University is strongly committed to affirmative action and encourages applications from and nominations for women and members of minority groups. Candidates should submit a letter of application, curriculum vita, and the names, addresses, and telephone numbers of at least three persons who could provide professional references. The screening process will begin August 15, 1991 with applications accepted until the position is filled. Applications and nominations should be directed to: Dr. Shirley Dowdy, Chairperson, Search Committee for Director of Academic Computing, 308 Stewart Hall, West Virginia University, Morgantown, WV 26506. Phone: (304) 293-4611

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STAFF CONSULTANT wanted. Duties: Designing, coding and testing interface UPLOAD program for a Trade Monitoring System, converting PC/Lotus ASCII files to Main Frame EBCDIC files to allow main frame users to get data from Lotus worksheet, transfer it to an on line transaction system and insert it into a DB2 table. Designing, coding and testing DOWNLOAD program for Trade Monitoring System, converting main frame EBCDIC files to PC/Lotus ASCII files to allow Lotus users to get data from on-line transactions and make analyses reports. Designing import files to Lotus worksheet procedures. Using Lotus MACROs to develop and generate Lotus analysis reports. Six foreign exchange, commodity, equity and short term investment reports. These duties will be performed using the following hardware, software and languages: IBM 3090, OS/MVS, COBOL, MVS/JCL, PANVALET, TSO/ISPF, PROEDIT, DB2/SQL, PC (IBM PS/2), LOTUS 1-2-3, PC3270, IMS DB/DC Need Master's in Computer Science and 1 yr exp as Software Engineer, Programmer Analyst or Consultant. The related exp. must include software development on an IBM 30xx and PS/2 computer using the OS/MVS operating system, IMS DB/DC softwares, and COBOL languages. 6 months of the related exp. must include software development using Lotus 1-2-3 software. Pay is $32,300 per year. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #28891. Employer Paid Ad.

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STAFF PROGRAMMER ANALYST wanted. Duties: Participating in converting an existing information system for a United States Government Department from a BURROUGHS system to a DEC-VAX 6310 Cluster. The DEC VAX platform included the following products: VAX/VMS, DECforms, Rdb/VMS, VAX COBOL, Datatrieve, CDD, CMS, and SQL. The project responsibilities include the following: analyze the existing code for conversion; perform a detailed design on the existing programs; and code and test the program. Need a Master's degree in Computer Science, Engineering or Business Administration and 1 yr. exp. as a Systems Analyst, (a/k/a Staff Consultant). The related exp. must include developing business applications software and performing software conversion on a VAX/VMS computer using Rdb/VMS database, DECforms or FMS Forms Management System, SQL or Rdb data manipulation and definition language, COBOL programming language, CDD and Datatrieve. Pay is $36,000/yr. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #28891. Employer Paid Ad.

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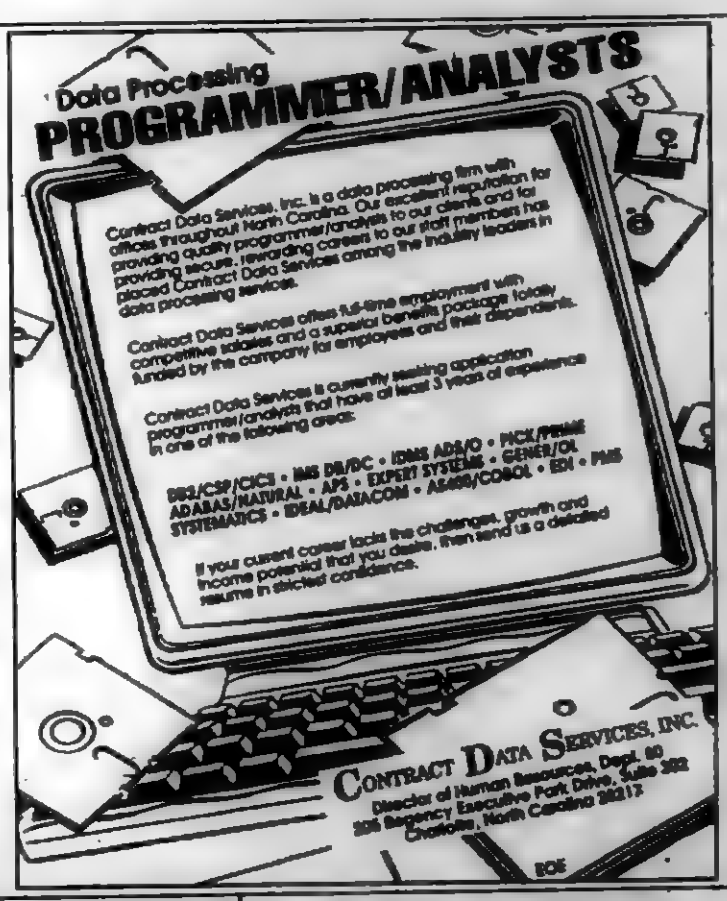
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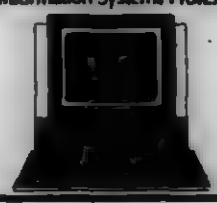
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PCs are often pricier than they seem

BY LUCIE JUNEAU
SPECIAL TO CW

From the moment a personal computer sheds its packaging until an employee can make the best use of it, any number of expenses will crop up to test an information systems manager's patience as well as impact the company's coffers.

Consequently, when experienced IS professionals calculate the cost of installing new PCs, they don't stop at the cost of the machines. PC installation includes everything from peripherals to furniture to training.

Of these expenses, the largest hidden cost is training, according to IS professionals.

When Dorr-Oliver, Inc. in Milford, Conn., installed a new 3+Open network from 3Com Corp., it adopted Compaq Computer Corp. 386 machines. Users also had to contend with learning Microsoft Corp.'s Word as well as its Excel spreadsheet.

"We had cost overruns in the user training area," says Charles Lasky, director of MIS at Dorr-Oliver. "We anticipated the need for some training, but the amount of training that users needed came as a surprise." The training portion of Dorr-Oliver's installation expenses ran about 30% over budget.

Another sometimes forgotten cost is the need for more than the minimum amount of memory and disk storage. Also, modems and add-in boards may be needed to connect the PC to a network, printer or scanner. Buyers who depend on vendors to provide technical advice may be disappointed when they discover that their vendors didn't mention these details, says Franc Perdomo, technology coordinator specialist at consultant Towers Perrin.

In addition, IS professionals sometimes don't establish appropriate purchasing guidelines, so users can end up with systems that are not compatible with installed hardware or software. "Organizations waste a lot of time because of the incompatibility of this application with that piece of hardware," confirms Howard Ditpner, vice president of engineering at Aurora Pump in North Aurora, Ill.



The best way to avoid incompatibility problems is to set companywide or departmentwide standards for PCs and applications. If users adhere to these standards when purchasing, a company can avoid spending time and therefore money trying to get new software or hardware products to work with existing products.

Less significant hidden costs can arise from the need to prepare the user environment for the new system by purchasing items such as furniture and air conditioners.

As ergonomics become an increasingly important issue, some cities are requiring companies to buy particular equipment as part of a new system installation. A recent San Francisco law mandated that employers provide glare screens, chairs with back support and adjustable keyboards to any user who requests the items, says Mike Ackerman, manager of support services at the San Francisco Chamber of Commerce.

For companies looking to install only a few PCs, the price of new furniture probably won't be prohibitive. But managers anticipating the installation of multiple PCs should take the issue more seriously. Taking measurements and pricing furniture before purchasing the PCs will at least enable them to forecast accurate installation costs up front.

Other minor items can hike the total cost of PC installation. Towers Perrin experienced unanticipated air conditioning expenses after installing Macintoshes, Perdomo says. "The graphics department tends to work late into the night. They have four Macs working till about 10, and the general A.C. goes off at about 6," Perdomo says. The price of cooling the space for an additional four hours was a hidden cost of installation, he says.

Juneau is a free-lance writer and editor based in Salem, Mass.

Big surprises for small firms

Not surprisingly, large organizations with departments dedicated to managing information systems find it easier to control installation expenses than do smaller companies that lack extensive in-house computer expertise.

"We avoid surprises by having the appropriate infrastructure in place to make sure we're managing growth," says Carl Wilson, senior vice president of management information services at Grand Metropolitan Food Sector. "We set specific standards, provide training and implement applications with the right level of integrity and control," he says.

Smaller firms with less experience are more likely to be caught off-guard. Dennis Love, vice president and IS manager at Acme Thread and Supply, Inc. in Los Angeles, found the expense of installing an IBM Personal System/2 in Acme's Honolulu office surprisingly hefty. About six months into the installation process, Acme found that 28% of its total installation expenses had been spent on training and program modifications and that those costs were still adding up.

"When installing a PC that will be used for order entry, invoicing, etcetera, in a small business, I would plan on the installation costs being at least as much as the hardware and software — probably more," Love says.

LUCIE JUNEAU

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PS/2 Model 30-286	$1,150	$1,300	$1,000
PS/2 Model 60	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,400	$3,600	$3,200
Compaq Portable II	$750	$1,050	$700
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SLT 286	$1,700	$1,900	$1,550
Portable 386	$2,000	$2,100	$1,500
LTE 286	$1,750	$1,900	$1,600
Deskpro 286	$800	$1,000	$700
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ANALYSIS IN BRIEF

The personal computer industry is nearing a mid-life crisis. PC makers are struggling to find growth strategies in what has become a saturated market. Possible directions for increasing profits and market share are the following:

Move up. PC companies can revamp their product lines to include workstations. Moving upscale in complexity is likely to provide sustained growth. However, the transition from PCs to workstations will not be easy for most PC vendors. For example, **Compaq Computer Corp.** would have to adopt new technologies and distribution channels. So far, it does not seem to have made any radical decisions in these areas.

Move down. Shifting PC technology down to small and medium-size businesses — or even into the home market — can open up areas that have been ignored by the mainstream "high road" strategies. **Apple Computer, Inc.** should know. The company has radically altered its product development philosophy and launched a "consumer computing" campaign. Apple's low-end products cannot be beat. When compared with machines running Microsoft Corp.'s Windows 3.0, Apple can now claim to have substantially better price performance. — *What's wrong with the PC industry, Alex. Brown & Sons, Inc., May 28, 1991.*

Semi-tough. The raging bull market for semiconductor stocks is probably over. Bookings have peaked and should decline in September. Most semiconductor stocks are trading at a premium to market price/earnings multiples. Ratings lowered from buy to hold on Altera Corp., Cypress Semiconductor Corp., LSI Logic Corp., Motorola, Inc. and VLSI Technologies, Inc. — *Semiconductor industry update, Prudential Securities, May 23, 1991.*

KIM S. NASH

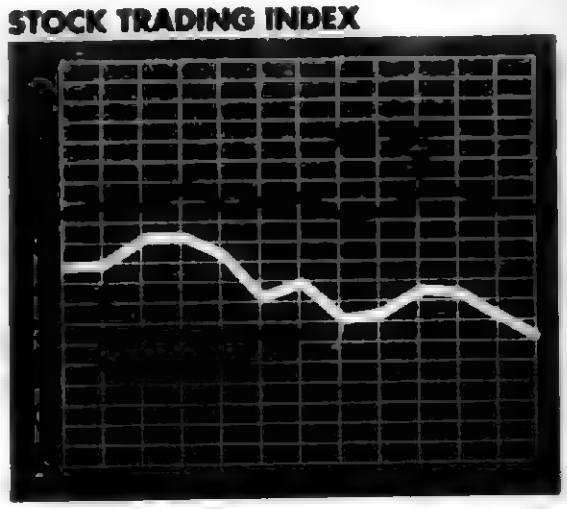
You decide

Current ratings on selected computer companies span a wide spectrum

Company	Bear Stearns & Co.	Shearson Lehman Brothers Inc.
[illegible]	Hold	Unattractive
[illegible]	Avoid	Neutral
[illegible]	Hold	Moderately attractive
[illegible]	Hold	Not rated
[illegible]	Not rated	Moderately attractive
[illegible]	Hold	Buy
[illegible]	Strong buy	Unattractive
[illegible]	Hold	Neutral
[illegible]	Hold	Neutral
[illegible]	Buy	Moderately attractive
[illegible]	Not rated	Neutral
[illegible]	Hold	Neutral

CW Chart: Janell Genovese

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- High-technology hardware stocks battened down the hatches in the wake of IBM's tidings of financial woe, but most were able to weather the storm. The company lost 1½ points last week, closing Thursday at 99⅛. Digital Equipment Corp., hit by layoff rumors, dropped 2¾ points to finish at 61⅜; Sun Microsystems, Inc. finished at 30⅜, down 2⅜; and Compaq Computer Corp. edged up ⅛ of a point to 34½.
- Microsoft Corp. fared worse after news of a gloomy internal memo hit the streets, sinking 10¼ points by Thursday to 100¾. Software rival Borland International, Inc. fell 4 points to 47. Adobe Systems, Inc. bucked the tide, rising 2¼ to 51.
- On the legal front: Hewlett-Packard Co., Microsoft's codefendant in a suit levied by Apple Computer, Inc., stumbled 1⅜ to 50⅜. Apple ended at 42, shaving ⅛ of a point. Everex Systems, Inc. held steady at 4⅜ after winning damages along with Microsoft in a separate case.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JUNE 21, 1991

TOP PERCENT GAINERS

Microcom Inc.	24.09
Sybaltern Inc.	20.09
MIPS Computer Systems	13.79
Quantum Corp.	11.25
Ansoomp Inc.	10.71

TOP PERCENT LOSERS

Altent Computer Sys.	-22.22
Legent Corp.	-15.54
Data Switch Corp.	-15.38
Televideo Systems	-15.27
Relcon Inc.	-14.89

TOP DOLLAR GAINERS

Symantec Corp.	2.50
MIPS Computer Systems	2.00
Cabletron Systems	2.00
BGS Systems Inc.	1.75
Microcom Inc.	1.50

TOP DOLLAR LOSERS

Microsoft Corp.	-8.50
Digital Equipment Corp.	-5.13
Legent Corp.	-4.88
Borland Int'l	-4.75
Storage Technology	-3.25

Exch	52-Week High	52-Week Low		June 21 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Off 1.47%
OTC	16.00	5.38	3 COM Corp.	7.88	-0.25	-3.08
NYS	69.75	52.50	American Info Techs Corp.	57.13	-0.88	-1.51
NYS	42.38	29.00	AT&T	38.00	1.00	2.70
OTC	5.25	0.88	Antel Communication Corp.	2.00	0.00	0.00
NYS	58.25	39.50	Bell Atlantic Corp.	46.00	-0.25	-0.54
NYS	56.25	46.75	Bellsouth Corp.	48.88	-1.13	-2.34
NYS	44.00	13.13	Cabletron Systems	39.38	2.00	5.35
OTC	25.88	8.25	Compression Labs Inc.	16.63	-1.75	-9.52
OTC	5.13	2.75	Data Switch Corp.	2.75	-0.50	-15.38
NYS	38.13	6.88	Digital Comm. Assoc.	15.00	-0.63	-4.00
OTC	25.25	12.25	Dynatech Corp.	19.25	-0.80	-2.87
OTC	12.38	5.50	Fibronic Int'l Inc.	7.75	-1.13	-12.68
OTC	3.88	1.75	Gandalf Technologies Inc.	3.25	-0.25	-7.14
NYS	4.13	1.63	General Datacomm Inds.	3.00	-0.13	-4.00
NYS	33.50	23.50	GTE Corp	29.75	0.13	0.42
NYS	63.00	40.25	ITT Corp.	50.38	-0.63	-1.84
OTC	42.63	17.88	MCI Communications Corp.	28.50	-0.50	-1.87
OTC	9.50	2.75	Microcom Inc.	7.75	1.50	24.00
NYS	9.75	4.00	Network Equipment Tech.	9.13	-0.50	-5.19
OTC	14.63	4.00	Network General	6.88	0.88	7.38
OTC	15.50	8.13	Network Systems Corp.	12.63	-0.63	-4.72
NYS	38.13	22.13	Northern Telecom Ltd.	38.75	-1.13	-2.97
OTC	58.50	17.25	Novell Inc.	49.25	-0.26	-0.51
NYS	83.50	67.00	Nynex Corp.	88.50	-1.13	-1.88
NYS	47.50	36.25	Pacific Telesis Group	40.25	-0.25	-0.62
ASE	15.38	4.75	Parvi Corp.	14.50	0.00	0.00
NYS	29.00	8.88	Scientific Atlanta Inc.	13.25	-0.38	-2.75
NYS	57.50	47.25	Southwestern Bell Corp.	51.13	-0.88	-1.68
NYS	40.50	20.63	United Telecom	39.00	1.13	3.90
NYS	40.75	32.38	US West Inc.	34.88	-0.88	-2.46
Computer Systems						Off 1.25%
OTC	5.00	0.56	Altent Computer Sys.	0.88	-0.25	-22.22
ASE	18.88	10.00	Amdahl Corp.	15.38	-0.58	-3.16
OTC	73.25	24.25	Apple Computer Inc.	42.00	0.75	1.82
OTC	11.00	4.25	Archive Corp.	6.63	-0.25	-3.64
OTC	32.75	7.50	AST Research Inc.	20.50	-2.38	-10.38
NYS	9.38	4.00	Bolt, Beranek & Newman	7.63	-0.25	-3.17
NYS	21.63	4.50	Commodore Int'l	12.50	-2.13	-14.59
NYS	74.25	32.50	Compaq Computer Corp.	33.63	-0.50	-1.47
OTC	2.13	0.13	Computer Automation Inc.	1.06	0.06	6.30
NYS	19.75	8.75	Control Data Corp.	10.88	-0.63	-5.43
NYS	20.88	8.38	Convex Computer	16.13	-1.00	-5.84
NYS	48.75	20.00	Cray Research Inc.	22.38	-3.00	-8.49
NYS	18.13	3.50	Data General Corp.	15.13	-0.63	-3.97
NYS	3.25	0.75	Datapoint Corp.	1.50	-0.25	-14.29
OTC	30.63	8.25	Dell Computer Corp.	22.63	-2.50	-9.95
OTC	66.88	46.50	Digital Equipment Corp.	60.25	-5.13	-7.84
NYS	35.75	13.75	Harris Corp.	27.88	-0.63	-2.19
NYS	55.13	34.88	Hewlett Packard Co.	51.50	0.00	0.00
NYS	139.75	98.25	IBM	99.63	-0.63	-0.62
OTC	13.50	7.75	Information Int'l	11.00	-0.88	-7.37
OTC	31.50	10.50	Intergraph	26.75	-2.00	-6.96
NYS	2.25	0.50	MAI Systems Corp.	0.56	-0.06	-9.52
NYS	148.75	114.00	Matsushita Electronics	118.00	-1.50	-1.26
OTC	23.88	9.00	Mentor Graphics Corp.	16.75	-1.13	-6.29
NYS	106.25	44.50	NCR Corp.	106.00	0.63	0.59
OTC	31.75	11.00	Pyramid Technology	19.25	1.25	6.94
OTC	33.25	9.75	Sequent Computer Sys.	13.75	-0.25	-1.79
NYS	47.25	18.00	Silicon Graphics	29.13	-3.25	-10.04
NYS	37.25	14.63	Stratus Computer Inc.	29.38	-1.13	-3.69
OTC	38.63	15.00	Sun Microsystems Inc.	29.63	-2.63	-8.14
NYS	24.75	8.88	Tandem Computers Inc.	14.88	-0.50	-3.25
NYS	39.50	23.50	Tandy Corp.	29.13	-2.88	-8.99
OTC	29.50	8.75	Teradata	16.00	0.38	2.56
NYS	7.88	1.38	Ultimate Corp.	5.63	0.50	9.76
NYS	14.00	1.75	Unisys Corp	3.88	-0.13	-3.13
ASE	5.75	2.00	Wang Labs Inc. (b)	4.00	0.25	6.67
Software & DP Services						Off 2.89%
OTC	63.00	17.00	Adobe Systems Inc.	50.38	-1.38	-2.66
OTC	13.50	6.00	Ascop	6.75	0.00	0.00
OTC	59.88	20.25	Atlas Corp.	43.25	-2.50	-5.46
OTC	28.50	12.00	American Mgmt. Systems	20.50	-0.75	-3.53
OTC	18.25	7.50	American Software Inc.	13.50	0.00	0.00
NYS	4.63	1.38	Ansoomp Inc.	3.88	0.38	10.71
OTC	23.50	10.00	Analysts Int'l	16.50	-0.25	-1.49
OTC	13.25	4.88	Ashton Tate	10.75	-0.50	-4.44
OTC	10.25	4.00	ASK Computer Sys.	7.63	-0.63	-7.58
NYS	37.00	22.63	Auto Data Processing	22.00	0.00	0.00
OTC	60.50	32.00	Autodesk Inc.	57.50	-2.25	-3.77
OTC	31.50	18.50	BGS Systems Inc.	29.00	1.75	6.42
OTC	43.88	17.75	BMC Software Inc.	38.50	-0.25	-0.86
OTC	21.50	8.88	Boole & Babbage Inc.	9.50	-0.75	-7.32
OTC	84.25	14.50	Borland Int'l	46.50	-4.75	-9.27
NYS	6.38	0.44	Businessland Inc.	1.13	0.00	0.00
OTC	20.88	5.13	Cognos Inc.	14.38	-0.58	-3.36
NYS	16.63	4.38	Computer Associates	10.25	-0.25	-2.38
OTC	17.75	9.50	Computer Horizons	11.50	0.75	6.98
NYS	73.25	36.75	Computer Sciences	57.38	-1.13	-1.84
NYS	11.25	6.63	Computer Task Group	8.13	-0.25	-2.99
OTC	25.25	13.00	Comshare Inc.	19.63	-0.13	-0.63
OTC	16.00	3.75	Corporate Software	9.50	-0.75	-7.32
NYS	49.00	27.38	General Motors E (EDS)	46.63	-0.50	-1.06
OTC	18.75	7.25	Goal Systems Int'l	13.50	-0.50	-3.57
OTC	7.00	1.88	Hogan Systems Inc.	5.25	-0.56	-9.60
OTC	23.63	7.75	Information Resources	21.00	-0.25	-1.18
OTC	17.50	2.69	Informix Corp.	6.25	0.25	4.17
OTC	7.88	1.38	Intellicorp Inc.	1.75	-0.06	-3.47
OTC	8.25	2.50	Interleaf Inc.	6.00	-0.38	-5.88
OTC	15.88	6.88	Interwin	9.00	0.00	0.00
OTC	43.25	10.00	Knowledgeware Inc.	25.50	-2.50	-8.93
OTC	46.00	16.75	Legent Corp.	28.50	-4.88	-15.54
OTC	36.50	12.50	Lotus Development	30.75	-2.00	-6.11
OTC	32.00	13.63	Microgrids	16.75	0.25	1.52
OTC	117.50	80.75	Microsoft Corp.	102.25	-8.50	-8.59
NYS	10.50	4.00	On Line Software Int'l	9.25	-0.50	-5.13
OTC	24.00	4.88	Oracle Systems	9.75	-0.38	-4.11
NYS	14.88	7.00	Parasonic Systems	11.13	-1.13	-9.18
OTC	9.25	1.25	Phoenix Technologies	7.75	0.25	3.33
NYS	52.00	33.38	Policy Management Sys.	47.63	-1.38	-2.81
NYS	22.75	11.50	Reynolds & Reynolds	21.00	-0.50	-2.33
OTC	27.25	14.75	Sell Corp	26.25	-0.25	-0.94
OTC	22.75	12.50	Shared Medical Systems	21.13	1.13	5.63
OTC	35.25	12.00	Software Publishing Corp.	19.00	-0.50	-2.56
NYS	14.63	5.50	Sterling Software	11.38	-1.63	-12.50
OTC	28.00	9.50	Sungard Data Sys.	16.50	-0.75	-4.35
OTC	55.88	17.75	Symantec Corp.	45.50	2.50	5.81
NYS	22.63	4.50	System Center Inc.	9.00	0.00	0.00
OTC	37.25	12.50	System Software Assoc.	14.13	-1.00	-6.61
OTC	22.75	4.75	Wallack	10.00	-1.50	-13.04
Semiconductors						Off 3.68%
NYS	14.25	3.63	Advanced Micro Devices	12.00	-0.75	-5.88
NYS	12.50	5.50	Analog Devices Inc.	9.75	-0.38	-3.70
OTC	21.75	5.25	Chips & Technologies	8.50	-0.63	-6.85
OTC	59.25	28.00	Intel Corp.	47.00	-1.63	-3.34
NYS	13.00	5.13	LSI Logic Corp.	8.13	-0.88	-9.72
NYS	19.13	6.75	Micron Technology	13.13	-1.13	-7.89
OTC	20.88	7.25	MIPS Computer Systems	16.50	2.00	13.79
NYS	68.25	46.75	Motorola Inc.	66.00	0.75	1.15
NYS	8.38	3.00	National Semiconductor	5.75	-0.75	-11.54
NYS	47.63	22.50	Texas Instruments	34.50	-1.38	-3.83
OTC	12.25	3.00	VLSI Technology	8.00	-1.38	-14.67
ASE	14.25	4.00	Western Digital Corp.	4.50	0.25	5.88
Peripherals & Subsystems						Off 3.27%
OTC	2.75	0.88	Aperture Technologies	1.88	0.00	0.00
OTC	22.63	7.50	Banctec Inc.	12.50	-0.50	-3.85
OTC	17.50	4.25	Cambex Corp.	11.13	-1.63	-12.75
ASE	11.75	4.13	Cognitronics Corp.	5.75	0.50	9.52
NYS	31.25	14.63	Conner Peripherals	16.88	-0.88	-4.93
ASE	22.00	7.00	Datarem Corp.	10.75	-0.13	-1.15
NYS	13.00	4.25	EMC Corp.	10.25	-1.50	-8.89
NYS	47.25	33.75	Eastman Kodak Co.	40.75	-1.13	-2.69
OTC	11.25	4.75	Emulex Corp.	7.75	-0.63	-7.46
OTC	31.50	14.00	Evans & Sutherland	19.50	0.75	4.00
OTC	8.50	3.88	Iomega Corp.	5.50	0.00	0.00
OTC	28.25	6.75	IPL Systems Inc.	19.88	-2.13	-9.68
OTC	1.38	0.13	Maxtor Systems	0.69	0.03	4.55
OTC	15.88	2.63	Maxtor Corp.	3.50	-0.38	-9.68
OTC	18.50	4.38	Micropolis Corp.	8.75	-0.50	-5.40
NYS	97.50	73.63	3M Corp	95.88	1.00	1.05
OTC	13.13	8.00	Petrotrix Inc.	8.00	-0.25	-4.00
NYS	34.75	8.50	QMS Inc.	20.38	-1.25	-5.78
OTC	19.25	8.25	Quantum Corp.	11.13	1.13	11.25
NYS	7.88	4.38	Recognition Equipment	7.00	-0.25	-3.45
OTC	11.50	4.00	Reson Inc.	7.88	-1.38	-14.88
OTC	19.88	5.63	Seagate Technology	9.38	0.00	0.00
NYS	47.00	11.00	Storage Technology	37.25	-3.25	-8.02
OTC	4.75	1.25	Tandon Corp.	3.31	0.00	0.00
NYS	26.38	11.63	Tektronix Inc.	26.25	0.38	1.45
OTC	0.53	0.16	Televideo Systems	0.34	-0.06	-15.27
NYS	60.13	29.00	Xerox Corp.	53.75	-0.50	-0.92
Leasing Companies						Up 2.28%
OTC	16.25	7.00	Amplicon Inc.	15.00	0.00	0.00
NYS	28.38	14.63	Comdisco Inc.	23.00	-1.25	-5.15
OTC	16.00	9.25	LDI Corporation	14.00	-0.50	-3.45
OTC	5.50	2.25	Safeterms Inc.	4.50	0.75	20.00

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Freedom

FROM PAGE 1

Technology in Gaithersburg, Md. "There are very few things that are either completely open or totally closed. The majority of the things are in-between, and users have to recognize that there is that continuum."

Eventually, many believe, the basic components of an open systems architecture will be worked out by users and various industry consortia, and products will materialize based on these definitions. Users will have the choices they want and will be assured of mostly compatible systems — both in the new computers just coming out and in their existing, so-called legacy, installed base.

Vendors have split into two leading industry groups, the Open Software Foundation (OSF) and Unix System Laboratories, Inc., to produce the premier definition of an open system based on different versions of the Unix operating system.

Although the groups are producing operating systems and other components of open systems that embody different approaches, executives from both camps said their operating systems are essentially compatible because they both abide by the same basic set of standards.

"The industry is coalescing in some pretty solid directions, but we have a long way to go," said Charles Gardner, director of information technology architecture at Eastman Kodak Co.'s Photographic Products Group in Rochester, N.Y. "Every vendor always implements something to differentiate, so users need to be smart. They need to know what's standard and what's not."

However, that is not always easy to discern. With at least 15 different versions of Unix and three different implementations of the OSF's OSF/1 operating system in the works, it can be difficult for users to figure it all out. Because none of the OSF/1 versions are available yet, it is unclear how compatible they will all be. But the vendors involved have already stated that they will build "value-added" features on top of OSF/1.

Maintaining standards

Vendors maintain that it is perfectly fine to differentiate, as long as the standards are maintained. "Interfaces can support many implementations," said Peter Cunningham, president of Unix International, the industry consortium in Parsippany, N.J. "An application programming interface just says the interface has to be a certain way, and if you implement against that, it will guarantee interoperability."

But for now, that simplicity is just a promise. Complicating the issues is the jockeying for position under way among industry consortia, several of which are laying claim as the standard bearer of open systems.

"It's a time of real confusion, but that's OK," said Judith Hurwitz, vice president at Patricia Seybold's Office Computing Group in Boston. "The market is sorting itself out. Change is very painful, not smooth and neat. The world is just not that simple anymore."

Still, some skeptics question whether vendors are truly working toward openness or just hyping up this year's leading marketing term. "I don't think any vendor will sacrifice profitability to bring standards to the world," said Gerald Tellefsen, senior vice president at Tellefsen Consulting Group, Inc. in New York.

Many users do see progress, however, especially when today's systems are compared with those from even a few years ago. But there is impatience with what some see as the snail's pace of progress. To help push open systems along, a group of about a dozen large users will make public in early July a list of de facto and formal standards it wants vendors to implement — and a timetable by which the group wants them implemented.

Next week: Vendors look for a proprietary edge to distinguish their open systems from others.

Too many cooks spoiling open systems broth?

Virtually everyone agrees that there are too many overlapping consortia trying to call the industry tune. But no one is exactly volunteering to go out of business, so the groups are jockeying for position to see which become the umbrella organizations that coordinate the most activities.

"There are too many standards groups and too many standards," said Ronald D. Lachman, executive vice president at Interactive Systems Corp. in Naperville, Ill. "We participate in about 25 groups, and I'm personally involved in four."

Dues can run high: Members pay $2.5 million per year to belong to the Cambridge, Mass.-based Open Software Foundation (OSF) and between $9,500 and $25,000 per year for membership in the Corporation for Open Systems.

No one has an accurate count of exactly how many industry groups there are, but the number easily reaches about 50, including the following:

- 88open Consortium Ltd. in San Jose, Calif., is the "gimmick," as President Thomas Mace said, for getting independent software vendors to port to the Motorola, Inc. 88000 platform.
- Sparc International in Menlo Park, Calif., has taken the mantle of Scalable Processing Architecture development from Sun Microsystems, Inc. and put it in the hands of its 195 members.
- Advanced Computing Environment (ACE) has no centralized organization. ACE is made up of about 30 members that have agreed to sell computers based on either the Mips Computer Systems, Inc. architecture or Intel Corp.'s 80286, 80386 or I486.
- The Corporation for Open Systems in McLean, Va., with more than 50 members, sees itself as a forum for users and vendors to come together and resolve issues. It has a testing and product-branding program for products that adhere to Open Systems Interconnect or Integrated Services Digital Network.
- X/Open Consortium Ltd. in London, developed the X/Open Portability Guide (XPG), which includes various interface specifications. XPG has been adopted by 19 vendors so far.
- Unix International in Parsippany, N.J., has some 230 members, virtually all vendors. Unix International gathers requirements for what its members want to see in AT&T's Unix System V and then gives those requirements in the form of a "road map" to Unix System Laboratories, Inc.
- The OSF calls itself a "member-sponsored research and development organization aimed at bringing global acceptance" to open software. About 60 of its 300 members are user organizations.
- The National Institute of Standards and Technology (NIST) in Gaithersburg, Md., is a U.S. government agency. NIST holds so-called "implementors' workshops" to help reach consensus on how vendors will actually implement standards.
- Uniforum in Santa Clara, Calif., was originally a technically oriented group made up mostly of Unix programmers. Currently, it is trying to take on a general role of promoting Unix and open systems.

Open systems dynamics

Demand for open systems is driving up market share for Unix-based systems, particularly in the workstation and minicomputer segments

Percent of installed computer platforms running Unix

Platform	1989	1990	1991*	1992*	1993*
[redacted]					
[redacted]	23%	34%	48%	60%	72%
[redacted]					
[redacted]	3%	4%	5%	6%	8%

Source: The Yankee Group — * Projected

The battle for control of the movement has forced major vendors into the opposing camps of the Open Software Foundation and Unix International, although a number of companies have a foot in each group

Both**
88open Consortium Ltd.
Altos Computer Systems
Concurrent Computer Corp.
Interactive Systems, Inc.
Informix Software, Inc.
Locus Computing Corp.
Phoenix Technologies Ltd.
Silicon Graphics, Inc.
Stratus Computer, Inc.
Wang Laboratories, Inc.

Source: The Yankee Group — **Does not include full membership rosters

Meanwhile, technology investment priorities for the next three years are remarkably similar for both open systems adopters and nonadopters

Survey of 2,750 U.S. businesses (published October 1990)

New technology priority	Open systems adopters: Importance	Open systems adopters: Mean***	Open systems nonadopters: Importance	Open systems nonadopters: Mean***
[redacted]				
[redacted]	3	7.9	2	6.7
[redacted]				
[redacted]	4	7.9	5	6.1
[redacted]				
[redacted]	6	6.9	4	6.4
[redacted]	8	6.6	9	5.6

Source: DMR Group, Inc. — ***On a scale of 1 to 10 where 1 is low priority

CW Chart: Tom Monahan

Open book on open systems

A big part of the confusion in open systems revolves around defining the term. Virtually everyone, it seems, has his own take on what an open system is.

Still, some agreement is being reached. Based on interviews with more than 40 users, consultants, vendors and consortium representatives, the following definition is pretty much agreed on:

An open system has three basic criteria: interoperability, scalability and portability. That is, it communicates with other systems, both open and proprietary; it allows a choice of anything from a desktop computer to a mainframe; and it allows software to be run across the board without being recompiled for various hardware systems.

Also, an open system is precisely that — a system. It encompasses a wide range of hardware and software, from operating systems to databases and applications, all of which meet the three criteria above. The Unix operating system, widely heralded by some as the answer, is only one part of the equation, most people agreed.

The arguments begin when a fourth item is added to the definition. Some users insisted that a truly open system is based on vendor-neutral standards achieved by consensus, such as the International Organization for Standardization's Open Systems Interconnect model for communications. Furthermore, proponents said, these open standards must be controlled by consortia, not by any one vendor.

However, some insisted that the industry cannot wait for formal standards to be developed because that takes too long. What is needed in the interim are products that adhere to some generally agreed upon ways of doing things, even if they are not yet [redacted] standards.

NEWS SHORTS

Travelers to cut IS staff

The Travelers Corp. said last week it is trying to lighten the ranks of its mid- to high-level information systems management to reduce costs. In a prepared statement, the Hartford, Conn., firm said it will try to persuade up to 300 of the managers to take a voluntary early retirement program. A spokesman said the company is making the move because a "significant" part of the overall IS budget is tied to those salaries, although he would not provide details. The 300 managers represent about 9% of Travelers' 3,400-person IS work force.

No surprises in after-hours trading

After a week of computerized after-hours trading, the New York Stock Exchange (NYSE) said the extra-hour sessions went as expected. Since the extended hour was added June 13, the exchange has logged an average of 432,000 shares for the first after-hours segment and 1.5 million shares for the second. Augmenting its trading day has been seen as the NYSE's effort to win back individual and institutional investors who now conduct an estimated 15 million to 20 million orders on other exchanges when the NYSE is closed.

Apple cuts will cost Sculley

Apple Computer Inc. began its first wave of 1991 layoffs last week, issuing 900 pink slips to employees. However, 300 more layoffs are expected in July, an Apple spokesman said last week. By May 1992, 1,500 jobs will have been lost through layoffs and attrition, resulting in a 10% overall reduction from Apple's May 1991 work-force level of 15,600. Apple also announced last week that Chief Executive Officer John Sculley would be taking a 15% pay cut, effective June 28, reducing his salary from $2.3 million to $1.9 million.

Hospital wins in faulty-system case

St. Luke's Hospital in Saginaw, Mich., was awarded a judgment of $850,000 in damages last week against SMS Computer Systems, Inc., a Malvern, Pa.-based systems house. The suit, brought by St. Luke's in 1987 and decided by a court-appointed arbitrator, concerned the hospital's 1984 contract with Computer Synergy, Inc. for an integrated hospital information system. Computer Synergy was acquired by SMS in 1985. The hospital argued that the system failed to perform as contracted.

Occam COO moves to Forrester

Occam's loss is Forrester's gain as Neal Hill has left Occam Research Corp., a Watertown, Mass.-based software development company. The former chief operating officer will join Forrester Research, Inc., a consulting firm in Cambridge, Mass. Hill will take on the position of senior analyst in Forrester's Software Strategy Service.

Adapso legal counsel dies

Milton R. Wessel, legal counsel to the Adapso trade association for the computer software and services industry, died recently. Wessel, 67, was special assistant to Adapso President Luanne James and had been with Adapso since 1965. As general counsel for the association, Wessel most recently led Adapso's efforts to establish an Alternate Dispute Resolution program and served on the group's foundation board of directors.

Cox buys into Teleport

Merrill Lynch & Co. and Cox Enterprises, Inc. last week announced that they have signed a definitive agreement for Cox to acquire a 12.5% minority interest in the stock of Merrill Lynch's wholly owned subsidiary, New York-based Teleport Communications Group. Teleport owns and operates fiber-optic networks in 17 U.S. cities. The networks serve primarily as backup facilities to customers also using local telephone company networks. As part of the transaction, Merrill Lynch and Cox said they will provide $80 million in additional funding for future Teleport expansion.

Hackers promote better image

BY MICHAEL ALEXANDER
CW STAFF

HOUSTON — Three self-professed members of the Legion of Doom, one of the most notorious computer hacker groups to operate in the U.S., said they now want to get paid for their skills. Along with a former securities trader, the members launched a computer security firm last week called Comsec Data Security that will show corporations how to keep hackers out.

"We have been in the computer security business for the last 11 years — just on the different end of the stick," said Scott Chasin, who said he once used the handle Doc Holiday as a Legion of Doom member. The group has been defunct since late last year, Chasin said.

The start-up firm plans to offer systems penetration testing, auditing and training services as well as security products. "We have information that you can't buy in bookstores: We know why hackers hack, what motivates them, why they are curious," Chasin said.

Already, the start-up has met with considerable skepticism.

"Would I hire a safe breaker to be a security guy at my bank?" asked John Blackley, information security administrator at Capital Holding Corp. in Louisville, Ky. "If they stayed straight for five to 10 years, I might reconsider, but 12 to 18 months ago, they were hackers, and now they have to prove themselves."

"You don't hire known ne'er-do-wells to come and look at your system," said Tom Peletier, an information security specialist at General Motors Corp. "The Legion of Doom is a known antiestablishment group, and although it is good to see they have a capitalist bent, GM would not hire these people."



Dan Reed Connolly/Picture Group

Launching a security firm: *(From left) Kenyon Shulman, Scott Chasin and Chris Goggans, former members of the Legion of Doom, with Robert Cupps*

Comsec already has three contracts with Fortune 500 firms, Chasin said.

"I like their approach, and I am assuming they are legit," said Norman Sutton, a security consultant at Leemah Datacom Corp. in Hayward, Calif. His firm is close to signing a distribution pact with Comsec, Sutton said.

Federal law enforcers have described the Legion of Doom in indictments, search warrants and other documents as a closely knit group of about 15 computer hackers whose members rerouted calls, stole and altered data and disrupted telephone service by entering telephone switches, among other activities.

The group was founded in 1984 and has had dozens of members pass through its ranks. Approximately 12 former members have been arrested for computer hacking-related crimes; three former members are now serving jail sentences; and at least three others are under investigation.

None of the Comsec founders have been charged with a computer-related crime.

Lotus notes

FROM PAGE 1

the product would be positioned as an intermediary solution pending the release of a corrected Officevision LAN 2.0.

Analysts agreed that IBM has to provide an update on Officevision LAN 2.0 and OS/2, which has already suffered at least three delays. "If IBM does not have any concrete, substantive announcement [this] week, it will clearly be a fiasco," the source close to IBM said.

There will be an announcement, but whether Lotus will be part of it is uncertain. The problem, then, is the extent to which IBM is willing to highlight the Notes contribution.

Working this through "is in the best interests of both Lotus and IBM," said Stuart Woodring, an analyst at Forrester Research, Inc. He added that both firms want to move forward.

"Lotus wants this deal for exposure and distribution, not the revenue," said Woodring. "Notes has yet to establish the beachhead that it needs to invade corporate America."

Strong indications

At an analyst briefing last May, IBM gave strong indications that it would respond to user requests for an "Officevision Lite" and/or a low-cost, low-level entry point to Officevision, several attendees said.

IBM also wants access to Lotus' CC:Mail electronic mail technology. Mail is one of Officevision's missing building blocks. Many companies need to choose an E-mail system before they can begin to consider an office automation package, Daubeck said.

At that May briefing, Tony Mondello, IBM's Programming Systems Director of Office Systems Development, responded to a question about IBM's interest in CC:Mail by saying that he would recommend it to customers, several attendees said.

The anticipated licensing arrangement with Lotus will be handled by IBM's Desktop Software Group, according to a source close to Lotus. The Milford, Conn.-based Desktop Software Group is charged with licensing technology from third parties for repackaging under the IBM logo.

Not ready

A second source close to Lotus said the company is ready to roll out its "Notes SWAT team" as soon as they get the green light from IBM.

IBM, on the other hand, is after specific pieces of technology, including Notes' database engine, asynchronous terminal support with network security and a graphical front end to the Notes client, according to a source close to IBM.

In addition, IBM is rewriting chunks of Officevision code, currently developed under C, in Borland International, Inc.'s C++, sources said. Borland recently announced that it had agreed to port C++ to OS/2.

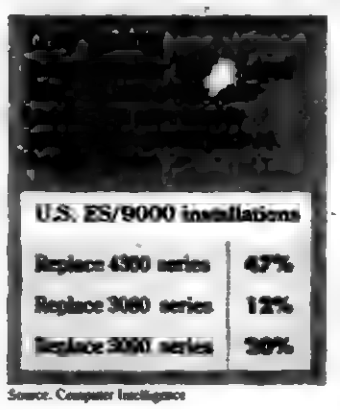
IBM stung

FROM PAGE 1

than the estimated 14,000 employees to leave IBM this year through a voluntary program.

IBM's immediate financial problems are, to a great extent, the result of the current lackluster mainframe product transition, analysts said.

Demand appears solid for the fully equipped Enterprise System/9000 models that will ship later in the year, several analysts said, so they expect an upswing in mainframe sales. But currently available ES/9000s did not sell as IBM had hoped during the first half of the year.



Source: Computer Intelligence

Company executives acknowledged that some large systems customers put off mainframe purchases in the first half of 1991 but said it was strictly because of a soft economy.

"The customers are postponing buying machines that in a stronger economy they would have purchased for sure," said Irving Wladawsky-Berger, assistant general manager of development at IBM's Enterprise Systems Division.

IBM attributed its financial problems to a weak economy, competitive pressures and product transitions, in addition to the mainframe line. While several analysts agreed, some also suggested that IBM's 1991 performance tells a bigger story.

"There's a decade-long transition happening here" as the revenue mix shifts from almost exclusive reliance on proprietary, high-margin products to an increasing percentage from standards-based products, said Frank Gens, vice president at Technology Investment Strategies Corp. "The profit implications of that are pretty clear. Margins will be much thinner."

Burden on mainframe

Gens and other analysts said that while IBM's current financial problems have been caused by competitive pressures in most industry segments, the mainframe business shoulders much of the responsibility. Some estimated that the large systems sales, including software and maintenance, account for about half of IBM's annual revenue and profits.

James Cassell, vice president at Gartner Group, Inc., said the mainframe transition illustrates a larger problem he calls "architectural gridlock," which has showed up in other product lines.

Cassell said IBM announced not only hardware but also software enhancements that it cannot deliver until later this year or next year. As a result, it has only a promise of new functionality to sell now. The actual systems it can deliver are commodities without those enhancements.

"They can't break out of a commodity-like marketplace," Cassell said, "and they are not structured to be a commodity company. They are structured to be a premium-price house."

Net plans get cool reception

IBM's announcements strike industry as restrictive, disappointing

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — IBM made several networking gestures last week that analysts described as conservative, ho-hum and predictable.

Although they acknowledged that IBM's moves into frame-relay technology, Transmission Control Protocol/Internet Protocol (TCP/IP) routing and enhanced Netview network management will benefit users, observers called the company's noncommittal ship dates and limited product scope disappointing.

IBM's announcement of two beefed-up models of its 3745 Communications Controller that offer 50% to 300% performance increases was the most positive move, one analyst said. But he cited hefty $42,000 to $72,600 upgrade prices as a drawback.

While IBM announced its intention to put a frame-relay interface on the 3745, it gave itself two years of ship-date elbowroom. No mention was made of putting a complementary frame-relay interface on the 3174 and 3172 cluster controllers.

"This is restrictive because the whole point of frame relay is to provide flexibility about where you can direct your information flow," said Mark Leary, director of communications research at Technology Investment Strategies Corp. in Framingham, Mass.

Steven A. Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C., said the 3745 is an appropriate initial frame-relay platform because "it opens up the technology to the large installed base of 3745s" but "doesn't address the 'flatter' topology" IBM advocates.

Frame relay is a form of packet switching that is a faster alternative to X.25 technology. Network Equipment Technologies, Inc. is putting a frame-relay interface and multiprotocol routing capabilities on its IDNX T1 multiplexer — which IBM resells — by December.

IBM also said it will tweak 3745 software to support encapsulated TCP/IP routing within two years. Large IBM shops often use the 3745 to route network traffic.

"If I were a customer, I'd seriously look at the drawback of routing TCP/IP encapsulated in [Systems Network Architecture] packets," said Mary Johnston-Turner, a principal at Northeast Consulting Resources, Inc. in Boston. "The real backbone continues to be SNA, and wrapping the TCP/IP in SNA is a real cycle hog."

On the network management front, IBM said it will ship Netview Service Points on its RISC System/6000 AIX platform, as well as the Sun Microsystems, Inc. Sparcstation, on July 26. Users will gain a direct link to IBM's Netview enterprise network management system and functionality that mirrors that of Netview/PC. Previously, the Unix workstations had to communicate with Netview/PC, IBM's software for managing non-IBM network devices.

"This move broadens network management access, but it doesn't really address distributed network management," Leary said. "You can probably count the people who have been satisfied with Netview/PC on one hand."

IBM's net points:

- Two faster models of the 3745 Communications Controller to ship in October 1991.
- 3745 host-to-host frame-relay interface within two years.
- Ethernet adapter card for the 3745 in third-quarter 1992.
- Support of encapsulated TCP/IP routing through the 3745 within two years.
- Resale of NET's IDNX T1 multiplexer with multiprotocol routing and frame-relay interface — December 1991.
- Ship date for IBM-developed stand-alone multiprotocol router to be announced by year's end.
- AIX, Sparcstation Netview Service Points to ship in July.
- Field test for fused multivendor Netcenter and SNA-only Graphics Monitor Facility to commence early in 1992.

Intel claims 50% performance gain for new chip

BY JIM NASH
and MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — IBM and Compaq Computer Corp. will lead the pack of vendors out of the gate this week with desktop personal computers based on the Intel Corp. 50-MHz I486DX microprocessor. The semiconductor company revealed details last week of its latest chip.

Intel has combined its chip with a second-level cache memory to attain the 50% performance gain that the firm said the DX has over its 33-MHz I486 microprocessor.

Limited amounts of the chip-cache module will be available next month, according to Intel. Volume shipments are expected in the fourth quarter.

Compaq's Deskpro 486/50L will range from a suggested retail price of $11,299 for a model with a 120M-byte hard disk to $13,999 for one with a 510M-byte hard disk.

Lynn Schlemeyer, Compaq's director of new product marketing, said the firm expects the 486/50L to be "a strong contributor to revenues" in 1991, despite a third-quarter ship date.

Unlike a number of high-end Intel-based desktop PCs announced recently, the 486/50L will not be upgradable. Schlemeyer said Compaq's design goals — "to get the highest level of performance from the machine" — required Compaq to tailor the system exclusively to the 50-MHz Intel chip.

DX demos

IBM, Dell Computer Corp. and NCR Corp. have demonstrated machines running the DX, although none has announced dates for shipping new machines or upgrade boards for existing computers.

IBM is expected to announce Personal System/2 Models 90 and 95 using the 50-MHz chip, as well as upgrade cards to allow users to upgrade earlier versions of the 90 and 95 that used the 20-MHz I486SX or the 25-MHz or 33-MHz I486.

IBM's PS/2 486/50 processor upgrade option will cost $3,695 for users of 33-MHz systems and up to $7,245 for users of I486SX systems.

Dell began marketing a PC using the new chip in Europe, according to Charlie Sauer, vice president of Dell's advanced systems development. A U.S. version will follow soon, he said.

A Netframe Systems, Inc. spokesman said his firm has reviewed the DX chip and intends to use it in one of its multiple independent bus superservers.

Dana Krelle, marketing manager for Intel's 386 architecture, said the new chip is designed for mainframes, entry-level PC servers and high-end desktops.

Krelle said that combining the chip with the memory cache on a board should save computer makers time that would be spent designing their own cache interfaces. He also said placing caches close to the microprocessor quickens CPU operations by reducing the distance and hardware that instructions must pass through.

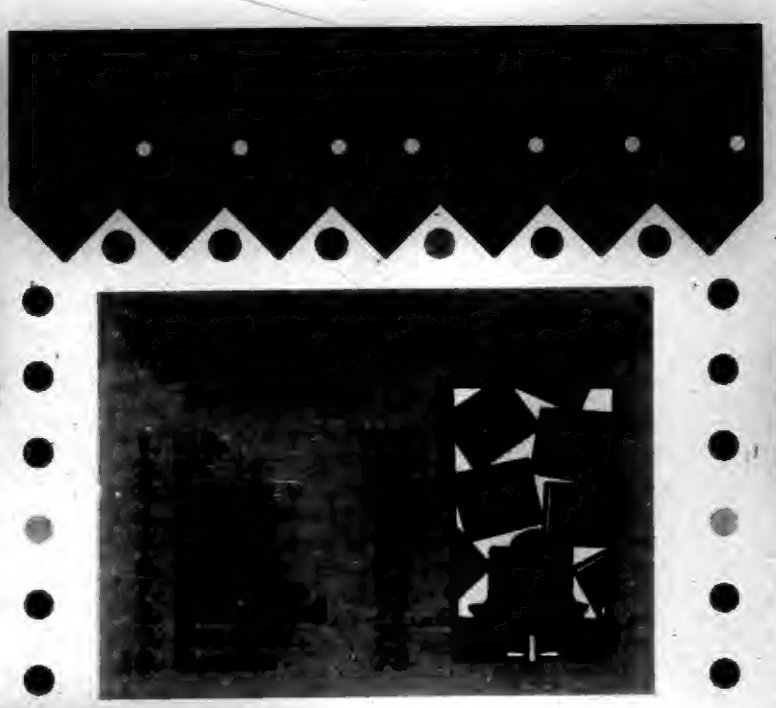
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A computer simulation of a hypersonic vehicle traveling at Mach 12.4, showing pressure on its surface and on a cross-section of the shock wave. Magenta is the highest pressure, blue the lowest.



Dumpin' on DOS

"I don't consider DOS an operating system. It's a bad collection of device drivers and I/O drivers." – *Michael Purcell, software consultant, Baxter Healthcare Corp., during a panel discussion on different platforms for client/server computing.*

OFFICE

A survey of 1,476 professional men and women found the following are unacceptable practices in the workplace:

1. **Kissing (86% rate it unacceptable**
2. **Ethnic jokes (84%)**
3. **Sexual jokes (83%)**
4. **Swearing (69%)**
5. **Short skirts (64%)**
6. **Wearing sandals (61%)**
7. **Smoking (61%)**

What's acceptable?

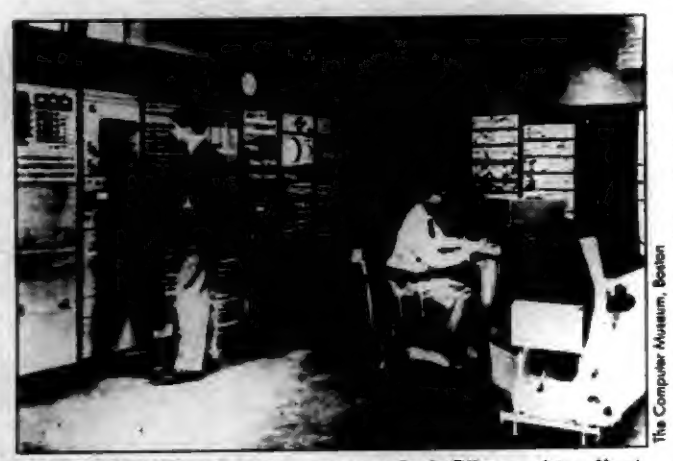
1. **Family pictures (98%)**
2. **Perfume (90%)**
3. **Long hair on men (70%)**
4. **Hugging (60%)**
5. **Touching (58%)**

▶ Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

(Sources: "Working Smart," a management newsletter published by the National Institute of Business Management, New York; The 1990 Computer Industry Almanac; special thanks to The Computer Museum, Boston.

Fifteen minutes of bliss

"Everything you always wanted to know about ISDN but were afraid to ask will be answered in Bellcore's newest [15-minute] videotape on the subject." – from a Bellcore press release



The Computer Museum, Boston

IN 1951, *MIT systems programmer Jack Gilmore (standing) trained Joe Thompson, 18, to be one of the first two computer operators. The computer was the Whirlwind. Thompson, now 58, is a senior analyst at Unisys Corp. The Whirlwind is on display during The Computer Museum's "People and Computers: Milestones of a Revolution" exhibit opening June 29 in Boston.*

And it's easy on the feet

Who would trudge through the endless, crowded aisles of a high-technology trade show if you could view the bustling event from the comfort of your desktop computer? The Association of Computer Machinery is offering a digital invitation to its 18th annual Siggraph '91 graphics conference, which meets July 28 through Aug. 2 in Las Vegas. The interactive invite (available for both the Apple Macintosh and IBM PCs) features graphics and information, including a list of exhibitors and seminar programs at the show. A copy of the disk can be obtained from Siggraph '91 Conference Management (312) 644-6610.

INSIDE LINES

Writing was on the wall

▶ The quiet departure of Cal Bauer, Microsoft's chief evangelist for its new Trueimage page description language, had many in the industry buzzing about the future of the language. Code has been shipping since last October, but its arrival has been controversial in an industry that has come to regard Adobe's Postscript as the standard. The Bill Gates memo released last week declared: "Offering a cheap Postscript turned out to not only be very hard but completely irrelevant to helping our other technologies." On the other hand, Gates said, the Truetype font format has proved to be an excellent decision.

Industrial relations

▶ Current Adapso President Judy Hamilton has left her job as a partner at Ernst & Young to become senior vice president at Locus Computing Corp., a vendor of Unix-based software in Los Angeles. So what about husband Stephen McClellan, computer services industry analyst at Merrill Lynch in New York? He's moving as well — to the Merrill Lynch office in Santa Monica, Calif. Same job, better weather.

Cold War heating up

▶ Since the introduction of the Advanced Computing Environment (ACE) consortium, the reduced instruction set computing (RISC) architecture market is looking like the Cold War. RISC architecture vendors have pumped up the stakes and are stockpiling weapons in the RISC Superpower game. At least one RISC vendor now on Sun Microsystems' Scalable Processor Architecture will defect to ACE this week, according to Summit Strategies analyst Tom Kucharvy.

Water evaporates under the Sun

▶ Sun Microsystems' co-founder and former president, Vinod Khosla, has been cited as the largest water waster in the drought-stricken Silicon Valley town of Palo Alto, Calif. According to public records, Khosla's home used more than 4 million gallons of water in the past 12 months — enough to give every resident in California, New York and Texas a glass of water. Khosla, for his part, claims the excess use was due to the construction of his new house, a 13,000-sq-ft mansion.

Enforcer goes commercial

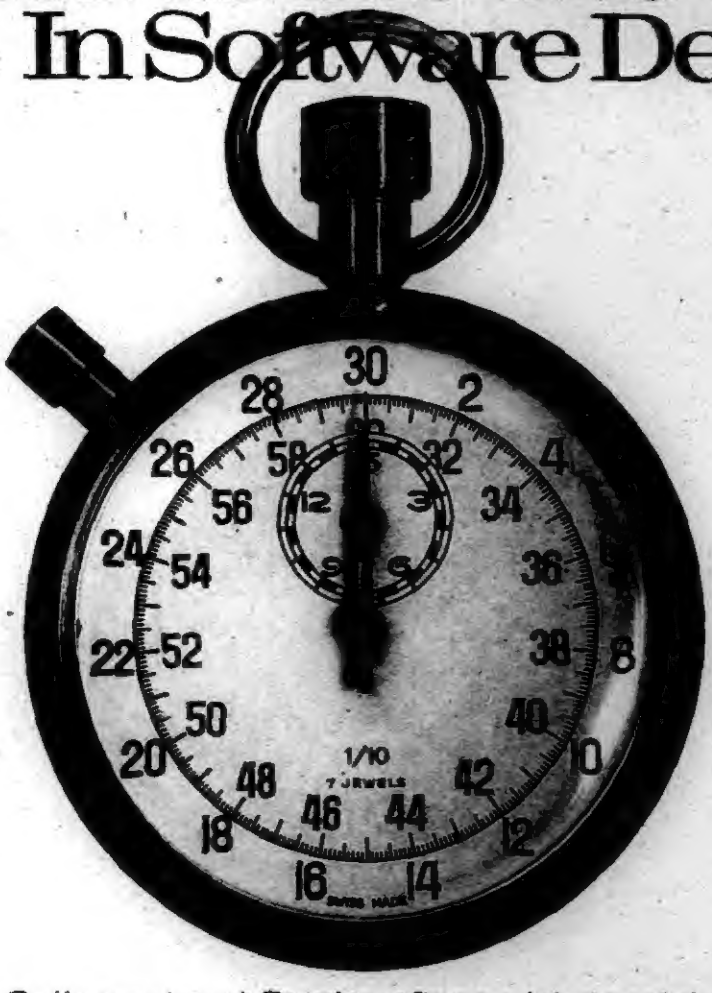
▶ Gail Thackeray, a special deputy attorney in Maricopa County in Arizona, has been appointed vice president at Gatekeeper Telecommunications Systems, Inc., a start-up in Dallas. Thackeray was one of the law enforcers working on Operation Sundevil, the much-publicized state and federal crackdown on computer crime. Gatekeeper has developed a device that it claims is a foolproof defense against computer hackers. Thackeray said her leaving will have little impact on the investigation, but one law enforcer, who asked not to be identified, said it is a sure sign the investigation is on the skids.

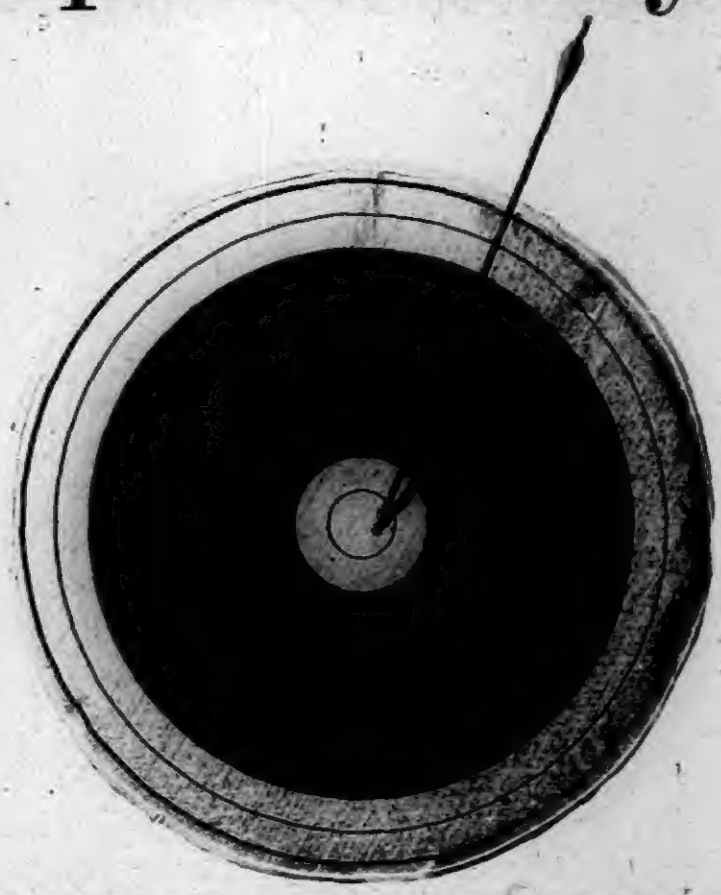
Don't repeat this

▶ Summing up his strategic insight for Microsoft's managers, Bill Gates, in his now-famous memo, offered a simple summary of the company's strategy: "Windows — one evolving architecture, a couple of implementations and an immense number of great applications from Microsoft and others." The reference to a number of implementations, he wrote, "is a somewhat humorous reference to the fact that our NT [New Technology]-based versions and our non-NT versions have a different code in a number of areas . . . Eventually, we will get back to one implementation, but it will take four years before we use NT for everything." But, he cautioned, "I would not use this simple summary for outside consumption . . ."

. . . And finally, lost in the stock market distraction over Bill Gates' warnings about challenges facing the firm was his recognition that successful companies are tied to their past and risk losing sight of what is important. The bottom line, Gates said, is that if Microsoft's strategy is executed, "The opportunity for us . . . is incredible." We, too, like incredible tidbits. Call them in to News Editor Pete Bartolik at (800) 343-6474, fax those secret memos to (508) 875-8931 or retransmit those electronic musings to our Compuserve address 76537,2413.

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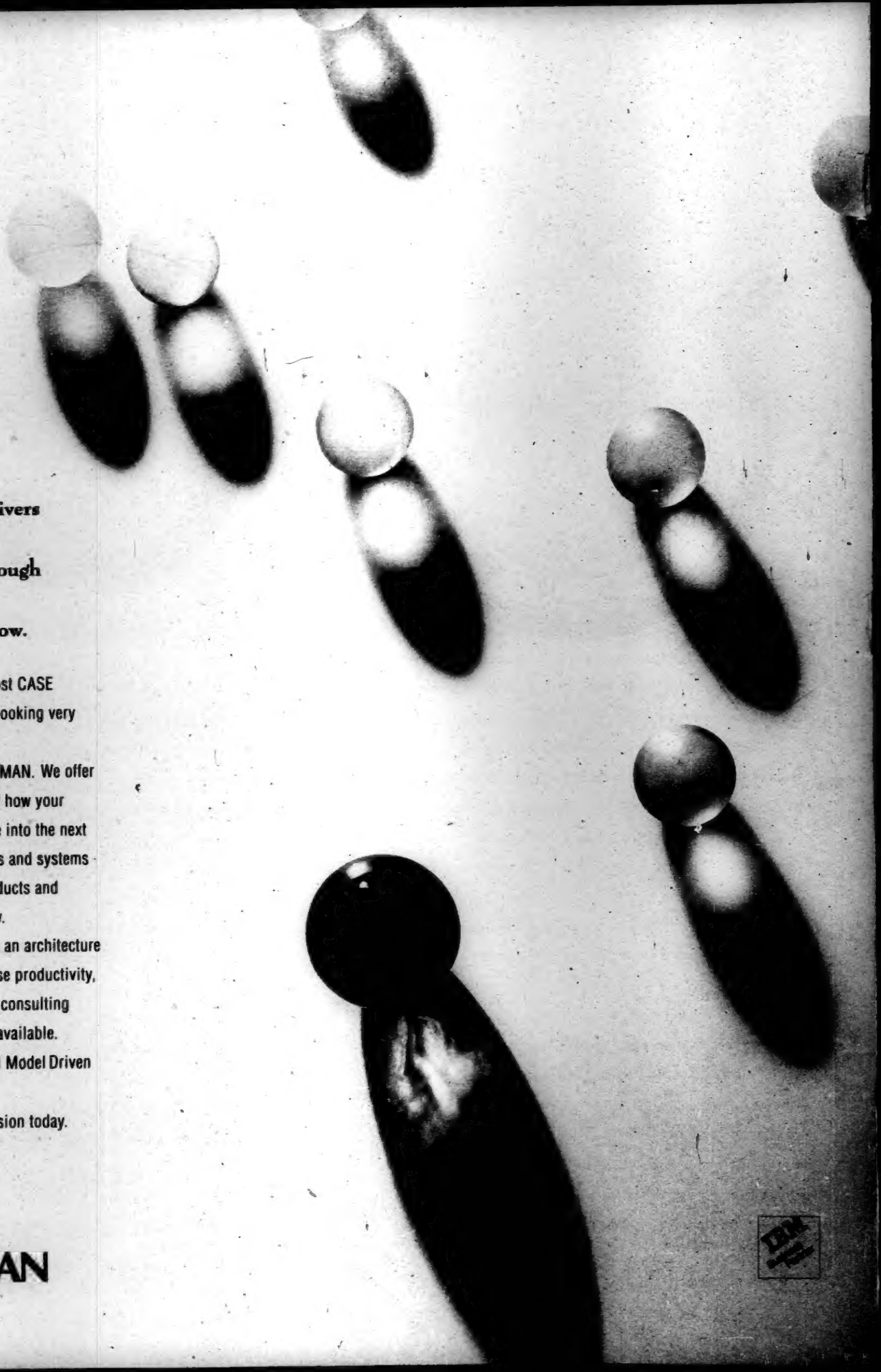


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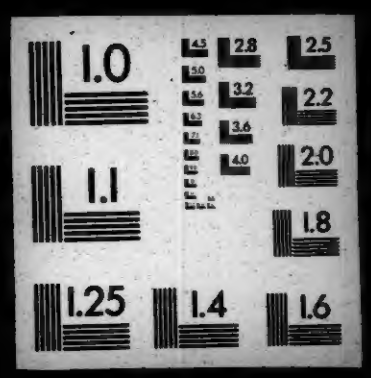
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